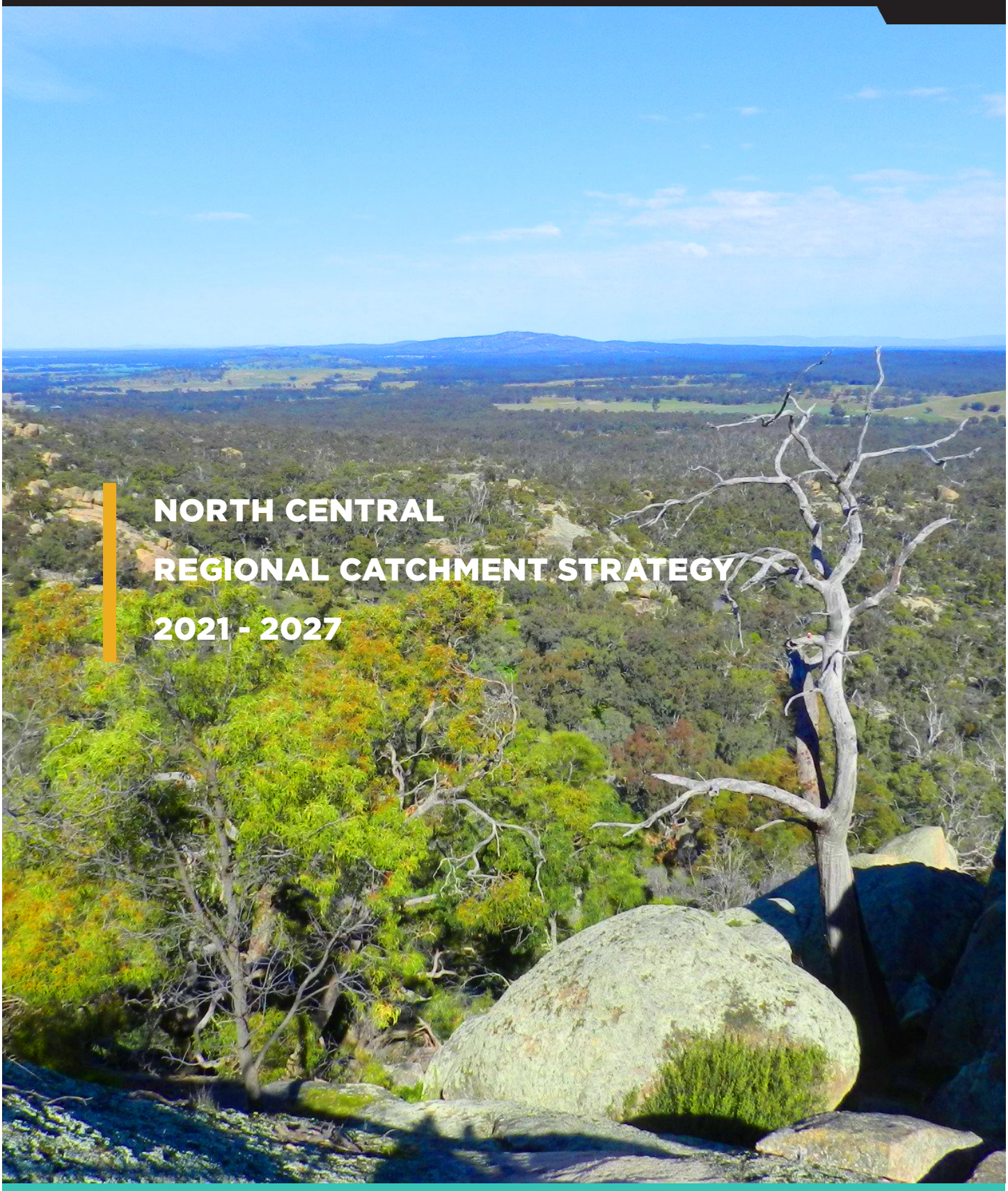

NORTH CENTRAL REGIONAL CATCHMENT STRATEGY 2021 - 2027

Date printed: 29 July 2024

Contents

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Our Region

The North Central Catchment Management Authority (CMA) region (the north central region) includes the Traditional lands of the Dja Dja Wurrung, Taungurung, Yorta Yorta, Barapa Barapa, Wamba Wemba, Wadi Wadi peoples and clans represented by the Barengi Gadjin Land Council. Click below for an introduction to people and Country, in their own words....

The north central region comprises four inland river catchments, the Campaspe; Loddon; Avoca and Avon-Richardson, that rise on the northern slopes of the Great Dividing Range and flow northward emerging onto the wide, flat riverine plains of northern Victoria. Click below for more about our region...

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North Central CMA

VICTORIA State Government

Traditional Owners of the region

The North Central CMA region includes the traditional lands of Dja Dja Wurrung, Taungurung, Yorta Yorta, Barapa Barapa, Wemba Wamba, Wadi Wadi and clans represented by the Barengi Gadjin Land Council.

We are grateful to all the Traditional Owners who have provided an introduction to their people and Country, for this page.

Dja Dja Wurrung

The Dja Dja Wurrung (Yes Yes speaking) Jaara (people of this Country) have been a part of this Cultural Landscape for countless generations. They have moved within their Djandak (Country) according to the seasons, customs and traditions of cultural practice. These movements were guided by a deep connection to Country, because there was no separation between people and Country, people are just one part of many that make up Country. Jaara believe that all of Country has Murrup (spirit), all things from creation are made of the same source of life. Water has spirit.

Jaara people were recorded early on in Colonial times as the Loddon tribe and the Avoca people, among many other names. The rivers are the life blood of Jaara Country (Djandak), pumping water throughout Country like arteries of our bodies. Water is life, and all life depended on the free flow of water throughout Country. We are nurtured by and born of water – we are water.

The legacy of Jaara Country and the life ways of the first people ensured that Djandak was healthy and capable of sustaining life for the next generations. Our inheritance was not a house or money, it was the promise that our Djandak could provide for our needs, that it would have clean and drinkable gatjin (water) and the food was abundant for farming, harvesting, hunting and gathering.

Our Lores monitored our environmental footprint and regulated our impacts through close observation and extensive knowledge of long-term patterns, customs and totemic relationships, keeping a balance. This was the way for so long until it could not be passed down anymore.

Taungurung

We are the First People of the rivers and mountains. We managed our land, forests, rivers and wetlands for thousands of years. We have shaped the Australian landscape through our traditional management practices and biocultural knowledge, and we relied heavily on a healthy Country to thrive. Our waterways are the lifeblood of Country; they are the blood and tears of our ancestors.

Our land and rivers remain central to Taungurung Identity; they are the spirit of the land. We have a deep physical and spiritual connection to our rivers; they flow through Country, watering our significant sites, bringing life and maintaining our connection with our ancestors. We are custodians of our waterways; it is our responsibility to heal our rivers and wetlands, protecting our living biocultural knowledge and improving the health and wellbeing of our people.

Yorta Yorta

"Gaka Yawall Ngulla Yorta Yorta woka" Come walk with us on Yorta Yorta Country

The Yorta Yorta Nation consist of eight different family groups. Yorta Yorta language is spoken by all Yorta Yorta people, including the Kailtheban, Wollithiga, Moira, Ulupna, Bangerang, Kwat Kwat, Yalaba Yalaba and Ngurai-illiam-wurrung clans.

The Yorta Yorta Nation retain an undeniable bloodline to the original Ancestors within the Yorta Yorta region. These bloodlines link our past, present and future to one another, with traditional laws, customs, beliefs, and sovereignty intact.

During the pre-colonial period Australia was an autonomous country. Yorta Yorta people lived in sync with the environment and the biodiversity was plentiful. Yorta Yorta people conserved the landscape and waterways for thousands of generations. We are freshwater people that maintained and occupied a landscape containing floodplains and grasslands that continue to provide an abundance of natural resources that are easily accessible throughout the seasons. Our social, spiritual, economic, and cultural links with the area have never been broken and our relationship and connection to country continues today.

Our ancestral land and waterways are equally important for the continuity of the Yorta Yorta connection with our inherent right. We hold a spiritual connection to the land; it's our mother. The human spirit is born from our land and creator and returns to it upon death. The land supplies us with everything that we need for living. We must look after it, so that it will look after us in return.

"We never wanted for anything, everything was free, down to the clear air we breathed, no pollution and clean water, plenty of birds, plant life and animal life. We lived and respected each other's right to co-exist, to care and practise those rights for our land and water. We resent the system that makes us beggars in our own land" – (Yorta Yorta Elder, Elizabeth Morgan 1927-2009).

Barapa Barapa

Video: Watch Aunty Esther Kirby, Barapa Barapa Elder, reflect on what Country means to her and her People.

Wamba Wemba

Video: Nick Stewart, Wamba Wemba Traditional Owner

Wadi Wadi

To Wadi Wadi people, water is life because water connects us to all aspects of our lives both physically, culturally, and spiritually. We have an obligation to our ancestors to be on country protecting our cultural heritage, waterways, flora, and fauna but since colonisation, this has never happened.

Naturally, we would love to see a healthy country and at the moment, we are not seeing that and although we would ideally like our waterways and country (bush) to go back to the way it was before colonisation, we fully understand that is never going to happen. But we, the Wadi Wadi are willing to collaborate with government departments to ensure the health and wellbeing of our waterways and country is sound for many years to come.

Our partnership should be played like the black and white keys on a piano, which creates harmony but without these two keys coming together, we will only have disharmony. We see a future where our Indigenous knowledge can combine with western science to help solve the issues of our waterways and country, but Wadi Wadi people must not be excluded from this process.

There are two vital elements that country (bush) is missing, one is water and the other is Traditional Owners (TO) rangers, if our rangers are not on country, then country will never heal or get better, even if you put millions of dollars into it. To us is like making coffee, you need coffee, milk and sugar to make a cup of coffee, if one of these elements are missing, it's just not coffee. To us country needs a healthy bush, water and Indigenous rangers on country, if one of these elements is missing, it's not a healthy country and it can never heal.

Places of significance include Nyah/Vinifera forest, Lake Tyrell, Tyrell creek, river junctions and all waterways on country.

Barengi Gadjin Land Council

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's.

We are part of our Country and our Country is part of us.
Country heals us and 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 us and provide for us.

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Regional overview

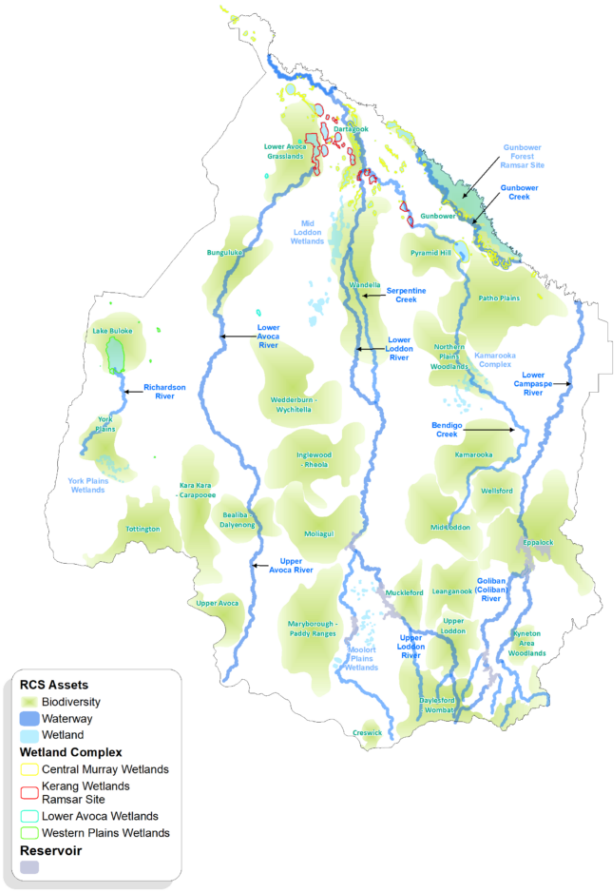
The north central region covers 13% (three million hectares) of Victoria. It comprises four inland river catchments – the Campaspe, Loddon, Avoca and Avon-Richardson – that rise on the northern slopes of the Great Dividing Range and flow northward onto the wide, flat riverine plains of northern Victoria. The catchments form part of the Murray-Darling Basin.

The region includes the traditional lands of the Dja Dja Wurrung, Taungurung, Yorta Yorta, Barapa Barapa, Wamba Wemba and Wadi Wadi peoples and the clans represented by Barengi Gadjin Land Council. Continuing to work towards self-determined participation and leadership of Traditional Owners in caring for Country is an important priority identified in this RCS.

The North Central RCS identifies priority assets to focus investment, including waterways, wetlands and biodiversity assets, as shown on the map here. Connections between these assets, places that are valued by local communities and places and landscapes that have cultural value to Traditional Owners, may not be captured by the priority assets, but are nonetheless important.

The region's waterways, which encompass more than 100,000 km of streams and 1600 wetlands, have significant economic, environmental, cultural and social values. The region is home to two internationally recognised Ramsar wetlands, Gunbower Forest and Kerang Wetlands, which support many migratory waterbirds. Recent research indicates that our region's waterways have not recovered from the millennium drought and are vulnerable to future drying under climate change. Maximising the potential of available water, will be important.

The natural environment and its biodiversity are fundamental to our economy, our physical and mental wellbeing. The region supports unique flora and fauna species, and many threatened species and communities as well. Our changing climate is putting increased pressure on the region's natural environment. Significant changes in species distribution are predicted and local extinctions are likely. Protecting what we have, building ecosystem resilience and connectivity, will be priorities for the next six years and beyond. The carbon market presents opportunities to increase the extent of native vegetation, and it will be important that we collaborate to maximise biodiversity benefits of this investment.



North central region showing all RCS priority assets

The region has a Mediterranean climate with winter dominant rainfall and evaporation highest over the summer months, although rainfall patterns have changed over the past 30 years, and over the long term, winter and spring rainfall is predicted to decrease. With reduced rainfall and increased temperatures our future climate will be hotter and drier overall. The impacts of climate change are pervasive, exacerbating existing threats and vulnerabilities. The region's landholders are already adapting to our changing climate. Continuing to trial and adopt land use practices that increase resilience, and support the long-term sustainability of agriculture in the region under climate change, will be important.

Eighty-seven per cent of land in the region is privately owned and most of it utilised for agriculture. In the steeper terrain of the uplands, land is mostly used for livestock grazing. Further north, in the gentler more undulating foothills of the Campaspe, Loddon, Avoca and Avon-Richardson river basins, cropping is common alongside mixed farming enterprises. Dryland farming is practiced on more than two million hectares and accounts for approximately 66% of the region's total land use, with most of the irrigated agriculture located within the Goulburn Murray Irrigation District (GMID) in the north. Improving soil health continues to be an important priority for farmers across the region. Reduced water availability in the region, has already caused significant changes to irrigated agriculture within the GMID. Continuing to improve the efficiency of irrigation systems, support increased resilience and long-term productivity of irrigated agriculture in this area will be important.

A prosperous regional economy has a very real impact on our collective ability to protect and enhance our natural resources. Agriculture is the dominant land use and mainstay of the regions economy. Changes and trends in the agricultural sector are discussed in this RCS. Employment in high skill service industries is concentrated in the southeast around Bendigo or within commuting distance to Melbourne, where the population is growing. Tourism is important for the regional economy, and the health of our natural resources directly supports agritourism and nature-based tourism in particular. Mining exploration activity has recently increased in some parts of the region. Several solar farms are operating and more are proposed across the northern parts of the region. Upgrades to the transmission network are also proposed across the region, to support renewable energy development more broadly.

Over 250,000 people call the north central region home. Almost half the population live in the City of Greater Bendigo, which is one of the fastest growing Local Government Areas in regional Victoria. Macedon Ranges, Mitchell, Mount Alexander and Hepburn shires are attracting significant numbers of tree-changers. Population growth and associated development is putting increasing pressure on our natural resources which is a key challenge for those areas. Whilst in the north and west of the region, an ageing population and continuing trend toward larger/corporate farms is contributing to further population decline and associated socio-economic impacts, including a reduced volunteer base.

We are fortunate to have more than 200 community-based environment groups including Landcare groups and networks, sustainable agriculture groups and others, actively working across the region. Supporting community-based groups to continue their good work, and increasing the number of environmental volunteers in the region are priorities of this RCS. Changes to the demographics of the region present both challenges and opportunities for engagement in NRM across the region.

This RCS has been developed together with Traditional Owners, partner organisations and the community. It provides a solid foundation for working together to achieve meaningful NRM outcomes. The health of our catchments relies on the active involvement of people in the region. People who farm and manage land or who live in towns, work, volunteer or go to school all have a role to play in achieving the North Central RCS 2021-27 vision.

Date printed: 29 July 2024
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North Central CMA

VICTORIA State Government

This Strategy

Chair's Foreword

The North Central Regional Catchment Strategy (RCS) is the overarching strategy for all involved in land, water and biodiversity management within the north central region. Through its vision – 'working in partnership for a healthy catchment' – it provides a roadmap for our collective efforts to care for our catchments over the next six years.

Our region is rich in natural assets, boasting internationally recognised wetlands, large areas of intact forests, and significant threatened species like the Plains Wanderer. Equally rich is the variety of land and soil types that sustain a range of productive agricultural enterprises – irrigation in the north, large-scale cropping in the west and mixed farming in the mid and upper catchments to the south. And there is significant commitment to a sustainable future amongst the 250,000 people that call the region home whether they are Traditional Owners, work a farm or live in a rural community or call urban Bendigo or one of the larger regional towns home.

We have connected with many people in putting together this RCS. Through these connections we have tapped into deep and diverse knowledge about the values, challenges and opportunities that exist in the region and the priorities for action that we must take to secure the health of our four river catchments. Two of these priorities for action are deserving of special mention.

Partnering with Traditional Owners and enabling their self-determined participation and leadership to care for Country is of the highest priority for the region. The North Central region has rich cultural value and includes the traditional lands of the Dja Dja Wurrung, Taungurung, Yorta Yorta, Barapa Barapa, Wamba Wemba, Wadi Wadi and Clans represented by the Barenji Gadjin Land Council. We are grateful to the Traditional Owners who have introduced their people and Country and shared with us their perspectives and priorities for the future.

Climate change is a pervasive threat that is putting increasing pressure on our natural resources and communities and all projections point to this pressure increasing in the future. People in our region are climate-aware and already adapting to change and working to improve resilience. To build on this work we must consider all our actions through a climate change lens, and we must act with urgency and courage. To enable this the RCS identifies likely climate change impacts on our natural resources and provides direction that will support their protection in a hotter and drier future.

The preparation of the RCS is work that we do on behalf of the region, but partnerships are essential in delivering it. There are many that have a role in caring for our region's natural resources and many that rely on them for their productivity and prosperity. To realise the ambition of the RCS we need farmers and public land managers, Government and community groups, scientists and Traditional Owners to work side by side.

On behalf of the North Central CMA team, I invite you to learn about our region, take stock of the priorities identified in this roadmap and join in on the work happening across the region to bring the RCS to life. By working together, we can protect and improve the health of our catchments for future generations.

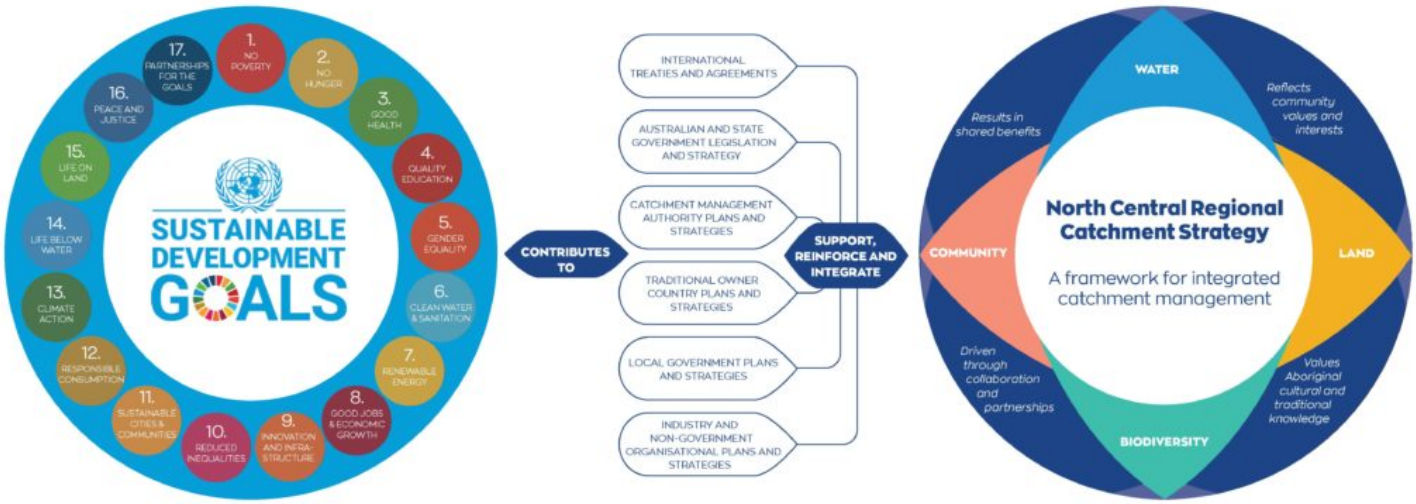
Julie Miller Markoff
North Central CMA Chair

Date printed: 29 July 2024

Policy context

The RCS supports and integrates key legislative policy frameworks, as well as the relevant United Nations Sustainable Development Goals (SDG).

The SDG and associated targets were agreed by 193 countries at the United Nations in 2015. The SDG provide a common overarching framework to achieve a better and more sustainable future for all. They address the global and local challenges we face, including poverty, inequality, climate change, environmental degradation, peace and justice. The commitments in this RCS, and our collaborative efforts to deliver on them, will contribute to global sustainable development, supporting many of the United Nations Sustainable Development Goals (SDGs) shown in the graphic below.



The RCS Outcomes Framework (refer Monitoring and Reporting) demonstrates how Regional Outcomes align with state-wide policies and outcomes, improving the way all RCSs reinforce, promote and support Government policy and objectives.

The policy context is described for each of the RCS themes, Traditional Owners and Aboriginal Victorians and Climate Change under the headers below.

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North Central CMA
VICTORIA State Government

Water policy context

Basin States

Murray-Darling Basin Plan (Basin Plan)

The Murray-Darling Basin Plan aims to bring the Basin back to a healthier and sustainable level, while continuing to support farming and other industries for the benefit of the Australian community. It does this by setting the amount of water that can be taken from the Basin each year, while leaving enough for our rivers, lakes and wetlands and the plants and animals that depend on them.

Victoria

Water Act 1989

The *Water Act 1989* provides the legal framework for managing entitlements to Victoria's water resources. The main purposes of the Act are to promote the equitable and efficient use of water resources, ensure water resources are conserved and properly managed for the benefit of all Victorians, and increase community involvement in conserving and managing water resources.

Catchment and Land Protection Act 1994

The *Catchment and Land Protection Act 1994* (CaLP Act) is the legislation that promotes and enables integrated catchment management across Victoria including establishment of catchment management regions and authorities and the requirement for Regional Catchment Strategies. The *CaLP Act* also establishes a framework for invasive species management, under the *Act* all land owners are legally required to manage declared noxious weeds and pest animals on their land.

Water and Catchment Legislation Amendment Act 2019

The purpose of this is *Act* was to make several amendments to both the *Water Act 1989* and the *Catchment and Land Protection Act 1994* including to have:

- greater consideration of the recreational values of water and waterways for communities
- greater recognition and involvement of Traditional Owners and Aboriginal Victorians in the management and planning of waterways and catchments and;
- clearer planning for future challenges such as climate change, population growth and changing demands for water.

Water Resource Plans

The Basin Plan required all Murray-Darling Basin states, including Victoria, to prepare water resource plans by June 2019. Those relevant to the north central region are:

- Wimmera–Mallee (groundwater & surface water)

- Northern Victoria (surface water)
- Goulburn–Murray (groundwater)

Traditional Owners were engaged to inform water resource planning and their contributions, including objectives and outcomes are a useful resource for understanding cultural values of water as documented here.

Water for Victoria

Water for Victoria is a plan for a future with less water as Victoria responds to the impact of climate change and a growing population. The actions set out in the plan support a healthy environment, a prosperous economy with growing agricultural production and thriving communities. Some of the key actions relevant to the RCS are:

- Embedding climate change considerations in all operational decisions (Action 2.2).
- Investing in Integrated Catchment Management (Action 3.3).
- Providing long-term investment to improve waterway health (Action 3.4).
- Managing waterways for shared benefits – social, cultural, economic and environmental (Action 3.6).
- Supporting community partnerships and citizen science (Action 3.8).
- Improving the recording of progress and how the information is reported back to communities, implementing new Rivers 2040 framework (Action 3.9).
- Dealing with the impacts of population growth, including resilient, cities and towns (Action 5.6).
- Chapter 6 Recognising and managing for Aboriginal values.
    - Action 6.1 Recognise Aboriginal values and objectives of water
    - Action 6.2 Considering Aboriginal values in water planning and management
    - Action 6.3 Support Aboriginal access to water for economic development
    - Action 6.4 Build capacity to increase Aboriginal participation in water management

Victorian Waterway Management Strategy

The Victorian Waterway Management Strategy provides the framework for government, in partnership with the community, to maintain or improve the condition of rivers, estuaries and wetlands so they can continue to provide environmental, social, cultural and economic values for all Victorians.

Our Catchments Our Communities

Our Catchments Our Communities is the first state-wide strategy for integrated catchment management in Victoria. It aims to provide healthy, sustainable and productive land, water and biodiversity maintained through integrated catchment management that is strongly community based, regionally focused and collaborative. The strategy will strengthen partnerships through co-ordinated planning, investment, and on-ground activities. Over the course of the strategy, CMAs and their regional partners and communities will deliver integrated catchment management projects across Victoria.

Integrated Water Management Framework for Victoria

The Integrated Water Management Framework for Victoria (IWM) is designed to help regional stakeholders to work together, ensuring the water cycle contributes to the liveability of towns and cities in Victoria, with communities at the centre of decision making. To facilitate this, IWM forums have been established across the state to identify, prioritise and oversee the implementation of critical collaborative opportunities, led by water authorities – for the north central region, this is Coliban Water.

Environmental Reference Standard

The *Environment Protection Amendment Act 2018* came into effect 1 July 2021, providing a new framework for the protection of human health and the environment from pollution and waste. The Environmental Reference Standard is a key tool in this new framework, for decision-makers and duty holders to assess risk to the environment. The Environmental Reference Standard is made up of several 'reference standards' that cover: ambient air, ambient sound, land, water (surface water and groundwater). Each identifies an environmental value and most include indicators and objectives too. These will be used to assess if the environmental value is being achieved, maintained, or threatened.

Victorian Rural Drainage Strategy

The Victorian Rural Drainage Strategy sets out new rules, protocols and support mechanisms to enable landowners and government agencies to overcome past barriers to the repair and management of degraded rural drainage systems. Under the new approach, landowners are empowered and supported to choose how they want to manage rural drainage.

One of the regional projects that delivers on the strategy outcomes is the Bullock Creek River Improvement Trust District Management Planning Pilot Study.

Regional

North Central Waterway Strategy

The North Central Waterway Strategy 2014-22 sets out priorities to protect and enhance the regions rivers and wetlands and deliver on actions set out in the Victorian Waterway Strategy.

North Central Regional Floodplain Strategy

The purpose of the North Central Regional Floodplain Management Strategy 2018-28 is to provide a single, regional planning document for floodplain management within the north central region and a high-level Regional Work Plan to guide future investment priorities.

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North Central CMA

VICTORIA State Government

Land policy context

STRONG, INNOVATIVE, SUSTAINABLE: A NEW STRATEGY FOR AGRICULTURE IN VICTORIA

Victoria's new 10-year Strategy for Agriculture emphasises building resilience including to our changing climate and digital agriculture. It is structured around the following five themes:

- **Recover** from the impacts of drought, bushfires and the coronavirus (COVID-19) pandemic and become an engine of growth for the rest of the economy. Including a commitment to; Support farmers with information and tools to build resilience.
- **Grow** the value and output of agriculture through increased exports, investment, greater diversification and new products.
- **Modernise** Victorian agriculture through innovation, investment and future skills. Including commitments to; Increase the adoption of new, effective and fit for purpose technology and Deliver the agriculture skills of the future.
- **Protect** and enhance the future of agriculture by ensuring it is well-placed to respond to climate change, pests, weeds, disease and increased resource scarcity. Including a commitment to; Ensure Victorian agriculture is well placed to manage climate risk and continues to be productive and profitable under a changed climate.
- **Promote** and build confidence in the sector to international markets and the community.

Digital Agriculture Strategy, Agriculture Victoria

Agriculture Victoria's Digital Agriculture Strategy outlines the Victorian Government's plan to support Victorian farmers harness digital technologies to build a more efficient, sustainable and productive agriculture sector in Victoria.

Loddon Campaspe Irrigation Region, Land and Water Management Plan

Over the past two years the North Central CMA has been working with regional stakeholders to renew the Land and Water Management Plan (LWMP) for the Loddon Campaspe Irrigation Region (LCIR) for 2020-30. This important plan provides an up-to-date road-map for public and private investment in sustainable irrigation works and measures on private land that holds an irrigation water licence. At the time of writing, the LWMP is awaiting final endorsement. Key directions have informed the Land theme and Irrigated Riverine Local Area.

North Central Victoria Regional Sustainable Agriculture Strategy

The Regional Sustainable Agricultural Strategy is a high level strategy that suggests moving towards greater adoption of sustainable agriculture will require land managers to collectively reconsider current practices.

North Central Victoria Soil Health Action Plan

The North Central Victoria Soil Health Action Plan provides a rationale and framework for delivering soil health outcomes across the region.

Biodiversity policy context

Australian

Environment Protection and Biodiversity Conservation Act 1999 Act

The Federal *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) identifies 'matter of national environmental significance,'(MNES) including RAMSAR wetlands, threatened species and ecological communities. If an action is likely to have a significant impact on a MNES, it must be referred to the Department of Environment and Energy under this *Act,* to determine if it can proceed. The north central region includes:

- The Gunbower Forest and the Kerang Wetlands RAMSAR wetlands.
- Several threatened species and threatened ecological communities listed under the *EPBC Act*.

Threatened Species Strategy 2021-31

The Australian Government invests in threatened species programs in the region. Going forward, this will be guided by priorities identified in the recently renewed Threatened Species Strategy 2021-31

Two high-level objectives will guide the direction of the strategy:

1. To improve the trajectories of priority threatened species by 2031.
2. To improve the condition of priority places by 2031.

The new place-based objective extends the focus of the previous strategy to threat mitigation and habitat protection efforts across landscapes, providing location-specific support for threatened ecological communities and many threatened species.

Victorian

Protecting Victoria's Environment - Biodiversity 2037

Protecting Victoria's Environment – Biodiversity 2037 (Biodiversity 2037) was launched in 2017 and gazetted as the new Flora and Fauna Strategy, a requirement of the *Flora & Fauna Guarantee Act 1988*. Biodiversity 2037 is a high-level strategy which recognises that stopping the decline of Victoria's biodiversity will not be achieved overnight. It contains ambitious targets that will require a concerted effort over many years by government and its partners across Victoria to put biodiversity back on a path to recovery. The vision and goals of Biodiversity 2037 are outlined below:

Biodiversity 2037 outlines a number of priorities and associated initiatives to reach these goals. Priority directions and outcomes in the biodiversity and community sections of this RCS outline how Biodiversity 2037 priorities will be implemented in the region and how we will contribute to the overall statewide targets.

Flora and Fauna Guarantee Act 1988

The *Flora and Fauna Guarantee Act 1988* provides for the listing of threatened species, threatened communities and potentially threatening processes. The *Flora and Fauna Guarantee Amendment Act 2019* came into effect on June 1, 2020, which aims to improve the implementation and enforcement of the Act including; *consideration of the rights and interests of Traditional Owners and the impacts of climate change...consideration of biodiversity across government... clarifies existing powers to determine critical habitat.. gives effect to a consistent national approach to assessing and listing threatened species... modernises the FFG Act's enforcement framework*. The *FFG Act* requires that a Biodiversity Strategy is prepared which includes proposals for achieving the objectives of the *Act,* targets to measure the achievement of the objectives and a monitoring, evaluation and reporting framework. *Protecting Victoria's Environment – Biodiversity 2037* is the current Biodiversity Strategy under the *FFG Act*.

Victorian Planning Provisions

The Victoria Planning Provisions are the standard provisions for all of Victoria's planning schemes. Local Government Planning Schemes have a key role in regulating development. Through strategic application of zones and overlays (e.g. Vegetation Protection Overlays or Environmental Significance Overlays) development can be excluded from sensitive areas and or impacts can be managed through permits, referrals and conditions.

Native vegetation removal regulations are primarily implemented through planning schemes. Guidelines for the removal, destruction or lopping of native vegetation 2017 outline how native vegetation removal is assessed and offset. These guidelines are an incorporated document in all Victorian planning schemes.

Regional

Biodiversity Response Planning

Biodiversity Response Planning (BDP) is a long term, place-based planning approach to biodiversity conservation designed to strengthen alignment, engagement and participation between government, Traditional Owners, non-government agencies (NGOs) and the community. It is the process DELWP are using to implement *Protecting Victoria's Environment – Biodiversity 2037*.

During 2019-20 regional DELWP worked with stakeholders to better understand local threats, action and gaps and to identify priorities including Focus Landscapes. Fact sheets have been developed for each Focus Landscape.

BRP will be an ongoing process, with priorities refined and reviewed over time based on; new information, stakeholder drivers, policy changes and landscape events.

Bushfire Management Strategies

There are two regional Bushfire Management Strategies that apply to the north central region; the Grampians (for Northern Grampians, Pyrenees and Hepburn Shires) and the Loddon Mallee (for the rest of the region). Different zones are identified according to the relative risk to people and property, with communities most at-risk in the south-eastern part of the region. For some zones the priority is to protect human life whereas others are managed for ecological outcomes. Tolerable Fire Interval and Vegetation Growth Stage Structure are used as indicators of ecosystem resilience to fire.

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Community policy context

Australian Government's National Landcare Program

The National Landcare Program is a key part of the Australian Government's commitment to protect and conserve Australia's water, soil, plants, animals and ecosystems, as well as support the productive and sustainable use of these valuable resources.

Victorians Volunteering for Nature - Environmental Volunteering Plan

Victorians Volunteering for Nature – Environmental Volunteering Plan is a coordinated and revitalised approach to environmental volunteering that looks at how we can support and sustain the existing environmental volunteering sector, while encouraging more active involvement from Victorians by making the sector more relevant and accessible.

North Central Regional Landcare Support Plan

The North Central Regional Landcare Support Plan explains how the North Central CMA supports Landcare and community based NRM groups in the region – working together to protect and enhance our natural assets. A Landcare community that is active and engaged is critical for the successful implementation of the RCS.

Landcare Network and/or Conservation Management Network Strategic Plans and Landcare Group Action Plans

Each of the Landcare Networks in the north central region has a community developed strategic or activity plan which outlines the strategic direction and priority landscapes of focus for the Network/Group to guide actions in achieving the goals and purpose of the organisation.

Traditional Owners and Aboriginal Victorians policy context

Legislation, strategies and plans for Victoria

Pupangarli Marnmarnepu 'Owning Our Future' Aboriginal Self-Determination Reform Strategy 2020-2025

Launched in August 2020, *Pupangarli Marnmarnepu 'Owning Our Future' Aboriginal Self-Determination Reform Strategy* is DELWP's reform strategy to replace the *Munganin Gadhaba Aboriginal Inclusion Plan*, that is referred in the 2019 RCS guidelines. The Strategy is a five-year roadmap that enables self-determination and aligns with the whole-of-government commitments set out in the Victorian Aboriginal Affairs Framework (VAAF). The VAAF is the Victorian Government's overarching framework for working with Aboriginal Victorians, organisations and the wider community to drive action and improve outcomes. The VAAF *Self-Determination Reform Framework* guides government and agencies to enable action towards Aboriginal self-determination.

Aboriginal Heritage Act 2006

The primary legislation for the protection of Aboriginal cultural heritage in Victoria is the *Aboriginal Heritage Act 2006* and *Aboriginal Heritage Regulations 2007*. The purpose of this *Act* is to provide for the protection and management of Aboriginal cultural heritage in Victoria. Dja Dja Wurrung Clans Aboriginal Corporation, Taungurung Land and Waters Council, Yorta Yorta Nation Aboriginal Corporation and Barengi Gadjin Land Council have Registered Aboriginal Party (RAP) status under the *Aboriginal Heritage Act*. At the time of writing, there are two new RAP applications (Barapa Country Aboriginal Corporation and Bangerang Aboriginal Corporation) and one RAP boundary amendment (Dja Dja Wurrung) listed on the Victorian Aboriginal Heritage Council website.

Traditional Owner Settlement Act 2010

Native Title is the recognition in Australian law that Indigenous people continue to hold rights to their lands and waters, which come from their traditional laws and customs. The purpose of the Federal *Native Title Act 1994* is to provide a process through which Indigenous Australians can lodge applications seeking a determination of native title. The *Traditional Owner Settlement Act 2010* (the *TOS Act*) provides for an out-of-court settlement of native title and delivery of land justice within Victoria. Dja Dja Wurrung Clans Aboriginal Corporation and more recently the Taungurung Land and Waters Council have signed Recognition and Settlement Agreements (RSAs) with the Victorian government, under the *TOS Act*, the boundaries of which are consistent with their RAP boundaries on the map above. The RSA provides legal recognition of Dja Dja Wurrung and Taungurung people as Traditional Owners of their Country and acknowledges past injustices. It outlines protocols for ongoing recognition, provides rights to access/use land, and formalises and provides resources for Traditional Owners' decision-making role over Country. For example, under the RSAs state government agencies have obligations to ensure that DDWCAC and TLaWC are provided with the opportunity to be actively engaged in regional natural resource management strategic planning processes (such as RCS) in the Agreement area.

The Dja Dja Wurrung RSA involved transfer of six parks in the region, to Aboriginal Title (see more detail under Plans for Country below).

The TLaWC RSA involved transfer of nine parks and reserves to Aboriginal title, including the Heathcote-Graytown National Park, which is partly within the north central region.

In 2013, a review recommended that the State and Barenji Gadjin Land Council (BGLC) consider future opportunities to enhance their 2005 Native Title agreements (for land outside the north central region), by entering into an RSA under the *TOS Act*. Both the state and the BGLC supported the report's recommendations and have been working to commence negotiations since 2014. In August 2017, the state formally approved entering into negotiations with BGLC towards a Recognition and Settlement Agreement under the *TOS Act.*

Prior to the *TOS Act*, the state government entered into a Cooperative Management Agreement with Yorta Yorta in 2004 to facilitate:

- The active and resourced involvement of the Yorta Yorta people in decisions about the management of Designated Areas, including 'the integration of Yorta Yorta knowledge, internal decision-making processes and perspectives into management planning and works programming.
- The development of mutual recognition and trust between the Yorta Yorta people and the state, and;
- The identification and promotion of employment, training and economic development opportunities for the Yorta Yorta people.

Ghow Swamp in the north central region is one of the three Designated Areas defined in this agreement.

Water for Victoria

Water for Victoria was released in 2016. It is Victoria's plan for a future with less water as Victoria responds to the impact of climate change and a growing population. Victoria's Aboriginal Water Policy was announced in *Chapter 6: Recognising and managing for Aboriginal values, Support Aboriginal participation in Victorian water planning and management*. In response, Traditional Owner groups and in some cases, CMAs, host state funded Aboriginal Water Officers to support greater Traditional Owner involvement in water management. Traditional Owners are engaged to identify cultural values and risks, to inform Seasonal Watering Plans (that outline annual planned water for the environment deliveries) and include opportunities for cultural benefits. Other activities to support this and related programs have included facilitating time on Country for Traditional Owner groups and supporting Traditional Owners to undertake Aboriginal Waterways Assessments (AWAs).

Water and Catchment Legislation Amendment Act 2019

The purpose of this is *Act* was to make several amendments to both the *Water Act 1989* and the *Catchment and Land Protection Act 1994* including to support Aboriginal cultural uses of water and underpin opportunities to use water for economic development for Traditional Owners and Aboriginal Victorians, and to support the self-determination of Traditional Owners by providing opportunities that best meet their water management needs.

Water Resource Plans

The Basin Plan required all Murray-Darling Basin states, including Victoria, to prepare water resource plans by June 2019. Traditional Owners were engaged to inform water resource planning and their contributions, including objectives and outcomes are a useful resource for understanding cultural values of water as documented here.

The Victorian Traditional Owner Cultural Fire Strategy

The Victorian Traditional Owner Cultural Fire Strategy supports Traditional Owner rights and interests in reintroducing Cultural Fire to the landscape. It was authored by Victorian Traditional Owners with the support of a partnership between the Federation of Victorian Traditional Owner Corporations, DELWP, Parks Victoria and the CFA. Traditional Owners will lead the implementation of the strategy, with support from DELWP, Parks Victoria and the CFA.

The Victorian Traditional Owner Game Management Strategy

The Victorian Traditional Owner Game Management Strategy sets out how Victorian Government departments and agencies will partner with Traditional Owners to deliver practical actions to build Traditional Owner participation in hunting, land management and conservation. Development of the strategy was led by the Federation of Victorian Traditional Owner
Corporations in close collaboration with Traditional Owners across Victoria and a Project Steering Group which included DJPR, GMA, Parks Victoria and DELWP.

Federation of Victorian Traditional Owner Corporation

Refer also the Federation of Victorian Traditional Owner Corporation Policy webpage to find; strategies they have been involved in developing (including the Traditional Owner Cultural Fire Strategy and Traditional Owner Game Management Strategy, listed above), policy submissions and soon to be released:

- Native Foods and Botanicals Strategy
- Cultural Landscape Strategy

Plans for Country

Some Traditional Owners of the region, have Country Plans. The RCS reflects and supports aspirations of these Country Plans at a high level. The Country Plans should be referred for more detail.

- *Dhelhunya Dja Dja Dja Wurrung Country Plan 2014-2034*
- *Taungurung buk dadbagi, Taungurung Country Plan 2016*
- *Yorta Yorta Whole-of-Country Plan 2021-2030*
- *Growing What is Good Country Plan, Voices of the Wotjobaluk Nations, Wotjobaluk, Jaadwa, Jadawadjali, Wergaia and Jupagulk Peoples, October 2017*

At the time of writing, BGLC and TLaWC were planning to refresh their Country Plans. A Healthy Country Plan developed by some Barapa Barapa people was reviewed but is not listed here because it is not publicly available. These links will be updated when new/renewed plans are available.

In collaboration with partner organisations the Dhelkunya Dja Land Management Board developed a Joint Management Plan for the Dja Dja Wurrung Parks which include:

- Greater Bendigo National Park
- Hepburn Regional Park
- Kara Kara National Park
- Kooyoora State Park
- Paddys Ranges State Park
- Wehla Nature Conservation Reserve

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North Central CMA

VICTORIA State Government

Climate change policy context

Climate Change Act 2017

Victoria was amongst the first governments in the world to legislate a net-zero emissions target in the *Climate Change Act 2017*. The *Act* provides a legislative foundation to manage climate change risks, maximise opportunities and drive transition to a climate-resilient community and economy.

The *Act* requires the government to develop a Climate Change Strategy every five years, to set out how Victoria will meet its targets and adapt to the impacts of climate change (refer below) and sits alongside other key Victorian Government energy and climate change initiatives including Victoria's Climate Change Framework, Victoria's Climate Change Adaptation Plan 2017-20 (refer below) and the Victoria's Renewable Energy Action Plan.

Victoria's Climate Change Strategy

Victoria's Climate Change Strategy for 2021-25 commits Victoria to cut emissions by 28-33% 2025, and by 45-50% by 2030 on the way to net-zero emissions by 2050. It also lays out how the Government will achieve this. Of particular relevance to the north central region and this RCS, the Strategy includes

Sector based emissions reduction pledges for 2021–25 including:

- 'Land use, land use change and forestry' sector pledge which focuses on; investing in low-carbon landscapes through sustainable plantations and incentivising plantings of shelterbelt trees and agroforestry, restoring natural habitat on public and private land to enhance carbon storage and caring for our forests.
- 'Agriculture' sector pledge which will involve testing new technologies and practices for the Victorian context, with farmers supported to use information and tools to realise emissions reduction opportunities on-farm.

Renewable energy will play a key role in achieving Victoria's 2050 net-zero emissions goal. The legislated Victorian Renewable Energy Targets will stimulate new investments in large-scale renewable projects including solar farms proposed in the north central region, creating jobs and providing flow-on benefits for supply chains, related services and the regional community. Development Plans for the Renewable Energy Zones (REZ) within the north central region are to ensure that investments are coordinated, timely and deliver positive outcomes for those communities.

