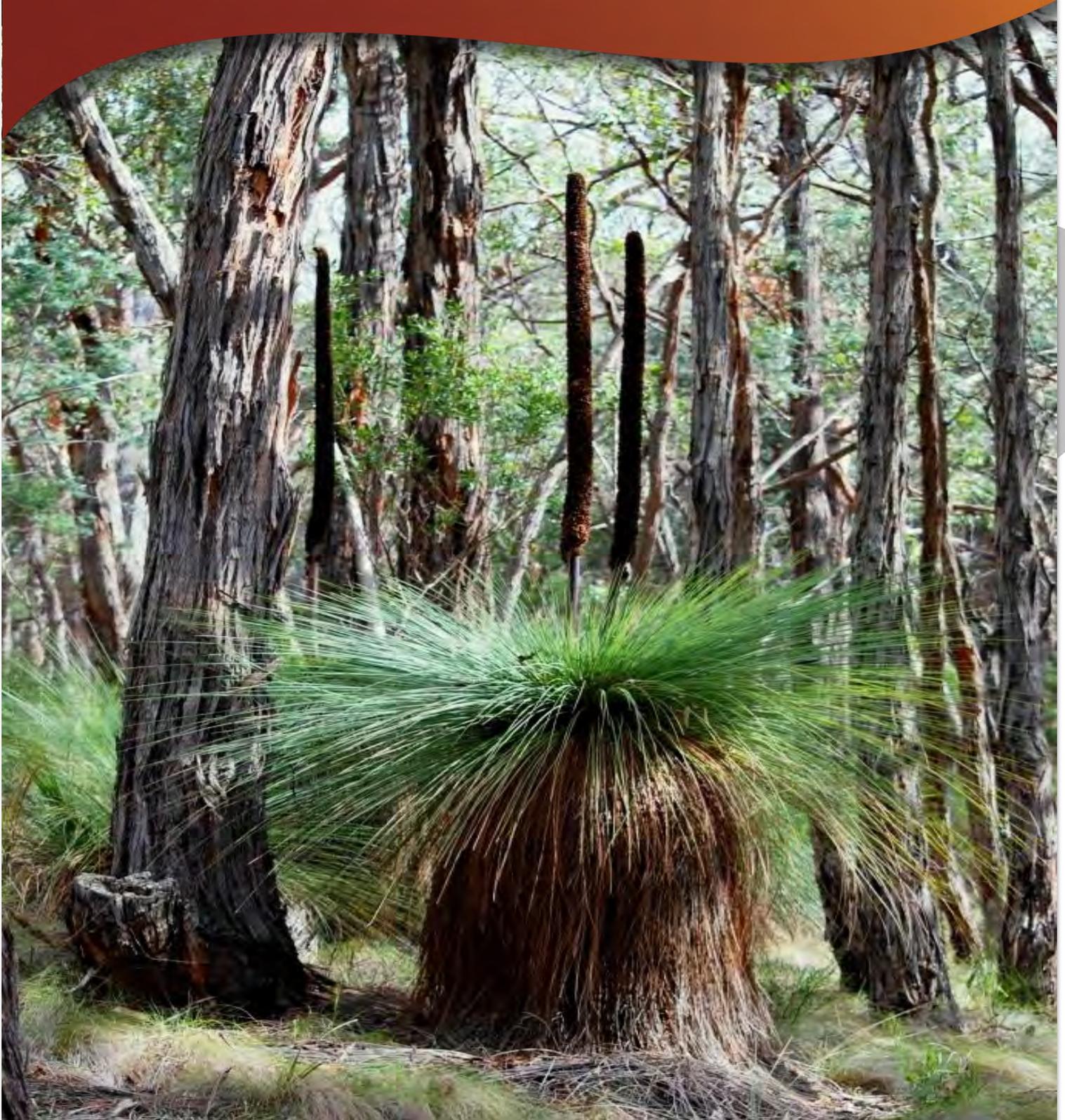




**Macedon
Ranges**
Shire Council

Biodiversity Strategy 2018

Adopted at the 19 December 2018 Ordinary Council Meeting



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Executive Summary

The biodiversity found in the Macedon Ranges Shire is unique and highly significant. The varying topography, range of altitudes and localised climatic patterns results in many diverse ecosystems hosting a wide range of native plants and animals. The shire is very fortunate to have extensive native vegetation and rich biodiversity present on public and private land.

Despite the impact of large scale clearance for farming and settlements, the Macedon Ranges Shire retains approximately 37% of its native vegetation in relatively good condition, much of it on private land. This remaining biodiversity directly supports the local economy including tourism and agriculture.

However our native plants and animals are under threat from habitat loss and fragmentation, changing land uses and a warming climate.

There is good news though. A Common Dunnart was found in the Mount William Range in 2018, the first recorded sighting in the shire in 30 years. Around the same time, two Phascogales were recorded for the first time near Chintin. This is concrete evidence that these animals persist in our environment. Their ongoing survival relies on protecting existing intact vegetation and improving landscape connectivity.

Whilst public parks and reserves are key habitat areas that require increased protection and on-going management, it is the places in-between that will provide opportunities in the future to connect and allow species to disperse across the landscape.

Macedon Ranges Shire plays a significant role in the broader landscape in providing connectivity and climate refugia due to its cooler and wetter climate in higher elevations. It is also an important place for our local community and visitors to connect with nature.

The Macedon Ranges Biodiversity Strategy establishes a shared vision between Council, the community and other stakeholders for the protection and enhancement of biodiversity values across the shire.

OUR VISION

We have flourishing and connected communities of native plants and animals, plentiful and accessible natural places, and healthy and vibrant waterways across the Macedon Ranges.

To achieve this vision, the Macedon Ranges Biodiversity Strategy has the following objectives:

- Objective 1: Protect existing biodiversity and native vegetation.
- Objective 2: Improve existing biodiversity and native vegetation across public and private land.
- Objective 3: Increase the extent of native vegetation cover for connectivity.
- Objective 4: Improve Council and the community's understanding and connection to biodiversity.
- Objective 5: Enhance the capacity of community groups to undertake conservation activities.
- Objective 6: Develop a shire-wide biodiversity monitoring program that assesses the health of the broader ecosystem.

Extinct in the Macedon Ranges Shire?

The following species have not been recorded in the Macedon Ranges Shire for over 50 years:

- Southern Brown Bandicoot,
- Leadbeater's Possum,
- Eastern Quoll.

The Greater Glider, while known to currently occur in the Wombat Forest, has not been recorded on Mount Macedon since 1987 despite intensive survey effort to locate them.

With increasing pressures on our natural environment, action needs to be taken to ensure the remaining native animals do not face the same plight.

Where we will focus our efforts

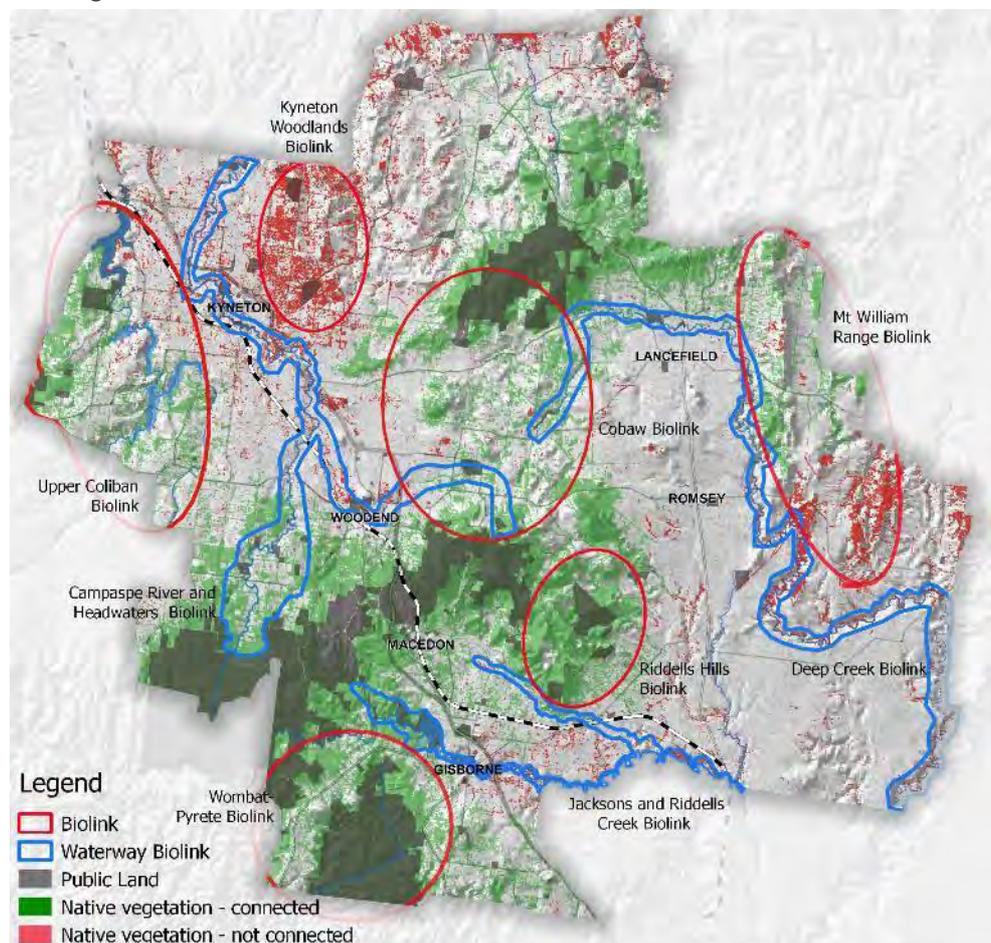
Under each objective, the strategy identifies a number of policy and planning initiatives, as well as priorities for community engagement, on ground action and monitoring change. The proposed actions are extensive and broad reaching. Major initiatives include:

- Investigate rezoning identified areas with significant native vegetation currently in the Farming Zone to ensure their protection.
- Restructure and expand existing Vegetation Protection Overlays (VPOs) and introduce new VPOs for biolinks and specific threatened species and vegetation communities.
- Increase resources for ensuring compliance with native vegetation regulations.
- Develop a new private land conservation and landholder education program including improved land management plan templates and additional resources for one-on-one advice and support to rural land owners.
- Improve protection and management of critically endangered grassy woodlands.
- Continue roadside and bushland reserve management and review bushland reserve zoning.
- Implement a landscape connectivity plan that includes six priority biolink areas and three waterway links that contain significant habitat patches, support numerous threatened species, and have a high level of community interest in their enhancement.
- Expand Council's popular environment events to a targeted community education program that will engage different sectors of the community.
- Increase engagement with Traditional Owner groups
- Continue support and funding for Community Environment Groups including the delivery of land management planning and education events.
- Implement a biodiversity monitoring program that incorporates citizen science and utilises a focal species approach to assess landscape health. Focus species and ecological communities include: Brush-tailed Phascogale, Greater Glider, Powerful Owl, woodland birds, significant tree species such as Silver Banksia and Snow Gum and the critically endangered Grassy Woodlands and Plains Grassy Woodland vegetation communities.

Actions consider climate change in all conservation efforts with a focus on building natural ecosystem resilience and connectivity.

Most importantly, the success of this strategy depends on strong partnerships and collaboration between landholders, community, Traditional Owners, agencies and Council.

It is only through combining our efforts that we will achieve our vision.



1. Introduction

1.1 Acknowledgement of Traditional Owners

Macedon Ranges Shire Council acknowledges the Traditional Owners of this land, the Wurundjeri, Dja Dja Wurrung and Taungurung, as the caretakers and custodians of the lands now situated within the Macedon Ranges Shire. We intend on engaging them throughout the implementation of this strategy as a genuine acknowledgement of their place in the management of their Countries.

The Wurundjeri, Dja Dja Wurrung and Taungurung continue to practice their culture and customs and experience a close spiritual, physical, social, historical and economic relationship with the land and waters that make up their country.

Council recognises that current land managers have much to learn from the elders and land managers of the Wurundjeri, Dja Dja Wurrung and Taungurung peoples. They have lived in the country now known as the Macedon Ranges Shire for thousands of years before the arrival of Europeans in a way that was sustainable and which preserved the wildlife, habitat, land and waterways of this country.

The highest benchmark of biodiversity for this area was reached when the Traditional Owners were managing this Country before the arrival of Europeans and land managers changed. Their contributions to this plan and their involvement in the implementation is valued and respected.

1.2 What is biodiversity?

Biodiversity encompasses all components of the living world: the number and variety of plants, animals and other living things, including fungi and micro-organisms across our land, rivers and wetlands. It includes the genetic information, the habitats and ecosystems within which they live, and their connections with each other (DELWP, 2017).

In the Macedon Ranges, the varying topography, range of altitudes and localised climatic patterns result in rich and unique biodiversity values in the form of many ecosystems, hosting a wide range of native plants and animals. The shire is very fortunate to have extensive native vegetation and rich biodiversity present on public and private land.



Biodiversity can be considered at multiple scales:

- Ecosystem diversity*
- Species diversity*
- Genetic diversity*

Figure 1: “The Macedon Ranges is an area with high value terrestrial habitat’, Loddon Mallee South Regional Growth Plan.

1.3 Why protect biodiversity?

Biodiversity conservation is an essential component of responsible environmental and natural resource management. Not only does biodiversity have its own value, it is fundamental to our quality of life. Biodiversity supports the health and wellbeing of our environment, economy, culture and community. There is a long and compelling list of benefits provided by biodiversity, as represented in Figure 2.



Figure 2: The benefits of biodiversity. Created by Sacred Heart College work experience student, Ollie Sullivan,

1.4 Purpose and Scope of Strategy

This Strategy considers the natural values of biodiversity in the Macedon Ranges Shire, the threats to these values, and actions Council can take to protect and enhance biodiversity (both directly and by working with others).

The purpose of the Biodiversity Strategy is to establish a shared vision between Council, community, Traditional Owners and other stakeholders for the protection and enhancement of biodiversity values across the shire. The strategy identifies a number of policy and planning initiatives as well as priorities for community engagement, on ground action and monitoring change.

Council's role in biodiversity conservation can be:

- Direct – implementing on-ground action on Council-managed land (such as bushland reserves and roadsides)
- Regulatory – developing and implementing planning policy and local laws
- Partnering – facilitating projects, providing community education and supporting groups
- Advocacy – encouraging collaboration and coordination with other stakeholders and public land managers

Council's roles and responsibilities are further outlined in section 4.2.

2. Methodology

The Macedon Ranges is fortunate to have a strong history of conservation activity. The important protected areas and remaining habitat we have today are a legacy to the commitment of many individuals, community groups, and agencies in the past. A thorough review of previous strategies and reports alongside meetings with many key individuals helped to establish an approach to the development of the Biodiversity Strategy.

Development of the Strategy involved four stages as outlined in the following diagram.



2.1 Landscape Connectivity and VPO Analysis

Mapping and desktop analysis undertaken by ecological consultants, Abzeco, helped inform the planning controls and connectivity components of the strategy. More detailed methodology for these analyses is provided in Abzeco, 2018.

Biodiversity asset identification: The shire's biodiversity values were mapped and five flagship species (Greater Glider, Brush-tail Phascogale, Brown Treecreeper, Powerful Owl, Grassy Woodlands) were investigated to highlight the biodiversity assets of the shire and ensure we are responding to their needs.

Connectivity modelling and mapping: Utilising the CSIRO Functional Connectivity Model (Doerr *et al* 2014) as a guide, natural features in the landscape that facilitate movement of wildlife and the recruitment and spread of native flora were identified. This model suggests that at least 10ha of habitat is needed for a good complement of woodland species. These patches should be less than 1 km from each other to allow dispersal with stepping stones or scattered trees every 100m. Using the latest vegetation extent mapping from DELWP as a base, areas across the landscape that are, or are not meeting these minimum standards were identified. Recommendations for areas requiring enhancement were provided. The impact of major roads and rail and more restrictive rules that apply to specific species were also applied (10ha/1.1km/100m for the Brown Treecreeper, 20ha/200m/50m for the Greater Glider, and 50ha/500m/20m for the Phascogale) to test these recommendations.

Vegetation Protection Overlays (VPOs) review: A review of the current planning scheme zones and VPOs using the most up to date conservation mapping for the shire was undertaken. This utilised DELWP's new vegetation extent layers, recent aerial photos, recent vegetation mapping projects, and Council's historic and recent roadside assessments data. Abzeco identified areas that should be investigated for inclusion into new VPOs and areas where the existing VPOs could be investigated for removal or review.

2.2 Community and Stakeholder Consultation

Preliminary community and stakeholder consultation occurred between January and April 2018 to seek input into the draft Strategy. Multiple techniques were used to gather community and agency input. These are summarised in Table 1. Full details of the themes raised during this consultation period are provided in the supporting document: *Biodiversity Strategy – Community Consultation – Summary of Key Themes*.

Table 1: Preliminary Community Consultation undertaken for development of Biodiversity Strategy

Consultation technique	Explanation	Number of responses
Community Mapping Survey	An on-line mapping survey using POZI Pro was used to identify the community's priority assets for biodiversity conservation. Participants were asked to describe why they are important and what actions were required. Participants could also 'like' or comment on sites already entered. The survey also gathered feedback on significant landscapes for the Landscape Assessment Study (5 Feb - 12 March). Results shown in Figure 3.	60 users identified 200 sites.
Drop-In Sessions	Three sessions were held in Lancefield (21 Feb), Gisborne (12 Feb) and Kyneton (15 Feb).	26 attendees
Community Environment Group Survey	Surveys were sent to all 30 local Landcare and Friends groups to help us understand their priorities for on-ground action, education, monitoring and Council support (Feb-March)	16 responses
Nature Quiz	Community members identified what they love about nature in the Macedon Ranges – at the Sustainability Festival (3 March), Farm Field Day (18 March), via displays at all local library's (26 Feb – 27 March), Alice Miller School (22 Feb) and Kyneton Youth Group (20 March).	119 responses
Independent Submissions	Community members were invited to send in submissions.	11 submissions
Stakeholder Meetings	Meetings with Biolinks Alliance (6 Feb), Upper Deep Creek Landcare Network (7 Feb), Jackson Creek Landcare Network (13 Feb), FEHMR (12 Feb), Upper Campaspe Landcare Network (27 March), Agribusiness Forum (5 Feb), Health and Well-being Committee (14 March), Youth Council (28 March), and agency stakeholders (22 March).	9 meetings
Community Biodiversity Forum	A community forum (1 May) to develop a vision statement and help prioritise the many actions raised through community consultation. Actions were assessed by community members based on their impact and feasibility.	40 participants

Outcomes of the consultation

Community members and stakeholders recognise and appreciate the important role of biodiversity and the natural environment in the Macedon Ranges. There is a solid appreciation of the good work that has been done across the shire to date. For example, through Landcare projects, Melbourne Water's Stream Frontage Management Program, North Central CMAs Kyneton Woodlands and Campaspe River programs and Council's annual roadside weed control program. The strong community and collaboration that exists across organisations was also acknowledged.

Community consultation highlighted some important key themes;

1. Increase focus on private land conservation and landholder education.
2. Improve protection of critically endangered grasslands.
3. Review of councils land management plan and increased compliance for native vegetation retention.
4. Increase resources for bushland reserve management and a review of bushland reserve zoning.
5. Complete and implement roadside management plan.
6. Continue support for community environment groups.
7. Continue and grow the community engagement program targeting specific groups (eg. youth, urban residents, families).



Figure 3: Over 200 sites across the shire were identified as important for protecting biodiversity and landscapes via the on-line mapper and Landcare surveys. This includes 98 sites (green) where existing biodiversity may need to be better protected or managed, 35 sites (yellow) that could connect or buffer existing native vegetation, and 69 sites (blue) sites that are valuable as special landscape features or views. In addition, 271 comments or 'likes' were added to sites already entered.

2.3 Developing the Monitoring Program

The aim of the monitoring component of the strategy is to enable baseline data to be determined, measure the impacts of management actions and track changes in biodiversity across the shire into the future.

Council engaged ecologists Dr Rodney Van Der Ree (Melbourne University) and Chris Jones (Arthur Rylah Institute) to collaborate with council in the development of the goals and objectives of the strategy. The ecologists then made recommendations for the on-going monitoring program using measurable environmental indicators to allow council to assess success against the strategy and broader landscape changes.

2.4 Review of the Draft Strategy

The draft Biodiversity Strategy was open for public comment from 20 September to 21 October 2018. Thirty-two submissions were received: twelve from individuals, twelve from community groups and eight from organisations.

Promotion of draft strategy and stakeholder engagement

The draft strategy was widely promoted in the local media, Council's environment e-news and via social media. Emails were sent to, and meetings were held with, agency stakeholders, community environment groups and people involved in the initial consultation phase of the strategy. Stalls were held at the Lancefield and Woodend Farmers Markets which were well attended with 114 visitors finding out more about the Strategy and other useful environmental information.

All Traditional Owner groups were consulted before finalisation of the Strategy. A Taungurung representative attended the stakeholder briefing and sent a response via email. Two meetings were held with Wurundjeri who also provided their response to the Localised Planning Statement for further information. Dja Dja Wurrung provided a detailed submission and review of the draft strategy.

Supported initiatives

In general, all except one of the submissions were positive and supportive of the direction and approaches proposed in the Draft Strategy. Specific initiatives that received very positive responses include:

- Proposed changes to the Vegetation Protection Overlays (VPOs).
- Rezoning of bushland reserves to Public Conservation and Resource Zone (PCRZ).
- Investigation into rezoning of Farming Zone areas where there is significant native vegetation.
- Private land conservation program and, in particular, engagement of a Private Land Conservation Officer to work directly with private land owners.
- Increased compliance to ensure native vegetation retention and land management plan implementation.
- Changing to a default dog on-lead approach and implementation of a cat curfew.
- The proposed landscape connectivity plan and identified biolinks.
- Increased engagement with Traditional Owners.
- Requiring the transfer of waterway corridors and associated buffer areas to public ownership and management as a part of new subdivisions.
- Commitment to see Barrm Birrm protected as a conservation reserve.
- Community connecting to nature initiatives and targeted education program.
- Landscape scale monitoring program.

Issues raised and addressed

There were several issues and recommendations raised by submitters. These include better engagement of Traditional Owners, showing the links between threats and actions, enhancing the pest plants and animals section, improving protection for grassy woodlands, enabling cross-council implementation, communicating with new landholders, and supporting citizen science. These issues and concerns were addressed in the completion of the strategy.

3. Vision and Objectives

3.1 Vision, Goals and Objectives

This strategy is based on basic landscape restoration principles, whereby the starting point for conservation is to protect and maintain existing vegetation and habitat for fauna. Next the focus is on improving and connecting these important patches. Finally, a commitment to community education and monitoring for change is essential to achieve these aims. Table 2 outlines the strategy structure.

Vision					
We have flourishing and connected communities of native plants and animals, plentiful and accessible natural places, and healthy and vibrant waterways across the Macedon Ranges.					
Goals	Improved Condition		Increased Extent	Engaged Community	
	To protect and improve the quality and diversity of native vegetation, fauna habitat and fauna populations.		To increase the area of native vegetation cover for connectivity.	To continue to motivate, support and partner with Traditional Owners and the local community to improve biodiversity in the local area.	
Objectives	Protect existing biodiversity and native vegetation	Improve existing biodiversity and native vegetation across public and private land	Extend and connect native vegetation and fauna habitat	Improve Council and the community's understanding and connection to biodiversity	Enhance the capacity of community groups to undertake conservation activities
Management Actions - Themes	Planning provisions Planning compliance Domestic animal management Permanent protection on private land Threatened communities and species	Weeds and pest animals Bushland reserves Roadside management Private land conservation Urban biodiversity	Climate change responses Landscape connectivity plan	Awareness raising and education activities	Support for community environment groups
Implementation approach	Working in partnership with local environment groups, Traditional Owners, relevant agencies, land owners and residents.				
Performance indicators	Monitoring Program – Monitoring for Landscape Change				

Table 2 Macedon Ranges Shire Biodiversity Strategy Structure

In addition, the Biodiversity Strategy also guides Council's Weed and Pest Animal Strategy, Roadside Management Plan and the individual Environmental Management Plans for Bushland Reserves.

3.2 Strategy Principles

This strategy is based on the following guiding principles:

Protect existing natural habitats to best conserve biodiversity.

Use multiple sources of knowledge (science-based, Traditional Owner, community), planning and monitoring to inform conservation actions.

Operate at the landscape scale across all land tenures.

Work closely with community and other stakeholders - recognising the critical link between ecological, cultural and spiritual systems.

Be agile and responsive - allow the strategy to develop, adapt and evolve.

Consider climate change in all conservation efforts with a focus on building natural ecosystem resilience and connectivity.

Acknowledge and respect the culture, values, innovations, practices and knowledge of Traditional Owners and Aboriginal Victorians.

Base decision making on the precautionary principle; whereby preventative measures should be taken in the face of scientific uncertainty



4. Background

4.1 Policy and Legislative Context

National Policy and Legislation

Environment Protection and Biodiversity Conservation Act 1999 (EPBC Act)

The *Commonwealth Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) identifies matters of national environmental significance, including nationally threatened species and ecological communities, migratory species, wetlands protected under the Ramsar Convention and world heritage areas. The EPBC Act is triggered by when a proposed activity will have a significant impact on a 'matter of national environmental significance'. In the Macedon Ranges, we have two vegetation communities and 18 species that are currently listed under the EBPC Act (listed in Table 3).

Critically Endangered	
Seasonal Herbaceous Wetlands (Freshwater) of the Temperate Lowland Plains	EVC 647 Plains Sedgy Wetland
Grassy Eucalypt Woodland of the Victorian Volcanic Plains	EVC 55 Plains Grassy Woodland.
<i>Synemon plana</i>	Golden Sun Moth
Endangered	
<i>Ballantinia antipoda</i>	Southern Shepherd's Purse
<i>Lepidium hyssopifolium s.s.</i>	Basalt Peppercross
<i>Dianella amoena</i>	Matted Flax-lily
<i>Botaurus poiciloptilus</i>	Australasian Bittern
<i>Lathamus discolor</i>	Swift Parrot
<i>Gymnobelideus leadbeateri</i>	Leadbeater's Possum (last recorded 1995)
<i>Bandicoot Isoodon obesulus obesulus</i>	Southern Brown Bandicoot (last recorded 1968)
Vulnerable	
<i>Glycine latrobeana</i>	Clover Glycine
<i>Eucalyptus aggregata</i>	Black Gum
<i>Xerochrysum palustre</i>	Swamp Everlasting
<i>Senecio psilocarpus</i>	Swamp Fireweed
<i>Amphibromus nervosus</i>	Common Swamp Wallaby-grass
<i>Thesium austral</i>	Austral Toad-flax
<i>Petauroides volans</i>	Greater Glider
<i>Nannoperca obscura</i>	Yarra Pygmy Perch
<i>Litoria raniformis</i>	Growling Grass Frog
Poorly Known	
<i>Cardamine tenuifolia</i>	Slender Bitter-cress
<i>Grevillea rosmarinifolia</i>	Rosemary Grevillea

Table 3: EPBC Listed vegetation communities and flora and fauna species found in the Macedon Ranges.

Biodiversity Conservation Strategy 2010-30

The Federal Governments Biodiversity Conservation Strategy has a key aim that Australia's Biodiversity is healthy, resilient to threats and is valued. It includes the following objectives:

- Engaging all Australian in biodiversity conservation
- Building ecosystem resilience in a changing climate
- Getting measurable results

State Policy and Legislation

Victorian Planning and Environment Act 1987

The *Planning and Environment Act 1987* sets out the objectives for land use planning in Victoria and the legislative framework for achieving these objectives. The Act sets out to “provide for the protection of natural and man-made resources and the maintenance of ecological processes and genetic diversity”. The Act requires municipalities to prepare and administer local planning schemes that can include targeted policies and provisions related to native vegetation removal and protection of the natural environment. The Act also sets out processes for enforcing planning schemes and planning permits. Relevant clauses include:

- Clause 12.01-15 (Protection of biodiversity)
- Clause 12.01-25 (Native vegetation management)

State planning policies and regulations apply to native vegetation clearance in the shire. Local planning policies and controls also apply to the protection of species, sites, and areas with high biodiversity value. These are discussed in more detail in Section 7.1.

Distinctive Areas and the Macedon Ranges Statement of Planning Policy (2018)

In August 2018, the Macedon Ranges Shire was declared a distinctive area and landscape under Part 3AAB – Distinctive areas and landscapes, Section 46AO of the *Planning and Environment Act 1987*.

The Macedon Ranges Statement of Planning Policy provides a framework to ensure the outstanding landscapes, layers of settlement history, impressive landforms, and diverse natural environment of the Macedon Ranges are protected and preserved. Implementation of this Biodiversity Strategy helps to meet Objective 2 of the Statement: *To ensure the significant biodiversity, ecological and environmental values of the declared area are conserved and enhanced.*

Flora and Fauna Guarantee Act (1988)

The *Flora and Fauna Guarantee Act 1988* (FFG Act) is the key legislation in Victoria for protection of biodiversity and is currently under review by the Victorian Government. It provides statutory protection for species and communities of threatened flora and fauna, and lists potentially threatening processes, both requiring ministerial approval. The FFG Act also requires Action Statements to be prepared to guide the protection of threatened species or communities, and to address threatening processes. It is noted that the FFG Act was under review at the time of preparing this strategy.

Table 4 shows species that are listed under the FFG Act as endangered or critically endangered are known to, or are likely to, occur within the shire. A full list of all listed species is provided in Appendix 2.

Endangered flora species	Endangered fauna species	Endangered Communities
Sutton Grange Greenhood (2011)	Spot-tailed Quoll (1992)	Western Basalt Plains Woodland Community
Hairy Leaf Trigger Plant (2014)	Leadbeaters Possum (1995)	
Large Flower Crane’s Bill (2010)	Greater Glider (2018)	
Purple Diuris	Australasian Bittern (1975)	
Matted Flax-lily (2016)	Barking Owl (2007)	
Black Gum (2015)	Masked Owl (1985)	
Basalt Peppercross (2005)	Blue-billed Duck (2007)	
Hairy Anchor Plant	Freckled Duck (2006)	
	Swift Parrot (2008)	
	Eastern Great Egret (2000)	
	Intermediate Egret (1975)	
	Little Egret (2018)	
	White-bellied Sea Eagle (2015)	
	Growling Grass Frog (2017)	
	Brown Toadlet (2018)	
	Golden Sun Moth (2011)	

Table 4: FFG Listed endangered flora and fauna species found in the Macedon Ranges. Most recent fauna sightings recorded in the VBA shown in brackets.

Protecting Victoria's Environment – Biodiversity 2037

Victoria's biodiversity strategy, Protecting Victoria's Environment - Biodiversity 2037, was released in April 2016. Required under the FFG Act, the plan states that a healthy natural environment provides vital life-sustaining services for humans and underpins many of the productive activities that generate value for Victorians. It lists 22 priorities to work towards two key goals:

- Goal 1: To encourage more Victorians to value nature.
- Goal 2: To ensure that Victoria's natural environment is healthy.

The strategy outlines the strong link between a healthy environment and a healthy community. It also dedicates an entire chapter to working with Traditional Owners and Aboriginal Victorians.

Catchment and Land Protection Act (1994)

The *Catchment and Land Protection Act 1994* (CaLP Act) sets out a framework for managing noxious weeds and pest animal matters to prevent degradation to catchments. The Act is applicable across all public and privately managed land throughout Victoria. The Act provides a hierarchy by which invasive species can be ranked based on their potential to degrade landscapes, both agricultural and natural, and specifies management responsibilities for land managers.

Under the Act, all landowners are required to take all reasonable steps to conserve soil, protect water resources, eradicate regionally prohibited weeds and pest animals and avoid contributing to land degradation which causes or may cause damage to the land of another land owner.

Importantly, in 2013 amendments were made to the CaLP Act to introduce Council's obligation to manage declared noxious weeds and established pest animals on Council managed roadsides.

The CaLP Act also established the Catchment Management Authorities and regional catchment strategies.

Traditional Owner Settlement Act 2010 and Aboriginal Heritage Act 2006

These Acts sets out legislative obligations to Traditional Land Owner groups that are paramount in our responsibilities in managing Victoria's resources. The Aboriginal Cultural Heritage Act 2006 limits control or management activities in areas of cultural heritage sensitivity. This is particularly relevant in the case of undertaking control measures which significantly disturb the soil, for example, the ripping of rabbit warrens to a depth greater than 60 centimeters.

The Aboriginal Heritage Act recognises the Dja Dja Wurrung, Taungurung, and Wurundjeri as Registered Aboriginal Parties for land that encompasses the Macedon Ranges Shire.

Regional Policy

Dhelkunya Dja (Healing Country) - Dja Dja Wurrung Country Plan

Dja Dja Wurrung's Country Plan reaffirms their aspirations and describes the future of the Traditional Owners of Dja Dja Wurrung Country. It recognises the importance of Dja Dja Wurrung cultural heritage – significant places and landscapes, stories and language, customs and practices and responsibilities for looking after Country. It sets a vision their lands and waters to be in good condition and actively managed to protect values and to promote the laws, culture and rights of all Dja Dja Wurrung People.

Taungurung Buk Dadbagi - Taungurung Country Plan

A key purpose of the Taungurung Country Plan is to educate and guide those making decisions about Taungurung Country, Culture and People, about their vision, aspirations, and key priorities for action. Aspiration four: *Taungurung knowledge is gathered, shared and protected* and Aspiration five: *Guardians of our Country are active and respected* will guides the Biodiversity Strategy implementation.

Wurundjeri Council Response to Shire of Macedon Ranges Localised Planning Statement

To the Wurundjeri people, the landscapes that are now within the boundary of the Macedon Ranges Shire are part of a single, holistic, cultural and spiritual landscape. The whole of the landscape is of cultural value. Wurundjeri people have a deep understanding and knowledge of Country and that connection should be respected and valued. The Wurundjeri community aspire to get back into Country and to examine landscape, geology and ecology.

Wurundjeri Council would like to work with Council to reinstate traditional practices where possible, including reintroduction of food, fibre and medicine plants, and traditional burning practices. They seek ongoing participation in the management of endangered grassland vegetation, consultation with native vegetation offsets, and involvement in species mapping projects and the development of culturally based on-going educational programs.

North Central Regional Catchment Strategy

The Regional Catchment Strategy sets out priorities for the future management of natural resources across the North Central Catchment Management Authority (NCCMA) region. It provides a roadmap for the future investment in the region's natural assets for the next six years to achieve cost effective outcomes for government and community. The strategy aims to strengthen people's skills, motivation, partnerships and resourcing so that they can continue their work in natural resource management. It sets outcomes for biodiversity across the region, which includes the northern part of the shire.

The NCCMA Regional Catchment Strategy 2013-2019 identified two priority biodiversity assets in the Macedon Ranges: CVU1 Daylesford/Wombat, and CVU3 Kyneton Woodlands.

Port Phillip and Westernport Regional Catchment Strategy

The Port Phillip and Westernport Catchment Management Authority (PPWCMA) Regional Catchment Strategy aims to strengthen the health and resilience of the region's natural environment. The strategy sets targets that aim to:

- Maintain areas of permanent native vegetation that will make important contributions to the health and resilience of natural systems.
- Achieve no net loss in the quantity/quality of other native vegetation across the landscape
- Maintain the diversity of native animal species that still inhabit the region; and
- Stabilise or improve the health of populations of selected 'indicator species' predicted to reflect the health of other animals sharing their landscapes and threats.

The strategy also identifies potential nature links as opportunities for creating large-scale vegetation corridors and improving landscape connectivity. For the Macedon Ranges, it highlights nature links along the Deep Creek and from the Cobaw Range to Mount Macedon and to Mount Disappointment.

Melbourne Water Healthy Waterways Strategy 2018-2028

For the Maribryngong catchment, the strategy has an aim to "establish 360 km and maintain 283 km of continuous vegetated buffers (using EVC benchmarks and to at least a level 3 vegetation quality) along at least 80% of priority. In addition, increase vegetation cover in existing and planned urban areas by 10 km to support social values."

Relevant performance objectives from the strategy include;

- Establish a continuous riparian vegetated buffer and maintain existing vegetation along priority reaches (using EVC benchmarks to at least a level 3 vegetation quality) which include, but are not limited to Jacksons Creek, Riddells Creek, Deep Creek, Emu Creek and tributaries.
- Maintain or achieve high and very high quality vegetation (level 4 and 5 vegetation quality is currently 28 km) along Deep Creek and tributaries through effective monitoring and management of threats including protection of endangered EVCs. Fill data gaps in mapping of high quality vegetation.
- Identifies the townships of Gisborne, Romsey, Riddells Creek, Lancefield, Macedon and Mount Macedon as stormwater priority towns.

Local Policy

Alongside the planning scheme, there are two key documents developed by the Macedon Ranges Shire Council that support the development of the Biodiversity Strategy – the Council Plan and the 2016 Environment Strategy. There are also a number of supporting documents including the Roadside Management Plan (in draft), Weeds and Pest Animals Strategy 2014 and thirteen Environmental Management Plans for council managed reserves.

Macedon Ranges Planning Scheme

The Macedon Ranges Planning Scheme sets out planning policies and permit requirements for development and works in the shire, including for vegetation removal. The Scheme includes state-wide provisions as well as local planning policies and overlays aimed at protecting locally significant environmental assets.

The key planning provisions and overlays relevant to biodiversity conservation are:

- Clause 35.06 (Rural Conservation Zone) - Schedule 1 refers to the Living Forests policy area, and Schedule 2 the Cobaw Biolink.
- Clause 21.03 (Rural Framework Plan) – strategic direction for rural areas, including the Living Forests and Cobaw Biolink areas.
- Clause 21.05 (Environment and Landscape Values) – intends to conserve the biodiversity values of the Shire by protecting, enhancing, managing and restoring indigenous vegetation and fauna habitat. Also acknowledges the Living Forests and Cobaw Biolink policies.
- Clause 42.01 (Environmental Significance Overlay) – state-wide provision aimed at protecting specific environmental assets which is applied to local areas requiring greater oversight of buildings, works and vegetation management that may impact local assets. The Macedon Ranges Shire supports 4 separate ESO schedules.
- Clause 42.02 (Vegetation Protection Overlay) – state-wide provision aimed at protecting vegetation which is applied locally to areas requiring greater oversight of vegetation management. The Macedon Ranges Shire supports 9 separate VPO schedules.
- Clause 52.17 (Native Vegetation) – state-wide provision relating to native vegetation removal which applies across Victoria.

Full details can be viewed at <http://planningschemes.dpcd.vic.gov.au/schemes/macedonranges>

Council Plan 2017-2027

Theme 2. Protect the natural environment

“We will protect our natural environment through proactive environmental planning, advocacy and policy to address climate change, support biodiversity, enhance water catchment quality, and manage waste as a resource.”

Relevant to the development of a Biodiversity Strategy, Council has committed to:

- implement best practice conservation techniques to protect biodiversity and manage threats,
- increase awareness and action for responsible and sustainable land management practices across the shire, aiming to improve the health of land and waterways,
- implement Council’s Environmental Management Plans across bushland reserves,
- prioritise local species in new public plantings wherever possible,
- preserve the landscape quality of vistas, and
- enhance and protect agricultural lands.

Environment Strategy 2016

In 2016 Macedon Ranges Shire released the Environment Strategy. It has an overarching vision;

“A place where Council leads by example and works with the community to maximise improved environmental outcomes in all aspects of life”.

Three strategic directions are set in the strategy:

- Demonstrate leadership by working in a coordinated manner to continuously improve Council’s environmental performance
- Partner with the community to deliver a shared vision for a healthier environment
- Work with management agencies to extend and adapt environment programs to the local level.

The development of the biodiversity strategy meets Action B1 of Council’s 2016 Environment Strategy; “Develop a biodiversity strategy for the Macedon Ranges Shire”. According to the Environment Strategy, the Biodiversity Strategy was to include:

- Developing a biodiversity monitoring program for the Shire, to enable baseline data to be determined, impacts of management to be measured, and changes in biodiversity status to be tracked. The monitoring program may include environmental indicators as appropriate.
- Preparing a landscape connectivity plan.
- Reviewing the application and effectiveness of local planning policies and controls for biodiversity in the Macedon Ranges Planning Scheme, including the potential to introduce additional provisions to address gaps in biodiversity protection.
- Developing a program for the protection of threatened vegetation communities.
- Identifying means to minimise threats to biodiversity.
- Analysing the likely impact of climate change on the Shire’s ecosystems and identifying adaptive management responses.

Weed and Pest Animal Strategy 2014–2024

The purpose of the Weed and Pest Animal Strategy is to:

- Identify a set of Council priorities for weed and pest animal control actions
- Establish a weed and pest animal management framework which takes an asset based protection approach and is effective and cost efficient
- Build the capacity of the local community in invasive weed and pest animal management
- Facilitate integrated management of public and private land
- Establish a robust monitoring, evaluation, review and improvement program

Key action areas in this strategy include:

- Implement an annual weed program according to a prioritisation criteria which takes into account the classification of weeds under the CaLP Act, the efficient use of Council resources and the location and conservation value of sites.
- Develop and implement a vehicle hygiene program with Council staff and contractors.
- Implement an annual pest animal program according to a prioritisation criteria which takes into account the location and conservation value of the site and efficient use of Council resources.
- Support for community led weed and pest animal control initiatives with in kind and financial contributions as appropriate.
- Utilise a range of mechanisms such as dedicated information sessions, existing festivals and events, Council publications and the local media to enhance community knowledge about weeds and pest animals.
- Implement an annual monitoring and site evaluation program to assess the impact of Council’s actions and assist with prioritising sites for future treatment.

Roadside Management Plan – under development

The purpose of the Roadside Management Plan is to establish a set of standards and guidelines that ensure works within Council's roadsides protect any existing biodiversity values while meeting Council's fire management and road safety obligations.

The Plan also seeks to establish a communications and engagement program aimed at raising awareness amongst the community about the role of roadsides and their conservation values, permitted activities and relevant regulations.

Hanging Rock Strategic Plan 2018

Hanging Rock is an iconic and highly significant feature of the Macedon Ranges landscape. It has a multitude of meanings and values to people and groups who interact with the Rock and its precinct. The Strategic Plan provides a vision for the future uses of the Rock and its immediate surrounds for the next 50 years. It also:

- Provides objectives, strategies and actions to support implementation of the Vision
- Provides a management plan to inform a governance model
- Identifies action priorities and time frames



4.2 Roles and Responsibilities

Macedon Ranges Shire Council

Council has demonstrated commitment to improving environmental management through the gradual growth of the environmental program. Today, Council has a strong Environment Team that includes a Bushland Reserve Officer, Environmental Planner, Engagement and Programs Officer, and Natural Resource Officer.

While the Environment Team will oversee the implementation of this strategy, several departments across the shire will have a role in its delivery. Table 5 outlines these roles and responsibilities.

Table 5: Macedon Ranges Shire departmental roles and responsibilities.

Department/Unit	Roles and responsibilities
Environment	Environment Strategy – adopted June 2016 Annual events program and environment e-news (1500 subscribers) Weed and Pest Animal Strategy 2014-2024 Management of Bushland Reserves – implementation of EMPs and SCRAPs Roadside Vegetation Management Plan (in progress) Monitoring program – nest boxes, spotlighting Environmental advice to other departments to inform planning permit decisions, strategic planning and infrastructure works. Support to Landcare and friends groups Support for individual landholders with Trust for Nature covenants Conservation status of roadside reserves
Strategic Planning	Landscape Assessment Study Farm Zone Review Localised Planning Scheme - DELWP Planning Scheme Review Township plans, strategies and rezonings
Statutory Planning	Implementation of the planning scheme Compliance with native vegetation controls
Local Laws	Domestic Animals Management Plan
Community Development	Engagement of youth, early childhood, senior citizens Arts and Culture Strategy Elevate – Youth Strategy
Parks and Recreation	Open Space Strategy Botanical gardens – Kyneton, Malmsbury, Gisborne
Operations	Management of Roadsides
Community Safety	Fire prevention works, including fuel reduction slashing and other works on roadsides and other Council-managed public land Municipal Fire Prevention Plan
Recreation and Sport	Hanging Rock Strategic Plan and Environmental Management Plan Sport and Active Recreation Strategy Walking and Cycling plan
Economic Development	Agribusiness Plan Visitor Economy Strategy (draft)

Stakeholders

Council shares responsibility for the protection and enhancement of the environment with other State Government departments, agencies, water authorities, Traditional Owner groups and community environment groups. Cooperation and partnerships with all these organisations is essential to make the most of limited resources and to take action when the need is identified. A full list of stakeholders and their roles is provided in Appendix 1 and simplified in Table 6. Figure 4 shows the administrative boundaries for the Catchment Management and Water Authorities and the Department of Environment, Land, Water and Planning (DELWP).

Table 6: Stakeholder groups involved in biodiversity conservation across the shire

Stakeholder group	Stakeholder name	Role
Catchment Management Authorities	North Central Catchment Management Authority Port Philip and Westernport Catchment Management Authority Goulburn Broken Catchment Management Authority	Manage landscape-scale project for biodiversity protection and waterway enhancement on public and private land.
Government departments and agencies	Department of Environment, Land, Water and Planning (DELWP) Department of Economic Development, Jobs, Transport and Resources Parks Victoria VicRoads VicTrack Country Fire Authority (CFA) Trust for Nature	Manage public land such as Mount Macedon Regional Park, Cobaw and Wombat State Forests, VicRoads managed roadsides, VicTrack managed rail reserves.
Water authorities	Melbourne Water Coliban Water Western Water	Carry out works for improving the environmental values and health of water ecosystems. Manage land at sites of water supply and treatment.
Traditional Owners	Taungurung Clans Aboriginal Corporation Wurundjeri Tribe Land and Compensation Cultural Heritage Council Dja Dja Wurrung Aboriginal Corporation.	Owners, caretakers and custodians of land – engaged in planning and implementation.
Community and not-for-profit groups	Landcare Groups Friends Groups Committees of Management Victorian Farmers Federation This Farm Needs a Farmer	Community engagement and local action on-ground.

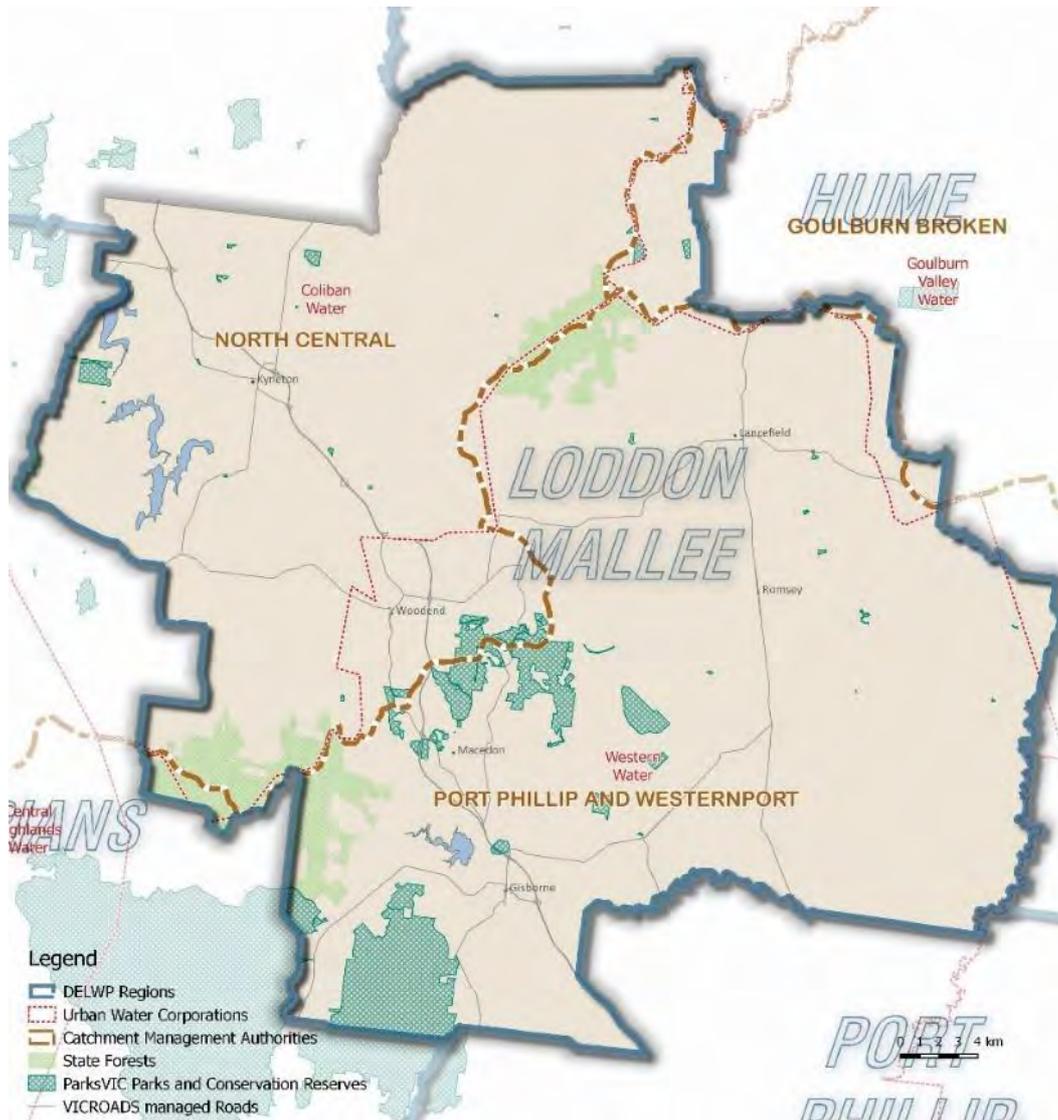


Figure 4: Administrative boundaries across Macedon Ranges Shire

Traditional Owners

Macedon Ranges Shire is under Indigenous custodianship of the Dja Dja Wurrung, Taungurung and Wurundjeri peoples who have lived in the area for more than 25,000 years. Shown in Figure 5, Wurundjeri country covers the land in and around the Yarra River and Maribyrnong watershed, this includes the Macedon Ranges and the towns of Gisborne, Heskett, Lancefield, Macedon, Riddells Creek and Romsey. Dja Dja Wurrung country covers a large area of central Victoria extending west of from the Campaspe River, and includes the towns of Kyneton, Woodend and Malmsbury. Taungurung country covers the area from the east side of the Campaspe River through to Rushworth and Euroa in the north, and extending east to Mount Buller.

Historically, the wealth of biodiversity found within the Macedon Ranges provided important resources for Indigenous people. Murnong, Bulbine Lilies and other tuber plants were commonly found through the plains and local foothills, with traditional burning and digging practices directing how the landscape looked. Black Wattles provided wood for tools and sap for glue. Many medicinal plants were located in and around wetlands, which were also a rich hunting and fishing areas.

The names of local townships connect to the Aboriginal story and Traditional Ownership; Barringo, Darraweit Guim, Jim Jim, Konagaderra Creek, Monegetta, Willimigongon Creek and Wurundjeri Creek. All of these creeks are recognised as sites of important cultural significance, as seen in Figure 5. The Mount William stone axe quarry is a special Aboriginal place located northeast of Lancefield. Known as *Wil-im-ee Moor-ring*, meaning 'axe place' in the Woiwurrung language, the greenstone quarry was an important source of raw material for the manufacture of greenstone ground-edge axes, which were traded over a wide area of south-east Australia.

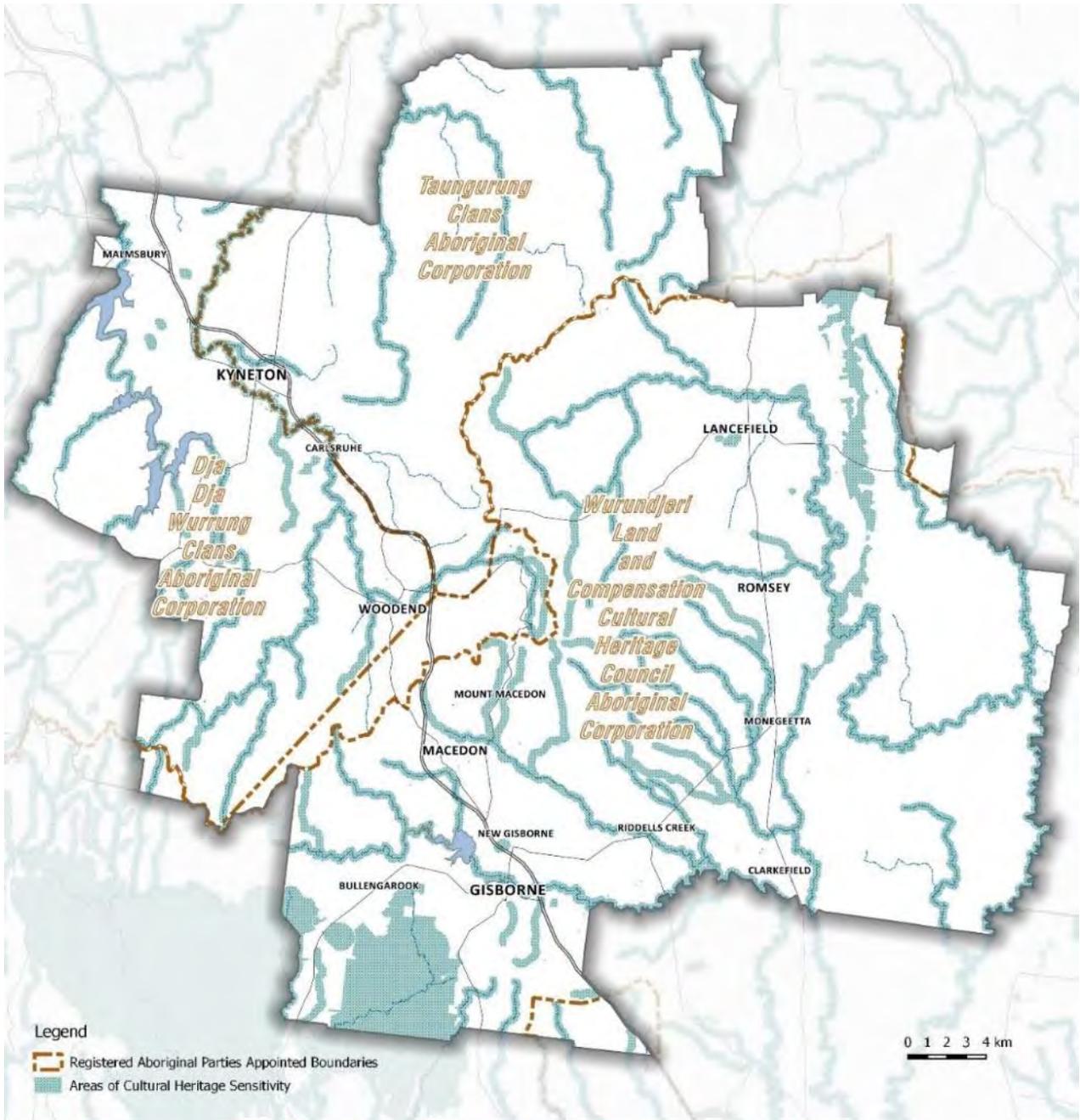


Figure 5: Areas of Cultural Heritage Sensitivity and Registered Aboriginal Parties

Community Environment Groups

The Macedon Ranges community highly values the Shire's natural environment and we are fortunate to have a strong network of active groups. There are some 37 community groups operating throughout the shire, shown in Figure 6: Location of Community Environment Groups in the Shire. They are supported by three overarching networks. More details on these groups is provided in Appendix 1.

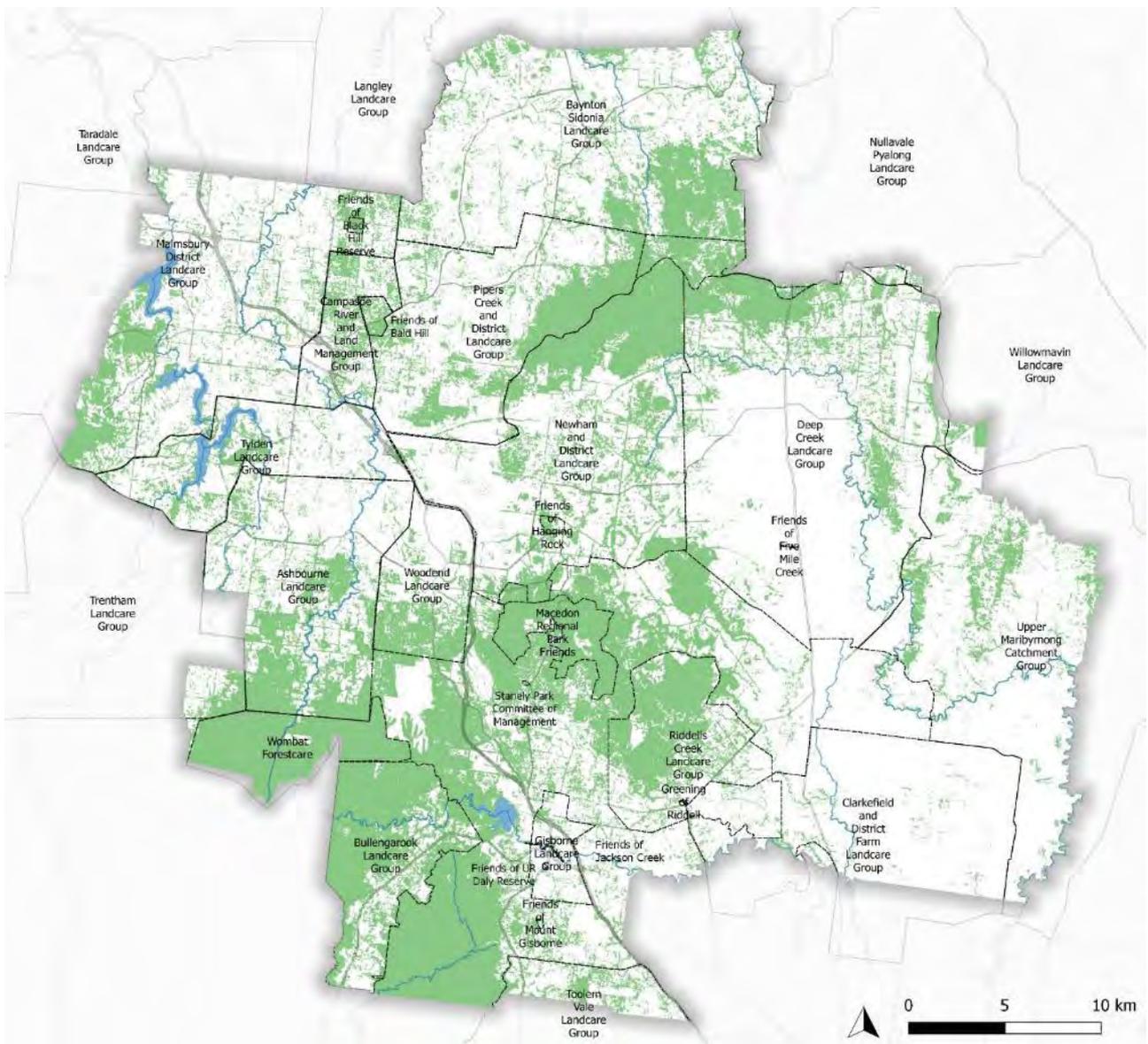
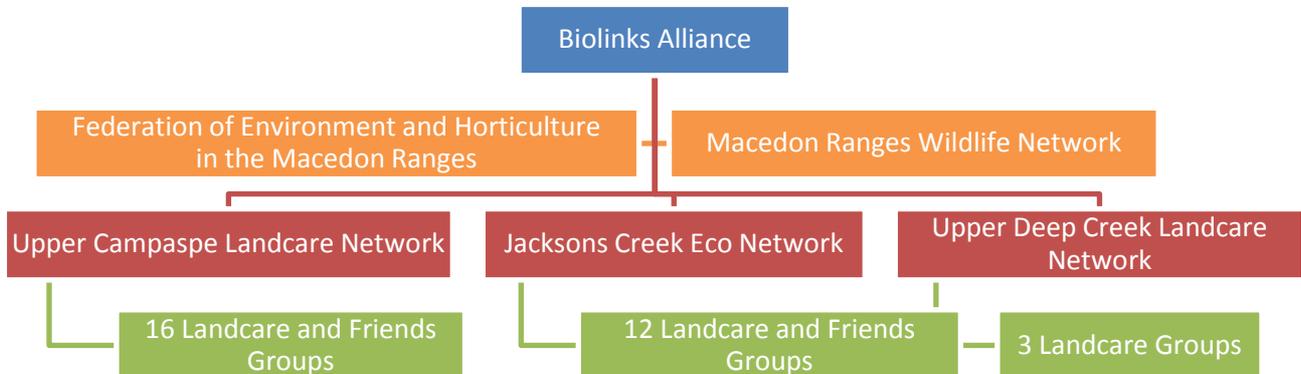


Figure 6: Location of Community Environment Groups in the Shire

4.3 Current Biodiversity Programs in the Shire

Upper Coliban Integrated Catchment Plan

The Upper Coliban Integrated Catchment Management Plan aims to enable provision of a safe and secure water supply for communities in central and northern Victoria along with enhanced river, biodiversity and catchment health outcomes. Importantly, for biodiversity enhancement, by 2037, this project aims to see a continuous vegetated riparian corridor of at least an average of 20m wide each side of Kangaroo Creek, the Upper Coliban River and the Little Coliban Rivers where land availability permits and for the Malmsbury, Lauriston and Upper Coliban Reservoirs. Other nominated unnamed waterways will be revegetated to 10m each side. Implementation of the plan is underway with a unique collaboration between the North Central CMA, Coliban Water, Macedon Ranges and Hepburn Shires, Upper Campaspe Landcare Network (UCLN), and other stakeholders.

Mount Macedon Pines Regeneration Project

Some of the pine plantation areas on Mount Macedon are over 30 years old. In 2018, HPV Pine Plantations commenced harvesting sections of these plantations in the Macedon Regional Park. Once harvesting has been completed, the areas may transition to Parks Victoria to revegetate with native species. This project will see 119 ha of land revegetated and added to the Macedon Regional Park. It is expected to be complete by 2021.

Deepening Connections – enhancing habitat of the Deep Creek

Adopting a landscape scale approach across the escarpments of the Deep Creek and surrounding plains south of Darraweit Guim, this DELWP funded Biodiversity Response Planning project aims to support a range of threatened species and communities including Platypus, Growling Grass Frog, and Plains Grassy Woodland. It will engage private landowners in the target area covering 6,700 hectares to control rabbits and priority woody weeds. The project aims to build landowner capacity, ability and stewardship of their land through the development of land management plans, education and facilitation. The project is led by the Port Phillip and Westernport CMA in partnership with Melbourne Water, Macedon Ranges Shire Council, Wurrundjeri Council, and the Upper Deep Creek Landcare Network. It is expected to be complete by 2021.

VEAC Central West Investigation

Commenced in 2016, the Victorian Environment Assessment Council (VEAC) Investigation into the public land that includes Wombat Forest, Macedon Regional Park and Cobaw Forest. The investigation will identify the environmental, social, economic and cultural values of public land in the study area and make recommendations for the balanced use and appropriate management of this land. The outcomes of the investigation could be changes to the reservation status or management of existing public reserves. Council provided an initial submission to the Council and has a representative on the Community Reference Group. A Proposals Paper is scheduled to be released in 2018 with a final report submitted to the Minister for Environment and Climate Change by March 2019.

Spotlight on Species

Spotlight on Species is a joint project between Upper Campaspe Landcare Network and the Macedon Shire Council to conduct citizen science surveys for three threatened species (Greater Glider, Powerful Owl and Phascogale) in the Macedon Ranges and the Upper Campaspe Landcare Network area. The data collected as a result of the surveys will be added to the Victorian Biodiversity Atlas to help inform future biodiversity policies and programs. It is expected to be complete by 2020.

Melbourne Water's Stream Frontage Management Program and Rural Land Program

Melbourne Water's Stream Frontage Management program provides assistance to private landholders to carry out work that will help to improve the condition of a river or creek. Deep Creek and Jackson's creek and their tributaries are eligible for funding. The program provides technical and financial assistance for improving waterways including streamside fencing, weed control and revegetation.

Melbourne Water's Rural Land Program works with landholders to improve land management practices to reduce sediment and nutrient loss from farms to waterways.

Landcare Projects

A number of significant Landcare Group projects are also underway including:

- Black Gum conservation in Woodend by Woodend Landcare and the Threatened Species Conservancy.
- Protection and enhancement of Monument Creek by Newham and District Landcare (part of the Cobaw Biolink).
- Platypus mapping and surveys by the Upper Campaspe Landcare Network
- Masterplans and their implementation for Bald Hill Reserve and Malmsbury Common.
- Campaspe River restoration program by Ashbourne Landcare
- Kangaroo Creek restoration program by Malmsbury Landcare



Figure 7: The Cobaw Biolink (also known as the Campaspe-Maribyrnong Headwaters Biolink) has been a focus for Newham Landcare for many years. The group's inspirational efforts revegetating roadsides, waterways and property boundaries can be seen in the above aerial photograph.

5. Biodiversity Values

5.1 Macedon Ranges Shire *at a glance*

The Macedon Ranges Shire is located in central Victoria with major townships including Kyneton, Romsey, Gisborne, and Woodend. The Shire is a popular place to live and visit. The current population of 48,953 is projected to increase to 65,405 by 2036.

The Shire has a unique and beautiful natural environment with high biodiversity values. The landscape is very diverse, with contrasting features such as the mountainous areas of the Great Dividing Range including Mount Macedon, volcanic eruption points at Hanging Rock, Camels Hump, Bald Hill, Mount Gisborne, Magnet Hill, Mount Aitken and Mount Bullengarook, and the grassy, flat volcanic plains around Kyneton, Gisborne and Lancefield. Several landscapes in the Shire have been recognised for their state significance.

Despite the impact of colonisation that has resulted in large scale clearance for farming and settlements, the Macedon Ranges retains large areas of native vegetation in relative good condition, much of it on private land. The forested areas of Macedon Ranges Shire support the majority of the 37% of modelled native vegetation remaining across the shire. This directly supports the local economy including tourism and agriculture.

Importantly, the Shire plays a significant role in the broader landscape in providing connectivity and climate refugia due to its cooler and wetter climate in higher elevations, as seen in Figure 8.

Figure 9 shows the key geological features and bioregions of the Macedon Ranges.

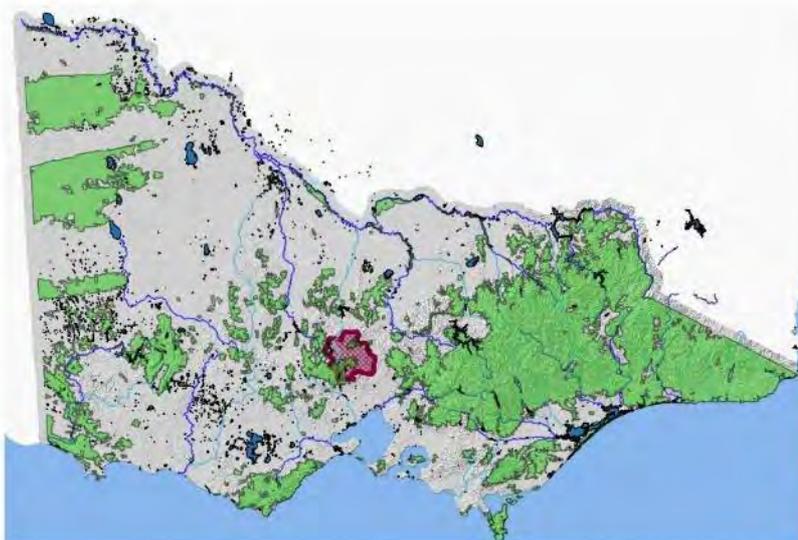
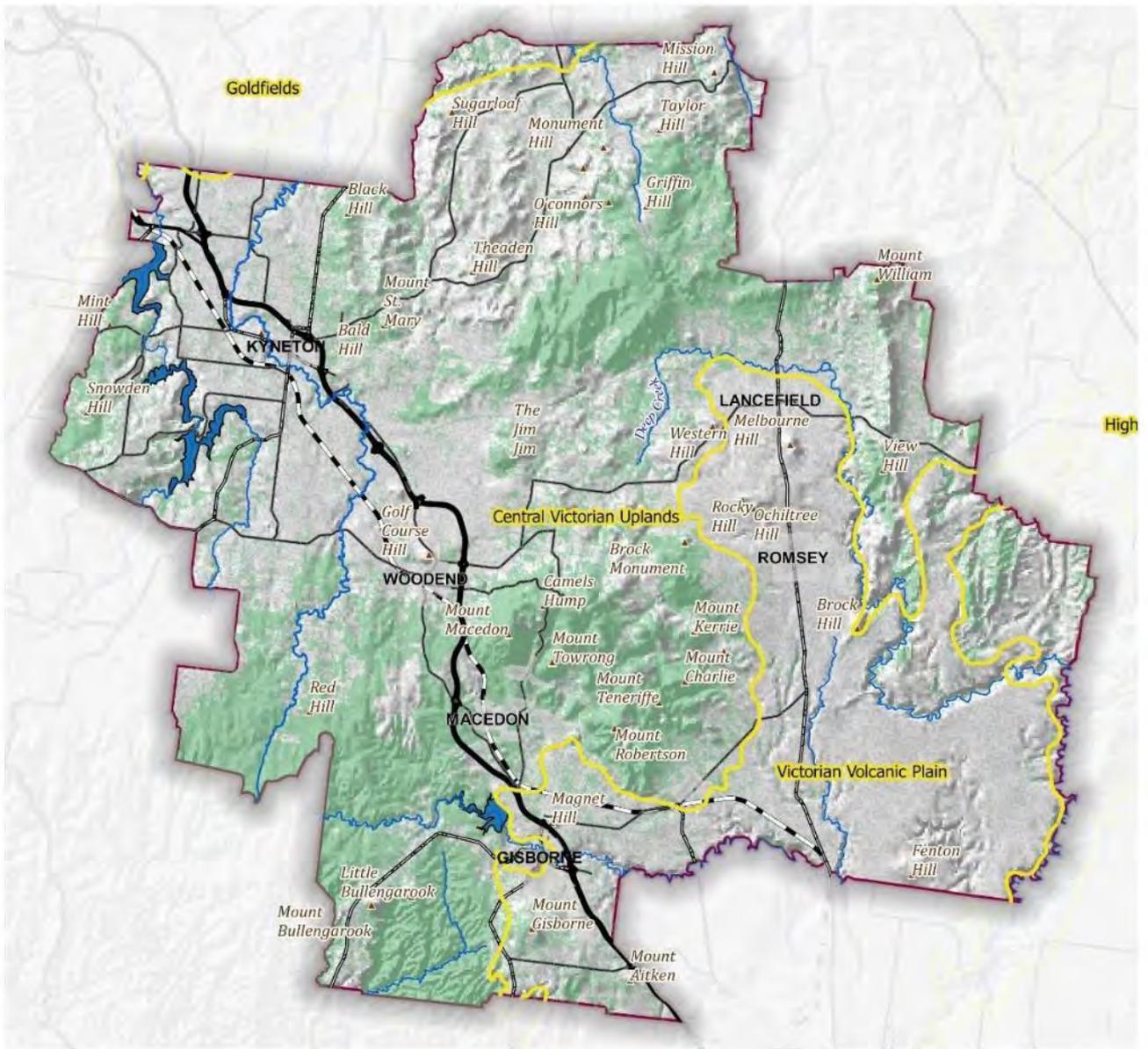


Figure 8: Location of Macedon Ranges (in purple) within Victoria.

Table 7: Macedon Ranges Shire - biodiversity at a glance.

Area	1,747 km ² (174,700 ha)
Area of native vegetation	Approximately 37% or 649 km ² (64,639 ha)
Bioregions	Central Victorian Uplands, Victorian Volcanic Plains, Goldfields
Ecological Vegetation Classes	33 Ecological Vegetation Classes (EVCs) known in the shire, of these; <ul style="list-style-type: none"> • 13 are listed as “endangered” in Victoria (<10% of pre-settlement coverage) • 9 are vulnerable (10-30% of pre-settlement coverage) • 4 are depleted (30-50% of pre-settlement coverage) • 6 of least concern (50% of pre-settlement coverage) • 1 wetland formation – status not determined
Significant Public Land	Public land covers 10% of the shire and includes Cobaw State Forest, Lerderderg State Park, Macedon Regional Park and Wombat State Forest
Bushland Reserves	517 ha protected across 20 bushland reserves plus various smaller conservation reserves
Landcare/Friends groups	37 groups with over 1,000 members



Legend

- Waterway
- Reservoir
- Native Vegetation Cover
- Bioregions
- Freeway
- Highway
- Railway

0 5 10 km



Figure 9: Macedon Ranges Shire Council highlighting key towns, bioregions and landscape features

5.2 Native Vegetation

Vegetation forms the basis of most terrestrial ecosystems with all animals, fungi and microorganisms relying on specific vegetation for their food and habitat. Within the relatively small area of the Macedon Ranges Shire there is a wide diversity of plant communities occupying the varying environments created by different altitudes, aspects and soils, as demonstrated in Figure 10.

The Victorian Government has classified the different combinations of species into Ecological Vegetation Classes (EVCs). EVCs are determined by vegetation structure and floristics, land systems and other environmental information including geology, aspect, slope, elevation, rainfall, fire frequency and ecological responses to disturbance.

Forest habitats generally refer to plant communities where tree cover is 30% or greater. Forests are widespread within the Shire but are most common across the foothills and mountain slopes of the Macedon and Cobaw Ranges. Woodland habitats generally refer to plant communities where tree cover is less than 30%.

Macedon Ranges Shire has 33 different EVCs represented across three bioregions (Victorian Volcanic Plains, Central Victorian Uplands and Goldfields) that cover a range of broad vegetation types including woodlands, grasslands, forests and wetlands. The most extensive remnant vegetation persists on soils too steep or poor to farm, or forests set aside for timber production occur on public land. Important smaller fragments of grassland or woodland can be found across the Shire on public and private land (MRSC 2009).

A short description of the broad vegetation types found across the shire is provided on the following pages. Figures 11 and 12 demonstrate where these vegetation types were located pre-colonisation and today.

A list of all EVCs found in the Macedon Ranges Shire, their conservation status and areas on public and private land is provided in Appendix 3.

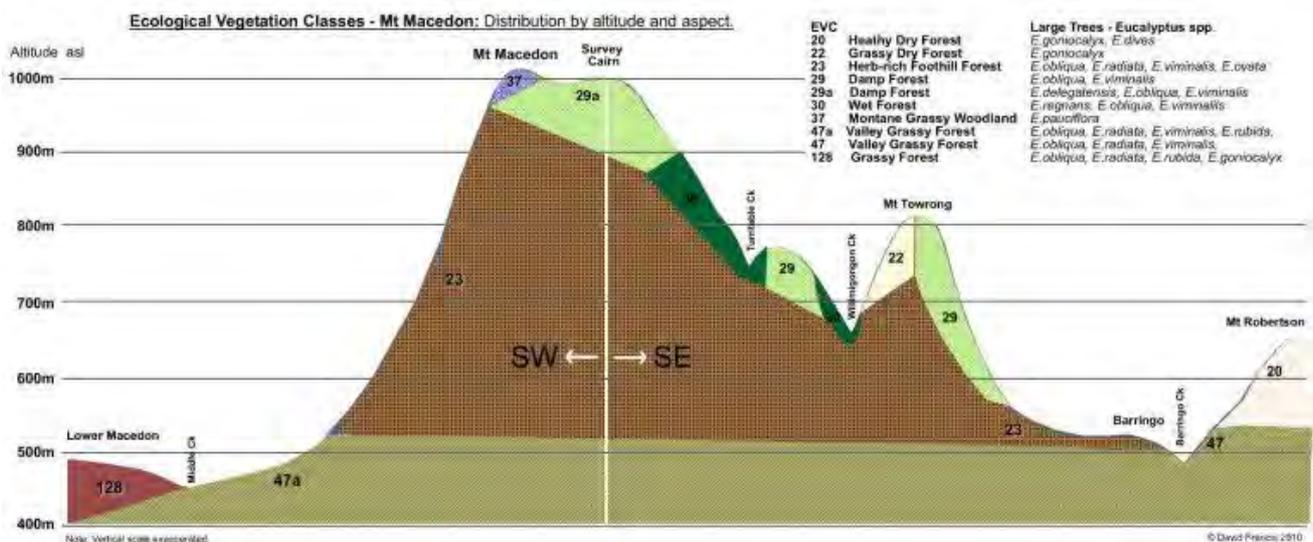


Figure 10: Vegetation Communities – Mount Macedon massif, profile. Source, David Francis 2010



Montane

Sub-alpine Low Woodland dominated by Snow Gums found only on Mount Macedon.

EVCs: Montane Grassy Woodland, Montane Grassy Woodland/Rocky Outcrop, and Shrubland/Rocky Outcrop Herbland Mosaic

Photo: David Francis



Wet Forests

Wet Forests on Mount Macedon occur in sheltered gullies with towering Mountain Ash trees and giant tree ferns. Messmate dominated damp forests occur through less sheltered areas. These forests are renowned for their diversity of fungi.

EVCs: Damp Forest and Wet Forest

Photo: William Terry



Dry Forests

Encompasses the open, dry forests of the foothills. Taller Eucalypt dominated with understorey of wattles, peas and grasses.

EVCs: Heathy Dry Forest, Shrubby Dry Forest, Grassy Dry Forest, Herb-rich Foothill Forest, Valley Heathy Forest, Grassy Forest, Shrubby Foothill Forest, and Valley Grassy Forest.

Photo: MRSC



Woodlands

Open Eucalypt areas on lower lying hills and alluvial areas with a rich understorey of grasses, pea and herbs. In the Shire, woodlands generally occur on relatively fertile soils and have a grassy understorey.

EVCs: Grassy Woodlands, Hillcrest Herb-rich Woodland and Scoria Cone Woodland. Alluvial Terraces Herb-rich Woodland/Creekline Grassy Woodland Mosaic, Creekline Herb-rich Woodland and Damp Sands Herbrich Woodland.

Photo: Krista Patterson-Majoor



Grasslands

Grasslands with a species rich understorey of shrubs, grasses and herbs and sparse Manna Gum and Swamp Gum. Local grassland communities are restricted to the fertile volcanic plains. Most former grasslands have been cleared or degraded and are highly endangered.

EVC: Plains Grassy Woodlands, Grassy Woodlands

Photo: Nadya Koronfsky



Riparian Grassy Woodlands

Found in isolated pockets along smaller seasonal streams on the plains and lower slopes of foothills. Open woodlands with an overstorey usually dominated on the plains by River Red Gum. Manna Gum may be found on the lower slopes of the foothills.

EVCs: Swamp Scrub, Riparian Forest, Riparian Forest/Swampy Riparian Woodland Mosaic, Swampy Riparian Woodland, Stream Bank, Shrubland and Creekline Grassy Woodlands.

Photo: MRSC

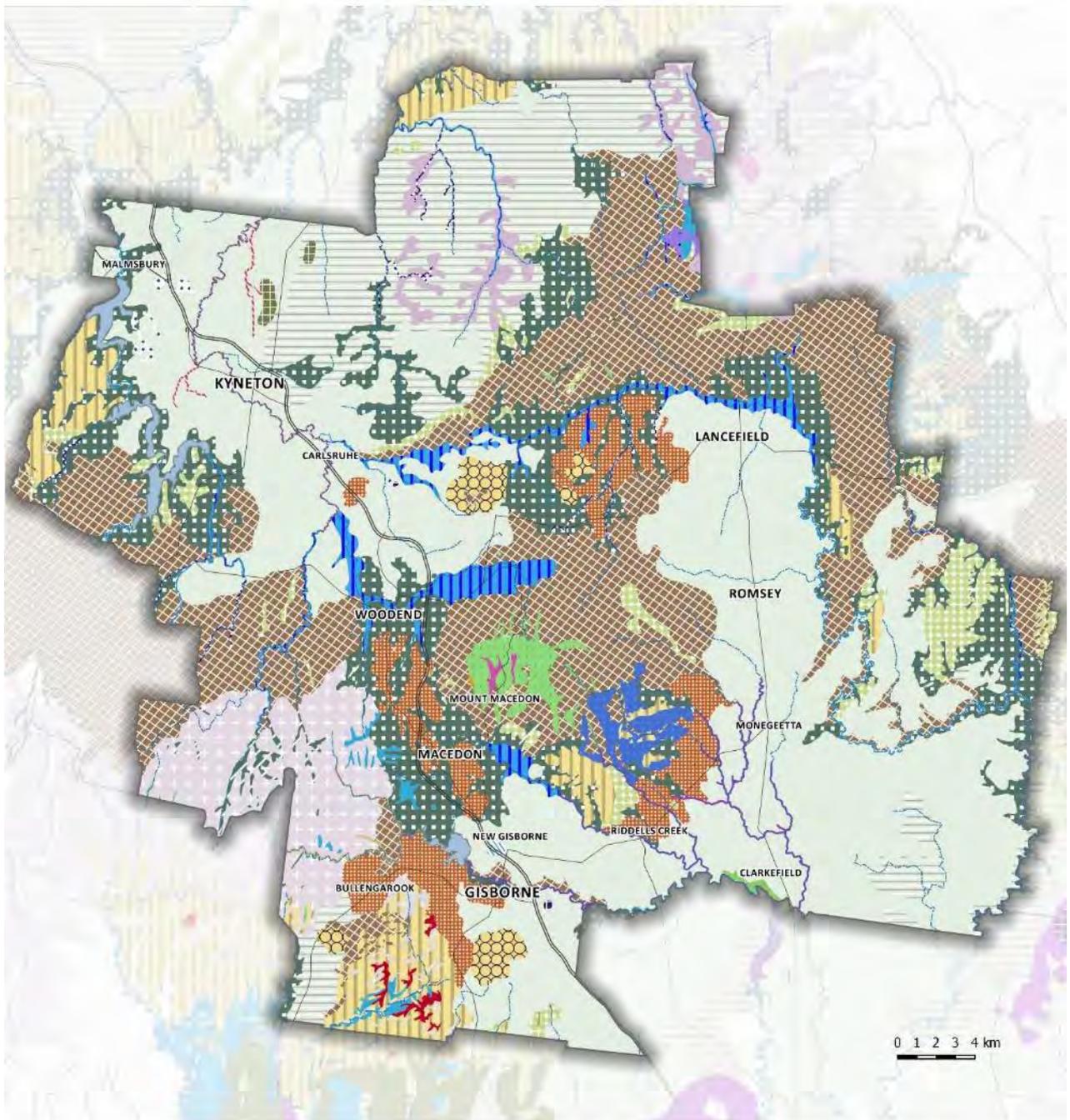


Wetlands

Natural wetlands are not common in the Shire, either because they have been drained/cleared or the terrain is too hilly. However, a range of wetland plants can still be found within artificial wetland habitats such as lakes, dams and water storage areas. The Gisborne Marshlands is a nationally significant remnant wetland.

EVSs: Plains Sedgy Wetland

Photo: William Terry



Legend

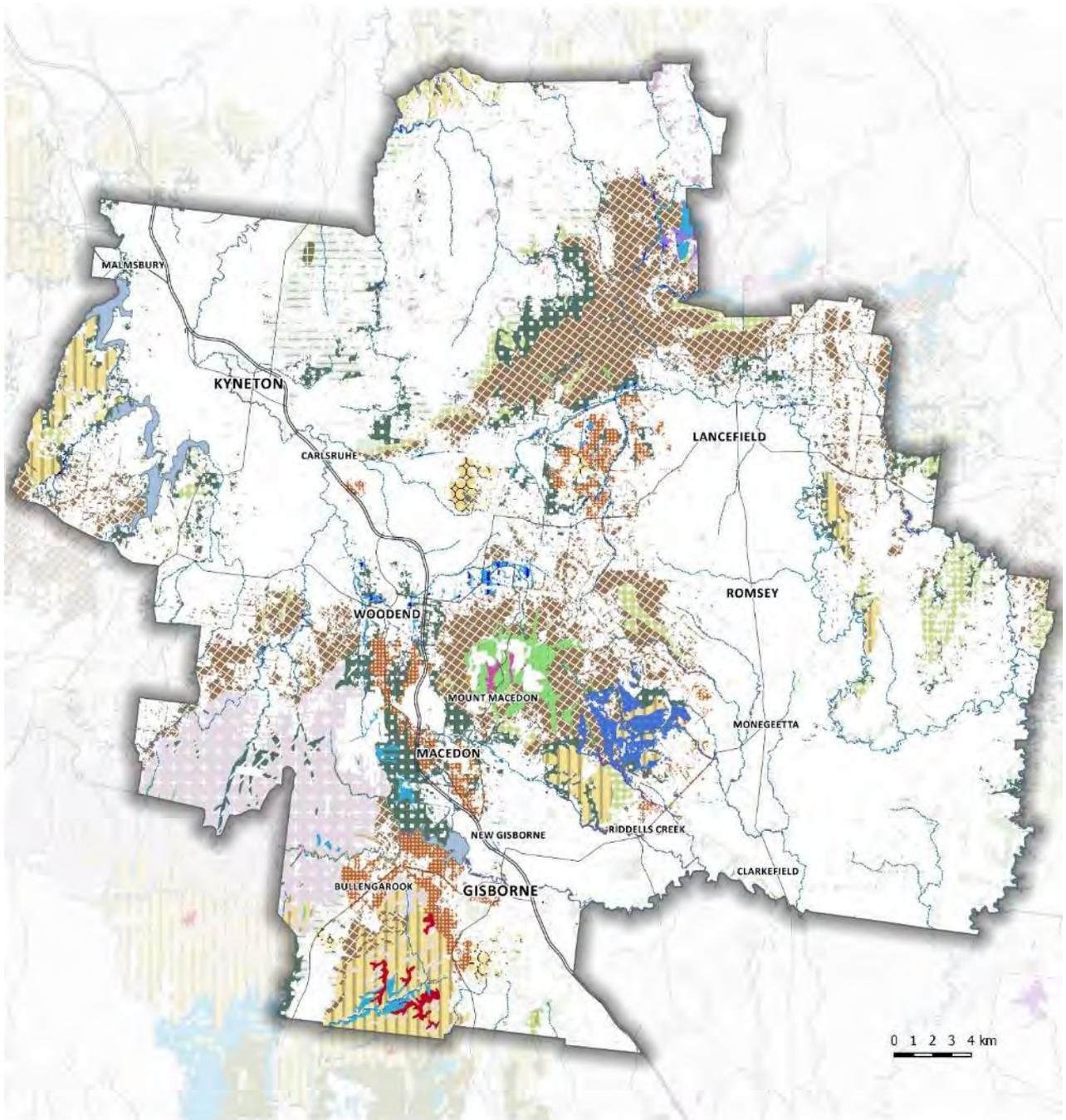
NV1750_EVC_Shapefile

- 125 Plains Grassy Wetland
- 127 Valley Healthy Forest
- 128 Grassy Forest
- 132 Plains Grassland
- 16 Lowland Forest
- 164 Creelike Herb-rich Woodland
- 174 Grassy Dry Forest/Rocky Outcrop Shrubland/Rocky Outcrop Herbland Mosaic
- 175 Grassy Woodland
- 18 Riparian Forest
- 19 Riparian Shrubland
- 190 Sedgy Riparian Woodland
- 20 Healthy Dry Forest
- 21 Shrubby Dry Forest

- 22 Grassy Dry Forest
- 23 Herb-rich Boxhill Forest
- 237 Riparian Forest/Swampy Riparian Woodland Mosaic
- 268 Valley Grassy Forest/Grassy Woodland Complex
- 269 Riparian Shrubland/Swampy Riparian Woodland Mosaic
- 272 Swampy Riparian Woodland/Spring Soak Woodland Mosaic
- 29 Damp Forest
- 3 Damp Sands Herb-rich Woodland
- 30 Wet Forest
- 37 Montane Grassy Woodland
- 45 Shrubby Rothill Forest
- 47 Valley Grassy Forest
- 48 Healthy Woodland
- 53 Swamp Scrub

- 55 Plains Grassy Woodland
- 61 Box Ironbark Forest
- 641 Riparian Woodland
- 647 Plains Sedgy Wetland
- 68 Creelike Grassy Woodland
- 72 Granite Hills Woodland
- 74 Wetland Formation
- 81 Alluvial Terraces Herb-rich Woodland/Creelike Grassy Woodland Mosaic
- 83 Swampy Riparian Woodland
- 851 Stream Bank Shrubland
- 859 Montane Grassy Woodland/Rocky Outcrop Shrubland/Rocky Outcrop Herbland Mosaic
- 894 Scoria Cone Woodland
- 895 Escarpment Shrubland

Figure 11: Pre 1750 Ecological Vegetation Classes of the Macedon Ranges



Legend

Native Vegetation 2005 EVC

- | | | |
|---|---|---|
| <ul style="list-style-type: none"> 125 Plains Grassy Wetland 127 Valley Healthy Forest 128 Grassy Forest 132 Plains Grassland 16 Lowland Forest 104 Creeline Herb-rich Woodland 174 Grassy Dry Forest/Rocky Outcrop Shrubland/Rocky Outcrop Herbland Mosaic 175 Grassy Woodland 18 Riparian Forest 19 Riparian Shrubland 190 Sedge Riparian Woodland 20 Healthy Dry Forest 21 Shrubby Dry Forest | <ul style="list-style-type: none"> 22 Grassy Dry Forest 23 Herb-rich Foothill Forest 237 Riparian Forest/Swampy Riparian Woodland Mosaic 268 Valley Grassy Forest/Grassy Woodland Complex 269 Riparian Shrubland/Swampy Riparian Woodland Mosaic 272 Swampy Riparian Woodland/Spring Soak Woodland Mosaic 29 Damp Forest 3 Damp Sands Herb-rich Woodland 30 Wet Forest 37 Montane Grassy Woodland 45 Shrubby Foothill Forest 47 Valley Grassy Forest 48 Healthy Woodland 53 Swamp Scrub | <ul style="list-style-type: none"> 55 Plains Grassy Woodland 61 Box Ironbark Forest 641 Riparian Woodland 647 Plains Sedge Wetland 66 Creeline Grassy Woodland 72 Granitic Hills Woodland 74 Wetland Formation 81 Alluvial Terraces Herb-rich Woodland/Creeline Grassy Woodland Mosaic 83 Swampy Riparian Woodland 651 Stream Bank Shrubland 889 Montane Grassy Woodland/Rocky Outcrop Shrubland/Rocky Outcrop Herbland Mosaic 894 Scoria Cone Woodland 895 Escarpment Shrubland |
|---|---|---|

Figure 12: 2005 Ecological Vegetation Classes of the Macedon Ranges. Based on DELWP modelling and mapping

5.3 Threatened Flora and Fauna

As previously noted, there are several flora species listed under the FFG Act known to occur within the Shire. Of these, four have more than 20% of their Victorian range located in the shire; the Black Gum (*Eucalyptus aggregata*), Hairy leaf Triggerplant (*Stylidium armeria subsp pilosifolium*), Wombat Bush-pea (*Pultenaea reflexifolia*) and Swamp Bush Pea (*Pultenaea weindorferi*).