Victorian Climate Change Adaptation Plan

Victoria's Climate Change Adaptation Plan will:

- Build a detailed understanding of Victoria's exposure to climate change risks and impacts.
- Catalyse partnerships for integrated and effective responses to climate change.
- Tackle immediate priorities to reduce climate change risks.

The following sector-based Adaptation Action Plans (AAPs) will also be relevant for RCS delivery:

- The current Pilot Water Sector Climate, Change Adaptation Action Plan (DELWP 2018) and the Water Sector Climate Change Adaptation Action Plan (due for release in 2021), will inform adaptation planning for waterways and water resources in the region.
- Climate Change Adaptation Action Plan for Primary Production is due for completion in 2021 and will inform adaptation planning for agriculture in the region.
- Climate Change Adaptation Action Plan for the Natural Environment System is due for completion in 2021 and will inform adaptation planning for biodiversity in the region.

The Guidelines for Assessing the Impact of Climate Change on Water Availability in Victoria have been developed to provide tailored guidance on how to apply hydroclimate science for water resource planning applications and to promote a consistent approach to climate change impact assessment across the water industry.

Regional Plans

Adapt Grampians (Northern Grampians, Pyrenees, City of Ballarat and Hepburn Shire) is a regional hub for information sharing, learning and inspiration to ensure we adjust and thrive in our changing climate. At the time of writing, the Grampians Region Climate Adaptation Strategy is being finalised.

ADAPT Loddon Mallee (rest of the region) aims to increase community resilience by building climate knowledge, grassroots leadership skills and supporting place-based adaption action. At the time of writing, the Loddon Mallee Climate Ready Plan is being finalised.

Both of these regional strategies will support and guide the delivery of the Victorian Climate Change Strategy in the region, considering people, places and sectors.

North Central Climate Change Adaptation and Mitigation Plan

The North Central Climate Change Adaptation and Mitigation Plan 2015 remains a relevant guide for climate action with regards NRM in our region. The Plan describes the implications of climate change for Land, Water and Biodiversity. It maps the relative vulnerability of waterways and remnant native vegetation across the region and also carbon potential. A range of adaptation and mitigation actions are identified. A priority direction has been developed to renew this plan by 2023.

Strategy development

RCS Guidelines issued by the Victorian Catchment Management Council guide RCS development.

The guidelines for this RCS:

- Put a greater emphasis on integration of climate change and Traditional Owner priorities.
- Introduce Local Areas as a basis for integration of RCS themes in a way that is relevant to local communities.
- Improve consistency across the state through the use of a web-based format and Outcomes Framework.

Key elements of the approach to RCS development included:

- Findings and recommendations from the final 2013-19 RCS review informed engagement of key partners, to improve ownership and accountability for delivery.
- RCS Steering Committee established to oversee RCS review and renewal.
- Discussion papers developed to frame discussions with stakeholders and inform RCS content.
- Extensive engagement with partner organisations, Traditional Owners and community.
- Priority assets identified for the 2013-19 RCS, reviewed and updated with respect to new knowledge and policy.

More detail under the headers below.

Learnings from RCS 2013-19

In 2019, a final review of RCS 2013-19 was undertaken. The RCS Steering Committee guided the review using a performance-based approach. This review was also informed by a comprehensive analysis of available data and reports, and in consultation with the CMA staff and Board and partner organisations. We engaged partners through interviews, meetings and an online survey. A summit workshop was held with a range of stakeholders to scrutinise draft responses to Key Evaluation Questions and formulate recommendations. The key findings and recommendations of the review are:

Key findings	Recommendations
1. The RCS has informed the strategic direction of CMA projects and programs and a majority of the NRM works were on RCS priority assets, but few partners report a sense of ownership.	Incorporate shared priorities in the RCS. Improve accountability for RCS implementation by identifying organisations to lead actions. Ask partner organisations to demonstrate their commitment to implementing the RCS. Improve CMA systems and practise to enable rapid reporting of RCS progress and to check-in with partners more regularly to review progress together.

2. Outputs, data and monitoring provided evidence of positive outcomes, which we can reasonably assume, contribute to asset condition. However, it was not possible to assess if, or to what extent, overall asset condition has improved due to a lack of baseline and monitoring data for the review period.	Develop and incorporate in the RCS, a robust approach to MERI (facilitated through the RCS Outcomes Framework).
3. Working with partners leverages more investment and networks. Active engagement of community is essential for landholder uptake of CMA initiatives, leads to improved knowledge, awareness, skills and attitudes and intention to make changes that protect and enhance RCS assets. Some areas for improvement and leverage were identified.	Consider expanding the current MERI approach to include cultural and social objectives. Continually improve our approach to engagement through evaluation and sharing learnings. Build on successful models of partner engagement including the North Central Catchment Partners Forum, MoUs and Partnership Statements.
4. Overall good progress, with most actions complete and some progress made towards most of the SMART objectives and targets. Baseline and follow up assessment/monitoring data was not available in many cases, which made accurate assessment of progress difficult.	Develop and incorporate in the RCS, a robust approach to MERI (facilitated through the RCS Outcomes Framework).
5. If NRM output data from all RCS partner organisations could be shared, the accuracy of evaluation including progress reviews would be improved and it may also improve the coordination of effort and help to identify more opportunities for collaboration.	Investigate the opportunity to develop and maintain a shared NRM database/repository for the region. Consider reviewing the RCS assets and incorporating some with social and cultural values. Consider alternative NRM planning frameworks and associated landscape areas to complement the existing asset-based approach. Consider how the RCS could be structured to both; retain relevance in the policy context and incorporate issues that cut across multiple RCS themes.
6. Since the RCS was first developed there have been various relevant government policies and plans introduced and while the RCS was not updated to incorporate these changes, the CMA and partners have adapted their focus.	Consider the impact of climate change on the implementation of the new RCS and likely adaptations required, with reference to the North Central Climate Change Adaptation and Mitigation Plan 2015.
7. CMA programs/projects have leveraged significant investment from landholders and other agencies to implement the RCS.	Consider how partnership health, including productivity could be evaluated and improved at project/program levels and through a regular 'health-check' of key partnerships.
8. Sustainability of on-ground works are largely dependent upon the commitment of the land manager and on properties where the landholder is more actively engaged, the works are better maintained in the longer term.	Continue 'Protecting Investment Improving Capacity' project and NRM Audits to reengage existing landholders and further our understanding of the factors that lead to enduring outcomes. Work with partner organisations to identify opportunities to engage landholders and deliver education and compliance activities to support enduring outcomes.

Overall approach

The North Central RCS Steering Committee was established to oversee and guide the RCS review and renewal process. The Chair of the CMA Board also chairs the RCS Steering Committee and includes CMA Board members, Community Leaders' Group members and representatives from key partner organisations (DELWP, Dja Dja Wurrung Clans Aboriginal Corporation, Parks Victoria, Agriculture Victoria, Coliban Water, Goulburn Murray Water). The RCS Steering Committee makes recommendations to the CMA Board. The CMA Board endorsed the approach to RCS renewal, and will endorse the final RCS for submission to the Minister.

- Recommendations from the final review of the 2013-19 RCS (refer above) have informed the RCS renewal process.
- The CMA Board endorsed five papers addressing foundational issues for RCS renewal in 2019.
- Following initial engagement of partners, community and Traditional Owners in early 2020, RCS discussion papers for Land, Water, Biodiversity, Community and Traditional Owners were developed, to frame conversations with stakeholders, obtain feedback and inform RCS content.

Engagement

Engagement of our partner organisations, Traditional Owners and the broader community to inform RCS renewal was largely online due to coronavirus (COVID-19) restrictions during 2020-21. Activities were promoted directly via an extensive contact list, as well as The Chat newsletter and social media. A total of 57 workshops/meetings (20 face-to-face and 37 online) were held including:

- Traditional Owners (22)
- Partners (24)
- Landcare Networks (2)
- Community (9)

In addition to this we held, 11 RCS Steering Committee meetings and five sessions with CMA staff. We attended meetings with CMA program steering committees, the CMA Board and its sub-committees to provide updates and obtain feedback throughout the process.

Representative groups/corporations from seven of the region's Traditional Owners were engaged separately. Addenda to the Traditional Owner Paper were developed to document outcomes, and confirm content for each. Water policy officers and other corporation staff were also invited to participate in partner workshops.

There were three phases of partner engagement, starting with a face-to-face workshop in March 2020, where key threats, challenges and priorities were identified. Then the theme-based discussion papers were drafted and the subsequent online workshops focused on reviewing and discussing the papers. Lastly, focused meetings were held with key partner organisations to discuss lead roles for priority directions and outcomes.

Due to COVID-19 restrictions most community engagement was online. There were two phases of community engagement in 2020, via a dedicated Engage Vic website focused on RCS renewal, and an online community workshop. During the first phase, 79 online surveys were completed and 57 favourite places or priority assets pinned on the interactive map. During the second phase community members could provide comments on a summary of the discussion papers, contribute to an online discussion regarding local priorities or attend an online workshop. During the draft RCS public consultation phase in March 2021, seven drop-in sessions were held across the region, and one online workshop, to provide an opportunity for face-to face community engagement.

Priority assets

The RCS takes an asset-based approach, identifying the region's highest priority natural assets (waterways, wetlands and biodiversity), including those of international, national, state and regional significance. This enables us to focus our efforts and investment, on protecting and enhancing those assets with the most significant values (ecological, social, cultural and economic), that are under the greatest threat and with the highest likelihood and feasibility of protection and enhancement.

RCS priority assets were first identified for the 2013-19 RCS, as described here:

Initial process to identify assets for the 2013-19 RCS

Step	Description
Community Asset Identification	Ten community meetings were held across the region seeking community nominations on environmental assets that were most valued by the community. These assets were mapped (where possible) and information regarding values and threats were captured in a database. These assets have been described at various scales such as a specific small patch of vegetation or a small section of river up to an entire forest or river system.
Expert Stakeholder Workshops	Experts, including agency staff with knowledge of environmental assets, attended workshops and added to the list of assets that were most valued within the region.
Asset Review	Assets were aggregated together, where appropriate. All assets identified were rated for their environmental significance and threat to help understand the importance of the asset. Highly significant assets were then rated for feasibility of implementation from a technical and socio-economic perspective. This process was consistent with former Department of Sustainability and Environment's guidelines 'Applying the Asset- Based Approach for the development of Regional Catchment Strategies' and supported by expert review, reference to relevant data and modelling (e.g. threatened species records, Natureprint, and decision support tools (Investment Framework for Environmental Resources (INFFER) assessments)
RCS Catchment Assets	RCS priority waterways, wetlands and biodiversity assets were further amalgamated to reflect a scale appropriate for the RCS.

Given the extensive process undertaken to identify priority assets, the approach for RCS renewal was to review the assets, together with partners and community, considering new knowledge, policy and strategy. This process and the updates made, are described on the Water and Biodiversity theme pages.

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Partners

There are many organisations involved in natural resource management in the north central region. The North Central CMA develops the RCS on behalf of the region, to focus investment and coordinate the efforts of all involved.

The RCS vision "Working in Partnership for a Healthy Catchment" highlights the importance of working together. We all have a role to play, and by leveraging networks and investment we can do more. The North Central Catchment Partners Forum is a great example of this. The North Central CMA facilitates the forum and, in partnership with its a diverse range of members, has developed a Regional Prospectus to facilitate NRM investment in the region (refer the Prospectus page for more information).

The table below identifies the government and non-government organisations, Traditional Owners and community-based groups who have key roles in RCS delivery. As recommended in the final RCS 2013-19, key partners have been engaged to reflect shared priorities and improve accountability by nominating key collaborators for delivery of priority directions and outcomes in this RCS.

	Partners	Role	Link to RCS
Traditional Owners	Dja Dja Wurrung Clans Aboriginal Corporation, Taungurung Land and Waters Council, Yorta Yorta Nation Aboriginal Corporation, Barengi Gadjin Land Council. Barapa Barapa, Wamba Wemba and Wadi Wadi Traditional Owners.	The north central region includes the Country of seven different Traditional Owners. We acknowledge their enduring connection to Country and their custodial responsibility to care for Country.	Traditional Owners aspire to heal, care for and manage their Country. This RCS identifies self-determined participation and leadership in cultural and natural resource planning as the long-term outcome.
Australian Government Departments	Department of Agriculture, Water and the Environment	Partner and regulate to enhance Australia's agriculture, environment and heritage, and water resources. Administer the Federal *EPBC Act* which seeks to protect matters of national environmental significance including threatened species and ecological communities and RAMSAR sites.	The National Landcare Program funds Regional biodiversity and sustainable agriculture projects to protect and enhance investment priorities, including RCS priority assets.
Basin States Authority	Murray Darling Basin Authority	The Murray–Darling Basin Authority (MDBA) is an independent expertise-based statutory agency, responsible for directing the sharing of the River Murray's water on behalf of the Basin states, in accordance with the Murray–Darling Agreement.	The Murray Darling Basin Plan (the Basin Plan) sets the amount of water that can be taken from the Basin each year. The Living Murray program focuses on maintaining the health of six icon sites along the Murray River, including the Gunbower-Koondrook-Perricoota Forest site, which is partly within the north central region. Basin States must comply within strict limits to the amount of salt permitted to enter the Murray River through the stream network as per the Basin Salinity Management Strategy 2030.

State Government Departments	Department of Environment, Land, Water and Planning (DELWP)	Prepare and lead the implementation of State Government policy for the sustainable use of natural resources, including for catchment management, land stewardship, biodiversity conservation, and climate change adaptation.	DELWP funds regional programs to improve land, water and biodiversity outcomes. DELWP manages 166,408 hectares (43% of all public land) including State Parks, State Forest and other reserved/unreserved crown land including several RCS assets, they have a role in forest fire management, coordinate regional biodiversity response planning, they are a referral authority for regional biodiversity and lead regional climate change adaptation.
	Parks Victoria	Parks Victoria is a statutory authority established to protect, conserve and enhance Parks Victoria managed land, including its natural and cultural values, for the benefit of the environment and current and future generations consistent with the *Parks Victoria Act 2018*. Parks Victoria works closely with Traditional Owners, other agencies and the community to continuously improve its capacity to deliver large-scale programs and on-ground actions to protect and manage the best of Victoria's natural assets, throughout the Parks estate.	Parks Victoria manages 183,063 ha (6% of the region, 48% of all public land) in the north central region, including the five National Parks (Terrick Terrick, Gunbower, Kara Kara, Heathcote Graytown and Greater Bendigo) and jointly manages six parks with Dja Dja Wurrung, and other areas within priority biodiversity assets. Parks Victoria run educational programs including Ranger Roo and Junior Ranger, as well as cultural programs led by Aboriginal Rangers.
	Environment Protection Authority	The Environment Protection Authority (EPA) Victoria is Victoria's environmental regulator, established in 1971 under the *Environment Protection Act 1970*. EPA's role is to prevent and reduce the harmful effects of pollution and waste on Victorians and their environment.	EPA has a role in preventing harm to the community and environment from farming practices (e.g. chemical storage and handling and effluent management) in regulating discharges to waterways and in the use of recycled water.
Rural and Urban Water Corporations	Goulburn-Murray Water (rural), Lower Murray (urban and rural), GWMWater (urban and rural). Coliban Water (urban), Central Highlands Water (urban),	Urban water services include: supply of drinking and recycled water, and the removal and treatment of sewage and trade waste – Rural water services include: water delivery for irrigation, domestic and stock purposes, drainage and salinity mitigation. Some water corporations also provide water for environmental purposes, manage bulk water storages and designated recreational areas.	Broader catchment health and improved water quality linked to water supply. Water reform, operational role in environmental water management, also management of waterways and public land associated with assets.

Local Governments	City of Ballarat, Buloke Shire, Campaspe Shire, Central Goldfields Shire, City of Greater Bendigo, Gannawarra Shire, Hepburn Shire, Loddon Shire, Macedon Ranges Shire, Mitchell Shire, Moorabool Shire, Mount Alexander Shire, Northern Grampians Shire, Pyrenees Shire, Swan Hill Rural City.	Local Government Planning Schemes are a key mechanism for environmental management and protection. Other responsibilities relevant to the RCS include waste management, stormwater management, management of public land, administering native vegetation retention controls in consultation with DELWP.	Public land manager, land use planning, community education and engagement in various local environmental programs with links to RCS catchment priority assets.
Non-Government organisations	Trust for Nature, Bush Heritage, Biolinks Alliance, Connecting Country, Greening Australia, Conservation Volunteers Australia, Wettenhall Environment Trust and other philanthropic bodies etc.	Various roles that contribute to NRM planning, participation and action.	Protecting, enhancing RCS assets. Role in broader community engagement, participation and resourcing.
Community-based groups	Landcare groups, Landcare networks, Conservation Management networks, delegated crown land managers (e.g., Committees of Management), friends of groups, field naturalists, citizen scientists, recreation groups, farming systems groups.	Various roles that contribute to NRM planning, participation and action at a local scale.	Protecting, enhancing local and RCS priority assets. Play a critical role in connecting people to nature, involving private landholders and educating the broader community.
Education and research organisations	Universities, research organisations (e.g. Arthur Rylah Institute, CSIRO), TAFE, schools.	Research, training and participation.	Capacity building of regional stakeholders including community. Filling key RCS knowledge gaps.
Industry groups	Industry based research groups including Vic No Till, Irrigation Cropping Council, CRCs. Industry groups including Murray Dairy, Grains Research and Development Corporation (GRDC) and Meat and Livestock Australia (MLA).	Research, extension, accreditation/marketing of sustainable practices.	Knowledge and capacity building, accreditation of farms and agribusiness.

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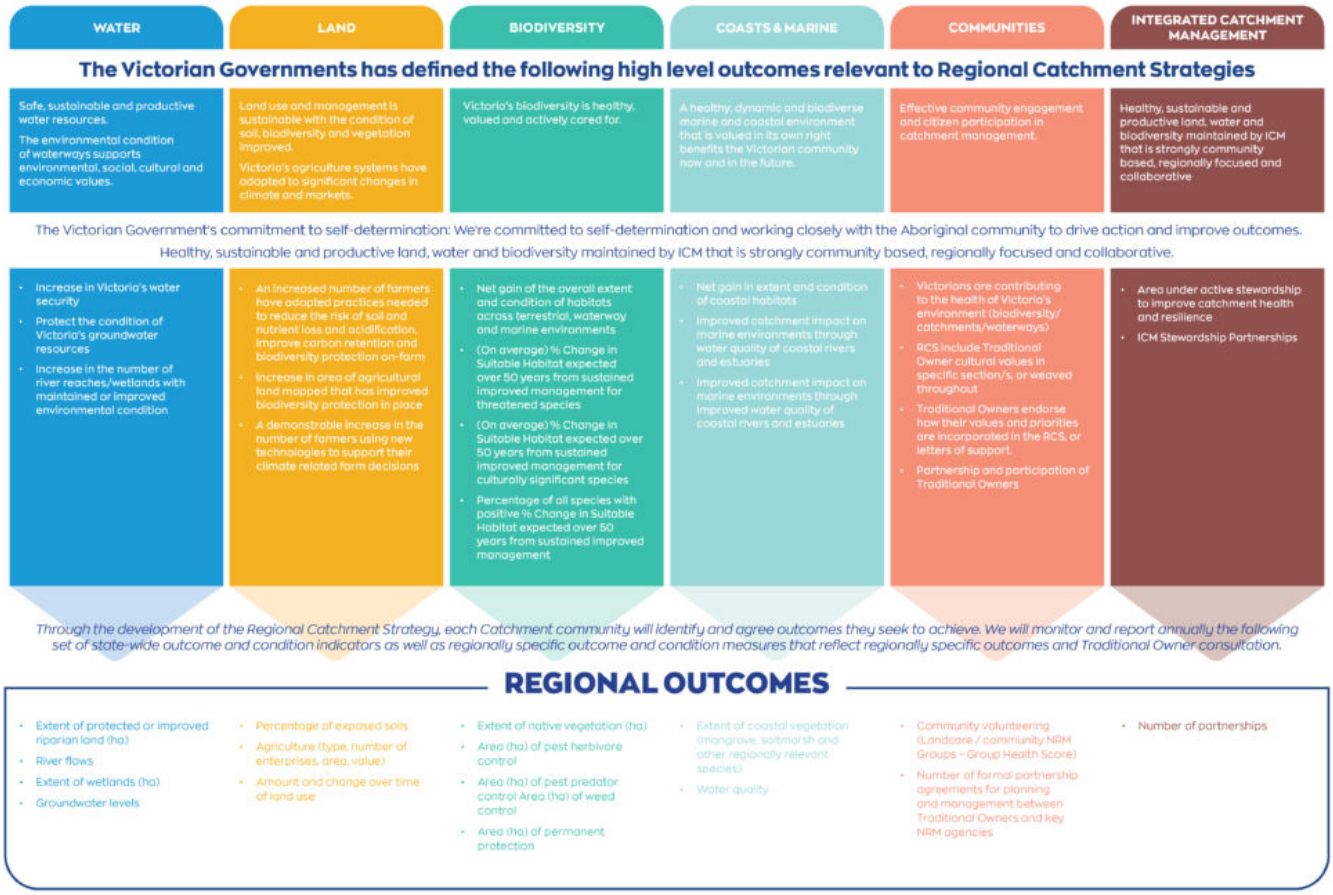
Monitoring and reporting

The *Catchment and Land Protection (CaLP) Act 1994* requires CMAs to identify procedures for monitoring the implementation of their Regional Catchment Strategy (RCS).

To improve alignment with State policy and consistency of monitoring and reporting across Victoria, an RCS Outcomes Framework has been developed.



RCS Outcomes Framework

The RCS Outcomes Framework: mandates a set of Regional Outcomes (refer bottom row) aligned with state policy outcomes that include condition and outcome indicators, to be included in all RCSs., and allows for RCS visions and other regionally relevant outcomes to be developed by CMAs.

The RCS Outcomes Framework includes guidance notes for each of the Regional Outcomes which specify the data source and format of presentation to ensure consistency of reporting. Regional Outcomes have been included under the relevant themes of this RCS in the 'Assessment of condition and trends' sections. They have been used to developed associated Outcomes (noting that 'number of partnerships' is included under the Community theme). Other regionally relevant outcomes have been developed too, ensuring that data to measure progress is readily available.

All priority directions and outcomes, including Regional Outcomes, are outlined in the RCS Monitoring, Evaluation Reporting and Improvement (MERI) Framework, noting relevant data, monitoring and reporting methods. As the overarching strategy for the North Central CMA, the RCS informs program/project planning. Implementation of these programs/projects is reported regularly in accordance with the North Central CMA's MERI strategy; policies; procedures, and systems and via corporate and investor reporting. Regional partner organisations have their own MERI processes.

Collating data from partners across the region, to accurately inform progress of RCS implementation is currently a time-consuming task, as each organisation has different methods and systems. It is expected that DELWP will provide regional data to track progress towards Biodiversity outcomes.

The North Central CMA will continue to work with our regional partners and state government departments to improve data sharing for other outcomes. For the time being, the North Central RCS MERI Framework identifies key datasets that are readily available. The mid-term and final review of the RCS present opportunities for more detailed evaluation and reporting (refer Strategy review section) including collation of relevant data from regional RCS partners to track progress of implementation.

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Strategy review

The *Catchment and Land Protection (CaLP) Act 1994* requires CMAs to prepare RCSs and undertake a mid-term review (after three years) and final review (after six years).

The objective for reviewing the RCS is to assess implementation progress including: achievements, learnings, constraints and adaptations and to identify areas for improvement. The *CaLP Act* does not specify how the review should be undertaken.

The North Central CMA's MERI policy sets minimum standards for the organisation, with more detail provided in the MERI strategy and associated procedures. The CMA's approach to mid-term and final review of strategies, including the RCS, is to prepare a performance report. The performance report is developed using a set of Key Evaluation Questions (KEQ) that address impact; appropriateness; effectiveness; efficiency and legacy. Through the review process, responses to each KEQ are developed drawing upon multiple lines of evidence, which are peer reviewed and workshopped with stakeholders.

The final review of the 2013-19 North Central RCS adopted this approach resulting in an evidence-based and robust KEQs that will help guide the review of this RCS. The KEQs explore:

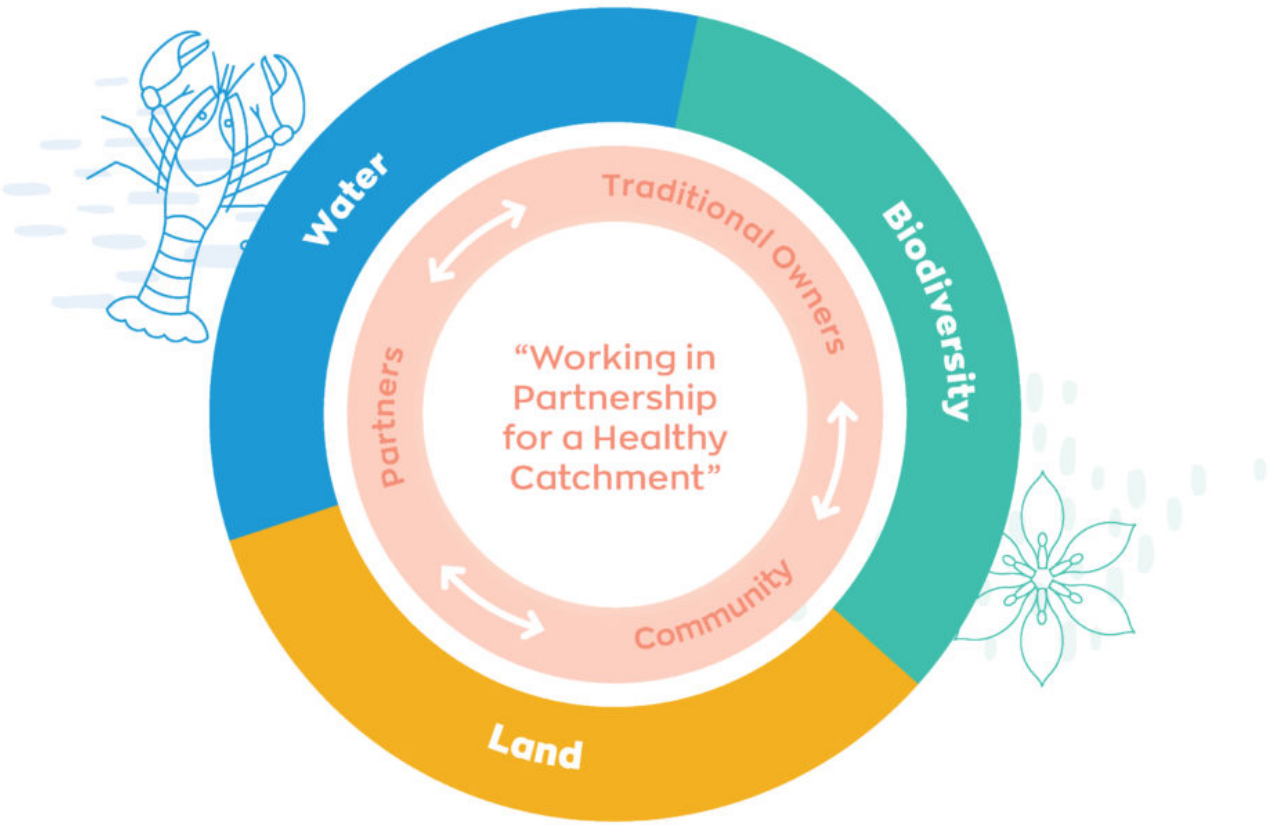
- strategic alignment and ownership
- progress
- information, adaptability, efficiency
- engagement and sustainable outcomes.

Themes

The Regional Catchment Strategy (RCS) themes are Water, Land, Biodiversity and Community, including Traditional Owners.

- The Water theme considers water resources, waterways, wetlands, floodplains, water dependent species and habitats
- The Land theme focuses on agricultural land use and management, as well as engaging the farming community.
- The Biodiversity theme focuses on terrestrial biodiversity, including native vegetation, habitats and threatened species.
- The Community theme considers the contribution of the regional community to NRM and how to maintain and build community involvement into the future
- The Traditional Owner pages describe the values and priorities of Traditional Owners with regards their Country and their role in caring for Country.

The RCS guidelines require an assessment of the condition and trends, threats and drivers of change for each theme. In response, we have identified priority directions and outcomes. Under Water and Biodiversity themes, priority assets (waterways, wetlands and areas of significant biodiversity) are also identified as places to focus our efforts.



Most of the technical content, and all of the priority directions and outcomes for this RCS, are included on the theme pages. The priority directions and outcomes appear on the theme page to which they are most relevant, acknowledging that many are relevant to other themes as well. Implementing the priority directions and outcomes in this RCS is subject to available funding. It is expected that key collaborators named for each theme will work together to seek investment.

Integrated Catchment Management (ICM) is place-based, collaborative, addressing multiple themes and the interactions between them. The RCS Local Areas complement the five RCS themes, describing local issues and opportunities, highlighting directions and outcomes of relevance, (copied from the theme pages) and these are intended to inform place-based ICM projects and programs to deliver this RCS. Strong partnerships and contributions from government and non-government partners, Traditional Owners, community-based groups and the broader community are needed to achieve the vision of the North Central RCS – 'Working in partnership for a healthy catchment'.

Through engagement with Traditional Owners of the region we learnt about their holistic perspective. Rather than talking about themes of Land, Water and Biodiversity separately, as we do in this RCS, these elements are all inter-connected. Cultural landscapes have been described as a traditional way of understanding and caring for Country – the Traditional Owners preferred planning unit. Describing and using cultural landscapes is an emerging priority for some Traditional Owners.

Climate change is a pervasive threat that affects all our natural resources, and all future planning will need to be through a climate change lens. We have developed a Climate Change page that can be updated as needed and which brings together all the climate change information in this RCS. Under each theme we have described the predicted impacts of climate change and highlighted some priorities for adaptation and opportunities for mitigation. Climate change related priority directions are identified under each of the themes. An overarching priority direction for the region, which brings them all together, and doesn't belong under any one theme is:

Priority Direction	Key collaborators
Consider current information and prioritise action to inform renewal of the North Central Climate Change Adaptation and Mitigation Plan by 2023.	CMA

Date printed: 29 July 2024

North Central CMA

VICTORIA State Government

Water

Vision: *Healthy waterways and floodplains, managed for shared benefits*

The Water theme focuses on surface and ground water resources, waterways (including wetlands) and floodplains. Water-dependent species, habitat values and management is considered. Refer Land theme or Irrigated Riverine Local Area regarding irrigation supply and systems and Biodiversity regarding threatened species.

The North Central CMA region includes four inland river catchments, the Campaspe, Loddon, Avoca and Avon-Richardson, that rise on the northern slopes of the Great Dividing Range and flow northward emerging onto the wide, flat riverine plains of northern Victoria.

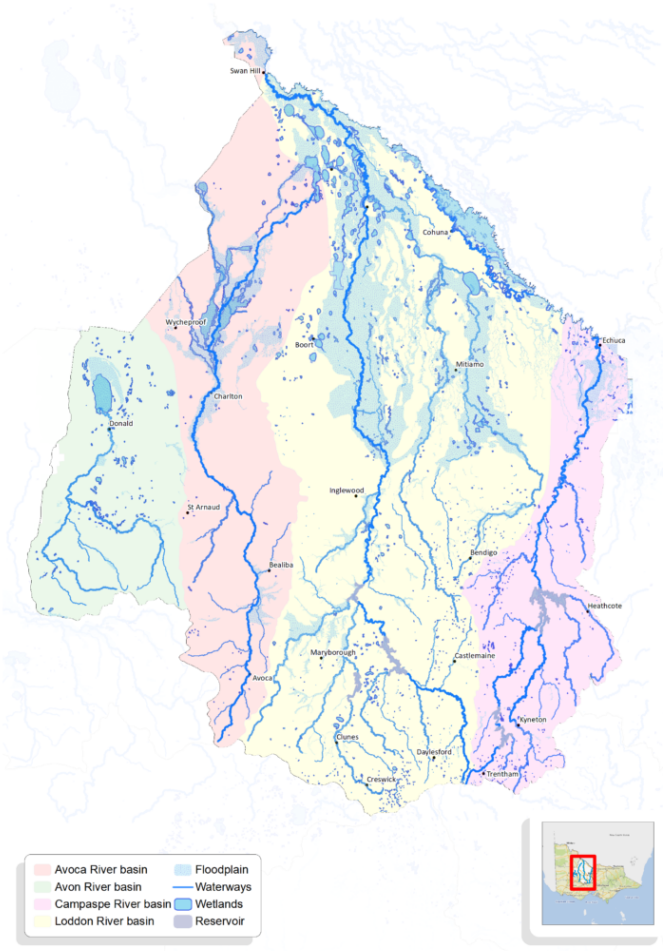
The catchments all form part of the Murray-Darling Basin, however average rainfall and streamflow is greater in the east of the region and declines across the basins moving from east to west. This influences the shape of the rivers and their floodplains, and the degree to which each river interacts with the mid-Murray River and its floodplain.

The region's waterways, which include more than 100,000 km of streams and 1600 wetlands, have economic, environmental, cultural and social importance to Traditional Owners and regional communities.

Waterways and the plants and animals they support provide benefits to communities such as; water for drinking, irrigation and industry, as well as being a focal point for many recreation activities which in turn support tourism.

Victoria's Water Plan, *Water for Victoria*, provides a framework to manage water for shared benefits – recognising social (including recreational), cultural, economic and environmental values. Our vision reflects this, to manage for shared benefits.

Waterways and water have significant value to Aboriginal people as recognised in Victoria's Aboriginal Water Policy that was announced in *Water for Victoria*. The Traditional Owners engaged for this RCS identified many water-related cultural values and have strong aspirations for more involvement in water planning and management and for cultural flows. For more on this refer the Traditional Owner page.



Waterways and wetlands of the north central region

There has been significant change to irrigated agriculture in the region, over the past 20 years, with water traded out of the region, and major upgrades to delivery infrastructure to improve efficiency. For more on this refer the Land theme and Irrigated Riverine Local Area pages.

Through engagement for RCS renewal we heard from many people in the region who are passionate about their local waterways. Residents and visitors enjoy walking, cycling, fishing, canoeing and camping in and around the region's waterways, they are important for wellbeing, and for the livability of urban areas. Waterways are important habitat, supporting a diversity of wildlife, they function as drought refuges, and movement corridors. Landholders and community-based NRM groups, make a significant contribution to protecting and improving the health of waterways across the region.

However our region's waterways are particularly vulnerable to hotter and drier conditions predicted with climate change. As our region's population grows, there are increasing demands on surface and groundwater resources, including for urban water supply and a growing number of small farm dams and bores associated with rural residential developments. In drier landscapes like the Western Dryland Plains Local Area, some tensions between uses are evident, and with reduced water availability overall, we anticipate sharing benefits will become more challenging in the future. It will be important to work together to raise awareness of water resource constraints and make the most of every drop.

Assessment of current condition and trends

Waterways

Based on the most recent State-wide Index of Stream Condition assessment (2010), the majority of our regions waterways were in moderate or poor condition:

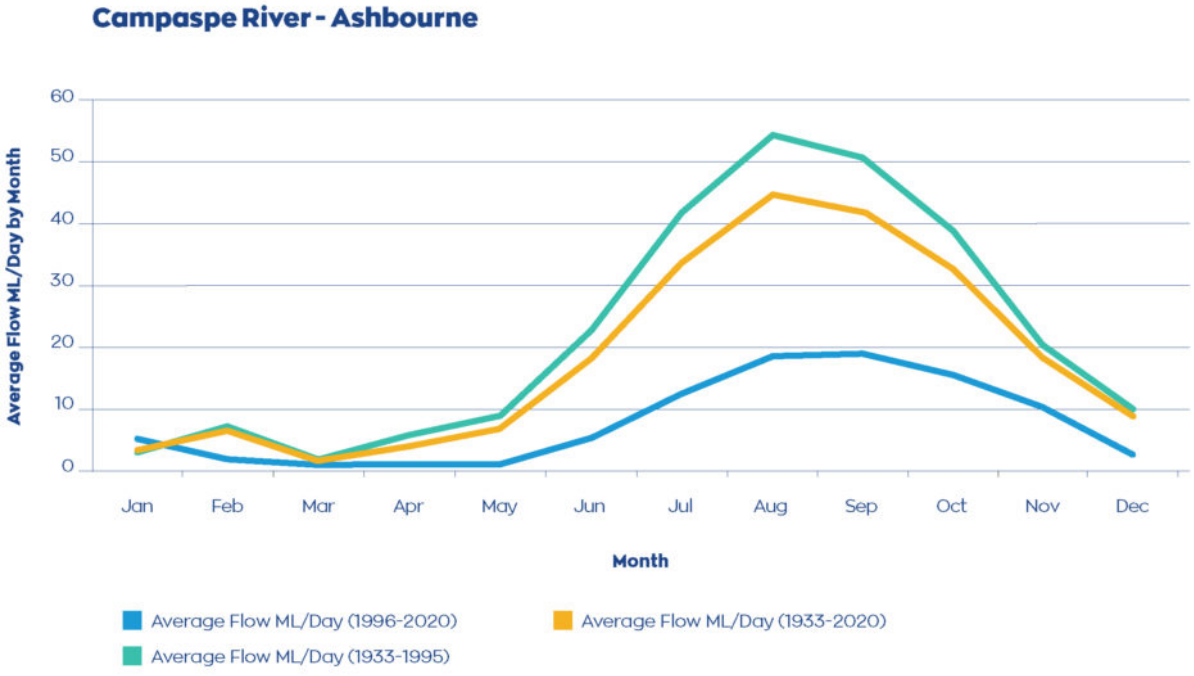
- 0% waterways in excellent condition
- 1% waterways in good condition (in Campaspe basin)
- 46% waterways classed as moderate, and
- 30% waterways in poor condition
- 21% waterways in very poor condition.

The impact of degraded ecosystems on aquatic plants and animals has been severe, both for species whose entire life history is within the region, but also for those who are only here for a short time.

For example, there has been a decline in waterbird populations across all feeding guilds by up to 90% since the 1980s across south-eastern Australia.

Of the 23 native fish species originally present in the region, only 18 species remain, and of those, eight species are listed as threatened under national and/or state legislation.

Climate change is a major threat to the region's waterways, wetlands and water resources. For example, in the past 20 to 30 years, there has been reduced average rainfall, with all river basins experiencing a significant decrease in average annual streamflow since the 1980s and 90s.



This graph compares the long-term stream flow data to records from 1996 (average daily stream flow by month) at one site in the headwaters of the Campaspe River at Ashbourne – demonstrating a significant decline in stream flow over the past 25 years.

The 'Victoria's Water in a Changing Climate, Insights from the Victorian Water and Climate Initiative' study found that the relationship between rainfall and run-off (which translates into streamflow) had changed significantly for many catchments during the Millennium Drought, meaning that a reduced proportion of rainfall is reaching our waterways. Eight years later, more than one-third of the catchments studied, including those in the north central region, show no signs of recovery. This clearly demonstrates the current and future vulnerability of water resources in our region in response to dry conditions and droughts.

Wetlands

McDonald's Swamp (from Monitoring Camera)

The north central region includes some significant wetlands, including the internationally recognised (Ramsar listed) Kerang and Gunbower Forest wetlands. Wetlands in the region are generally rated in moderate condition although only a limited number of high priority wetlands have been assessed based on the Index of Wetland Condition.

For example:

- 16 wetlands assessed within the Ramsar listed Kerang Wetlands are in moderate condition with two in poor condition.
- In Gunbower forest, 50% of plots assessed were in good condition, 30% in moderate condition and 10% in poor condition.

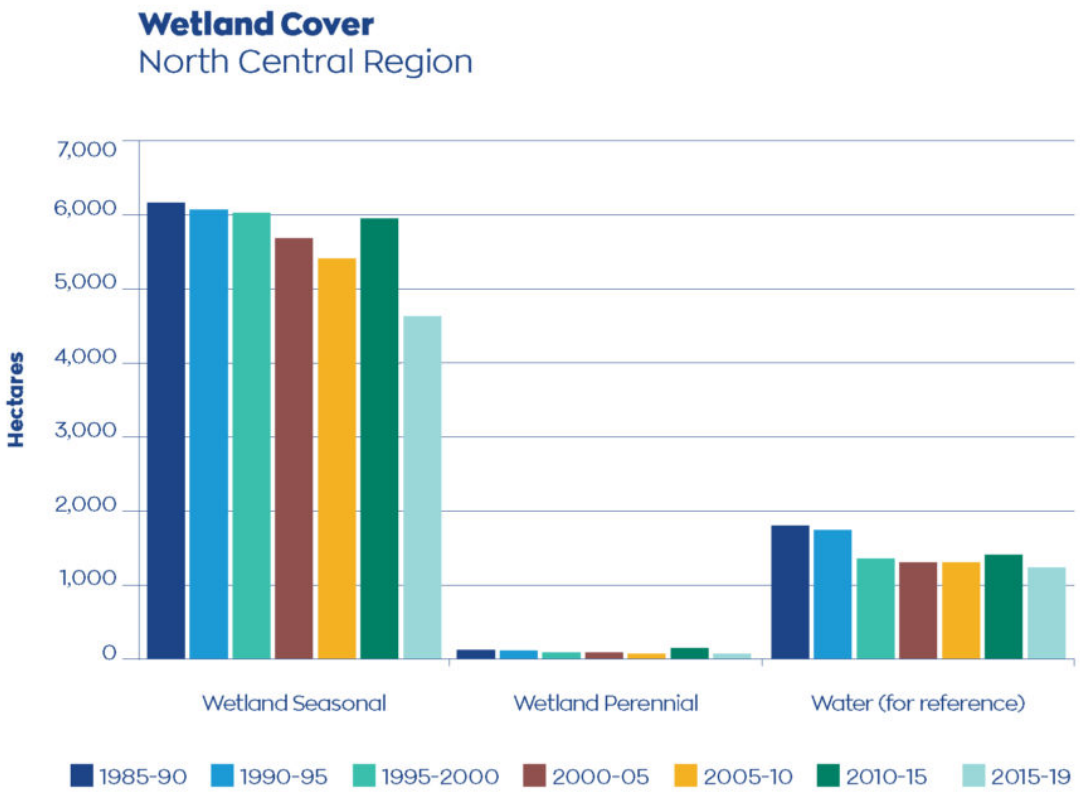
The Living Murray program, funded by Basin States and the Commonwealth and coordinated by the MDBA, focuses on maintaining the health of six icon sites along the Murray River, including the Gunbower-Koondrook-Perricoota Forest site. The Victorian part of this site is within the north central region. The program involves, engineering works to facilitate the efficient delivery of water for the environment to protect and enhance environmental and cultural values, and a long-term ecological monitoring program which is useful to understand the condition of this site.

The Victorian Land Cover Time Series 1985-2019 shows trends over time for different land cover classes, including wetlands. This will enable us to track changes in wetlands and associated vegetation cover across public and private land over time. As shown in the graph here, both perennial and seasonal wetland extent decreased between the first and last epoch. Whilst improved protection and management of wetlands, including the delivery of environmental water, can influence the extent of wetlands, rainfall has a big influence.

Floodplains

More than 780,000 ha of rural and urban land across the region, under both public and private ownership, are subject to inundation by a 1% Annual Exceedance Probability flood (1–in-100-year average recurrence interval). River regulation works and inappropriate development in the past, have had a significant impact on the natural floodplains by changing the flood frequency and flooding patterns, causing deterioration in the natural riverine, floodplain and wetland environments. Often, natural wetlands can remain dry (or at least not fill) in a flood because natural flood runners have been modified or the delivery infrastructure to direct flows is limited.

Groundwater



Regional groundwater systems are for the most part, ancient river gravels that lie buried below the floodplains of the river systems and their tributaries, extending from the upland valleys of the region, out into the Riverine Plains. Groundwater within most local and sub-regional flow systems in the region is saline, particularly in those areas where the annual rainfall is below 600 mm. Sub-regional aquifer systems within the Loddon and Campaspe catchments are an exception, as they are known to contain useful quantities of lower salinity groundwater commonly used for stock and domestic purposes or for irrigation (e.g. potato industry in the upper Loddon River basin around Smeaton). Lower salinity groundwater also features in the mineral water industry in both the upper Campaspe and Loddon catchments, and is well known from the Daylesford and Hepburn Springs areas.

Groundwater in the larger freshwater aquifers is extensively used for irrigation, with trading and allocations managed by rural water authorities. A drying climate means less groundwater recharge (replenishment) and recession of groundwater levels has been observed across most aquifers. Whilst this recession is not yet severely impacting availability for all irrigators, it is nevertheless a longer-term concern, and coupled with a trend of increasing groundwater use across the region, will need to be closely monitored. Several of the more extensively used systems, such as the Lower Campaspe Valley Water Supply Protection Area (WSPA), the Loddon Highlands WSPA and the Mid-Loddon Groundwater Management Area (GMA) are showing trends of decreasing recovery over time. Irrigator access to groundwater entitlements in the Lower Campaspe Valley have been limited to 75 per cent since 2019-20.

Groundwater level trends for WSPAs and GMAs in the north central region (from Victorian Water Accounts reports).

Groundwater level trends (June)	Lower Campaspe Valley WSPA	Loddon Highlands WSPA	Central Victorian Mineral Springs GMA	Mid Loddon GMA
2014	Rising	Rising	*(no data)*	Rising
2015	Stable	Rising	*(no data)*	Rising
2016	Declining	Declining	*(no data)*	Declining
2017	Declining	Declining	Stable	Declining
2018	Declining	Declining	Stable	Declining
2019	Declining	Declining	Stable	Declining

Improvements in condition

Implementation of the RCS, and the North Central Waterway Strategy by the North Central CMA, partner organisations and community groups, has seen significant investment in management interventions over the past 10 years. The North Central CMA and program partners undertake monitoring, evaluation, reporting and improvement (MERI) activities as part of all NRM programs and projects that, while unable to determine the condition of entire river systems or wetland complexes, have demonstrated improvements in condition where works have occurred. For example:

- Improved conditions for native fish such as silver and golden perch and Murray cod and improved riparian conditions on the Campaspe River through the Caring for Campaspe and Water for Environment program.
- The Waterwatch program has shown how citizen science can be used to demonstrate outcomes. For example, Waterwatch has measured an increase in diversity and abundance of macroinvertebrates on sites where woody habitat has been reinstalled in the Pyramid Creek.
- The benefits of riparian works including for example; exclusion of stock, pest plant and animal control, and revegetation (as shown in the photos below) are well established.

Before works 2009

Post revegetation 2009

Post works 2010

Riparian works to exclude stock and revegetate

Riparian works undertaken by the North Central CMA will be used to track progress of our efforts to protect or improve the condition of riparian land and track progress towards related targets (refer outcomes below).

Major threats and drivers of change

Our changing climate

Climate change is the major threat to our region's waterways, putting pressure on water resources and exacerbating existing threats. Key climate change projections for the region include; increased temperatures, reduced rainfall over the cooler months, and increased frequency of extreme weather events.

Surface and groundwater resources are under pressure from population growth in some areas. The 'Victoria's Water in a Changing Climate, Insights from the Victorian Water and Climate Initiative' study clearly demonstrates the current and future vulnerability of water resources in our region in response to dry conditions and droughts. This must be accounted for in water resource and climate change adaptation planning for our waterways and wetlands.

Reduced streamflow has adverse impacts on water quality and instream habitat. **Waterways** that are predicted to be more vulnerable to climate change, are the unregulated waterways including the upper reaches of the Loddon and Campaspe Rivers and the Avoca and Avon-Richardson catchments. Existing threats to waterways including erosion and sedimentation are likely to be exacerbated by increased frequency of intense rainfall events, so erosion control, including exclusion of stock and revegetation of riparian zones will continue to be important. Water quality in water storages will also be affected by increased temperatures and low flow conditions, particularly in summer and autumn, increasing the risk of blue-green algal blooms containing toxins that are harmful to humans and animals.

For **wetlands**, the timing of wetting and drying cycles is likely to change significantly and combined with increased temperatures and evapotranspiration this may lead to permanent and irreversible changes in wetland structure and function. Some wetlands are more vulnerable than others because they are sensitive to the key climate stressors. The source of water is an important factor, with floodplain wetlands that have tenuous connections to major rivers (e.g. Kamarooka wetlands complex), or wetlands that fill solely from surface run-off such as the (e.g. Moolort Plains wetlands) being particularly vulnerable to dry conditions. Refer mapping in the North Central Climate Change Adaptation and Mitigation Plan for other vulnerable wetland systems.

Flooding is a natural hazard and the region is threatened both from the reduced frequency and duration of minor to moderate floods that are essential for many ecological and cultural values across the landscape, and also from the social and economic impacts when major to extreme flooding occurs. The North Central Regional Floodplain Management Strategy identifies actions that will improve the flood resilience of our communities and facilitate quicker recoveries by individuals and businesses, reducing the social and economic impacts of future flood events. Making the most of available water will be increasingly important in the hotter, drier climate predicted with climate change, and this includes floodwaters. Restoring natural flows across areas of the floodplain, can have both land health and ecological benefits, and this has been identified as a priority for investigation in this RCS.

Groundwater recession is expected to worsen with climate change, so managing increasing demand in this context will be a challenge. This not only a concern for irrigators, but it also threatens ecosystems that are dependent on shallow groundwater systems, including ephemeral soaks that support unique flora and fauna. Knowledge of the water balance in these areas is still developing. There is an ongoing need to manage salinity issues generated by the discharge of saline groundwater, particularly within the irrigated lands of northern Victoria. Recent applications to use saline groundwater for irrigation in this area have raised concerns, particularly for the longer-term viability of soils irrigated with high salinity water. Domestic and stock access remains an issue, as licences are only required for bore construction, but not use. The proliferation of domestic and stock bores without licences only increases the pressure on aquifer systems.

Population growth

Greater Bendigo is among the fastest growing regional Local Government Areas in Victoria, with a projected 1.6% increase in population between 2018-36, which equates to an additional 37,700 people. In the south-east of the region accessibility, affordability (compared to Melbourne) and amenity values are driving strong population growth. This growth puts increasing demands on urban water supply. There is also strong growth in rural residential developments, which typically include small dams or bores, which puts added pressure on surface and groundwater resources in these important water supply catchments.

Other threats and impacts

The list below describes other threats and impacts to waterways, noting that some are the result of past land use or management and some are ongoing.

Threats	Impacts
Legacy of extensive land clearing. Present day clearing or over grazing of riparian areas and wetlands. Recreational practices that cause erosion or contamination of waterways.	Run-off from exposed soils, with erosion exacerbated by dry spells and extreme weather events, increase sediment and contaminant loads (also direct contamination) impacting water quality and instream habitat. Reduced input of organic matter and structural woody habitat to rivers leading to limited food availability and impacting habitat available for biota to complete critical life stages.
Waterway regulation, water extraction, altered flow regime in rivers and wetlands.	Loss of biological cues for aquatic species, reduced linkages, changes to habitat availability and changed geomorphic processes.
Removal of structural woody habitat in waterways.	Loss of habitat for aquatic biota to complete critical life stages

Clearing, grazing, drainage and laser grading of wetlands.	Reduced extent or loss of wetlands.
Pest plant and animals.	Predation of native species, outcompete native species Reduced regeneration of native vegetation.
Cold water releases from the depths of large water reservoirs (e.g. Eppalock).	Causes water temperature change, impacting critical life stages for many native fish species.
In-stream barriers, levees and other infrastructure that restrict connectivity.	Reduction or loss of floodplain linkages and disrupted linkages to waterways reduces habitat, and restricts species movement between systems in response to changing conditions.
Blackwater occurs when organic material is washed into waterways. When the weather isn't too hot and the water is flowing, this nutrient-rich water is good for the ecosystem. But when the weather is hot, a summer storm hits, and the water is not moving, too much oxygen is used up trying to break it down.	Insufficient oxygen in the water for fish and waterbugs, and if they can't move to a safer spot in the river with more oxygen, they can die.

Opportunities

There are many opportunities at local and regional levels to support restoration and improve waterway health. A key to realising these opportunities is to ensure that RCS partners, Traditional Owners and community are working together to address the threats facing our waterways.

Climate change will continue to be a key threat to the region's waterways and water resources. Our efforts to protect and improve riparian zones and wetlands, to exclude stock and revegetate, have many benefits including to improve climate resilience. Revegetation helps prevent erosion and filter contaminants, while shading helps lower the water temperature and reduce evaporation. Protection of drought refuges, e.g. shading of deep pools where water persists in dry periods, will be a priority.

Delivery of water for the environment in systems where this is possible, and when the water is available, can offset the impacts of climate variability to a degree. By understanding what patterns are likely to be in the future, some resilience can be built into the systems. Then over time, the system can be managed to adjust to longer-term changes to flows. For some waterways and wetlands, adaptation options may be limited, and in the long-term a transition to a more terrestrial system is likely.

Local government has an important role to play in protecting local waterways, as public land manager, through planning controls, and engagement with community to build awareness. Many volunteers and local community groups are actively involved in caring for local waterways, for more on this contribution refer the Community theme page. Urban waterways are important for recreation and wellbeing, the Integrated Water Management Framework for Victoria is designed to help regional stakeholders to work together, ensuring the water cycle contributes to the liveability of Victoria's towns and cities. To facilitate this, Integrated Water Management forums have been established in the region, to identify, prioritise and oversee the implementation of projects, to implement Water Sensitive Urban Design (WSUD) principles.

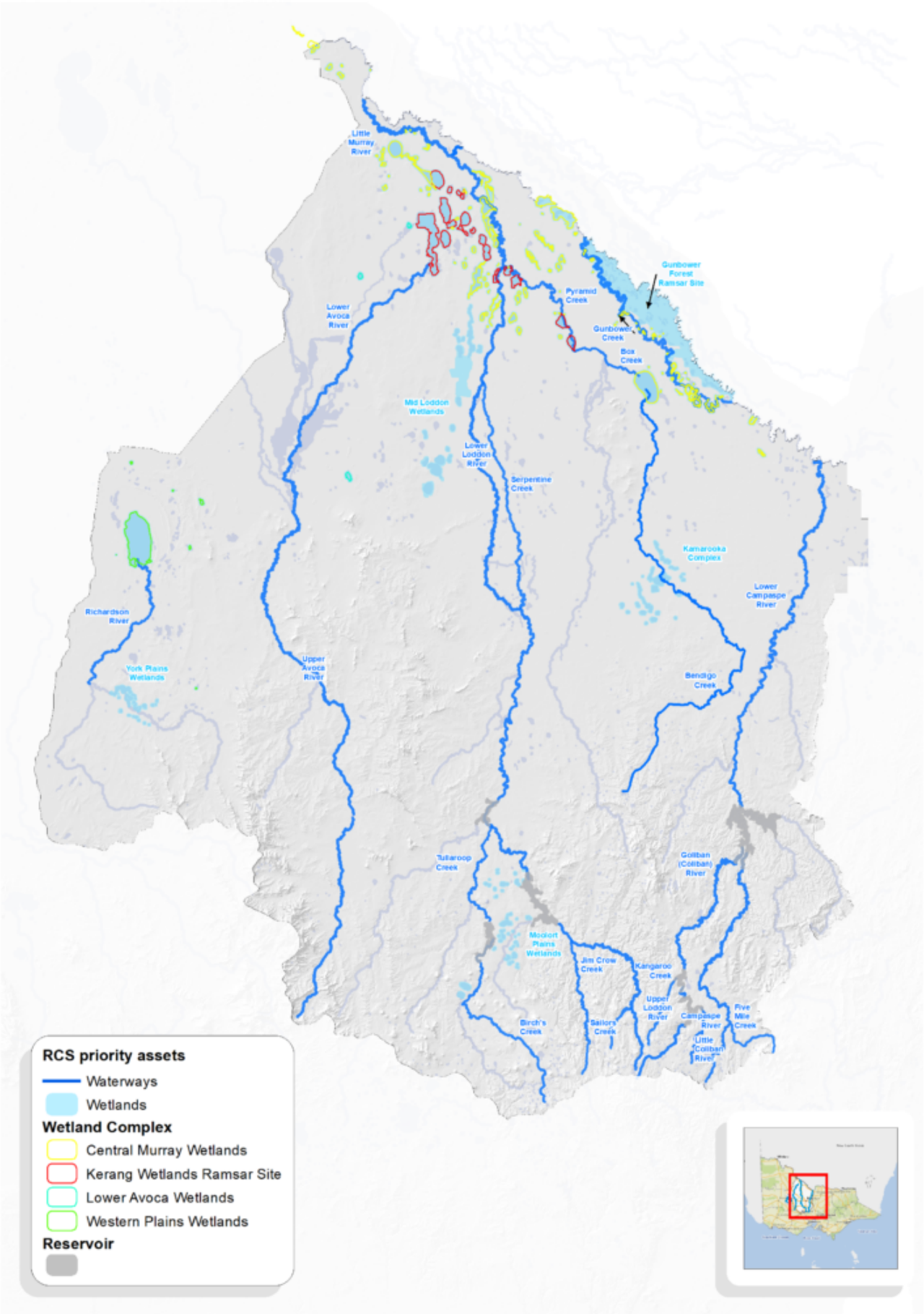
With reduced water availability we must also continue our efforts to improve the efficiency of irrigation systems (see Land theme page). Building community awareness and capacity around the management of water resources and waterways, in the context of climate change will be important. There are also opportunities to maximise the potential of available water. As with the Native Fish Recovery Plan, where ecological outcomes are being achieved within a highly regulated waterway system by embedding fish restoration flows into irrigation flows – that is using every drop twice, once to assist native fish and again to meet consumptive uses. Further opportunities are being investigated, to restore natural flows across parts of the floodplain for ecological and land health benefits.

Over the past 10 years large-scale integrated waterway restoration projects like Caring for the Campaspe have shown that concentrated effort can improve riparian and in stream conditions. Development pressure, particularly in the south east of the region and within water supply catchments, is putting pressure on water resources and threatening the health of our waterways too. Projects like A Healthy Coliban Catchment take a collaborative and integrated approach which includes updates to planning controls, works to protect and improve the health of the catchment and water quality, backed up with a long-term monitoring program including citizen scientists.

It is important that we continue to collaborate to deliver successful integrated catchment management projects, and support the efforts of local communities to care for their local waterways. The region's waterways hold a special place for the region's Traditional Owners. Supporting the Traditional Owners right to self-determination and their specific aspirations around water and waterways will be important focus for government partners.

Priority assets

The North Central RCS takes an asset-based approach, identifying the region's highest priority natural assets (waterways, wetlands and biodiversity) to focus our efforts and investment on protecting and enhancing those assets with the most significant values, that are under the greatest threat, and with the highest likelihood and feasibility of protection and enhancement.



RCS priority waterways and wetlands

The RCS priority waterway and wetland assets were first identified as part of 2013-19 RCS development (refer Strategy Development for more detail). Further assets were identified as part of North Central Waterway Strategy 2014-22 development. This priority setting was based on a rigorous process in which community and partners identified assets that were assessed considering; environmental significance, threat to asset, feasibility of action, technical and socio-economic risks.

For RCS renewal, new knowledge, policy and strategy were considered. The proposed priority water assets for RCS 2021-27 as shown on the map include:

- All 2013-19 RCS waterway and wetland assets
- Additional waterway and wetland assets from the North Central Waterway Strategy 2014-22
- Additional assets identified through engagement, considered significant due to new knowledge or policy.

Through RCS renewal engagement process there were some places identified as important by the community that have not been included as priority assets. This does not diminish the value of these places. Engaged and active communities who care for their local environment are an asset in themselves, and different funding streams (e.g. Landcare grants) can be leveraged for locally important assets. It is acknowledged that the health of tributaries is linked to the health of priority waterways. A more detailed review of waterway assets is anticipated for the upcoming renewal of the Regional Waterway Strategy in 2022-23.

RCS priority waterways and wetlands map Download

RCS priority waterways and wetlands – list Download

Priority directions

Priority directions and outcomes were developed to respond to the challenges and opportunities identified, and to align with the state-wide RCS Outcomes Framework. We engaged key government partners to confirm delivery roles and improve accountability for RCS implementation. The organisations identified as 'key collaborators' in the tables below, will be involved in initiating (including to source investment), but in order to succeed, partnerships, participation and support of many others is needed, including;

- Rural landholders, associated community-based NRM groups, volunteers and the broader community.
- Non-government organisations, industry and research organisations.
- Traditional Owners to speak for Country and participate/partner/lead (self-determination) in the delivery of RCS directions and outcomes.

Priority Directions	Key Collaborators
Continue to build partnerships with Traditional Owners towards self-determined participation and leadership in water planning and management.	Traditional Owners and RCS partners
Collaborate to: – improve our understanding of the predicted impacts of climate change on water resources and aquatic ecosystems in the region – consider related impacts and scenarios in strategic and operational planning – prioritise and implement urgent climate change mitigation and adaptation strategies.	CMA, Water Corporations, DELWP, Parks Vic
Improve current monitoring and analysis of water resources and waterways to detect long-term changes and trends due to climate change and enable timely adaptation.	CMA, DELWP, Water Corporations
Build community awareness and capacity around the management of water resources and waterways, in the context of climate change.	CMA, DELWP, VEWH, Water Corporations
Continue to support the collaborative development and implementation of Integrated Catchment Management projects.	CMA, Water Corporations, public land managers

Continue to collaborate to implement integrated water solutions in urban areas by applying Water Sensitive Urban Design principles.	Urban Water Corporations, Local Governments, CMA
Within the floodplain, identify locations where natural flows could be restored across and retained within the landscape, to improve connectivity, to increase waterbird habitat and for land health benefits, implementing pilot projects to trial and expand this practice.	CMA, GMW
Avoid, reduce and manage flood risk to community, through continued implementation of the North Central Regional Floodplain Management Strategy 2018-28.	CMA, LGs, SES
Seek to continue socio-economic monitoring of environmental watering, to contribute to a more holistic understanding of outcomes.	CMA, VEWH, Parks Vic
Continue to apply an integrated approach to the planning and delivery of water for the environment, undertaking complementary works and where possible using consumptive water, to achieve landscape scale outcomes.	CMA, VEWH, DELWP, Parks Vic, Water Corporations
Maintain and improve the health of priority waterways through continued implementation of the North Central Waterway Strategy 2014-22, renewing this strategy by 2023.	CMA
Continue to implement Flagship Waterway projects including the mid-Murray Native Fish Recovery project.	CMA
Investigate environmental watering of other potential wetlands in the Wimmera Mallee pipeline area.	CMA
Investigate opportunities to reconnect Avon Plains wetlands to increase natural flow conditions.	CMA

Outcomes

Long-term SMART outcomes	Key Collaborators
Improved condition of RCS priority waterways (rivers and wetlands), by 2041	CMA
Improved floodplain connectivity for ecological function, considering social and economic risks to communities, by 2041	CMA

Medium-term SMART outcomes	Key Collaborators
Increase the extent of protected or improved riparian land, on priority RCS waterway assets, by 850km, by 2027	CMA, DELWP
Improved stream connectivity by 240km and improved instream habitat by 100km, by 2027	CMA, GMW
Increased protection and improved management of 20,000 ha of priority RCS wetland assets, by 2027	CMA, DELWP, Parks Vic, Rural Water Corporations
Deliver on 95% the environmental watering actions at planned sites based on annual Seasonal Water Plans, by 2027.	VEWH, Water Corporations

The RCS Water Discussion Paper was drafted to frame conversations with stakeholders, obtain feedback and inform the development of this webpage. It includes more detail and references.

Discussion Paper Water Download

Date printed: 29 July 2024

This information was correct at the time of printing. The North Central Catchment Management Authority takes no responsibility for information that is inaccurate or out of date. To view the current North Central Regional Catchment Strategy go to https://northcentral.rcs.vic.gov.au/.

Land

Vision: *Healthy landscapes and soil managed for the future*

The Land theme considers land health with a focus on agricultural land use.

The north central region has been extensively cleared for agriculture, particularly on the flatter more fertile plains, where less than 30% native vegetation remains (refer Biodiversity theme page for more information). Eighty seven per cent of land in the region is privately owned and much of it used for agriculture.

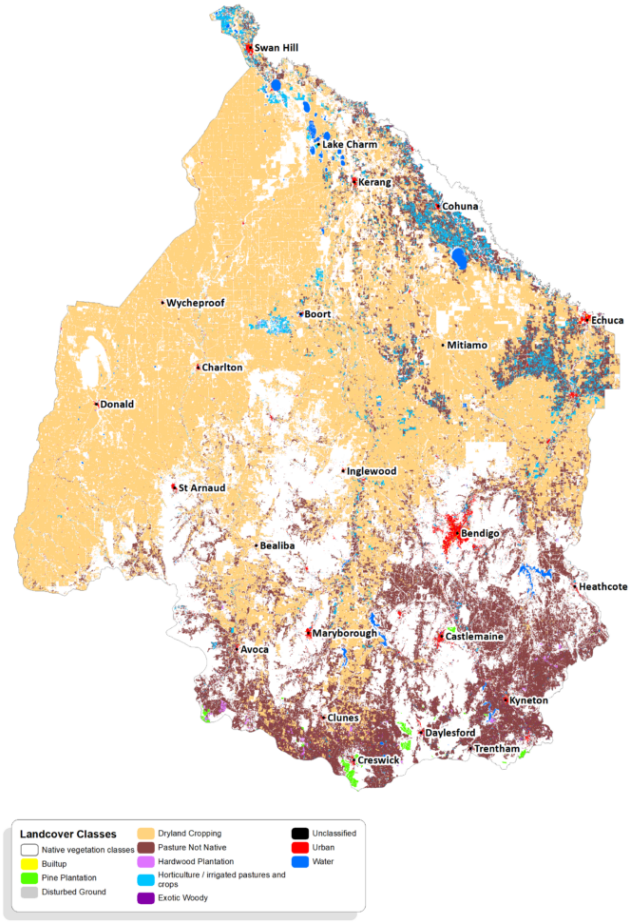
The region's land managers are recognised as successful and innovative growers of food and fibre, who work hard to improve the condition of the natural resources on which they rely. Landcare was founded in the region in 1986 and there are now more than 160 Landcare and other sustainable farming groups active in the region.

The region comprises a variety of land and soil types that sustain a diverse range of agricultural enterprises. In the steeper terrain of the uplands, land is mostly used for livestock grazing, however further north in the gentler more undulating foothills of the Campaspe, Loddon, Avoca and Avon-Richardson river basins, cropping is common, alongside mixed farming enterprises. Irrigated agriculture is concentrated within the Goulburn Murray Irrigation District (GMID), in the north of the region on the Riverine Plains.

In the south east part of the region, predominantly south of Bendigo, the demographics continue to change with an increasing demand for rural residential living (lifestyle, hobby farm) development. With this expansion comes a wide range of landholders new to land management.

Whilst an ageing population and trend toward larger/corporate farms in the north and west is leading to population decline and associated socio-economic impacts including a reduced volunteer base.

Across the northern irrigation districts of the region, there has been significant change, driven by climate change, drought, irrigation modernisation, changing water policy, water trade out of the region and fluctuating commodity prices. This has reduced the amount of irrigation in the region and changed; the mix of irrigation enterprise types, irrigation businesses, surface and subsurface drainage requirements.



Extent of land uses 2015-19 (click arrows to see 1985-90 map)

Changing demographics and land use and climate change bring considerable challenges but also opportunities.

The key approaches proposed to deliver on priorities for the Land theme are:

- Participatory community-based approaches that build capacity, empowering land managers/owners to make informed decisions.
- Supporting and recognising stewardship, and holistic land management for agricultural productivity and ecological values.

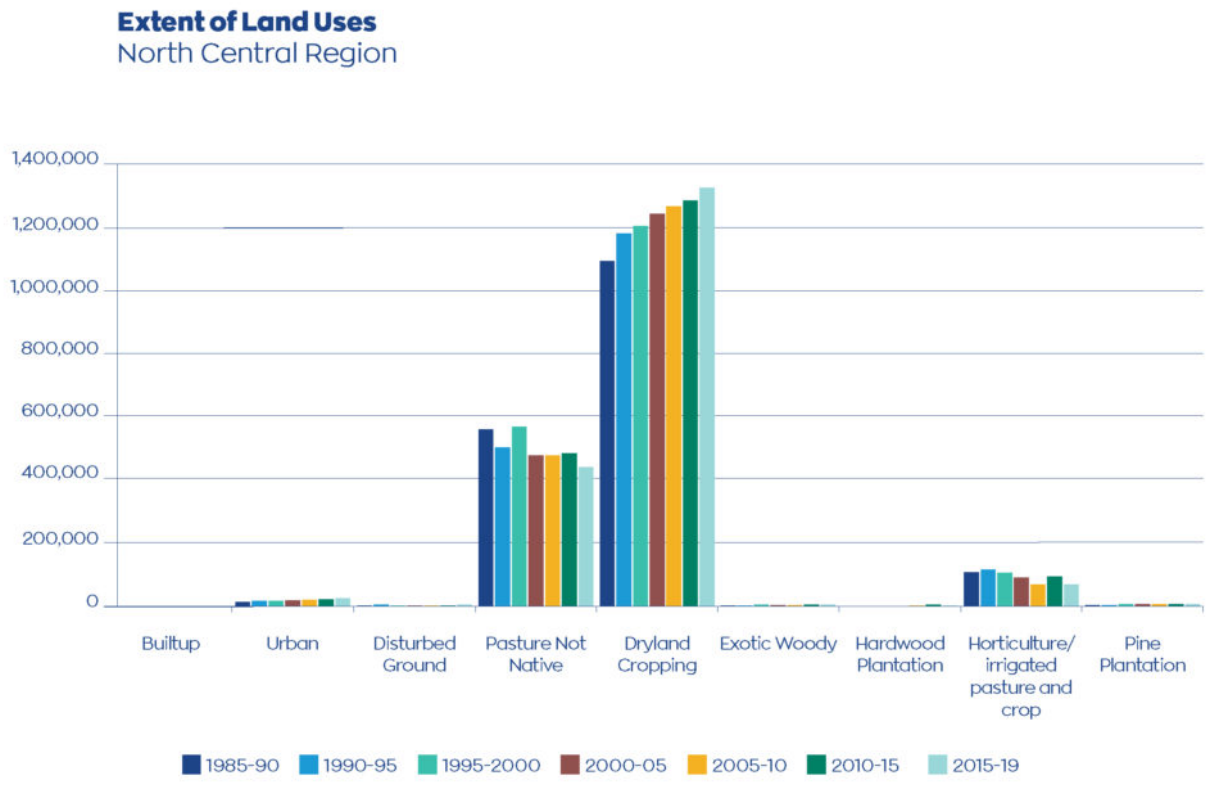
Assessment of current condition and trends

Land use

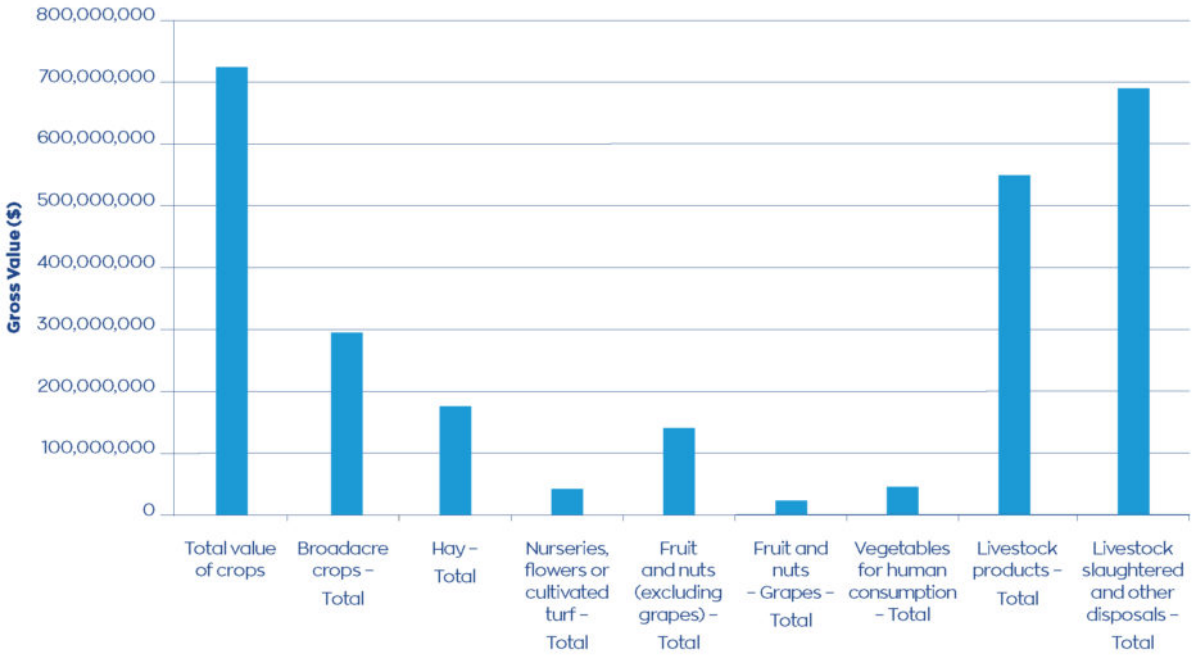
At a catchment scale, agricultural land use is commonly considered either from a dryland or an irrigation perspective. Irrigation is most common within the northern Riverine Plains comprising the lower reaches of the Campaspe and Loddon catchments and is largely based on the dairy industry, although horticulture is practised where soils are less sodic. The Harcourt apple industry along the foot-slopes of Leanganook (Mt Alexander), the potato industry in the rich red basaltic soils of the upper Loddon catchment and the stone fruit industry established on the lake lunettes of the Kerang area are other examples of irrigated horticulture in the region. Most water used for irrigation is sourced from reservoirs in the mountainous areas east of the region, however, a small but significant component is also drawn from regional and sub-regional aquifers, largely deep leads (ancient river gravels) and fractured rock aquifers.

Dryland farming is predominant wherever land is not irrigated or urbanised. Cattle and sheep grazing are common in the steeper uplands. Cereal cropping and grazing are common throughout the northern foothills and cereal cropping increases northwards into the Riverine Plains and onto the lighter Mallee lands of the north west.

The recently released Victorian Land Cover Time Series 1985-2019 show land use across the region, for broad classes and trends over time. The Extent of Land Uses graph below shows an increase in the dryland cropping area and a decline in pasture (not native) over the last 35 years. The breakdown of agricultural commodities reflects land use, with crops, livestock and livestock products contributing the most to overall gross value, as shown in the graph here. This data will be used to monitor future trends.



Agricultural Commodities Gross Value ($)
North Central Region (2018-19)

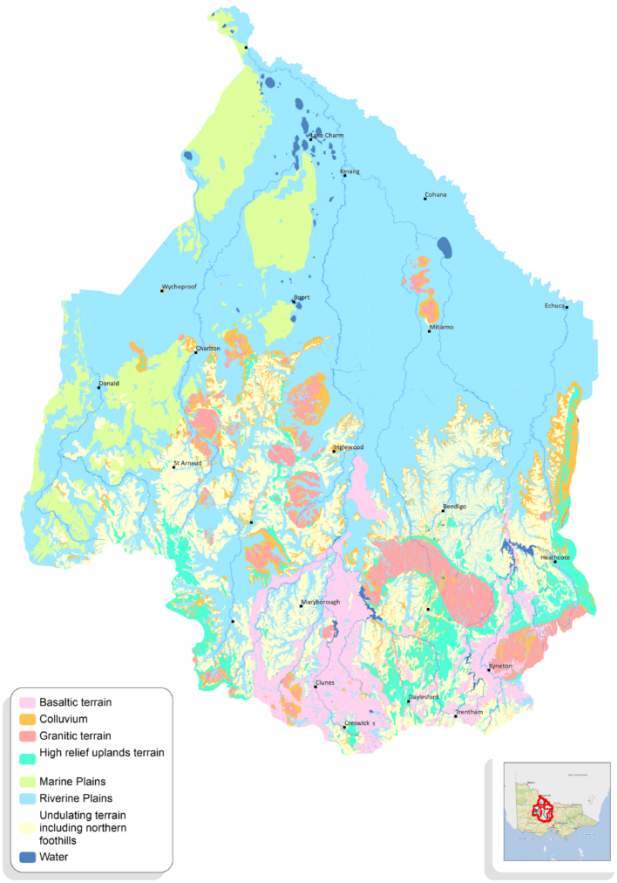


Soil health

Much has been achieved over the past decade, to slow the rate of soil loss and enhance the productive value of farmlands, through initiatives including conservation tillage, multi-species cover cropping and regenerative agriculture. Considerable challenges remain, however, in the quest for sustainable agriculture. Topsoil is still being depleted at an alarming rate. Seventy-five percent of the region has sodic subsoils which are sensitive to soil structure decline resulting from low levels of soil organic carbon. Declining soil structure impacts on soil quality and health leading to poor water-plant-soil relationships that retard root penetration and limit plant available water within subsoils.

Healthy water-plant-soil relationships are the foundation of healthy farming systems. This understanding is leading to innovations in soil management that recognise the role of soil organic carbon and soil biology in realising sustainable farming systems. Increasing soil organic carbon has considerable potential to improve resilience in the face of the transient climatic conditions now experienced throughout the region as extreme climate variability heralds the onset of climate change.

The soil landscapes map shown here is an aggregation of geomorphic units, considering geology, geomorphology, and relief which together, establish soil type. Understanding soil landscapes and their constraints, can inform our management responses, as outlined in the table below.



RCS Soil Landscapes – an aggregation of geomorphic units

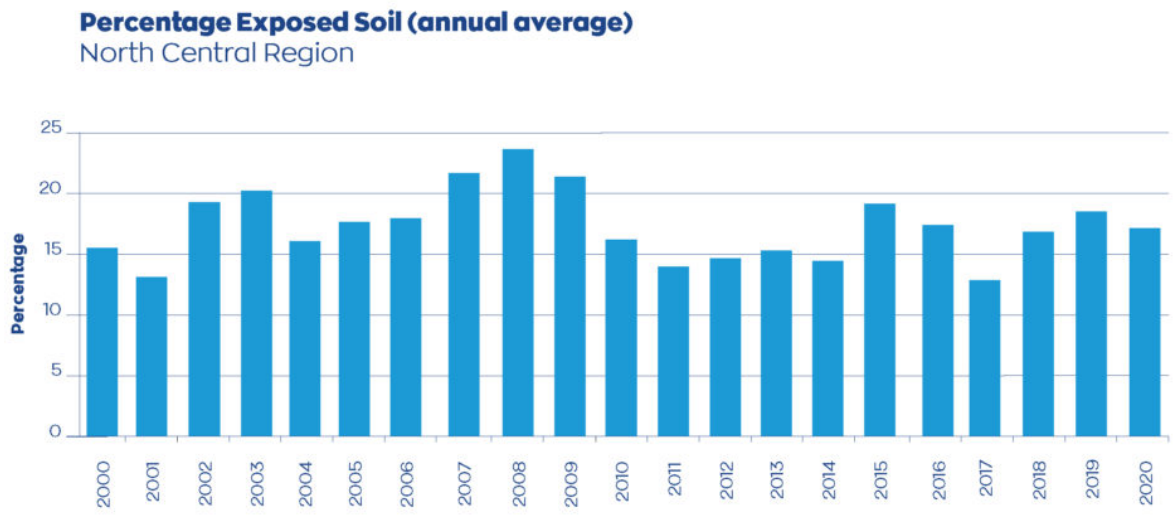
Soil landscape	Issues	Management responses
High relief uplands terrain – steeper hilly terrain of the Great Dividing Ranges featuring prominent sandstone/slate ridges including metamorphic aureoles surrounding granitic intrusions.	Land degradation is prominent where excessive runoff induces gully erosion within adjacent valleys. This is exacerbated by excessive clearing of native vegetation, shallow soils with poor water holding capacity, and soil acidity with attendant aluminium toxicity.	Erosion control structures, land retirement, perennial agriculture, careful grazing management, revegetation and farm forestry.

Soil landscape	Issues	Management responses
Undulating terrain including northern foothills – gently undulating terrain of the northern foothills comprising intensely weathered metasedimentary rocks.	Dryland salinity can be very severe where salt stores are elevated in intensely weathered terrain. Salinity affects both farmland and water quality within streams. Soils sodicity is also commonplace and maintenance of soil structure remains an ongoing challenge.	Farming for sustainable soil management through the adoption of practices that include targeted farm forestry, saline agriculture, deep rooted perennial pastures, cover crops and conservation tillage. Adoption of erosion control structures can also be very important where gullies are severe.
Colluvium – unconsolidated sediments deposited as alluvial fans on the hillslopes of most terrain types found throughout the northern slopes and foothills of the Great Dividing Ranges.	Unconsolidated sediments deposited as alluvial fans on sloping terrain can be problematic from both a salinity and erosion perspectives given both surface water and groundwater processes are involved. The extent of issues depends, to a large extent on local hydrological conditions including the parent material from which colluvial aprons are formed. Dryland salinity and gully erosion are commonplace.	Colluvial aprons form within a wide variety of terrain types and, accordingly, management options are best devised through knowledge of local hydrological processes and geomorphic conditions. Options, however, will nearly always include opportunities for improving the water balance of farming systems. In some instances more targeted approaches include 'break of slope farm forestry' afford an effective and innovative approach.
Granitic terrain – includes all terrain types found in granitic lands ranging through (for example) the high relief terrain of the Mt. Alexander complex through to the intensely weathered low relief lands of Murphy's Creek.	Gully erosion, soil acidity, silicified hard pans, and dryland salinity are all common in granitic terrain. Susceptibility to degrading processes is intimately linked to the physical nature of the terrain recognising a spectrum that extends from sandy outwash in steeper terrain through intense weathering in lower relief lands.	Management options must be tailored to local geomorphic circumstances. Options may include break of slope forestry, perennial agriculture, deep ripping, cover crops, manure injection and so on. Options must be linked to local hydrologic circumstances.
Basaltic terrain – Quaternary basalt flows that infill many of the larger valleys found throughout the mid to upper Campaspe and Loddon catchments.	Issues largely relate to soil structure which is generally excellent in the red soils and poor in the grey soils. Water logging frequently occurs in the latter.	Management options generally focus on opportunities to promote soil health through increased biological activity following the adoption of practices that increases soil organic matter.
Alluvial Floodplains – the vast alluvial plains extending northwards beyond the foothills of lower Loddon, Campaspe and Avoca catchments. Formed from unconsolidated sediments deposited by the present-day rivers and their ancestral streams.	Issues that require management for irrigated areas include the maintenance of soil structure, and salinity. The dryland areas are susceptible to the loss of soil structure associated with widespread occurrence of sodosols. The plains also suffer from dryland salinity.	Key principles and practices are established in a range of specific salinity management plans and consolidated in the recently renewed Loddon Campaspe Irrigation Region, Land and Water Management Plan (North Central CMA, 2020). The management of the dryland areas is largely concerned with attaining health soils through practices that sustain ground cover to avoid wind erosion and the adoption of practices that sustain or increase soil organic matter in an effort to retain and improve soil structure through soil biology.

Soil landscape	Issues	Management responses
Marine Plains – the gently undulating lands bordering the eastern Wimmera and Mallee country formed from marine sands deposited during the retreat of the Murray Sea	The lighter soils of the low rainfall lands in the west of the region are very prone to wind erosion	Practices that avoid wind erosion include the maintenance of soil cover in concert with minimum tillage and the maintenance of soil organic matter.

Erosion

Percentage exposed soils is an important indicator of susceptibility to wind and water erosion. Generally speaking, >50% vegetation protects soil from wind erosion, and >70% vegetation cover protects soil from water erosion. Although with high rainfall, steep slopes or erodible soils greater than 70% cover is required.



Erosion management is informed by local soils, terrain, climatic conditions and enterprise type. In many instances soil erosion has been mitigated in the region's broadacre cropping areas through the adoption of conservation cropping techniques including minimum tillage, cover crops, the adoption of new farm machinery and the advent of precision agriculture, though dry conditions obviously make it more challenging to maintain cover. Refer table and map above, for information regarding soil landscapes and their susceptibility to different types of erosion. The graph here shows the annual average percentage of exposed soils for the region. This is a high level indicator, which can mask high levels of exposed soils over summer-autumn in some years. This indicator, along with more detailed information including percentage area protected from wind or water erosion and associated maps, and information from the Community Dustwatch program, will be monitored over time, to track condition and progress against related targets (refer Outcomes below).

Salinity

Salinity occurs throughout the north central region. In a few places it is natural, meaning it was there prior to colonisation, for example the salt lakes to the west of Donald. However, in most instances it is the result of changes in the hydrology of the land that can be attributed to the adoption of European agricultural practices. Increased recharge resulting from the (historical) clearance of native vegetation and irrigation ultimately led to an increase in groundwater discharge and the changes in the water balance bring salt previously stored below the land to the surface and degradation then occurs. The widespread occurrence of salinity around Kerang and Pyramid Hill is an example.

Salinity is not restricted to agricultural land, it is also a substantive issue in terms of the water quality of the region's rivers and streams. Saltloads within the Axe Creek catchment southeast of Bendigo, for example, range from 5,000 tonnes per annum to more than 10,000 tonnes depending on seasonal climatic conditions. Salinity is also an issue in urban areas where it typically referred to as 'urban salinity'. Where developments are proposed in close proximity to saline groundwater discharge local councils must give special consideration to the design of subdivisions ahead of their approval. Guidelines for subdivision design in saline areas have been produced and published by the North Central CMA and the City of Greater Bendigo.

The north central region, along with all other states and regions in the Murray Basin must comply within strict limits to the amount of salt permitted to enter the Murray River through the stream network. Procedures including reviews, audits and accounting are established under the Basin Salinity Management Strategy 2030.

Major threats and drivers of change

The over-riding issue for dryland farming enterprises, particularly in cropping areas, is soil structure. Economic imperatives continue to drive farming communities into traditional farming practices that have limited opportunity to sequester soil organic carbon. The lack of carbon limits the biology needed to build and retain soil structure, which is necessary to offset subsoil sodicity and salinity.

The over-riding issue for mixed irrigation enterprises is the affordability of water. Water charges represent a high proportion of income per megalitre and unless infrastructure is rationalised to more affordable levels, this industry will come under increasing pressure. Water pricing for example, may impact on horticultural industries. The industry is already at risk of increased crop failures resulting from variable/volatile growing conditions. Water pricing will be a factor influencing the industry's capacity to meet increasingly specific and targeted quality assurance/market requirements.

Changing climate

Over the past two decades the region has witnessed extreme climate variability. The mid-1990s saw the onset of fundamental changes in rainfall patterns and water availability and these have prevailed through to the present. Within the new regime, extensive periods of drought are interspersed with extreme wet years with high rainfall events causing flooding. Over the past 30 years, average rainfall over the cooler months has declined and this is predicated to continue.

Climate adaptation is already happening on many levels – land managers and communities have been responding to the increased frequency of drought, flood and fire through a range of actions that minimise future risk. Farmers will need to continue to adapt, and be prepared for a range of scenarios. Development of practical place-based climate change resources that consider local conditions, land uses and multiple climate scenarios, to better inform adaptation has been identified as a priority direction.

Hotter, drier conditions and more intense extreme rainfall events are predicted under climate change which will increase the risk of erosion and loss of topsoil. Lighter textured soils in areas of higher relief that are susceptible to wind and water erosion, will be particularly vulnerable. Preventing overgrazing and maintaining groundcover will be important to protect soils. Increasing soil carbon will be important; as it not only captures carbon (mitigation), but also improves the overall health and adaptive capacity (ability to adapt) of soils.

Since the 1990s reduced rainfall has lessened the impact and threat of salinity as in many areas groundwater has receded in response to both reduced rainfall and a reduction in irrigated agriculture. Nevertheless, the threat remains and needs to be considered in future changes in land use and land management.

Land use change

Agricultural land use in the region is changing, largely in response to changes in market forces (including the water market), production costs and dry conditions. In cropping areas, increased mechanisation has led to farm aggregation and more corporate farms. In irrigation districts, drought; irrigation modernisation; changing water policy; and water trade out of the region have caused significant changes. The net effect has been a significant reduction in the amount of irrigation in the region (approximately 50% since the 1990s) and changes to the mix of irrigation enterprise types, irrigation businesses, surface and subsurface drainage requirements. This has and will continue to cause population decline in some rural communities, with knock on effects to the economy of local townships. Intensive agricultural enterprises (e.g. piggeries and poultry farms) are increasing in some areas. Land in transition is often not well managed for pest plants and animals, and new agricultural enterprises to the region, introduce new invasive species risks (e.g. almonds).

Clearing of native pastures, as a result of land use changes (grazing to cropping), including of threatened grassland communities that are protected by Federal legislation, continues to be a concern. Further mechanisation in cropping areas, is reportedly leading to further loss of paddock trees. A general lack of understanding or regard for legislation designed to protect biodiversity, as well as cultural heritage, has been identified as a concern across the region and this is reflected in priority directions on the Biodiversity and Traditional Owner pages.

RCSs are referred in the Victorian Planning Scheme. Local governments engaged to develop this RCS commented that the RCS does not currently provide sufficiently detailed guidance to inform planning decisions. More detailed information regarding erosion and salinity has been included in response to this. A priority direction has been identified to work with local and state governments to better align the RCS and Planning Schemes. In relation to strategic planning, several Councils indicated there was a need for up to date information to inform rural land use planning and manage development to protect values including productive agricultural land. As a result a priority direction to develop a regional land capability assessment has been identified to support this.