The Shire is also rich in fauna species, many of which are threatened or endangered, such as the Powerful Owl, Brush-tailed Phascogale, Greater Gliders, Brown Toadlet, and Yarra Pygmy Perch. Other iconic and significant species include Platypus, Wombats and Koalas.

Significantly, numerous native animals have disappeared from the Macedon Ranges Shire including the Southern Brown Bandicoot (last recorded in 1968), Leadbeater's Possum (last recorded in 1995) and the Eastern Quoll (last recorded in the late 1800s). The Greater Glider, while known to occur in the Wombat Forest, has not been recorded on Mount Macedon since 1987 despite intensive survey effort to locate them. With increasing pressures, action needs to be taken to ensure the remaining native animals do not face the same plight.

Known records of threatened species are shown in Figure 14. Four threatened fauna species and one critical endangered vegetation community that are valued for their flagship and iconic nature have been investigated in depth for this strategy. The monitoring program has a focus on surveying for these species as they are good indicators of broader ecosystem health. The following provides a brief description.



Brush-tailed Phascogale

The Brushtailed Phascogale *Phascogale tapoatafa* is a small carnivorous marsupial that occurs in the woodlands of eastern and south-eastern Australia. Their preferred habitat is Box-Ironbark forests and grassy and shrubby woodland. Phascogales, and especially males, have large and exclusive home ranges, up to 100 ha in some localities, and therefore occur at relatively low densities. All male Phascogales die synchronously in about July – August after a brief but intense mating period. This combination of species-ecological factors (i.e. large home range, low density and annual male die-off) with habitat loss and fragmentation and predation by foxes and cats has resulted in their decline and listing on the FFG Act as vulnerable.

Photo: William Terry



Greater Glider

The Greater Glider *Petauroides volans* is the largest of Australia's gliding possums, with a body size of 900 – 1700 gm (McKay 2013). The diet of the Greater Glider is almost entirely leaves of eucalypt trees, and they have relatively small home ranges of just a few hectares. The primary and preferred mode of movement across gaps between trees is by gliding from tree to tree. The Greater Glider is considered Vulnerable under the Federal EPBC Act and the Victorian FFG Act.

Photo: John Walter, NatureShare



Powerful Owl

The Powerful Owl *Ninox strenua* is Australia's largest owl which occupies eucalypt forest and woodland, has home ranges of 400 – 4000 ha in size, and utilises large hollows in trees for breeding. A top-order carnivore, the Powerful Owl is reliant on possums and gliders for most of its food. Its occurrence and successful rearing of young in an area is indicative of good populations of its prey. Large forest owls are often considered as indicator species, because of their reliance on forest and woodland and a reliable prey source.

Photo: William Terry



Brown treecreeper (Woodland Birds in general)

Woodland birds are typically associated with woodlands and forests of temperate southern Australia. The continuing decline of species within this group is of significant concern, principally due to the loss, fragmentation and degradation of habitat.

One species within this group is the Brown Treecreeper *Climacteris picumnus*, which is widespread in eastern Australia, occupying a range of eucalypt-dominated forests and woodlands. It is especially abundant in those habitats with open grassy understorey and large amounts of dead and fallen timber. Brown Treecreepers are gregarious and live in social groups of up to eight to 12 individuals, and forage extensively on the ground and in trees for insects, primarily ants. Brown Treecreepers nest in hollows in standing trees (dead or alive).

Photo: David Francis, NatureShare



Plains Grassy Woodlands

The native grassy dominated areas within the Shire primarily fall into two Ecological Vegetation Classes (EVCs): Grassy Woodland (EVC 175) and Plains Grassy Woodland (EVC 55). The pre-European extent of these grassy woodland communities was extensive within the Shire, but because these areas had fertile soils and were among the simplest to cultivate, they are now the most extensively cleared. Due to this dramatic reduction in native grassy woodland communities, there has been a subsequent reduction in flora and fauna associated with these systems, many of which are now threatened in Victoria. The Plains Grassy Woodland EVC also corresponds closely with the nationally threatened grassy eucalypt woodland community of the Victorian Volcanic Plain (EPBC Act 1999). This community was listed as critically endangered in 2009.

Photo: Giorgio De Nola, NatureShare

5.4 High Value Conservation Areas

The Macedon Ranges Shire covers a region with important natural values and has been fortunate to have a long history of conservation in the area - from halting logging in the Wombat Forest, increasing the protection of the Cobaws, establishing Mount Macedon as a Regional Park and strong local planning policies. We are also fortunate to have a large number of Council managed reserves which protect interesting and often largely threatened vegetation types. Whilst these areas provide key habitat that require increased protection and on-going management, it is the places in-between that will provide opportunities to connect and allow species to disperse across the landscape in the face of climate change and development pressures.

Figure 13 shows the DELWP modelled Strategic Biodiversity Values of the Shire with the darker green showing areas of higher value. Figure 14 indicates the extent of vegetation across the Shire considered to be of high conservation value based on analysis of this mapping, threatened species records and the connectivity analysis.

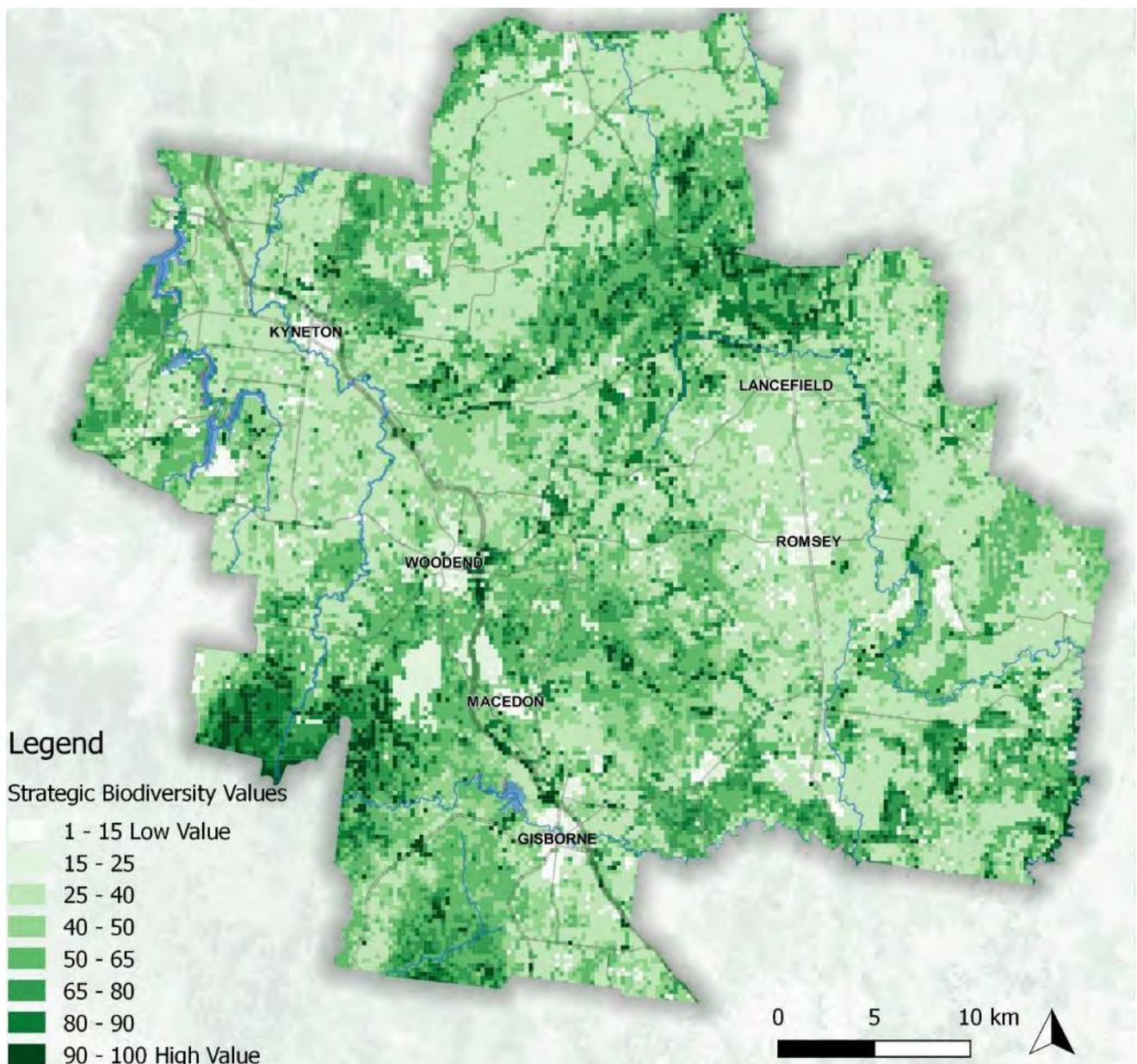


Figure 13: DELWPs Strategic Biodiversity Values for the Macedon Ranges Shire. These values combine important areas for threatened flora and fauna, levels of depletion, connectivity, vegetation types and condition to provide a view of relative biodiversity importance over all parts of Victoria.

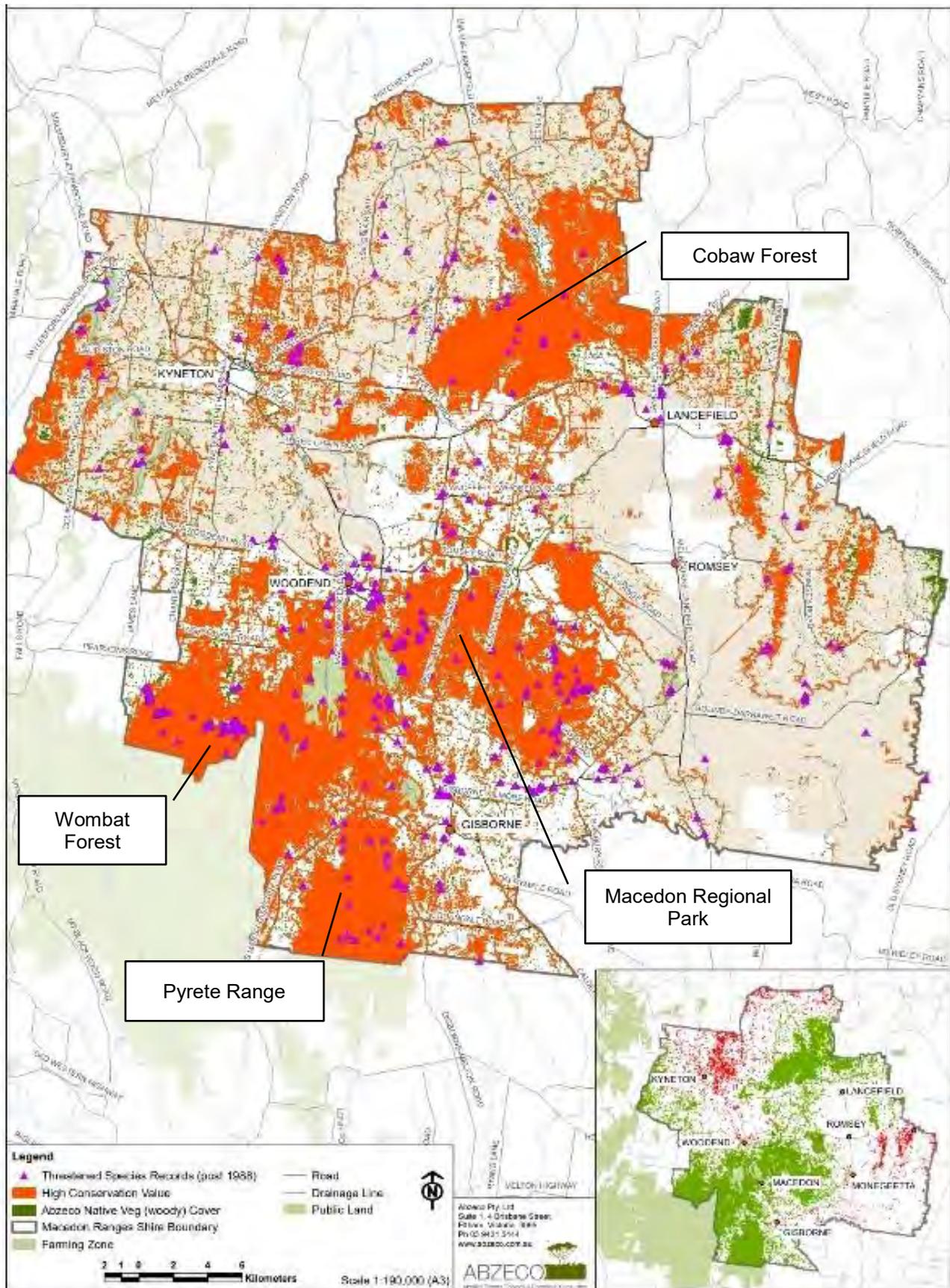


Figure 14: Abzeo Modelled Distribution of High Conservation Areas for the Macedon Ranges Shire –based on DELWP Strategic Biodiversity Value, threatened species records, and the landscape connectivity assessment.

5.5 Waterways, Wetlands and Reservoirs

The Macedon Ranges Shire is located at the top of two major catchments. To the north of the divide, the Campaspe and Coliban Rivers eventually flow to the Murray River. To the south, Deep Creek and Jackson's Creek are part of the Maribyrnong River catchment and flow into Port Phillip Bay.

Waterways are highly valued by community for their landscape and environmental importance. The major waterways of the shire is shown in Figure 15. Community groups and agencies are actively undertaking enhancement works along the Campaspe River, Deep Creek, Jackson Creek, Coliban River, Turitable Creek, Monument Creek, Emu Creek, Riddells Creek, Kangaroo Creek and the two Five Mile Creeks (in Woodend and Romsey).

These waterways and the vegetation that lines them provide valuable habitat and play an essential role in landscape connectivity. They have also been identified as having high conservation value for macro invertebrates, Yarra Pygmy Perch and Platypus by Melbourne Water. The Gisborne Marshlands Reserve protects the significant EPBC listed wetland community, Plains Sedgy Wetland.

The shire contains important catchments and reservoirs including Rosslynne, Malmsbury, Lauriston, and Upper Coliban. These reservoirs provide drinking water for local towns, Melbourne and Bendigo. They are also highly valued by community for their recreation and scenic values. Revegetation at the Lauriston Reservoir was highlighted as an excellent restoration project by community members.

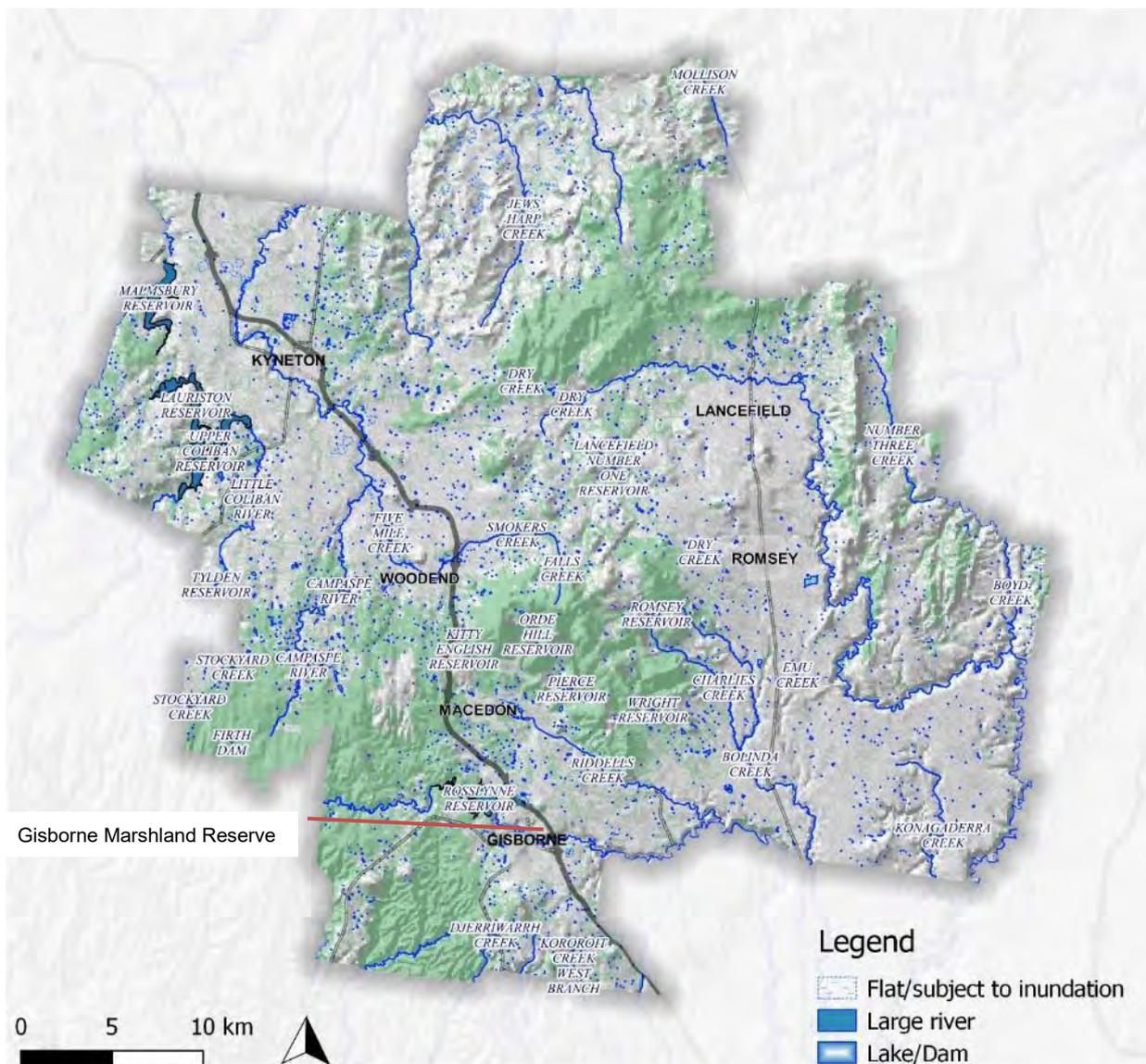


Figure 15: Waterways of the Macedon Ranges Shire.

5.6 Public Land

The Macedon Ranges Shire is fortunate to have a number of large public land reserves. These patches of native vegetation cover some 11% of the shire and are critical to protecting threatened species and supporting biodiversity in the region. Figure 16 shows the locations of the public reserves.

State Parks and Forests

Macedon Regional Park protects 2,379 ha of native vegetation near the southern end of the Great Dividing Range. Its altitude and size means that it is a significant refuge for native species. It is highly valued by the community for its conservation and recreation values. The section of the park from Mount Macedon to Romsey Rd was also highlighted as an important remnant patch that is regenerating after being a golf course and is part of the Cobaw Biolink.

The **Cobaw Forest** is a 2,220 ha area of native vegetation within a surrounding landscape that is largely cleared, and so provides vital habitat for a diverse range of native flora and fauna. The forest is almost totally comprised of threatened vegetation types with the depleted Herb-rich Foothill Forest widespread and the vulnerable Valley Grassy Forest also common. Threatened fauna species within the forest include Eastern Pygmy-possum, Powerful Owl, Brush-tailed Phascogale, Feather-tailed Glider and Brown Treecreeper. Threatened flora species present includes the Weak Daisy (*Brachyscome debilis*). The entire forest is currently designated as a Special Protection Zone.

The **Wombat State Forest** forms a large part of the only remaining 'largely intact' area in Central Victoria. It plays a critical role in the maintenance of ecological processes and ecosystem resilience within the region. A report by the Victorian National Parks Association identified the Wombat State Forest as one of the highest priority conservation areas in Central Victoria and calls for its increased protection as a state or national park (VNPA 2010). The Wombat State Forest contains a very diverse range of native flora with over 360 indigenous plants recorded. Twenty-seven flora species in the Wombat State Forest are listed as rare, vulnerable or threatened at a State or National level. Two species are endemic to the region; the Wombat Bossia (*Bossiaea vombata*) and Wombat Bush-pea (*Pultenaea reflexifolia*). Fifteen threatened fauna species are found in the Wombat State Forest, including the Spot-tailed Quoll, Growling Grass Frog, Powerful Owl and Greater Glider. In many cases, the populations of threatened species in the Wombat Forest are sizeable and stable.

The **Lerderberg State Park (Pyrete Range)** is a 5930 ha isolated block of mountainous bushland on the eastern side of the Gisborne-Bacchus Marsh Road. The Range covers an extensive area of relatively undisturbed old growth forest in steep and rugged terrain. An incredibly special place, it supports flora and fauna communities of State significance and is a site of regional geological and geomorphologic significance. The park is home to the threatened Brush-tailed Phascogale and over 130 bird species including the Swift Parrot, Great Egret and the Powerful and Masked Owls.

Other important public land sites include Lauriston Bushland Reserve, Mount Charlie Flora and Fauna Reserve, T-hill, and Conglomerate Gully.

Council Bushland Reserves

Macedon Ranges Shire Council manages over 20 bushland reserves covering 517 ha which play an important role in protecting biodiversity and providing habitat for wildlife. A number of these reserves have an Environmental Management Plan or similar guiding document in place, as listed in Table 8. The Environmental Management Plans provide direction for protecting and enhancing the conservation values of the reserves and managing threats.

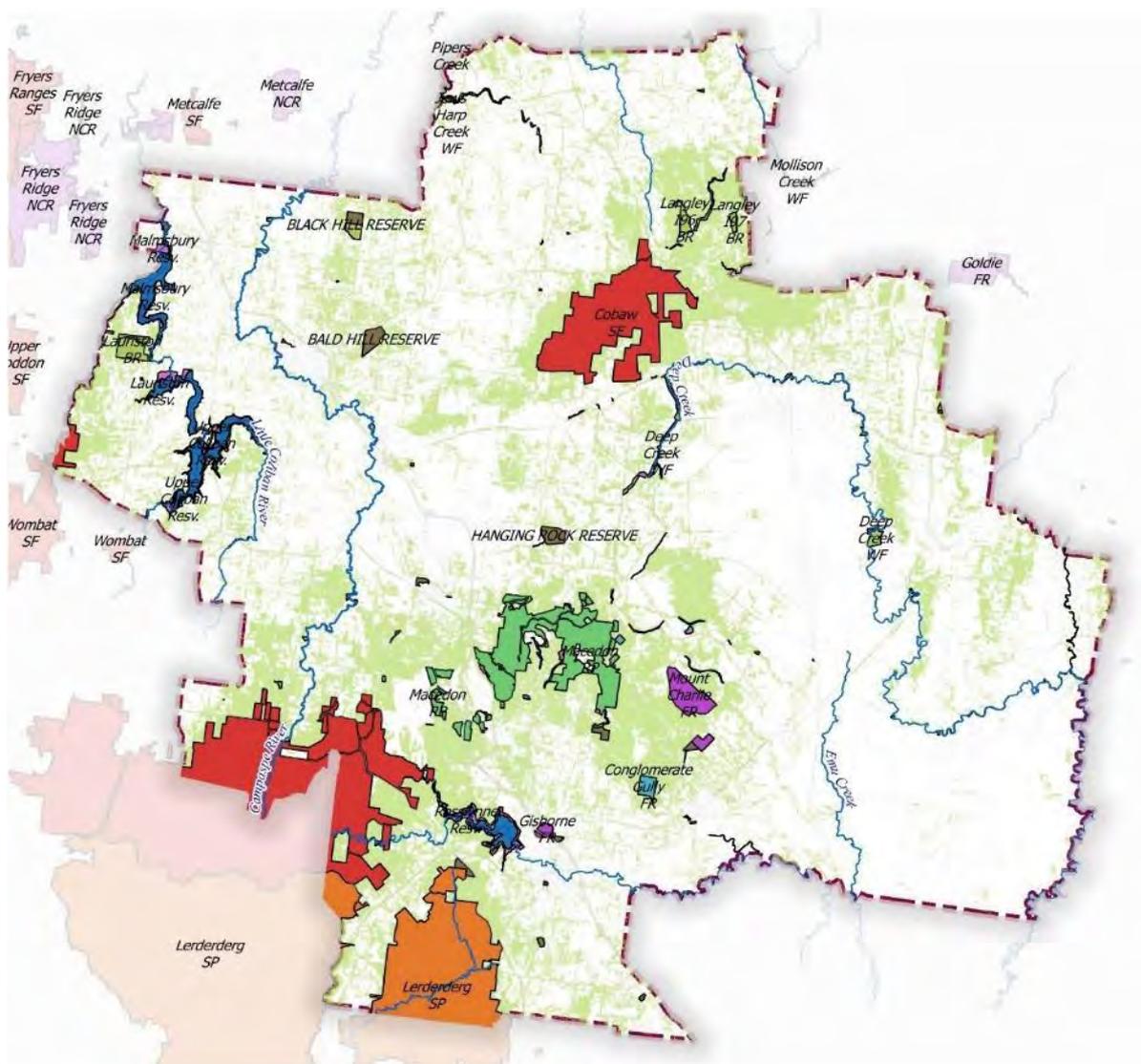
Bald Hill Reserve, Kyneton	UL Daly Nature Reserve, Gisborne
Woodend Grassland Reserve	Barringo Recreation Reserve, New Gisborne
Mount Gisborne Reserve	Stanley Park Reserve, Mount Macedon
Hobbs Rd Bushland Reserve	Sandy Creek Road Bushland Reserve
Black Hill Reserve	Hanging Rock Reserve
Gisborne Marshlands	Magnet Hill, Gisborne
Malmsbury Common	

Table 8: Major Council Reserves with an Environmental Management Plan.

Other important public land

VicTrack Sites: A number of VicTrack rail corridors support intact native vegetation, including the rail corridor in Riddells Creek, Norton Road and Smith St in Macedon, and Quarry Rd in Woodend. They are especially valued for their presence of grassland species, rare orchids and wildflower displays in Spring. These sites are under threat from woody weeds and frequent mowing.

Cemeteries: Due to their protected status, cemeteries are often known to contain significant remnant strands of vegetation. Carlsruhe, Kyneton, Tylden and Macedon cemeteries have all been noted for their flora values.



Legend

Waterways	Public Land	Council Bushland Reserves
— Major	NATIONAL HERITAGE PARK	Native Vegetation
— Medium	NATURAL FEATURES RESERVE	
— Minor	NATURE CONSERVATION RESERVE	
■ Reservoirs	REGIONAL PARK	
	STATE FOREST	
	STATE PARK	
	OTHER PUBLIC LAND	
	WATER PRODUCTION	

Figure 16: Public Land in the Macedon Ranges Shire.

5.7 Roadside Conservation

Many stretches of roadside vegetation in the Shire are noted for their significant vegetation species. Council is responsible for managing 1,700km of roadside vegetation for multiple outcomes – for protection and enhancement of biodiversity and habitat, to manage fire risks and to ensure vehicle access and public safety. This is inevitably complex, requiring a considered and balanced approach to decision making. However, with careful consideration and planning, practices like woody weed control can help meet goals for both fuel reduction and biodiversity protection.

Council recognises the importance of vegetation corridors along roadsides and a Roadside Management Plan is currently in development which will apply to Council managed roads. Figure 17 shows the most up to date mapping of roadside conservation values across the Shire. Roadside have been assessed for their conservation values in 2006 and 2011. Approximately 60% of Council managed roadsides were assessed for their conservation value between September 2016 and July 2017, with more to be assessed in 2018. The Roadside Management Plan will be informed by this data. VicRoads manage major roads in the Shire which also have conservation values.

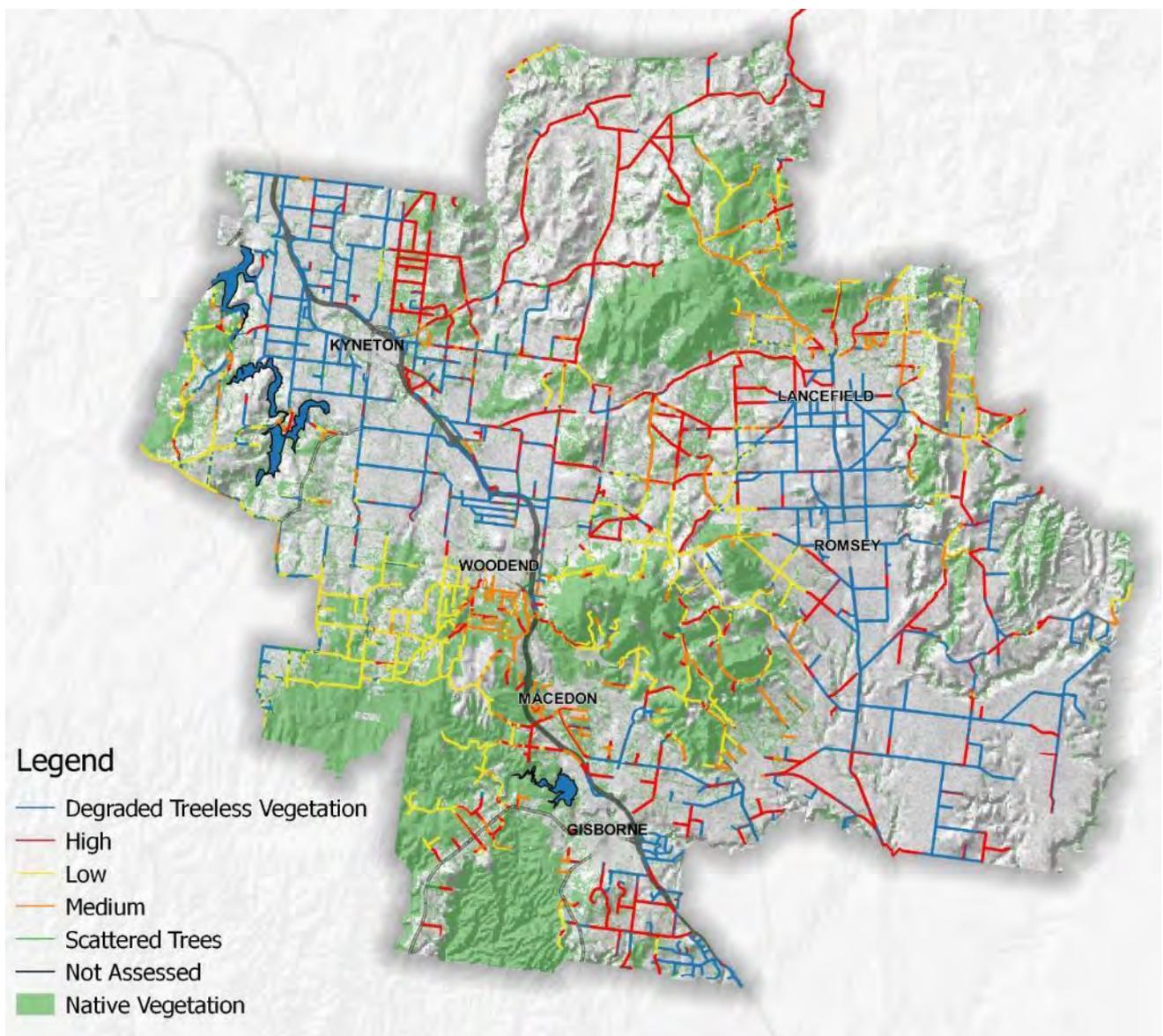


Figure 17: Roadside conservation values across the Macedon Ranges Shire.

6. Threats Facing Biodiversity

There are many threats to biodiversity across the Shire, ranging from generic threats like climate change to more site specific threats like vegetation clearance, grazing and compaction by stock, and the impacts of weeds and pest animals. An outline of these key threats is provided below.

6.1 Human Uses and Activities

Development

Development can result in incremental habitat fragmentation for dwellings and associated services and facilities through direct vegetation removal as well as activities such as timber collection, domestic gardens and use, maintenance of defensible space and fuel management on roadsides.

Private land management practices

Inappropriate land management practices can result in weed and pest animal invasion, over grazing by stock in riparian areas and remnant vegetation, severe gully erosion, and nutrient input into waterways. Lack of knowledge, experience and awareness about land management issues often results in these practices which in turn have a significant impact on biodiversity values and agricultural productivity. Fortunately, many landholders in the shire are very interested and motivated in learning about and improving the management of their land.

Firewood harvesting

Fallen timber and logs provide vital food and habitat for insects and native animals. Hence, firewood collection poses a threat to biodiversity values, most notably in the removal of soil nutrients and habitat. With an increase in population, more people are likely to collect firewood from state forests and roadsides. Sources such as plantation timber could be promoted as an alternative fuel source.

Domestic cats

Predation by introduced animals is a major threat for native animals. Pet cats can stray widely, especially at night. Research has shown that on average that one domestic cat prey on approximately 32 native animals each year (Patton, 1991). With around 3,000 domestic cats registered in the shire, there is potential for the demise of 96,000 native animals in the Macedon Ranges Shire every year.

Domestic dogs

Domestic dogs can impact on the behaviour, dispersal and survival of native animals. This includes through their scent which can discourage some native species from staying in an area, and direct chasing and predation.

Public land management practices

Poor practices of public land managers can degrade the significant biodiversity found on public land. For example, insufficient weed control along railway lines. At a larger scale, timber harvesting and mining in State Forests can lead to soil degradation and habitat and species loss. While these uses are currently not occurring in the native state forests of the shire, they have potential to be resumed.

Recreational activities on public land

Most recreation activities have little or no environmental impact. However some activities have the potential to directly threaten natural values (e.g. destruction of vegetation, compaction and erosion) or indirectly (e.g. spread of weed seed). Some recreation activities that may be damaging include off track trail biking and four wheel driving, illegal trail making for mountain biking, horse riding, camping, and rock-climbing. Recreational hunting an intrusive and potentially dangerous activity in forests that are open to the public. While shooting may have a role in pest animal management, it needs to be carefully controlled.

6.2 Pest Plant and Animals

Weeds

Invasive plants present a significant threat to the shire's biodiversity. In fact, weed invasion is ranked second only to habitat loss in causing biodiversity decline and weeds are estimated to cost Australian agriculture \$4 billion annually due to yield losses and product contamination (MRSC 2014). They invade and out-compete indigenous vegetation. In some cases they smother native plants, provide harbour to vermin, choke waterways and often do not provide suitable habitat for native animals.

While many weeds are officially recognised under the *Catchment and Land Protection Act*, there are other weeds that pose a threat to land managers. Environmental weeds are invasive plants that have an impact on bushland by competing for resources. These are often 'garden escapees', which are spread by clothing, dumped garden waste, vehicles, stock, wind and water. Sometimes, species that are native to Australia but not locally indigenous to an area are also potential environmental weeds.

A number of Weeds of National Significance are found in the Macedon Ranges Shire. These are weed species that are a priority to control due to their invasiveness and environmental, social and economic impacts. Weeds of National Significance commonly found in the Shire include Blackberry, Gorse, Broom, Willow, Serrated Tussock and Chilean Needle Grass.

Pest Animals

Pest animals are invasive species that have been introduced into Victoria or Australia. There are two key threats to biodiversity posed by pest animals – overgrazing / habitat destruction and predation of native animals.

Grazing by feral animals impacts on the regeneration of native vegetation. Pest herbivores known to occur in the Macedon Ranges Shire include goats, pigs, deer, hares and rabbits. These species threaten native flora and fauna through competition for the same resources and creation of additional grazing pressure on native vegetation communities and agricultural systems. In the case of rabbits, more than 2 rabbits per hectare can virtually eliminate the regeneration potential of plant species. 12 rabbits per hectare can exhibit the same grazing pressure as 1 dry sheep equivalent (MRSC, 2014).

Predation of native animals occurs by species such as foxes, feral and domestic cats and wild dogs. Foxes are very intelligent predators which prey on native animals, young lambs and calves and spread weeds. Domestic, stray and feral cats are a particularly dangerous predator to birds and smaller marsupials such as Sugar Gliders. DELWPs Strategic Management Prospects output for the Shire predicts that controlling foxes and cats will have the biggest impact on native birds, mammals and reptiles compared to any other management technique.

“Problem” wildlife

Some native species can impact agricultural productivity and residential amenity and therefore perceived to be problematic. For example, high numbers of Kangaroos can overgraze native vegetation and pasture, damage fencing and cause concern to motorists. This is often around the interface between bushland and pasture where they have access to cover, abundant grass and water from farm dams. Similarly, other species such as Cockatoos and Wombats have been known to damage houses and fencing. All native wildlife species are protected under the *Wildlife Act 1975*, so cannot be managed the same as introduced pest species.

Phytophthora cinnamomi disease

Phytophthora cinnamomi is an introduced plant root pathogen, or root-rot fungus, that can destroy entire vegetation communities. Phytophthora attacks the roots and stems of susceptible plants and causes them to rot. Once affected, plants are no longer able to take up sufficient water and nutrients, so they die. Listed as a key threatening process under the EPBC Act, Phytophthora is present in some of Council managed bushland reserves.

6.3 Fire and Biodiversity

Fire is an important part of the environment and native plants and animals have evolved to require specific fire regimes. With climate change and an increase of population, more people and places are now vulnerable to bushfires. As more people want to live near the bush there is increasing demand to reduce the risks of fire with clearing on private land and fuel-reduction burns on public land. The challenge for the Shire is to balance the need to protect life and property and to provide an appropriate fire regime for different ecosystems.

Macedon Ranges Shire has a history of wildfires (MRSC 2016). In 1983, two fires including Ash Wednesday destroyed the townships of Macedon and Mount Macedon. In 2009, the Black Saturday bushfires impacted the Redesdale area where properties were lost. More recent fires occurred in Gisborne South and Mickleham (2014), Lancefield-Cobaw (2015), and Edgecombe (2016).

Impact of bushfire

The Shire has three key bushfire prone natural landscapes, as outlined in Table 9. Each landscape has unique characteristics which when combined with the weather conditions of the day, will determine how fire behaves. The intensity of the bushfire dictates the impact on biodiversity. Severe bushfires may burn all the vegetation in a particular area and limit natural recovery, while more moderate fires will, generally, cause less damage to the natural surroundings. Each landscape also has different requirements for ecological burns, with grasslands benefiting from regular burning and forests requiring very low frequency burns.

Table 9: Vegetation and fire in the Macedon Ranges Shire

Landscape	Fuel hazard level	Topography	Requirement for fire for natural regeneration
Grasslands	Moderate to extreme	Flat	High
Woodlands	High to extreme	Undulating	Medium
Forests	High to extreme	Undulating	Low

Large scale planned burns

Large scale prescribed burns are undertaken by the state government, generally on public land. They can have a negative impact on some ecosystems and can result in increased biomass in the short term, generating the need for frequent burn regimes. Impacts of large scale planned burns include:

- Interruption to native species life-cycles if the burn is carried out in Spring before some plants have flowered and set seed.
- Decline in the number of old trees with hollows if burns are carried out at frequent intervals.
- Changes in the composition of forests if carried out at high frequencies, including the loss of some species and the dominance by others (such as bracken).
- Death of native animals that are not able to escape the smoke and / or fire.
- Loss of local food resources for wildlife.

Council fire prevention works

Council implements an annual fuel reduction program along roadsides – including slashing and planned burns. These need to be carefully timed and located to avoid spreading weeds or adversely impacting on native plants.

Fuel reduction works on private land

Removing fine fuels and mowing grass for fire prevention is important directly around the home. However “tidying up” understorey plants, leaf and log litter across the broader area of rural properties, bush blocks and adjoining roadsides can impact on biodiversity through the reduction of nutrients and moisture to the soil, reduction in food sources for native species and reduction of habitat and understorey species.

6.4 Climate Change

The threat of climate change to biodiversity cannot be underestimated. While the shire's variable topography and associated microclimates make climate forecasting difficult, we can expect more extreme events such as flooding and bushfires, alongside long term trends such as reduced rainfall and increased temperatures.

Based on predictions by the CSIRO and BoM (2015), by 2050, average temperatures will be up to 2.5 degrees warmer, with fewer frosts, more heatwaves and more fires. The hottest summers we remember will be the new normal. We can expect more intense storms in summer and less rain in winter and spring.

Ecosystems will be affected as a whole and individual species will be affected either directly or indirectly. Current threats to biodiversity, including the impact of habitat loss, weeds, pest animals and drought, are expected to intensify. The impacts of climate change are likely to be more pronounced in areas that are vulnerable to moisture stress, increased risk of bushfires, restricted natural climatic range and poor adaptive capacity associated with level of depletion and loss of quality. (NCCMA, 2015; Spatial Vision & Natural Decisions, 2014).

Figure 18 indicates the vulnerability of native vegetation across the Macedon Ranges Shire to climate change. It shows that wetter ecosystems and isolated patches are the most vulnerable to projected changes. Some species like Snow Gum (*Eucalyptus pauciflora*) in Macedon Regional Park may not be able to tolerate changed climatic conditions. Other species may be able to tolerate changes in climatic factors but not the increased competition from weeds and pathogens favoured by the changed conditions.

The areas in the Shire identified as sensitive to significant future climate change are:

- Large areas of native vegetation in Macedon, Mount Macedon and along the Great Divide north of the Cobaw Ranges and Lancefield.
- Upper reaches of Deep Creek and Jacksons Creek where erosion risk is increased by climate-induced vegetation loss and more frequent intense fire.
- Soils on steeper slopes along the divide around Macedon and south through Gisborne.
- Vegetation to the north and around the edges of the Cobaw Range.
- Fragmented vegetation through the Cobaw Biolink, Kyneton Woodlands and Baynton-Sidonia area.

Climate change will alter “the look, sound and smell of places we are familiar with”. The natural areas that our children and grand-children will experience in 2050 will look and feel very different to the places that we have cherished.

Michael Dunlop and Peter Brown, CSIRO scientists



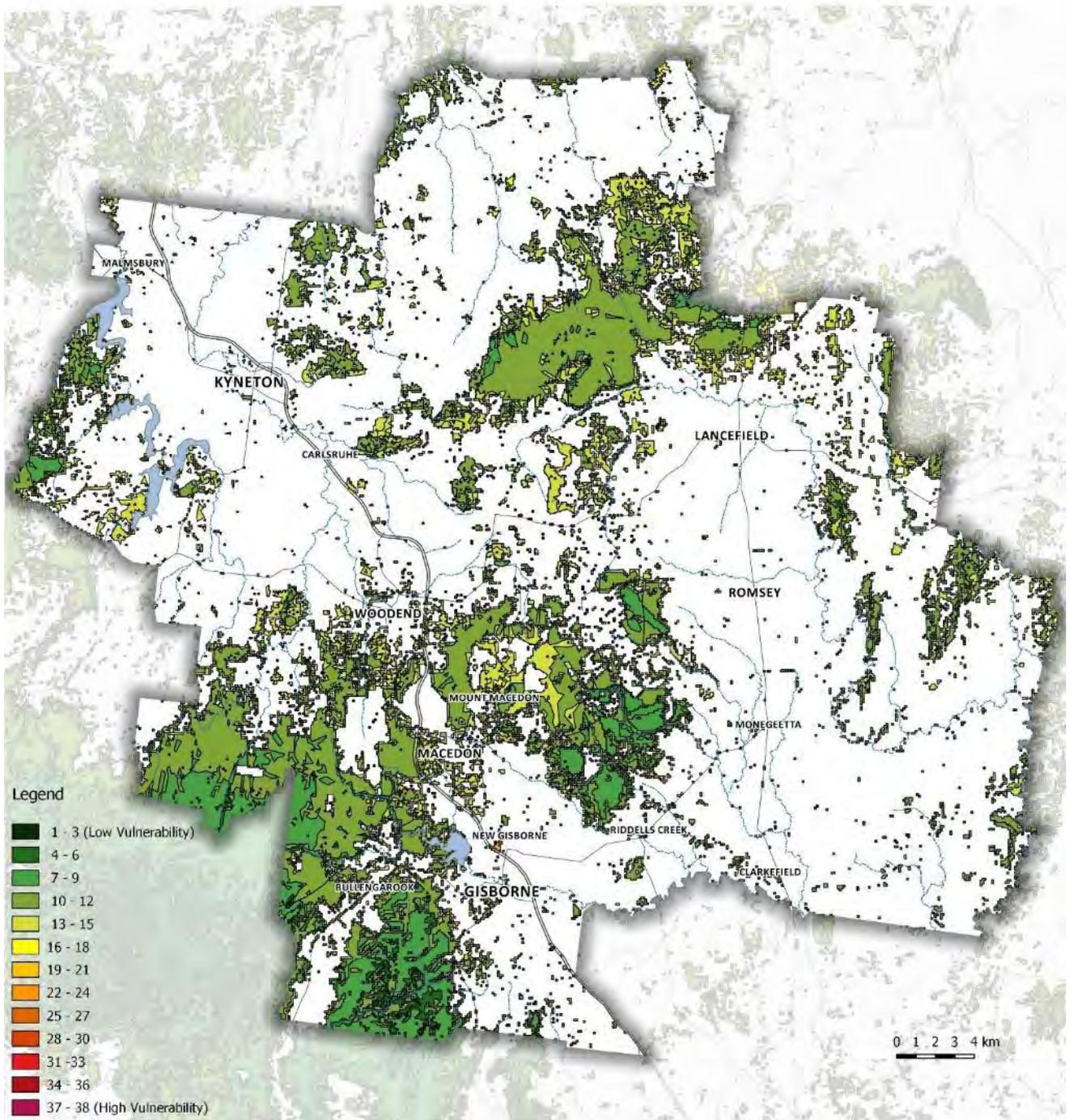


Figure 18: Native Vegetation Vulnerability to climate change. Based on a RCP of 8.5, timeframe - 2050

6.5 Linking Threats to Actions

Table 10 outlines how the management actions address the identified threats.