Engaging the changing demographic

Generally speaking, the ageing population and trend toward larger/corporate farms in the north and west of the region is leading to population decline and associated socio-economic impacts including a reduced volunteer base. Whilst in the south and east of the region there is strong growth in rural residential development which is increasing pressure on natural resources and introducing new landholders. Through engagement for RCS renewal we heard that:

- On the whole corporate agribusiness is not engaging in NRM programs or contributing to local communities. Given there is a growing number of corporate farms in the region, there is a need to address this, to influence land management practices and leverage support for local programs.
- The younger generation of farmers is more likely to leave the farm for a job in the city these days. With increasing land prices, young farmers who buy in, are very focused on business viability, so farm planning programs are likely to be of interest. Young farmers who inherit the family farm are not under the same pressure and may be more open to other types of NRM programs including new and emerging land management practices.
- New rural residential landholders often don't have skills or knowledge in land management, a priority direction has been identified to deliver targeted programs to build capacity, like the Macedon Ranges Shire Council's Sustainable Land Management program. Mentoring of new landholders by more experienced or retired farmers was also suggested through engagement for RCS renewal, like the Macedon Ranges program This farm needs a farmer.

Invasive species

Biosecurity and management of invasive pest plant and animal species across all land tenures continues to be important, with increased and new risks identified related to; climate change (species moving south as our climate warms) and land use change (land in transition not managed for pests, new industries in the region introduce new risks). Invasive species are an ongoing concern for government and private land managers, impacting on agricultural production and biodiversity. The Victorian Government's approach is outlined in the Invasive Plants and Animals Policy Framework, which includes a risk-based approach to determine the most appropriate intervention to maximise public benefit, but also notes that community-led action and support, and the engagement of key stakeholders is essential to complement the roles of land and natural resource managers.

Opportunities

In order to respond to the challenges identified for the Land theme, it will be important to continue to build the resilience of agricultural enterprises to climate variability. Some land management practices that contribute to this include:

- Practices that increase soil organic carbon, have multiple benefits (including to sequester carbon), improve agricultural productivity and overall soil health. The amount of additional carbon that can be sequestered depends on the initial carbon content, the management practice, soil type and climate. For example, reduced tillage, the use of multi species cover crops and rotational grazing can build soil carbon.
- Revegetation on farm can: prevent erosion, provide shelter for livestock from adverse weather conditions, sequester carbon, and provide habitat for wildlife. Biodiverse and regenerative forestry can deliver multiple benefits too. The carbon market can be leveraged to support large-scale revegetation or regenerative forestry on farm. Refer to the opportunities and priority directions on the Biodiversity theme page for more information.

Regenerative Agriculture is a growing movement that incorporates these and other practices and is gaining traction amongst landholders.

Adoption of digital technologies will make an important contribution to building a more efficient, sustainable and productive agriculture sector. For example, remote sensors can collect data on key variables and relay to farmers quickly, providing greater insights into farm performance and improving decision making on farm.

It is acknowledged that new, creative and innovative solutions will be required as we adapt to our changing climate. Fostering partnerships with key research organisations, keeping abreast of evidence-based technologies and systems and supporting trail blazers will enable this.

Stewardship programs and community-based participatory programs are the key approaches proposed to deliver on priorities for the Land theme, as described below.

Stewardship

Catchment stewardship recognises the efforts of landholders who provide benefits beyond agricultural productivity, using best practice management to improve the condition of soils, waterways and biodiversity. Many of our region's landholders are proud stewards of their land. Area under active stewardship is a policy indicator of interest to the state government. Development of a pilot stewardship program to recognise and support stewardship has been identified as a priority direction in this RCS – refer below.

The community-based participatory approach

Community-based participatory approaches have proven to be an effective way of building and increasing the adoption of new management practices. This involves supporting groups of landholders to work together and bringing in others to share skills and knowledge. The core principles of this approach are:

- Participatory and designed, as far as practical, to pass responsibility for NRM back to the regional communities that manage the land.
- Encompasses both public and private land and builds capacity and inclusion across the community.
- Encourages knowledge from different areas (e.g. government agencies, research organisations, traditional knowledge).
- Integrated and inclusive of sustainable agriculture, biodiversity, Traditional knowledge, productivity, and informed by a triple bottom line approach.
- Encourages peer learning and mentoring opportunities to support practice change
- Supports community well-being and connectedness.

Priority directions

Priority directions and outcomes were developed to respond to the challenges and opportunities identified, and to align with the state-wide RCS Outcomes Framework. We engaged key government partners to confirm delivery roles, and improve accountability for RCS implementation. The organisations identified as 'key collaborators' in the tables below, will be involved in initiating (including to source investment), but in order to succeed, partnerships, participation and support of many others is needed, including:

- Rural landholders, associated community-based NRM groups, volunteers and the broader community.
- Non-government organisations, industry and research organisations.
- Traditional Owners to speak for Country and participate/partner/lead (self-determination) in the delivery of RCS directions and outcomes.

Priority directions	Key Collaborators
Deliver community-based participatory programs that build the capacity of land managers/holders, to improve land health.	CMA, Parks Vic
Design and pilot a holistic landholder stewardship program that measures improvements in land health, supports and recognises landholders efforts as improvements are made.	CMA, Ag Vic, DELWP
Continue to increase the skills and capacity of partners, service providers and land managers/holders to improve soil health.	Ag Vic, CMA, Parks Victoria
Collaborate to develop a soil health knowledge resource, to improve understanding of the potential and limitations of soils across the region, updating as needed to capture new knowledge gained through research.	CMA, Ag Vic, research organisations & universities
Develop and maintain: – up-to-date, geographically referenced land use information – consistent messaging to inform decision making around land use and system change.	CMA, Ag Vic, industry
Work together to develop place-based climate change resources for landholders and managers, to inform adaptation.	Ag Vic, CMA, DELWP, Water Corporations, key agricultural industry groups
Work with local and state governments to improve alignment of RCSs and Local Planning Schemes.	CMA, DELWP, Local Govt.
Undertake a land capability assessment of the region, considering values, constraints, and land use under multiple climate change scenarios, to inform land use planning and management.	CMA, Local Govt.
Continue to improve collective understanding of the latest evidence-based technologies and systems, support innovation and provide landholders with relevant and credible information.	Ag Vic, industry groups, farming systems groups and research organisations
Build stronger connections between on-ground needs and research activity.	Ag Vic, industry groups, research organisations, CMA
Deliver targeted programs to build the capacity of rural residential landholders, to protect and enhance soils, water and biodiversity values.	CMA, Ag Vic, Local Govt.
Identify drivers to better engage corporate agribusiness and leverage their support for local NRM programs.	CMA, Ag Vic, Landcare, key agricultural industry groups
Continue to increase the uptake of sustainable agricultural practices through implementation of the Regional Sustainable Agriculture Strategy, Soil Health Action Plan and Land and Water Management Plan for the Loddon Campaspe Irrigation Region (LCIR).	CMA, Ag Vic, GMW

Support a coordinated approach, to protect the region's natural assets and agricultural industries from the introduction, establishment and spread of pest plants and animals.	CMA, Ag Vic, and public land managers

Outcomes

Long-term SMART outcomes	Key Collaborators
Improved management of irrigation and drainage systems, considering efficiency of water use and opportunities for ecological connectivity, by 2041.	Ag Vic, GMW, CMA, DELWP
Improved land health considering productivity, adaptive capacity and ecological function, by 2041.	Ag Vic, CMA

Medium-term SMART outcomes	Key Collaborators
Maintain an annual average percentage of no more than 20% exposed soils across the region, increasing area protected from wind and water erosion over dry months, by 2027.	Ag Vic, CMA
Increased uptake of improved soil management practices across 600,000 ha, to improve productivity, adaptive capacity and ecological function by 2027.	Ag Vic, CMA, Parks Vic
Engage 200 new rural landholders in community-based participatory programs, to build capacity by 2027.	CMA
600 rural landholders in the LCIR adopting technologies and systems to improve agricultural productivity, water use efficiency and ecological connectivity by 2027.	Ag Vic, GMW, CMA

The RCS Land Discussion Paper was drafted to frame conversations with stakeholders, obtain feedback and inform the development of this webpage. It includes more detail and references.

Discussion Paper Land Download

Biodiversity

Vision: *Diverse, connected landscapes valued by the community*

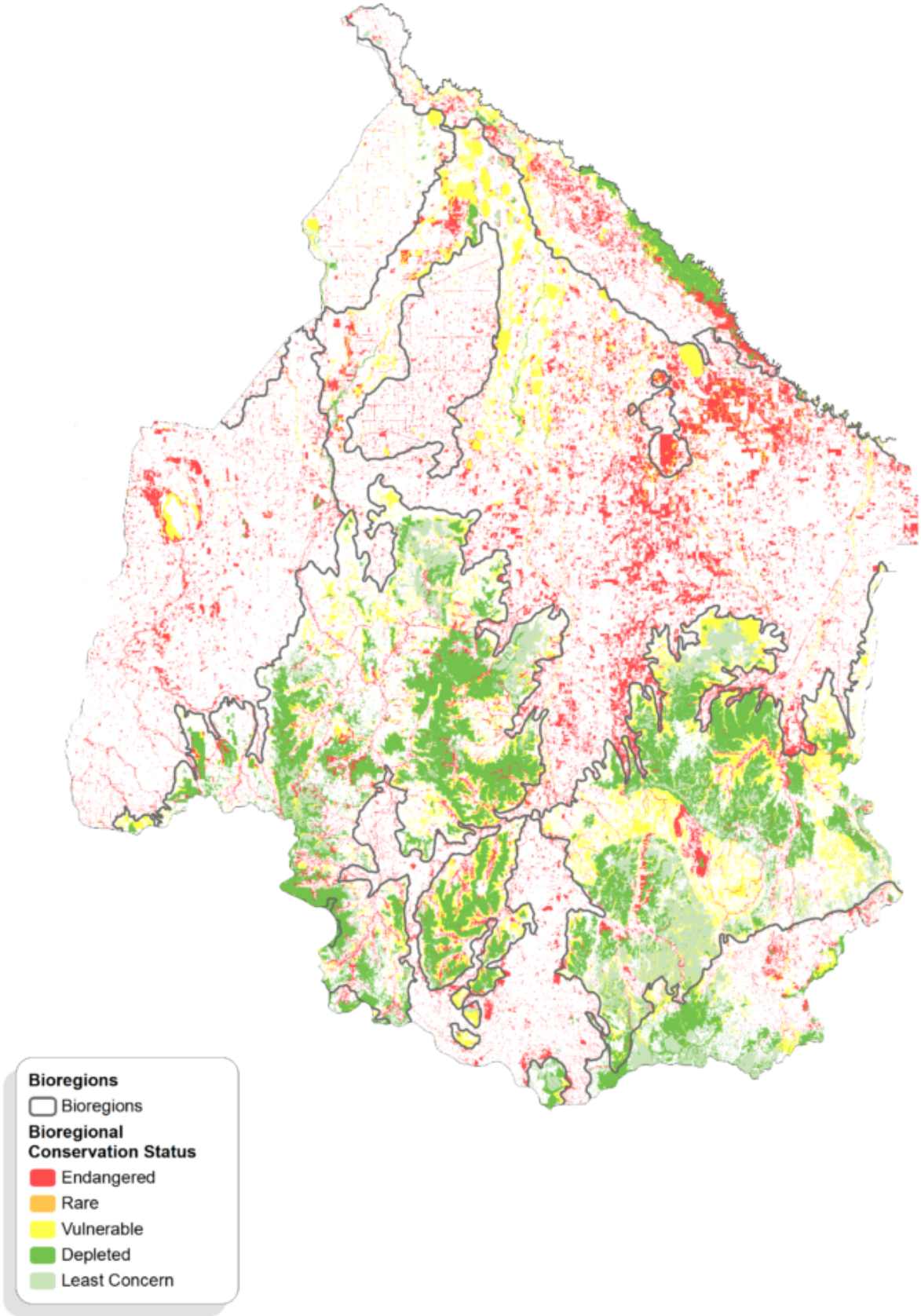
The Biodiversity theme considers native vegetation and habitats including threatened species, with a focus on terrestrial species and environments. Water-dependent species and habitats are addressed under the Water theme.

Biodiversity is the variety of lifeforms, including plants, animals, fungi and micro-organisms. It is the genetic diversity within species, between species and ecosystems.

Biodiversity underpins a healthy natural environment. It is fundamental to our economy, our physical and mental wellbeing. Native plants and animals also have intrinsic value, a right to exist. For the region's Traditional Owners certain species have cultural or spiritual value, and biodiversity is important for Country to be healthy.

The north central region's natural environment includes many natural wonders that are treasured by local and visitors alike. From the forests of the Great Dividing Range in the south, through the Box-Ironbark Forests and Woodlands, the Riverine Grasslands, to the River Red Gum Forests along the Murray River corridor in the north. Through engagement for RCS renewal, we heard from community members who are passionate about their local area and are working to protect, enhance and monitor its biodiversity. There are also many nature-based tourism attractions in the region that are important for the regional economy and indirectly support conservation efforts.

However, the region has been extensively cleared for agriculture, particularly on the flatter more fertile plains, where there is less than 30 per cent native vegetation cover. Remnant native vegetation is subject to ongoing loss and degradation, particularly where it is already fragmented. Our changing climate is putting increased pressure on the region's natural environment. Significant changes in species distribution are predicted with local extinctions likely. Protecting what we have, building ecosystem resilience and connectivity, will be priorities for the next six years and beyond.



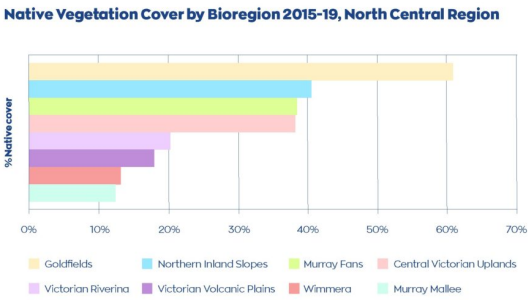
Bioregional conservation status of remnant native vegetation

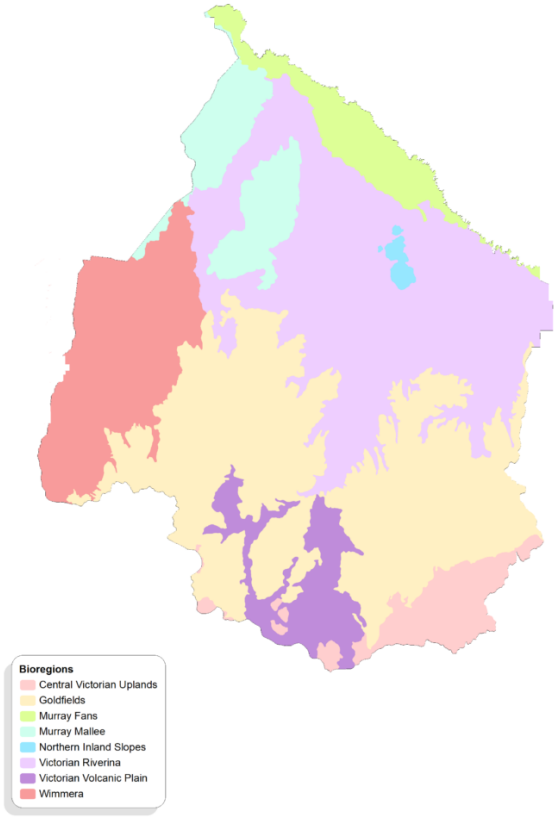
Assessment of current condition and trends

The RCS Outcomes Framework mandates a set of Regional Outcomes, (condition and outcome indicators) to be included in all RCSs. For biodiversity, we have described extent of native vegetation and area of permanent protection as indicators of condition on this page, with others addressed in our RCS MERI Framework. Indicators around extent of protected or improved riparian land, and extent of wetlands, whilst relevant to biodiversity, have been included on the Water theme page.

Extent of Native Vegetation

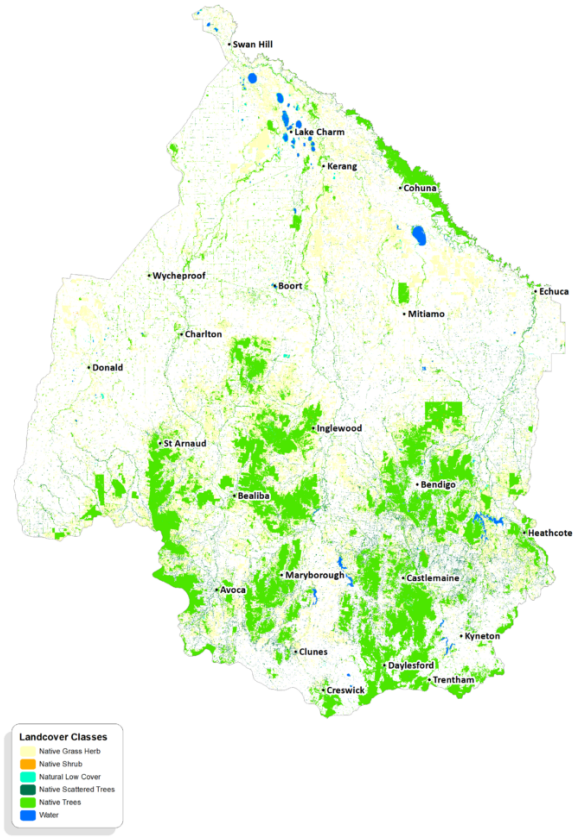
Native vegetation and habitat in the region have undergone a dramatic decline in extent and quality since colonisation. The bioregions with the smallest proportion of native vegetation are the more fertile plains which have been favoured and cleared for agriculture (e.g. Murray Mallee, Wimmera). Conversely the bioregions with a higher proportion of native vegetation, are those with steeper terrain and poorer soils, less favoured for agriculture (e.g. Goldfields).

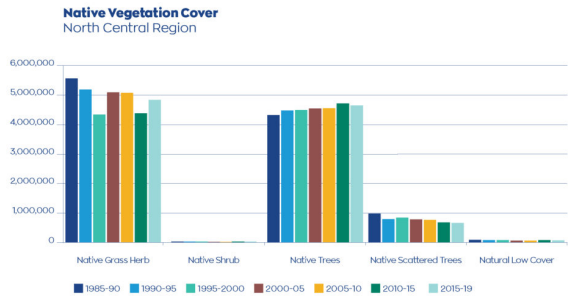




Bioregions

The Victorian Land Cover Time Series 1985-2019 shows trends over time for different land cover classes, including five classes of native vegetation. As shown in the map and graph below, over the past 34 years (between the first epoch 1985-90 and the last 2015-19) there has been a net loss of native vegetation in the north central region. The 'Native grass herb' and 'Native scatted trees' classes account for most of the losses. 'Native shrub' and 'Natural low cover' (environments with naturally low to negligible vegetation such as saline lake beds and rocky outcrops) have also declined somewhat – but make up a relatively small proportion overall. 'Native trees' is the only class that has increased in area. These native vegetation classes do not account for quality, and it is noted that the relatively large area of 'Native Grass Herb' includes grasslands that have been derived through the clearing of trees and/or shrub cover and likely includes large areas of degraded native pastures. This data will be used to track extent of native vegetation over time and progress towards related targets. Refer outcomes below.





Native Vegetation Cover

Condition of native vegetation and habitat

Generally, the condition of native vegetation and habitat is assumed to be relatively stable across intact landscapes but declining in fragmented landscapes (except where specific interventions are being made). The bioregional conservation status of remnant native vegetation map above, shows extensive fragmentation across the northern plains. Whilst not visible on this map, fragmentation is also present within bigger remnants. Fragmented remnants are more vulnerable to a range of threats including pest plants and animals.

In the absence of more detailed and accurate information regarding condition, bioregional conservation status provides high level overview of condition as it considers remaining extent, threats, quality of remnants and security of land tenure. Strategic Biodiversity Value (SBV) mapping, which has been used to inform updates to our priority assets updates, also considers condition, combining information on areas important for threatened flora and fauna, vegetation types and condition to provide a view of relative biodiversity value across Victoria. However, there are some important exceptions to these general assumptions and mapping with regards condition, including Box-Ironbark Forests and Woodlands.

Box-Ironbark Forest and Woodlands

Since colonisation Box-Ironbark Forests and Woodlands have been extensively modified through clearing for agriculture, gold mining, urban development, and timber harvesting. Only 17% of the original extent of Box-Ironbark Forests and Woodlands in Victoria remain, most of which are on public land within the north central region, including parks jointly managed by Parks Victoria and Dja Dja Wurrung.

These landscapes support a diverse assemblage of flora and fauna, including many threatened species and communities. However, they are generally in poor condition and active restoration is required to halt further decline and build climate resilience.

Previous clearing and timber harvesting has left forests and woodlands dominated by very high densities of small trees, with little undergrowth, groundcover or topsoil contributing to poor water infiltration and slow rates of litter recycling (refer photo on left). The loss of large trees as an important source of food and habitat, has significant implications. Drainage lines and associated gullies, which are important habitat and refuges in this landscape, have been disproportionately disturbed and badly eroded, and heavy rainfall runs off quickly instead of being absorbed (refer photo on right). Poor water use efficiency makes these landscapes vulnerable to further drying under climate change.

Typical structure with high density of small trees, Photo by Paul Foreman

To allow trees to mature and improve the structure and habitat value of these forests, interventions such as ecological thinning is required. Restoration works are needed to improve the retention and infiltration of water and the ecological functions of soil (and associated biota) in this landscape. Other management recommendations from the Environment Conservation Council's Box-Ironbark Forests and Woodlands, Investigation (2001) are still relevant today. At the time of writing, a pilot project is being developed, to trial a holistic approach to restoration – the Spring Plains Watershed Repair in the Spring Plains Nature Conservation Reserve, Heathcote. An RCS priority direction has been developed to support more pilot projects across the region and to inform and broaden this practice in Box-Ironbark Forests and Woodlands.

Badly eroded gully, Photo by Paul Foreman

Parks Victoria manages 183,063 hectares (6% of the region, 48% of all public land) in the north central region, including the five National Parks (Terrick Terrick, Gunbower, Kara Kara, Heathcote Graytown and Greater Bendigo). Their 'State of the Parks' program gathers, analyses and summarises the best-available information on the condition, issues and the management effectiveness for Parks Victoria managed land and is another resource for understanding the condition of biodiversity within Parks Victoria's estate in the region.

Threatened species and communities

The north central region is home to many threatened flora and fauna species and communities. Just prior the release of this RCS, the Conservation Status Assessment project, was concluded, which established a consistent approach to assessing and listing threatened species and resulted in a single list, called the *Flora and Fauna Guarantee Act 1988* (FFG Act) Threatened List for Victoria. The status of many of Victoria's threatened species were updated through this process.

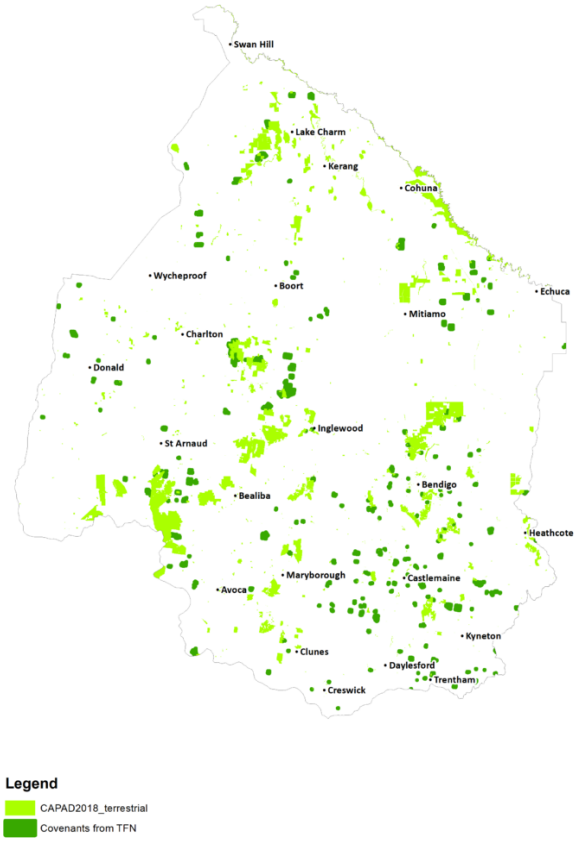
Threatened species can require substantial expertise and survey effort to monitor population trends. For this reason, our knowledge of many threatened species is deficient. Regardless, we know that threatened species are vulnerable to any change that might push them to the edge of their tolerance, including climate change. In the region's Box-Ironbark Forests and Woodlands for example, many species, particularly woodland birds, continue to decline even though widespread clearing of these landscapes has stopped. It is recognised that a time-lag on species response to past clearing occurs, but fragmentation and ongoing threats are also contributing. Unless these declines are reversed, it is expected that more common species will become threatened, and many threatened species will become extinct.

Many threatened ecological communities listed under the *EPBC Act* and *FFG Act* are known to occur within the region. A map of *potential* distribution of EPBC-listed ecological communities across Victoria can be viewed here, though accurate mapping is limited, as field assessments are required to determine if relevant condition thresholds are met. A few examples that are known to occur in the region include, the White Box-Yellow Box and Blakely's Red-Gum ecological community (*EPBC Act*) the Northern Plains Grassland community and the Victorian Temperate Woodland Bird Community (*FFG Act*).

Area of permanent protection

Australia's National Reserve System is made up of Commonwealth, state and territory reserves, Indigenous lands, protected areas managed by non-profit conservation organisations, and areas protected on private land. Given the majority (87%) of the north central region is privately owned, permanent protection of significant biodiversity values on private land, through mechanisms such as covenants, is an important component of the region's conservation projects, including the current Plains Wanderer project (refer below). Trust for Nature is a not-for-profit conservation organisation working to permanently protect and restore biodiversity on private land, using legally binding covenants. Using the National Reserve System's guidelines for establishing a 'Comprehensive, Adequate and Representative' (CAR) reserve system, Trust for Nature estimates there is a total of 678,913 ha of under-represented vegetation on private land in the north central region. Within these areas, and in accordance with their conservation objectives, Trust for Nature is targeting areas that increase viability at a landscape-scale and increase resilience in the context of climate change. Refer Trust for Nature's Statewide Conservation Plan for private land in Victoria.

The 'area permanently protected' is one of the RCS Outcomes Framework state-wide condition and outcome indicators. This will be tracked over time using the Collaborative Australian Protected Areas Database (CAPAD). Areas currently protected are shown in the table and map below. DELWP has provided the north central regions' contribution to *Protecting Victoria's Environment – Biodiversity 2037* targets, including for increasing the area permanently protected. See Outcomes below.



Areas Permanently Protected

Areas of permanent protection in the north central region. *Source: Collaborative Australian Protected Areas Database Terrestrial (CAPAD) and Trust for Nature for covenants.*

Protection Type	Number of protected areas	Proportion of total protected area (%)	Total area (ha)	Addition area (ha) since 201
Conservation covenant and other private lands	259	8%	13,045	1,702
National Park	5	30%	47,039	241
State Park	588	51%	79,171	-179
Other*	4	10%	15,516	0

*Other: includes any other protected area types listed in the region, e.g. Heritage River, Natural Features Reserve, Wilderness Zones, etc.

Major threats and drivers of change

Loss and degradation of native vegetation, habitat and fauna

Native vegetation and habitat loss, subsequent fragmentation and degradation continue to be significant threats to biodiversity across the north central region. Historically, the agriculture and mining sectors were primarily responsible for broad-scale clearing. These days the main drivers are residential development and agricultural intensification, including the conversion of pastures, to crops or 'improved pasture', which though less obvious in terms of structural changes to the vegetation, are equally destructive. Habitat loss and degradation reduces the resource base (i.e., food, shelter and mates) for individual animal species resulting in smaller populations with lower genetic diversity, increasing the probability of local extinction. It reduces overall species richness and diversity and leads to a decline in landscape amenity and intrinsic values.

Native vegetation and habitat loss (clearing, lopping and destruction) through:
-regional population growth and associated residential, industrial, infrastructure development
-land use changes (e.g. grazing to cropping) and increased mechanisation (bigger machines and removal of paddock trees)
-timber and firewood harvesting
-wildfire and clearing to reduce wildfire risk in increasingly populated areas
-conversion of irrigation channels to pipelines.

Native vegetation and habitat degraded and further fragmented through: -weed invasion -illegal off-road activity on public land -over-grazing by stock and pest animals (e.g. rabbits, pigs) and native herbivores (e.g. kangaroos) -inappropriate fire regimes -altered hydrology, introduction of in-stream barriers (e.g. weirs), removal of in-stream habitat (e.g. woody debris) -introduction of sediments, increased nutrients and contaminants through run-off (from roads, urban areas, agricultural land, and industry).
Native fauna loss through: -pest animal predation (e.g. foxes and feral cats), poaching and vehicle accidents -diseases introduced/spread by human activity.

Given the extensive loss in native vegetation extent and quality since colonisation it is important to protect, maintain and restore what is left – much of which is already fragmented, in poor condition and subject to ongoing threats. Building climate resilience, including climate-wise connectivity between remnants will also be important, as discussed further under the climate change and connectivity headers below.

Remnant native vegetation along roadsides include threatened communities and are important corridors for wildlife particularly in otherwise cleared agricultural landscapes. In the early 2000s significant vegetation along roadsides was mapped across the region and some signage installed. Through engagement for RCS renewal many community members and partners expressed frustration that illegal removal of native vegetation, including of listed threatened communities, continues to occur through slashing/clearing/cultivating of roadsides and on private land, with no consequence. This is particular concern for threatened grasslands, which are not as easy to identify. Some barriers include lack of community awareness or appreciation and a lack of resources for Local Government enforcement. Increasing the awareness of legal requirements to retain native vegetation and advocating to improve compliance has been identified as a priority direction in this RCS.

Given most of the region is privately owned, initiatives that encourage and support landholders to protect remnant native vegetation and habitat on their land, and to revegetate continue to be important. Landholders and their communities working together through community-based NRM groups such as Landcare make a significant contribution to protecting and enhancing the regions biodiversity. Refer to the discussion under the Community theme for more on community-based NRM groups. Refer to the discussion regarding leveraging the carbon market under the Opportunities header below. Refer to the Land theme page for more regarding stewardship programs.

Pest Plants and Animals

Pest plants and animals, including predators and herbivores, are major threats to our region's biodiversity and are the focus of significant effort by public land managers, private landholders and community-based natural resource management groups like Landcare. Weeds outcompete native species, changing and destroying habitat and in some cases increasing wildfire risk (e.g. gorse in southern areas of the region). Predators including cats and foxes, are the number one cause of native animal extinctions. Herbivores, like rabbits, deer and goats, also contribute to loss of native vegetation and habitat and soil degradation. Pest plant and animals also impact agricultural productivity. Both public and private landholders have a responsibility under the *Catchment and Land Protection Act 1994* (*CaLP Act*) to control pest plants and animals. Some Landcare networks engaged for this RCS, expressed their frustration that members were overwhelmed and fatigued by weed management activities. Supporting volunteers is vital to enable them to continue their important role in controlling pest plant and animals to protect our region's biodiversity as discussed further under the Community theme. Targets for weed and pest animal control are included under Outcomes below.

Threatened species

Protecting Victoria's Environment – Biodiversity 2037 shifts the conservation management approach from planning for individual threatened species to broader-scale threat management that benefits multiple species, thus reducing the risk of species becoming more threatened. However, it also acknowledges that some endangered and critically endangered species will not benefit from this approach. Using DELWP's new Threatened Species Framework we will be able to identify critically endangered and endangered species, with core habitat in the region that are not expected to benefit from the landscape-scale actions currently in Strategic Management Prospects (SMP). For these species a targeted approach is warranted. The Threatened Species Framework and other Naturekit products such as Species Reports and Specific Needs Assessments can inform the development of effective targeted threatened species programs. Single species management actions will need to be balanced against landscape-scale approaches, to maximise the benefit to the most species and to enhance resilience across the landscape.

The Australian Government invests in regional threatened species management through the Regional Land Partnerships (RLP) program, guided by their Threatened Species Strategy which has been renewed for 2021-31 to include a new place-based objective. This extends the focus to threat mitigation and habitat protection across landscapes, which is more aligned with the Victorian approach. For more on current RLP investment in threatened species in the north central region refer the Delivery page.

The Plains-wanderer is a Critically Endangered species, listed under the Federal *EPBC Act*. Ninety-one per cent of its Habitat Distribution Model is within the north central region and it is in the bottom 10th percentile of species benefiting from landscape scale actions currently in SMP. So it is a prime candidate for a targeted program, as described below.

Critically Endangered Plains wanderer

The Plains-wanderer has already lost 95% of its native grassland habitat through development and cultivation, with an estimated 250 – 1,000 individuals left in the wild. Both the Plains-wanderer and its native grassland habitat in the region (Natural Grasslands of Murray Valley Plains) are listed under the Federal *EPBC Act*. Habitat within the north central region includes the Patho Plains, Lower Avoca Grasslands and Bunguluke priority biodiversity assets. While the species can coexist with a sustainable grazing regime there is ongoing loss of habitat due to land use change from grazing to cropping in the region, which is a serious concern for the species. The Northern Plains Conservation Management Network is a group of farmers working with government and non-government organisations to raise awareness to permanently protect and enhance habitat and monitor populations. Parks Victoria manage two of the critical habitats for Plains-wanderer at Terrick Terrick National Park and Bael Bael Nature Conservation Reserve, and the ecological management of grassy biomass across these parks requires intensive and responsive management to meet specific habitat requirements. Zoos Victoria supports these efforts through a captive breeding program.

Fire

Aboriginal people used fire as a tool to manage landscapes for thousands of years prior to colonisation. Ecosystems evolved to tolerate and depend on fire. With colonisation, the fire regime changed. Today fuel reduction burns are carried out to reduce the risk of bushfires which threaten communities and can burn too hot to achieve ecological benefits. With a warmer and drier climate predicted under climate change, bushfire risk is set to increase. Through our engagement for RCS renewal, inappropriate fire regimes and removal of woody debris (habitat) to reduce fire risk, were identified as threats to biodiversity. There is a strong aspiration amongst Traditional Owners to reinstate cultural burns and a growing recognition of their value. DELWP and Parks Victoria are committed to resource and actively support the integration of Traditional Owner-led cultural burns in the region. Refer priority directions below.

Climate change

Climate change poses a serious threat to biodiversity, exacerbating existing threats. Native vegetation is likely to be directly impacted through changes to annual and seasonal rainfall patterns and increased temperatures, with flow-on effects including increased fire frequency and severity, and more favourable conditions for some weeds. Any change to the local ecological niche of species can place them near the limits of their physiological tolerance. There is already evidence of climate change causing large shifts in the composition of communities and changes in the centres of species distribution. Overall, changes in species composition are expected to occur more quickly in ecosystems already under stress, and more gradually elsewhere.

However, it is inherently difficult to predict the more specific impacts of climate change on our region's biodiversity, given the complexity of interactions within and between ecosystems against background variability. Long-term monitoring is required to detect changes, particularly gradual changes like the observed decline in the woodland birds of our region. However, interventions are urgently required to halt and reverse declines such as this. Long lead times and increased effort are required over and above what we're doing now. Even then, it may be too late to prevent local extinctions.

The North Central Climate Change Adaptation and Mitigation Plan 2015, considers the vulnerability of native vegetation in the region under climate change. This analysis highlighted a number of priority areas (e.g. Wedderburn – Wychitella) are especially vulnerable to climate change. However, vulnerabilities also exist where remnants are fragmented. Low-cost and low-regret adaptation strategies that minimise current risks to biodiversity and improve climate resilience should be prioritised including:

- Maintaining, enhancing, buffering good quality remnant native vegetation and habitat including areas more resistant to climate change (mostly in the southern parts of the region), riparian corridors and high-quality drought refuges.
- Continuing to improve the resilience of native vegetation and habitat generally, through management of current/emerging threats.
- Using species of different provenances (future climate analogs) for revegetation as is happening in the Bush Heritage Climate-Ready Revegetation Research Project at Nardoo Hills.

Other more specific adaptation actions to protect biodiversity such as large-scale connectivity projects or conservation of threatened species, warrant consideration of climate scenarios, risks, vulnerabilities, costs, benefits etc., to inform decision making. New and innovative approaches may be needed.

A priority direction has been developed to identify biodiversity adaptation priorities for the region, including refuges to protect, areas to build climate resilience and a strategic approach to climate-wise connectivity.

Connectivity

Given the fragmentation of remnant native vegetation and habitat in the region, connecting areas of native vegetation, to enable species movement, so they can access suitable and sufficient habitat to meet their needs, is a priority for the region. We must now consider this in the context of climate change. 'Climate-wise connectivity' is about connecting current habitat with habitat that will become suitable in the future in order to create a network of migration pathways. North-south connectivity, to allow species to move to cooler areas in the south of the region will be important. Continuing to enhance the riparian corridors of major river systems in the region will contribute to this, as they are natural movement corridors, climate gradients, and refugia.

The North Central Climate Change Adaptation and Mitigation Plan 2015 provides some guidance on broad north-south and east-west connectivity priorities for the region. The Biolinks Alliance identify broad landscapes for connectivity across the region, support local planning and capacity building. Landcare Networks, Trust for Nature and Bush Heritage amongst others, are actively involved in planning connectivity projects, including the Kara Kara Wedderburn Landscape Plan, which encompasses six RCS biodiversity priority assets.

While large-scale connectivity projects can be costly and difficult to deliver because they can require the support of several private landholders and public land managers, the carbon market may help to facilitate this, as described further under 'Opportunities' below. It is encouraging to note that functional connectivity can, and has been achieved by local communities working together, to enhance existing corridors (riparian and roadside) and include stepping stones, such as scattered trees, in the landscape, as has been achieved with the Cobaw Biolink (otherwise known as Campaspe-Maribyrnong Headwaters Biolink) in the south of our region.

A priority direction has been set to develop a strategic approach to climate-wise connectivity in the region in order to prioritise future works. Connectivity is also important for aquatic species and this is addressed under the Water theme.

Opportunities

The carbon market will support bio-sequestration projects. This presents opportunities for extensive investment in the region, to deliver on a range of co-benefits including for biodiversity e.g. retention and protection of on-farm biodiversity, biodiverse farm forestry and large-scale revegetation (including for connectivity) projects across both public and private land. Government and industry mandated emissions targets, stewardship and industry accreditation schemes will also help drive this. In order to maximise the biodiversity benefits from these projects, e.g. encourage biodiverse, connected plantings rather than isolated monocultures, collaboration between government partners, private landholders and investors is required.

The North Central Climate Change Adaptation and Mitigation Plan 2015 includes a regional map of carbon potential, which suggests that the southern parts of the region, with higher average rainfall, have the greatest potential. Further research is underway to better understand the carbon sequestration potential across Victoria, considering different methods, costs and benefits, to help water corporations achieve net zero carbon emissions by 2040. This work will inform further investment in our region to maximise benefits.

Priority assets

The North Central RCS takes an asset-based approach, identifying the region's highest priority natural assets (waterways, wetlands and biodiversity) to focus our efforts and investment on protecting and enhancing those assets with the most significant values, that are under the greatest threat, and with the highest likelihood and feasibility of protection and enhancement.

The RCS priority biodiversity assets were initially identified for the 2013-19 RCS. This process involved engaging the community and partner organisations, the use of ecological databases, modelling, decision support tools and advice from ecologists. Finally, these were amalgamated to form large catchment-scale assets. For more details refer Strategy Development.

In renewing the RCS for 2021-27, we reviewed the priority biodiversity assets considering new knowledge and policy. The North Central CMA worked with DELWP to engage with partner organisations, community and Traditional Owners and identify priorities for both the RCS and regional Biodiversity Response Planning. Some biodiversity priorities were also identified through the interactive map on the North Central RCS renewal, Engage Victoria webpage.

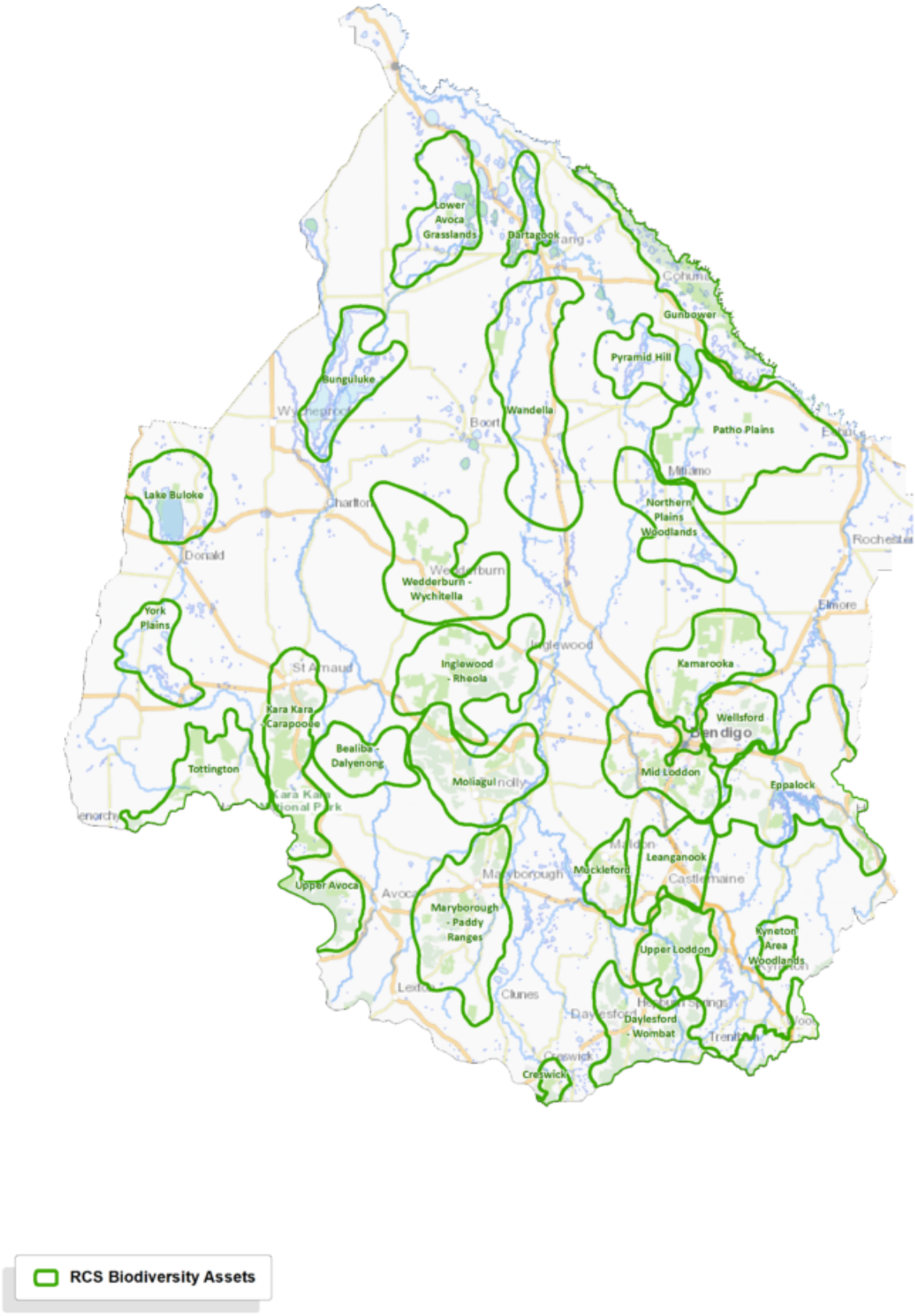
Updates were made to the RCS priority biodiversity assets, by comparing the areas identified through engagement, with Strategic Biodiversity Values (SBV) and Strategic Management Prospects (SMP). Where these aligned, and there was a concentration of values, either adjacent to an existing asset or large enough to constitute a new asset, they have been included as updates, as shown on the map here. Through the RCS renewal engagement process some places which the community identified as important have not been included as priority assets. This should not diminish the value of these places. Engaged and active communities who care for their local environment are an asset in themselves, and different funding streams (e.g. Landcare grants, carbon market) can be leveraged for locally important assets.

The key outcome of the DELWP-led regional Biodiversity Response Planning process was a set of Focus Landscapes and associated fact sheets. Within the north central region these landscapes are broadly based on and generally align with the RCS priority biodiversity assets, though there are some differences due to the different approaches used. DELWP intends to update the Focus Landscapes over time, whereas the RCS priority biodiversity assets will remain in place for the next six years.

The decision support tools and products available via the Naturekit portal, notably SMP, will help biodiversity managers identify and prioritise the most effective and efficient management options for the greatest number of species, within the priority areas identified.

'Climate-wise connectivity' has been identified as a priority for this RCS. This may involve improving connectivity within and between these priority biodiversity assets.

Traditional Owners have a holistic view and understand Country to be interconnected. The separation of RCS themes and prioritisation of specific assets in this RCS runs contrary to this view. When presented with a draft map of priority biodiversity assets, one Traditional Owner suggested that we start by connecting them all up. Exploring how cultural landscapes might inform future planning is an emerging priority for some Traditional Owners. Cultural landscapes are a traditional way of understanding and managing Country, 'the planning unit of choice.'



RCS priority biodiversity assets

RCS priority biodiversity assets map Download

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Priority directions

The priorities in *Protecting Victoria's Environment – Biodiversity 2037*, together with challenges and opportunities identified through engagement for RCS renewal, have informed development of the following priority directions for biodiversity.

We engaged key government partners to confirm delivery roles and improve accountability for RCS implementation. The organisations identified as 'key collaborators' in the tables below, will be involved in initiating (including to source investment), but in order to succeed, partnerships, participation and support of many others is needed, including;

- Rural landholders, associated community-based NRM groups, volunteers and the broader community, who make a significant contribution to biodiversity management on both private and public land.
- Government, non-government, industry and research organisations.

Traditional Owners

The key approaches proposed to deliver RCS outcomes (including biodiversity) on private land as described further on the Land theme page include:

- Participatory community-based approaches that build capacity empowering land managers/owners to make informed decisions.
- Supporting and recognising stewardship, and holistic land management for agricultural productivity and ecological values.

Self-determined participation and leadership by Traditional Owners, including in biodiversity planning and management, is identified as a priority direction for this RCS, consistent with Victorian government policy. (Refer Traditional Owners and Aboriginal Victorians Policy Context for more details). Some specific Traditional Owner identified priorities for biodiversity include, bringing back species of cultural importance and integration of traditional management practices such as cultural burns, as reflected in the priority directions below.

Species of cultural importance identified by Dja Dja Wurrung to bring back include:

- Murrup (spirit) that is connected with stories and identity, including Gal Gal (Dingo), Barramul (Emu) and Yung (Quoll).
- Food and fibre plants that were once abundant on Djandak (Country), and have cultural significance, such as Buwatj (grasses used for grain), Witji (weaving grasses) and Gatjawil Matom (tuberous plants with scented flowers).
- Wamba Wemba, Barapa Barapa and Yorta Yorta Traditional Owners identified totem species of importance. (Refer to the Traditional Owner page and associated pages for each Nation to find more detail on Traditional Owner values and priorities).

Plans for implementation

There is currently no biodiversity strategy or plan for the north central region. The key outcome of DELWP's regional Biodiversity Response Planning process in 2020, was a set of Focus Landscapes and associated fact sheets. The fact sheets for each Focus Landscape include:

- Outcomes of engagement including values, threats and species of interest identified by Traditional Owners, partners and community.
- Outputs from SMP identifying species with >5% of their Victorian range in each landscape and maps showing the top 10% of cost-effective actions.

The following plans outline approaches to biodiversity management for specific areas of the region:

Parks Victoria's state-wide Land Management Strategy (under development) will set the direction for Parks Victoria's land management including nature conservation, cultural heritage management and visitor management and services. Parks Victoria is also developing Conservation Action Plans (CAP) for each of their landscapes across Victoria. So far there is a CAP for the River Red Gum Park Landscape and others are being developed for the Central Goldfields and Northern Plains and Riverina landscapes, which are all relevant to the north central region.

The Dja Dja Wurrung Recognition and Settlement Agreement involved transfer of six parks in the region to Aboriginal Title. In collaboration with partner organisations the Dhelkunya Dja Land Management Board developed a Joint Management Plan (JMP) for these parks which include:

- Greater Bendigo National Park
- Hepburn Regional Park
- Kara Kara National Park
- Kooyoora State Park
- Paddys Ranges State Park
- Wehla Nature Conservation Reserve.

Bush Heritage Australia and Trust for Nature jointly developed the Kara Kara-Wedderburn Landscape Plan 2016–20 (soon to be renewed) to enable the local community to work together to reverse the decline of threatened species and to reconnect natural ecosystems of the Kara Kara-Wedderburn region. This area encompasses six priority biodiversity assets.

Priority Directions	Key collaborators
Continue to build partnerships with Traditional Owners towards self-determined participation in biodiversity planning and management.	DELWP, Parks Vic and Traditional Owners in partnership.
Identify regional priorities for biodiversity adaptation to climate change, including refuges to protect, areas to build climate resilience and a strategic approach to climate-wise connectivity.	DELWP, Biolinks Alliance, Parks Vic, Trust for Nature, Bush Heritage, CMA
Maintain and improve the quality of our remnant native vegetation and habitats, considering climate resilience, with a focus on RCS priority biodiversity assets.	DELWP, CMA, Parks Vic, Trust for Nature
Build climate-wise connectivity by: promoting a broad strategic approach, enabling and encouraging local investment and action, leveraging incentives and market opportunities.	CMA, DELWP, Landcare networks, Parks Vic, Biolinks Alliance. Trust for Nature
Continue to support targeted programs for threatened species that do not benefit from broad scale approaches, using DELWP's Threatened Species Framework to identify priority species and develop cost-effective management options, to halt their decline.	DELWP, Parks Vic, Trust for Nature, Bush Heritage, CMA
Undertake pilot projects across the region, to develop effective methods for holistic Box-Ironbark Forest and Woodland restoration, to inform and broaden this practice and increase investment in their management.	Parks Victoria, Biolinks Alliance, Dja Dja Wurrung and Taungurung, CMA
Establish a regional biodiversity forum for RCS partners to collaborate on enhancing the region's biodiversity.	CMA, DELWP
Improve the retention and restoration of native vegetation and habitat on private land through; community education and community-based programs that support stewardship and permanent protection, leveraging government and market-based incentives.	CMA, DELWP, Ag Vic, Local Govt., Trust for Nature, Connecting Country
Support strategic, long-term programs to monitor the effects of climate change on the region's biodiversity.	DELWP, CMA, Parks Vic
Collaborate to maximise the potential of carbon market investment, to contribute to land, water and biodiversity outcomes.	DELWP, CMA, Parks Vic, Ag Vic
Collaborate to increase awareness of legal requirements for cultural heritage management, and the protection of threatened species and communities, and improve compliance.	DELWP, Local Govt, CMA, Parks Vic
Support and enable opportunities for Traditional Owners to return species of importance to the landscape.	DELWP, public land managers and relevant non-government organisations to support Traditional Owners.

Support the integration of Traditional Owner-led cultural burns.	DELWP and Parks Vic to resource and actively support Traditional Owners.

Outcomes

Aside from the 'extent of native vegetation' outcome, the following outcomes were provided by DELWP as the north central regions contribution to *Protecting Victoria's Environment – Biodiversity 2037* targets.

It is expected that the state-wide target of *Protecting Victoria's Environment – Biodiversity 2037*, for net improvement in the outlook of all species by 2037, as measured by Change in Suitable Habitat, will be achieved by using decision support tools like SMP to inform cost-effective management approaches that benefit most species, and by reaching our regional contribution to *Protecting Victoria's Environment – Biodiversity 2037* targets as provided by DELWP and outlined below. Allocation of hectares for each outcome is based on priority locations to maximise cost-effectiveness for biodiversity benefit, as determined by the SMP tool. Noting that some endangered or critically endangered species do not benefit from landscape approaches, and targeted programs are required.

Implementation of these outcomes in the north central region, will be guided by the following key biodiversity priority directions (from table above)

- Identify regional priorities for biodiversity adaptation to climate change, including refuges to protect, areas to build climate resilience and a strategic approach to climate-wise connectivity.
- Maintain and improve the quality of our remnant native vegetation and habitats, considering climate resilience, with a focus on RCS priority biodiversity assets.
- Build climate-wise connectivity by promoting a broad strategic approach, enabling and encouraging local investment and action, leveraging incentives and market opportunities.

Long-term Outcomes	Key collaborators
Increase overall extent of native vegetation from 2017 levels, by 2037.	DELWP, Parks Vic, Trust for Nature, Bush Heritage, CMA
13,000 ha increase in the area permanently protected, between 2017 and 2037.	Trust for Nature
22,000 ha of revegetation in priority locations for habitat connectivity, between 2017 and 2037.	DELWP, Parks Vic, CMA
70,000 ha of priority assets under sustained weed control (not year by year cumulative total) by 2037.	DELWP, Parks Vic, CMA
130,000 ha of priority assets under sustained herbivore control (not year by year cumulative total) by 2037.	DELWP, Parks Vic, CMA
40,000 ha of priority assets under sustained pest predator control (not year by year cumulative total) by 2037.	DELWP, Parks Vic, CMA
Medium-term outcomes	**Key collaborators**
Increase native vegetation extent to 2017 levels, by 2027.	DELWP, Parks Vic, Trust for Nature, Bush Heritage, CMA
6,500 ha increase in the total area permanently protected, between 2017 and 2027.	Trust for Nature
11,000 ha of revegetation in priority locations for habitat connectivity, between 2017 and 2027.	DELWP, Parks Vic, CMA
56,000 ha of priority assets under sustained weed control (not year by year cumulative total) by 2027.	DELWP, Parks Vic, CMA
104,000 ha of priority assets under sustained herbivore control (not year by year cumulative total) by 2027.	DELWP, Parks Vic, CMA

32,000 ha of priority assets under sustained pest predator control (not year by year cumulative total) by 2027.	DELWP, Parks Vic, CMA

The RCS Biodiversity Discussion Paper was drafted to frame conversations with stakeholders, obtain feedback and inform the development of this webpage. It includes more detail and references.

Discussion Paper Biodiversity Download

Date printed: 29 July 2024

This information was correct at the time of printing. The North Central Catchment Management Authority takes no responsibility for information that is inaccurate or out of date. To view the current North Central Regional Catchment Strategy go to https://northcentral.rcs.vic.gov.au/.

North Central CMA

VICTORIA State Government

Dja Dja Wurrung

Introduction

Dja Dja Wurrung Country is entirely within and comprises 58 per cent of the north central region. It extends from the upper catchments of the Bulutjal Yaluk (Loddon River) and Golipan (Coliban River) to Lalgambook (Mount Franklin) and the towns of Creswick and Daylesford in the southeast, to the Yaluk (Campaspe River) Kyneton, Redesdale and Rochester in the east, Yung Balug Djandak (Boort Lakes) in the north, Lake Buloke, Donald in the northwest, to the Avon Richardson River, Navarre Hill and Mount Avoca marking the south west boundary.

In 2013, the Dja Dja Wurrung Aboriginal Clans Corporation (DDWCAC) signed a Recognition and Settlement Agreement (RSA) with the Victorian government, under the *Traditional Owner Settlement Act 2010.* The Dja Dja Wurrung RSA involved transfer of six parks in the region, to Aboriginal Title. In collaboration with partner organisations the Dhelkunya Dja Land Management Board developed a Joint Management Plan (JMP) for the parks which include:

- Greater Bendigo National Park
- Hepburn Regional Park
- Kara Kara National Park
- Kooyoora State Park
- Paddys Ranges State Park
- Wehla Nature Conservation Reserve

DDWCAC also has Registered Aboriginal Party (RAP) status under the *Aboriginal Heritage Act 2006.* The boundaries of the RAP and RSA areas are consistent. For more details see the Traditional Owners and Aboriginal Victorians Policy Context page.

To inform RCS renewal, DDWCAC representing Dja Dja Wurrung Traditional Owners, were engaged. As for other Traditional Owners of the region, we have sought to reflect Dja Dja Wurrung values and aspirations in this RCS, at a high level. For more specific information, RCS partners should engage directly with DDWCAC and reference the Dhelkunya Dja, Dja Dja Wurrung Country Plan.

All Traditional Owners engaged for RCS renewal were asked if they would like to identify values, including places of value in the RCS. We also discussed a range of concerns and aspirations for the future. Those identified by Jaara (Dja Dja Wurrung people) who were engaged for RCS renewal are outlined on this page. Together these have informed the development of priority directions and outcomes for all Traditional Owners as outlined on the Traditional Owners page

Values, concerns and aspirations

The following values, concerns and aspirations were developed through discussions and provided by Dja Dja Wurrung in writing (written contributions are shown in *italics*). In relation to biodiversity, we have referenced outcomes of DELWPs regional Biodiversity Response Planning engagement with Dja Dja Wurrung. In relation to water, we engaged the Dja Dja Wurrung water knowledge group Kapa Gatjin. Dja Dja Wurrung made it clear that all areas of Djandak (Dja Dja Wurrung Country) are of great importance and that the naming and identification of specific locations and species in this RCS, is intended to provide a focus for this RCS and should not compromise the importance of those not listed. They also stressed that cultural values identified here do not fully define the interests and beliefs of Jaara, which are multifaceted and cannot be defined through a single standpoint or response.

Vision for Country

From *Dhelkunya Dja, Dja Dja Wurrung Country Plan*:

"*Our Vision for Country is to ensure that:*

The health and wellbeing of our people is strong, and underpinned by our living culture.

Our lands and waters are in good condition and actively managed to protect our values and to promote the laws, culture and rights of all Dja Dja Wurrung People.

As this Country's First People we are politically empowered with an established place in society and capable of managing our own affairs from a strong and diverse economic base."

Cultural Lore

Bunjil, the creator being, bestows Jaara with the laws and ceremonies that ensure the continuation of life. Mindi the Giant Serpent is known as a protector and enforcer of Bunjil's Lore and is a large and powerful creator being that was not to be messed or disturbed with. Mindi holds the powers of justice for Lore breakers and death/destruction. Mindi the Giant Serpent guides and enables the Lore keepers, punishes Lore breakers and continues the cycles of life force and creation.

Waa the Crow is known to be the protector of the rivers and waterways, ensuring that water (Gatjin) continues to run through the veins of our Country and provide for Bunjil's creations, the animals and the plants across Djandak. Waa is also the discoverer of Wi (fire), having stole the secret of Wi, burning his feathers black in the process.

The roles that these creators play are central to the Lores and laws that dictate Jaara today. Similarly, Wi and Gatjin are essential for life, essential for the regeneration of Country and central to the restoration of ecological balance across Djandak. These lessons begin in childhood with the stories of Country, teaching the relationship and cultural worldview that make the foundation of the relationship to all the aspects of Country.

Impacts and threats to healthy Country

After the frontier wars, after the surviving Jaara people were forced onto missions to free up the land for more migrants to occupy, many drastic changes to the Cultural Landscape took place. Goldmining, agriculture and urban development had inadvertently been the downfall of living in balance with our Djandak in a way that all things could live sustainably. These drastic changes are what we refer to as 'upside-down Country'.

Gold mining tempted many people from all over the world to come with much haste. The race was on in a 'free for all' manner, digging up the Country to find the precious Kara Kara (gold). Alluvial mining added mass sediments to the water and leached out the arsenic, poisoning groundwater systems which are alarmingly expensive to mitigate or just keep at bay. This is the legacy of mining that still interferes with the health of the land and the people today. Many of these practices are no longer legal due to the environmental harm caused. However, mining continues today with different methods that still require large amounts of water and by process still contaminate it. The mines go for kilometres underground with tunnels honeycombing Jaara Country and eventually will destabilise it.

The introduction of foreign crops, animals and mindsets completely changed the landscape in a radical nature. The land was cleared for farming, removing many of the mother trees that supported and stabilised the forest and water table. This triggered the main problems of the future, our present dilemma of erosion and salinity. This was accelerated by the introduction of hard-hoofed animals: cattle and sheep. Widespread clearing has caused much of the productive topsoil to erode away and allowed the establishment of many pest animals and plants that are displacing and preying on our native species. In some cases, the shift in ecosystem composition is causing an over-abundance of native species like kangaroo, which is increasing the demand on already limited food resources. The majority of native animal habitat has since been fragmented and reduced to small pockets, islands and parks.

Up to 81 per cent of Dja Dja Wurrung Country is privately owned and 65 per cent of this is used for agriculture. Having crops is not something new or since colonisation in north central Victoria, Aboriginal People were farmers as well. However, they were farming native grains and perennial grasses and tubers that could be eaten all year round and did not require watering after establishment. Some surviving remnant patches of Buwatj (Kangaroo grass), Murnong (Yam Daisies) and other tubers can still be found around Jaara Country today.

The natural and seasonal flow regimes on Jaara Country have been significantly altered by the creation of reservoirs and channels, enabling the control and release of flows when farmers want it for foreign crops that need it all year round. This is not in line with breeding times of many native species and therefore affects levels of sustainable populations. It also effects the movement of animals to have to go where the water is stored. Irrigation would have been a strange concept to our ancestors. Meddling with the natural course of water for human only purposes would have caused more harms than gains and breached the Lore's of this land. It has undermined the spirituality of water and its integrity of the knowing the best path for its role in Country.

All of Bunjils creations

Instead of Biodiversity, Dja Dja Wurrung refer to 'all of Bunjils creations' as more easily understood and appropriate for Djandak (Dja Dja Wurrung Country). In relation to all of Bunjils creations, they highlighted the following priorities:

Returning of Murrup

The landscape that is Djandak is of great importance to Dja Dja Wurrung. The returning of Murrup (spirit), practice and people to landscapes is vital to enable Dja Dja Wurrung to lead the decolonisation of the landscape to allow for reconciliation to occur. Important Murrup to return to Country are those that are connected with our Stories and identity, Gal Gal (Dingo) has a named connection to clans which were dispersed from the southern section of Djandak, including the Gal Gal Balug and Gal Gal Gunditj. Lalgambook (Mt Franklin) the 'Emu's nest' is conspicuous with the absence of Barramul (Emu). Yung Balug in the Boort landscape have spiritual connections to the Yung (Quoll). To return Dja Dja Wurrung to the landscape we must ensure that we return the people and their Murrup to enable these landscapes to heal again.

Food and fibre plants

Buwatj (grasses used for grain), Witji (weaving grasses), Gatjawil Matom (tuberous plants with scented flowers) are some key food and fibre plants and include Kangaroo grass, Lomandra and Dianella species, Chocolate, Vanilla and Bulbine Lilies and Murnong (Yam daisies).

These plants where once abundant on Djandak and seasonally the fields would change colour from yellow in Datimn Datim – Wai Kalk (early spring) to purple in Wanyarra – Gurri (late Spring) to Orange bronze in Boyn – Lawan (summer). Removal of Dja Dja Wurrung and our knowledge of how to work with and care for these plants in the landscapes through sustainable use and the intricate unforced use of Wi resulted in the initial collapse of many of these populations. This was compounded by the bringing of Sheep and Cattle by invaders which largely decimated our farming systems and reduced a once plentiful abundance of food and fibre, maintained and cared for over millennia... Returning food and fibre to the landscape, not just in parks and reserves but in the most productive parts of Djandak is key to ensuring healing of Djandak.

Wi (fire)

When the squatters came to our Country, they saw multiple plumes of smoke in the air, little did they know that was one form of communication to make other nations aware that intruders are coming to be on the lookout. At night time that's all they could see in the distance was flickering fires everywhere. Wi is a tool with many uses, it comes in many forms, you obviously have Wi to cook, you have Wi to keep you warm, Wi for ceremony, Wi for hunting, lighting strikes can cause wild Wi and you have Wi for Caring and Healing Country. Wi is a tool to Jaara use in many ways and its use is always guided and informed by Our Lore as it has been for millennia.

The name of one of the great Jaara ancestors Walpanumin/Jacky Logan translates to "burning with fire" it was said he was the fire and messenger man for his clan. Jaara have always used Djandak Wi in many forms to manicure the landscape. They say our fire people would be like Picasso with a paint brush, instead of paint brushes our people used grasstree spikes as firesticks to paint the landscape, with the right fire, at the right time, we care for the Country the way our ancestors have for millennia. We have always been told when growing up that Wi is the way our ancestors manage the land and manipulated the environment. We live this today.

In the dreamtime stories about the two feuding volcanoes Tarrengower big and heavy (a mountain situated near the township of present-day Maldon) and Lalgambook (the nest of Barramul now known as Mt Franklin), near Daylesford. The story about the hawk getting a red hot ember from the fire and taking it up to the sky then dropping it further along in the unburnt to start the fire further ahead so he can hunt the insects coming out of the fire. Boort which is our word for smoke and its said that saying consecutive Boort Boort means big smoke, Boort also refers to the town on Jaara country, embedding smoke and Wi in the landscape. There is a hill in the middle of Boort now called Bald Hill where the water tower is located today. Yung Balug Clan would pile up a big heap of green vegetation and light it up to signal to other nations that trading season has begun and that they were open for trade.

Mick Bourke, Dja Dja Wurrung man, cultural burn

Gatjin (water)

Use and cultural heritage

Jaara people used the waterways as travel routes on canoes, fishing with spears and woven nets, water birds were brought down with boomerangs and above water nets. Women would give birth in the birthing trees close by to water holes, swamps, and rivers. Gatjin ceremonies and celebrations were conducted with gatherings in high flood times. Children would laugh and play in the water's edge while the women dug out water ribbon, harvested weaving plants and reeds for ceremony adornments. Skin bags and tarnuks were filled with water to drink from and soak weaving plants. Food that needed to be leached was put in dilly bags and tied to the banks of flowing water. Fish traps were made at different elevations with knowledge of the river flows and fish breeding times. In the dry season, holes would be dug in the sand of the riverbed to access water from the lower ground waters. Rock wells found on travel routes held water for periods of the drying out rivers, these had rock or bark lids to prevent leaves or animals falling in and contaminating the water.

Within the Cultural Landscape there are memories and stories of past visits and management of Country pre-colonisation. All waterways are culturally sensitive areas that trigger the Aboriginal Heritage Act 2006. There is extensive, vast and recorded cultural heritage all over Dja Dja Wurrung Country, especially around water sources. Cultural heritage surveys have given us some insight into the extent of the resource use by Dja Dja Wurrung people. Revealing intergenerational meeting places and travel routes, artefact scatters, culturally modified trees (scarred trees and ring trees) midden sites and earth ovens (amongst many other artefacts, sites and places).

Artefact scatters can show us that whilst visiting that site there was plenty of food around to designate time to knapping stones and creating spear heads, scrapers and other implements. It can also show us their path where the stone came from or trade routes where a stone has been traded from other groups. The scar trees showed us where the water was suitable for canoes and fishing was practiced from them. Ring trees show us that this was a path used navigating from one place to another. Midden sites and earth ovens can show us what types of food were eaten there and what was abundant at the time of visiting and seasonal movement over the land. It also reveals how often the site was used by the soil layers over time. The past use and history of our living culture is read from the land and not from a book.

Today, via DDWCAC and Dja Dja Wurrung Enterprises, Jaara people are engaged in recording and documenting these important places to ensure their conservation and preservation under the Aboriginal Heritage Act 2006. This work includes conducting cultural heritage surveys to document and protect cultural heritage, and salvaging artefacts affected by land use activities. Contemporary use and connection are maintained through a deep relationship with Country and respect to the ancient traditions and Lore that still govern Jaara today.

Dependent values and stories

There are many stories shared about water and water spirits describing the simple and also complex role of gatjin in our lives. There are many Lores around the use and protection of gatjin. There were highly spiritual waterbodies that were not for swimming or drinking but were known for the presence of spirit beings that reside there. There are stories of water bodies that are women's places and men are forbidden, with song lines and stories that speak of water as women's business, and animals like the Brolga representing life and birth. There are Lores of water sharing in times of drought and ceremonies to bring the water and celebrate it.

Brolga, photo by Stu McCurdy

The Brolga is a waterbird native to many wetlands across Jaara Country and are highly important to Dja Dja Wurrung people. The Brolga's natural movements are often referred to as 'dancing', due to their mating rituals that look similar to dancing. Today, the Jaara people have ceremonial dances that have been passed down through generations, that mimic the movements of the Brolga, and the calls that they make to each other. In Jaara Lore, the Brolga is known as a symbol of self expression, a symbol of life and birth linked closely to water and women's business. The Brolga is representative of our connection to Country, and the transformation between a human spirit and the spirit of the creature. The Brolga holds close ties to the ceremonies and Lore that surround water and birth, such as the use of birthing trees to bring new life to Djandak. It represents that birth and life is what unifies us as Bunjil's creations. Brolga populations have declined rapidly due to the degradation of their natural nesting habitat over time, meaning they struggle to breed successfully due to a lack of water and food sources. Tang Tang Swamp is a well-known Brolga nesting site that has a close connection and rich history with the Jaara people.

The Murray Cod has its birthplace imprinted in its stomach as a memory of its creation. The stomach lining shows the imprint of the tree on the river where it first came into this world. This demonstrates the dendritic connection and reflection of Country – the very relationship shared between the Cod and the tree through the river. Fish populations across Country are seeing a drastic decline due to introduced exotic fish species such as mosquitofish and carp that threaten water quality as well as take over the habitat and food supply of native fish. Most of these pest species are aggressive, causing detrimental impacts to native fish and their ability to survive, and thrive.

River systems and places of special interest

Originally, the great waters of Jaara Country ebbed and flowed with seasonal rain events that pumped water to the flood plains and grasslands and forests. Connecting lakes, creeks and rivers and swamps. The periodic wetting and drying phases made for healthy and abundantly diverse swamps. Rivers and waterways would pool and pond in their paths, creating many ecosystems and habitats. In drought, these deep ponds would create refuges for aquatic creatures. Occasional high flows and floods would connect them all up and this was the time for large gatherings, trade and ceremony with neighbouring clans. Jaara people traditionally travelled to meet with most neighbours at seasonal times of sharing. This includes high floods that linked up creeks, swamps and rivers to Kow Swamp and the Murray River. Traditionally, Jaara used the waterways as travel routes as well, either on canoes or walking nearby for the water and the food source that it provides.

Steamboats were used along the Murray to transport goods and resources, including the trees that were cut down for timber. In order to utilise the river as transport for large water craft, all the logs and snags in the river that supported fish habitat, stabilised the banks and slowed down the flow – reducing turbidity, were removed. This had devastating effects that were not considered by the new migrants, because they didn't understand that Country. Since then, the important role of logs and snags in the river have been realised and some put back in the rivers.

Like all naturally occurring rivers, the Campaspe River was much larger than it is today, seeing scar trees and artefact scatters on the highbanks (elevation of up 10 metres), tells of a time of a mighty river. It is considered a boundary marker and neutral resource between Dja Dja Wurrung and Taungurung tribes, both traditionally and contemporarily. It is highly significant to both groups, with scar trees, ring trees, burial sites, stone quarries, artefact scatters and other cultural heritage sites being recorded along the waterway. Large stone tool scatters and significant archaeological sites have been identified along the main section of the waterway, demonstrating continuous use of the land and resources along the waterway for many thousands of years. The Campaspe River is home to many species of fish – redfin, yellowbelly – as well as water rats and many native birds such as black ducks and ibis. It is also a well known platypus habitat.

In the past, the Coliban river was a rich habitat for native flora and fauna. However, the introduction of water catchments and the allocation of water in the Coliban river prevent the waterway from having a consistent flow of water. Sections of the river have been dramatically modified and the construction of levees and sills has altered the course of waterway, therefore the flow is no longer natural. Large stone tool scatters and significant Tachylite quarry sites can be found along the main channel and adjacent to storages in the Upper Coliban.

Gutjun Bulok (Tang Tang Swamp) is a freshwater wetland situated within the Dja Dja Wurrung landscape. It is a culturally significant place for the Jaara people who still practice culture and ceremony there today. The wetland features bial (River Red Gums) with significant marker 'ring trees', scar trees, ovens, basket weaving grasses and many other cultural features. The Swamp is managed as a Wildlife Reserve by Parks Victoria, and is registered on the National Directory of Important Wetlands due to Brolga nesting and many other visiting migratory waterbirds. It contains ecologically important plants and vegetation communities such as Southern Cane Grass, aquatic plants and patches of rare native grassland. Dja Dja Wurrung Clans Aboriginal Corporation have previously completed a Cultural Heritage Assessment and Aboriginal Waterways Assessment at the Swamp to record and document cultural and ecological values as well as cultural heritage present across the Swamp. In the past, Tang Tang Swamp was naturally a temporary wetland, with periods of wet and dry phases, fed by flows from Bendigo Creek. However, land use changes upstream and the construction of levees and sills has altered how the swamp gets water so that the water flow is no longer natural. The wetland is not connected to a water source and so relies on natural inflows caused by rain. Currently, Dja Dja Wurrung and The North Central CMA are exploring ways to deliver water to Tang Tang Swamp. The connection of the swamp and delivery of environmental or cultural water will help the Brolga and all other of Bunjil's creatures to breed and thrive at the wetland, delivering important outcomes for both the environment and Jaara people.

Water holds memory, songs and stories. Water has spirit – Murrup – the life-force in the energy of all things. It must be respected as an entity in itself that knows where it needs to go. The Lores that govern our relationship with our Country are simple – only take what you need. If you must take more, then you must give back. So what are we giving back to the rivers to keep the balance?

Tang Tang Swamp

Climate change

The Dja Dja Wurrung Country Plan 2014-2034, Dhelkunya Dja, outlines the strategic direction for the Dja Dja Wurrung Clans Aboriginal Corporation (DDWCAC) and Djandak Enterprises as well as the rights and aspirations of Djaara peoples. Dhelkunya Dja provides a critical framework and policy context for the region in which to implement climate change mitigation and adaptation strategies. Climate change is not new to Djaara peoples – cultural practices of land management including fire, forest care and water health have been utilised to adapt and mitigate past climate change events. These practices are recognised in Djaara peoples' current rights to heal and manage Djandak, or Country. The recognition and ability given to DDWCAC and Djandak Enterprises to implement those rights have far-reaching regional benefits to the environment and communities to mitigate and adapt to contemporary, human-induced climate change.

'Walking Together' to care for Country

Dja Dja Wurrung describe 'Walking Together' as the roles and ways in which they are comfortable to work or would like to work with partners.

Dja Dja Wurrung would like to be participating at a level of 'Collaborate' or Empower' (IAP2 spectrum). They see a need for more Dja Dja Wurrung people in leadership roles, mentorship and capacity building of Jaara youth to work in caring for Country roles, for roles on advisory groups relating to RCS delivery, and roles in monitoring.

Connecting to Country, Talking to Country,

…there is a need to first and foremost reconnect Jaara with land and to reconnect stories and knowledge to place. Our knowledge is stored in our stories, in our landscape and in our Murrup.

As we continue to return to Djandak we need to be enabled time to talk to Djandak to understand what are all the places that need to be cared for and what are the steps we need to take to begin the healing Journey with these places.

Enabling practice

To enable the return of Dja Dja Wurrung practice to Country including the intangible connection to Country and the practices that have been passed down through our Elders we need to ensure that there is a supportive and enabling environment. This environment needs to not only allow Dja Dja Wurrung to return practices in a culturally safe way but implement a measurable approach to allow us to celebrate with partners and stakeholders who actively and systematically look to overcome barriers.

Cultural values, healthy Country

Our cultural places need to be adequately protected for us to truly be able to call a landscape 'healthy'. This includes Cultural sites that may not be considered a priority under the current ecological Western-based frameworks. Things that are considered healthy to us, are not the same things that CMAs, water corporations consider healthy. This perception needs to change and cultural values protected the same way that ecological values are, in order for us to be able to truly call a landscape 'healthy'.

Stop looking at the system in isolation 'If you take the landscape away – there is no culture. It is all intermingled. If we are only taking care of pieces, we are not properly caring for Country'

Knowledge

Our knowledge has been built up over generations of observation and management and passed down. We are gardeners of the environment. We care for the land and it provides for us. We use Lomandra and matt rush to weave baskets. We hunt wallaby, emu and goanna. We eat the eels, mussels, crayfish and yellow belly from our streams. We gather bardi grubs and duck eggs, nardoo and yam daisies and wattle seeds for food and medicine. We use buloke and red gum timber for our tools and ceremonies.

We know the place where Mindi first emerged. It is still a sacred place, but sadly it is a desecrated space. We know the places where our waterbirds nest, and what Bunjil's other creatures need to breed and thrive. We remember when the rivers were once mighty – our Elders hold memories of their crystal clear waters with an abundance of platypus, water plants and good fish.

We know where to go to collect our medicine, food plants and weaving grasses – many of these can still be found in the landscape today. We know where these plants will flourish and thrive, and we the best ways to harvest them. Many species require harvesting at specific times of the year or in specific ways, and others will not grow without certain seasonal conditions such as rainfall. These are the things we continue to pass down to our children.

Regarding sharing of intellectual property, there is a constant battle between fear that information may be lost forever (as much already has) vs the fear that it may be stolen or misused.

…there needs to be a levelling of the knowledge fields between Western Science and Dja Dja Wurrung knowledge. There is currently a high level of bias towards western science-based decision support tools with little active and or resourcing to support the development of Dja Dja Wurrung knowledge-based tools.

Until this relationship becomes equal, the risk to Dja Dja Wurrung people of sharing knowledge remains significant and unfair.

Education is required on both ends, to be able to understand one another, particularly the more complex components of Aboriginal culture, so therefore we must work together to learn from each other, using past experiences as a guide to shape the future.

Jaara want to build partnerships, including with private landholders and engage with the broader community to raise cultural awareness.

"We feel a moral responsibility to care for our Country as it binds us to the past, present and future. Our ancestors looked after this Country and we are duty bound to look after it for the next generation. We believe we are an integral part of the ecosystem and place strong value the balance of natural resources and their management.
When the Country is sick, we are sick. We must do better."

Date printed: 29 July 2024

North Central CMA

VICTORIA State Government

Community

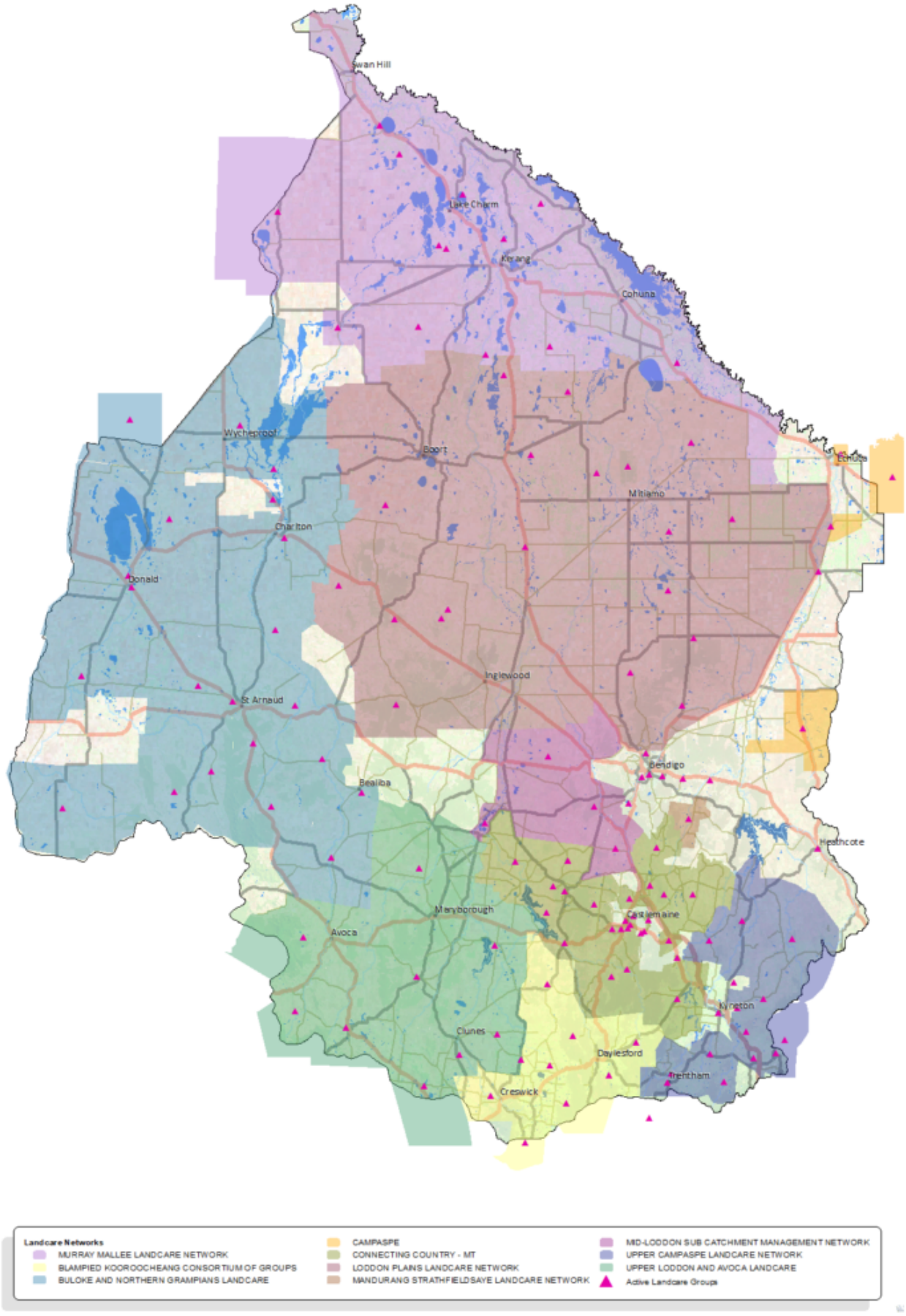
Vision: *Active and resilient communities adapting to challenges including climate change*

The Community theme describes the regional community and their contribution to NRM, considering emerging trends, challenges and opportunities and how to maintain and build community involvement into the future

The health of our catchments relies on the active involvement of people in the region. An engaged and active community is critical for the success of the RCS. People who farm and manage land or who live in towns, work, volunteer or go to school all have a role to play in realising the RCS vision.

Eighty-seven per cent of land in the region is privately owned and most of it used for agriculture. As such, rural landholders continue to be the foundation for landscape-scale NRM in the region.

Through engagement for RCS renewal we heard from many people in the region who are passionate and knowledgeable about their local waterways, wetlands, farmland and bushland. Residents and visitors to the region enjoy the amenity and recreational opportunities of these natural environments. Spending time connecting to nature, is important for our wellbeing, it also builds appreciation and inspires action. Landholders and community-based NRM groups, make a significant contribution by caring for their land and local places, protecting and improving the health of soils, waterways and native vegetation and habitats across the region.



Landcare groups and networks

Assessment of current condition and trends

An estimated 250,000 people call the north central region home with almost half the population located in the City of Greater Bendigo, which is among the fastest growing regional Local Government Areas in Victoria. A large survey of rural landholders (with properties >10 ha) was conducted in 2014 and repeated in 2019, to better understand the demographics, values and beliefs of the regional community. Agriculture remains the dominant land use, however primary production is not the focus for many rural landowners, with 51% considering themselves part-time, hobby or non- famers. That said, full-time farmers remain the largest farmer identity group (49%) of those surveyed and manage around 80% of the land.

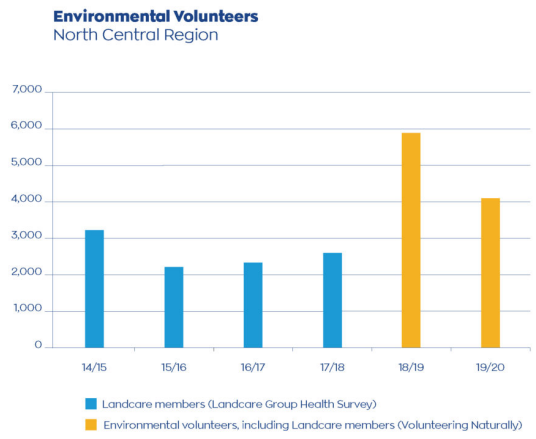
Generally speaking the ageing population and trend toward larger/corporate farms in the north and west is leading to population decline and associated socio-economic impacts, including a reduced volunteer base. Whilst in the south and east of the region there is strong growth, including in rural residential development which is increasing pressure on natural resources and introducing new landholders.

Environmental volunteering

Trends in environmental volunteering show that people are continuing to sign-up for volunteering programs, but for less time than in the past. Volunteers want more event-based volunteering that enables them to make short-term, but meaningful commitments to a cause, like citizen science. Results of a recent survey suggest there is an opportunity to increase the number of environmental volunteers and identifies key motivators to leverage. These are important learnings for groups needing to engage and maintain volunteers, including a more diverse demographic.

Our region is fortunate to have over 200 active community-based NRM groups including Landcare, sustainable agriculture and other environmental volunteer groups and networks actively working across the region, generating significant social, environmental, and economic benefits. In 2018-19, nearly 6,000 environmental volunteers contributed over 90,000 hours, valued at $3.7M. Through engagement for RCS renewal we heard about how important volunteers are in rural communities, for example CFA and SES volunteers, as well as environmental volunteers. In areas where the rural population has been declining (e.g. Western Dryland Plains Local Area) there are now less volunteers and this can make it challenging to sustain local activity and groups.

The Victorian Government's Environmental Volunteering Plan aims to have five million Victorians acting to protect the natural environment by 2037. Landcare group healthy surveys have been collecting data for Landcare groups and networks for many years. Volunteering Naturally surveys began in 2018-19, they include Landcare groups and networks, as well as other environmental volunteering groups, including; citizen scientists, advocacy, wildlife rescue and rehabilitation, recreation/nature experience and sustainable living. The graph and table below present Landcare data (pre 2018-19) and Volunteering Naturally data which will be used to track environmental volunteer numbers in the region, as per the RCS Outcomes Framework. The reduced response rate and number of active volunteers in 2019-20 can be attributed to the COVID-19 pandemic and associated restrictions on activity.

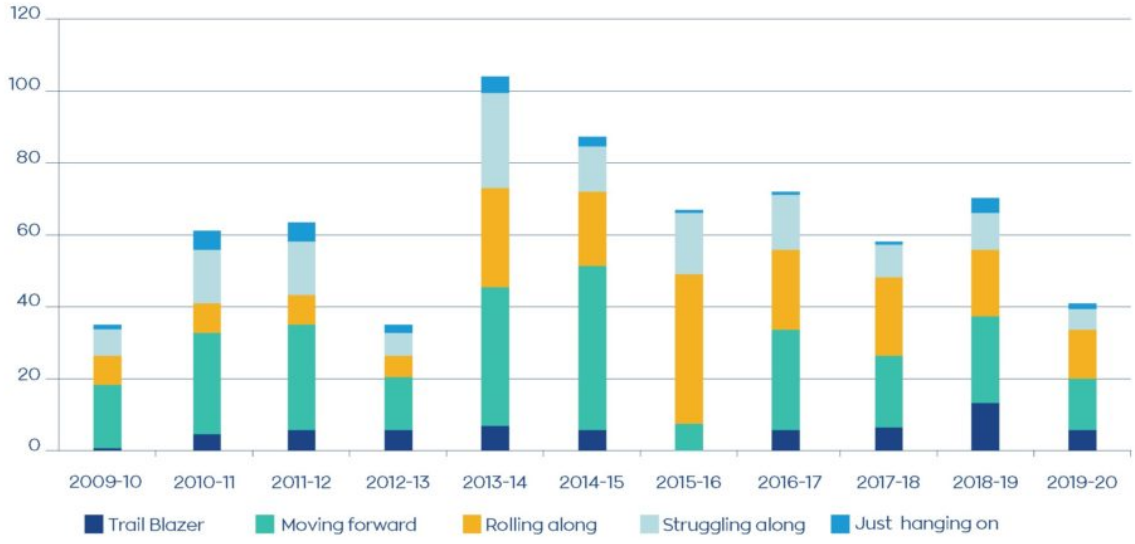


	18/19	19/20
Total groups who received survey	226	213
Response rate	77%	46%
Total active volunteers	5,876	4,098
Total volunteer hours	93,827	31,709
Value of volunteer contribution ($)	$3,753,080	$1,268,360

Volunteering Naturally Survey Results for North Central Region

Landcare groups

Landcare groups are typically made up of older people, who have time and interest in group-based membership and traditional styles of volunteering. It is this demographic that has kept Landcare stable in our catchment for the past 35 years. Each year, Landcare groups are invited to complete a Landcare Group Health Survey. The survey captures group perceptions of their current health and activity levels. The most recent survey results for the north central region, indicate a slight decrease in self-assessed health.