Table 10: Linking threats to management actions

Key Threat	Management actions
Development	<p>Improvements to planning controls – Page 47 Planning compliance – Page 76 Permanent protection of biodiversity on private land - Page 80 Protection of threatened species and communities – Page 82</p> <p>Conservation on private land – Page 92 Urban biodiversity – Page 94</p>
Private land management practices	<p>Improvements to planning controls - Page 47 Planning compliance – Page 76 Domestic Animal Management – Page 77 Fire and biodiversity – Page 78 Permanent protection of biodiversity on private land - Page 80 Protection of threatened species and communities – Page 82</p> <p>Conservation on private land – Page 92 Community connecting to nature – Page 109</p> <p>7.5 Objective 5: Enhance the Capacity of Community Groups to Undertake Conservation Activities– Page 113</p>
Firewood harvesting	<p>Improvements to planning controls - Page 47 State managed reserves – Page 80</p> <p>Conservation on private land – Page 92 Community connecting to nature – Page 109</p>
Domestic cats and dogs	<p>Domestic Animal Management – Page 77 Protection of threatened species and communities – Page 82 Community connecting to nature – Page 109</p>
Public land management practices	<p>State managed reserves – Page 80 Protection of threatened species and communities – Page 82</p> <p>7.5 Objective 5: Enhance the Capacity of Community Groups to Undertake Conservation Activities– Page 113</p>
Recreational activities on public land	<p>State managed reserves – Page 80 Community connecting to nature – Page 109</p>
Weeds	<p>State managed reserves – Page 80 Weeds and pest animal management – Page 86</p> <p>Bushland reserve management – Page 87</p> <p>Roadside management – Page 91</p> <p>Conservation on private land – Page 92</p> <p>7.5 Objective 5: Enhance the Capacity of Community Groups to Undertake Conservation Activities– Page 113</p>

Pest animals	State managed reserves – Page 80 Bushland reserve management – Page 87 Conservation on private land – Page 92 7.5 Objective 5: Enhance the Capacity of Community Groups to Undertake Conservation Activities– Page 113
Problem wildlife	Bushland reserve management – Page 88 Conservation on private land – Page 92 8.1 Biodiversity Monitoring Program – Page 117
Fire prevention works	Fire and biodiversity – Page 79 Bushland reserve management – Page 87 Roadside management – Page 91 Conservation on private land – Page 92
Planned burns	Fire and biodiversity – Page 79 State managed reserves – Page 80 Bushland reserve management – Page 87
Climate Change	Climate change responses – Page 95 Landscape connectivity plan – Page 96

7. Management Actions

7.1 Objective 1: Protect Existing Biodiversity and Native Vegetation

Improvements to planning controls

Planning plays an important role in achieving biodiversity conservation outcomes. Planning assists in managing uses and development to avoid or minimise impacts on biodiversity. State planning policies and regulations apply to native vegetation clearance across the state. Local environmental planning policies and controls also apply in some areas aimed at protecting specific species, sites, and areas with high biodiversity values.

Outlined in Section 6, threats to biodiversity associated with the use and development of land include:

- **Grazing** - Removal of native understorey, compaction of soil, erosion of river banks and contamination of waterways.
- **Intensive farming** – Loss of native vegetation for buildings, structures and access ways. Contamination of waterways associated with disposal of effluent.
- **Housing** – Loss of native vegetation for buildings, structures, driveways, effluent fields, gardens and recreation areas and to create defensible space. Introduction of weeds and pathogens associated with human activity. Impacts associated with domestic animals.

Local Planning Policies

Local policy content can be used to assist decision makers with their application of discretion. It can also be used to identify application requirements. To support implementation of this strategy, it is recommended that the Macedon Ranges Planning Scheme be reviewed and revised as necessary to refer to the following matters and achieve the following outcomes (noting that the form and structure of the planning scheme may change as a result of recent State Government planning reforms and as an outcome of Council's Planning Scheme Review):

- Refer to the biolinks identified in this strategy and provide policy direction for their protection and enhancement.
- Emphasise the importance of remnant vegetation across the shire, including scattered trees, grasslands and "habitat stepping stones" in providing core habitat as well as functional landscape connectivity (as discussed in the Landscape Connectivity Plan section of this strategy).
- Require a land management plan to be submitted with permit applications or as a permit condition for a change of use or new development in proposed biolink areas to facilitate conservation and revegetation that furthers the biolink objectives.
- Require a land management plan to be submitted with permit applications or as a permit condition for a change of use or new development within the Rural Conservation Zone to mitigate any environmental impacts and achieve the conservation outcomes envisaged by the zone.
- Prioritise the use of locally native species as wind breaks and along property boundaries
- Clarify that achieving a net conservation or biodiversity benefit is the priority in the Cobaw Biolink and across the Rural Conservation Zone in general.
- Ensure the transfer of waterway corridors and appropriate buffer areas to public ownership and management as a part of new subdivisions.
- Protect paddock trees, including dead trees that have habitat value
- Re-enforce the significance of dead vegetation
- Highlight the habitat values of features such as exposed rocks, logs, fallen timber and leaf litter.
- Ensure all new subdivisions seek to improve native vegetation condition and implement water sensitive urban design to reduce nutrient run-off into urban waterways.
- Promote the use of locally native species as street trees in new subdivisions

Recommendation for Local Planning Policies

- Review the local policy content within the Macedon Ranges Planning Scheme to investigate the inclusion of the policy directions listed above.

Zones

The following zones apply to the majority of the rural land across the shire and have been considered as part of the Biodiversity Strategy:

- **Public Conservation and Resource Zone (PCRZ)** - The primary purpose of the PCRZ is to protect and conserve the natural environment and natural processes that occur on public land.
- **Public Park and Recreation Zone (PPRZ)** - The primary purpose of the PPRZ is to provide for public recreation and open space.
- **Farming Zone (FZ)** - The primary purpose of the FZ is to provide for farming and agriculture. As a result, most traditional farming practices, along with the associated development and vegetation removal, is "as of right" – i.e. it does not require planning permission.
- **Rural Conservation Zone (RCZ)** - The primary purpose of the RCZ is to protect and enhance the natural environment, natural resources, landscape values and biodiversity. Agriculture is allowed in this zone provided it is consistent with the environmental and landscape values of the area. As a result, a broader suite of agricultural and rural industry uses are either "permit required" or "prohibited".
- **Rural Living Zone (RLZ)** - The primary purpose of the RLZ is to provide for residential use in a rural environment. As a result, dwellings are "as of right" provided the land meet's the minimum lot size for a dwelling specified. Agriculture and a range of other rural industries are permitted in this zone provided the site has capacity to support the use and the use does not adversely affect the amenity of surrounding land.

In general, planning zones manage the use and development of land while overlays manage development only and do not control use. This means that overlays are not generally effective at mitigating threats to biodiversity associated with the use of land.

Table 11 provides an overview of the key differences between the zones applied to private land in rural areas in terms of allowable uses and native vegetation removal.



Table 11: Planning permit requirements for Farm, Rural Conservation and Rural Living Zones.

Uses	Planning permit requirements		
	FZ	RCZ	RLZ
Agriculture	As of right	Permit required	Permit required
Poultry Farm	As of right (up to 100 chickens)	As of right (up 100 chickens)	As of right (up to 100 chickens)
Bed and Breakfast	As of right (subject to conditions)	As of right (subject to conditions)	As of right (subject to conditions)
Dwelling – lots less than 40ha	Permit required	Permit required	As of right (different min. lot sizes apply)
Dwelling – lots over 40ha	As of right	Permit required	As of right
Primary produce sales	As of right (subject to conditions)	Permit required	Permit required
Racing dog training	As of right	Permit required	Permit required
Rural industry	As of right (subject to conditions)	Permit required	Permit required
Rural store	As of right (subject to conditions)	Permit required	Permit required
Timber production	As of right (subject to conditions)	Permit required	Permit required
Primary school	Permit required	Permit required	Permit required
Secondary school	Permit required	Permit required	Permit required
Restaurant	Permit required	Permit required	Permit required
Winery	Permit required	Permit required	Permit required
Warehouse	Permit required	Prohibited	Prohibited
Intensive animal production	Permit required	Prohibited	Prohibited
Place of assembly	Permit required	Prohibited	Permit required
Abattoir	Permit required	Prohibited	Prohibited
Retail (<i>other than Landscape gardening supplies, Market, Primary produce sales and Restaurant</i>)	Prohibited	Prohibited	Prohibited (some exceptions apply)
Office	Prohibited	Prohibited	Prohibited
Removal of native vegetation – CI 52.17 (native veg) and CI 52.48 (bushfire exemptions)			
For a dwelling	As of right (subject to conditions)	Permit required	Permit required
For buildings and works associated with agriculture, including a dam or access way	As of right (subject to conditions)	Permit required	Permit required
For defensible space in a BMO	As of right (subject to conditions)	Permit required	As of right (subject to conditions)

Farming Zone Investigation Areas

The Farming Zone covers a large proportion of the shire. As identified above, the primary purpose of the Farming Zone is to facilitate agriculture, including grazing. As such, most agricultural uses do not require planning permission. In addition, a number of exemptions apply to removal of native vegetation in the Farming Zone if the removal is associated with an agricultural use or development. These provisions within the Farming Zone have the potential to compromise the biodiversity values of land with remnant or intact native vegetation.

Analysis has identified four high value conservation areas where there is considered to be a mismatch between the land's environmental characteristics and its inclusion in the Farming Zone. These areas are shown in Figures 19 and 20 and are considered high value for the following reasons:

- They support significant large stands of intact remnant native vegetation
- The native vegetation performs an important biodiversity function supporting landscape connectivity
- The areas support rare or threatened species or vegetation communities
- Most areas adjoin public reserves and / or large patches of intact remnant native vegetation

Much of the land shown in Figure 20 contains intact, dense native vegetation where traditional grazing would not be possible without loss of biodiversity assets through large scale clearing.

The appropriateness of the current zoning of the land will be considered in the Council's Farm Zone Strategy.

When considering the appropriate zone, it is recommended that the following matters should be considered in order to protect the conservation values of these sites:

- Does the zone enable grazing uses to be assessed through the planning permit application process?
- Does the zone enable grazing to be limited to suitable locations?
- Does the zone ensure *all loss* of native vegetation, including loss associated with farming activities, is assessed through the planning permit application process?
- Does the zone ensure permitted loss of native vegetation is offset, facilitating achievement of a "no net loss" in biodiversity in accordance with State Government planning policy and *Protecting Victoria's Environment – Biodiversity 2037*?
- Does the zone enable Council to require the preparation of a Land Management Plan as required to help guide sustainable land management and conservation outcomes on the site?

Should any zone changes occur, this will only affect new uses and works proposed after any change in zone comes into effect. All existing uses which are currently occurring lawfully will be able to continue.

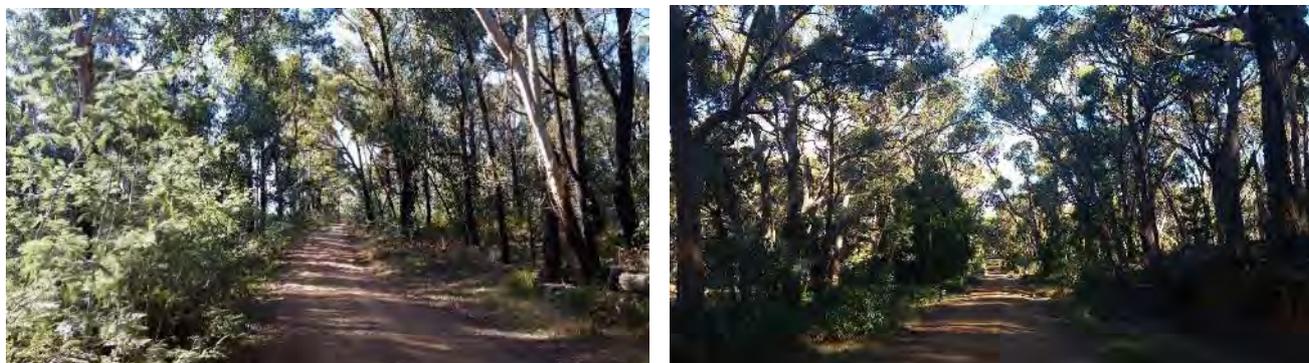
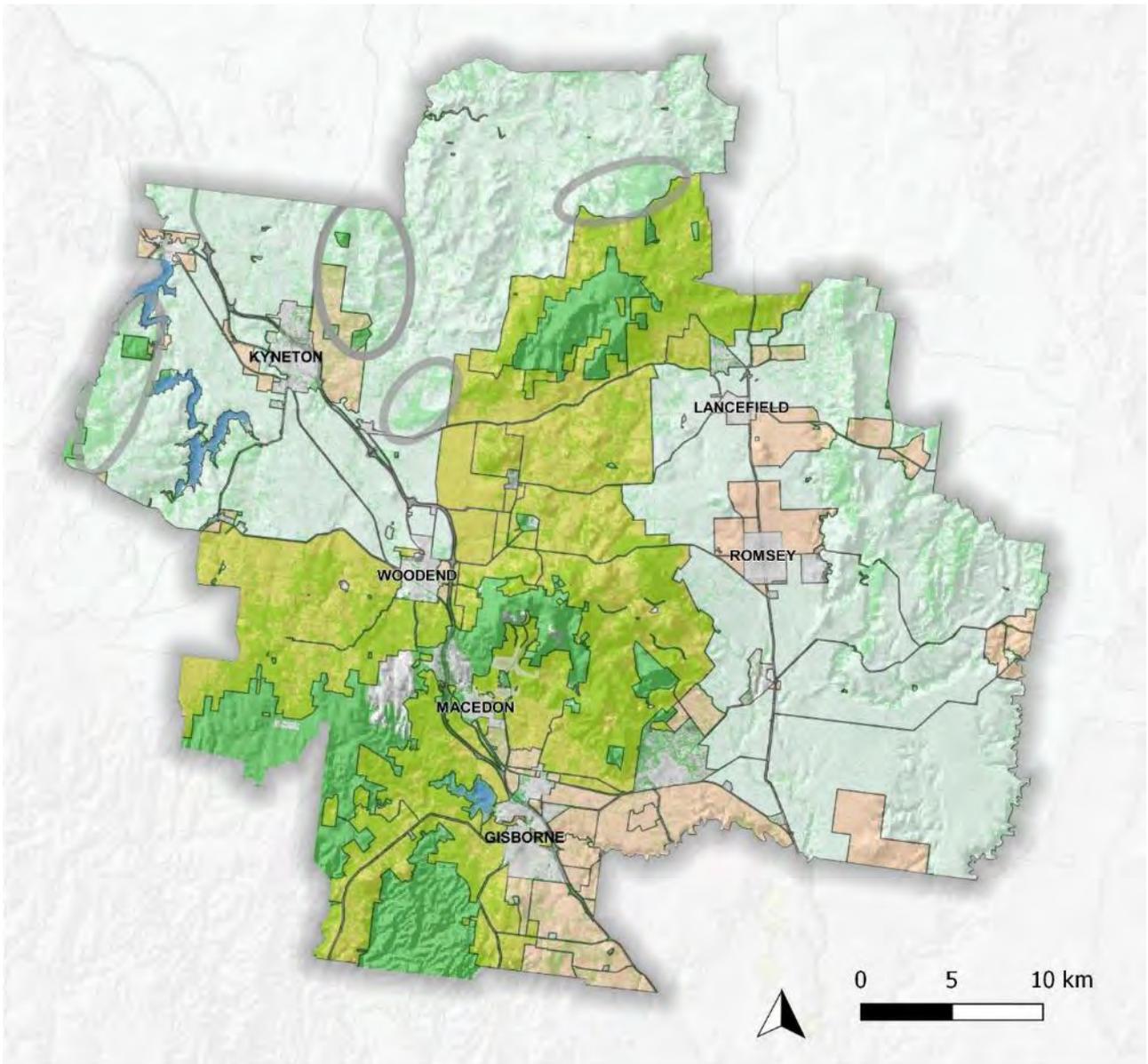


Figure 19: Current Farming Zone Land - Kitchenhams Road, Benloch on left, Salisbury Road, Lauriston on right.



Legend

- Farming Zone (FZ)
- Public Conservation and Resource Zone (PCRZ)
- Public Park and Recreation Zone (PPRZ)
- Rural Conservation Zone (RCZ1)
- Rural Living Zone (RLZ1)
- Farm Zone Investigation Areas
- Native Vegetation

Figure 20: Proposed areas for Farming Zone investigation

Bushland Reserves

DELWP's *Planning for Biodiversity, December 2017* guidance note advises that reserves established for conservation purposes should be zoned PCRZ. As such, it is recommended that most Council managed bushland and conservation reserves be zoned PCRZ. In some cases application of Vegetation Protection or Environmental Significance Overlays may be appropriate as well to identify and ensure protection for specific threatened species or communities, or to recognise the contribution the site makes to an existing or proposed biolink.

Table 12 provides an overview of the planning zones and overlays applicable to Council managed bushland reserves and outlines some recommended changes. These changes will not impact on the current uses of the reserves. In both zones uses conducted by or on behalf of the public land manager do not require planning permission. Uses conducted by other individuals or organisations either require planning approval or are prohibited.

Table 12: Zoning for Macedon Ranges Shire Bushland Reserves.

Reserve	Current Zoning and Overlays	Recommendation
Hobbs Road	PUZ6, ESO5, WMO, EAO	Rezone to PCRZ Include in new VPO (Wombat-Pyrete Biolink)
UL Daly Nature Reserve	PCRZ, DCP02	No change
Mount Gisborne Bushland Reserve	PPRZ, SLO2	Rezone to PCRZ Apply new VPO (Scoria Cone Woodland)
Gisborne Racecourse Marshlands Reserve	PCRZ, DCPO2	Apply new ESO (Plains Sedgy Wetland)
Magnet Hill	RLZ2, SLO2, DCPO2	Rezone to PCRZ
Malmsbury Common	Main area: PPRZ, LSIO, EMO1, HO148, ESO4 North side: RLZ5, EMO1, HO148, ESO4	Rezone to PCRZ (entire site) Include in new VPO (Upper Coliban Biolink)
Browning Street Conservation Reserve	LDRZ, RO13, VPO1, ESO4	Rezone to PCRZ
Woodend Grasslands	PCRZ, VPO3, ESO4	Review VPO3
Hanging Rock	PCRZ, WMO, ESO4, SLO1, HO88 East paddock- PPRZ, WMO, SLO1, VPO8, ESO4	Extend VPO4 (Cobaw Biolink) over Reserve.
Black Hill Reserve	PCRZ, WMO, SLO1, ESO4	Include in new VPO (Kyneton Woodland Biolink)
Bald Hill Bushland Reserve	PPRZ, SLO1, WMO, EAO, ESO4	Rezone to PCRZ Include in new VPO (Kyneton Woodland Biolink)
Stanley Park	PPRZ, SLO1, WMO, ESO5	Rezone to PCRZ Extend VPO9 over the site
Barringo Reserve	PPRZ, SLO1, WMO, ESO5	Rezone to PCRZ Extend VPO9 over site
Sandy Creek Bushland Reserve	PUZ6, DPO12, WMO	Rezone to PCRZ

Land Management Plan Requirements

Landholders within the Farm or Rural Conservation Zone who are developing or constructing a dwelling are required to prepare a property management plan as part of a planning permit application or as a condition of the permit. Council's current Property Management Plan template includes the following requirements:

- Analysis of the site's existing uses, infrastructure, natural features and pest plant and animal hot spots
- Overview of the proposed uses and activities
- Preparation of a Weed Management Plan
- Preparation of a Pest Animal Management Plan
- Preparation of a Revegetation List

While the current template provides a good basis for managing threats, the sections on native vegetation protection and enhancement could be expanded. It is also recommended that the template highlight the role of the property in landscape connectivity, and include a perpetual action plan with 5 and 10 year goals and a monitoring program to be implemented by the landholder.

It is possible to ensure ongoing implementation of property and land management plans by registering them on the Certificate of Title for the property. This can be achieved via a Section 173 Agreement with Council. This approach ensures future land owners are aware of the land management requirements for the property. It also ensures Council is able to require implementation of land management plans if this is not occurring. This is particularly important where the implementation of specific land management practices such as fencing off waterways or revegetation are a condition of approval for a specific use.

It is recommended that all Land Management Plans that form part of an approved use or development be registered on title via a Section 173 Agreement. Further discussion about land owner engagement and ensuring compliance with land management plans is provided at Section 7.2 – Conservation on Private Land.

Vegetation Protection Overlays

The Macedon Ranges Planning Scheme currently contains nine Vegetation Protection Overlays (VPOs). Some of these overlays apply to a specific species in a discreet location. Others apply to broad areas and aim to protect and enhance biodiversity at a landscape scale. Many of these overlays were applied many years ago and were based on mapping which may now be outdated.

The primary purpose of the Vegetation Protection Overlay is to protect areas of significant vegetation. Consequently, the VPO triggers a planning permit for vegetation removal (native and/or non-native depending on the purpose of the overlay). It does not trigger a permit for other buildings and works. According to DELWP's *Planning for Biodiversity, December 2017* guidance note, the VPO should be used in:

“areas of native vegetation where that the local government has identified in its MSS as a priority for retention, as habitat or to enhance wildlife corridors through links with other patches of native vegetation.”

An overview of VPOs currently in the Macedon Ranges Planning Scheme is provided below.

It should be noted that many VPOs in the Macedon Ranges Shire were applied before the current state wide native vegetation planning provisions were introduced as Clause 52.17. This clause establishes broad reaching planning permit and offset requirements for native vegetation removal across Victoria. Given the existing permit requirements of Clause 52.17, a Vegetation Protection Overlay is beneficial in areas where Council wishes to “over-ride” the exemptions under Clause 52.17 and provide additional policy support to achieve a conservation outcome. These circumstances include:

- Areas that support native vegetation where most lots are less than 0.4ha - *Clause 52.17 includes an exemption for native vegetation removal on lots less than 0.4ha.*

- Native vegetation within the Farming Zone - *Clause 52.17 exempts vegetation removal associated with a dwelling, the creation of defensible space and agricultural uses and infrastructure.*
- Areas where the significance or role of the native vegetation is not self-evident and additional policy guidance is required to assist with the application of discretion.

The above matters were taken into account when considering what changes are required to the existing VPOs and what new VPOs may be appropriate.

When reviewing the VPOs in more detail as recommended in the Strategy, all elements of the relevant schedules will need to be reviewed to ensure the statement of significance, the vegetation protection objective, the permit and application requirements and the decision guidelines align with the intention of the overlay.

VPO1 Black Gums

Current provisions

Vegetation protection objective to be achieved:

- *To protect all remnant Black Gums.*
- *To conserve the habitat and environs of this species of eucalypt.*

A permit is currently required to remove **remnant Black Gums** only.

Discussion

The Black Gum is a highly restricted species within Victoria, occurring only in Macedon Ranges region. It is listed as vulnerable under the EPBC Act, and is listed under the FFG Act as endangered in Victoria.

The current extent of VPO1 occurs at 25 locations over a total area of 175ha. All of the VPO1 areas are within 4km of Woodend with the majority focused along Slatey Creek and Five Mile Creek. The VBA contains 54 records for Black Gum, of which 87% are located within the current extent of the VPO1. Other known populations occur along Slatey Creek and at Hanging Rock are not covered by the current VPO. This discrepancies are shown in Figure 21.

Suggested changes to VPO1

- Review and document the location and extent of Black Gum populations in the shire, including ground-truthing via site assessments.
- Modify the mapping of VPO1 based on the review.



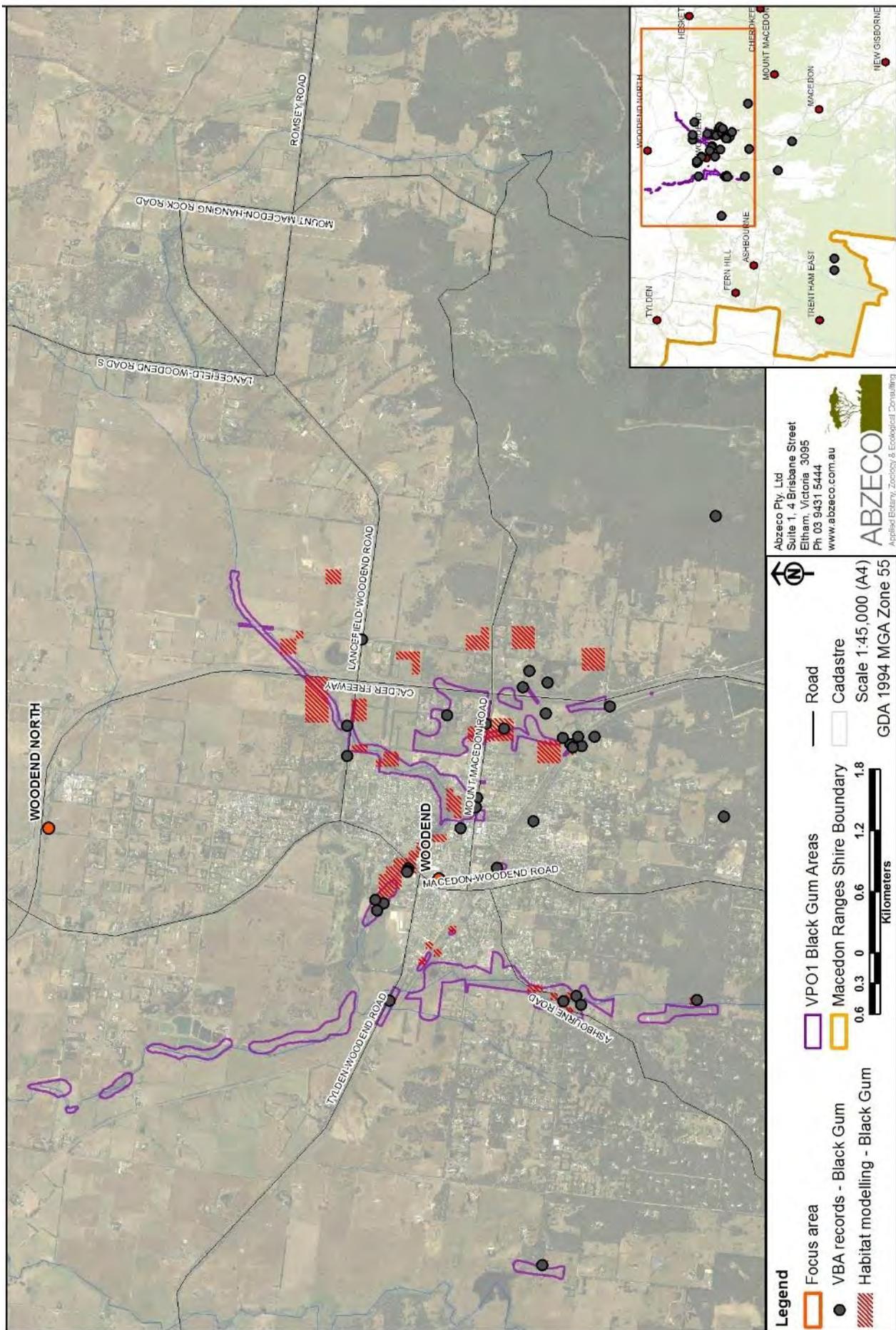


Figure 21: VPO 1 Black Gum Areas

VPO2 Roadside Vegetation

Current provisions

Vegetation protection objective to be achieved:

- *To protect areas of significant remnant vegetation located along roadsides throughout the municipality.*

A permit is currently required to remove **any vegetation**.

Discussion

Roadside vegetation plays an important role as some of the only native vegetation in an otherwise cleared landscape. Roadside vegetation also provides important wildlife habitat.

It is unclear of the specific criteria originally used to apply VPO2 shown in Figure 22. It would appear that the VPO was applied to roadsides classified as having “high” and “medium” conservation value based on assessments and mapping conducted prior to 1999 (AVS 2004).

Between 2006 and 2008 vegetation along most of the roadsides in Macedon Ranges Shire was surveyed and scored according to prescribed criteria developed by the North Central Catchment Management Authority. These assessments were repeated in 2016-18.

Based on their score, each roadside has been assigned a conservation value of very high, medium or low. In general, these categories reflect the following characteristics:

- **Very high value** – Almost no soil disturbance, less than 5% weed cover, natural regeneration present and native ground flora, shrubs and canopy species present.
- **High conservation value** – Minimal soil disturbance, native ground flora present, less than 25% weed cover, large old trees may be present, range of habitat values present such as woody debris, tree hollows or surface rock.
- **Medium conservation value** – low to moderate soil disturbance, some indigenous ground flora present, either shrub layer or canopy species present, exotic species present, but not dominating, large old trees generally absent and some, but not all habitat values present.
- **Low conservation value** – Substantially disturbed, high cover / dominance of exotic species such as pasture grasses, generally no native ground flora or shrub layer present, some large old trees present.
- **Special** – Roadsides that may require special management such as grasslands, wetlands, locations where state or federally listed species are present or locations that support grassy weed species.

See Figure 17 for current roadside conservation values.

The application of VPO2 does not reflect more recent assessments of roadside conservation values. As such, it is recommended that the location and extent of the VPO be reviewed to cover roadsides assessed more recently as having “very high”, “high” or “medium” conservation value.

The key value in this VPO is to raise awareness about conservation values on our roadsides. It is noted that planning permit is required for the removal of all native vegetation anyway, regardless of the presence of a VPO. However, exemptions apply to vegetation removal associated with road safety and maintenance works undertaken by or on behalf of the road authority (VicRoads and Council). These exemptions are documented in the *Road safety exemption procedure for the removal of native vegetation* prepared by the State Government.

Suggested changes to VPO2

- Modify VPO2 to ensure it applies to roadsides assessed to be of very high, high and medium conservation value.
- Remove VPO2 from roadsides assessed to be of low conservation value.
- Apply the permit trigger to removal of native vegetation only.

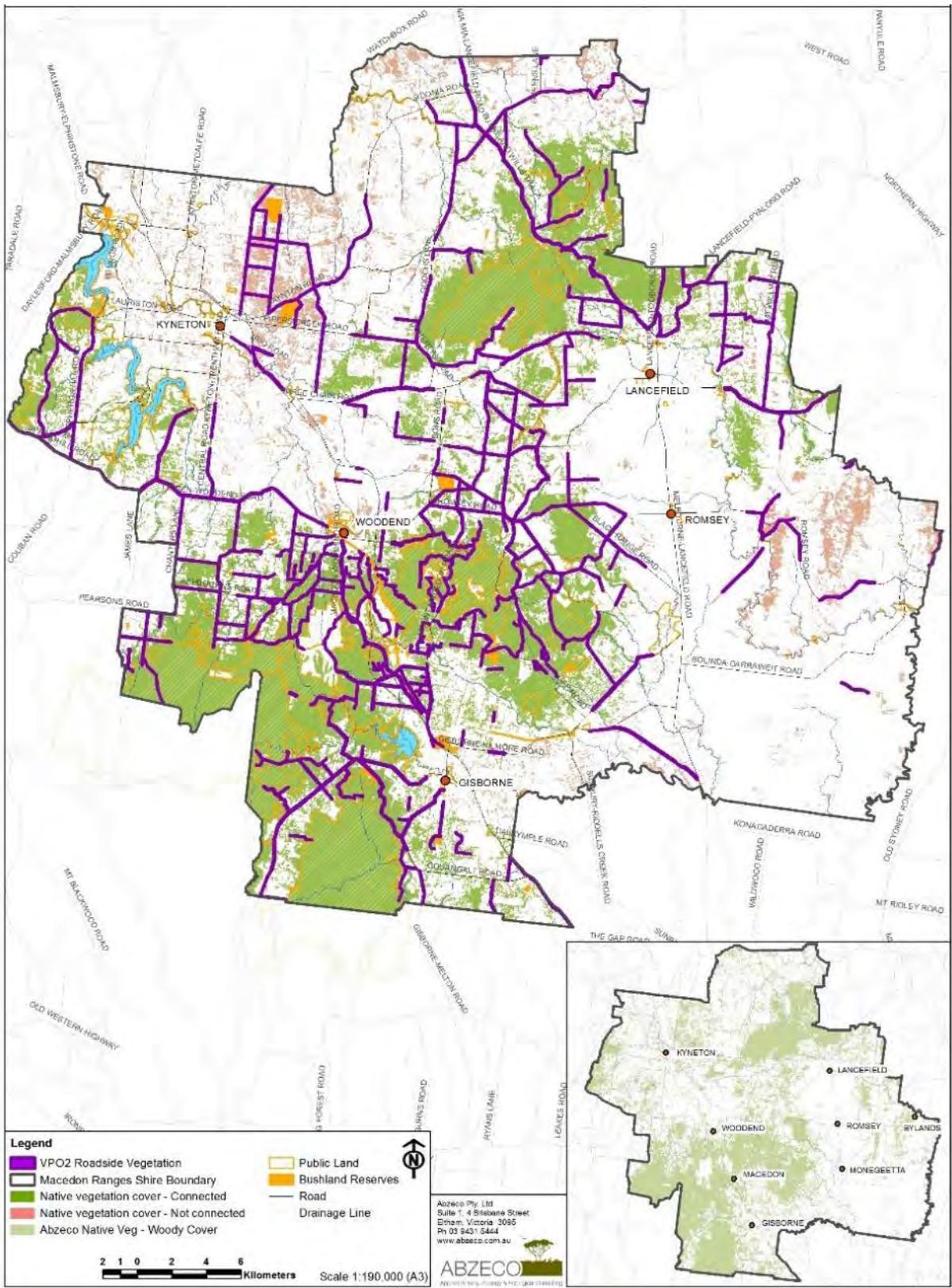


Figure 22: VPO 2 Roadside Vegetation

VPO3 Native Grassland

Current provisions

Vegetation protection objective to be achieved:

- To protect the Narrow-leaf New Holland Daisy *Vittadinia muelleri* and Woolly Buttons *Leptorhynchos panaetioides* all native grasslands
- To protect locally significant native grassland species.

A permit is currently required to remove **any** vegetation.

Discussion

This VPO currently covers Woodend Grassland Reserve which has one of the most significant remnant grassland areas within Victoria. The reserve supports intact native grassland dominated by Kangaroo Grass *Themeda triandra* with a rich diversity of grassland herbs, lilies and orchids; some of which are considered rare for the region (Atlas Ecology 2012).

The current extent of VPO3 is not an accurate representation of the location of the Grassland as mapped by Atlas Ecology (2012) and shown in the Environmental Management Plan for the Woodland Grassland Reserve (Figure 23). Slight modifications to the current extent of VPO3 will need to be undertaken to provide a true representation of the native grassland.

The title of the VPO3 is suggestive of the inclusion of all 'Native Grassland Areas', across the Macedon Ranges Shire. However, the statement outlining the scope of the schedule is restricted to Woodend racecourse, of which the Woodend Grassland Reserve is a section

Across the Macedon Ranges Shire, remnant Plains Grassland patches are known to occur on volcanic-derived soils in Woodend North and to the south within the Lancefield, Gisborne and Riddells Creek areas. Valuable grassland remnants are known to occur within these areas where they have been protected from agricultural threats – for example on road and railway reserves, in cemeteries, on rifle ranges, Commonwealth land, and old racecourses. Large areas of private land may support high-quality remnant grassland depending on historic land use activities.

Areas of the Karlsruhe Cemetery (VPO4) supports a remnant native grassland that could be included with VPO3. Kyneton Cemetery, Tylden and Macedon also supports areas of native grassland that could be included in this overlay. These areas require further site assessment and investigation.

It is recommended that the permit requirement applies to removal of **native** vegetation only to ensure the permit trigger reflects the purpose of the overlay.

Suggested changes to VPO3

- Assess the conservation value of other remnant grasslands across Macedon Ranges Shire to consider including them to VPO3. Sites to consider include the grasslands at Hanging Rock and Bald Hill Reserve, along select roadsides and railway reserves and at cemeteries in the shire.
- Reword the scope of the VPO3 to confirm that the VPO applies to a range of native grassland areas.
- Re-align the boundary of VPO3 to ensure it applies to the full extent of the Woodend Grassland Reserve.
- Apply the permit trigger to removal of native vegetation only.

VPO4 Carlsruhe Cemetery

Current provisions

Vegetation protection objective to be achieved

- *To protect the remnant grasslands located within the Carlsruhe cemetery reserve.*

A permit is required to remove **any vegetation**.

Discussion

Carlsruhe Cemetery supports remnant derived grassland and another important ecological vegetation community, EVC 894 Scoria Cone Woodland, that is considered endangered within the Central Victorian Uplands and Victorian Volcanic Plain bioregions. The significant grassland and scoria cone woodland is shown in Figure 24. Opportunity exists to simplify Council's suite of VPOs by including the grassland component of the Carlsruhe cemetery in VPO3 and applying a new VPO for Scoria Cone Woodland to the remaining part of the site.

Suggested changes to VPO4

- Remove VPO4.
- Include the remnant grassland that the cemetery supports into a revised VPO3.
- Develop a new VPO for Scoria Cone Woodland.
- Consider assessing the Scoria Cone Woodland on the adjoining private land for inclusion in the new VPO.



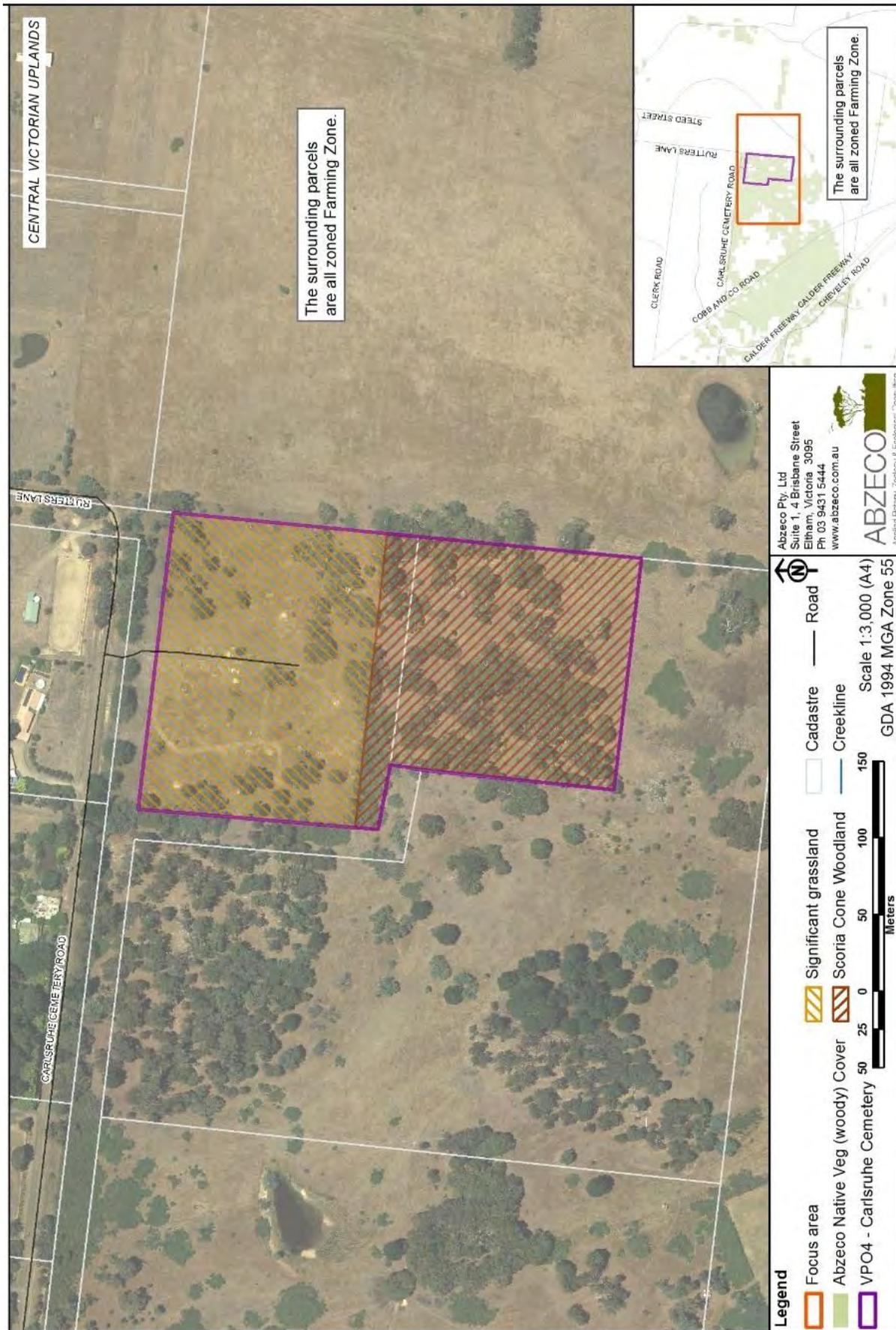


Figure 24: VPO4 Carlsruhe Cemetery – showing significant grassland and Scoria Cone Woodland area.

VPO5 Narrow-leaved Peppermint

Current provisions

Vegetation protection objective to be achieved

- To protect all remnant Narrow-leaved Peppermint gums.
- To conserve the habitat and environs of the Narrow-leaved Peppermint gum.

A permit is required to remove **any vegetation**.

Discussion

Narrow-leaved Peppermint *Eucalyptus radiata* is a relatively widespread and common forest tree in the cooler, higher rainfall regions of central and southern Victoria. The 1ha area covered by VPO5 is located on public land north of Five-Mile Creek and represents a stand of Narrow-leaved Peppermints, shown in Figure 25. The stand is likely to support a number of large-old trees which are of conservation significance. The protected stand currently occurs on public land currently managed by the Woodland Gold Club.

The VBA contains a total of 186 records for Narrow-leaved Peppermint within the Macedon Ranges Shire, recorded from 1975 to 2017. The records are distributed throughout the ranges between the townships of Woodend in the north and Gisborne in the south, extending to the western boundary of the Shire. This suggests Narrow-leaved Peppermint is not a species of conservation significance, nor is it considered to be locally significant in Macedon Ranges Shire.

Suggested changes to VPO5

- Conduct a field assessment to verify that the single mapped polygon defining the VPO5 area, currently supports a stand of Narrow-leaved Peppermint and has no other significant conservation values.
- If no other significant conservation values or species are present, remove VPO5.