Landcare group health survey results

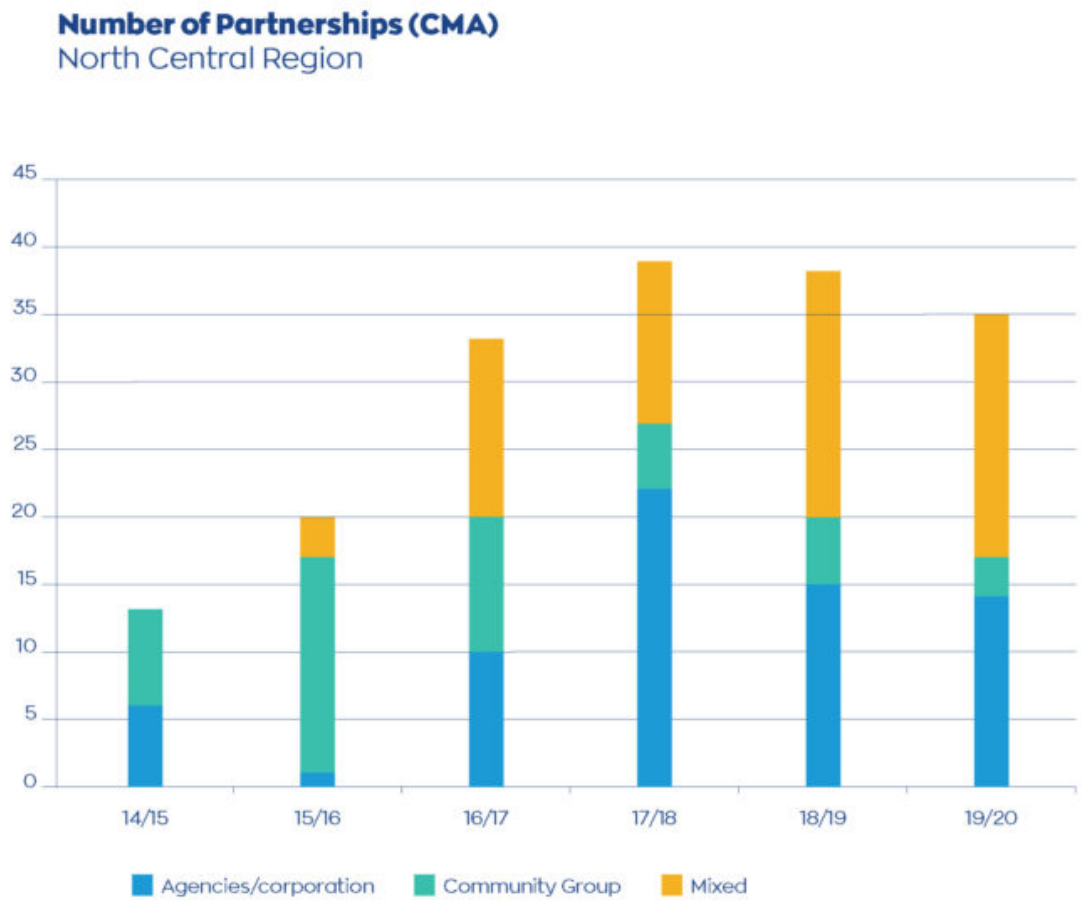
Some Landcare Chairs and Facilitators engaged for RCS renewal reported: difficulties in recruiting new members, that some Landcare groups are fatigued, that weed management in particular is overwhelming and support to progress this in some areas, is needed. They expressed frustration at the administrative load and limited funding available. They suggested we need to get the fun and enjoyment back into Landcare, to celebrate achievements. Groups out west in areas where the population is declining, reported a reduced volunteer base. Others in the southern parts of the region have had success in attracting new rural landholders, with working parents and family groups joining Landcare or reigniting groups that had been in recess. A focus on sustainable agriculture has proved successful for some Landcare groups. Landcare Networks have an important role, in developing strategic plans for their areas, supporting their member groups and sourcing investment, but they are currently under resourced to fulfill this potential. Continuing to support groups to adapt, share learnings, recognise and celebrate achievements and leverage more funding will be important to the long-term sustainability of Landcare groups and networks in the region.

Citizen Science

Citizen science programs involve volunteers collecting scientific data to support monitoring programs that improve understanding and management. Citizen science approaches have been proven to engage, connect and empower community within their local environment and change their appreciation of place. It is a collective and cost-effective approach to sharing important local and ecological information about land, water, climate and biodiversity resources. The North Central CMA is now integrating citizen science into its integrated catchment management projects. There are many citizen science programs in the region, including the long-running Waterwatch program.

Partnerships

Partnerships provide opportunities to further industry and community involvement in NRM. Tracking the number of partnerships, as a standard indicator of the RCS Outcomes Framework contributes to understanding how CMAs are working collaboratively towards achieving regional outcomes by formally engaging with people and organisations. The graph here presents the number of partnerships established, modified or maintained by the CMA over the past six years.

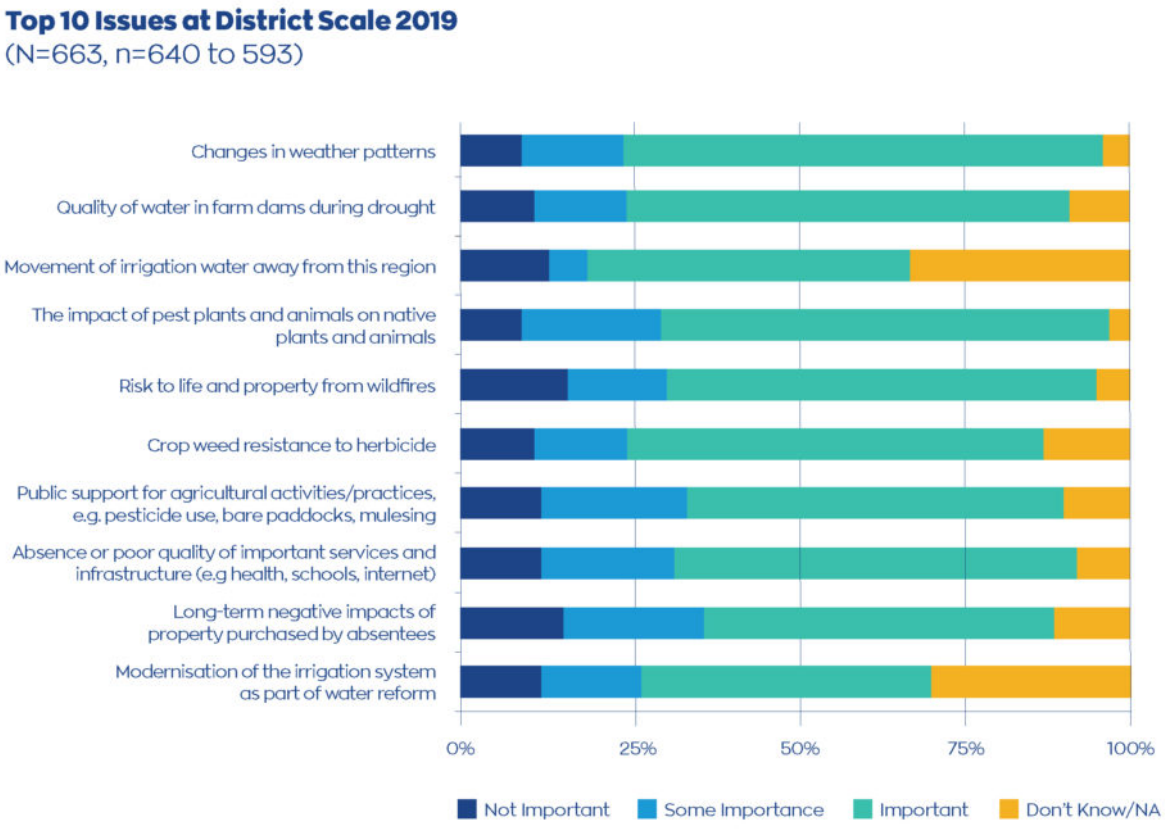


Number of partnerships established, modified, or maintained by the North Central CMA

Over the next six years, the life of this RCS, the demographics of the region will continue to change, Landcare and other community-based NRM groups will need to adapt to continue their important role into the future. It is vital that we continue to monitor trends in land ownership, the issues facing rural communities across the region, and barriers/motivators to volunteering, to maintain effective engagement with landholders around NRM.

Major threats and drivers of change

Results of a large survey of rural landholders (with properties >10 ha) in 2019, indicate the top issues at district-scale include soil management, changes in weather patterns and dam water quality during drought.



Top 10 issues for rural landholders surveyed (with properties > 10 hectares) at district-scale, 2019

Climate change

Climate change is a key driver of change for communities across our region. Adaptation to our changing climate is already happening on many levels – land managers and communities have been responding to increased incidence of drought, flood and fire through a range of actions that minimise future risk, improve water security and conserve high value agricultural soils. The work of many Landcare and other community groups to buffer remnant vegetation and improve landscape connectivity supports natural assets to adapt to future changes. Community members engaged for RCS renewal told us that communities need to be involved in climate change planning and that creative solutions will be required. Some climate change challenges specific to the community are:

- Rural landholders and community volunteers will be affected by extreme weather more often and will need to continue to adapt their management practices to our changing climate.
- With increased temperatures, green spaces will be increasingly important for regional communities as refuges from heatwaves.
- With reduced water availability overall, managing trade-offs between potable, irrigation and recreation demands and environmental needs will be challenging.
- Managing growth in a changing climate while protecting and enhancing natural resources will be a challenge, particularly in those areas in the south east of the region where there is growing demand for rural residential properties.

DELWP plays a key role in engaging and supporting communities around climate change adaptation. ADAPT Loddon Mallee aims to increase resilience of the regional community by building climate knowledge, grassroots leadership skills and supporting place-based adaption action. Current initiatives include a Leadership Program and a Youth Climate Advisory Board. Many of the region's local governments have climate strategies or plans, and are running local projects to monitor changes, support adaptation and promote mitigation.

Engaging the changing demographic

Changes to the demographics of the region present both challenges and opportunities for engagement in NRM across the region. Through engagement for RCS renewal we heard:

- Landcare groups and networks engaged for RCS renewal reported difficulties in recruiting new volunteers particularly in areas where the population is declining, reported that some groups were fatigued with weed control in particular and expressed frustration at the administrative load and limited funding available. Landcare groups will need to adapt to engage the changing demographic of the region, Continuing to to support groups to adapt, share learnings, recognize and celebrate achievements and leverage more funding will be important to the long-term sustainability of Landcare groups and networks in the region.
- On the whole corporate agribusiness is not engaging in NRM programs or contributing to local communities. Given there is a growing number of corporate farms in the region, there is a need to address this, to influence land management practices and leverage support for local programs.
- The younger generation of farmers, is more likely to leave the farm for a job in the city these days. With increasing land prices, young farmers who buy in, are very focused on business viability, so farm/business planning programs are likely to be of interest. Young farmers who inherit the family farm are not under the same pressure and may be more open to other types of NRM programs including new and emerging land management practices.
- New rural residential landholders often don't have skills or knowledge in land management. Absentee landholders, common where there are weekender properties in the southeast, are more difficult to engage and don't always spend enough time managing their property. The increasing number of smaller rural properties and landholders make engagement more time consuming. However in the south east of the region there is certainly a willingness amongst rural residential landholders to protect and enhance environmental values, including to manage land for conservation, as evidenced by the success of the Connecting Country program in Mt Alexander Shire and Macedon Ranges Shire Council's Sustainable Land Management program. Mentoring new landholders by more experienced or retired farmers was also suggested through engagement for RCS renewal, like the Macedon Ranges program This farm needs a farmer. Economic constraints are a barrier to consider for other rural residential areas within the Western Goldfields Local Area.

Opportunities

Opportunities for each of the Local Areas, informed by our engagement for RCS renewal, are described in that section of the RCS. Some key opportunities for the regional community are:

Leadership

Leadership within our communities is essential for achieving the RCS's aspirational goals. Continuing to actively promote and support, the delivery of regional leadership programs and community-led solutions to local issues, will be important.

Connecting with nature

Green spaces, open spaces, natural spaces and shade are integral to the health and wellbeing of everyone in our region. An increasing amount of research is finding the many positive impacts of urban green spaces on our health and wellbeing. 'Victorians value nature' is a goal of Victorian Biodiversity Strategy, recognising that by connecting people with nature, they value nature, and are inspired to act. Creating and enhancing green spaces for communities, will be increasingly important as temperatures increase under climate change, and can also contribute to biodiversity outcomes.

Supporting communities

What do you get passionate about? Do you know others who feel the same way? Emerging issues can be the spark for environmental volunteering. Data shows that increased awareness of issues can lead directly to people wanting to play their part in living more sustainably, taking local action and contributing to community projects.
Whilst financial incentives and provision of information/advice are fairly standard NRM support interventions, peer support through the establishment of local community-based and community led interest groups is a growing trend. Supporting established groups to maintain and grow their membership is important too. Celebrating success, sharing learnings and brokering partnerships to leverage funding are some of the ways we can support these groups.

Priority directions

Priority directions and outcomes were developed to respond to the challenges and opportunities identified, and to align with the state-wide RCS Outcomes Framework. We engaged key government partners to confirm delivery roles, and improve accountability for RCS implementation. The organisations identified as 'key collaborators' in the tables below, will be involved in initiating (including to source investment), but in order to succeed, partnerships, participation and support of many others is needed, including;

- Rural landholders, associated community-based NRM groups, volunteers and the broader community.
- Non-government organisations, industry and research organisations.
- Traditional Owners to speak for Country and participate/partner/lead (self-determination) in the delivery of RCS directions and outcomes.

Priority Directions	Key collaborators
Expand the approach to MERI, to better consider the social and cultural outcomes of NRM.	CMA
Continue to improve understanding of rural landholders and their communities to enable tailored approaches and improved engagement.	CMA
Build capacity, networks and leadership to enable community led climate solutions for land, water and biodiversity management.	DELWP, Local Govt, Ag Vic, Water Corporations, CMA
Support, improve and expand the environmental volunteering sector, including Landcare, to enable adaptation to demographic shifts, to continue their important role in NRM.	DELWP, Parks Vic, CMA
Enable, improve and promote opportunities for people to connect with nature, in both urban and rural settings, for wellbeing, to build awareness and appreciation, and inspire action.	CMA, DELWP, Parks Vic and other public land managers
Support schools and young people to participate in programs that increase their knowledge and awareness of natural resource management.	CMA, Parks Vic
Continue to support integrated citizen science programs that engage community and provide useful targeted data to inform water, land, climate and biodiversity programs.	CMA, Water Corporations, Local Government, Parks Vic, Non-government Organisations

Outcomes

Long-term SMART outcomes	Key collaborators
More community members connected to nature, working to protect, improve and monitor our regions natural assets, by 2041	CMA, DELWP, Parks Vic
Medium-term SMART outcomes	**Key collaborators**
Increase the number of active environmental volunteers in the region, by 2027	CMA, DELWP, Parks Vic
Increase the number of formal partnerships established, modified, or maintained, under CMA initiatives, by 2027	CMA
Improve awareness, knowledge and skills to enable practice change through 4400 community members participating in events and programs, by 2027.	CMA, Parks Vic
250 volunteer citizen scientists regularly monitoring land, water, climate and biodiversity, by 2027	CMA, Water Corporations, Local Government, Parks Vic, Non-government Organisations
Engage a younger and more culturally diverse demographic of event and program participants by 2027.	CMA, Parks Vic
Maintain an average Landcare Group Health score of 'Moving Forward' or above, through to 2027.	CMA

The RCS Community Discussion Paper was drafted to frame conversations with stakeholders, obtain feedback and inform the development of this webpage. It includes more detail and references.

Discussion Paper Community Download

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North Central CMA

VICTORIA State Government

Traditional Owners

The North Central CMA region includes the traditional lands of the Dja Dja Wurrung, Taungurung, Yorta Yorta, Barapa Barapa, Wamba Wemba, Wadi Wadi people and clans represented by Barengi Gadjin Land Council (Wotjobaluk, Jaadwa, Jadawadjali, Wergaia and Jupagulk). The map here shows the boundaries of Country for those with Registered Aboriginal Party status under the *Aboriginal Heritage Act 2006* and labels show approximate location of other traditional lands.

The term 'Traditional Owners' acknowledges the distinct custodial rights of peoples who, over countless generations, have a unique spiritual, social, and cultural connection with their Country, and it respects the principles of 'Right people for Country'.

To inform RCS renewal, we reviewed Country Plans (where available) and engaged Traditional Owners. Each group was asked to provide an Introduction to people and Country. We asked about values and priorities for the future to inform the development of priority directions and outcomes for all Traditional Owners as outlined on this page.

The specific values and priorities for each group are described on a dedicated page for each group – to find these pages, click on the labels on the map here. We have sought to highlight Traditional Owner values and priorities in this RCS, at a high level. For more specific information, RCS partners should refer to Country Plans (where available) which include more detail and engage directly with the relevant Traditional Owners.

Aboriginal and Torres Strait Islander community

Many Aboriginal and Torres Strait Islander people live in our regional communities and have a strong connection to Country and/or an interest in natural resource management (NRM) but may not be recognised Traditional Owners of this region. Our engagement for RCS renewal focused on Traditional Owner groups in respect of cultural custodianship and rights to determine appropriate spokespeople. Non-Traditional Owner Aboriginal perspectives and participation in NRM may be enabled through the Traditional Owner groups with which they are connected, or through broader community engagement.

Country

Country includes the land, water and all living things. Prior to colonisation, Country was cared for by Traditional Owners, using a social structure and knowledge system that enabled a sustainable lifestyle over thousands of generations. Traditional Owners have a deep connection with, and obligation to care for Country. Some express being born from the land, that they belong to the land or that the land and people exist as one. We are told that, spirit and identity are at the core of this connection to land. Rather than talking about land, water and biodiversity separately, as we do in this RCS, these elements are all inter-connected and the health of Country is very much connected to their health – 'Healthy Country, healthy people'.

"Hundreds of years ago, our Country was mostly covered in open forests and woodlands, providing us with the plants and animals that we used for food, medicine, shelter and customary practices. Today, though our Country is vastly changed, it still holds many important values. We feel a moral responsibility to care for our Country as it binds us to the past, present and future."

-Dhelkunya Dja Country Plan

Traditional Owners have a holistic view and understand Country to be interconnected. The separation of RCS themes and prioritisation of specific assets in this RCS runs contrary to this view. When asked about important places, we were often told that all of Country is important. When presented with a draft map of priority biodiversity assets, one Traditional Owner suggested that we start by connecting them all up. Exploring how cultural landscapes might inform future planning is an emerging priority for some Traditional Owners. Cultural landscapes are a traditional way of understanding and managing Country – the planning unit of choice.

Spending time on Country, connecting to Country, to share knowledge and practice culture is a clear priority for all Traditional Owners.

Cultural heritage and other cultural values

Throughout the north central region, the landscape is embedded with the physical imprint and spiritual connections of thousands of generations of Aboriginal people. Physical or tangible Aboriginal cultural heritage such as stone artefacts remain in situ, predominantly in relatively undisturbed remnant patches of native vegetation. However, tangible heritage and other cultural sites can also be located within highly modified landscapes. Intangible cultural heritage includes cultural knowledge and practice (e.g., indigenous biocultural knowledge, language, stories, ceremonies) passed down from generation to generation, and often has a strong connection with Country.

The *Aboriginal Heritage Act 2006* provides for the management of cultural heritage, covering both tangible and intangible heritage. Areas of cultural heritage sensitivity, as defined in the Aboriginal Heritage Regulations 2018, identify landforms and soil types where Aboriginal places are more likely to be located and include land within 200 metres of named waterways and within 50 metres of registered Aboriginal cultural heritage places. Registered places are those that have been surveyed, mostly for proposed developments, and likely represent only a small proportion of all such places. To date there is only one instance of intangible cultural heritage being registered. Protecting cultural heritage from damage and increasing awareness of the requirements of the Act, was identified as a priority by many of the Traditional Owners engaged, and a priority direction has been developed in response.

Some plant and animal species have particular significance for Traditional Owners, either spiritually or as a source of traditional food and fibre. Several of these species are now rare or regionally extinct and there is a desire to restore or return them to the landscape. A priority direction has been developed in response.

Waterways and water have significant value to Aboriginal people as recognised in Victoria's Aboriginal Water Policy that was announced in Water for Victoria. Implementation of this policy to date has involved engagement of Traditional Owners to identify cultural risks, values and outcomes, to inform environmental water deliveries. This is an example of 'projects/programs that incorporate and deliver on culturally relevant objectives' (refer medium-term outcome below). Further to this, several of the Traditional Owners engaged indicated a desire for cultural flows. Murray Lower Darling Rivers Indigenous Nations (MLDRIN) has developed the following definition of cultural flows, which is recognised in the Murray-Darling Basin Plan:

"Cultural flows are water entitlements that are legally and beneficially owned by the Nations of a sufficient and adequate quantity and quality to improve the spiritual, cultural, natural, environmental, social and economic conditions of those Nations. These are our inherent rights."

-MLDRIN Echuca Declaration, 2007

Other places, connections between places and cultural landscapes also have value. Cultural landscapes can be described as a traditional way of understanding and managing Country – the planning unit of choice. They were highlighted by Taungurung and Dja Dja Wurrung, as an emerging priority.

Cultural values, as referred to in the priority directions below, are intended to include tangible and intangible cultural heritage as defined by the *Aboriginal Heritage Act 2006*, as well as species, places and landscapes of significance. Documenting cultural values, is a priority of many Traditional Owners, to enable better protection and restoration.

Knowledge

There have been instances where knowledge shared by Traditional Owners has been misappropriated, misused or used without authority. There are also opportunities for Traditional Owners to benefit from partnerships where the sharing of knowledge will achieve mutual outcomes (e.g. to conserve cultural heritage). In these circumstances free, informed prior consent should be given, and the nature, extent and use must be agreed to, and be culturally appropriate.

For the purposes of this RCS, the North Central CMA offered to sign an Intellectual Property Commitment with each Traditional Owner group engaged, to cover the potential sharing of any intellectual property during RCS engagement and its use. Pages for each group were not published until written approval was obtained.

Traditional Owners we engaged acknowledged there is a lot to learn from each other. However, they also expressed frustration that traditional knowledge is not respected in the same way as western science, and when this knowledge is shared, it is not well integrated into management. Bridging tools that enable a respectful integration of knowledge systems and practices were suggested to facilitate this.

Self-determined participation and leadership

The United Nations Declaration on the Rights of Indigenous Peoples identifies Free Prior and Informed Consent as essential, to enable Indigenous Peoples' right to self-determination in decisions that affect their lives, their ancestral lands and natural resources. Put simply, Free Prior and Informed Consent is good process, which ensures people have adequate knowledge and understanding of the consequences and outcomes which may result from their contribution or permission.

The guiding principle for Traditional Owner participation and leadership in NRM, is self-determination. This is described in DELWP's *Pupangarli Marnmarnepu 'Owning Our Future' Aboriginal Self-Determination Reform Strategy 2020-2025*, which aligns with whole-of-government commitments set out in the Victorian Aboriginal Affairs Framework (VAAF), *and* the VAAF Self-Determination Reform Framework, which guides government and agencies to enable action towards Aboriginal self-determination.

For RCS delivery this will include enabling Traditional Owners the opportunity to participate and lead, if and how they choose, working collaboratively from the outset to plan and implement projects, working and 'walking together.' With reference to the IAP2 Public Participation Spectrum, 'walking together' is at the Collaborate or Empower level of the spectrum. Some Traditional Owners also suggested that the Aboriginal Participation Guideline for Victorian Catchment Management Authorities was a good reference for working with Traditional Owners. The Victorian Government Traditional Owner Engagement Project focuses on improving engagement where there is no formal recognition. In our region that includes; Barapa Barapa, Wamba Wemba and Wadi Wadi Traditional Owners. The Project has published a report and developed a *Draft Framework for strong relationships and engagement between the Victorian Government and Traditional Owners*. For Dja Dja Wurrung and Taungurung their Recognition and Settlement Agreements stipulate formal requirements for notification and participation in NRM and enable joint management of Country.

Priority directions

Given there are seven Traditional Owner groups in the north central region, a set of priority directions and outcomes that broadly apply to all, have been developed. These respond to common aspirations and are supported by all the Traditional Owners engaged for this RCS. How these are applied in practice will vary, depending on capacity and opportunities (including for investment), on Country.

While the priority directions and outcomes developed for this RCS are high level and are generally expected to retain relevance over the next six years (life of this RCS), there are likely to be developments over time that will affect how they are implemented, including:

- Strategies and plans to further enable self-determination.
- Development and renewal of Country Plans.
- Changes to formal recognition status.

Important updates, such as links and references to new/renewed Country Plans and changes to the formal status of Traditional Owners can be made to the RCS website during the next six years.

An example of a new strategy is the soon to be launched Federation of Victorian Traditional Owner Corporations' Cultural Landscape Strategy.

Priority directions	Key collaborators
Continue to build partnerships with Traditional Owners towards self-determined participation and leadership in water planning and management.	CMA, Water Corporations and Traditional Owners, in partnership.
Continue to build partnerships with Traditional Owners towards self-determined participation and leadership in biodiversity planning and management.	DELWP, Parks Vic and Traditional Owners in partnership.
Traditional Owners are acknowledged and provided the opportunity to speak for Country through their own self-determined processes, noting that groups without formal recognition will need more support to do so.	RCS partners to initiate and enable.
Support and enable opportunities for inter-generational connection to Country, to share knowledge and maintain culture.	RCS partners to support and enable.
Support the assessment and documentation of cultural values (tangible and intangible), traditional ecological knowledge and practices.	RCS partners to support.

Collaborate to protect and enhance cultural values (tangible and intangible), through integrated management, including the use of indigenous biocultural knowledge and practices.	RCS partners and Traditional Owners working together.
RCS partners to improve cultural awareness and competency, recognise and remove barriers to Traditional Owner participation, and share learnings.	RCS partners to initiate with advice and input from Traditional Owners.
Build capacity both ways, respecting the value of traditional knowledge, and the right of its custodians to determine if/how it is shared and used.	RCS partners and Traditional Owners working together.
Collaborate to increase awareness of legal requirements for the protection of cultural heritage (intangible and tangible) and improve compliance.	Traditional Owners, First Peoples – State Relations Group and RCS partners
Support and enable opportunities for Traditional Owners to return species of importance to the landscape.	DELWP, public land managers and non-government organisations to support Traditional Owners.
Support the integration of Traditional Owner-led cultural fire management.	DELWP and Parks Vic to resource and actively support Traditional Owners.

Outcomes

Long-term outcomes	Key collaborators
Traditional Owners self-determined participation and leadership in cultural and natural resource management, by 2041	Traditional Owners and RCS partners.
Medium-term SMART outcomes	
Increase the number of projects/programs that incorporate and deliver on culturally relevant objectives, by 2027.	Traditional Owners and RCS partners.
Increase the number of projects/programs co-designed, delivered in partnership with, or led by Traditional Owners, by 2027.	Traditional Owners and RCS partners.
Increase and maintain the number of formal partnerships between RCS partner organisations and Traditional Owners of the region	Traditional Owners and RCS partners
More Traditional Owners and Aboriginal Victorians employed to actively care for Country, enabled through; skill development and employment opportunities, by creating culturally safe and inclusive workplaces, and engaging Aboriginal owned business enterprises.	Traditional Owners and RCS partners.

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North Central CMA

VICTORIA State Government

Taungurung

Introduction – Baan Marram-Nganjin Dilbadin (We protect our water)

Taungurung Recognition Settlement Agreement area (and Registered Aboriginal Party area) is bounded by the Campaspe River (south of Rochester) in the west, the Great Dividing Range in the south, and extends a long way east of the north central region. Our Country includes the upper reaches of the Goulburn River and its tributaries, east to the Ovens River, the northern boundary running between Rochester, Euroa and Everton.

Taungurung buk (people) have managed their land, forests, rivers, wetlands and floodplains for thousands of years. We relied heavily on a healthy Country; our traditional knowledge and management practices shaped our cultural landscape for us to thrive. Despite the ongoing effects of settlement and removal from our lands, our people have maintained their ancestral connection to Country. In the heart of the Taungurung identity, we find our land, forests, rivers, stories and songlines; we are an intrinsic part of Country.

Currently, water management and governance in Victoria exclude our cultural landscape and our traditional knowledge and practices; an unsustainable extraction of resources drives land and water management. Our valued species were often found lining waterways and billabongs. With the increased water demand and the effects of grazing and cropping, the habitat conditions for these species has decreased dramatically. Harmful land-use and water extraction profit from Country's degradation; and has interrupted years of accrued ecological knowledge and practices.

Before contact, an essential aspect of Taungurung culture was the maintenance and harvest of food and fibre plants found in abundance along floodplains of the Campaspe, Goulburn River, Ovens, and tributaries; the mountains and caves of our high Country and in places of habitation and ceremony. These same species have been widely used for generations as knowledge has been passed along family lines throughout the colonial period. In particular, knowledge of our medicines aided our ancestors to survive, both physically and through the continuing practice of Cultural Lore.

The settlement aftermath is one of despair; our Country is sick and requires attention and healing. As custodians of our land and waters, we feel there is no other time for action. The future of the catchment is at risk due to the accrued impacts of past water management decisions, river flow regulation and land use transformations within Country which have been detrimental to riverine ecosystems.

But the past cannot be accounted for as a past event yet; we can still feel the effects and impacts of the historical social and political exclusion. Our lack of water rights highlights the flaws of water management and recent water reforms. Today, there is no equitable water use and ownership, and we have been historically denied the opportunity for commercial water use that would enable our economic growth. We can't benefit from water reforms as others due to the lack of Taungurung water and the constraints to participate in the water market.

Taungurung has recently gained legal and political recognition to exercise relative self-determination with the Recognition of Settlement Agreement signage. The agreement allows us to be involved as equal and valued partners in all matters of planning and decision-making instances regarding our land and waters and to look for our economic independence through caring for Country. Furthermore, it enables the opportunity to raise awareness of Taungurung culture as a Nation and redefine our relations with the settler society.

However, the competing contemporary land uses put enormous pressure on the ecosystems, now managed for a different set of values. A context of water scarcity and climate change configure a more complex scenario to incorporate our aspirations. In this more competitive scenario, whose water values are prioritized is not merely a technical discussion but a socio-political one, one of environmental justice. Our Catchment Management authorities are in a highly challenging situation today where they must navigate between State and Basin guidelines, community aspirations and Traditional Owners priorities and perspectives.

The recent droughts and bushfire events have violently and brutally impacted our region, along came COVID-19. These extreme events are examples of how the future would look if we don't address the issues from the past and present. From our perspective, river flow regulation and the water market have perverse effects on the catchment and the community, not exclusively to Taungurung. Their effects are mostly unperceivable because of their delayed effects; and compared to the acute shocks, they get little attention from the community. At the core of the Regional Catchment Strategy the discussions should be about whose water objectives are prioritized and what is genuinely sustainable for our rivers, our catchment and our community.

As stewards of Country, culturally and legally obliged to look after our land, we feel water management not only requires avoiding the mistakes from the past or merely the redistribution of water allocations but to prioritize the river health and its connections over other uses and practices. Today, the lack of Taungurung water rights is not merely an impediment to control water resources or benefit from them. It is a denial for future Taungurung generations to heal Country and heal traditional knowledge and practices, and exercise our culture which is undeniably linked to our land and water.

To inform RCS renewal, TLaWC representing Taungurung Traditional Owners, were engaged. As for other Traditional Owners of the region, we have sought to reflect Taungurung values and aspirations in this RCS, at a high level. For more specific information, RCS partners should engage directly with TLaWC and reference their Taungurung buk dadbagi, Taungurung Country Plan, which is a living document, updated as needed.

All Traditional Owners engaged for RCS renewal were asked if they would like to identify values, including places of value in the RCS. We also discussed a range of concerns and aspirations for the future. Those identified by Taungurung representatives engaged for RCS renewal are outlined on this page, noting that text in italics was written and provided by TLaWC. Together these have informed the development of priority directions and outcomes for all Traditional Owners, as outlined on the Traditional Owners page.

TLaWC Planning Framework

Taungurung Land and Waters Council (TLAWC) planning framework consists of the whole of country government arrangements for their nation, which are currently partially embodied in Taungurung policy documents like the Taungurung buk dadbagi Taungurung Country Plan and the Baan Dhumba-Dji-Ngan Murndak Gunga (water chapter). TLaWC is working on the review of their Country Plan and consequently the development of sub strategies (references, quotes and links to the current Country Plan will be updated here once it has been renewed). *This is part of a new emerging Taungurung Cultural Natural Resource Management strategic framework, that allows Taungurung to be the land and water managers of our Country.*

The Taungurung buk dadbagi, Taungurung Country Plan *communicates Taungurung vision and aspirations for Country, Culture and People… to educate and guide those making decisions about Taungurung Country, Culture and People…*

The Country Plan identifies six key areas for action, aspirations and goals for each:

- Identity, Recognition and Rights
- Health and Wellbeing
- Cultural Heritage
- Taungurung Traditional Knowledge
- Caring for Our Country
- Economic Independence

Goals relevant to the RCS were identified through discussions with TLaWC representatives. The TLaWC, with direct participation of Baan Ganalina water knowledge group, have developed a more detailed water chapter for the Country Plan – Baan Dhumba-Dji-Ngan Murndak Gunga which was also referred through our engagement with them.

Cultural values

Water itself is sacred to us, let alone our places

All waterways are all very high significance culturally

Rivers of our Country are the veins of our bodies

River boundaries bring groups together, spiritually important.

As highlighted in the Federation of Victorian Traditional Owner Corporations', Cultural Landscape Strategy (soon to be launched), "Australia forms as a tapestry of interwoven cultural landscapes that are the product of the skills, knowledge and activities of Aboriginal land managers over thousands of generations. Cultural landscapes are reflections of how Aboriginal people engage with the world and are the planning unit of choice for Traditional Owners." Through RCS implementation, TLaWC are committed to continuing to work with RCS partners to understand these cultural landscapes and to provide that greater opportunity to have common understanding of our visions and objectives.

TLaWC representatives identified the Campaspe River as significant within the north-central region, partly because it is a boundary, but added that all waterways are an essential part of Country*. The Taungurung people have been the custodians of Country for countless generations, undertaking our cultural obligations to care for Country and ensuring the health of Country as if she is one of our own kin.*

Upon the invasion of Aboriginal Territories, which began in 1788, the role of the Taungurung Nation as it relates to the management of Country started to change. With that came competing contemporary land uses that put pressure on the ecosystems, managed for different set of values.

Taungurung culture relied heavily on healthy waterways to thrive; our valued species were often found along waterways and billabongs. It is critical for Taungurung to protect all the water related values and the spiritual connection with our rivers. Our medicinal, food and fibre plants, were found in abundance along floodplains of our rivers and their tributaries, in the mountains and caves of our high Country and places of habitation and ceremony. Even in contemporary times these species have been used as a means to generate an income and share part of our rich history, culture and deep knowledge of Country that our people have with non-indigenous peoples.

Concerns and considerations for the RCS

Through engagement with TLaWC we heard:

- Most of the current access points to the Campaspe are outside Taungurung Country. Gaining access to the Campaspe River from Taungurung Country is very important.
- Concerns about water quality in the upper Campaspe following recent discharges from treatment plants.
- Regarding the traditional (holistic) versus Western (divided) way of looking at Country; there is an overlap between water rights/custodianship, water management/governance, cultural outcomes and economic outcomes. In the RCS, there is an overlap between themes.
- While ecological and cultural objectives are probably most relevant to the RCS, Taungurung participation in planning processes is essential. From a Traditional Owner perspective, various things need to be considered concerning Country. If Country is not cared for, the economic opportunities for Traditional Owners are eroded.
- RCS partners must commit to developing a long-term sustainable relationship based on the true principles of self-determination and respect Taungurung's cultural protocols, goals and rights.
- We seek equity in decision making, a reasonable timeline and an opportunity for resourcing at the outset of any engagement process, to allow us to engage with our Taungurung community members appropriately. RCS partners should make a genuine effort to share power, and to partner in developing agreed conflict resolution processes and create transparency around decision making.

Priorities

Taungurung buk dadbagi Taungurung Country Plan goal	Priorities related to goals

Taungurung buk dadbagi Taungurung Country Plan goal	Priorities related to goals
2.1 Gather and record Elders' stories about Country, including language, songlines, traditional ecological knowledge, cultural practice, and knowledge about significant places, people and events	This includes to uncover what stories mean, and check this still aligns to place Language revitalisation is important, interested in renaming and naming waterways
2.6 Establish a Taungurung Cross Cultural Awareness Package that embraces the broader community, including agencies	We need capacity building, both ways -Raising cultural awareness in organisations -Improving Taungurung understanding of how government works Cross cultural awareness includes training, work placements, joint project delivery
3.1 Establish ongoing support and investment for a major audit – cultural mapping activity – on Taungurung Country – from the tops of our mountains to our waterways and tributaries, including tangible and intangible heritage.	Cultural mapping is in progress Plan to include cultural layers in mapping tools and in the future add stories, photos, diagrams Want to increase cultural signage and consider using new technology such as QR codes and virtual reality to enhance the experience with stories and visuals Important to Taungurung that they can access the Campaspe River from their Country to undertake cultural mapping, to build on AWAs CMA and other partners to enable opportunities for Taungurung to undertake cultural mapping via/on private land through landholder engagement
5.3 Establish a Taungurung skills pathway program from entry level (on-ground) to business management for Caring for Country roles, and other contract works that Taungurung People could benefit from	Some examples of this: -Secondees in both directions and particularly in water management. -School age apprenticeships / traineeships -Immersions where both groups work on a particular issue -Youth leadership program -Build capacity through AWA implementation and increased participation in developing SWPs etc
5.6 Be the leading group in monitoring our threatened species	Taungurung leading the monitoring of biodiversity and water quality
5.7 Participate in climate change forums at a State level and in Taungurung Country specific forums to improve our understanding and capacity to influence decision-making about climate change strategies	Taungurung role in relation to climate change is outlined in the RSA Learning how to include at the Board level down to the project level – support building capability together Interested in carbon offset opportunities
6.3 Secure rights to access and use natural resources for sustainable commercial uses such as water, timber, flora and fauna on public lands	Partnership and stakeholder agreements to enable access – this is in Water for Victoria.
6.8 Acquire freehold property as part of building the Taungurung economic base i.e. land that can be use for private enterprise such as agri-business, cultural tourism, accommodation, and healing services. These could be existing viable business operations	Assistance to identify suitable land would be appreciated Interested in building relationships with farmers, agricultural opportunities Education of owners to improve knowledge and stewardship – including collecting and distributing good stories

Actions and Outcomes

TLaWC support the priority directions and outcomes defined for all Traditional Owners of the north central region, as outlined on the Traditional Owner page, and accept they will apply differently to each Nation. TLaWC have identified priority actions and outcomes here, which broadly align with those, but articulate Taungurung' s priorities more specifically.

The Taungurung Country Plan is being refreshed over the next period. The following are Taungurung current emerging strategic priorities:

Goal: *To heal and strengthen knowledge and practice and, through its application, heal Taungurung culture and Country.*

Action Themes:

Healing Knowledge

- Re-activating Taungurung systems of knowledge and practice transfer and management
- Healing practice: cultural fire and forest gardening (for land management), cultural and environmental flows (for water management), management of culturally important species.
- Research programs (including monitoring).

Healing Country

- Cultural landscape management: healing and management of important landscapes, places and species.
- Reading Country (explained below): the assessment and development of cultural objectives to guide management of water, forests and biocultural diversity.
- Training in cultural practices and conservation and land management.
- Management of Parks and Reserves in partnership with Council and the State.

Cultural and Natural Resource Management (CNRM) based economic development

- Private land conservation and management.
- CNRM enterprise development (agriculture, forestry, fisheries).
- Contract services on the public and private land estate.

Embedding Taungurung knowledge and practice

- Activation of legal rights in the Aboriginal Heritage Act (2006, Vic), Traditional Owner Settlement Act (2010, Vic).
- Supporting development and revision of government legislation, regulations, local laws, plans, strategies, policies and procedures, in partnership.

We feel confident that we will continue working together as equal partners, following the principles of self-determination enabling us to achieve two major outcomes. The outcomes being sought for us are:

- To develop two-way capacity between RCS partners and Taungurung Nation to apply On-Country knowledge and practice in contemporary settings.
- Taungurung are managing and governing our Country

Wadi Wadi

Introduction

Wadi Wadi Country begins between Lake Boga and Swan Hill, straddles the Murray River downstream to the junction of the Murrumbidgee River, then west to Lake Tyrell, within Victoria. Wadi Wadi Country includes the major river red gum stand in Nyah Vernifera Forest and Lake Tyrell (outside the region).

There are currently several groups representing Wadi Wadi Traditional Owners. To inform RCS renewal, we first contacted the Wadi Wadi Murray Lower Darling River Indigenous Nations (MLDRIN) delegates. Wadi Wadi Land and Water Indigenous Corporation Board members responded and elected to participate.

Traditional Owners engaged for RCS renewal were asked to identify values, including places of value (optional), aspirations and priorities around caring for Country. Input from the Wadi Wadi Land and Water Indigenous Corporation is outlined on this page. The input from all Traditional Owners has informed the development of priority directions and outcomes, as outlined on the Traditional Owners page.

Places of value

All areas of Country are of great importance and that the naming of specific places here, should not compromise the importance of those not listed.

- Cultural heritage – mounds, sand hills, scar trees
- Important landscapes – waterways, river junctions such as the Murrumbidgee junction (outside north central region), are of importance, as meetings places, for ceremonies.
- Nyah-Vinifera important (outside north central region)

Key concerns

Regarding current management

- Regulation of Murray River, speed and height of flow.
- Bank erosion from boats, bad water quality
- Pest and weed control
- Harm to Country from visitor behaviour – e.g. damage caused by 4WD, dumped rubbish, damage to cultural heritage
- Country not taken care of properly, we're not there to control or look after Country, e.g. too much leaf litter, fire hazard
- Problems with the rivers, it's the flows, neglect by the government, how they release it, it's all about the irrigators. We can tell the damage to the river by just looking at the river.

Regarding Wadi Wadi role

- Prioritisation of farmers.
- Traditional Owners powerless at present, yet the river is ours.

"To the rangers it's their job, to us it's our life"
"Where'd you fellas get your degrees from? Well I got mine from the bush"
"The bush and the waterways aren't happy unless we're out there"

Key aspirations

Actively caring for Country

- Aim to be restored as caretakers of the bush. Want to be able to manage own Country.
- Employing Traditional Owners as rangers is key to looking after land and waterways.
- To provide evidence of capacity, Wadi need to be supported to get on land and look after it. Need some more people on Country, compliance officers.
- Positions created, not just a couple of days here and there, long term thinking and funding.
- Wadi people need to have input, long term approaches, put our values into works. Working groups, employment, and Traditional Owner management needs to be ongoing.
- Revegetation and fencing along rivers.
- Once we're set up as rangers, we'd like government contracts, pest control, weed control, water monitoring
- Aboriginal people need to be there fulltime, otherwise government departments will never get there.

Connecting to Country, assessment and monitoring

- Opportunities to gather regularly – meeting place, resources, getting Wadi set up.
- Not out on Country enough, want to be camping out. Increased number of hours on Country = Wadi cultural objective.
- Need support to hold a Wadi tour to assess and identify issues
- Regarding water assessment, a few samples not enough, needs to be more extensive, should be more funding to go out more often and do more testing – combine indigenous knowledge and Western science, needs to be in collaboration.
- Aboriginal Water Assessments (AWAs) good but limited to specific waterways. Would be good to do a Cultural Management Plan – to map out our Country.

Formal recognition, land ownership and planning

- RAP status
- Land and water ownership
- Country planning could be helpful to access funding. Want to see results.

Date printed: 29 July 2024
This information was correct at the time of printing. The North Central Catchment Management Authority takes no responsibility for information that is inaccurate or out of date. To view the current North Central Regional Catchment Strategy go to https://northcentral.rcs.vic.gov.au/.

North Central CMA

VICTORIA State Government

Barapa Barapa and Wamba Wemba

Introduction

Barapa Barapa and Wamba Wemba are two independent Nations with Traditional lands on both sides of the Murray River. When this RCS was being developed, there were several groups representing Barapa Barapa and Wamba Wemba Traditional Custodians, both separately and together.

To inform the RCS, we first approached the Barapa Barapa Wemba Wamba Native Title Working Group who advised us to engage the Barapa Barapa Wamba Wemba Water for Country Committee. The Committee includes both Barapa Barapa and Wamba Wemba Traditional Custodians who work in partnership on shared and contested ancestral lands. We have presented input from the Committee on this page, noting where it is specific to Barapa Barapa or Wamba Wemba. The Barapa Country Aboriginal Corporation, represent another group of Barapa Barapa Traditional Owners, who wanted to provide input to the RCS. The two contributions are presented separately under the tabs below.

As with other Traditional Owners of the region, we have sought to reflect Barapa Barapa and Wamba Wemba values and aspirations in this RCS, at a high level. For more specific information, RCS partners should engage directly with Barapa Barapa and/or Wamba Wemba. The input from all Traditional Owners has informed the development of priority directions and outcomes, as outlined on the Traditional Owners page.

Barapa Barapa Wamba Wemba Water for Country Committee

Video: Nick Stewart, Aboriginal Water Officer for the Barapa Barapa Wamba Wemba Water for Country project, introduces the Committee.

Regarding terminology and references:

Elsewhere in the RCS, we have used the term Traditional Owners, however Barapa Barapa Wamba Wemba Water for Country Committee members stated a preference for Traditional Custodians, explaining their role is to look after Country rather own it, so we have used that terminology here. The *Barapa Barapa Healthy Country Plan 2018-2021* was developed by a group of Barapa Barapa Traditional Custodians, focusing on the Victorian part of Barapa Country. It is not a publicly available document, but Barapa Barapa members of the Water for Country Committee have given permission for us to use some excerpts from the plan here.

People and Kurrek (Country)

Traditional Custodians view people and Kurrek (Country, including lands and waterways) as interdependent entities linked through the landscape, through culture and through spiritual significance. As such there is no separation of nature and culture. The wellbeing of Barapa Barapa and Wamba Wemba people is directly influenced by both the health of the environment and the degree to which Barapa Barapa and Wamba Wemba people are actively involved in management, ownership and caring for our Kurrek.