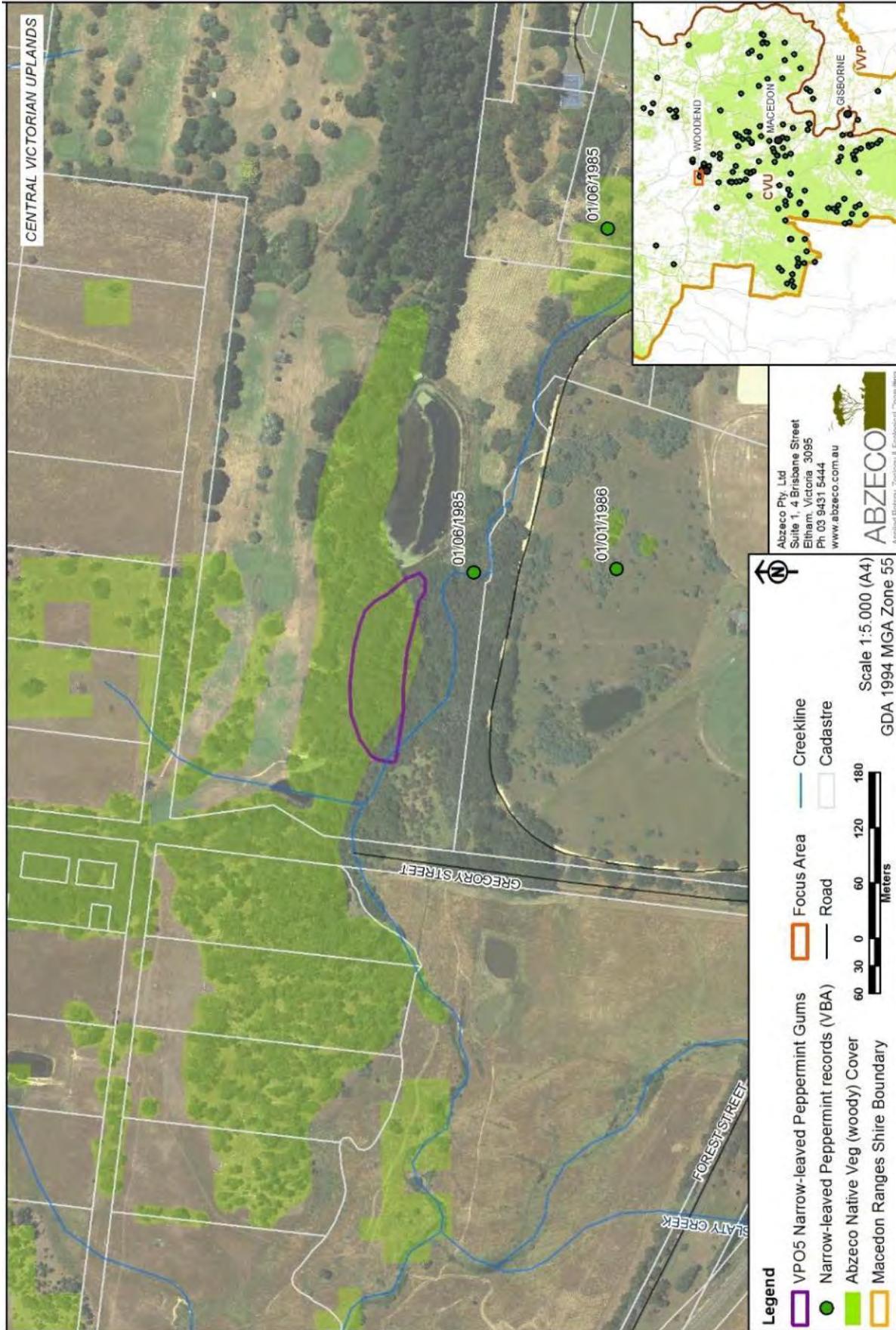


Figure 25: VPO5 - Narrow-leaved Peppermint

VPO6 Wildlife Corridors

Current provisions

Vegetation protection objective to be achieved:

- *To protect all significant vegetation for biodiversity.*
- *To conserve the habitat and environs of identified wildlife corridors.*

A permit is required to remove **any vegetation**

Discussion

VPO6 currently applies to a select number of roadsides (Figure 26), most of which are also within VPO2. As such, VPO6 and VPO2 are both seeking to protect significant roadside vegetation for its biodiversity and habitat value. This duplication of provisions is not required.

As such, VPO6 as it currently exists is not required.

A wildlife corridor is not just limited to the significant vegetation along the roadsides, but can also include other landscape elements such as native vegetation along waterways, railway corridors, fence lines or potentially any patch of native vegetation that acts as a linear 'stepping stone'. These areas are likely to be covered by the new VPO areas proposed for the shire's biolinks, an updated roadside vegetation VPO2 and the ESOs proposed for significant waterways.

Suggested changes to VPO6

- Remove VPO6 Wildlife Corridors
- Ensure all very high, high and medium conservation value roadsides are included in an updated VPO2 Roadside Vegetation.
- Support the application of ESOs along four major waterways within the Macedon Ranges Shire; Campaspe, Deep Creek, Coliban and Jackson's Creeks, by Melbourne Water and Coliban Water.
- Expand the VPO8 Cobaw Biolink or VPO9 Living Forests to cover other significant biolink areas identified in this strategy (Section 7.3) including the Kyneton Woodlands, Upper Coliban, Wombat-Pyrete, Riddells Hills and Mount William Range



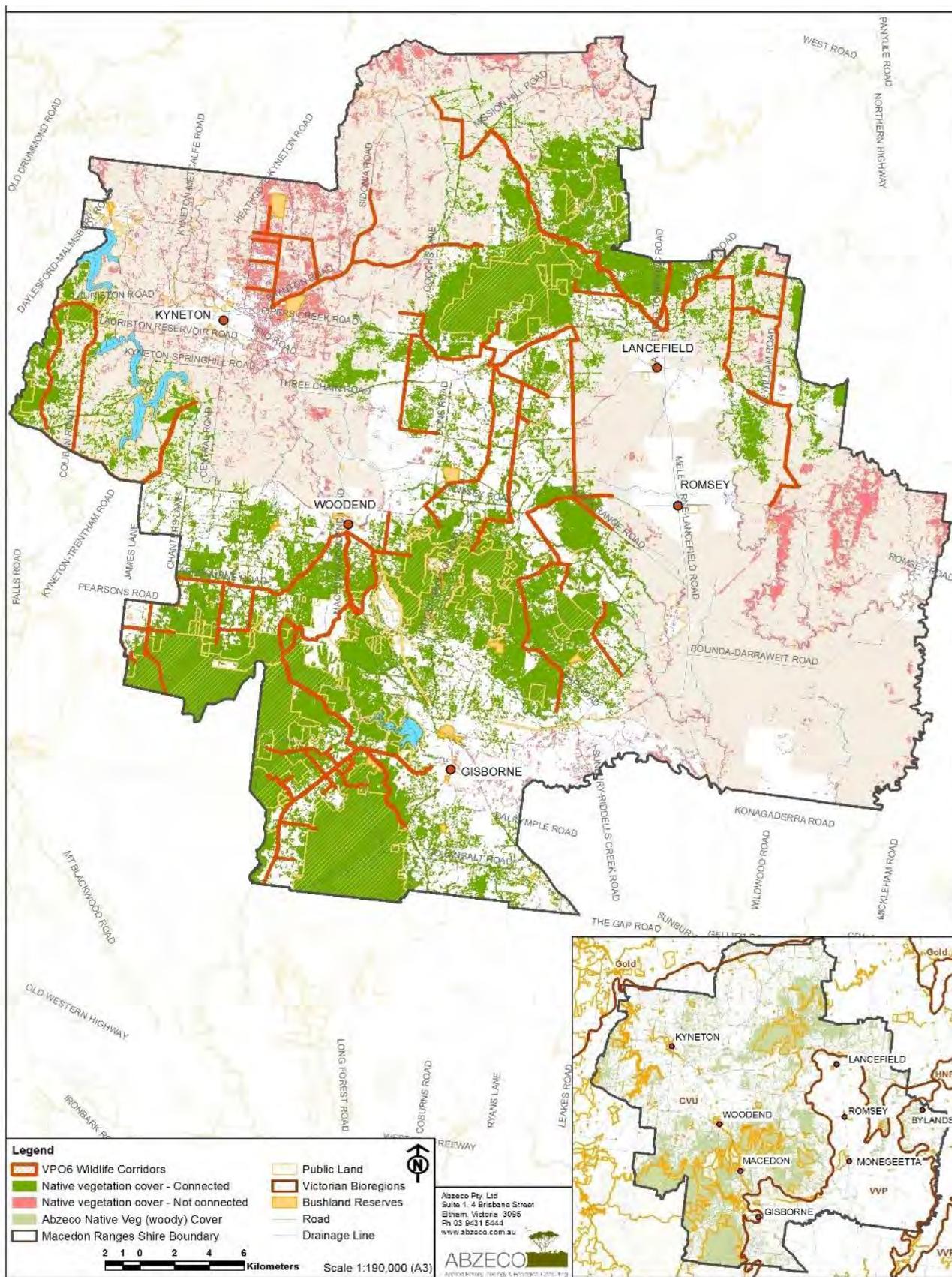


Figure 26: VPO6 Wildlife Corridors

VPO7 Yarra Gums

Current provisions

Vegetation protection objective to be achieved

- *To protect all remnant Yarra Gums.*
- *To conserve the habitat and environs of the Yarra Gum.*

A permit is currently required to remove **remnant Yarra Gum vegetation**.

Discussion

Yarra Gum *Eucalyptus yarraensis* is classified as rare in Victoria (DSE 2013). Remnant stands are located within the vicinity of Woodend township. The VBA contains a total of 19 records for Yarra Gum recorded within the Macedon Ranges Shire, from 1936 to 2011. Most of the VBA records are located within the extent of VPO7 (Figure 27). Several outliers have been recorded near the township of Riddells Creek with one recorded in 2010 along a railway reserve and another 1km out of town recorded in 2007 (this record is unverified). Another group of 6 outliers were also recorded in 2011 east of Trentham East in heavily forested areas.

Most of the natural distribution of Yarra Gum is in Victoria and what remains has been very fragmented by clearing. As the remaining stands of this eucalypt tend to be small pure stands, all known records should be protected. This process will require further ground-truthing.

Suggested changes to VPO7

- Review and document the location and extent of Yarra Gum populations in the shire, including ground-truthing via site assessments
- Determine the most appropriate buffer that is required to achieve adequate protection and apply it to all known locations of Yarra Gum.



Mark Williams, NatureShare

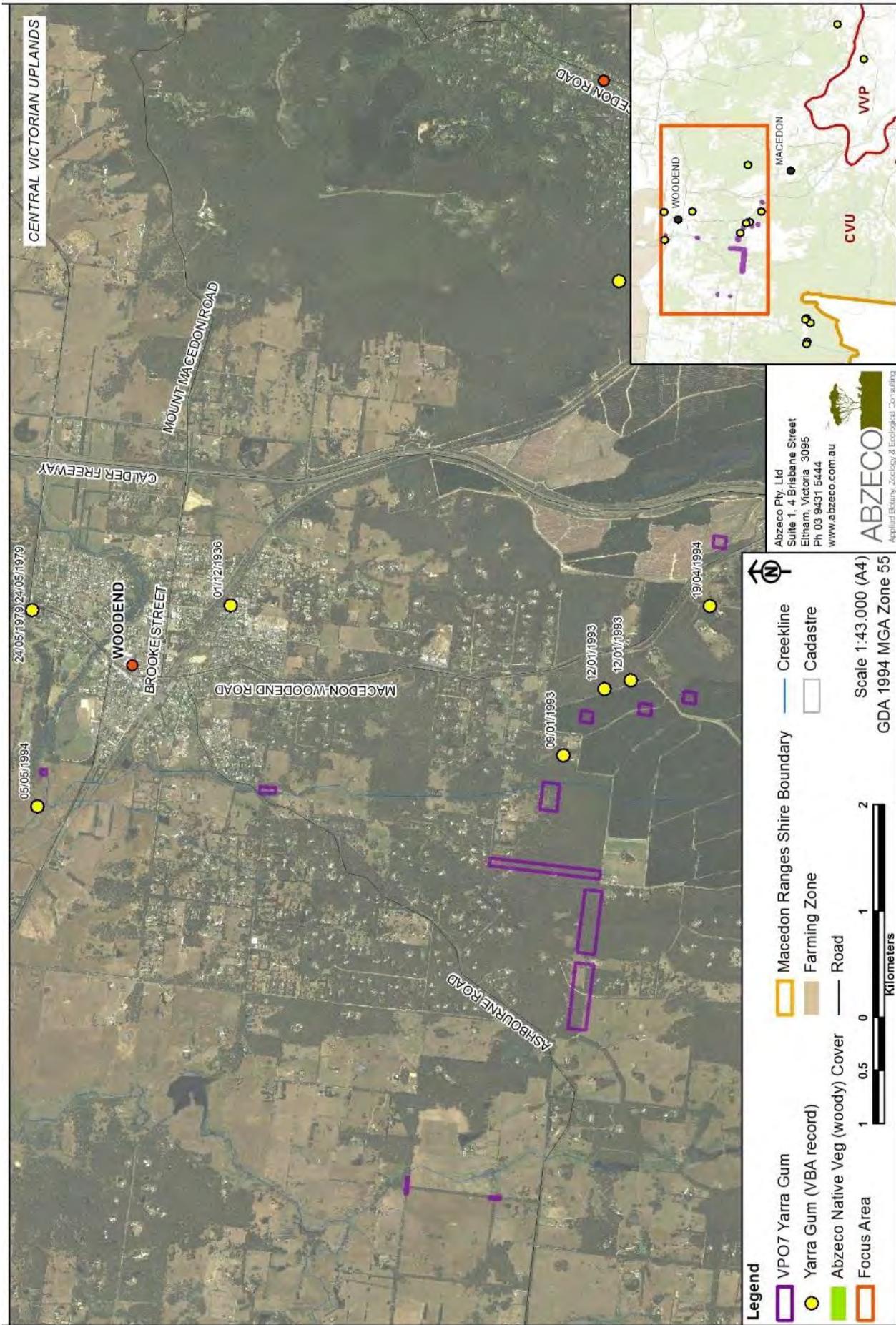


Figure 27: VPO7 Yarra Gum

VPO 8 Cobaw Biolink

Current provisions

Vegetation protection objective to be achieved

- *To protect and enhance all remnant native vegetation for its role in biodiversity and habitat.*

A permit is required to remove any **native vegetation**.

Discussion

The Cobaw Biolink aims to protect and enhance the area between the significant vegetation in the Macedon and Cobaw Ranges (Planning Scheme, Clause 21.05), creating a corridor to strength the connectivity through this fragmented landscape. The Cobaw Biolink VPO is shown in Figure 28.

Analysis has identified significant gaps in its coverage to the north and east of the biolink. These scattered patches of remnant vegetation provide significant stepping stones or landscape elements that should be protected under this biolink overlay.

In addition, the connectivity analysis has highlighted additional areas across the shire that play an important role in landscape connectivity. These biolink areas are not currently covered by a VPO and would benefit from increased protection to ensure no further native vegetation loss.

Suggested changes to VPO8

- Revise the Cobaw Biolink VPO schedule and undertake the necessary research to investigate its application to biolinks in general that cover other significant connectivity areas identify in this strategy (Section 7.3) including the Kyneton, Woodlands, Upper Coliban and Mount William Range
- Ensure VPO8 applies to the extent of the Cobaws Biolink between the Macedon Ranges and Cobaw Ranges. Remove VPO9 in these locations to ensure no duplication of provisions.



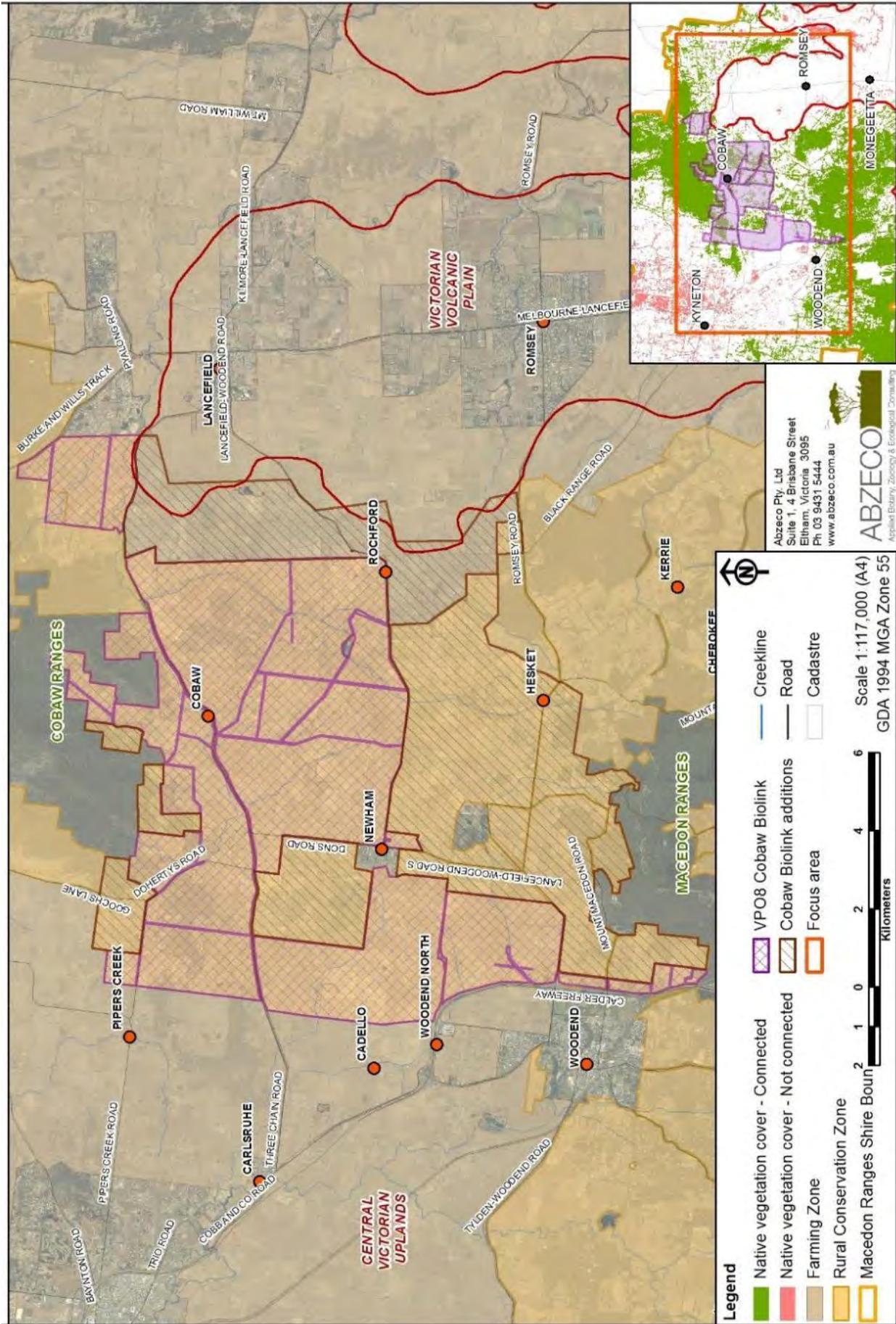


Figure 28: VPO8 Cobaw Biolink

VPO9 Living Forest

Vegetation protection objective to be achieved

- *To protect and enhance all remnant native vegetation for its role in biodiversity, natural resource management, and landscape and character.*

A permit is required to remove **any native vegetation**.

VPO9 provides protection to the vegetation along the Great Dividing Range that extends from the Cobaw Ranges in the north-east of the Shire to Trentham East and Gisborne in the south west. The VPO applies to land zoned Rural Conservation in this location, as seen in Figure 29.

Schedule 9 to the VPO supports vegetation of varying quality, however provides a buffer to more intact patches through the middle which are within State parks and reserves.

The areas protected under VPO9 entwine with areas protected by the VPO8 in order to form a wide corridor to conserve and enhance the vegetation associated with and buffering the Great Dividing Range.

Under VPO9 a permit is required to remove native vegetation, unless it is associated with the collection of firewood for personal use. This exemption is considered to be inconsistent with the intention of the overlay to protect biodiversity. It is noted that, when VPO9 was introduced via Amendment C21 and C48, it was intended that this exemption apply to collection of *fallen* timber only. The exemption was not intended to facilitate lopping or removal of standing trees for firewood.

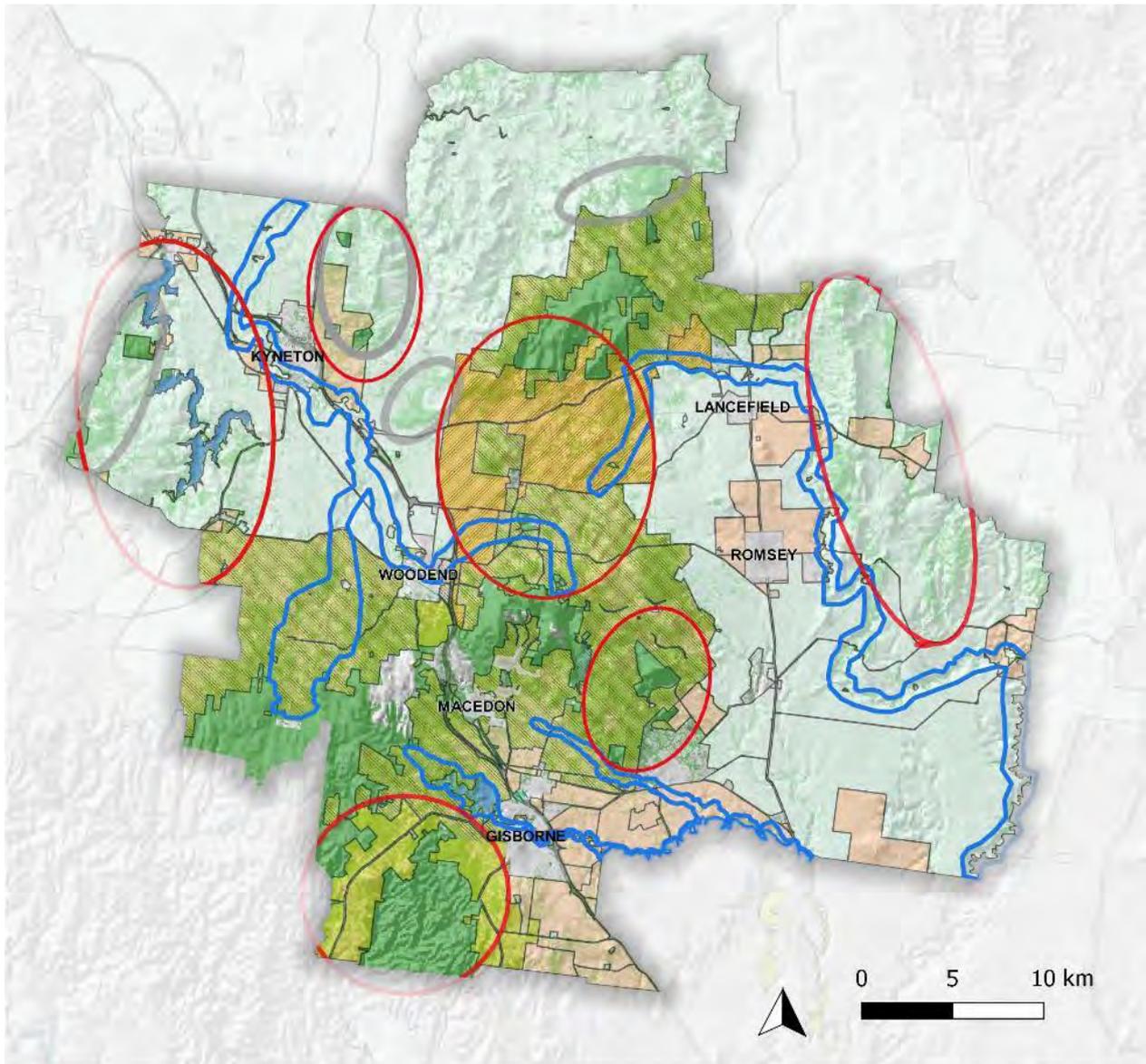
Fallen timber is important habitat and critical for general ecosystem health. Therefore, it is recommended that the permit exemption for the collection of fire wood for personal use be removed with the exemption of the collection of *fallen* timber undertaken in accordance with an approved fire management plan.

Considering the role and intent of VPO9 to protect native vegetation along the Great Dividing Range and adjoining State parks and reserves, the following gaps have been identified which are recommended for inclusion in the VPO:

- Bullengarook – Rural Conservation Zoned land between the Pyrete Range and the Lerderberg State Park
- Gisborne South – Rural Conservation Zoned land adjoining the Pyrete Range
- Woodend – Rural Conservation Zoned land bound by South Road, the Calder Freeway, Sawyers Road and Black Forest Road.

Suggested changes to VPO9

- Review the boundaries of VPO9 to ensure all areas of conservation value buffering the Great Dividing Range are within the overlay, including areas north of the Cobaw Ranges and in and around Bullengarook and the Pyrete Range.
- Ensure no duplication of provisions between VPO8 and VPO9.
- Amend the permit exemption related to collection of fire wood to ensure it only applies to the collection of *fallen* timber associated with an approved fire management plan.
- Consider referencing the Riddells Hills Biolink and the Wombat-Pyrete Biolink in the schedule to VPO9.



Legend

- | | |
|--|-------------------------------|
| Farming Zone (FZ) | Farm Zone Investigation Areas |
| Public Conservation and Resource Zone (PCRZ) | Biolinks |
| Public Park and Recreation Zone (PPRZ) | Waterway Links |
| Rural Conservation Zone (RCZ1) | VPO 8 |
| Rural Living Zone (RLZ1) | VPO 9 |
| Native Vegetation | |

Figure 29: VPOs 8 and 9 and relationship to FZ and RCZ. Proposed biolinks and waterway links.

NEW: VPO covering Scoria Cone Woodlands.

Scoria Cone Woodland is restricted to scoria cones (also known as cinder cones) and adjacent areas across the volcanic plains. The EVC 894 *Scoria Cone Woodland* is classified as endangered within the Central Victorian Uplands and Victorian Volcanic Plain bioregions. This EVC has been heavily cleared across its range for agriculture and intact examples are rare in Victoria. High value remnants of this vegetation community are known to occur in the Carlsruhe Cemetery, the Jim Jim, Mount Gisborne, Mount Bullengarook and along Hennebergs Rd in Newham. Figure 30 shows DELWP’s pre 1750 modelling of where Scoria Cone Woodland may occur.

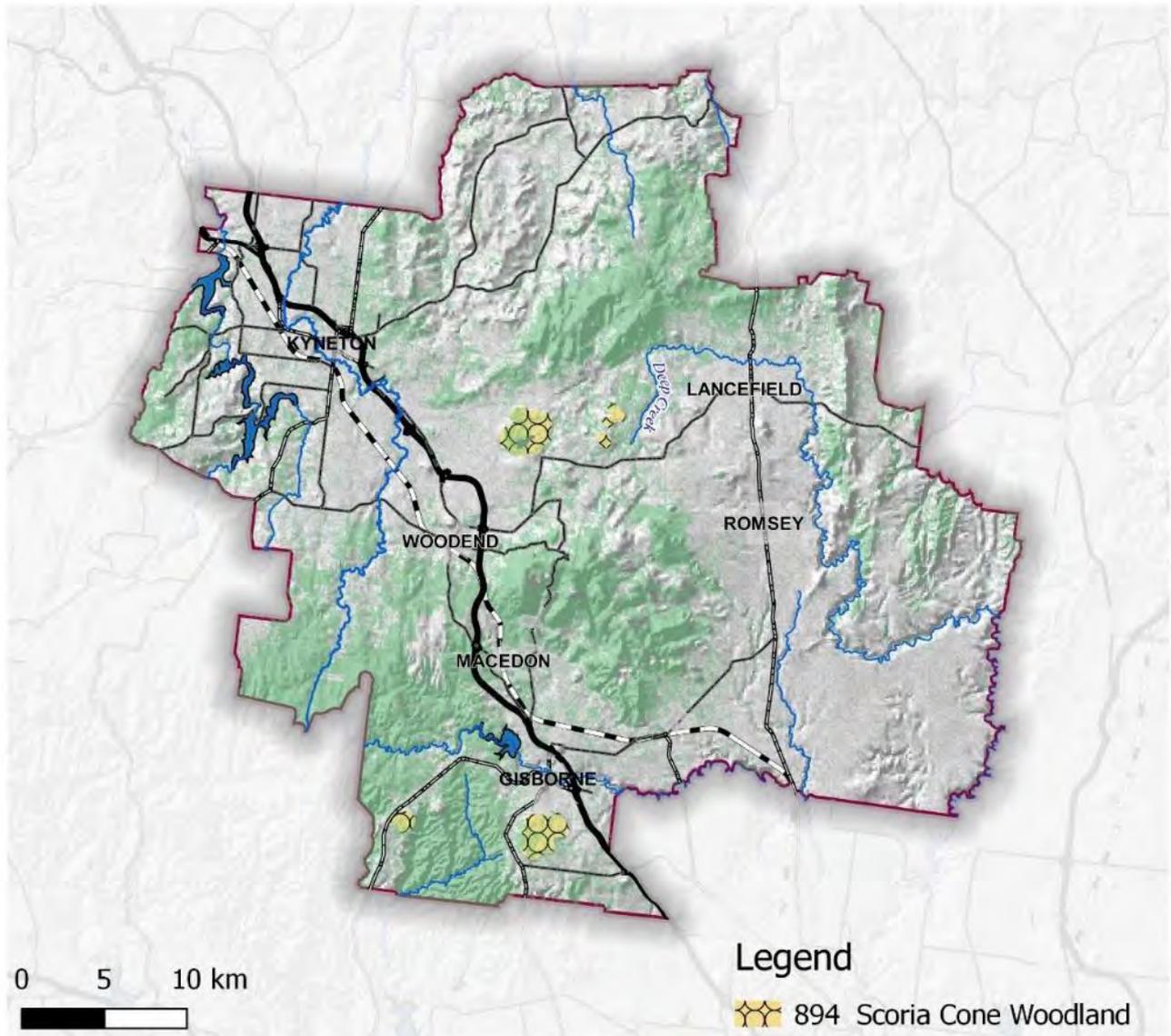


Figure 30: Potential sites for Scoria Cone Woodland requiring investigation.

Recommendations for new VPO: Scoria Cone Woodland
Conduct site assessments as required to confirm the location and condition of existing Scoria Cone Woodlands within the Shire, prioritising Council managed sites.
Create a new VPO for Scoria Cone Woodland to cover all known remnant sites.

NEW: VPO covering Plains Grassy Woodland.

Plains Grassy Woodland (EVC 55) is an ecological community that supports an open, eucalypt woodland with trees up to 15m tall and an understorey dominated by grasses or grass-like herbs with a few interspersed shrubs. Depending on the bioregion where it is found, this EVC tends to be dominated by Manna Gum *Eucalyptus viminalis* subsp. *viminalis* within the Central Victorian Upland bioregion also including Swamp Gum *E. ovata* across colluvial deposits around Newham, whilst in the Victorian Volcanic Plains the dominant eucalypt is River Red Gum *E. camaldulensis*.

The Plains Grassy Woodland EVC is closely associated with the nationally threatened Grassy Eucalypt Woodland community of the Victorian Volcanic Plain (EPBC Act 1999). This community was listed as critically endangered in 2009 (DSEWPaC 2011).

This EVC has been heavily cleared due to its occurrence on the most arable soils, and is now degraded through most of the Macedon Ranges Shire with very few intact remnants remaining. Very small, isolated and fragmented patches are found mostly in the north of the catchment; north of Kyneton and Langley, between Metcalfe and Barfold and some north of Woodend and around Newham, predominately within private land and road reserves.

To determine the extent of Plains Grassy Woodland vegetation in the shire, DELWP's 2005 EVC data layer could be used as a starting point, however this is based on modelling and is not likely to be accurate. Consequently, on-ground assessments will be required. Given Council's limited resources, surveying all private land that may contain Plains Grassy Woodland vegetation is not practical. Instead remnant patches on private land are only likely to be identified when a subdivision, development or a change of use is planned. In these instances, it is recommended that remnant patches of Plains Grassy Woodland be set aside and protected as a part of any subdivision or land management plan. It is recommended that Council maintain a record of these remnant patches and consider applying a VPO to them in the future.

In the short term, it is recommended that Council prioritise identification and protection of this EVC on public land such as roadsides, rail reserves and other open space.

Recommendations for new VPO: Plains Grassy Woodland

Include high quality remnant patches of Plains Grassy Woodland occurring on public land in a VPO.

Ensure remnant patches of Plains Grassy Woodland are set aside or protected as a part of subdivisions, change of use proposals or development applications. Maintain a record of these remnant patches and consider applying a VPO to them in the future.

Environmental Significance Overlays

The primary purpose of the Environmental Significance Overlay (ESO) is to identify areas where development may be affected by environmental constraints and to ensure development is compatible with environmental values. As the purpose of the ESO is broader than the VPO, opportunity exists to use the ESO to trigger a permit for buildings and works, as well as or instead of vegetation removal.

DELWP's *Planning for Biodiversity, December 2017* guidance note, the ESO should be considered in the following circumstances (paraphrased):

- Areas with biodiversity values that are likely to be subdivided into lots less than 0.4ha.
- Important habitat for rare or threatened species that is non-native vegetation, or where no vegetation is present.
- Protection is required from impacts of development other than direct removal of native vegetation – e.g. to control the impacts of biodiversity of earthworks
- Waterways, wetlands, riparian and coastal habitats
- Areas of local importance that would not be protected by Clause 52.17

The above matters were considered when reviewing the relevant existing ESOs in the Macedon Ranges Planning Scheme and determining what changes or new ESOs may be required.

ESO4 and 5: Potable Water Catchments

Environmental Significance Overlays 4 and 5 apply to the potable water supply catchments in the shire. Both overlays trigger a planning permit for removal of any vegetation, including non-indigenous species and environmental weeds. Opportunity exists to narrow the scope of this permit requirement to ensure it is targeted at vegetation removal that may impact water quality and supply, rather than all vegetation removal.

Suggested Changes to ESO 4 and 5

In collaboration with the relevant water authorities, review the vegetation controls / permit requirements currently in place under Environmental Significance Overlays 4 and 5 (ESO4 and ESO5) to ensure only vegetation removal that is likely to affect water quality and supply is assessed under these overlays.

NEW: ESO for Plains Sedgy Wetlands

Plains Sedgy Wetland is a sedge dominated wetland vegetation found on lowland plains. The vegetation community has a conspicuous and potentially diverse herbaceous component, including species characteristically associated with wet sites on fertile soils. It is listed as critically endangered under the EPBC Act as part of the ecological community *Seasonal Herbaceous Wetlands (freshwater) of the Temperate Lowland Plains*.

In the Macedon Ranges Shire, a nationally significant remnant of this vegetation community is found at the Gisborne Marshland Reserve. Inclusion of this site in an ESO is recommended in order to highlight its environmental values and ensure proposals that may impact the site's vegetation, including buildings, works and earthworks, are assessed through the planning process.

Recommendations for new ESO: Plains Sedgy Wetlands

Implement a new ESO covering the Gisborne Marshland reserve to ensure protection for the nationally significant Plains Sedgy Wetlands.

NEW: ESO for Waterways

Protecting waterways and enhancing them as waterway corridors offers multiple benefits for the landscape, biodiversity and connectivity. Waterways often form natural corridors that wildlife follow and with revegetation or further protection of remnant vegetation, the health of creek-line systems are also improved. Melbourne Water and Coliban Water are both in the process of developing an ESO for the Upper Coliban and Deep Creek respectively. Council supports these ESOs acknowledging the important role waterways can play in biodiversity conservation and landscape connectivity.

Applying ESOs to these waterways will ensure works that may impact waterway health or the riparian habitat, including buildings, works and earthworks, are assessed through the planning process.

Recommendations for new ESO: Waterways

Support the application of ESOs covering high value waterways (currently underway with Melbourne Water for Deep Creek, and Coliban Water for Upper Coliban).

Summary of planning scheme recommendations

Table 13 summarises Council's overall recommendations for improving biodiversity conservation in the planning scheme.

Table 13: Summary of planning scheme recommendations for biodiversity assets

Biodiversity Asset	What we want to achieve	Suggested planning tools
Core habitat, high quality patches and areas of strategic biodiversity value	<p>Protect remnant vegetation from threatening processes – e.g. grazing, stock access and degradation associated with domestic uses</p> <p>Ensure removal of native vegetation is assessed through the planning process</p> <p>Facilitate revegetation where appropriate as a part of preparation of land management plans</p>	<p>Review the zoning of high quality and strategic conservation areas to facilitate assessment and control of agriculture, including grazing where deemed appropriate.</p> <p>VPO to increase permit triggers for native vegetation removal and facilitate rehabilitation through preparation of land management plans</p>
Biolinks	<p>Ensure removal of native vegetation is assessed through the planning process</p> <p>Facilitate revegetation where appropriate as a part of preparation of land management plans</p>	<p>VPO to increase permit triggers for native vegetation removal and facilitate rehabilitation through preparation of land management plans</p>
Threatened Flora Species and Vegetation Communities	<p>Ensure proposals to remove threatened species are assessed through the relevant state and local approval processes (ensure property owners are aware they need a permit).</p> <p>Ensure works that may directly or indirectly impact grassland and wetland vegetation communities are assessed through the planning process.</p>	<p>Amend existing VPOs for Black Gums and Yarra Gums to highlight the location of the threatened species to property owners and increase permit triggers for removal of native vegetation.</p> <p>Remove VPO for Narrow-leaf Peppermint as this is not a threatened species.</p> <p>New VPO to protect known areas of Plains Grassy Woodland and Scoria Cone Woodland.</p> <p>New ESO to protect known areas of Plains Sedgy Wetland.</p>
Waterways	<p>Ensure works that may directly or indirectly impact the waterway corridor are assessed through the planning process.</p>	<p>ESOs to ensure works in the river corridor (up to the top of the escarpment) are assessed and managed to prevent erosion and facilitate rehabilitation. To be progressed in collaboration with Melbourne Water and Coliban Water.</p>
Other native vegetation	<p>As detailed above</p>	<p>Local policy content</p>
Environmental weeds	<p>Facilitate removal of environmental weeds where a permit trigger applies to removal of any vegetation. See Section 7.2 Pest Plant and Animal Management for further details.</p>	<p>Inclusion of a mechanism that exempts specified environmental weeds from requiring a permit for their removal.</p>

Planning Scheme Actions:

- 1.1 Investigate rezoning identified areas with significant native vegetation currently in the Farming Zone to ensure their protection.
- 1.2 Rezone the following Council managed bushland reserves to “PCRZ” - Hobbs Road Reserve, Mount Gisborne, Magnet Hill, Malmsbury Common, Bald Hill, Stanley Park, Sandy Creek and Barringo Reserve.
- 1.3 Undertake further investigations to revise Council’s current VPOs and apply new VPOs for Scoria Cone Woodland and Plains Sedgy Wetland Vegetation communities as outlined in this strategy (summarised in Table 13).
- 1.4 Support Melbourne Water and Coliban Water’s efforts to introduce a new ESO for high value waterways (covering Deep Creek and the Upper Coliban).
- 1.5 Review MRSC’s Property Management Plan template & guidelines required for planning permits to ensure they place significant emphasis on biodiversity enhancement and expected minimum standards (eg. protecting remnant vegetation, pest plant and animal control, revegetation, wildlife friendly fencing).
- 1.6 As part of the planning permit process, continue to utilise Section 173 agreements where appropriate to protect significant native vegetation to ensure protection into perpetuity.
- 1.7 Review the local policy content within the Macedon Ranges Planning Scheme to include the policy directions outlined in the strategy.

Planning compliance

The existing provisions of the planning scheme, in particular, Clause 52.17 Native Vegetation, provide some baseline protection for native vegetation. As stated in the planning scheme, the purpose of Clause 52.17 is as follows;

To ensure that there is no net loss to biodiversity as a result of the removal, destruction or lopping of native vegetation. This is achieved by applying the following three step approach in accordance with the Guidelines for the removal, destruction or lopping of native vegetation:

1. *Avoid the removal, destruction or lopping of native vegetation.*
2. *Minimise impacts from the removal, destruction or lopping of native vegetation that cannot be avoided.*
3. *Provide an offset to compensate for the biodiversity impact if a permit is granted to remove, destroy or lop native vegetation.*

In most cases, a permit is required to remove, destroy or lop native vegetation, including dead native vegetation. A number of exemptions apply, including exemptions for road safety works, emergency works and, in some cases, management of vegetation for fire risk management purposes.

Council has an Environmental Planner and a Planning Resolution Officer that ensure native vegetation protection at both the pre and post-permit approval stage. Council is committed to working with landholders to avoid native vegetation loss wherever possible. Where avoiding loss is not possible and Council determines that the proposed native vegetation removal is acceptable, a planning permit is issued subject to a set of conditions. These conditions may relate to the protection of existing trees on the site during construction. The permit may also set out requirements for offsetting the permitted native vegetation loss in order to achieve the State Government’s goal of “no net loss to biodiversity”. In some cases, depending on the development or use proposed, permit conditions may also be require land management and / or revegetation plans

Council’s current resources only enable investigation into potential illegal native vegetation removal or non-compliance with permit conditions in response to internal and external reports. This ensures that action is taken when Council becomes aware of it. Additional resources would be required to take a more proactive approach to the enforcement of permit conditions – e.g. via audits and spot checks.

It is noted that each council in Victoria takes a different approach to how they respond to and prosecute cases of illegal native vegetation clearance. Achieving a consistent approach across the state would be beneficial. In lieu of this, a review of Council's current processes and development of a Native Vegetation Compliance Policy is recommended to ensure a consistent approach is adopted.

Current penalties for illegal native vegetation clearance do not provide sufficient disincentive for some land owners to apply for a planning permit. As such, Council will continue to advocate to the State Government to increase fines for illegal native vegetation removal, facilitate the consistent approach to native vegetation compliance across the state and increase resourcing for compliance.

Planning Compliance Actions:

- 1.8 In partnership with Statutory Planning, adequately increase Council's resources for pro-active compliance activities to ensure implementation of planning permit conditions relating to environmental matters such as tree protection, native vegetation offset and land management plans.**
- 1.9 Develop and implement an Illegal Native Vegetation Removal Compliance Policy.**
- 1.10 Continue to raise awareness amongst landholders about the legal requirements associated with native vegetation clearing.**
- 1.11 Advocate that the State Government increases penalties for illegal native vegetation removal, facilitates a consistent approach to native vegetation compliance across the state and increases resourcing for compliance.**

Domestic Animal Management

Reducing the impact of domestic animals on native wildlife is an important action that can be undertaken by Council. Through the Domestic Animal Management Plan 2017-2021, Council has acknowledged the impact that domestic animals can have on native wildlife and the environment. Key objectives in the plan are to reduce the impact that cats and dogs can have on wildlife and the environment. In 2018/19 Council will be reviewing dog on and off lead regulations as well as investigating whether a cat curfew should be introduced.

It is recommended that the outcomes of the cat curfew and dog off lead investigations inform Council's bushland reserve management and any new or updated bushland or conservation reserve action plans that are prepared. It is also recommended that Council's Environment Unit work with Local Laws to raise awareness about the impact of domestic dogs and cats on native fauna.

Dog walking

In the Macedon Ranges Shire, dogs in public places are not required to be on a lead, unless the area is signed. On-lead areas include Macedon Regional Park and Council managed bushland reserves (where signed). Some of Council's bushland reserve environmental management plans recommend that dogs be on lead. Others such as the environmental management plan for the Gisborne Marshlands, recommend excluding dogs altogether. Some environmental management plans are silent about dogs altogether. This inconsistency places Council in a weak policy position to make decisions about domestic animal regulations for other reserves.

When considering dog exclusion and dog on and off lead areas, it is recommended that a consistent approach be adopted across Council's bushland and conservation reserves. It is recommended that consideration be given to the likely risk dogs present to native wildlife and biodiversity in the reserves as well as the community benefits associated with enabling dog walkers to access Council's bushland areas and connect with nature.

Domestic Animals Actions:

- 1.12 Environment team in conjunction with Local Laws to increase public awareness about the impact of outdoor cats and domestic dogs on native wildlife and the environment.**
- 1.13 Provide support for any initiatives outlined in the Domestic Animal Management Plan and the 2018 investigation which reduce the impact of cats on native wildlife.**
- 1.14 Create awareness and education about the impacts of dogs in sensitive bushland environments and support initiatives that help to reduce these impacts.**

Fire and biodiversity

Following Black Saturday, the Victorian Bushfires Royal Commission found that the 'planning system should prevent, or strongly discourage, people from living in areas where it is not possible to have the minimum defendable space without excessive costs for biodiversity.'

Council's Municipal Fire Management Plan 2016-17 was developed by the Municipal Fire Management Planning Committee (MFMPC) in consultation with the community. The plan aims to reduce the number and the severity of bushfires and create a more fire educated and resilient community. The plan guides Council's annual roadside slashing program and private property fire hazard inspection program. The plan also identifies other treatment options to reduce risk such as planned burns. Implementing planned burns for reduction of risk and for ecological purposes is done in collaboration with agencies on the committee.

Council has a role in supporting landholders to manage fire risk without having an adverse impact on biodiversity. A balance can be found that meets the necessary steps for fire prevention directly around the home and enhancing biodiversity across the rest of the property. Council can also advocate for careful and strategic fire risk management to ensure planned burns do not have an adverse effect on biodiversity. Council also plays a role after a fire to provide advice to land owners about how to rehabilitate their land. This is an important function which can result in a positive environmental outcome while assisting land owners to restore the productive value of their land.

Fire and Biodiversity Actions

- 1.15 Continue involvement of the Environment Unit in the Municipal Fire Management Planning Committee including delivery of community education and determining Council's annual roadside slashing and planned burns program.**
- 1.16 Continue to work with other agencies through relevant fire recovery committees to assist the community restore their land post-fire.**



State managed reserves

Only 4.4% of the Central Victorian Uplands bioregion is contained in conservation reserves (VEAC, 2011). The 2008 Victoria State of the Environment Report also identified the Central Victorian Uplands as having significant areas of public land not in the conservation reserve system (CES 2008). Hence, the current VEAC Central West Investigation provides a unique opportunity to improve conservation of the Cobaw State Forest, the Macedon Regional Park and the Wombat State Forest through changing their conservation status or reviewing current management practices and permitted activities. As a result, the impact of significant threats including high impact recreation uses and firewood collection can be reduced.

The situation is worse for the Victorian Volcanic Plain bioregion. The native vegetation of the Victorian Volcanic Plain bioregion is one of the most depleted in Victoria. Most of the bioregion is private freehold land dominated by agriculture and with very small areas of public land. There are no large state managed reserves in the Macedon Ranges Shire in this bioregion.

Council's role in relation to state managed conservation reserves includes assisting with the establishment of complementary and / or cross tenure conservation works that help mitigate threats to state and national parks. Council can also advocate for better protection of state managed parks and reserves and other public land.

State Managed Reserves Actions

- 1.17 Assist with cross tenure project identification, development and implementation to support landholders mitigate threats to public reserves.**
- 1.18 Collaborate with Parks Victoria and DELWP to develop projects to attract grant and external funding for conservation works to reduce impacts and enhance biodiversity values in state parks, forests and reserves.**
- 1.19 Advocate and work with public authorities such as VicRoads, VicTrack, Powercor, cemeteries, water authorities, and the Emergency Management Centre to improve conservation values on their land.**
- 1.20 Continue to advocate to the State Government for improved protection and enhancement of public reserves in the shire.**

This includes advocating for;

- The reclassification of the Cobaw State Forest, Wombat State Forest and Macedon Regional Park to improve their levels of protection and limit destructive uses in these important forests.
- A review of the appropriate location for different recreation uses to minimise land use conflicts and environmental impacts.
- Increased resources for enforcement and compliance
- Increased resources for pest plant and animal control programs on public land.
- Consolidation of public land management in specific locations with one public land manager to facilitate coordinated and efficient on ground outcomes.
- Improved publicly available information for visitors such as brochures, maps and interpretive signs
- The cautious application of controlled burns on public land taking into account community consultation, threatened species records, and appropriate ecological burning regimes.

Permanent protection of biodiversity on private land

Promotion of Trust for Nature Covenanting

The ultimate form of habitat protection on private land in Victoria is a Trust for Nature conservation covenant. This is a permanent, legally binding agreement placed on a property's Title to ensure native vegetation on the property is protected. Its purpose is to permanently conserve and protect the natural, cultural or scientific assets of the land. The agreement is voluntary and negotiated between Trust for Nature and each individual landowner. Once agreed, the covenant is registered on the title and protects habitat forever. Trust for Nature then offers a Stewardship Program to work with landowners to improve the condition of the covenanted habitat.

The Macedon Ranges Shire falls into Trust for Nature's focal landscape; the Victorian Midlands. Currently 20 properties have Trust for Nature covenants covering 360 ha across the shire. In partnership with Trust for Nature, Council would like to see more land protected under conservation covenants. Priority should be given to private land that occurs in the priority biolink zones and that buffers public reserves.

Council offers a rate rebate on land protected by a Trust for Nature conservation covenant. The rebate provides a 100% waiver of rates over the proportion of land protected by the covenant. For example, if a landowner places a conservation covenant over 100% of their land, they receive a rate rebate of 100%. If a conservation covenant applies to 50% of the land, a 50% rebate of rates applies.

Trust for Nature Actions

1.21 Continue to encourage covenanting of high priority private land through Trust for Nature with targeted promotion in biolink areas.

1.22 Continue to provide the rate rebate for covenanted land.

Native Vegetation Offsets

All permitted clearance of native vegetation is required to be offset. This can occur on site via a "first party offset", or permit holders can purchase offsets elsewhere in the shire or the catchment management area where the clearance occurred. This is called a "third party offset".

The Macedon Ranges Shire contains a limited supply of native vegetation offsets for purchase. This means that most land owners with a permit to clear native vegetation purchase offsets from other parts of the North Central or Port Philip and Westernport Catchment Management areas. Opportunity exists to promote offsetting as an opportunity for land owners in the shire to gain some income for land management works that protect and enhance the quality of remnant native vegetation on their property. This would involve landholders becoming "Third party offset" owners who can then sell native vegetation credits to people with approval to remove native vegetation.

In the longer-term Council may investigate the establishment of a Native Vegetation Offset Scheme for Council managed conservation reserves. Revenue derived through this scheme would be used to directly manage Council's offset sites and the Scheme's operational requirements.

Native Vegetation Offsets Actions

1.23 Promote the opportunity for landholders in the shire to utilise areas of remnant native vegetation on their land for native vegetation offsets

Permanent Protection for Barm Birm

The former Shone and Schultz sub-division in Riddells Creek, known as 'Barm Birm' (place of many yam roots), has high quality woodlands in private and Council ownership. The 118.6 hectare site was subdivided in the 1880s into over 162 allotments ranging in size from 0.3 hectares to 5.2 hectares. The estate was sold in the 1970's. Today the land is owned by approximately 130 different landowners.

The site contains native vegetation of high conservation significance on the south east side of the Macedon Ranges. Mapped as mostly Grassy Dry Forest EVC, it has over 27 species of native orchids and the only plant endemic to the Macedon Ranges Shire - the Hairy-leaf Triggerplant. The site plays an important landscape connectivity role, adjoining public land at Conglomerate Gully Reserve and providing habitat links through to T Hill Flora Reserve and Mount Charlie Reserve.

Due to the site's natural values, high fire risk and lack of services, the land is not considered to be suitable for development. As a result, current planning controls prevent development in the estate.

The tenure of the land shown in Figure 31 prevents coordinated land management and has resulted in negative impacts such as rubbish dumping, firewood collection and inappropriate recreation uses such as motorbike riding and four wheel driving.

Council currently operates a "gift back" scheme to encourage the transfer of private land parcels to Council. This process is slow and relies on the voluntary participation of landowners. A more efficient and effective alternative would be for the state government to acquire the land. State government acquisition would enable the site to be integrated into the adjoining public reserve system, facilitating contiguous management and reducing fragmentation of public land management across the landscape.

In lieu of state government acquisition, promoting and allocating resources to Council's "gift back" program provides an alternative means to expedite the transfer of the land to public ownership. This proactive campaign would encourage land owners to gift back their land. It would include a mail out to land owners with the following information:

- Information about current planning restrictions and the conservation of the land which precludes development
- Information about the gift back opportunity and its conditions.
- Advice that Council plans to conduct a full flora and fauna assessment of the site. Land owners could choose to be excluded from this process.



Figure 31: Barm Birm (red outline) showing council owned land in green.

Barm Birm Actions

- 1.24 **Commit to creating a nature conservation reserve and improving biodiversity health at Barm Birm.**
- 1.25 **In partnership with Riddells Creek Landcare, promote and allocate resources to Council's "gift back" program to expedite the transfer of land to public ownership.**
- 1.26 **With the permission of relevant land owners, undertake a full formal assessment of the site's biodiversity values including a detailed flora and fauna survey.**
- 1.27 **Install signage at access points to inform the public that the area is private land with significant vegetation and that gathering of firewood and camping, except by owners, is prohibited.**
- 1.28 **In partnership with Riddells Creek community environment groups, continue to advocate for the public acquisition of Barm Birm by the state government and integration of the area into the adjoining public reserve system.**

Protection of threatened species and communities

Council, community and agencies want to ensure no further local extinctions of EPBC or FFG listed species. Council's role in threatened species management includes:

1. Protecting known populations or communities of threatened species through the planning scheme with Vegetation Protection or Environment Significance Overlays.
2. Protecting and monitoring threatened species and communities on Council managed land.
3. Complying with relevant approval processes under the FFG and EPBC Act if works are proposed on Council managed land that may impact the species or community.
4. Facilitating surveying, monitoring and protection of threatened species through awareness raising campaigns, land owner engagement programs and citizen science projects.

Grassy Woodlands of the Victorian Volcanic Plains

The 'critically endangered' EPBC listed Grassy Eucalypt Woodlands of the Victorian Volcanic Plains used to cover a large area of the shire from Clarkefield to Lancefield (Figure 32). This vegetation community also occurs in the Central Victorian Upland bioregion side of the shire from Woodend through to Malmsbury. A description of the vegetation community is provided in Section 7.1 Vegetation Protection Overlays.

This vegetation community can support highly threatened species such as the Growling Grass Frog, Golden Sun Moth and Striped Legless Lizard as well as a suite of herbs and rare orchids. While most of these threatened fauna species have not been sighted in the Macedon Ranges Shire for many years, a number of threatened herbs and orchids can still be found in the shire.

Today there are only a few areas in the shire containing Grassy Woodlands.

Remnants predominately occur on private land and road and rail reserves. They are under considerable threat from land use practices and development, weeds and inappropriate disturbance regimes leading to excessive biomass (lack of disturbance) or species removal (too frequent/intense disturbance). Management to control weeds and reinstate an appropriate disturbance regime (by grazing or fire) are most commonly used to mitigate threats. Management is often difficult, due to the small and patchy distribution of remnants over a large area and the significant threats from pests and weeds.

Protection and enhancement of this threatened vegetation community would be facilitated by the following activities:

- Community engagement to raise awareness about the environmental values of Grassy Woodlands and appropriate management regimes.
- Ensuring remnant patches are retained and protected as a part of subdivisions, change of use proposals and development applications.
- Inclusion of known remnant patches in a Vegetation Protection Overlay.
- Undertake enhancement works on public land in collaboration with relevant land managers and community groups.

Surveying private land to determine the extent of remnant Grassy Woodlands in the shire is not practical given Council's current resources. Alternatively, it is recommended that Council maintain a record of known remnant patches on private land when they are identified through the planning process, and consider including these patches in a VPO in the future. In the meantime, it is recommended that Council include known patches occurring on public land in a VPO to help identify where this vegetation occurs and to facilitate its ongoing protection.

Actions relating to protection of Grassy Woodland EVCs through the planning system are provided at Section 7.1 Vegetation Protection Overlays.

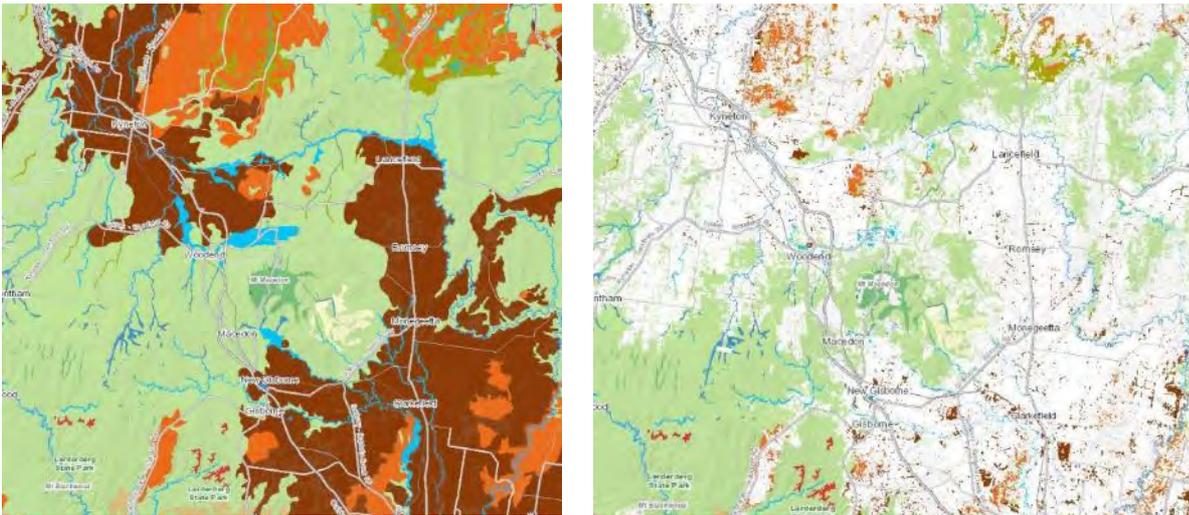


Figure 32: Ecological Vegetation Class (EVC) maps within the MRSC (and immediate surrounds) for pre-1750 modelled EVC extent (left) and in 2005 (right), showing the dramatic reduction in Plains Grassy Woodland EVC (brown) and Grassy Woodland (orange).

Other threatened species

A number of individual flora and fauna species are listed as threatened under the FFG and EPBC Act occur within the shire. These are listed at Appendix 2.

Some threatened flora species are included in existing Vegetation Protection Overlays to ensure their presence is known to decision makers and to facilitate their ongoing protection. Recommendations for improvements to these VPOs are set out in Section 7.1 Vegetation Protection Overlays.

Many listed threatened species occur on Council managed land. In these instances Council has an obligation to protect these species. This includes complying with any permit or approval processes under the FFG and EPBC Acts if works are proposed that may impact the species. Flora and/or fauna surveys may be required where threatened species are likely to occur to confirm presence or absence prior to conducting works. Ongoing monitoring of threatened species on Council managed land is also recommended to ensure Council's general management practices are benefiting the health of the species and not having a detrimental impact.

Opportunity also exists to raise awareness of threatened species amongst private land owners and work with DELWP and relevant community groups to survey for and monitor specific threatened species through citizen science and other community engagement programs. This includes programs such as the "Spotlight on Species" project which involves working with the Upper Campaspe Landcare Network to survey for Greater Glider, Powerful Owl and Phascogale on public and private land. This type of project could be explored for Brown Toadlet or other threatened species occurring in the shire.

Where there is community interest, Council can also assist with projects that protect threatened species and their habitat on private land – e.g. through the installation of nest boxes, or through coordinated pest animal control.

Engaging the community about threatened species on their land is a valuable means of building knowledge amongst private land owners about biodiversity and sustainable land management.

In addition, the monitoring program outlined in Section 8 of this Strategy includes implementation of targeted surveys for Greater Glider, Powerful Owl, Phascogale and Brown Treecreeper which are all threatened species that are good indicators of broader ecological health.

It is important to recognise that in some instances non-native vegetation can provide important habitat for threatened species. For example, Golden Sun Moth has been found in patches of Chilean Needlegrass. Similarly Brown Toadlet have been found in patches of pasture grasses and Gorse thickets.

Threatened Species Actions

- 1.29 Raise awareness through landholder engagement, education events and development of communication materials of the importance of Grassy Woodlands and appropriate management actions including holistic grazing, mowing and cultural and ecological burns.
- 1.30 In partnership with relevant community groups and Traditional Owners, prioritise Grassy Woodland enhancement on public land along roadsides, rail reserves and waterways where remnants persist.
- 1.31 Ensure that detailed flora and fauna (e.g. Golden Sun Moth and Growling Grass Frog) assessments are undertaken in areas likely to support grasslands or grassy woodlands as part of planning processes such as permit applications for subdivisions and the preparation of development plans and precinct structure plans.
- 1.32 In partnership with the community and agencies, undertake specific threatened species protection measures on Council managed or other public land when need or opportunity arises.
- 1.33 Survey for and monitor threatened species populations on Council managed land to inform future management actions.
- 1.34 Comply with FFG and EPBC approval processes as relevant if works are proposed on Council managed land that may impact the species.
- 1.35 Raise awareness amongst the community of specific threatened species that occur within the shire, including the need to comply with FFG and EPBC approval processes
- 1.36 Explore community engagement activities that engage Traditional Owners, landowners and community groups in surveying, monitoring and protecting threatened species populations on private land.
- 1.37 Ensure management actions targeting non-indigenous vegetation consider possible impacts on threatened species populations that may be present.



7.2 Objective 2: Improve Existing Biodiversity and Native Vegetation across Public and Private Land

Weeds and pest animal management

The management of weeds and pest animal on Council managed roadsides and reserves is an ongoing exercise for Council.

In 2014 Council prepared a *Weed and Pest Animal Strategy 2014-2024* which sets out Council's priorities and approach to pest plant and animal works in the shire. This strategy also guides community engagement activities to encourage weed and pest animal control on private land. In addition, all Environmental Management Plans for Council managed bushland reserves include a prioritised program of weed and pest animal management.

The strategy lists the following priorities that are considered when allocating resources for weed control:

1. Protecting and enhancing sites of high conservation value
2. Meeting Council's legal obligations and, therefore, prioritising listed noxious weeds
3. Contributing to Council's fire hazard reduction efforts
4. Supporting community-led projects and responding to community priorities
5. Protecting adjoining sites of high conservation value
6. Minimising harbour for pest animals
7. Achieving cost efficiencies

It is recommended that this strategy is reviewed to take into account the Biodiversity Strategy and changes in government policy (such as the declaration of feral cats and deer as pests).

On average, over 500 hectares of roadside is treated as a part of Council's annual roadside weed program in accordance with the above priorities. Council generally prioritises treatment of noxious weeds listed under the *Catchment and Land Protection Act 1994*. Chilean Needle-grass is also considered a priority given the threat this weed poses to conservation and agricultural land. Council's priorities for weed control may change as woody weed loads decrease across the shire as a result of effective management. Council also undertakes strategic rabbit control within Council managed bushland reserves in accordance with adopted Environmental Management Plans.

In some circumstances Council treats environmental weeds which are not listed under the *Catchment and Land Protection Act 1994* including non-indigenous native species which have the potential to be invasive such as Sallow Wattle and Cootamundra Wattle. Currently Environmental Significance Overlays 4 and 5 trigger a permit for removal of *any* vegetation including all environmental weeds. Given that these overlays apply to a large part of the shire, including many conservation and bushland reserves, this creates unnecessary administration that can hamper implementation of conservation works. As such, it is recommended that Council explore ways to exempt specified environmental weeds from requiring planning permission for their removal where vegetation controls apply to *any* vegetation.

In terms of private land, the responsibility for controlling weeds and pest animals rests with the land manager. Community members are concerned about the impact of invasive weeds on unmanaged land such as absentee landholders or land bankers. It is suggested that increased education is required to help landholders understand their legal obligations as land managers.

Notices for weed removal can be given to landholders under the follow scenarios:

- Under the CaLP Act, property owners who do not eradicate or control Regionally Prohibited or Regionally Controlled weeds in declared areas may be issued with a Land Management Notice from DEDJTR.

- Under the Country Fire Authority Act 1958, Council has a legal obligation to ensure the community's risk of wildfire is reduced and can issue Fire Prevention Notices which may include the requirement to remove weeds.
- There are also provisions under Local Law No. 10 Item 30 – Unsightly or Dangerous Land or Buildings that enable Council to undertake some enforcement. These provisions are generally only invoked for extreme cases

An integrated approach across all land tenures is required for both weed and pest animal control to facilitate effective outcomes. This involves substantial community engagement and resources for coordination and project management. If resources allow, facilitating these types of cross tenure projects could be explored in the future, particularly in relation to pest animal control.

There is a growing recognition that some weeds provide cover for small birds and that their removal should be part of a larger staged program to replace weed species with native species providing similar habitat. This should be considered as a part of Council's weed eradication works.

Pest Plant and Animal Actions

2.1. Continue implementation of Council's Weed and Pest Animals Strategy 2014-2024 through prioritised weed control on Council managed roadsides and bushland reserves. Investigate options for minimal chemical use in weed control practices.

2.2. Continue the annual funding program for community groups for weed control on roadsides and public land.

2.3. Provide regular and topical weed education to landholders through a variety of channels such as direct mail, social media and articles in Shirelife and the environment eNews.

2.4. Review and update Council's Weed and Pest Animals Strategy in 2021.

2.5. Advocate for and strengthen partnerships for coordinated pest plant and animal programs across public land and private land in priority areas.

2.6. Introduce a mechanism to planning overlays that trigger a permit for any vegetation removal to exempt specified environmental weeds.



Bushland reserve management

Community consultation highlighted the important environmental, educational and recreational values of Council's bushland reserves. Council manages 13 large bushland reserves which cover 518 ha (Table 14). These reserves are owned and managed for the conservation of local flora and fauna in partnership with the relevant community environment groups. In addition, over 25 small conservation reserves also require Council management (Table 15). Some reserves are popular places to visit, while others are underutilised and present opportunities for nature tourism and environmental education.

As set out in Table 14, all large bushland reserves have existing Environmental Management Plans (EMPs) to help guide their management. Small Conservation Reserve Action Plans (SCRAPs) are being prepared for smaller sites. These plans all utilise different methods to assess vegetation quality. They also all contain different levels of information about management activities such as reserve regulations, fuel management and flora and fauna monitoring. It is recommended that a consistent approach be adopted when existing EMPs are reviewed or new action plans are prepared. Discussion about specific management issues relevant to bushland reserves can be found in other sections of this strategy. Recommendations relating to vegetation condition assessments can be found in Section 8.1.

The 2018-19 Council budget allowed for a Bushland Reserves Officer to oversee implementation of existing Environmental Management Plans. The position will manage preparation or review of environmental management plans and work with existing community environment groups as required. This resource will enable a more strategic and coordinated approach to reserve management.

While Council's resources for on-ground works have resulted in noticeable improvements, additional resources may be required in the future as environmental management plans are reviewed, new plans are prepared and Council takes on management of additional conservation reserves as a result of new development and subdivisions.

Table 14: Bushland reserves with existing Environmental Management Plans (EMPs)

Bushland Reserves	EMP Date
Gisborne Racecourse Marshlands Reserve	2018
Magnet Hill	2018
Malmsbury Common	2018 (masterplan)
Black Hill Reserve	2017
Hanging Rock	2015 (EMP), 2018 (Strategic Plan)
Stanley Park	2014
UL Daly Nature Reserve	2014
Barringo Reserve	2013
Hobbs Road Reserve	2013
Sandy Creek Bushland Reserve	2013
Mount Gisborne Bushland Reserve	2013
Woodend Grasslands	2012 (re-surveyed 2018)
Bald Hill Bushland Reserve	2012 (infrastructure masterplan for Mount St Mary's Lane entrance completed 2018)

Table 15: Small Conservation Reserves in the Macedon Ranges Shire

Small Conservation Reserve	SCRAPs
Woodend / Ashbourne / Trentham East Area	
Browning Street Road Reserve	2018
Ashbourne Roadside Reserve	2018 (underway)
Five Mile Creek Reserve	
Noonan Grove Conservation Reserve	
Quarry Road Reserve (southern waterway)	
Slatey Creek Black Gum Reserve	
Ashbourne Road Old Tip	

Small Conservation Reserve	SCRAPs
Marsh Court	
Firth Road Reserves	
Macedon / Mount Macedon Area	
Anzac Road Waterway Reserve	2018 (underway)
Devonshire Lane / Turitable Creek Waterway Reserve	
Norton Road Nature Reserve	
Tony Clarke Bushland Reserve (west)	
Cable Street Reserve	
Macedon Bushland Parcel Network	
Gisborne / Bullengarook Area	
Mount Aitken	2018 (underway)
Napier Road Reserve	2018 (underway)
Gilligan Recreation Reserve	
Upper Jacksons Creek Waterway Reserve	
Cassandra Close Embankment	
Wyralla Crescent Drainage Reserve	
Dalton Street Reserve Network	
Hamilton Road Estate	
Bullengarook Recreation Reserve	
Darraweit Guim / Romsey / Lancefield Area	
Darraweit Guim Recreation Reserve	
Pascalls Lane Road Reserve	
Riddells Creek Area	
Amess Road Triangle	
Dry Creek Waterway Reserve	
Barrm Birm (Council owned areas)	
Baynton / Sidonia Area	
Mission Hill Rd Reserves	

Many Council managed reserves are highly significant Aboriginal cultural sites. Under the Aboriginal Heritage Act 2006 a permit is required to disturb or impact a site or feature of Aboriginal significance. This is in addition to the requirement for a Cultural Heritage Management Plan for works that result in significant ground disturbance in an identified area of cultural heritage sensitivity. The Dja Dja Wurrung Land Use Activity Agreement defines how council should notify, consult and negotiate with the Dja Dja Wurrung on public land in the Agreement areas.

An Aboriginal Cultural Heritage Land Management Agreement (ACHLMA) can be prepared for land where ongoing works is proposed, such as bushland reserves. Preparation of an ACHLMA for Council managed bushland reserves will enable Council to be proactive about protecting sites of significance, avoiding the need to obtain permission retrospectively should a site or feature of cultural heritage value be identified during works.

Council has the opportunity to demonstrate leadership by learning from Traditional Owners and exploring traditional methods of land management, including cultural burning.

Bushland Reserves Actions:

- 2.7 Increase resources for on-ground works in bushland reserves and small conservation reserves as required. This includes resources for monitoring of flora and fauna, ecological burns, installing signage, phytophthora control, installing wildlife friendly fencing, pest plant and animal control, and improve parking areas and walking paths.**
- 2.8 In the grassland areas of Council Managed Reserves, peg out high value areas in advance to slashing and install signage to increase community understanding about the value of these areas.**
- 2.9 Work with relevant Registered Aboriginal Parties to prepare Aboriginal Cultural Heritage Land Management Agreements for Council managed bushland reserves.**
- 2.10 Engage the Wurundjeri Council's Narrap and Dja Dja Wurrung's Djandak teams for on-ground work where possible and appropriate, especially when considering ecological and cultural burns.**
- 2.11 Regularly review and prepare new Environment Management Plans and Small Conservation Reserve Action Plans, working closely with relevant community groups and Traditional Owners. Develop consistent methodology for vegetation condition assessments and a consistent approach to their scope and content. In addition undertake systematic recording of visitor use and visitor surveys of bushland reserves as part of EMP reviews.**
- 2.12 Work with relevant Community Environment Groups to develop a suite of guides and information for Council's reserves including brochures and maps of walking tracks. Aim to prepare a suite of brochures using a consistent format and branding.**
- 2.13 Consider implementation of biosecurity measures for reserves where phytophthora is known to occur.**
- 2.14 Monitor Kangaroo numbers and their grazing impacts. Consider sustainable and humane control options if deemed appropriate.**



Roadside management

In landscapes that have been highly altered, all remnant vegetation becomes important. The linear patches of remnant native vegetation along roadsides provide critical habitat for native fauna and flora and connectivity to larger, more significant areas. As roadsides are within the road reserve, management of roadside vegetation will always be influenced by the primary function of the road.

Council is responsible for managing 1,700km of roadside vegetation for multiple outcomes– for protection and enhancement of biodiversity and habitat, to manage fire risks and to ensure vehicle access and public safety. This is inevitably complex, requiring a considered and balanced approach to decision making. However, with careful consideration and planning, practices like woody weed control can help meet goals for both fuel reduction and biodiversity protection.

Council is currently in the process of preparing a Roadside Management Plan aimed at establishing guidelines and processes to help manage the competing objectives of roadside management.

As a part of preparation of this Plan, Council is reassessing the conservation value of roadsides in the shire. The conservation value attributed to each roadside will inform the management approach adopted for that land. It is also recommended that the updated assessments inform the review of the shire's roadside Vegetation Protection Overlays as outlined in Section 7.1.

While the Roadside Management Plan is being prepared, Council has been trialling various initiatives to protect roadside conservation values including:

- Working with Council's Emergency Management Unit to ensure roadside slashing occurs after target grassy weeds have been treated and after native grasses have set seed.
- Implementation of vehicle hygiene processes.
- Public education about roadside conservation values.
- Development of an approval process for resident initiated environmental works on roadsides.
- Preparation of a pilot action planning process for Three Chain Road involving landowners, Landcare, Council and the CFA.

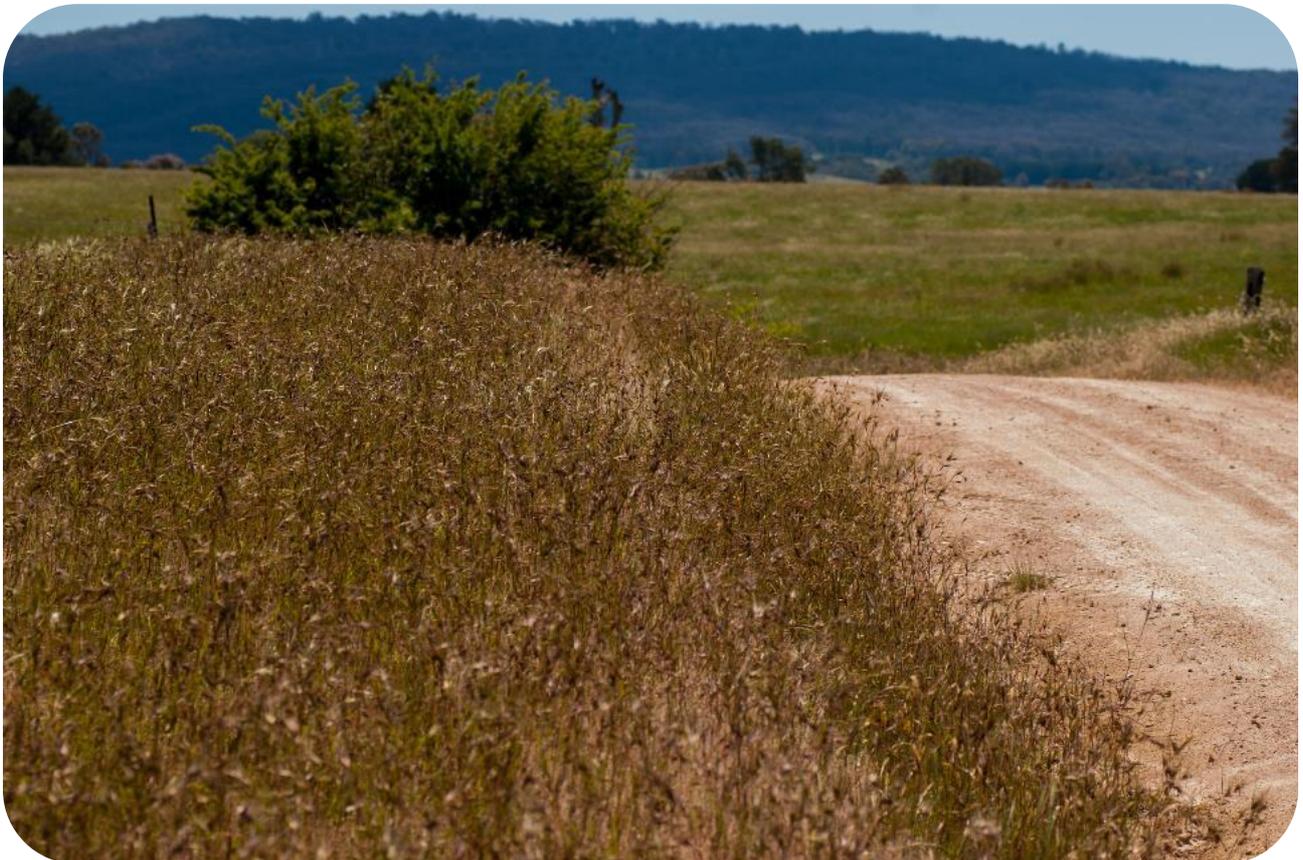
Many local Landcare groups across the shire have been very active in maintaining their local roadsides – mostly through weed control and advocacy. Specific significant roadsides highlighted by community members include: Hennebergs Rd (Newham), Coffeys Rd (Bullengarook), Falls Rd (Macedon), Gap Rd (Riddells Creek), Waterworks Rd (Newham), Nursery Rd (Macedon), Urquhart St (Woodend), Muntz Rd (Woodend), Gibbs Access Rd (Trentham East), Plants Lane (Woodend), Browning St (Woodend), Bolgers Lane (Newham), Forest Rd (Newham), Shelton Rd (Newham), Kilmore-Gisborne Rd (Riddells Creek) and Hamilton Road (Riddells Creek). There are many more roadsides of value as shown in Figure 17.

Roads, railways and other types of linear infrastructure can also act as barriers to the movement of wildlife, sometimes having detrimental impacts to functional connectivity. For those wildlife that tend to avoid clearings, their movement can be restricted or blocked. In addition to gaps in vegetation, other factors including noise, light, roaming pets and disturbance by vehicles can exacerbate the impact of the disturbance (van der Ree *et al* 2015). The Calder Freeway is the shire's greatest barrier, imposing a 50m wide gap in native vegetation cover.

The Macedon Ranges Shire is one of the highest areas of wildlife collision in the Victoria. Not only does this have a significant impact on the wildlife, it is a safety and costly concern for drivers. Council's innovative wildlife signage on Ashbourne Road attempts to address this issue. It is recommended that Council continue to explore innovative approaches to wildlife signage and crossings to facilitate the safe movement of wildlife. Community members have highlighted Mount Macedon Road and Kilmore-Gisborne Rd as high risk areas for wildlife crossing.

Roadside Management Actions:

- 2.15 Complete and implement the Roadside Management Plan. Integrate outcomes into council work practices.**
- 2.16 In partnership with the Macedon Ranges Wildlife Network, extend the safe wildlife crossing program to identified hot spots. Explore innovative approaches to wildlife signage and crossings as appropriate.**
- 2.17 Support and encourage community members and environment groups to play an advocacy and awareness raising role for roadsides in their area.**
- 2.18 As part of Council's Roadside Slashing Program, develop guidelines for mowing in high conservation areas and install signage to increase community understanding about the value of these areas.**
- 2.19 Consider implementation of a revegetation program along high priority roadsides so they can play a role identified in the landscape connectivity plan.**
- 2.20 Continue to work with Council's Emergency Management Team to ensure the roadside slashing program is designed to minimise weed spread and facilitate protection of native vegetation, particularly native grasslands, where relevant.**
- 2.21 Develop an education program to encourage landholders to better manage their roadsides and understand their rights and responsibilities.**
- 2.22 Establish a roadside environmental works approval process for landholders wishing to undertake environmental works on their roadsides.**
- 2.23 Finalise the Three Chain Road Fire Risk Mitigation Action Plan and consider applying this process to other roadsides with complex management considerations.**



Conservation on private land

Private land biodiversity conservation is recognised as one of the most important conservation needs in Australia. This is the case in the Macedon Ranges Shire where 87% of the land is privately owned. Of this private land, some 17% supports native vegetation modelled by DELWP to be high quality. It includes pockets of indigenous grassland, large tracts of bushland, corridors of vegetation and paddock trees.

Significantly, 248 landholders covering some 3,495 ha have demonstrated their commitment to biodiversity by registering their property with Land for Wildlife. A further 20 properties have Trust for Nature covenants covering 360 ha. The locations of these properties are shown Figure 33. Many more landholders have been involved in on-ground projects such as the NCCMA's Kyneton Woodlands and Campaspe River enhancement programs, Melbourne Water's Stream Frontage Management Program and local Landcare projects.

During the consultation process community members identified 28 important biodiversity sites on private land, including the bushland in rural residential areas around Riddells Creek, Woodend, Kyneton, and in the Upper Coliban Catchment. These areas have high habitat value for a range of fauna species and create connectivity across the landscape. Community consultation has highlighted the need for landowner education and awareness, including the provision of resources and one-on-one extension with landholders about land management issues such as weeds and revegetation.

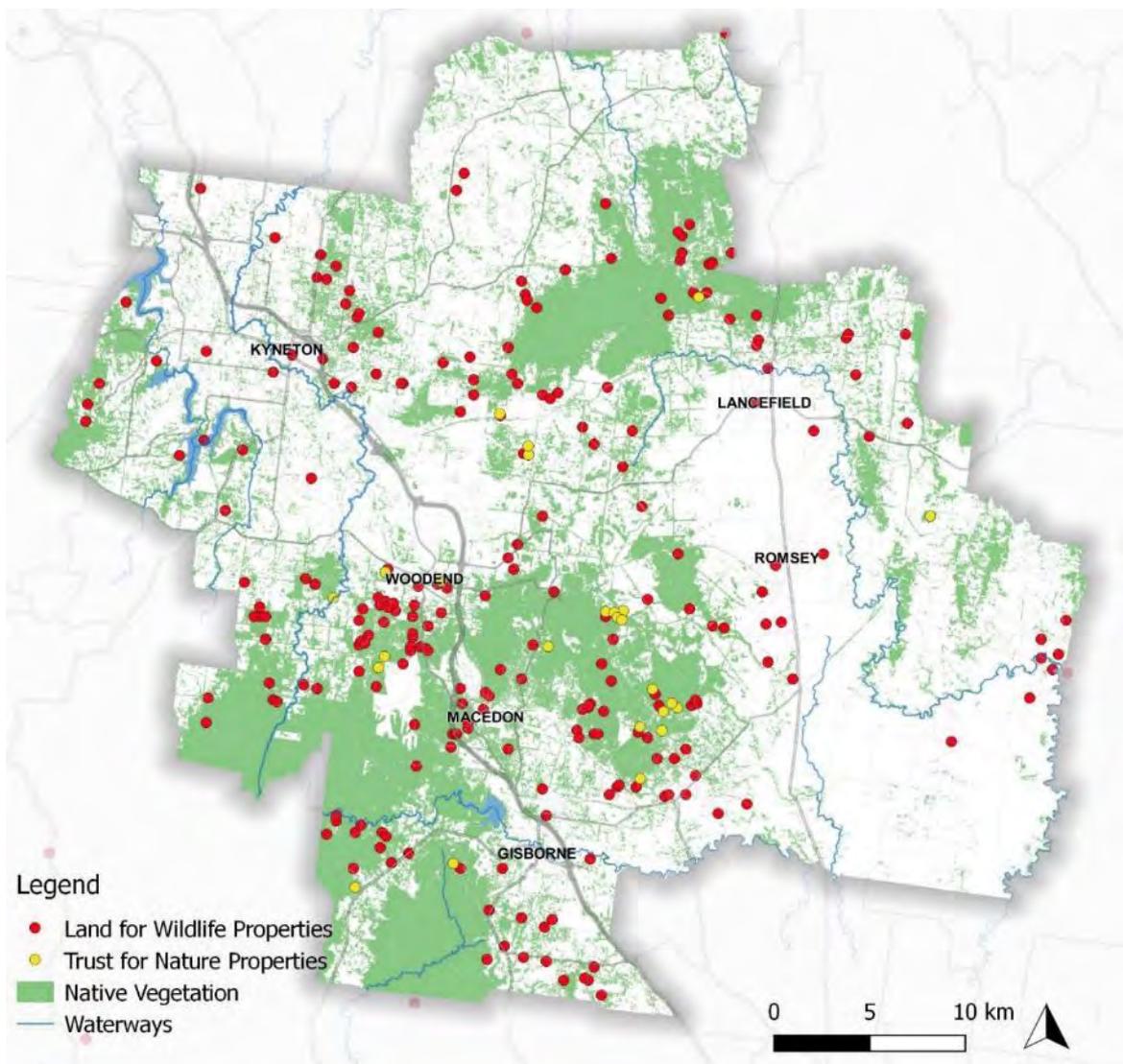


Figure 33: Private Land Conservation across the Macedon Ranges

Conservation on Private Land Actions:

- 2.24** Establish a Private Land Conservation Officer / “Extension Officer” role to work with private landholders to protect biodiversity on their properties, with a specific focus on the biolink areas and the shire’s grassy woodlands. The role would provide conservation advice, coordinate education program, develop property plans, link residents to Landcare groups, assist land owners with grant opportunities and enter data gathered into the Victorian Biodiversity Atlas. Explore opportunities to co-fund this position with other agencies and community organisations.
- 2.25** Develop a strong education program for private landholders in partnership with Traditional Owners, local groups and agencies focusing on property management for biodiversity. The program should cover important topics including flora and fauna identification, native vegetation protection, protecting paddock trees, soil management, bushfire preparation, wildlife friendly fencing, waterway protection, planting native species, grazing management, pest plant and animal control, traditional land management practices and the cultural value of biodiversity.
- 2.26** Conduct property management courses that help improve biodiversity and agricultural values of properties in partnership with local groups, agencies and Traditional Owners. Target courses for particular enterprises (eg. small farms, equestrian, viticulture, grazing).
- 2.27** Support “This Farm Needs a Farmer” to incorporate education and mentoring about land restoration and the value of biodiversity for productivity and business.
- 2.28** Develop and update information resources for rural land owners, including the new farmers kit, covering a range of topics including living with wildlife, native plants and revegetation guide, managing grasslands, weed control and weed identification, contacts for local community environment groups, and the impact of climate change in managing land.
- 2.29** Continue to have a Council presence at community events such as local agricultural shows, providing information and advice about biodiversity conservation and land management.
- 2.30** Review the private land conservation program within 3 years of its implementation to ensure it is achieving improved private land conservation outcomes.

Urban biodiversity

Council and the community recognise the environmental and amenity value of native vegetation and habitat within town boundaries. Our township areas have high value natural areas that are home to rich diversity of native plants and animals. They also provide important opportunities for residents to connect with nature close to home. Public open space, particularly waterway corridors through the townships of Woodend, Kyneton, Riddells Creek, Romsey and Gisborne were all highlighted by the community for their biodiversity value. Many hours of volunteer effort has gone into enhancing these important community places.

Encouraging residents to create wildlife-friendly gardens can also have a huge impact on local biodiversity. The use of locally native plants in gardens and public open space areas, including as a part of new subdivisions can create havens for insects, lizards, butterflies, birds and arboreal mammals. Native plants are also ideal as they are naturally adapted to suit local environmental conditions, low maintenance, drought tolerant, require minimal water and no fertilisers or pesticides.

Urban Biodiversity Actions:

- 2.31 In partnership with Council's Operations Department, develop landscaping guidelines that encourage locally native plants to be used in public spaces, as street trees and in new developments where appropriate.**
- 2.32 Support residents to preserve and plant locally native vegetation as much as possible and consider implementing an urban biodiversity program such as "Gardens for Wildlife".**
- 2.33 Continue support for community groups and Traditional Owners undertaking biodiversity projects in township areas and assist with community planning.**
- 2.34 For new developments, seek opportunities to transfer waterways and appropriate buffers to public ownership.**



7.3 Objective 3: Extend and Connect Native Vegetation and Fauna Habitat

Climate change responses

The forests of the Macedon Ranges Shire are at high elevations along the Great Dividing Range. This means they are generally cooler and wetter than the country further north. Climate change predictions indicate a gradual heating and drying in south-eastern Australia with a shift in vegetation and habitats south. The geographical position of the elevated country along the divide in central Victoria means that it will become an important refuge area for species as climate changes (Reside et al, 2013).

The PPWCMA Climate Adaption Plan suggests the following strategic actions for the Macedon Ranges:

- For the PPWCMA region, there is a 'very high' priority rating for plantings that contribute to the development of the following 'nature links; Cobaw Range to Mount Disappointment Nature Link, Cobaw Range to Macedon Ranges Nature Link, and the Maribyrnong River Nature Link.

Protecting nature will be a dynamic endeavor in which we confront an increasingly complicated series of choices. We will have to learn how to support the process of adaptation rather than preserving old patterns. To do this properly we need to become flexible, collaborative and proactive.

Susan Lawler, La Trobe University

The NCCMA Climate Change Adaption Plan (2016) suggests the following strategic actions for the upper catchments which includes the Macedon Ranges:

- Support programs that aim to reduce fire risk to communities and natural assets.
- Establish large-scale carbon sequestration by planting biodiverse plantations/trees on poorer soils or along the riparian zone. Examine drier country species for inclusion in the plantings.
- Identify and protect existing biodiversity hotspots and refugia.
- Implement an incentive program to stabilise soils on agricultural land in water catchments.
- Implementation of a citizen science program that makes biodiversity information more widely available, maps biodiversity assets at risk under future climate scenarios, and communicates about how to implement management options for these assets.

Climate Change Actions

3.1 Consider the future health and the resilience of ecosystems under changing climate in all on-ground and education activities.

This includes:

- Continue to protect high quality remnant vegetation (such as bushland reserves), promote natural regeneration, and control weeds to improve quality and condition.
- Plant climate-ready revegetation on Council managed land by selecting plant species and provenances to extend genetic diversity and match future climatic conditions.
- Support community and government agencies to plan large-scale plantings of new vegetation to sequester carbon in a manner consistent with ecological restoration principles.
- Improve and protect waterway corridors and wetlands as refuges for native flora and fauna in times of climate-related stress. This includes fencing these areas off, revegetation, seeking to maintain water levels and connecting them to other patches of habitat via vegetation links.
- Promote the maintenance of ground cover on rural land, especially during periods of drought.
- Contribute to collective action and learning by supporting community environment groups and rural industry-based organisations.

Landscape connectivity plan

Supporting biodiversity under a warmer, drier climate requires connected, functioning landscapes. In the Macedon Ranges Shire, this will require strategic biolinks to be established. These linkages have benefits for local wildlife, support the movement of migratory species, and provide a refuge for species impacted by the effects of climate change in drier areas (NCCMA, 2015). Naturally connected landscapes and ecosystems are generally healthier and can store carbon more effectively than degraded landscapes (National Wildlife Corridors Plan, 2012).

Biolinks are not corridors in the traditional sense but rather landscapes across which there is increased tree and other native vegetation cover. They recognise the value of smaller bushland patches, remnant corridors particularly along waterways and road reserves, and scattered paddock trees, as habitat where some species can live and breed and as stepping stones across fragmented landscapes. While some of the best corridors and stepping stones are on public land, private bushland plays an important role.

Council has already recognised the Cobaw Biolink in its role to connect the Macedon Regional Park to the Cobaw State Forest. Policy to achieve this biolink is included in the Macedon Ranges Planning Scheme (Clause 21.05-1 and VPO 8). Additional biolinks have been identified through the connectivity analysis and in conjunction with the Upper Campaspe Landcare Network, Upper Deep Creek Landcare Network, Jacksons Creek Eco Network and the Biolinks Alliance.

CSIRO Functional Connectivity Model.