As the Traditional Custodians, Barapa Barapa and Wamba Wemba people hold inherent rights in our Kurrek that were never traded, given or signed away. Barapa Barapa and Wamba Wemba people have continued to maintain our cultural identity and practices. We recognise our custodianship and ownership rights in Kurrek, including our unique responsibility to care for land and katen (water), the ecosystem and places of cultural significance.

Barapa Barapa Wamba Wemba Water for Country Committee members

Ongoing access to Kurrek and its resources is essential to allow Barapa Barapa and Wamba Wemba people to continue cultural practices and values, maintain connection with the land and care for Kurrek. This relationship is a unique relationship where the Barapa Barapa and Wamba Wemba people belong to the land, and the land exists in harmony and in pain, with Barapa Barapa and Wamba Wemba people. Barapa Barapa and Wamba Wemba people have a wealth of knowledge and experience that can be utilised with regards to land and natural resource management. Barapa Barapa and Wamba Wemba people can also obtain valuable knowledge and skills through being proactively engaged in environmental management and conservation of our Kurrek.

Barapa Barapa and Wamba Wemba Countrymen and Countrywomen feel we have been entrusted with the care and protection of our sites and song lines until the time comes to pass on our responsibilities to our next generations according to our cultural lore.

Barapa Barapa and Wamba Wemba people acknowledge that several government and non-governmental organisations and structures exist that currently have responsibility for land and katen issues on Barapa Barapa and Wamba Wemba Kurrek. Barapa Barapa and Wamba Wemba people seek to engage with these organisations and structures to ensure that Barapa Barapa and Wamba Wemba peoples' rights and interests are respected and protected.

Barapa Barapa and Wamba Wemba Traditional Ecological Knowledge both tangible and intangible is passed down from generation to generation and is valued highly and respected. To ensure that stories and knowledge are protected, the Barapa Wamba Water for Country Project utilises intellectual property agreements.

Barapa Barapa Wamba Wemba Water for Country Committee Vision

"Barapa Barapa and Wemba Wamba people aspire to actively manage land and water, sharing and protecting culture, across generations"

Values

When asked about values, the Barapa Barapa and Wamba Wemba Water for Country Committee members spoke of the connection between healthy Kurrek and healthy people, and the significance of katen:

No water, no Country, no people

Healthy Country, healthy people

How to measure the pride and happiness that watering at Guttrum brought?

Key for environmental watering is the breeding seasons

Traditional customary practices come first, can't carry them out without water.

If water's not there, we can't practice culture

If you want to make a comparison, water is like gold to us.

It's not just a commodity, it's heart and soul. I'm emotionally and spiritually linked.

People, land and water are all linked

One big story – our story.

The Barapa Barapa Healthy Country Plan includes a Yemurriki Map of water related cultural values including many important plant and animal species. These include; bats, Owlet Nightjar, Brolga, Black Swan, turtle, native fish (Murray Cod, Catfish and Yellow Belly), crayfish and yabbies, Bunyip bird (Australasian Bittern), and the Red-tailed Black Cockatoo.

Some clan totem species for Barapa Barapa people include the Owlet Nightjar and micro bats.

Some clan totem species for Wamba Wemba people include the Red-tailed Black Cockatoo and the Black Swan.

Black Swan, Photo by Geoff Park

Places of cultural value

When asked if they would like to identify places of cultural value in the RCS, the Barapa Barapa and Wamba Wemba Water for Country Committee chose to identify several places. Some have significant cultural and/or environmental values, others need improved or continued management. Listing these places is intended to provide a focus for this RCS and does not diminish the importance of other places, nor should it limit the opportunities to work on other places. These places are not listed in any order of priority.

Place	Value
Lake Boga, including Turtle Lagoon	Lots of creation stories here, spiritually, culturally significant. Want to continue our work at Turtle Lagoon to restore/maintain, need to address issue of turtles being run over. Lake Boga has been included as an RCS priority waterway asset based on these cultural values.
Round Lake	Want to understand better. Cotton weed that grows there is significant, used to be traded as fire starting material

Place	Value
Lower Avoca marshes including Lake Bael Bael (Kerang Wetlands Ramsar)	Highly significant both environmentally and culturally. Lake Bael Bael – high density of cultural heritage sites (silcrete, quartz, clay balls, scar trees, mounds, middens, burials). A cultural heritage assessment of the area or mapping is needed to record sites and protect them from the recreational users. Also bat survey/monitoring
Lake Tutchewop (Kerang Wetlands Ramsar)	Needs better management, the pest plant/animal work needs to be maintained. There's also a long-term project to repair the sill, and create a pool again. Good memories here. Used to catch Yellow Belly in here, want to return this species. Control erosion around lake edges with reeds. Want to know more about salt interception and interactions, hydrology of Kerang lakes. Concern around increasing salinisation of this and other lakes.
Lake Cullen (Kerang Wetlands Ramsar)	Needs better management, the pest plant/animal work needs to be maintained.
Hird and Johnson Swamps (Kerang Wetlands Ramsar)	Reeds too thick. Driveway to Johnson needs work
Reedy Lakes (Kerang Wetlands Ramsar)	Cultural and broader community values too (for swimming)
Gunbower Forest RAMSAR site and Gunbower Creek	Very important for Barapa Barapa, culturally and environmentally significant, least disturbed. Need to reduce impacts by European Carp on Reedy Lagoon
Guttrum Benwell	Very significant culturally and environmentally, some of the biggest trees. Cultural objectives developed for watering reed bed; record sites, more animal and plant survey/monitoring, burn the site before water is delivered and measure the water quality, monitor the weeds, want to be involved pest animal control
Lake Murphy	Needs better management, the pest plant/animal work needs to be maintained.
McDonalds Swamp	Concern that reeds are too thick
Red Gum Swamp	Want to see watering and a Cultural Heritage Management Plan developed, some tree planting
Bannacher Creek	Significant cultural values, want to access and document the in situ cultural heritage
Loddon River	Culturally significant, food sources
Little Murray River	Culturally significant, food sources
Pyramid Creek	Needs instream habitat, re-snagging, fish hotels
Piccaninny Creek	Want to work on it and rename

Place	Value
Barr Creek	Poor condition around Kerang, needs some understory including grasses, sedges, rushes etc to act as biofilters
Wandella Creek	Runs through Tragowel Swamp which is important habitat, but water quality poor (dairy farm effluent) and choked with lignum
Lake Leaghur	Presence of mussels in dry bed – do a mussel survey in the wet and also for yabbies. Record CH sites to ACHRIS, revegetation maintenance (remove the mallow) look after the medicinal plants. Water bird survey. To be involved in the Fox program/ baiting, follow up on the tree planting to remove weeds.
Lake Baker	Cultural heritage values, including burials, lunettes, some public land, no chance of delivering water but could work to protect sites (e.g. by revegetating) also opportunities for cultural education (e.g. interpretive signage)
Kow Swamp	Within Yorta Yorta RAP area however Barapa Barapa elders have connections to this place.

Key concerns

- Lack of access to some areas
- Can't control (own/sell/use) our water – cultural water is environmental water and we don't have 100% say over it
- Regulation of flood waters – water is not getting through to all the lakes, there's not enough water, lakes should all be connected
- Need water in all the lakes, need water to practice culture.
- We shouldn't be charged for filling lakes, there's also a broader community benefit from filling the lakes
- Traditional Owners should have access to water and the profits from water sales

Aspirations, priorities

The Barapa Barapa Healthy Country Plan outlines a range of targets, challenges and issues, with goals defined for each.

Barapa targets	*Key challenges and issues*
Barapa Barapa People *Cultural Heritage* *Cultural places and knowledge* *Country* *Wetland fauna* *Water*	*Carp* *Cultural awareness* *Weeds* *Pest animals* *Fire management* *Policy and regulation* *Farming practices* *Toxic black water* *Building capacity* *Lack of access to Country*

Cultural mapping, Country Plans:

- Barapa Barapa and Wamba Wemba committee members expressed an interest in further mapping of cultural values (like the Yemurriki Map from the Barapa Barapa Healthy Country Plan) to inform planning and also education of the broader community.
- Barapa Barapa committee members would like to renew their Healthy Country Plan.
- Wamba Wemba committee members would like to develop a Healthy Country Plan.

Connection to Country:

- Connection to Country and land/water management are the highest priority
- Anything that gets the kids on to Country, educate youth for the future, future elder building.
- Access to Country to practice culture

Acknowledgement and rights

- Prior right to land and water needs to be acknowledged.
- Government authorities need to be consult us, take us seriously as Traditional Owners of land and water.
- Need to consider potential implications of Treaty in Victoria

Water

- Traditional Owners to have more say on how water is managed
- Cultural water

Governance

- Committee members want to secure funding to continue the Water for Country Committee

Employment

- Want on Country management jobs (like water rangers) and regulatory roles too, modernising the system to save water

Barapa Country Aboriginal Corporation

We acknowledge and show respect to all Traditional Owners/Custodians of these lands. With their vibrant, rich, living culture, traditions, and resilient long history. Giving us our Strength, Courage and Pride to do what we do, for families, communities, and country.

People and Country

Barapa Barapa people are independent proud and strong in their culture and traditions. Barapa Barapa people work in partnership with surrounding traditional owner groups, sharing knowledge and delivering cultural practices on country. Barapa Country Aboriginal Corporation have built strong relationships with government, education bodies, private landowners, tourism, Landcare groups, and many other organisations and community groups. We value working together for the benefit of current and future resources and maintaining a sustainable ecological future for generations to come.

Barapa Barapa AWA Reedy Lake 2021

Caring for Ancestral lands, cultural sites, environment, and community

Barapa Barapa culture, knowledge and traditions provide strong connections to our lands and water. Barapa Barapa people are invested in promoting, protecting, nurturing, and restoring country, via robust land and water resource management. Our aim is to improve the health, wealth, and wellbeing of the Barapa Barapa people and country for the generations to come.

Barapa Barapa prides itself on working with government, landowners, and land users to deliver a Healthier Country, via cultural knowledge and practices in Natural Resource Management.

Shaun Berryman practicing culture with traditional burns

Vision

Barapa Barapa strives towards Self Determination, by increasing our capacity in employment, training, and education, continuing our culture, and protecting our heritage. This includes creating and securing opportunities for our community to continue cultural practices on our traditional lands. To keep improving the health and wellbeing of the Barapa Barapa traditional owners/custodians, relieving issues within our community by recognition and reconciliation, providing cultural practice, education, employment, and ability to deliver better outcomes for our people. Barapa Country Aboriginal Corporation provides opportunities for increasing cultural practices, values and connection to community and country from ancestors to elders to the next generation. This work is completed in conjunction with promoting, protecting, nurturing, and restoring our lands, creating, healthier community with knowledge and skills, increasing local, regional, state, and federal economic participation, development, awareness, and growth.

Values

Barapa Barapa people care for community and country, lands, and waters. Barapa Barapa have had our stories passed down from ancestral times, generation to generation, which is what makes our connection to families, community, and country so significant and strong.

Our country is so rich in our family's history from thousands of generations with so much to see, hear and feel within our diverse landscape. We work towards ensuring long term positive outcomes and accomplishments embracing culture equality by empowering our community.

Barapa Barapa Traditional Owners continue to provide consultation on cultural development, planning and delivery, with agility and positive mindsets when caring for country. As the **Traditional Ecological Knowledge Holders** regarding culture and sustainable management of local resources it is our imperative nature to protect and support the development and protection of these lands.

Priorities within the landscape

The priority of the Barapa Country Aboriginal Corporation is to support the self-determination of Barapa Barapa people by providing resources and knowledge for the effective management of the country and waters, culture, and heritage.

People are the value in the landscape, as they help maintain a positive ecological and environmental outcome for the land and waterways, as they support food production, management of pest weeds, animals, and diseases to protect and restore our local native flora and fauna and minimise the damages to these lands.

Caring for Country – involves all the people, lands and waters ensuring health and sustainability

Barapa Caring for Country is supported and carried out through on-ground conservation projects and activities on country, building capacity and encouraging collaborative partnerships with key stakeholders and custodians. This is also supported by protection of cultural sites, restoring cultural practices, story lines and ceremonies that come with caring for country, environment, and water.

Barapa Country Aboriginal Corporation are invested in:

- Sharing knowledge and skills in land and water management in a cultural way and while empowering our community – making it stronger and healthier, generating better opportunities and knowledge sharing for our future generation.
- Respecting and appreciating all the work over the years since colonisation, that many other Barapa Barapa Traditional Owners and Elders past and present have been doing on country, and fighting for our rights to be seen, heard, and recognised as the Custodians of this land.
- Create and secure opportunities for community to continue sharing and acknowledging cultural knowledge and practices on traditional country.
- Increase cultural practices, values and connection to country, land, and water, for all from Elders to the next generation.
- Creating a healthier community with knowledge and skills in caring for families and country to improve the health and wellbeing of the Barapa Barapa people.
- Self Determination in community care, employment, training, and education for the health and wealth of our community and future generations.
- Gaining, recording, and sharing our cultural knowledge, skills and experience and continuing our cultural heritage by caring for families, community, and country both in land and waters.

Key Concerns

Manage and improve the overall health of our waterways and environment:

Place	Concerns	Conservation and Protection Priorities
All water ways on country including: Lakes, Wetlands, Rivers, Streams, Creeks, Swamps	• Destruction of cultural sites, placers, and areas. • Cultural site protection. • Limited opportunities for Cultural Practice. • Limited opportunities to engage in Cultural ecological cool burn practice, maintaining land and waters. • Soil quality and erosion. • Native plants loss and reduced diversity. • Native animals, insects, fish. • Water pollution. • Access to water ways for recreation and cultural practices. • Water quality. • Water access. • Changes and disturbances to the natural and expected water flows. • Changes and disturbances to the waterflows in all wetland's areas. • Water diversions, bypass and discontinuation of water storage sites. Climate change.	• Care and protection of cultural sites. Identification and registration of Aboriginal Cultural Heritage sites. Management and protection around site (fencing and pest control). Protection, education, and training. • Research/Mapping sites and story lines. • Care and protection soil quality. • Improve water quality. • Improve access to waterways. • Improve access to lands around water. • Cultural Water Flows supported through cultural knowledge and scientific evidence. • Aboriginal waterway assessments and mapping of all waterways on country. • Aboriginal water and land management and consultation. • Aboriginal water and land ownership. • Protected species of flora and fauna monitoring and conservation (and correlating opportunities for employment and training). • Feral animal management (including exclusion fencing, baiting of rabbits and foxes, Fumigation of rabbit warrens where indicated. Assessing, monitoring, and reporting on pest animal activities, shooting, and cultural burns). • Weed control (removal, maintenance, spraying, cutting/pasting, reporting, monitoring, and recording. GPS, mapping and revegetation programs). • Fire management (cultural burns, training). • Soil erosion control. • Habitat restoration of native plants to support, animals, birds, fish, and insect populations.

Example

	Protection and Promotion	BCAC Priorities
Reedy Lakes (Lake 3) (Ramsar Listed)	Southern Purple Spotted Gudgeon (zombie) Fish was presumed extinct in Victoria for about 70 years. Sighted in the Kerang Lakes (third Reedy Lake). Education and Training	Protect and ensure the survival and breeding of this species. Monitoring and protecting the whole ecosystem for the survival of the fish it was found, with feeding, breeding and temperature are suitable. Training of Traditional Owners, Barapa Barapa to maintain these lands and waterways for years to come.

Second Reedy Lake The Ibis Rookery (Ramsar Listed)	Home to a variety of water birds – black swan, Straw necked and white ibis, heron, and other spectacular birds such as Pelicans, Swans, Spoonbills, Egrets and Ducks. Over population of limited bird species and reduction in diversity of species due to climate change and water leaves.	Encourage Waterbirds and other living species. Revegetation and protection of these habitats to support these populations and encourage diversity. Signage to provide ecological and cultural education for visitors to these lakes. Water quality assessment and management and bird access to breeding sites.
First Reedy (Ramsar Listed)	Cultural sites, and associated cultural practice being lost due to limited access. Cultural landscapes changed through farming and environmental changes. Cultural vegetation site diversity being lost. Limited access for community recreation, fishing, swimming, bird watching, camping, tourism.	Protection, education, and management of vegetation to support diversity and cultural connection to lands and water. Signage and artwork to combine the environmental and cultural significance of plant and bird species. Cultural knowledge and practices shared and inclusion in tours of the wetlands.

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North Central CMA

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Yorta Yorta

Introduction

The Dhungalla (Murray River) is central to Yorta Yorta Country, extending to Cohuna in the west, just outside Albury/Wodonga in the east to a northerly point in NSW near Finley, and reaching almost as far as of Nagambie in the south. The Yorta Yorta region includes several significant State and National Parks, major waterways, wetlands and tributaries.

Yorta Yorta Nation Aboriginal Corporation (YYNAC) represents Yorta Yorta Traditional Owners. YYNAC have Registered Aboriginal Party (RAP) status under the *Aboriginal Heritage Act 2006.* Prior to the *Traditional Owner Settlement Act 2010*, the state government entered into a Cooperative Management Agreement with Yorta Yorta, and within the north central region this applies to Ghow Swamp. For more details refer Traditional Owners and Aboriginal Victorians Policy Context page.

YYNAC were engaged to inform RCS renewal. As for other Traditional Owners of the region, we have sought to reflect Yorta Yorta values and aspirations in this RCS, at a high level. For more specific information, RCS partners should engage directly with YYNAC and reference the Yorta Yorta Whole-of-Country Plan 2021-2030.

All Traditional Owners engaged for RCS renewal were asked if they would like to identify values, including places of value in the RCS. We also discussed a range of concerns and aspirations for the future. Those that were identified by YYNAC are outlined on this page. Together these have informed the development of priority directions and outcomes for all Traditional Owners, as outlined on the Traditional Owners page.

Paragraphs on this page in *italics*, were provided by YYNAC.

Values

Our land, water, and resources are important to the wellbeing of Yorta Yorta people. Maintaining spiritual connection with our environment and water is central to our culture and identity.

Water is core to life for Yorta Yorta people. Protecting and managing water is a custodial and intergenerational responsibility. If the cultural and spiritual values of water are sustained by providing water that is sufficient in both quantity and quality, then many other components of our biodiversity will be healthy.

The following places within the north central region, have particular significance for Yorta Yorta people:

- Lower Yalka (Campaspe River)
- Upper Gunbower Forest and the broader Dhungalla (Murray River) corridor
- Ghow (Kow) Swamp and connection to Mt Hope Creek (Lower Bendigo Creek)
- Richardson's Lagoon, which is significant because it includes Bayadherra (Broad Shelled Turtle) habitat, and other important biodiversity values, as well as precolonial lunettes

All of the above-listed places are identified as priority RCS assets, refer Regional Maps to view RCS assets in relation to the YYNAC RAP boundary. The full extent of Bendigo Creek up to Ghow (Kow) Swamp, was added as part of the RCS renewal process, in part, because of the cultural values for both Yorta Yorta and Dja Dja Wurrung Traditional Owners.

The Bayadherra (Broad Shelled Turtle) pictured above, is a Yorta Yorta totem. Protection and enhancement of Bayadherra habitat is important because of its spiritual significance to Yorta Yorta people and also because it is an endangered species.

Protection of cultural heritage is important.

Concerns

The landscape has been over-cultivated, and our native vegetation has been overgrazed.

The degradation of our land has created soil erosion, a major decline in native vegetation, invasive weeds and other atrocious plants have increased and cause extensive complications. Water is also being over-extracted from our waterways, wetlands and billabongs, and being utilized for commodities such as hydroelectric power and irrigational purposes. The quality of the water has become poor and extremely murky because of the high-volume flows and constant water extraction which has created detrimental slumping and notching of the banks.

Priorities

Self-determined participation

Yorta Yorta people would like to be involved in all matters relating to their Woka (Country). Whenever an opportunity arises, Yorta Yorta would like to be advised by RCS stakeholders and provided with enough time to make a decision and respond. This is self-determined participation.

Yorta Yorta noted that self-determined and active participation in caring for Woka (Country), requires a level of economic independence. It is important to build economic independence for Yorta Yorta people, which includes providing mentoring/training/employment opportunities as well as supporting the growth of Woka Walla (YYNAC's owned and operated NRM enterprise).

Ashton Cashion from Woka Walla crew with a Broad-shelled Turtle

Connecting to Country, Caring for Country

Yorta Yorta people have managed and conserved their Country for thousands of years and it is not a new concept or a privilege to be managing Country; it is our responsibility. Yorta Yorta must be appropriately resourced to continue this stewardship role at all levels from research and policy development through to on-ground caring for Country roles and service delivery.

Getting Yorta Yorta people back on Woka (Country) to share knowledge and broaden their collective understanding of traditional management practices, was identified as important.

Yorta Yorta are interested in managing the whole landscape, considering for example how Walla (water) flows, or used to flow, across the landscape and intangible cultural values. Yorta Yorta are interested in opportunities to work with private landholders including farmers, to share traditional ecological knowledge and practices that restore and improve land health, e.g., reintroducing native vegetation to complement adjacent remnants and the integration of cultural burning practices, e.g., areas west of Pig Swamp.

Monitoring outcomes, species recovery, sharing knowledge

Yorta Yorta want to be actively involved in research and monitoring programs, particularly in monitoring the outcomes of culturally informed practices (e.g., burns, water deliveries) to demonstrate the benefits and educate the broader community.

Yorta Yorta want to have a greater role in species recovery. There are stories from Elders regarding species that used to be on Woka (Country), and Yorta Yorta want to see those species returned. There is also an interest in building knowledge of plants, involving ecologists, considering what was there before and what is there now.

The Living Murray fish survey with Woka Walla crew and Barmah Parks Victoria rangers

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Barengi Gadjin Land Council

Introduction

Barengi Gadjin Land Council (BGLC) is the trustee for the Native Title rights and interest of the Wotjobaluk, Jaadwa, Jadawadjali, Wergaia and Japagulk peoples, collectively known as the Wotjobaluk peoples as recognised in the Consent Determination on 13 December 2005. BGLC's Registered Aboriginal Party (RAP) area under the Victorian *Aboriginal Heritage Act 2006* includes places such as Guru/Lake Hindmarsh, Lake Albacutya, Pine Plains Lake, Lake Werringrin, Lake Coorong, Warracknabeal, Beulah, Hopetoun, Dimboola, Ouyen, Yanac, Hattah Lakes and the Barengi Gadjin (Wimmera River).

Within the North Central CMA region, the RAP area runs from Banyenong (Lake Buloke) south along the Richardson River, to Kara Kara National Park, encompassing the Avon River.

Traditional Owners of the north central region, including BGLC, were asked to identify values, including places of value, and priorities regarding their Country. The input from all Traditional Owners has informed the development of priority directions and outcomes, as outlined on the Traditional Owners page.

Input from the BGLC is outlined on this page. Words in italics were written and provided by BGLC. For more specific information, RCS partners should engage directly with BGLC and reference Growing What is Good Country Plan, Voice of the Wotjobaluk Nations.

Vision and plan for healthy Country

Integrated catchment management will be a platform for activities that contribute to self-determination and nation-building by First Nations communities. Wotjobaluk People share rights and interests in the living cultural landscapes, rich in values and heritage. We share kinship across the region and continue to shape the landscape to support cultural continuity, renewal, and revitalisation.

There must be a holistic approach to caring for Country, with longer term approaches from all partners. Working closely with neighbouring First Nation communities' will be critical to identify future priorities and opportunities and provide a strong platform for improving the overall wellbeing of the community. Our community members will carry out cultural heritage surveys and Aboriginal Water Assessments across Country to identify cultural values.

Cultural heritage protection is an important aspect of integrated catchment management, but it is just one aspect. First Nations communities' participation and engagement in integrated catchment management and partnerships with CMAs and other organisations across this sector are much broader than just cultural heritage protection.

> ***"That's the importance of the landscape for us as Traditional Owners, as Wotjobaluk people. What you've captured is the strong connection. It's part of our identity. That landscape and cultural heritage has a significant meaning to us all. It touches us and has a significant meaning to us all. That's special."***
>
> JO CLARKE, BGLC MANAGER COMMUNITY DEVELOPMENT AND COMMUNICATIONS AND WOTJOBALUK TRADITIONAL OWNER.

Growing What is Good Country Plan, Voice of the Wotjobaluk Nations, outlines the following vision:

Wotjobaluk Nations working together as custodians of Culture, Country Heritage, Lore and Language, sharing our values and representing the rights and interest of our People.

The Country Plan outlines the following goals and priorities, and a series of actions to realise them.

Goals

- Strong and healthy Wotjobaluk Culture
- Healthy Wotjobaluk Country
- An engaged and connected Wotjobaluk Community
- Recognition and respect
- Economic sustainability
- Healthy Wotjobaluk Peoples
- A strong corporation with excellent governance
- A strong voice for Wotjobaluk Peoples

Priorities

- More time on Wotjobaluk Country
- Strengthening Wotjobaluk Culture and Language
- Education and rewarding jobs for Wotjobaluk People
- Stronger partnerships
- A strong voice for our People
- Caring for our County

Places of cultural value

Places of importance to Wotjobaluk, Jaadwa, Jadawadjali, Wergaia and Jupagulk peoples, within the north central region include Banyenong (Lake Buloke) and the Richardson River, which are also identified as RCS priority assets.

Several significant places are outlined through our Country Plan, but like all places across our Country, the river, the lakes, the swamps, and all other landscape features in this area are of high cultural significance. Our creation stories of these places are ours to sustain and we wish to tell our story as the knowledge holders of the traditional land management practices and the ancient narrative of this area.

We wish to work collaboratively, honestly, and transparently with partners to heal Country by cultivating a deeper connection between it and all people. Many of our families have deep Ancestral connection to this region and are inherently invested in seeing the better management of the land and water so we can achieve greater outcomes for Country and those that live on it.

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Local areas

The RCS Local Areas characterise the diversity of the region and provide a basis for integration of RCS themes in a way that is relevant to local communities. Our local areas were defined based on the following criteria:

- Predominantly agricultural or rural residential.
- Proximity to regional centres for employment.
- Dominant agricultural land use.

Each of the Local Areas have unique sets of threats to land, water and biodiversity and/or challenges for farmers/rural landholders and by extension their communities.

A summary of the RCS Local Areas and how they were defined is outlined below. Characteristics of each area are described in more detail, and priority directions and outcomes of particular relevance are highlighted, on the pages for each area. You can access those pages by clicking on the labels on the map here.

Irrigated area

- Irrigated Riverine – defined by Goulburn Murray Irrigation District (GMID) within region, irrigated but many transitioning to dryland agriculture, water availability is biggest driver, includes significant wetlands.

Dryland – predominantly agricultural

- Western Dryland Plains – mostly full-time farmers, dryland cropping, remote from regional centres.
- Northern Dryland Plains – mostly full-time farmers, dryland cropping, not too far from regional centres.

Dryland – mixture agricultural and rural residential

- Western Goldfields – high proportion of rural residential between Talbot and Wedderburn but not well connected to regional centres for employment, cropping on the Natte Yallock plains and grazing elsewhere, relatively high proportion of remnant native vegetation.
- Upper Loddon Plains – some rural residential areas but mostly agricultural, productive soils with a mixture of dryland grazing and cropping not too far from regional centres low proportion native vegetation.

Dryland – rural residential areas

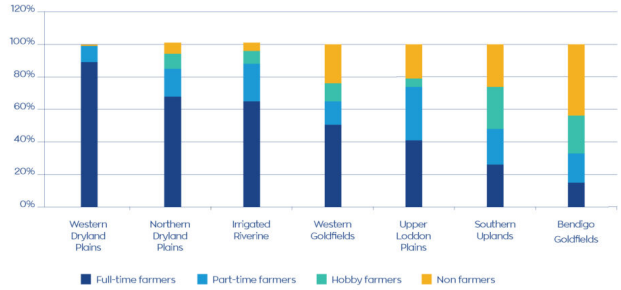
- Southern Uplands and Bendigo Goldfields – within commuting distance to Melbourne, Ballarat or Bendigo; high proportion and growth in rural residential properties; relatively high proportion of remnant native vegetation, otherwise mostly grazing.

Engagement for RCS renewal has informed our understanding of RCS Local Areas, together with an analysis of ABS data, Victoria's Land Cover Time Series, and the results of a large survey of rural landholders (properties > 10 ha.) across the region. This survey was undertaken in 2014 and repeated in 2019, to better understand the demographics, values and beliefs of the regional community. Both surveys found significant differences between responses from Full-time farmers, Part-time farmers, Hobby farmers and Non-farmers. The 2014 and 2019 survey reports describe the methodology, and present responses by landholder type and Local Government Area. The survey results were then cut by RCS Local Area, which is presented in another report – see link below.

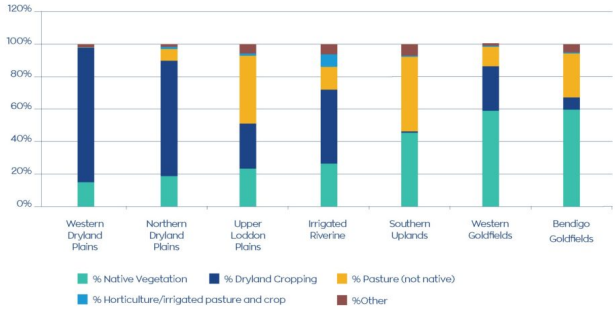
Social Benchmarking for Natural Resource Management 2019, North Central Victoria, RCS Local Areas Download

These reports provide useful insights regarding rural landholders in the region, highlighting significant differences between landholder types, Local Government Areas and RCS Local Areas. Some of the significant differences between RCS Local Areas, including proportion of full-time farmers, native vegetation cover and agricultural land use are shown in the graphs below.

Rural Landholder Occupation by Local Area



RCS Local Areas: Land Cover Types



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Southern Uplands

Introduction

The Southern Uplands includes the traditional lands of the Dja Dja Wurrung (west of Campaspe River and Five Mile Creek) and Taungurung (east of Campaspe River and Five Mile Creek) peoples.

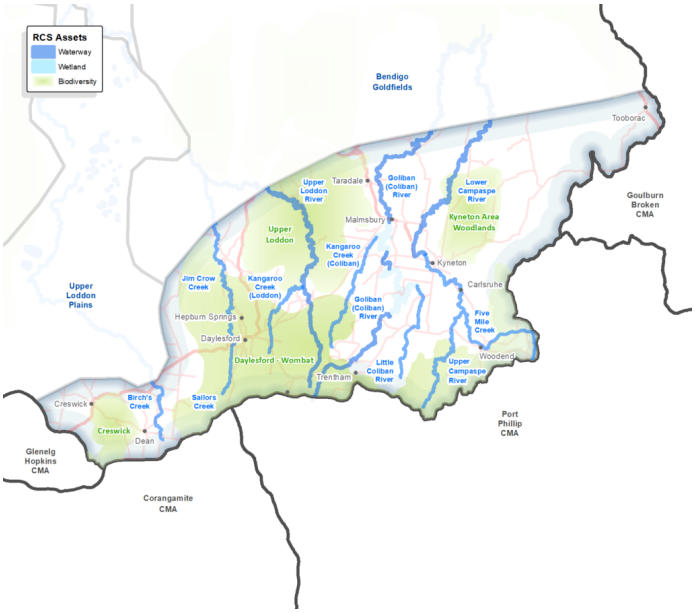
This is the southern fringe of the region, centred around the Calder corridor between Woodend and Malmsbury, and extending west to Creswick. Many residents commute to Melbourne and Ballarat for work. Accessibility, affordability (compared to Melbourne) and amenity values are driving strong population growth including in rural residential development.

This area has the highest elevation and rainfall in the region, includes the upper reaches of the Campaspe, Goliban (Coliban) and Loddon Rivers, and is entirely within a declared special water supply catchment area. The Macedon Ranges has been declared a Distinctive Area and Landscape, which designates long-term settlement boundaries for townships expected to grow, and provides for better protection and enhancement of natural and rural landscapes. Being within a 100 km radius of Melbourne the Planning for Melbourne's green wedges and agricultural land project is also relevant to this Local Area. This planning aims to strengthen planning controls to protect values, including to manage land use to support long term agricultural use.

Mineral springs around Daylesford are major a tourism drawcard, along with agritourism attractions and fine restaurants for weekenders from Melbourne.

There is a relatively high proportion of remnant native vegetation, including within the Wombat State Forest, Castlemaine Diggings National Heritage Park and the Hepburn Regional Park, the latter which is jointly managed by Parks Victoria and Dja Dja Wurrung.

When asked about their long-term vision through RCS renewal engagement, respondents from this Local Area spoke about; diverse and connected landscapes, healthy waterways, alternative/sustainable agricultural practices, and an active and engaged community.



Southern Uplands Local Area, with RCS assets

A snapshot

Aspect	Description
Key RCS partners	Traditional Owners: Dja Dja Wurrung, Taungurung DELWP, Parks Victoria, Trust for Nature and Agriculture Victoria Local Government: Macedon Ranges, Hepburn, Mitchell and Mt Alexander Shires Landcare Networks: Upper Campaspe, Blampied Kooroocheang, Connecting Country Water corporations: Goulburn Murray Water (rural), Coliban Water (urban), Central Highlands Water (urban) and Western Water (urban)

Socio-economic	Within commuting distance to Melbourne or Ballarat. Journey to work data (2011 census) shows 34% of Macedon Ranges Shire residents commute to metropolitan LGAs, 11% from Hepburn and 9% from Mt Alexander Shire. Around the Calder Freeway and Creswick areas more than ten per cent of the workforce are employed in higher-skill service industries. Relatively high socio-economic advantage.
Bioregion	Central Victorian Uplands
Native vegetation cover	Relatively high proportion of native vegetation. The Land Cover Time Series data for the period 2015-19 showed that native vegetation of some type, covered 45% of this area.
Rural residential or agricultural	>80% of rural households are estimated to be rural residential (non-farmers) – as interpreted from ABS data.
Agricultural land use	Predominantly dryland grazing. The Land Cover Time Series data for the period 2015-19 showed that pasture (not native) covered 46% of this area. Mostly smaller properties because higher land prices due to rural residential demand. Also includes niche agri-business.
Soils and land use summary	These lands display considerable diversity. In the west steeper terrain occurs within the headwaters of the Loddon and Campaspe valleys. Quaternary basalt flows partially infill valleys dissected within metasedimentary basement rocks, typically sandstones and slates. This higher relief upland terrain comprises elevated ridges typically dissected by adjacent ancient valleys in-filled with basalt. Large areas of steeper terrain retain native vegetation. Further east in the upper Campaspe catchment around Kyneton extensive basalt flows have formed a large basaltic plain. The mineral water industry is significant throughout the Southern Uplands with low salinity mineralised groundwater being withdrawn from both the basaltic and metasedimentary terrain. Traditional agricultural pursuits continue to focus on grazing, although large areas now comprise hobby farms.

Current and future challenges

The following challenges are considered particularly relevant to the Southern Uplands:

- Population growth and demand for rural residential properties is putting pressure on water resources (e.g. small farm dams, bores) and biodiversity (habitat loss through clearing for development and to reduce wildfire risk) which will be exacerbated by climate change, and if not well managed could impact the significant amenity, environmental and cultural values of this area. Integrated Catchment Management projects, such as the current A Healthy Coliban Catchment project, are needed to protect waterways and water quality into the future.
- Unregulated waterways in the upper catchments (Loddon and Campaspe) are vulnerable to climate change, which is a threat to water resources and aquatic ecosystems.
- Reduced water availability, as predicted with climate change, will mean less water for all users, and sharing benefits may be challenging, so building understanding and support for management strategies will be important.
- New rural landholders, don't always have the skills, knowledge or time, to manage their land in a way that supports environmental values. Education and capacity building is needed.
- Many smaller properties and landholders, means that engaging can be time consuming and this can be a barrier for some programs.
- Absentee landholders who use properties as weekenders, are relatively common in this area. They're generally not well connected with the local community, so more difficult to engage and generally have less time available to manage their land.
- Increasing threat of wildfire due to climate change is a particular concern for this area.

Opportunities

Future opportunities for the Southern Uplands include:

- There is generally a willingness amongst new rural residential landholders to protect and enhance the local environment, including interest in, managing for conservation or sustainable agriculture (in its many forms).
- Given the popularity of this area with weekenders from Melbourne there are opportunities for agritourism.
- New rural landholders present an opportunity to reinvigorate local community based NRM groups such as Landcare, to maintain strong community based NRM organisations and momentum.
- This area is entirely within a declared special water supply catchment area and includes spring fed ecosystems which are important drought refuges, a priority for protection and enhancement.
- This area has higher carbon sequestration potential as compared to the rest of the region which presents opportunities to leverage the carbon market for revegetation projects.

Priority directions

Priority directions are covered in more detail under each theme – those of particular relevance for the Southern Uplands include:

- Continue to build partnerships with Traditional Owners towards self-determined participation and leadership in water and biodiversity planning and management.
- Continue to support the collaborative development and implementation of Integrated Catchment Management projects.
- Deliver targeted programs to build the capacity of rural residential landholders, to protect and enhance soils, water and biodiversity values.
- Build community awareness and capacity around the management of water resources and waterways, in the context of climate change.
- Maintaining and enhancing the quality of our remnant native vegetation and habitats with a focus on RCS priority biodiversity assets.
- Collaborate to maximise the potential of carbon market investment, to contribute to land, water and biodiversity outcomes.

And those relevant to the regional community generally, include:

- Build capacity, networks and leadership to enable community led climate solutions for land, water and biodiversity management.
- Support, improve and expand the environmental volunteering sector, including Landcare, to enable adaptation to demographic shifts, to continue their important role in NRM.
- Enable, improve and promote opportunities for people to connect with nature, in both urban and rural settings, for wellbeing, to build awareness and appreciation, and inspire action.
- Support schools and young people to participate in programs that increase their knowledge and awareness of natural resource management.
- Continue to support integrated citizen science programs that engage community and provide useful targeted data to inform water, land, climate and biodiversity programs.

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Bendigo Goldfields

Introduction

The Bendigo Goldfields includes the traditional lands of the Dja Dja Wurrung (west of the Campaspe River) and Taungurung (east of the Campaspe River) peoples.

This area, within the Goldfields bioregion, centred around the Calder highway and Bendigo, with residents more likely to travel to Bendigo for employment than Melbourne. Greater Bendigo is among the fastest growing regional Local Government Areas in Victoria, with a projected 1.6% increase in population between 2018-2036, which equates to an additional 37,700 people.

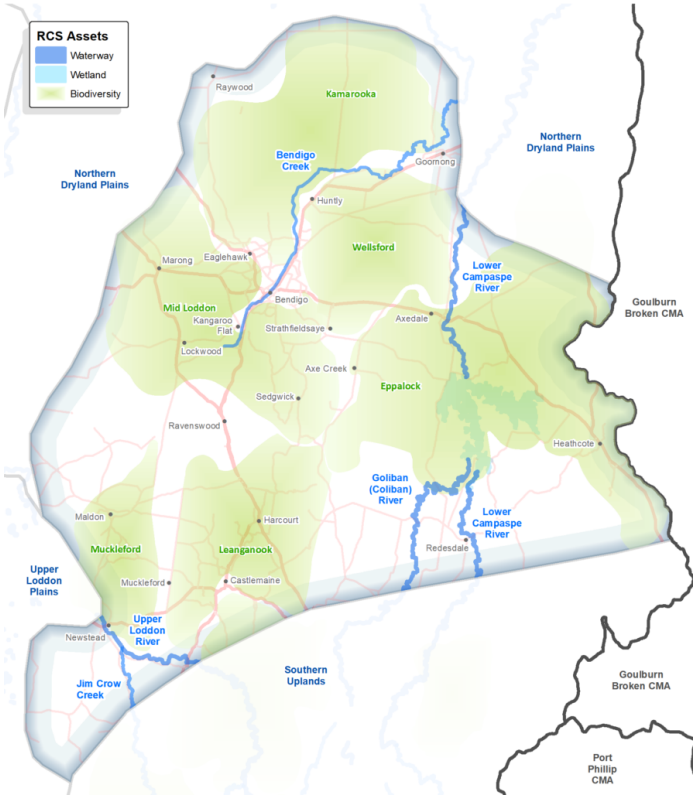
Affordability, compared to Melbourne, is driving population growth including in rural residential development around Bendigo. A strong demand for rural blocks is leading to a transition from farming to rural residential across this area. Managing this growth whilst protecting natural values and resources, in a changing climate, is a key challenge.

Bendigo is not only a popular place live, but also an important regional tourist destination, with many popular cultural attractions. In 2019, Bendigo was designated a UNESCO Creative City, in the category of gastronomy.

Box-Ironbark Forests and Woodlands once covered this landscape, but when gold was discovered in Bendigo Creek in 1851, attracting people from all over the word, the land was cleared, mined and developed. It produced the largest amount of gold in any field in eastern Australia. The area still includes large areas of remnant native vegetation dominated by Box Ironbark forests and including the Greater Bendigo National Park which is now jointly managed by Parks Victoria and Dja Dja Wurrung. Whilst these Forests and Woodlands support many unique and rare species they are generally in poor condition as a result of previous logging, gold mining etc.

This area spans the Loddon and Campaspe catchments, the upper sections of which are within a declared special water supply catchment area. It also includes Lake Eppalock which is an important irrigation and urban water supply.

When asked about their long-term vision during RCS renewal engagement, respondents from this Local Area spoke about; the importance of people connecting with and valuing nature, sustainable agricultural practices, working together to protect and restore waterways and habitat for future generations.



Bendigo Goldfields Local Area, showing RCS priority assets

A snapshot

Aspect	Description
Key partners	Traditional Owners: Dja Dja Wurrung and Taungurung DELWP, Parks Victoria, Trust for Nature and Agriculture Victoria Local Government: City of Greater Bendigo, Mt Alexander and Mitchell Shires. Landcare Networks: Upper Campaspe, Mid-Loddon, Mandurang Strathfieldsaye, Campaspe, Loddon Plains and Connecting Country Water corporations: Goulburn Murray Water (rural), Coliban Water (urban)

Socio-economic	Journey to work data (2011 census) shows 77% of City of Greater Bendigo residents works within their Shire, while 57% from Mt Alexander Shire residents work within their Shire and 22% work within neighbouring Shires (mostly CoGB). Areas where more than ten per cent of the workforce are employed in higher-skill service industries are concentrated around the Calder Freeway and some parts of Bendigo. Relatively high socio-economic advantage, except for some areas, notably the area west of Heathcote.
Bioregion	Goldfields
Native vegetation cover	Relatively high proportion of native vegetation. The land cover time series data for the period 2015-19 showed that native vegetation of some type, covered 59% of this area, which is the highest for the region.
Rural residential or agricultural	>80% of rural households are estimated to be rural residential (non-farmers) – as interpreted from ABS data.
Predominant agricultural land use	Predominantly dryland grazing. The Land Cover Time Series data for the period 2015-19 showed that pasture (not native) covered 27% of this area. Mostly smaller properties because of higher land prices due to rural residential demand. Some intensive animal industries situated north and west of Bendigo, with orchards around Harcourt.
Soil and land use overview	Apart from both historical and contemporary gold mining and exploration, the main land use is grazing, although this gives way to horticulture on the slopes of the granitic lands of the Harcourt granodiorite. Horticulture thrives within an array of colluvial fans (granitic outwash) comprising sand released through intense weathering of the granodiorite. The Harcourt Apple industry is a good example of the horticultural niche these landforms afford. This granitic terrain is very prone to both tunnel and gully erosion where it is intensely weathered. Proximity to Bendigo also raises issues with future potential for urban development and given the sensitivity of soils to erosive forces careful planning will be essential if further subdivision is to proceed. The Harcourt granodiorite intrusion is marked by a large metamorphic ridge featuring slates and quartzites known locally as the Big Hill Range. Some of the rugged higher relief lands remain under native forest, whilst in other areas it is grazed but experiences issues with shallow soils, low water holding capacity and soil acidity.

Current and future challenges

The Bendigo Goldfields has and continues to face many challenges including:

- Population growth and demand for rural residential properties is putting pressure on water resources (e.g. small farm dams, bores) and biodiversity (habitat loss through clearing for development and to reduce wildfire risk) which will be exacerbated by climate change, and if not well managed could impact the significant environmental and cultural values of this area.
- Rural residential landholders don't always have the skills, knowledge or time, to manage their land in a way that supports environmental values.
- Many smaller properties and landholders, means that engaging can be time consuming and this can be a barrier for some programs.
- The legacy of gold mining, including abandoned mining shafts, subsidence, contaminated land and groundwater, is what Dja Dja Wurrung call 'upside down Country,' and one of the goals of their Dhelkunya Dja, Dja Dja Wurrung Country Plan is to make this Country is healthy again.
- Groundwater contamination and rising levels below Bendigo is a major concern.
- Box-Ironbark Forests and Woodlands of this area are in poor condition, vulnerable to further drying under climate change, and require active restoration to halt further decline (refer Biodiversity theme page for more on this).
- Reduced water availability, as predicted with climate change, will mean less water for all users, and sharing benefits may be challenging, so building understanding and support for management strategies will be important.
- Increasing threat of wildfire due to climate change is a particular concern for this area.

Opportunities

Key opportunities for the Bendigo Goldfields include:

- New landholders present an opportunity to reinvigorate local community based NRM groups such as Landcare, to maintain strong community-based NRM organisations and momentum.
- There is generally a willingness amongst new rural residential landholders to protect and enhance the local environment.
- Transition of marginal agricultural land to rural residential use, presents opportunities to manage for conservation.
- Includes some areas with relatively high carbon sequestration potential as compared to the rest of the region which presents opportunities to leverage the carbon market for revegetation projects.
- Pilot projects are proposed to develop effective methods for holistic Box-Ironbark Forest and Woodland restoration.
- Increasing tree canopy cover in urban areas refer (Greening Greater Bendigo), will be important for community wellbeing, in our changing climate, as well as having environmental benefits.
- Water Sensitive Bendigo has provided a vision and transition plan on how Bendigo will deal with the future challenges in managing water over the next 50 years. An integrated approach across government agencies, Dja Dja Wurrung and the community is important to manage future water challenges in Bendigo. There is a greater focus on integrated water management, particularly in the urban areas, with opportunities to embed Water Sensitive Urban Design (WSUD) principles into future planning and implementation, examples include Reimagining Bendigo Creek and Wanyarram Dhelk.

Priority directions

Priority directions are covered in more detail under each theme – key priority directions for the Bendigo Goldfields include:

- Continue to build partnerships with Traditional Owners towards self-determined participation and leadership in water and biodiversity planning and management.
- Deliver targeted programs to build the capacity of rural residential landholders, to protect and enhance soils, water and biodiversity values.
- Build community awareness and capacity around the management of water resources and waterways, in the context of climate change.
- Maintain and improve the quality of our remnant native vegetation and habitats, considering climate resilience, with a focus on RCS priority biodiversity assets.
- Collaborate to maximise the potential of carbon market investment, to contribute to land, water and biodiversity outcomes.
- Undertake pilot projects across the region, to develop effective methods for holistic Box- Ironbark Forest and Woodland restoration, to inform and broaden this practice and increase investment in their management.
- Continue to collaborate to implement integrated water solutions in urban areas by applying Water Sensitive Urban Design principles.
- Continue to support the collaborative development and implementation of Integrated Catchment Management projects.

And those relevant to the regional community generally, include:

- Build capacity, networks and leadership to enable community led climate solutions for land, water and biodiversity management.
- Support, improve and expand the environmental volunteering sector, including Landcare, to enable adaptation to demographic shifts, to continue their important role in NRM.

- Enable, improve and promote opportunities for communities to connect with nature, in both urban and rural settings, for wellbeing, to build awareness and appreciation, and inspire action.
- Support schools and young people to participate in programs that increase their knowledge and awareness of natural resource management.
- Continue to support integrated citizen science programs that engage community and provide useful targeted data to inform water, land, climate and biodiversity programs.

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North Central CMA

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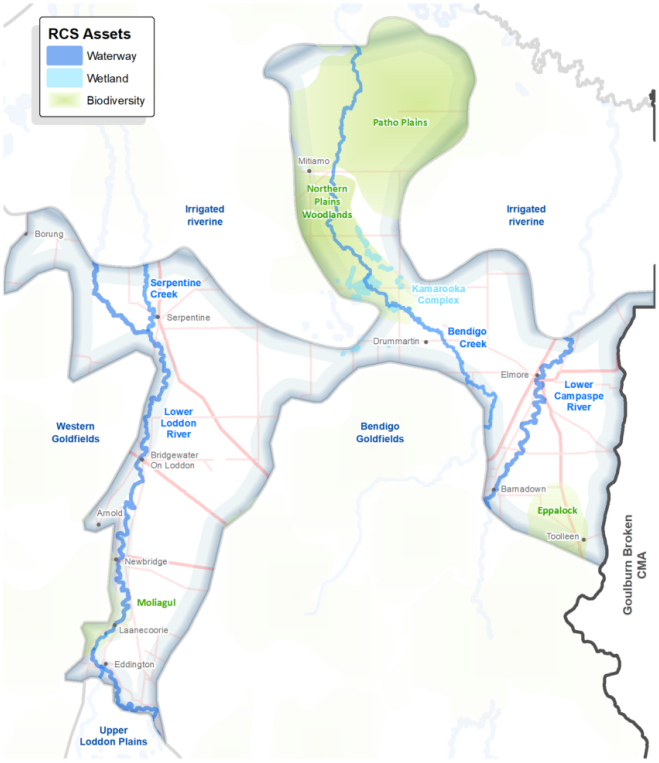
Northern Dryland Plains

Introduction

The Northern Dryland Plains includes the traditional lands of the Dja Dja Wurrung (west of the Campaspe River), Taungurung (east of the Campaspe River) and Barapa Barapa (north of Mitiamo) peoples.

The area is located on the riverine plains to the north and west of Bendigo, and is largely agricultural, with dryland cropping the dominant land use. It is generally within commuting distance of regional centres (Bendigo, Echuca), which is what distinguishes it from the cropping areas further west.

The lower Loddon and Campaspe Rivers and Bendigo Creek run through the area. The landscape is largely cleared for farming, and there is a relatively low proportion of native vegetation, though it does include most of the Patho Plains biodiversity asset (including Terrick Terrick National Park), which comprise native grasslands that are critical habitat for the Plains-wanderer (refer Biodiversity theme page for more). There are concerns regarding the ongoing loss of threatened native grasslands in this area due to change of land use (grazing to cropping).



A snapshot

Aspect	Description
Key partners	Traditional Owners: Dja Dja Wurrung, Taungurung, Barapa Barapa DELWP, Parks Victoria, Trust for Nature and Agriculture Victoria. Local Government: Campaspe and Loddon shires, City of Greater Bendigo Landcare Networks: Campaspe, Loddon Plains, Mid Loddon, Connecting Country. Water corporations: Goulburn Murray Water (rural), Coliban Water (urban).
Socio-economic	Moderate socio-economic advantage overall.
Bioregion	Victorian Riverina Northern Inland Slopes
Native vegetation cover	There is a relatively small percentage of native vegetation. The Land Cover Time Series data for the period 2015-19 showed that native vegetation of some type covered just 18% of this area.

Rural residential or agricultural	Mostly agricultural – as interpreted from ABS data.
Agricultural land use	Predominantly dryland cropping, with some irrigated areas along the Loddon and Campaspe Rivers. The Land Cover Time Series data for the period 2015-19 showed that dryland cropping covered 72% of this area.
Soils and land use overview	The Northern Dryland Plains, at the southernmost extent of the vast Riverine Plains, comprise red and grey clay soils extensively used for cereal cropping. Subsoils soils are intrinsically sodic and, accordingly, need to be managed very carefully to avoid both wind and water erosion issues that stem from the loss of soil structure in response to dispersion promoted by a lack of ground cover and/or excessive cultivation. Sustaining soil structure and building suitable levels of soil organic carbon within an intensive cropping regime continues to be problematic although progress has been made through the widespread adoption of conservation tillage and more recently the growing of cover crops. The Riverine Plains are interrupted in the north by the Terrick Ranges north of Mitiamo. This is a granitic intrusion that for the most part remains parkland under native vegetation. East of the ranges lies the Patho Plains, and the floodplain of the Bendigo Creek. In common with the plains further south and west the Patho Plains are prone to issues with soil structure and perhaps to an even greater extent given the fine-grained nature of the sediments consistent with lower catchment distal deposition.

Current and future challenges

The Northern Dryland Plains continues to face many challenges including:

- The increasing mechanisation of cropping reduces labour requirements and increases farm sizes (through amalgamation) which leads to a declining population and volunteer base. However, because of the proximity to off-farm employment in Bendigo and Echuca, there is less pressure for farm aggregation in the Northern Dryland Plains area (as compared to the Western Dryland Plains) and the main towns have not experienced population decline.
- Climate change will continue to place pressure on farmers , with drier conditions and more frequent extreme weather events predicted. Maintaining groundcover to reduce erosion and community-based planning and adaptation will be important.
- Intensification of land use (e.g. grazing to cropping) is a serious concern for threatened native grasslands and the critically endangered Plains-wanderer in this area.

Opportunities

Key opportunities for the Northern Dryland Plains include:

- Participatory approaches where farmers work together on common challenges and solutions, including to better understand the future impacts of climate change, explore future scenarios and consider possible long term adaptation options.
- Improved retention of native vegetation including threatened native grasslands.
- Solar farm developments in this area, further supported by the proposed Kerang Link transmission upgrade, present an opportunity to work with developers to contribute to local biodiversity and other RCS outcomes.

Priority directions and outcomes

Priority Directions and Outcomes are covered in more detail under each Theme. The following are particularly relevant to the Northern Dryland Plains:

- Continue to build partnerships with Traditional Owners towards self-determined participation and leadership in water and biodiversity planning and management.
- Deliver community-based participatory programs that build the capacity of land managers to improve land health.
- Work together to develop place-based climate change resources for land managers to inform adaptation.
- Build community awareness and capacity around the management of water resources and waterways, in the context of climate change.
- Improve the retention and restoration of native vegetation and habitat on private land through; community education and community-based programs that support stewardship and permanent protection, leveraging government and market-based incentives.
- Collaborate to increase awareness of legal requirements for the protection of native vegetation and habitat and improve compliance.

Outcomes (region-wide targets):

- Maintain an annual average percentage of no more than 20% exposed soils across the region, increasing area protected from wind and water erosion over the dry seasons, by 2027.

Priority directions relevant to the regional community generally include:

- Build capacity, networks and leadership to enable community led climate solutions for land, water and biodiversity management.
- Support, improve and expand the environmental volunteering sector, including Landcare, to enable adaptation to demographic shifts, to continue their important role in NRM.
- Enable, improve and promote opportunities for people to connect with nature, in both urban and rural settings, for wellbeing, to build awareness and appreciation, and inspire action.
- Support schools and young people to participate in programs that increase their knowledge and awareness of natural resource management.
- Continue to support integrated citizen science programs that engage community and provide useful targeted data to inform water, land, climate and biodiversity programs.

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North Central CMA

VICTORIA State Government

Irrigated Riverine

Introduction

The Irrigated Riverine area includes the traditional lands of the Dja Dja Wurrung people (southern parts), then along the Murray River from east to west; Yorta Yorta, Barapa Barapa, Wamba Wemba and Wadi Wadi peoples.

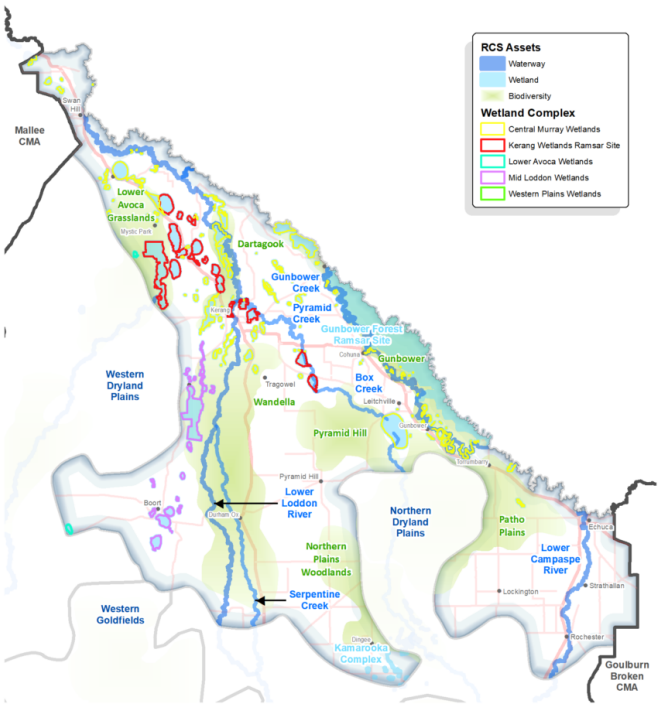
The area includes the floodplains of the Campaspe, Loddon and Avoca River catchments, encompassing a complex system of waterways and many wetlands. Development of irrigation infrastructure and flood levees have altered the natural connectivity between waterways in this landscape.

This is the northern fringe of the north central region and defined by the extent of irrigation infrastructure in the GMID area. Since the 1990's when irrigation use was at its peak, there have been significant changes leading to a reduction in irrigation and land use change, which is continuing today. Many farmers have or are transitioning to dryland agriculture or only irrigate opportunistically.

Echuca is a popular tourist destination and there are many other attractions along the Murray River valued by locals and visitors including; the Murray River Adventure Trail, wharf precincts, and Gunbower National Park and other reserves.

Despite being predominantly agricultural, the area has high environmental and cultural significance including internationally recognised Ramsar wetlands (Kerang Wetlands and Gunbower Forest) and is habitat for many migratory water birds and threatened species including; the iconic Murray cod, the freckled duck, growling grass frog, broad-shelled turtle and, Australasian bittern

When asked about their long-term vision during engagement for RCS renewal, respondents from this Local Area spoke about; habitat restoration, productive soils, sustainable farming, and healthy waterways.



A snapshot

Aspect	Description
Key RCS partners	Traditional Owners: Dja Dja Wurrung, Yorta Yorta, Barapa Barapa, Wamba Wemba and Wadi Wadi. DELWP, Parks Victoria, Trust for Nature and Agriculture Victoria. Local Governments: Campaspe, Loddon, Gannawarra and Swan Hill shires. Landcare Networks: Murray Mallee, Campaspe, Loddon Plains Water corporations: Goulburn-Murray Water (rural), Coliban Water (urban), Lower Murray Water (urban).
Socio-economic	Moderate socio-economic advantage overall. Around Swan Hill there is a higher percentage of the workforce employed in higher-skill service industries.
Bioregions	Victorian Riverina and Murray Fans
Native vegetation cover	Except for Gunbower National Park, native vegetation is generally associated with waterways or otherwise scattered across the landscape. The Land Cover Time Series data for the period 2015-19 showed that native vegetation of some type, covered only 26% of this area.
Rural residential or agricultural	Mostly agricultural except rural residential areas around Echuca and some clusters between Kerang and Swan Hill.
Agricultural land use	Many have or are transitioning to dryland agriculture or only irrigate opportunistically. The dairy and mixed and dryland farming industries are in transition whilst horticulture, specialist and emerging industries are expanding. The Land Cover Time Series data for the period 2015-19 showed that dryland cropping covered 46%, pasture (not native) covered 14% and horticulture / irrigated pastures and crops covered only 8% of this area.
Soil and land use overview	These lands comprise the northern extent of the Riverine Plains in the lower catchments of the Loddon and Campaspe valleys. They comprise clay-based alluvium with occasional sand seams. The red and grey sodic soils of the area are extensively irrigated, mainly in support of the dairy industry. As with the Dryland Plains subsoils are intrinsically sodic and need to be managed carefully to avoid issues with potential loss of soil structure. Most water for irrigation is sourced from the Murray River, however groundwater from deep leads (ancient, buried streams) is also used to supplement irrigation. Recent abstraction of saline groundwater from deeper aquifers for irrigation is of concern, given the negative impact it may have on soils already prone to structure decline.

Current and future challenges

Key challenges for the Irrigated Riverine area:

As most land in the region is privately owned, rural landholders play a critical role in managing our natural resources. Farming in this area has undergone significant change in recent years. The key drivers of change include climate change, drought, irrigation modernisation, changing water policy, water trade out of the region and shifting commodity prices and farm business advantage.

The net effect has been a significant reduction amount of irrigation in the region (approximately 50% since 1990s) and changes to the mix of irrigation enterprise types, irrigation businesses, surface and subsurface drainage requirements.

A considerable amount of water was permanently transferred out of the GMID to support the large scale almond developments in Victoria (mostly) but with the limitations of water security, the Barmah Choke restrictions and trade out of the Goulburn (lower Goulburn flow limits), this pattern of expansion is likely to slow.

Under climate change more frequent/extreme climatic conditions (floods, droughts, intense rainfall events) and less rain falling in cooler months is predicted:

- With increasing temperatures and more frequent dry conditions, there'll be less water available for all uses (irrigation, recreation, environment) and sharing benefits will be challenging.
- Increased heavy summer rainfall may cause drainage and storage issues for irrigators
- Community flood planning and preparation will be important.
- Farmers will need to continue to adapt and prepare for multiple scenarios under climate change.

Related threats to natural assets of the area include:

- Changes to more intensive land use, which have potentially adverse environmental impacts (e.g. loss of biodiversity, effluent run-off) and land in transition is sometimes not well managed for pest plants and animals.
- Potential for re-emergence of salinity from high watertables. Use of saline groundwater for irrigation in some areas is a concern as it could also have adverse impacts on soil structure.
- A hotter drier climate contributing to more frequent blue-green algae outbreaks which impact on aquatic ecosystems and recreational use.

Current Initiatives

The Victorian Government is supporting farmers efforts to increase the resilience and long-term productivity of irrigated agriculture in this area, through programs such as:

- DELWP's Sustainable Irrigation Program – helping irrigators use water wisely while protecting and improving the environment. This program supports development and implementation of the LCIR Land and Water Management Plan 2020-30 which has informed the RCS and is a key plan for this area.
- The GMW Efficiency Project, is building on the water savings gained through the now completed GMW Connections Project by rationalising and modernising off-farm irrigation delivery infrastructure.
- The Goulburn-Murray Resilience Strategy has been developed to support people and industries to continue to build resilience, so the region can thrive in the face of change

The Irrigated Riverine area includes significant waterways and wetlands and it will be important to continue the following initiatives to protect and enhance environmental values:

- The Living Murray program, funded by Basin States and coordinated by the MDBA, focuses on maintaining the health of six icon sites along the Murray River, including the Gunbower-Koondrook-Perricoota Forest site, and the Victorian part of this site is within this Local Area. The program involves, environmental watering, infrastructure delivery and a long-term ecological monitoring program to protect and enhance environmental and cultural values.
- Delivery of environmental water to support other significant wetlands of this area and ongoing monitoring of outcomes.
- Improvement of native fish habitat through programs like the Native Fish Recovery Plan.
- Targeted threatened species recovery programs, like the current Plains-wanderer program in this area.

Opportunities

Future opportunities for this area include:

- Participatory approaches where farmers work together on common challenges and solutions, including to better understand the future impacts of climate change, explore future scenarios and consider possible long term adaptation options.
- Leveraging the carbon market to support stewardship program.
- Enabling and supporting farmers to contribute to landscape scale environmental outcomes
- Solar farm developments in this area, further supported by the proposed Kerang Link transmission upgrade, present an opportunity to work with developers to contribute to local biodiversity and other RCS outcomes.
- Self determined participation of Traditional Owners, in planning and management of the many significant waterways of this area.

Priority directions and outcomes

Implementation of the following RCS sub plans and strategies will be important for the Irrigated Riverine area:

- LCIR Land and Water Management Plan 2020-30
- North Central Waterway Strategy 2014-2023
- North Central Floodplain Strategy 2018-2028

The following RCS priority directions and outcomes from the relevant theme pages, are of particular relevance to the Irrigated Riverine area:

Priority directions

Land theme:

- Deliver community-based participatory programs that build the capacity of land managers/holders, to improve land health.
- Design and pilot a holistic landholder stewardship program that measures improvements in land health, supports and recognises landholders efforts as improvements are made.
- Develop and maintain; up to date, geographically referenced land use information and consistent messaging to inform decision making around land use and system change.
- Work together to develop place-based climate change resources for landholders and managers, to inform adaptation.

Water theme:

- Continue to build partnerships with Traditional Owners towards self-determined participation and leadership in water planning and management.
- Continue to apply an integrated approach to the planning and delivery of water for the environment, undertaking complementary works and where possible using consumptive water, to achieve landscape scale outcomes.
- Continue to implement flagship waterway projects including the mid-Murray Native Fish Recovery project.
- Seek to continue socio-economic monitoring of environmental watering, to contribute to a more holistic understanding of outcomes.
- Build community awareness and capacity around the management of water resources and waterways, in the context of climate change.
- Within the floodplain, identify locations where natural flows could be restored across and retained within the landscape, to improve connectivity, to increase water bird habitat and for land health benefits, implementing pilot projects to trial and expand this practise.

Biodiversity theme:

- Continue to build partnerships with Traditional Owners towards self-determined participation and leadership in biodiversity planning and management.
- Improve the retention and restoration of native vegetation and habitat on private land through; community education and community-based programs that support stewardship and permanent protection, leveraging government and market-based incentives.
- Collaborate to increase awareness of legal requirements for the protection of native vegetation and habitat and improve compliance.

Outcomes

Land theme

- Improved management of irrigation and drainage systems, considering efficiency of water use and opportunities for ecological connectivity, by 2041.
- 600 rural landholders in the LCIR adopting technologies and systems to improve agricultural productivity, water use efficiency and ecological connectivity by 2027.

Water theme

- Improved floodplain connectivity for ecological function, considering social and economic risks to communities, by 2041.
- Improved stream connectivity by 240 km and improved instream habitat by 100 km by 2027
- Increase protection and improved management of 20,000 ha of priority RCS wetland assets, by 2027.
- Deliver on 95% the environmental watering actions at planned sites based on the annual Seasonal Water Plans by 2027.

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Western Dryland Plains

Introduction

The Western Dryland Plains includes the traditional lands of clans represented by the Barengi Gadjin Land Council (west of Avon River), Dja Dja Wurrung (south-east of Lake Buloke and Avon River) and Barapa Barapa (north-east of Lake Buloke) peoples.

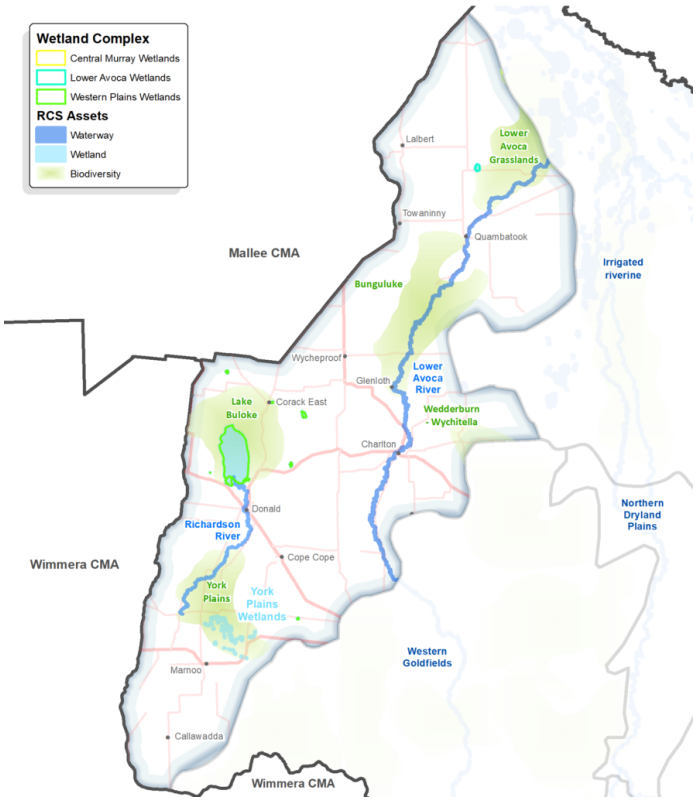
This is the westernmost part of the north central region, and the landscape is dominated by broadacre cereal cropping on large farms. Increased mechanisation of cropping enterprises, has led to fewer, larger farms and population decline in this area. A trend which has slowed, but is still ongoing.

Natural assets in this area include Lake Buloke, York Plains wetlands, the Bunguluke and Lower Avoca Grasslands. The Avon- Richardson Rivers and the lower Avoca River flow through this area.

There is a relatively low proportion of native vegetation in this landscape, and there are ongoing concerns regarding the illegal removal of native vegetation, particularly of threatened native grasslands.

This area has lower average rainfall compared with the south eastern parts of the region and waterways are vulnerable to the hotter, drier conditions predicted with climate change. The Wimmera Mallee Pipeline which replaced open channels, currently delivers environmental water to seven wetlands in this area, providing a much-needed refuge for wildlife. Waterways in this dry landscape are a precious resource, valued by community for: recreation, as green spaces which improve the livability of towns and for the environment. Through engagement for RCS renewal, we noted concerns regarding water quality in some areas, and some tensions between recreational and environmental uses.

In our changing climate, with reduced water availability overall, we anticipate sharing benefits will only become more challenging. It will be important to work together to raise awareness of water resource constraints and make the most of every drop. Integrated Water Management in urban areas will be important. Investigating opportunities to restore some natural flows to the Avon Plains wetlands and deliver environmental water to other wetlands have also been identified as priorities for this area.



A snapshot

Aspect	Description

Key partners	Traditional Owners: Barengi Gadjin Land Council, Dja Dja Wurrung and Barapa Barapa. DELWP, Parks Victoria, Trust for Nature and Agriculture Victoria. Local Government: Gannawarra, Buloke, Northern Grampians shires. Landcare Networks: Murray Mallee, Buloke Northern Grampians Water Corporations: Grampians Wimmera Mallee Water (rural and urban).
Socio-economic	Relatively high socio-economic advantage. Ageing population. Farm amalgamations continue to contribute to population decline.
Bioregion	Wimmera
Native vegetation cover	Relatively low proportion of native vegetation. The Land Cover Time Series data for the period 2015-19 showed that native vegetation of some type covered just 14% of this area.
Rural residential or agricultural	Predominantly agricultural. Moderate percentage rural residential in areas west of St Arnaud and south of Swan Hill.
Agricultural land use	Predominantly dryland cereal cropping. The Land Cover Time Series data for the period 2015-19 showed that dryland cropping covered 83% of this area.
Soils and land use overview	Better known as Mallee country, these lands were formed during the retreat of the Murray Sea some two million years ago They comprise the remnants of coastal dunes and marine sands re-worked through wind action. With average annual rainfall less than 400 mm these are arid lands that are prone to wind erosion especially where the fine grained sediments including sands are exposed. Conservation cropping, cover-cropping and reduced traffic are all important approaches to managing these lands.

Current and future challenges

The Western Dryland Plains continues to face many challenges including:

- Increasing mechanisation of cropping has reduced labour requirements and increased farm sizes (through aggregation) including corporate farms, driven by a history of continuing price pressures on producers.
- Farm aggregation leads to a declining population and volunteer base. Whilst the rate of decline has slowed and the largest towns of the area (Charlton and Donald) have stable populations, smaller towns are still experiencing population decline.
- Generally an ageing population, though farm aggregation and corporate farms generally attract younger farmers. Significant shifts in the farming demographic expected in the short-to medium term.
- Dry conditions exacerbate risk of wind erosion, maintaining groundcover important.
- The unregulated Avon Richardson and Avoca River systems and the Bunguluke priority biodiversity asset are vulnerable to drying under climate change, placing significant pressure on these ecosystems. Refer Bunguluke case study in the North Central Climate Change Adaptation and Mitigation Plan.
- Under climate change there are likely to be more floods, so community planning and preparation will be important.
- In this dry landscape, some tensions between uses of water are evident and under climate change sharing the benefits of this precious resource will be a challenge.
- There are ongoing concerns about illegal removal of native vegetation particularly threatened native grasslands.

Opportunities

Key opportunities for the Western Dryland Plains include:

- Participatory approaches where farmers work together on common challenges and solutions, including to better understand the future impacts of climate change, explore future scenarios and consider possible long term adaptation options.
- Improved engagement with corporate farms.
- Improved retention of native vegetation including threatened native grasslands.
- The Richardson River and Lake Buloke are priorities for the Barengi Gadjin Land Council.
- Solar farm developments in the north of this area, further supported by the proposed Kerang Link transmission upgrade, present an opportunity to work with developers to contribute to local biodiversity and other RCS outcomes.

Priority Directions and outcomes

The following priority directions are relevant to this Local Area only.

- Investigate environmental watering of other potential wetlands in the Wimmera Mallee pipeline area.
- Investigate opportunities to reconnect Avon Plains wetlands to increase natural flow conditions.

Other priority directions and outcomes of relevance for the Western Dryland Plains include:

Priority Directions:

- Deliver community-based participatory programs that build the capacity of land managers to improve land health.
- Work together to develop place-based climate change resources for landholders and managers, to inform adaptation.
- Build community awareness and capacity around the management of water resources and waterways, in the context of climate change.
- Improve the retention and restoration of native vegetation and habitat on private land through; community education and community-based programs that support stewardship and permanent protection, leveraging government and market-based incentives.
- Collaborate to increase awareness of legal requirements for the protection of native vegetation and habitat and improve compliance.

Outcomes (region-wide targets):

- Maintain an annual average percentage of no more than 20% exposed soils across the region, increasing area protected from wind and water erosion over the dry seasons, by 2027.

Priority directions relevant to the regional community generally, include:

- Build capacity, networks and leadership to enable community led climate solutions for land, water and biodiversity management.
- Support, improve and expand the environmental volunteering sector, including Landcare, to enable adaptation to demographic shifts, to continue their important role in NRM.
- Enable, improve and promote opportunities for people to connect with nature, in both urban and rural settings, for wellbeing, to build awareness and appreciation, and inspire action.
- Support schools and young people to participate in programs that increase their knowledge and awareness of natural resource management.
- Continue to support integrated citizen science programs that engage community and provide useful targeted data to inform water, land, climate and biodiversity programs.

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Western Goldfields

Introduction

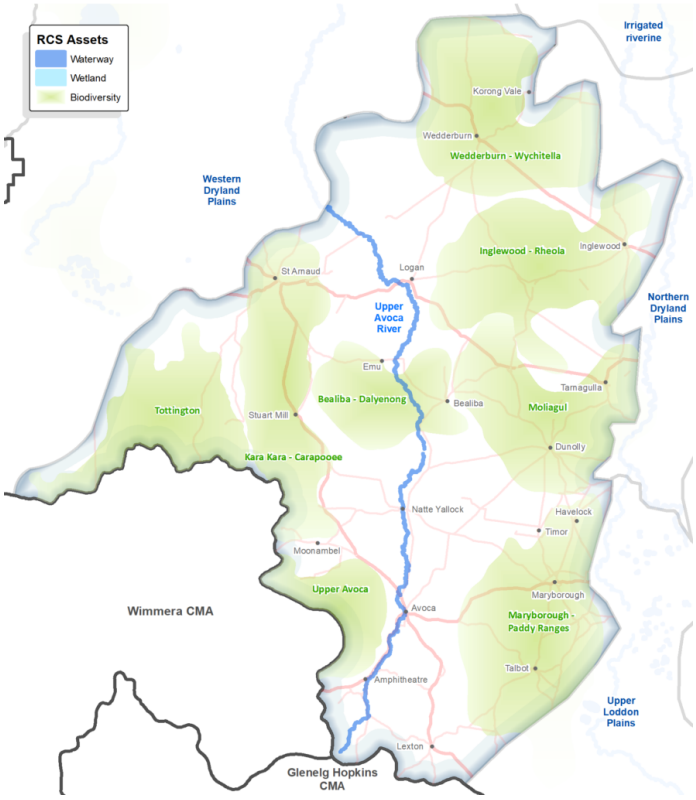
The Western Goldfields includes the traditional lands of clans represented by the Barengi Gadjin Land Council (west of St Arnaud and Kara Kara National Park) and Dja Dja Wurrung peoples.

The area spans the upper Loddon, Avoca and Avon Richardson catchments, which are vulnerable to dry conditions under climate change. The upper Loddon catchment in this area is within a declared special water supply catchment area.

Mostly within the Goldfields bioregion, this area includes Box Ironbark Forests and Woodlands, and has a relatively high proportion of remnant native vegetation, protected in conservation reserves including Kara Kara National Park and others that are jointly managed by Dja Dja Wurrung and Parks Victoria. While these forests and woodlands support many unique and rare species they are generally in poor condition as a result of previous logging, gold mining etc.

There is a high proportion of rural residential properties in the eastern half of the area between Talbot and Wedderburn. These smaller properties are a legacy of the gold mining era, but when the gold ran out, the blocks were too small to make a living from farming. Unlike the rural residential areas to the southeast, this area is not well connected to regional centres for employment.

Agricultural land use is predominantly dryland grazing, except for the plains around Natte Yallock where dryland cropping is common, and the Pyrenees wine region around Avoca. Erosion is an issue on the steeper slopes in the southern parts of this area.



Western Goldfields Local Area map, showing RCS priority assets

A snapshot

Aspect	Description
Key partners	Traditional Owners: Barengi Gadjin Land Council, Dja Dja Wurrung DELWP, Parks Victoria, Trust for Nature, Bush Heritage and Agriculture Victoria Local Government: Pyrenees, Central Goldfields, Northern Grampians and Loddon shires. Landcare Networks: Buloke Northern Grampians, Upper Loddon and Avoca, Loddon Plains. Water corporations: Goulburn Murray Water (rural), GMW (urban and rural), Coliban Water (urban), Central Highlands Water (urban).
Socio-economic	Area between Talbot and Wedderburn is the most extensive area of socio-economic disadvantage in Victoria (aligns with rural residential area).
Bioregion	Goldfields, Victorian Volcanic Plain
Native vegetation cover	Relatively high proportion of native vegetation. The Land Cover Time Series data for the period 2015-19 showed that native vegetation of some type, covered 58% of this area.
Rural residential or agricultural	>80% of rural households between Talbot and Wedderburn are estimated to be rural residential (non-farmers), less so in the western part around St Arnaud – as interpreted from of ABS data.
Agricultural land use	Dryland cropping on the Natte Yallock Plains and dryland grazing elsewhere. The Land Cover Time Series data for the period 2015-19 showed that dryland cropping covered 28% of this area, and pasture (not native) covered 12% of this area.
Soil and land use overview	This is an area of considerable contrast. On the one hand there are the rich soils formed on the alluvial floodplains in the upper Avoca River valley exemplified by the Natte Yallock basin. On the other is the rugged hill country comprising repeated high and low relief granitic lands and their attendant steep metamorphic ridges typical of the land between St Arnaud and Inglewood. The former is highly productive and well-suited to productive cropping and grazing industries. Fertility in the latter is most often restricted to the alluvium and colluvium found in the valleys and foot-slopes of the granitic lands. Both units are prone to severe water erosion and gully erosion is commonplace in some areas. The intensely weathered low relief granitic terrain is highly prone to both tunnel and gully erosion, cf. Murphy's Creek granite.

Current and future challenges

The Western Goldfields faces challenges including:

- The most extensive area of social disadvantage in rural Victoria which is associated with rural residential properties between Talbot and Wedderburn.
- Rural residential landholders don't always have the knowledge, skills or resources to manage their land in a way that supports environmental values. Capacity building and support are needed.
- Many smaller properties and landholders, means that engaging can be time consuming and this can be a barrier for some programs.
- Vacant rural residential blocks within Central Goldfields and Pyrenees shires (planning legacy issue), can't be developed or aggregated for farming because they are marginal agricultural land.
- Increasing temperatures and more heatwaves predicted under climate change, could have adverse impacts on community wellbeing.
- Climate change will affect flows in the unregulated Upper Avoca River – putting significant pressure on the aquatic ecosystems.
- Box Ironbark Forests and Woodlands of this area are in poor condition, vulnerable to further drying under climate change, and require active restoration to halt further decline (refer Biodiversity theme page for more on this).

- Erosion is already an issue in the steeper terrain (Lexton and Amphitheatre areas), which may be exacerbated due to increasing incidence/intensity of floods/drought under climate change
- Increasing threat of wildfire due to hotter drier conditions predicted with climate change.

Opportunities

Key opportunities for the Western Goldfields include:

- This area has large areas of remnant vegetation, with non-government organizations (Trust for Nature and Bush Heritage) invested and community-based NRM groups established – presenting opportunities for restoration and improved connectivity.
- Where there is marginal agricultural land and vacant rural residential blocks that can't be developed, there may be opportunities to manage for conservation.
- Includes some areas with relatively high carbon sequestration potential as compared to the rest of the region which presents opportunities to leverage the carbon market for revegetation projects.

Priority directions

Plans of relevance to this area include:

The Dja Dja Wurrung RSA involved transfer of six of the region's parks to Aboriginal Title – four of which are within the Western Goldfields (listed below). In collaboration with partner organisations the Dhelkunya Dja Land Management Board developed a Joint Management Plan (JMP) for:

- Kara Kara National Park
- Kooyoora State Park
- Paddys Ranges State Park
- Wehla Nature Conservation Reserve

Bush Heritage Australia and Trust for Nature jointly developed the Kara Kara-Wedderburn Landscape Plan 2016–20 (soon to be renewed) to enable the local community to work together to reverse the decline of threatened species and to reconnect natural ecosystems of the Kara Kara-Wedderburn region. This Plan encompasses six priority biodiversity assets in this area.

Priority directions of relevance to the Western Goldfields include:

- Continue to build partnerships with Traditional Owners towards self-determined participation and leadership in water and biodiversity planning and management.
- Deliver community-based participatory programs that build the capacity of land managers/holders, to improve land health.
- Continue to increase the skills and capacity of partners, service providers and landholders to improve soil health.
- Work together to develop place-based climate change resources for landholders and managers, to inform adaptation.
- Build community awareness and capacity around the management of water resources and waterways, in the context of climate change.
- Deliver targeted programs to build the capacity of rural residential landholders, to protect and enhance soils, water and biodiversity values.
- Maintain and improve the quality of our remnant native vegetation and habitats, considering climate resilience, with a focus on RCS priority biodiversity assets.
- Build climate-wise connectivity by; promoting a broad strategic approach, enabling and encouraging local investment and action, leveraging incentives and market opportunities.

- Collaborate to maximise the potential of carbon market investment, to contribute to land, water and biodiversity outcomes.
- Undertake pilot projects across the region, to develop effective methods for holistic Box- Ironbark Forest and Woodland restoration, to inform and broaden this practice and increase investment in their management.

Priority directions relevant to the regional community generally, include:

- Build capacity, networks and leadership to enable community led climate solutions for land, water and biodiversity management.
- Support, improve and expand the environmental volunteering sector, including Landcare, to enable adaptation to demographic shifts, to continue their important role in NRM.
- Enable, improve and promote opportunities for people to connect with nature, in both urban and rural settings, for wellbeing, to build awareness and appreciation, and inspire action.
- Support schools and young people to participate in programs that increase their knowledge and awareness of natural resource management.
- Continue to support integrated citizen science programs that engage community and provide useful targeted data to inform water, land, climate and biodiversity programs.

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North Central CMA

VICTORIA State Government

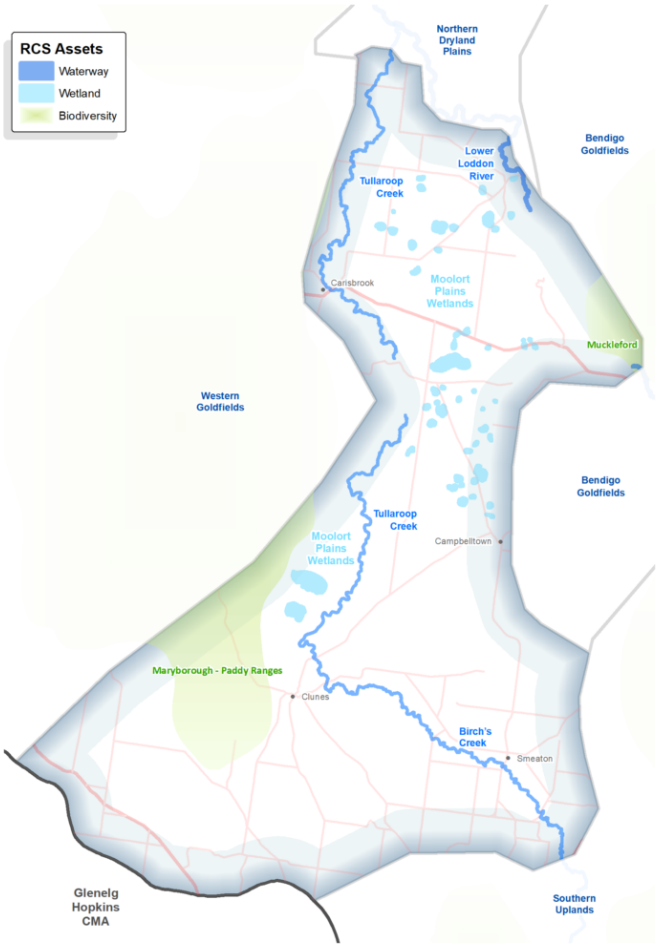
Upper Loddon Plains

Introduction

The Upper Loddon Plains is within the traditional lands of the Dja Dja Wurrung people.

The area is located on the upper Loddon, within a declared special water supply catchment area, and includes Cairn Curran and Tullaroop Reservoirs that provide irrigation supplies to downstream users. This area has fertile volcanic soils and has been extensively cleared for agriculture. Agricultural land use is a mix of dryland cropping and grazing, with some irrigated areas along the Loddon and in potato growing areas around Smeaton (groundwater). The township of Clunes is located centre of the area and has been earmarked for some growth.

Key environmental assets within this area include the Loddon River, Birch's Creek and the Moolort Plains wetlands. A significant program was completed several years ago to protect many of the highly valued Moolort Plains wetlands.



A snapshot

Aspect	Description
Key partners	Traditional Owners: Dja Dja Wurrung. DELWP, Parks Victoria, Trust for Nature and Agriculture Victoria. Local Government: City of Ballarat, Hepburn, Central Goldfields shires. Landcare Networks: Upper Loddon and Avoca. Water Corporations: GMW (rural) Central Highlands Water (urban).
Socio-economic	Moderate socio-economic disadvantage.

Bioregion	Victorian Volcanic Plain
Native vegetation cover	Relatively low proportion of native vegetation. The Land Cover Time Series data for the period 2015-19 showed that native vegetation of some type, covered only 22% of this area.
Rural residential or agricultural	Mix of agricultural and rural residential.
Agricultural land use	Mix of dryland cropping and grazing, with some irrigated areas along the Loddon River and around Smeaton (groundwater) The Land Cover Time Series data for the period 2015-19 showed that pasture (not native) covered covered 42% and dryland cropping covered 28% of this area.
Soils and land use overview	This land is in stark contrast to the adjacent Southern Uplands to the east and the Western Goldfields to the immediate west. It owes its origin to extensive volcanism that occurred repeatedly throughout the Quaternary period (the past 2.6 million years). The terrain largely comprises a basaltic plain frequently interrupted by extinct volcanoes. Volcanic eruptions have delivered a legacy of basalt flows and scoria cones. Ancient valleys have been infilled with basalt flows forming extensive plains. Well-drained soils formed on the basalt are deep, red, very fertile, and well-suited to horticultural pursuits. This is good potato growing country. Where the soils are less well drained heavier grey soils prevail that afford greater challenges where the goal is to build and maintain soil structure. Fresh groundwater found within the basalt flows is a big asset in the basaltic lands of the Upper Loddon Plains particularly where the water supports the potato industry. Rainfall is quite high relative to the rest of the region. Maintenance of soil structure and pest plant issues are the main farming challenges.

Current and future challenges

The Upper Loddon Plains has and continues to face many challenges including:

- Climate change is affecting flows in the unregulated Upper Loddon River placing significant pressure on the aquatic ecosystems and the water resource outlook in irrigation reservoirs (Cairn Curran and Tullaroop).
- Water quality continues to be a concern, with significant and frequent Blue Green algae outbreaks in Tullaroop Reservoir.
- There is a low proportion of remnant native vegetation in this landscape.

Opportunities

Key opportunities for the Upper Loddon Plains include:

- This area has been identified as having high carbon potential, carbon markets could be leveraged to fund large-scale revegetation projects and improve habitat connectivity across this landscape.
- Implementation of Integrated Catchment Management projects to protect and enhance this catchment, improve climate resilience, water quality, etc.

Priority directions

Priority Directions are covered in more detail under each theme – those of relevance to the Upper Loddon Plains include:

Priority directions

- Continue to build partnerships with Traditional Owners towards self-determined participation and leadership in water and biodiversity planning and management.
- Deliver community-based participatory programs that build the capacity of land managers/holders, to improve land health.
- Continue to support the collaborative development and implementation of Integrated Catchment Management projects.
- Work together to develop place-based climate change resources for landholders and managers, to inform adaptation.
- Build community awareness and capacity around the management of water resources and waterways, in the context of climate change.
- Collaborate to maximise the potential of carbon market investment, to contribute to land, water and biodiversity outcomes.
- Build climate-wise connectivity by; promoting a broad strategic approach, enabling and encouraging local investment and action, leveraging incentives and market opportunities.

Priority directions relevant to the regional community generally, include:

- Build capacity, networks and leadership to enable community led climate solutions for land, water and biodiversity management.
- Support, improve and expand the environmental volunteering sector, including Landcare, to enable adaptation to demographic shifts, to continue their important role in NRM.
- Enable, improve and promote opportunities for people to connect with nature, in both urban and rural settings, for wellbeing, to build awareness and appreciation, and inspire action.
- Support schools and young people to participate in programs that increase their knowledge and awareness of natural resource management.
- Continue to support integrated citizen science programs that engage community and provide useful targeted data to inform water, land, climate and biodiversity programs.

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North Central CMA

VICTORIA State Government