CSIRO's Functional Connectivity Model identifies the role of isolated patches of remnant vegetation and how close or how connected to core habitat they have to be for them to be occupied by fauna species. The '10ha/1.0km/100m' rule (Doerr *et al* 2014) suggests that at least 10ha of habitat is needed for a good complement of species, with patches within 1km of each other to allow dispersal and gaps of less than 100 m between the stepping stones of corridors or scattered trees, see Figure 34. The distance of the inter-patch size is based on the abundance and movement of woodland specialists but it also allows for minimal abundance of exotic invasive species, such as the Noisy Miner, that could have detrimental impacts to some species.

Using DELWP's latest vegetation extent mapping, the Shire's native vegetation was assessed to demonstrate where we are, or are not meeting these minimum standards. Barriers for species movement were also examined. The Calder Freeway proved to be the greatest barrier (Abzeco, 2018). However railways lines, pine plantations and townships would also prevent or greatly impact on the movement of some species.

It is important to note that habitat connectivity is a complex process and this analysis has only considered a small component of spatial connectivity by employing a model based on generalist woodland species. The analysis, for example, does not consider the various landscape factors that influence the type and number of species that persist in the landscape particularly habitat quality, critical habitat resources and threats such as predation risk.

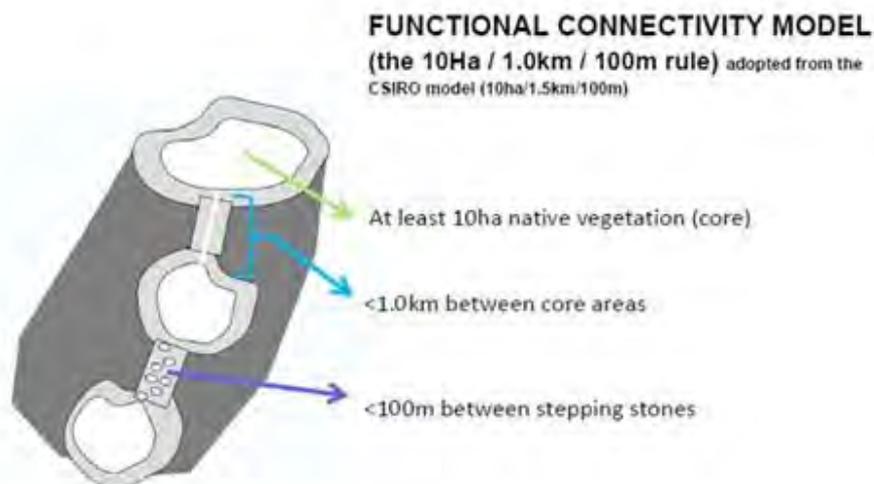


Figure 34: CSIRO Functional Connectivity Model

The connectivity analysis is shown in Figure 35. Some 50,832ha (84%) of native vegetation was identified as 'connected' (shown in green and orange). This indicates that the large patches of native vegetation that occur along the Great Dividing Range are spatially connected from the north through to the south of Macedon Ranges. Native vegetation in the south-west of the shire, from south of Kyneton to Gisborne is also spatially connected.

9,695ha of native vegetation was identified as "not connected" (shown in red). The analysis indicates that all of the vegetation that runs along the northern boundary, e.g. areas north of Kyneton and Baynton, is not spatially connected to the vegetation of the Great Dividing Range. Apart from the connectivity along the Great Dividing Range there is very limited north-south connection of native vegetation across the shire particularly in the east and west parts. Similarly, there is limited east-west connectivity across the Macedon Ranges Shire. The limited extent of native vegetation in the eastern portion of Shire is also shown to be very poorly connected.

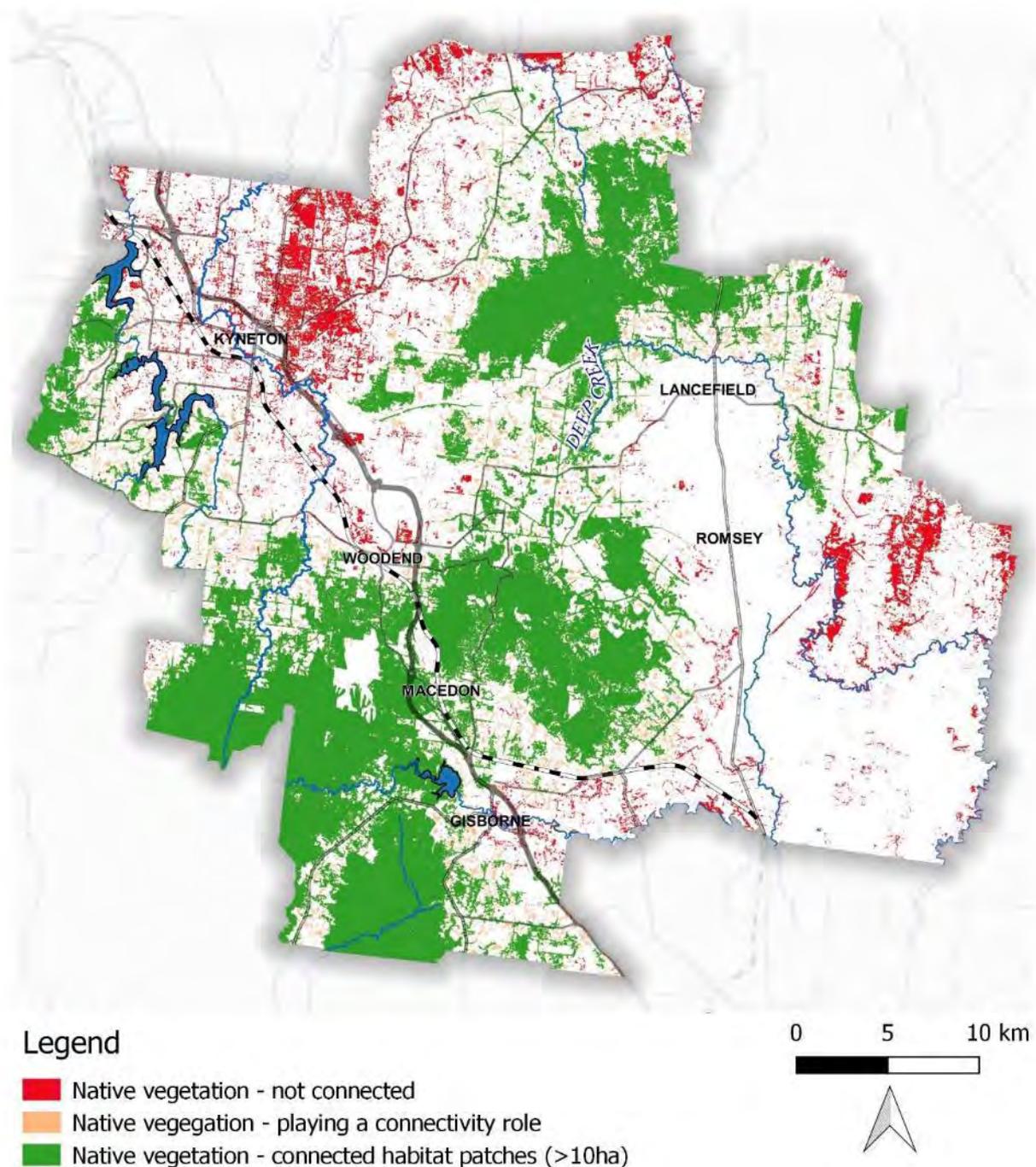


Figure 35: Extent of native vegetation showing the results of the connectivity analysis (10ha/1.0km/100m)

Based on community consultation, a review of mapping and the above connectivity analysis, Council has developed a landscape connectivity plan (Figure 36) that includes:

Six priority biolink areas that provide for significant landscape connectivity. These occur predominately across private land, contain significant habitat patches, have numerous threatened species records, and have a high level of community interest in their enhancement. These areas are: Kyneton Woodlands, Cobaw, Upper Coliban, Mount William Range (Will-im-ee Moor-ing), Riddells Hills and Wombat-Pyrete.

Three waterway links: Campaspe River and headwaters, Deep Creek, and Riddells-Jackson Creeks.

Strategic habitat links: Areas that would benefit from strategic revegetation to connect core habitat have been identified by arrows in Figure 36.

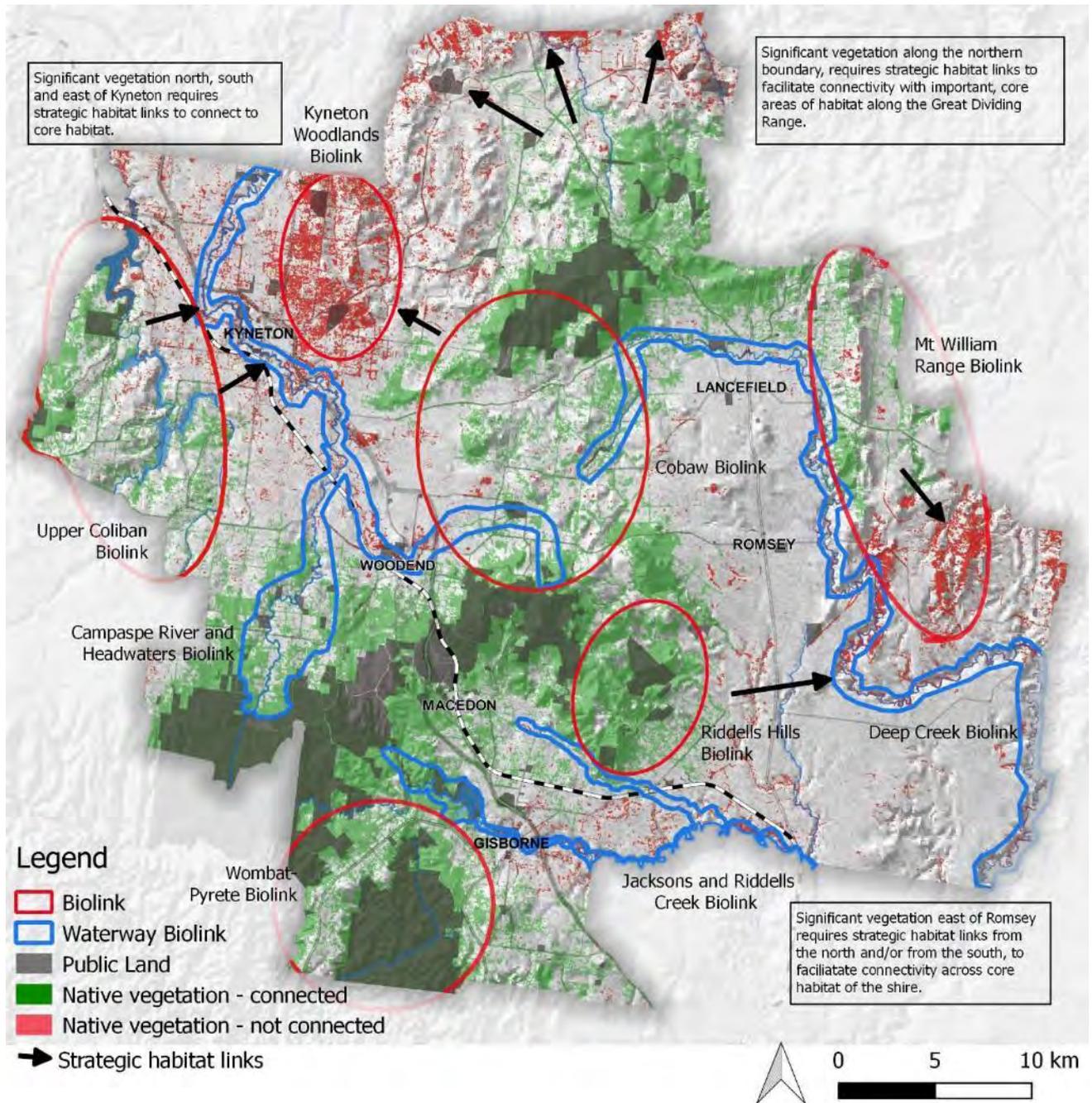


Figure 36: Priority Biolink Zones across the Macedon Ranges

A simple description with detailed actions for each of these biolink areas is provided in the following pages. Implementation of these biolinks would be impossible without collaboration with community environment groups, Traditional Owners, and agencies.

It is intended that the following biolink summaries will be used to attract funding and support for on-ground action. Within these biolink zones, Council will work closely with the identified partners to achieve biodiversity enhancement works including targeted on-ground action (such as remnant protection, strategic revegetation, pest plant and animal control), community education, and monitoring.

It is recommended that the biolink areas are re-enforced with planning provisions that seek to protect native vegetation and encourage ecological restoration and revegetation in these areas. Further details about these recommended planning provisions is set out in Section 7.1.

Landscape Connectivity Actions

- 3.2 Collaborate with and actively support biolink partners in the development of project plans for the priority biolink areas and assist with engagement of landholders.**
- 3.3 Contribute to improving connectivity by prioritising councils on-ground works on council managed land and along roadsides in biolink and strategic habitat link areas.**
- 3.4 Actively pursue Federal and State Government grants to develop and implement enhancements in biolink areas. Partner with Traditional Owners, community environment groups and relevant agencies to develop cross tenure conservation projects that can be the basis or funding applications.**



Cobaw Biolink

The Cobaw Biolink (also known as the Campaspe-Maribyrnong Headwaters Biolink) includes the upper reaches of Deep Creek and Monument Creek. The biolink contains high quality areas of remnant vegetation on both public and private land. In the heart of the biolink is Hanging Rock which has high environmental and cultural significance. The biolink provides connectivity for species between Mount Macedon and the Cobaw Ranges. Much work has already been undertaken by the local Landcare group. This includes extensive mapping and monitoring of roadsides, recruitment of 30 landholders to participate in funded enhancement projects, and the provision of information, training and assistance, plus subsidized revegetation materials to more than 50 other landholders.

Significant native animals: Brush-tailed Phascogale, Greater Glider, Powerful Owl, Barking Owl, Brown Treecreeper, migratory birds (Swift Parrot, Lathams Snipe)

Significant native plants: *Dianella amoena*, *Brachyscombe debilis*.

Endangered Ecological Vegetation Classes: Scoria Cone Woodland, Swampy Riparian Woodland, Plains Grassy Woodland

Current zoning: Most private land in the Cobaw Biolink is Rural Conservation Zone, VPO8.

Key threats: Fragmentation of land management, degradation and clearing of vegetation on private land for housing and agriculture, inappropriate grazing regimes, excessive water extraction, deer, goats, rabbits and weed invasion.

Goal: To establish a network of native vegetation linking Macedon Regional Park with the Cobaw Forest and improve water quality in the Maribyrnong and Campaspe River catchments.

Objectives	Council Actions	Measure
Protect existing remnant native vegetation and increase the extent and condition of native vegetation in strategic locations so that it provides viable habitat for threatened species and ecological connectivity	Support project development and funding proposals to implement on ground actions including protection of existing vegetation, revegetation to increase connectivity between remnants, control of high threat weeds, and rabbit/fox control. Ensure property management plans developed in the biolink area strive to enhance biodiversity. Promote Trust for Nature covenants and offset opportunities to landholders.	No. landholders participating Ha. remnant vegetation enhanced Ha. revegetated
Improve the vegetation quality along roadsides	Collaborate on roadside management with Newham and District Landcare, including prioritised weed control and engagement with landholders.	Km. roadsides treated for weeds Km. high conservation roadsides
Improve water quality in the Maribyrnong and Campaspe river catchments.	Promote Melbourne Water's Stream Frontage funding program to landholders and encourage active take-up.	Km. waterway enhanced

Plans and Partners: Newham and District Landcare Group, Upper Campaspe Landcare Network, Parks Victoria, DELWP, Upper Deep Creek Landcare Network, Central Victorian Biolinks Alliance, Melbourne Water, Wurundjeri, North Central Catchment Management Authority, Port Philip & Westernport Catchment Management Authority, Macedon Ranges Wildlife Network

This biolink is highlighted as a priority in both PPWCMA and NCCMA Regional Catchment Strategies, Melbourne Water's Healthy Waterway Strategy, and matches the Cobaw Biolink as identified in Macedon Ranges Planning Scheme. The area forms part of the Biolinks Alliance "Melbourne Ark" concept.

Upper Coliban Biolink

The Upper Coliban catchment provides drinking water for over 130,000 people and supports important environmental and cultural values. The biolink extends from Malmsbury Common and takes in the major waterways in the upper Coliban catchment covering an area of some 27,750 ha. The biolink area covers large remnant patches in public land including the Wombat State Forest, Lauriston Bushland Reserve and the Tylden South Education Area. Important patches of remnant native vegetation also exist on private land. These areas contain significant habitat and act as stepping stones providing the potential for linkages through the landscape.

Significant native animals: Powerful Owl, Brush-tailed Phascogale, and Greater Glider.

Significant native plants: *Dianella amoena*, *Grevillea obliqua*, *Discaria pubescens*

Endangered Ecological Vegetation Classes: Plains Grassy Woodland, Herb-rich foothill forest, Shrubby Foothill Forest, Valley Grassy Forest.

Current zoning: Most private land in the Upper Coliban Biolink is in the Farming Zone, no VPO.

Key threats: Degradation and clearance of existing vegetation from human use associated with residential development, uncontrolled livestock access to areas of intact native vegetation, waterways and riparian areas, pest plant and animals, clearance of native vegetation for farming activities.

Goal: To protect and increase connectivity between existing native vegetation found on private and public land and improve water quality in the Coliban River catchments.

Objectives	Council Actions	Measure
Restoration of major rivers and creeks in the project area so that 50% are in good condition by 2035 and are more naturally functioning ecosystems	Encourage and support on-ground implementation of Upper Coliban Integrated Catchment Plan and UCLNs Coliban Biolink. Provision of information, awareness raising and advice regarding land management, property planning, septic tanks and dams. Support Coliban Water's process to amend the ESO over the Upper Coliban catchment.	Km. of riparian areas fenced Index of Stream Condition
Protect existing remnant native vegetation and increase the extent and condition of native vegetation in strategic locations so that it provides viable habitat for threatened species and ecological connectivity	Support UCLN to develop finer-scale action plans in priority areas, engage landholders and seek funding. Deliver education events and explore opportunities to deliver one-on-one landholder engagement in collaboration with other stakeholders and project partners. Introduce VPO to highlight importance of native vegetation in the landscape and prevent further loss or decline.	No. landholders participating No. events held No. hectares native vegetation enhanced
Ensure the long-term persistence of threatened species	Continue to facilitate threatened species monitoring, including through the Spotlight on Species partnership project.	No. records in VBA
Enhance the condition of roadside vegetation	Implementation of the Roadside Management Plan Install signage identifying significant roadside vegetation	Km roadside weeds treated Signage installed where appropriate

Plans and Partners: Malmsbury, Tylden, Trentham and Ashbourne Landcare, Parks Victoria, NCCMA, Coliban Water, DELWP, UCLN, Biolinks Alliance, Dja Dja Wurrung, Djandak Enterprises, Dhelkunya Dja Country Plan, Hepburn Shire Council. This biolink is part of Coliban Water and NCCMA's Upper Coliban Integrated Catchment Plan. Identified as a priority in the Upper Campaspe Landcare Networks Strategic Plan and Coliban Connections Conservation Action Plan.

Riddells Hills Biolink

The important vegetated areas in the foothills surrounding Riddells Creek are of high conservation value. This biolink includes large blocks of public land including Conglomerate Gully, T-Hill, Mount Charlie, Barringo Reserve, Sandy Creek Bushland Reserve and the land along Middle and Riddells Creek. Private land connects these protected areas, most of which is mostly covered by native vegetation, including eight Trust for Nature properties and Barrm Birrm.

Significant native animals: Brush-tailed Phascogale, Greater Glider, Powerful Owl, Barking Owl, Brown Treecreeper, migratory birds (Swift Parrot)

Significant native plants: *Dianella amoena*, *Stylidium armeria subsp pilosifolium*, *Diruris punctata*

Threatened Ecological Vegetation Classes: Grassy Forest, Valley Grassy Forest, Riparian Woodland

Current zoning: Most private land in the Riddells Hills Biolink is zoned Rural Conservation, VPO9.

Threats: Degradation of existing vegetation from human use associated with residential development, Pest animals including deer and goats. Fuel reduction works on public and private land.

Goal: To enhance the quality of native vegetation on private land in order to improve habitat between public parks and reserves.

Objectives	Council Actions	Measure
Protect existing remnant native vegetation so that it provides viable habitat for threatened species and ecological connectivity	Collaborate with local groups and stakeholder agencies in project development and funding applications. Promote Trust for Nature covenants to permanently protect native vegetation on private land between public land areas.	No. hectares native vegetation enhanced No. covenants registered
Maintain the high conservation value of Council managed land	Implement the Sandy Creek and Barringo Reserve Environmental Management Plans.	Ha. Weeds treated
Create a nature conservation reserve at Barrm Birrm	Implement actions outlined under objective 1 of this strategy: Barrm Birrm	No. of properties in public ownership
Enhance the condition of roadside and railway reserve native vegetation	Implement the Roadside Management Plan and continue prioritised roadside weed control program. Install signage identifying significant roadside vegetation	Km roadside weeds treated Significant roadside vegetation signs installed where appropriate
Restore and enhance native vegetation along waterways.	Continue support for Melbourne Water's Stream Frontage Management Program and promote to landholders.	Km of creek restored
Connect community to nature	Consider opportunity and viability of a low-impact walking trail linking the public reserves around Riddells Creek.	Km walking trails created

Plans and Partners: Parks Victoria, Greening of Riddell, Riddells Creek Landcare, Jacksons Creek Econetwork, Melbourne Water, Wurundjeri, Clarkefield Landcare. Park of Biolinks Alliance "Melbourne Ark" concept. High DELWP strategic biodiversity ranking. Melbourne Water's Healthy Waterways Strategy 2018-2028 identifies Riddells Creek and Main Creek as priority waterways for vegetation buffers to establish (Riddells Creek), or high quality vegetation to retain (Main Creek/Mount Charlie).

Mount William Range (Will-im-ee Moor-ing) Biolink

This biolink covers the Cobaws, across the Mount William range through to the hills of Chintin. This area is of highly valuable habitat and the green stone quarry at Will-im-ee Moor-ing (Mount William) is of high cultural significance to the Wurundjeri. A Common Dunnart was found in the biolink area in 2018, the first recorded sighting in 30 years. At around the same time two Phascogales were also recorded near Chintin. These animals require intact and connected vegetation to persist. While the native vegetation covering the hill sides to the east of the shire contain significant habitat value, the connectivity analysis shows that these areas are not functioning as a 'connected landscape'.

Significant native animals: Brush-tailed Phascogale, Common Dunnart

Significant native plants: *Eucalyptus pauciflora*, *Allocasuarina verticillata*, *Banksia marginata*

Threatened Ecological Vegetation Classes: Plains Grassy Woodland, Valley Grassy Forest, Riparian Forest

Current zoning: Most private land in the Mount William Range Biolink is zoned Farming, no VPO.

Threats: Degradation of existing vegetation from human use associated with residential development, uncontrolled livestock access to intact native vegetation, waterways and riparian areas, clearance of native vegetation for residential development and farming activities, pest plants and animals.

Goal: To protect existing native vegetation and increase cover to improve connectivity between remnant patches on private land along the Mount William Range and waterways.

Objectives	Council Actions	Measure
Protect and extend existing remnant native vegetation on private land in strategic locations so that it provides viable habitat for threatened species and ecological connectivity	<p>Collaborate with local groups and agencies to identify priority areas, engage landholders, develop projects and seek funding.</p> <p>Site visits and condition mapping to gain a better understanding of the condition of the ecosystems in this area.</p> <p>On-ground management actions required includes fencing and rabbit and weed control to improve remnant vegetation and revegetation on private land to build and connect habitat.</p> <p>Promotion of TfN and offset opportunities.</p>	<p>Ha. native vegetation protected</p> <p>Ha. revegetated</p>
Informed and educated landholders working to protect habitat of their properties.	<p>Continue running property management courses and environment events focused on landholders living in these areas.</p> <p>Introduce a VPO to highlight importance of native vegetation in the landscape and prevent further loss or decline.</p>	<p>No. landholders engaged</p> <p>VPO introduced</p>
Promote the restoration of major rivers and creeks	<p>Continue support for Melbourne Water's Stream Frontage Management Program and promote to landholders along Deep Creek, Number Three Creek and tributaries.</p>	<p>Km. of creek restored.</p>
Ensure no further decline in condition and increase the condition in priority roadside vegetation	<p>Implementation of Roadside Management Plan</p> <p>Focus area for roadside weed program.</p> <p>Increase signage for significant roadside vegetation</p>	<p>Km. roadside weeds treated.</p> <p>No. signs installed</p>

Plans and Partners: Upper Deep Creek Landcare Network, Deep Creek Landcare, Upper Maribyrnong Landcare, Melbourne Water, PPWCMA, Wurundjeri, Biolinks Alliance.

Addresses the "Cobaw Range to Mount Disappointment" Nature Link identified in the PPWCMA Regional Catchment Strategy, where it is rated as a very high priority for plantings. Part of Biolinks Alliance "Melbourne Ark" concept. High priority in Melbourne Water Healthy Waterway Strategy 2018-28.

Kyneton Woodlands Biolink

The Grassy Woodlands in the hills north of Kyneton are treasured for their picturesque scenery and environmental significance. These woodlands were once widespread through the Edgecombe, Greenhill, Langley, Pastoria, Pipers Creek and Sidonia districts north of Kyneton. Today they are now considered at high risk of extinction as remnants are reduced to isolated, small patches which are in decline. Connectivity mapping shows that this landscape is highly fragmented and currently not functionally connected to other surrounding patches. The Kyneton Woodlands area is not connected with habitat to the south and south-west, or to the Great Dividing Range to the east. Important connectivity opportunities have been identified from Black Hill to Bald Hill and further towards the Cobaws. Langley Landcare is looking to connect to the west to the Campaspe River.

Significant native animals: EPBC listed is the vulnerable Growling Grass Frog (*Litoria raniformis*). In addition 14 State threatened species have been recorded within the project area including Brush-tailed Phascogale, Brown Toadlet, Painted Honeyeater, Powerful Owl, Barking Owl, Brown Treecreeper, and migratory birds (Swift Parrot).

Significant native plants: EPBC listed endangered Matted Flax-lily (*Dianella amoena*), vulnerable Clover Glycine (*Glycine latrobeana*), threatened Castlemaine Spider Orchid (*Caladenia clavescens*).

Threatened Ecological Vegetation Classes: Damp Sands Herb-rich Woodland, Valley Grassy Forest, Plains Grassy Woodland, Grassy Woodland

Current zoning: Most private land in this biolink area is zoned Farming or Rural Living. No VPO.

Threats: Degradation of vegetation from human use associated with residential development, weeds including gorse and pest animals including rabbits. Fuel reduction works on public and private land.

Goal: To preserve remnants of the endangered Grassy Woodland vegetation community and increase connectivity between Bald Hill and Black Hill Reserves.

Objectives	Council Actions	Measure
Protect and extend existing remnant native vegetation on private land in strategic locations so that it provides viable habitat for threatened species and ecological connectivity	<p>Collaborate with local groups and agencies to identify gaps, engage landholders and to seek funding.</p> <p>On-ground action includes fencing to protect remnant vegetation, revegetation of trees, shrubs, grasses and herbs and weed control to prevent the infestation or spread of new and emerging threats to biodiversity.</p> <p>Introduce VPO to highlight importance in landscape and prevent further loss.</p>	<p>Ha. vegetation protected</p> <p>Ha. revegetated</p> <p>VPO created</p>
Maintain the high conservation value of Council managed land.	<p>Continue to implement Council's Environmental Management Plans in Black Hill and Bald Hill Reserves.</p> <p>Use these sites as important educational sites for engaging surrounding landholders and Traditional Owners.</p>	Ha. weed control
Ensure no further decline in condition and increase the condition in priority roadside vegetation	<p>Implement Roadside Management Plan</p> <p>Focus area for roadside weed program.</p> <p>Increase signage for significant roadside vegetation</p>	<p>Km roadside weeds treated</p> <p>No. signs installed</p>
Ensure no further loss of key threatened species	<p>Continue Council's monitoring program in reserves to assess outcomes of management actions.</p>	No. sites monitored

Plans and Partners: NCCMA, Upper Campaspe Landcare Network, Baynton Sidonia Landcare, Pipers Creek Landcare, Langley Landcare, Friends Groups for Bald Hill and Black Hill. Identified as a key asset in the NCCMA Regional Catchment Strategy 2013-19 – "Kyneton Area Woodlands".

Wombat-Pyrete Biolink

The Wombat Forest and Lerderderg State Park (Pyrete Range) are the largest remaining tracts of habitat in the shire. The Pyrete Range covers an extensive area of relatively undisturbed old growth forest in steep and rugged terrain and it supports flora and fauna communities of State significance. This biolink looks to provide important buffering and connectivity for the eastern end of the Wombat Forest through to the northern part of the Pyrete Range. It also includes Council managed Mount Gisborne Bushland Reserve, Hobbs Road Reserve and Bullengarook Recreation Reserves.

Significant native animals: Brush-tailed Phascogale, Greater Glider, and 130 species of birds, including the Swift Parrot, Great Egret and the Powerful and Masked Owls.

Significant native plants: magnificent wildflower displays can be seen in late winter and spring.

Threatened Ecological Vegetation Classes: Heathy Woodland, Grassy Woodland, Scoria Cone Woodland, Plains Grassy Woodland

Current zoning: Most private land in the biolink area is currently zoned Rural Conservation. No VPO

Threats: Degradation of existing vegetation from human use associated with residential development. Pest animals including deer and goats. Fuel reduction works on public and private land. Illegal rubbish dumping and trail and mountain bike tracks in public reserves.

Goal: To buffer and connect important habitat found in the Pyrete Range and Wombat State Forest.

Objectives	Council Actions	Measure
Protect and extend existing native vegetation on private land in strategic locations to provide viable habitat and connectivity	Collaborate to develop projects, engage landholders and seek funding. Promotion and support for Bullengarook tree program and education events. Introduce VPO to highlight importance in the landscape and prevent further loss or decline.	Ha. vegetation protected No. trees planted No. participants
Remove threatening processes from public land which are affecting recruitment of native plants.	Facilitate a “community conversation” with public land managers, Landcare, residents and users about future use. Pest animal species: Advocate for more feral goat and deer eradication program on public land with DELWP and Parks Victoria. Illegal rubbish dumping: Advocate for increased monitoring. Bike trails: Work with recreational users to reduce impact on biodiversity. Monitor for illegal tracks.	Ha. pest animal treatment
Maintain the high conservation value of Council managed land	Implement Council’s Environmental Management Plans in Mount Gisborne and Hobbs Road Reserves and consider development of a plan for Bullengarook Recreation Reserve.	No. events held Ha. weeds treated
Restore native vegetation along waterways	Continue support for Melbourne Water’s Stream Frontage Management Program and promote to landholders.	Km of creek restored.
Ensure no further loss of threatened species.	Continue monitoring program on Mount Gisborne and nestbox monitoring program with Bullengarook Landcare.	No. sightings recorded

Plans and Partners: Gisborne Landcare, Bullengarook Landcare, Friends of Mount Gisborne, Jacksons Creek EcoNetwork, Melbourne Water, Port Phillip CMA, Parks Victoria, DELWP, HPV. Part of Biolinks Alliance “Melbourne Ark” concept. Melbourne Water’s Healthy Waterways Strategy 2018-2028 identifies the waterways in the Pyrete Range and Wombat Forest as high quality vegetation to retain, with private properties that buffer these public reserves as priority waterways.

Deep Creek Biolink

The incised escarpments of the Deep Creek south of Darraweit Guim provide habitat for a range of threatened species and communities. The Deep Creek has significant rocky escarpments and basalt cliffs that separate the creek from the surrounding farmland and provide habitat for fauna species such as Peregrine Falcons and Wedge-Tailed Eagles. The riparian zones contain important stands of riparian remnant vegetation. There are also many deep pools that have formed in Deep Creek that provide refuges for native fauna when the creek does not flow. The creek supports an isolated population of platypus that are vulnerable to the threat of low summer flows.

Significant native animals: EPBC listed Growling Grass Frog, Yarra Pygmy Perch, and Swift Parrot. Other significant species include Platypus and Southern Toadlet.

Threatened Ecological Vegetation Classes: Plains Grassy Woodland.

Current zoning: Most private land in the biolink area is zoned Farming, VPO8 in Upper Catchment.

Threats: Drought (Pygmy Perch), Chilean Needle-grass, Serrated Tussock, de-rocking, all impacts associated with farming.

Goal: To enhance riparian habitat and create a corridor of native vegetation along Deep Creek and associated tributaries.

Objectives	Council Actions	Measure
Promote the restoration of major rivers and creeks to ensure 50% are in good condition by 2035.	Continue support for Melbourne Water's Stream Frontage Management Program and promote to landholders. Maintain and revegetate public land sites around Daly's Bridge, Forbes Rd, Dogget's Bridge, Sheehans Crossing and Musty's Bridge.	Km. of creek restored
Enhance biodiversity on private property	Support Deep Creek Landcare Network in project development, landholder engagement and funding applications focusing on pest animal and weed control.	No. landholders engaged Ha. Weed and pest animals treated
Control rabbits and priority woody weeds.	Participation in the Deepening Connections – engaging communities and enhancing habitat of the Deep Creek	No. of landholders engaged Ha. weeds and rabbits treated
Permanent protection for native vegetation through the planning scheme.	Support Melbourne Waters project to have an ESO over the Deep Creek catchment.	Waterway ESO applied or amended

Plans and Partners: Melbourne Water, Upper Deep Creek Landcare Network, Deep Creek Landcare, Upper Maribyrnong, Port Phillip CMA, Wurundjeri, Rivers of the West Project.

Identified as a very high priority for plantings that contribute to the development of the 'Nature Links' in this area in the PPWCMA Regional Catchment Strategy. Melbourne Water Healthy Waterways Strategy 2018-2028 identifies most of the Deep Creek Catchment as a priority area for the establishment of vegetation buffers along the waterways. For the Maribyrnong catchment, the strategy has an aim to "establish 360 km and maintain 283 km of continuous vegetated buffers (using EVC benchmarks and to at least a level 3 vegetation quality) along at least 80% of priority. In addition, increase vegetation cover in existing and planned urban areas by 10 km to support social values."

Riddells and Jackson's Creek Biolink

Riddells and Jackson's creeks provide important habitat through the modified landscape in the south of the shire. These creeks have deep pools that act as drought refugia and provide valuable open space for the communities of Gisborne and Riddells Creek. Along both creeks, community groups have undertaken extensive weed control and revegetation. Along Riddells Creek, an increased area will soon become public land as developers transfer land beside creeks to public management. This offers an opportunity for increased public access along the creek and significant biodiversity gains. The tributaries to Jacksons Creek have been a particular focus for Gisborne environment groups who have aspirations to enhance the environmental and recreation values of these waterways.

Significant native animals: EPBC listed Growling Grass Frog, Yarra Pygmy Perch (possible re-introduction), and Swift Parrot. Other significant species include Rare White Spot Skipper (*Trapezites lutea*), Powerful Owl, Platypus and Southern Toadlet.

Significant native plants: *Diuris punctata variety punctata*, *Acacia rostriformis*

Threatened Ecological Vegetation Classes: Plains Grassy Woodland.

Current zoning: This biolink crosses township, rural living, rural conservation and farming zones. VPO9 in Upper Catchment.

Threats: Drought, weeds, rabbits, urban development.

Goal: To enhance riparian habitat and create a corridor of native vegetation along Jacksons Creek and Riddells Creek and associated tributaries.

Objectives	Council Actions	Measure
Promote the restoration of major rivers and creeks to ensure 50% are in good condition by 2035.	Continue support for Melbourne Water's Stream Frontage Management Program and promote to landholders. Support Gisborne Landcare to develop a masterplan for Howie and Bunjil creeks	Km of creek restored
Enhance biodiversity on public land.	Support biodiversity enhancement activities along public waterway reserves through Gisborne and Riddells Creek townships in partnership with Melbourne Water and community environment groups. Support Greening of Riddell in their work enhancing Wybejong Park and the creek frontage to Smiths Nursery	Ha weeds treated No plants planted
Permanent protection for native vegetation	Support Melbourne Water's project to apply an ESO to waterways in the catchment.	Waterway ESO applied or amended
Enhance recreation values along the main stem and relevant tributaries	Support development and implementation of masterplans that identify priority recreation infrastructure Improve public access through the formalisation of walking tracks.	Masterplans completed Infrastructure works completed

Plans and Partners: Melbourne Water, Port Phillip CMA, Wurundjeri, Greening of Riddell, Riddells Creek Landcare, Clarkefield Landcare, Friends of Jacksons Creek, Gisborne Landcare, Jacksons Creek Econetwork, VicTrack, Amaryllis Environmental, Wurundjeri, FEHMR, Rivers of the West Project. For the Jacksons Creek sub-catchment, the Healthy Waterways Strategy has an aim to "establish a continuous riparian vegetated buffer (97 km, 389 ha) and maintain existing vegetation (129 km, 516 ha) along priority reaches. In addition, maximise multiple benefits from vegetation management for social values in existing and planned urban areas

Campaspe River and Headwaters Biolink

The Campaspe River and its major tributary, Five Mile Creek, provides important connectivity from Mount Macedon and the Wombat Forest through the more open plains woodlands around Kyneton. The water source for Lake Eppalock, the habitat along the river contains several threatened vegetation communities, aquatic life and provides habitat for many terrestrial species. The flood plains of Five Mile Creek around Woodend is the only known natural occurrence of the FFG listed, Black Gum (*Eucalyptus aggregata*).

Significant native animals: Platypus, Mountain Galaxias, Great Egret, Blue-billed Duck, Brush-tailed Phascogale, Squirrel Glider, Swift Parrot.

Significant native plants: Black Gum, Yarra Gum and Tall Wallaby Grass.

Threatened Ecological Vegetation Classes: Plains Grassy Woodland, Swampy Riparian Woodland, Valley Grassy Forest

Current zoning: RCZ (Upper Catchment), Farm Zone (Lower Catchment).

Threats: Major weeds (Willows, Gorse, Broom, Blackberries), grazing restricting natural regeneration and causing erosion of river banks.

Goal: To enhance riparian habitat and create a corridor of native vegetation along the Campaspe River and associated tributaries.

Objectives	Actions for Council	Measure
Ensure on-going protection of Black Gum	Black Gum conservation actions including recording populations, revegetation and weed control on public and private land. Review of Black Gum VPO to ensure all populations are protected.	Population size of Black Gum VPO updated
Ensure best practice management of the regionally important Woodend Grassland Reserve.	Continue conservation works on Woodend Grassland Reserve including ecological burns and weed control.	Implementation of EMP
Protect and extend native vegetation on private land in strategic locations in the headwaters so that it provides viable habitat and connectivity	Collaborate to develop projects, engage landholders and seek funding. Support Ashbourne Landcare in the implementation of the Ashbourne biolink covering private land in the headwaters of the Campaspe.	Ha. vegetation protected No. trees planted No. participants
Protection of waterways and streamside vegetation.	Project development to identify gaps and to seek funding. Support Coliban Water's process to amend the ESO over the Upper Coliban catchment. Consider inclusion of other waterways as waterway corridors into the VPO6 or a separate, new VPO. Support for river health projects by Landcare groups and NCCMA.	Waterway VPO / ESO applied or amended Km waterway fenced Ha revegetated

Plans and Partners: Dja Dja Wurrung, Ashbourne, Woodend and Newham Landcare Groups, UCLN, Threatened Species Conservancy, NCCMA, Coliban Water, Braemer College. Upper Catchment highlighted as a priority in NCCMA Regional Catchment Strategy. Waterways included in NCCMA's Caring for the Campaspe Program and Five Mile Creek Action Plan.

7.4 Objective 4: Improve Council and the Community’s Understanding and Connection to Biodiversity

Community connecting to nature

Nature is good for us. In 2017, the Victorian Memorandum for Health and Nature stated that “a *thriving natural environment not only conserves biological diversity but also sustains the health and wellbeing of people and communities.*” Spending time in nature has physical, psychological, cultural and social health and wellbeing benefits.

The Victorian Public Health and Wellbeing Plan 2015-19 and Protecting Victoria’s Environment: Biodiversity 2037 suggest that the personal and economic wellbeing of all Victorians is dependent on the health of the natural environment. In turn, research has shown that people who are ‘connected to nature’ will be more motivated to act to protect it.

Community members in the Macedon Ranges Shire are very fortunate to have many places to enjoy the natural environment – both larger public bushland reserves and smaller natural spaces within townships. Community consultation indicated that residents most regularly experience ‘nature’ in their own backyards and in townships. Therefore it is vital to create more opportunities for nature based experiences to occur in our homes and towns.

Targeted Environment Education Program

Community members would like to see Council expand the existing program of popular environment events. In order to increase exposure to nature and build the capacity of the community, it is recommended that Council explore different types of activities, workshops and events that engage different sectors of the community. Table 16 provides recommendations and ideas for Council’s environment event program. Its delivery requires strong partnerships with other departments, agencies and community groups.

Key messages include:

- The physical and mental benefits of being active in nature.
- Connecting with nature is good for child health and development.
- Nature is messy.
- Value of urban areas in biodiversity conservation.
- Every property can provide valuable habitat and contribute to landscape improvements.
- Vital role of Community Environment Groups in engaging community.
- We can learn from the culture, values, practices and knowledge of our Traditional Owners.

As part of our consultation, community members identified the following ways they connect to nature in the Macedon Ranges:

- *Top 5 plants/animals:* Wombat, Koala, Kangaroos, Gum Trees, Birds
- *Top 5 places to visit:* Mount Macedon, Wombat Forest, Hanging Rock, Black Hill, Home/Backyard, Local town reserves/river walks/parks.
- *Why do they go there?* Peaceful/relaxing/quiet, exercise/walking tracks, to be outdoors/in nature, to see native plants and animals, good for kids
- *What would help you to visit nature more?* More time, better tracks, more natural places, more information on walking tracks, going with friends and family.



Table 16: Targeted education and engagement recommendations

Partners	Recommendations
Audience: Township residents	
MRSC Local Laws MRSC Arts and Culture Libraries Community Environment Groups Traditional Owner Groups	Promote the Aussie Backyard Bird Count and similar activities. Develop brochures about living with wildlife, native gardens and attracting birds and other wildlife. Provide information around responsible pet ownership. Encourage use of natural locations as alternative arts spaces – increasing access to nature. Support the Lancefield Megafauna Festival and Wil-im-ee Moor-ing Tours. Install nature displays in public places such as libraries.
Audience: Families and Early Years	
Community Environment Groups Traditional Owner Groups Scouts Playgroups Kindergartens Schools (including homeschools) MRSC Sports and Recreation Libraries Parks Victoria	Organise and / or support family focused events, eg. Spot-lighting, family friendly working bees and library talks. Investigate provision of child minding services or activities for adult focused events and workshops. Encourage and promote a Junior Rangers Program in Macedon Regional Park with Parks Victoria. Encourage opportunities to obtain Scout Nature Certificates with local Landcare groups. Promote bush playgroup and bush kinder and build capacity in the community to start and run these programs. Develop a tool kit for exploring biodiversity in the Macedon Ranges including reserve maps, and bird and plant identification guides. Continue to host education events, annual camp-outs and spotlighting experiences at Hanging Rock.
Audience: Youth	
MRSC Youth Community Environment Groups Neighbourhood Houses MRSC Sports and Recreation Health providers Malmsbury Youth Justice Centre Libraries Traditional Owner Groups	Support of the UDCLN to establish Intrepid Landcare in the shire. Provide training and information to community groups about how to involve young people. Host youth focused nature walks and experiences. Incorporate nature based activities into the school holidays programs. Host a camp out at Hanging Rock specifically for young people. Support development of Junior Landcare Groups, Youth Naturalists Club and/or Junior Bushwalking Club Partner with relevant service providers and schools to facilitate nature based activities for young people experiencing mental health issues. Partner with schools and other youth organisations in conservation activities, eg. nest box construction, tree growing and planting, and conservation work in bushland reserves.

Partners	Recommendations
Audience: Older residents	
MRSC Community Services	Promote the volunteering opportunities that are available with community environment groups
MRSC Eco Development	Promote and engage in citizen science programs – eg. Birds in Backyards, U3A bird watching, Waterwatch
Community Environment Groups	Host and/or support activities to engage the retired community – eg. Woodend Landcare’s Thursday Crew, Men’s Sheds
Mens Sheds	
U3A, seniors clubs	Investigate partnerships with service providers and seniors clubs to run programs for older residents – e.g. bush walks and talks
Libraries	
Traditional Owner Groups	Creation of a podcast series on the natural history, cultural heritage biodiversity and landscapes of the Macedon Ranges Shire
Audience: Owners of bush blocks	
Community Environment Groups	One-on-one support through private land conservation program
MRSC Local laws	Short course covering plant identification, weed control, increasing biodiversity, and living with fire and biodiversity
Traditional Owner Groups	Creation of a podcast series on the natural history, cultural heritage biodiversity and landscapes of the Macedon Ranges Shire
	Provide information around responsible pet ownership
	Engage in citizen science threatened species monitoring projects
Audience: Owners of rural properties and farms	
MRSC Economic Development	One-on-one support through private land conservation program
Community Environment Groups	Support development and implementation of biolink projects
Water and Catchment Management Authorities	Provide land management and farm planning courses
Agriculture Victoria	Presence at This Farm Needs a Farmer Field Day
This Farm Needs a Farmer	Engage in citizen science threatened species monitoring projects
Traditional Owner Groups	Provide information around responsible pet ownership
	Update and promote the new farmers kits to new rural residents
	Creation of a podcast series on the natural history, cultural heritage biodiversity and landscapes of the Macedon Ranges Shire
Audience: Shire Visitors and General Community	
MRSC Eco Development	Create of a podcast series on the natural history, biodiversity and landscapes of the Macedon Ranges Shire
Visitor Centres	
Community Environment Groups	Promote nature tourism events to engage more people in nature.
Traditional Owner Groups	Improve cultural and environmental interpretation information at bushland reserves including Hanging Rock
	Develop walking, riding and biking trail guides
	Presence at Sustainability Festival, Kyneton Show, Lancefield Show

Communication Materials

Council develops education materials to help promote and protect biodiversity. These resources can be used at events and on-line by both Council and community environment groups.

The following topics are recommendations for new or updated resources:

- *Flora of the Macedon Ranges*. Field guide for bushwalkers and residents. (*underway*)
- *Revegetation in the Macedon Ranges*. Guide for planting of native species.
- *Birds of the Macedon Ranges*. Field guide to local birds.
- *Grassy Woodlands of the Macedon Ranges*. Highlighting importance of grasslands and how to manage them (e.g. ecologically sound mowing, grazing and burning regimes).
- Update the *Landcare in the Macedon Ranges* brochure with group websites and contacts.
- *Threatened Species of the Macedon Ranges*. Guide profiling different threatened species.
- *Climate change impacts in the Macedon Ranges*. Fact sheet implications of climate change.
- *Traditional Owners of the Macedon Ranges*. Highlighting traditional owner groups, their vital role in Caring for Country, and landholder obligations for protecting cultural values and heritage.

Community Education Actions

- 4.1 Continue to promote and integrate nature and biodiversity into other Council strategies.
- 4.2 Explore creation of a podcast series on the natural history, cultural values, cultural heritage, biodiversity and landscapes of the Macedon Ranges Shire for residents, visitors and shire staff.
- 4.3 Host and support community engagement and education opportunities that target a variety of demographics – see Table 16 for recommendations.
- 4.4 Update or create information sheets, brochures, and webpages as recommended.
- 4.5 Continue to deliver biodiversity events in partnership with local groups, agencies and Traditional Owners.
- 4.6 Increase ‘nature’ experiences in urban areas (including promoting ‘gardens for wildlife’ and as part of new development design).
- 4.7 Deliver training for relevant Council staff, including as part of induction programs, raising awareness about indigenous cultural heritage and cultural values of Country, biodiversity, plant identification and conservation in the Macedon Ranges.
- 4.8 Host talks, events and demonstrations about traditional ecological knowledge, and Aboriginal management and use of the land.



7.5 Objective 5: Enhance the Capacity of Community Groups to Undertake Conservation Activities

There are over 30 community environment groups operating in the Macedon Ranges Shire, seen in Figure 6. We are fortunate to have groups active in most townships and localities. These groups are vital, undertaking substantial conservation work and holding critical local knowledge. They are also important advocates for their local area.

Environmental volunteer groups and programs engage and inspire individuals and communities to sustain the health of Victoria's environment. DELWP, 2018

The groups are supported by three catchment-based Landcare Networks (Upper Campaspe, Upper Deep Creek, and Jacksons Creek Eco-Network). Two Landcare facilitators are employed part time to work with the groups.

Some groups and networks have developed their own strategic plans that include biodiversity components and others have detailed biolink plans they are implementing through on-ground action. Activities undertaken by local community environment groups include;

- On-ground action through grant funded projects and regular working bees
- Community education through walks and talks, seminars, land management workshops and the development of useful brochures and information
- Monitoring and citizen science programs

The ongoing involvement and local knowledge of these community groups is vital to conservation of biodiversity across the Macedon Ranges Shire. Ensuring strong and enduring partnerships will be the critical element for the success of the biodiversity strategy into the future.

Community environment groups in the Shire work closely with public land managers, Traditional Owners, private landholders, and each other.

There are a number of ways community environment groups can work with Traditional Owners to care for country. Relevant Traditional Owners can give a *Welcome to Country* or Smoking Ceremony at the start of events or undertake a cultural heritage survey of a site. In Dja Dja Wurrung country, groups need to comply with the Land Use Activity Agreement for works on Crown Land and can engage the DDWCAC for Djaara people's involvement. One of the most valuable things groups can do is continue to share and learn more about the cultural heritage values of our area.



Schletma

Through consultation, many groups acknowledged the support already provided from Council and hopes that this will be maintained into the future. Many groups also reported declining numbers and difficulties in recruiting new volunteers (especially to committee roles).

The on-going capacity for community environment groups in an aging population is a significant challenge. Council can support the future of these groups through education events and extension activities targeting new landholders moving into the shire.

Trends in environmental volunteering suggest that people want more flexibility in how and when they volunteer (DELWP, 2018). In the future, this may mean supporting groups to provide more event-based volunteering opportunities and assisting our community to access these events. Council is committed to maintaining and supporting the high community capacity required to respond to change and to participate in shaping the future.

Community Group Actions

- 5.1 Encourage and assist with community-initiated biodiversity programs and projects. This may be through partnerships, mapping, landholder contacts, and support with funding applications.**
- 5.2 Continue community environment group funding program including the provision of partnership funding to the three Networks. As part of the annual Landcare Funding application process, record and share the activities and volunteer contribution of community environment groups.**
- 5.3 Deliver ‘train the trainer’ programs aimed at building capacity of Traditional Owners and community environment groups to run events and programs in the local area.**
- 5.4 Host networking and social events for community environment groups and Traditional Owners, enabling members to share ideas, collaborate and celebrate their voluntary contributions.**
- 5.5 Advocate for CMAs and State Government to develop a mapping information layer showing grant funded revegetation works to ensure past works are adequately protected.**
- 5.6 Assist with the promotion of community environment group events and working bees such as through the development of an on-line community calendar and the environment e-news.**
- 5.7 Support groups to engage with Traditional Owners, enhance their cultural understanding, and meet cultural heritage obligations if working on public land.**



8. Monitoring Landscape Change

Council currently undertakes ecological monitoring in collaboration with the community. Most activities are conducted on Council managed land. Figure 37 indicates the locations of Councils nest box monitoring program. In 2016-2018 Council also conducted fauna monitoring activities in collaboration with DELWP, Parks Victoria and local community groups within public land reserves. These activities resulted in recent sightings of a number of threatened species including Brush-tailed Phascogale, Greater Glider, Mountain Brush-tailed Possum, Feathertail Gliders and Latham’s Snipe.

Detailed flora surveys have also been undertaken as a part of the preparation of the management plans for Council managed bushland reserves. In some reserves and roadsides Council undertakes flora surveys to confirm the presence of threatened species and to monitor the impact of threats such as weeds, fire and browsing by herbivores.

Monitoring by the community across the shire is varied and includes:

- Waterwatch by groups in Malmesbury, Woodend, and Gisborne;
- Silver Banksia surveys in Baynton Sidonia; and
- Recording sightings on NatureShare.

Many motivated individuals are undertaking flora and fauna surveys, but often these are not being collated across the shire – nor are we aware how many are being entered into the Victorian Biodiversity Atlas (VBA).

Despite its high biodiversity values and the monitoring effort undertaken by many individuals and Council to date, the Macedon Ranges Shire remains a ‘cold spot’ in the Victorian Biodiversity Atlas. This represents a lack of scientific research identifying or confirming ecological values across the shire. Hence the need for a strong biodiversity monitoring program to be established across the shire.

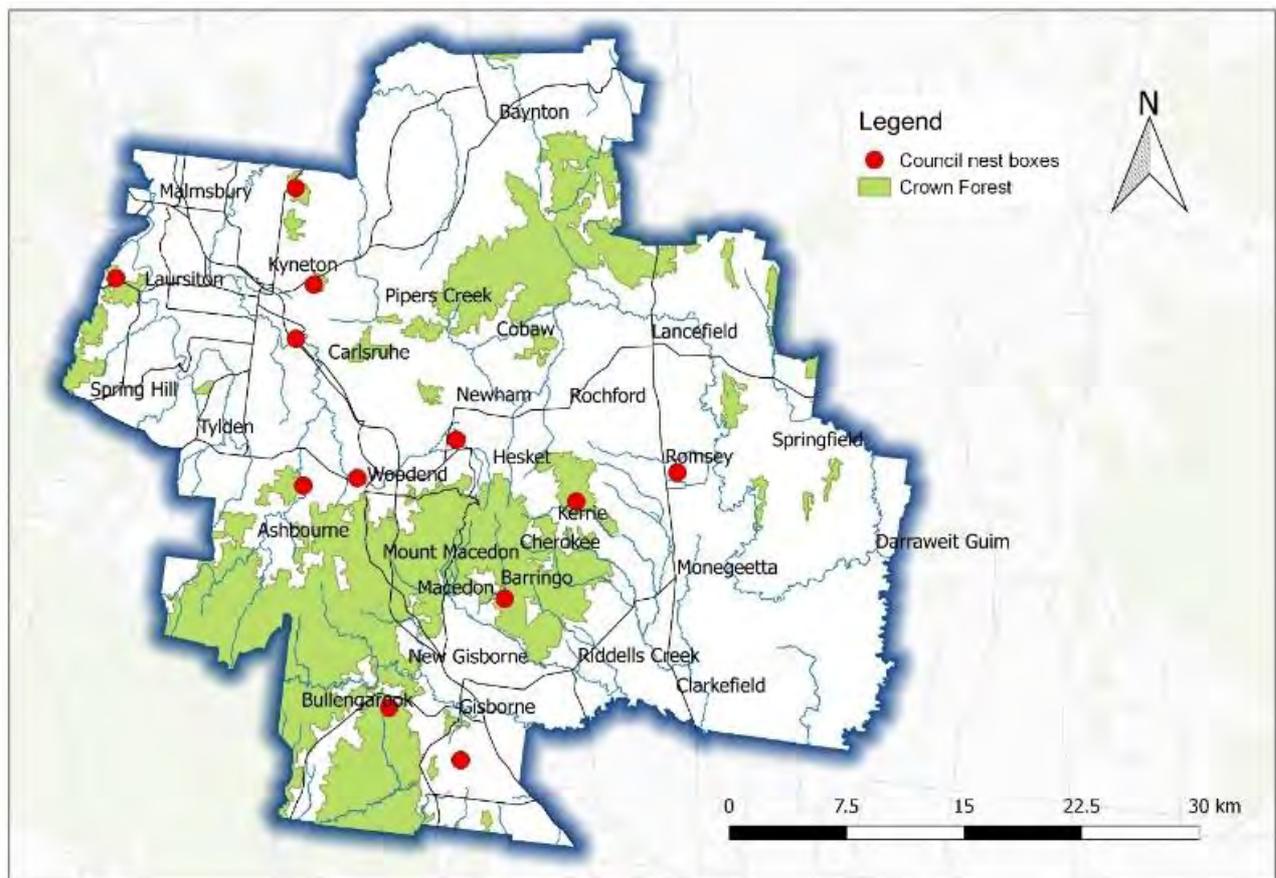


Figure 37: Sites with Council Nest Boxes for monitoring

8.1 Biodiversity Monitoring Program

The Biodiversity Monitoring Program is designed to assess how Council is tracking against each of the five objectives in the strategy. Table 17 provides a summary of the proposed approach.

Table 17: Summary of proposed monitoring program.

Objective	Protect existing biodiversity and native vegetation	Enhance existing biodiversity and native vegetation	Extend and connect vegetation and fauna habitat.	Improve Council and community's understanding and connection to biodiversity	Enhance the capacity of community groups to undertake conservation activities
Monitoring Question	What changes to biodiversity are occurring across the Macedon Ranges landscape?	What improvements to biodiversity are occurring on council managed land in the Macedon Ranges?	Has the extent of native vegetation changed across the Macedon Ranges?	Has Council's and community's understanding of and connection to nature and biodiversity changed?	How are our community environment groups tracking?
Performance Indicators	Presence of indicator species* to monitor ecosystem health: <ul style="list-style-type: none"> • Brush-tailed Phascogale • Powerful Owl • Greater Glider • Woodland birds (Brown Treecreeper) Significant species and communities to monitor population health	Percent cover of noxious weeds on Council managed roadsides. Condition of Council managed bushland Number and distribution of records of selected pest animal species	Native vegetation extent within biolink areas Distribution of wildlife populations, with focus on indicator species*	Percent of event participants who learnt something new Change in favourite native species of community Change in landuse practices as a result of training programs	Health and activity of Landcare and Friend groups

*Indicator species were selected using the following broad criteria:

- The presence and abundance of the species is an indicator of broader ecosystem health
- The species is known to occur within the Macedon Ranges Shire.
- The species is listed as threatened within Victoria or is regionally significant.
- The species possesses one or more traits that would appeal to the local community and stimulate conservation awareness and action.
- The species is able to be readily surveyed by Council and/or the local community.
- The species may already be a focal species with local Landcare groups.

Determining survey sites

For the formal monitoring of the indicator species, it is proposed to establish set survey sites. Sites will be selected by a stratification of the 6 biolink areas plus 2 forest blocks (Wombat, Cobaws), patch size (habitat patch, connectivity site), and vegetation type (dryer woodland on slopes, wetter woodland in gullies) giving 32 combinations of treatments. Figure 38: Stratification of monitoring sites outlines this proposed stratification approach. A minimum of three survey sites per treatment is recommended, but this may not be possible for all combinations of site types. As much as possible utilise the sites already determined for the Spotlight on Species project and councils existing nest boxes program. A minimum of 50 – 70 sites are recommended for the entire Shire.

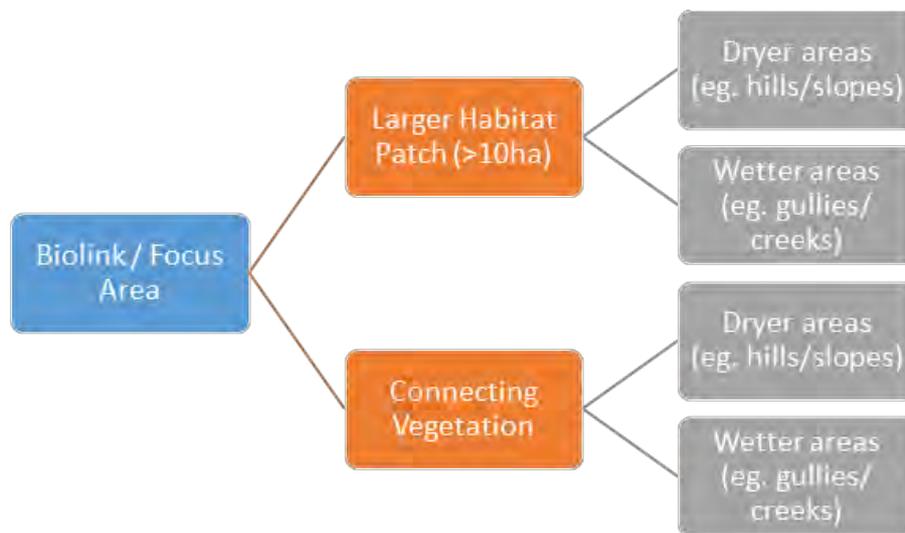


Figure 38: Stratification of monitoring sites

Note that that implementation of the monitoring program does not preclude other surveys and monitoring activities which will also increase our knowledge and understanding. The monitoring program is a minimum, base level of study.

Objective 1: Protect existing biodiversity and native vegetation

Key Monitoring Question

What changes to biodiversity are occurring across the Macedon Ranges landscape?

Monitoring / Performance Indicators

Presence of indicator species to monitor ecosystem health.

- Brush-tailed Phascogale
- Powerful Owl
- Greater Glider
- Woodland birds (Brown Treecreeper)

Significant species and communities to monitor population health.

- Silver Banksia, Snow Gum
- Plains Grassy Woodland (PGW)
- Threatened flora species such as Black Gum, Dianella Amoena, Hairy-leaf Trigger Plants
- Threatened fauna species such as Brown Toadlet

Monitoring Approach for Indicator Species

Phascogale

What: A small hollow-dependent carnivorous marsupial that occurs in woodlands.

Why: Good indicator species for woodlands and the associated community of hollow-dependent tree and ground dwelling mammals such as Sugar Gliders, Squirrel Gliders and Antechinus. Presence of

Phascogale may also indicate well-connected habitats, low rates of predation and healthy populations of vertebrate and invertebrates.

How: Nest box surveys and camera traps (optional)

Where: Install 3 nest boxes spaced 25m apart at each survey site. This will require, at minimum, 96 nest boxes to be installed and surveyed.

When: Monitor nest boxes annually, report every 5 years.

Note: Council has installed approximately 400 nest boxes in eight bushland reserves around the shire to monitor populations of Phascogales. These 400 nest boxes provide an opportunity for Council to support research projects to investigate aspects of the ecology of Brush-tailed Phascogales and for community engagement purposes.

Powerful Owls and Greater Gliders

What: The Powerful Owl *Ninox strenua* is Australia's largest owl which occupies eucalypt forest and woodland. The Greater Glider *Petauroides Volans* is the largest of Australia's gliding possums.

Why: Indicators to represent overall forest health. Both species rely on large old trees with hollows for breeding. As an apex predator, Powerful Owl rely on the presence of small mammals and marsupials for food.

How: Use acoustic survey tools to detect Powerful Owl rotated around to potential sites every two years. Greater Gliders would be surveyed in the same locations by spotlighting, during which time owls may be seen or heard.

Where: Stratified survey sites.

When: Annually. Reporting every 5 years.

Note: Population dynamics of Powerful Owls could be monitored though annual surveys of some or all known nests, depending on the number of nests and capacity of local community groups to assist.

Woodland Birds/Brown Treecreeper

What: Woodland birds, include Brown Treecreepers *Climacteris picumnus*. Treecreepers are widespread in eastern Australia, occupying a range of eucalypt-dominated forests and woodlands.

Why: Brown Treecreepers are to be used as a flagship species to garner interest from the local community, however woodland birds as a whole are to be monitored. Different woodland birds tend to use different habitats – and their presence or absence may act as indicators of habitat type and quality

How: Field surveys of the diversity, distribution and abundance of woodland birds over time. Standardized 20 min, 2 ha area searches are the standard method for broad-scale surveys of woodland birds. At best, sites should be surveyed in winter and spring, either in the morning or at the end of the day, and windy days avoided. At a minimum, coordinate once a year surveys as part of the "Birds in Backyards" week using citizen scientists.

Where: Stratified survey sites.

When: Undertake systematic survey in year 2 (after initial inventory) and at yearly intervals thereafter. Reporting at five-yearly intervals.

Note: The results of each survey should be submitted to the VBA or Birdlife Australia's Birddata by setting up the "Macedon Ranges Woodland Birds Monitoring" as a project within their online atlas. The newly established Birdlife Castlemaine and District group may be able to support the establishment and delivery of this bird monitoring program.

Monitoring Approach for Significant Species

Significant plant species: eg. Silver Banksia, Snow Gum, Black Gum

What: The Silver Banksia (*Banksia marginata*) was once widespread throughout western Victoria, including parts of the Macedon Ranges Shire. Snow Gums occur across the plains and on Mount Macedon.

Why: These species are vulnerable under a warmer climate. They are also likely to be more susceptible than many species to altered processes due to their growth patterns, recruitment, dispersal and lifespan attributes.

How: Citizen Science approach focusing on surveys of population size, distribution and evidence of recruitment.

Where: Known “hot spots” for the species and areas with suitable habitat.

When: The frequency of monitoring is dependent on community interest. Different species could become the focus of different citizen science campaigns.

Note: Several members of the community are already involved in the established programs for both Silver Banksia and Black Gum. The approach here would be to support and extend their efforts.

Plains Grassy-Woodland

What: Plains Grassy Woodland (EVC 55) is an ecological community that supports an open, eucalypt woodland with trees up to 15m tall and an understorey dominated by grasses or grass-like herbs with a few interspersed shrubs. Due to grazing and clearing this EVC has mostly disappeared, and remnant areas are severely degraded.

Why: Given that there are many threatened flora and fauna species associated with these grassy woodland communities, it is impractical to monitor and manage each of them individually.

How: Monitoring for this community requires spatial data and on-ground surveys. In order to effectively monitor the extent of Plains Grassy Woodland, the following actions are suggested:

- Extent – Develop an initial assessment of the extent of remnants in the Shire based on DELWP modelling and Councils internal sources.
- Condition - continue to assess condition of Grassland areas on public land

Where: Across the Plains Grassy Woodland areas within the shire.

When: The frequency of monitoring is specified below for the different data inputs:

- Initial inventory: One-off at the commencement of the program
- Trajectory of extent and condition monitoring: Every five years
- Targeted monitoring for specific management works: Every year until works program completed.

This program for Plains Grassy Woodland monitoring should be reviewed and evaluated upon commencement after the initial inventory assessment, and then every five years after each trajectory assessment.

Notes: This information will also be important to make recommendations on increased protection (e.g. through a VPO or ESO) and could be used for targeting extension/education activities with private landholders.

Additional Notes:

All monitoring should follow Council’s Standard Operating Procedures (SOP) for fauna monitoring.

Annual monitoring results should be incorporated in the Annual Environment Report and entered in the Victorian Biodiversity Atlas or Birdata.

Objective 2: Enhance existing biodiversity and native vegetation

Key Monitoring Question

What improvements to biodiversity are occurring on council managed land in the Macedon Ranges?

Monitoring / Performance Indicators

2.1 Roadside weeds - percentage cover of noxious weeds on Council managed roadsides.

2.2 Bushland reserves –changes in native vegetation quality though time

2.3 Pest animals – number and distribution of records of selected pest animal species.

Monitoring Approach for Indicators

2.1 Annual roadside weed audits to identify where threats are increasing, decreasing or changing, and where management needs to be undertaken. In particular, audits can note presence of new and emerging weeds and distribution of Serrated Tussock and Chilean Needle Grass (i.e. containment / reduction of infested areas). Public observations can be verified and incorporated where possible. For the sake of consistency, comparability and timeliness, the audits are undertaken annually over a 3 month window from April to June. All data is recorded in a database.

2.2 Reserve monitoring is complex and requires much consideration of objectives and resources. Focus monitoring on native vegetation response to management (or lack of) as well as disturbance (natural, human or pests). It is suggested that an assessment of native ground storey cover (as utilised in the Hanging Rock and Black Hill Reserve EMPs) would be suitable for Council's needs, with the exception of grassland ecosystems where species may need to be taken into account as well. Most importantly, the surveys need to be consistent, rapid and replicable.

Photopoint monitoring is a simple and effective tool in documenting changes within native vegetation over time. It is recommended that council established one or more of photopoint sites in each reserve. The location of the photopoint should be carefully chosen to illustrate one feature (eg. an area undergoing weed control, a good example of a particular vegetation community, supplementary planting site, or changes in groundcover). Consider incorporating citizen science utilising the Fluker Post approach and app.

2.3 Monitoring of pest animals is recommended with the implementation of an integrated, regional, co-ordinated approach to pest animal control. In the absence of such a plan, general high-level monitoring by the community and council staff through existing monitoring programs.

Objective 3: Extend and connect vegetation and fauna habitat.

Key Monitoring Question

Has the extent of native vegetation changed across the Macedon Ranges?

Monitoring / Performance Indicators

3.1 Change in native vegetation extent within identified biolink areas

3.2 Distribution of wildlife populations, especially focal species listed under Monitoring Objective 1.

Monitoring Approach for Indicators

3.1 Utilise DELWP native vegetation extent mapping and the more recent connectivity analysis included in this report to guide efforts to increase extent and connect patches.

3.2 Utilise data from focus species (outlined in objective 1) as a priority. For other species, use existing data and encourage collection of new records using VBA Go, Birddata, NatureShare or equivalent. BioBlitz events are also good ways to encourage data collection from the public.

Objective 4: Improve Council and the community's understanding and connection to biodiversity

Key Monitoring Question

Has the Council's and community's understanding of and connection to nature and biodiversity changed?

Monitoring / Performance Indicators

4.1 Percent of event participants who learnt something new

4.2 Change in favourite native species of community

4.3 Changed landuse practices as a result of property planning courses and internal council training programs.

Monitoring Approach for Indicators

4.1 Record number of participants and complete standard participant evaluations of all events. A simple evaluation form should be utilised at all events. Information gathered should be collated in a shared database to assist with future event planning.

4.2 An understanding of resident's attitudes and connection to nature can help guide future events and approaches. It will also help with evaluation of the success in the environment program in changing attitudes. Repeat the 'nature quiz' (see Section 7.4) or similar at all public events that Council attends (eg. Sustainability Festival, Kyneton Show).

4.3 Follow up with past participants of land management and property planning courses to evaluate the long term benefits of these programs. A simple survey of past property management courses will help to determine what landuse practices have changed.

4.4 A simple survey to council staff upon completion of the training to determines usefulness and application.

Objective 5: Enhance the capacity of community groups to undertake conservation activities

Key Monitoring Question

How are our Traditional Owners and community environment groups tracking?

Monitoring / Performance Indicators

5.1 Landcare group health check

Monitoring Approach for Indicators

5.1 As part of the annual Landcare funding program, ask groups to complete a quick survey to understand how group is tracking as well as identifying any issues and future priorities. Surveys can focus on including number of volunteers and level of activity. Alternatively, this information is also collected by the Catchment Management Authorities as part of their annual Landcare program, so information can be obtained from them.

Monitoring Actions

6.1 Implement monitoring program as recommended.

6.2 Develop a formal database to record monitoring program results and allow for analysis.

6.3 Encourage and support the establishment of a Macedon Ranges Field Naturalist Group to help implement citizen science aspects of the monitoring program.

6.4 Continue to liaise with DELWP to ensure Nature Share data is entered into the Victorian Biodiversity Atlas.

6.5 Continue to provide support and training to Traditional Owners, residents and community groups to record and share their biodiversity data.

8.2 Annual Review and Reporting

Council has a commitment to accountability and reporting on program outcomes. Adaptive management is especially important for biodiversity conservation as new information is gathered. Monitoring, Evaluation, Reporting and Improvement (MERI) are simple concepts that, when applied, help us understand what is being achieved and help identify possible improvements, for projects and programs.

- **Monitoring** is about the collection of data and information (ie. the monitoring program)
- **Evaluation** is about analysing the monitoring data and assessing what it means. Based on this data, informed judgements can be made about the success of a project, or program, and improvement can be made.
- **Reporting** is about communicating what we have found through monitoring and evaluation. It is about sharing information, including achievements and lessons learnt.
- **Improvement** is about using this information to improve the way things are done.

Reporting and Review Actions

6.6 Include information in the Council's annual environment report about activities implemented and monitoring program results.

6.7 Review the biodiversity strategy every 5 years, or as required, to ensure it is current and meets the needs of the community and environment and amend where necessary



9. Summary of Strategy Actions

Legend

Timeframe to commence

- Short – within 2 years
- Medium – 2-5 years
- Long – 5 plus years
- On-going
- AOA - As opportunity arises

Budget

- \$ <\$5000
- \$\$ \$5,000-\$25,000
- \$\$\$ \$25,000-\$50,000
- \$\$\$\$ \$50,000-\$100,000
- \$\$\$\$\$ >\$100,000
- Existing – Existing Resources

Note: Implementation of these actions is subject to Councils annual budget processes.

Action	Timeframe	Budget
Objective 1: Protect existing biodiversity and native vegetation		
Theme: Improvements to Planning Controls		
1.1 Investigate rezoning identified areas with significant native vegetation currently in the Farming Zone to ensure their protection.	Short	\$\$\$
1.2 Rezone the following Council managed bushland reserves to “PCRZ” - Hobbs Road Reserve, Mount Gisborne, Magnet Hill, Malmsbury Common, Bald Hill, Stanley Park, Sandy Creek and Barringo Reserve.	Short	\$\$
1.3 Undertake further investigations to revise Council’s current VPOs and apply new VPOs for Scoria Cone Woodland and Plains Sedgy Wetland Vegetation communities as outlined in this strategy (summarised in Table 13).	Short	\$\$\$\$
1.4 Support Melbourne Water and Coliban Water’s efforts to introduce a new ESO for high value waterways (covering Deep Creek and the Upper Coliban).	AOA	Existing
1.5 Review MRSC’s Property Management Plan template & guidelines required for planning permits to ensure they place significant emphasis on biodiversity enhancement and expected minimum standards (eg. protecting remnant vegetation, pest plant and animal control, revegetation, wildlife friendly fencing).	Short	Existing
1.6 As part of the planning permit process, continue to utilise Section 173 agreements where appropriate to protect significant native vegetation to ensure protection into perpetuity.	On-going	Existing
1.7 Review the local policy content within the Macedon Ranges Planning Scheme to include the policy directions outlined in the strategy.	Short	\$\$

Theme: Native vegetation retention compliance		
1.8 In partnership with Statutory Planning, adequately increase Council's resources for pro-active compliance activities to ensure implementation of planning permit conditions relating to environmental matters such as tree protection, native vegetation offset and land management plans.	Short	\$\$\$\$
1.9 Develop and implement an Illegal Native Vegetation Removal Compliance Policy.	Short	Existing
1.10 Continue to raise awareness amongst landholders about the legal requirements associated with native vegetation clearing.	On-going	Existing
1.11 Advocate that the State Government increases penalties for illegal native vegetation removal, facilitates a consistent approach to native vegetation compliance across the state and increases resourcing for compliance.	On-going	Existing
Theme: Biodiversity protection through regulation		
1.12 Environment team in conjunction with Local Laws to increase public awareness about the impact of outdoor cats and domestic dogs on native wildlife and the environment.	Short	Existing
1.13 Provide support for any initiatives outlined in the Domestic Animal Management Plan and the 2018 investigation which reduce the impact of cats on native wildlife.	Short	Existing
1.14 Create awareness and education about the impacts of dogs in sensitive bushland environments and support initiatives that help to reduce these impacts.	Short	Existing
Theme: Fire and biodiversity		
1.15 Continue involvement of the Environment Unit in the Municipal Fire Management Planning Committee including delivery of community education and determining Council's annual roadside slashing and planned burns program.	On-going	Existing
1.16 Continue to work with other agencies through relevant fire recovery committees to assist the community restore their land post-fire.	On-going	Existing
Theme: State Managed Reserves		
1.17 Assist with cross tenure project identification, development and implementation to support landholders mitigate threats to public reserves.	On-going	Existing
1.18 Collaborate with Parks Victoria and DELWP to develop projects to attract grant and external funding for conservation works to reduce impacts and enhance biodiversity values in state parks, forests and reserves.	As required	Existing
1.19 Advocate and work with public authorities such as VicRoads, VicTrack, Powercor, cemeteries, water authorities, and the Emergency Management Centre to improve conservation values on their land.	On-going	Existing

1.20 Continue to advocate to the State Government for improved protection and enhancement of public reserves in the shire.	On-going	Existing
Theme: Permanent Protection on Private Land		
1.21 Continue to encourage covenanting of high priority private land through Trust for Nature with targeted promotion in biolink areas.	On-going	Existing
1.22 Continue to provide the rate rebate for covenanted land.	On-going	Existing
1.23 Promote the opportunity for landholders in the shire to utilise areas of remnant native vegetation on their land for native vegetation offsets	On-going	Existing
1.24 Commit to creating a nature conservation reserve and improving biodiversity health at Barrm Birrm.	On-going	Existing
1.25 In partnership with Riddells Creek Landcare, promote and allocate resources to Council's "gift back" program to expedite the transfer of land to public ownership.	Short	Existing
1.26 With the permission of relevant land owners, undertake a full formal assessment of the site's biodiversity values including a detailed flora and fauna survey.	Medium	\$\$
1.27 Install signage at access points to inform the public that the area is private land with significant vegetation and that gathering of firewood and camping, except by owners, is prohibited.	Medium	\$
1.28 In partnership with Riddells Creek Landcare, community environment groups, continue to advocate for the public acquisition of Barrm Birrm by the state government and integration of the area into the adjoining public reserve system.	On-going	Existing
Theme: Threatened Species and Communities Protection		
1.29 Raise awareness through landholder engagement, education events and development of communication materials of the importance of Grassy Woodlands and appropriate management actions including holistic grazing, mowing and cultural and ecological burns.	Medium	Existing
1.30 In partnership with relevant community groups and Traditional Owners, prioritise Grassy Woodland enhancement on public land along roadsides, rail reserves and waterways where remnants persist.	AOA	Existing
1.31 Ensure that detailed flora and fauna (e.g. Golden Sun Moth and Growling Grass Frog) assessments are undertaken in areas likely to support grasslands or grassy woodlands as part of planning processes such as permit applications for subdivisions and the preparation of development plans and precinct structure plans.	AOA	\$\$
1.32 In partnership with the community and agencies, undertake specific threatened species protection measures on Council managed or other public land when need or opportunity arises.	On-going	Existing
1.33 Survey for and monitor threatened species populations on Council managed land to inform future management actions.	On-going	Existing

1.34 Comply with FFG and EPBC approval processes as relevant if works are proposed on Council managed land that may impact the species.	On-going	Existing
1.35 Raise awareness amongst the community of specific threatened species that occur within the shire, including the need to comply with FFG and EPBC approval processes	On-going	Existing
1.36 Explore community engagement activities that engage Traditional Owners, landowners and community groups in surveying, monitoring and protecting threatened species populations on private land.	AOA	\$\$
1.37 Ensure management actions targeting non-indigenous vegetation consider possible impacts on threatened species populations that may be present.	On-going	Existing
Objective 2: Improve existing biodiversity and native vegetation across public and private land		
Theme: Pest Plants and Animals		
2.1 Continue implementation of Council's Weed and Pest Animals Strategy 2014-2024 through prioritised weed control on Council managed roadsides and bushland reserves. Investigate options for minimal chemical use in weed control practices.	On-going	Existing
2.2 Continue the annual funding program for community groups for weed control on roadsides and public land.	On-going	Existing
2.3 Provide regular and topical weed education to landholders through a variety of channels such as direct mail, social media and articles in Shirelife and the environment eNews.	On-going	Existing
2.4 Review and update Council's Weed and Pest Animals Strategy in 2021.	Medium	\$\$
2.5 Advocate for and strengthen partnerships for coordinated pest plant and animal programs across public land and private land in priority areas.	On-going	Existing
2.6 Introduce a mechanism to planning overlays that trigger a permit for any vegetation removal to exempt specified environmental weeds.	Medium	\$\$
Theme: Bushland Reserves		
2.7 Increase resources for on-ground works in bushland reserves and small conservation reserves as required. This includes resources for monitoring of flora and fauna, ecological burns, installing signage, phytosphthora control, installing wildlife friendly fencing, pest plant and animal control, and improve parking areas and walking paths.	On-going	\$\$\$
2.8 In the grassland areas of Council Managed Reserves, peg out high value areas in advance to slashing and install signage to increase community understanding about the value of these areas.	Short	\$
2.9 Work with relevant Registered Aboriginal Parties to prepare Aboriginal Cultural Heritage Land Management Agreements for Council managed bushland reserves.	Short	\$\$\$

2.10 Engage the Wurundjeri Council's Narrap and Dja Dja Wurrung's Djandak teams for on-ground work where possible and appropriate, especially when considering ecological and cultural burns.	AOA	\$\$
2.11 Regularly review and prepare new Environment Management Plans and Small Conservation Reserve Action Plans, working closely with relevant community groups and Traditional Owners. Develop consistent methodology for vegetation condition assessments and a consistent approach to their scope and content. In addition undertake systematic recording of visitor use and visitor surveys of bushland reserves as part of EMP reviews.	On-going	Existing
2.12 Work with relevant Community Environment Groups to develop a suite of guides and information for Council's reserves including brochures and maps of walking tracks. Aim to prepare a suite of brochures using a consistent format and branding.	Medium	Existing
2.13 Consider implementation of biosecurity measures for reserves where phytophthora is known to occur.	Medium	\$\$
2.14 Monitor Kangaroo numbers and their grazing impacts. Consider sustainable and humane control options if deemed appropriate.	On-going	Existing
Theme: Roadside Management Plan		
2.15 Complete and implement the Roadside Management Plan. Integrate outcomes into council work practices.	Short	Existing
2.16 In partnership with the Macedon Ranges Wildlife Network, extend the safe wildlife crossing program to identified hot spots. Explore innovative approaches to wildlife signage and crossings as appropriate.	On-going	\$\$
2.17 Support and encourage community members and environment groups to play an advocacy and awareness raising role for roadsides in their area.	On-going	Existing
2.18 As part of Council's Roadside Slashing Program, develop guidelines for mowing in high conservation areas and install signage to increase community understanding about the value of these areas.	On-going	\$
2.19 Consider implementation of a revegetation program along high priority roadsides so they can play a role identified in the landscape connectivity plan.	Medium	\$\$, annually
2.20 Continue to work with Council's Emergency Management Team to ensure the roadside slashing program is designed to minimise weed spread and facilitate protection of native vegetation, particularly native grasslands, where relevant.	On-going	Existing
2.21 Develop an education program to encourage landholders to better manage their roadsides and understand their rights and responsibilities.	Short	\$\$
2.22 Establish a roadside works approval process for landholders wishing to undertake works on their roadsides.	Short	Existing
2.23 Finalise the Three Chain Road Fire Risk Mitigation Action Plan and consider applying this process to other roadsides with complex management considerations.	Short	Existing

Theme: Private Land Conservation

<p>2.24 Establish a Private Land Conservation Officer / “Extension Officer” role to work with private landholders to protect biodiversity on their properties, with a specific focus on the biolink areas and the shire’s grassy woodlands. The role would provide conservation advice, coordinate education program, develop property plans, link residents to Landcare groups, assist land owners with grant opportunities and enter data gathered into the Victorian Biodiversity Atlas. Explore opportunities to co-fund this position with other agencies and community organisations.</p>	<p>Medium</p>	<p>\$\$\$\$, annually</p>
<p>2.25 Develop a strong education program for private landholders in partnership with Traditional Owners, local groups and agencies focusing on property management for biodiversity. The program should cover important topics including flora and fauna identification, native vegetation protection, protecting paddock trees, soil management, bushfire preparation, wildlife friendly fencing, waterway protection, planting native species, grazing management, pest plant and animal control, traditional land management practices and the cultural value of biodiversity.</p>	<p>Short</p>	<p>\$\$</p>
<p>2.26 Conduct property management courses that help improve biodiversity and agricultural values of properties in partnership with local groups, agencies and Traditional Owners. Target courses for particular enterprises (eg. small farms, equestrian, viticulture, grazing).</p>	<p>On-going</p>	<p>Existing</p>
<p>2.27 Support “This Farm Needs a Farmer” to incorporate education and mentoring about land restoration and the value of biodiversity for productivity and business.</p>	<p>Short</p>	<p>Existing</p>
<p>2.28 Develop and update information resources for rural land owners, including the new farmers kit, covering a range of topics including living with wildlife, native plants and revegetation guide, managing grasslands, weed control and weed identification, contacts for local community environment groups, and the impact of climate change in managing land.</p>	<p>On-going</p>	<p>Existing</p>
<p>2.29 Continue to have a Council presence at community events such as local agricultural shows, providing information and advice about biodiversity conservation and land management.</p>	<p>On-going</p>	<p>Existing</p>
<p>2.30 Review the private land conservation program within 3 years of its implementation to ensure it is achieving improved private land conservation outcomes.</p>	<p>2021</p>	<p>\$\$</p>

Theme: Urban Biodiversity

<p>2.31 In partnership with Council’s Operations Department, develop landscaping guidelines that encourage locally native plants to be used in public spaces, as street trees and in new developments where appropriate.</p>	<p>Short</p>	<p>Existing</p>
<p>2.32 Support residents to preserve and plant locally native vegetation as much as possible and consider implementing an urban biodiversity program such as “Gardens for Wildlife”.</p>	<p>Medium</p>	<p>\$\$</p>

2.33 Continue support for community groups and Traditional Owners undertaking biodiversity projects in township areas and assist with community planning.	On-going	Existing
2.34 For new developments, seek opportunities to transfer waterways and appropriate buffers to public ownership.	On-going	Existing
Objective 3: Extend and connect native vegetation and fauna habitat		
Theme: Climate Change Responses		
3.1 Consider the future health and the resilience of ecosystems under changing climate in all on-ground and education activities.	On-going	Existing
Theme: Landscape Connectivity Plan		
3.2 Collaborate with and actively support biolink partners in the development of project plans for the priority biolink areas and assist with engagement of landholders.	Short	Existing
3.3 Contribute to improving connectivity by prioritising councils on-ground works on council managed land and along roadsides in biolink and strategic habitat link areas.	On-going	Existing
3.4 Actively pursue Federal and State Government grants to develop and implement enhancements in biolink areas. Partner with Traditional Owners, community environment groups and relevant agencies to develop cross tenure conservation projects that can be the basis or funding applications.	On-going	Existing
Objective 4: Improve Council and the community's understanding and connection to biodiversity		
4.1 Continue to promote and integrate nature and biodiversity into other Council strategies.	On-going	Existing
4.2 Explore creation of a podcast series on the natural history, cultural values, cultural heritage, biodiversity and landscapes of the Macedon Ranges Shire for residents, visitors and shire staff.	Medium	\$\$
4.3 Host and support community engagement and education opportunities that target a variety of demographics – see Table 16 for recommendations.	On-going	Existing
4.4 Update or create information sheets, brochures, and webpages as recommended.	On-going	Existing
4.5 Continue to deliver biodiversity events in partnership with local groups, agencies and Traditional Owners.	On-going	Existing
4.6 Increase 'nature' experiences in urban areas (including promoting 'gardens for wildlife' and as part of new development design).	On-going	Existing
4.7 Deliver training for relevant Council staff, including as part of induction programs, raising awareness about indigenous cultural heritage and cultural values of Country, biodiversity, plant identification and conservation in the Macedon Ranges.	Short	Existing
4.8 Host talks, events and demonstrations about traditional ecological knowledge, and Aboriginal management and use of the land.	Medium	\$\$

Objective 5: Enhance the capacity of community groups to undertake conservation activities

5.1 Encourage and assist with community-initiated biodiversity programs and projects. This may be through partnerships, mapping, landholder contacts, and support with funding applications.	On-going	Existing
5.2 Continue community environment group funding program including the provision of partnership funding to the three Networks. As part of the annual Landcare Funding application process, record and share the activities and volunteer contribution of community environment groups.	On-going	Existing
5.3 Deliver 'train the trainer' programs aimed at building capacity of Traditional Owners and community environment groups to run events and programs in the local area.	On-going	\$
5.4 Host networking and social events for community environment groups and Traditional Owners, enabling members to share ideas, collaborate and celebrate their voluntary contributions.	On-going	Existing
5.5 Advocate for CMAs and State Government to develop a mapping information layer showing grant funded revegetation works to ensure past works are adequately protected.	Short	Existing
5.6 Assist with the promotion of community environment group events and working bees such as through the development of an on-line community calendar and the environment enews.	On-going	Existing
5.7 Support groups to engage with Traditional Owners, enhance their cultural understanding, and meet cultural heritage obligations if working on public land.	Short	\$\$

Objective 6: Monitoring for landscape change

6.1 Implement monitoring program as recommended.	Short	\$\$
6.2 Develop a formal database to record monitoring program results and allow for analysis.	Short	\$
6.3 Encourage and support the establishment of a Macedon Ranges Field Naturalist Group to help implement citizen science aspects of the monitoring program.	Medium	Existing
6.4 Continue to liaise with DELWP to ensure Nature Share data is entered into the Victorian Biodiversity Atlas.	Short	Existing
6.5 Continue to provide support and training to Traditional Owners, residents and community groups to record and share their biodiversity data.	On-going	Existing
6.6 Include information in the Council's annual environment report about activities implemented and monitoring program results.	On-going	Existing
6.7 Review the biodiversity strategy every 5 years, or as required, to ensure it is current and meets the needs of the community and environment and amend where necessary	On-going	\$

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11. Acronyms

CALP Act – Catchment and Land Protection Act

CFA – Country Fire Authority

DELWP – Department of Environment, Land, Water and Planning

DEDJTR – Department of Economic Development, Jobs, Transport and Resources

EPBC – Environment Protection and Biodiversity Conservation Act

FEHMR – Federation of Environment and Horticulture in the Macedon Ranges

FFG Act – Flora and Fauna Guarantee Act

JCEN – Jackson Creek Eco Network

MRSC – Macedon Ranges Shire Council

NCCMA – North Central Catchment Management Authority

PPWCMA – Port Phillip and Westernport Catchment Management Authority

TfN – Trust for Nature

UCLN – Upper Campaspe Landcare Network

UDCLN – Upper Deep Creek Landcare Network

VBA – Victorian Biodiversity Atlas

VEAC – Victorian Environment Advisory Council

Appendix 1: Stakeholders

STAKEHOLDER	PLANS/STRATEGIES RELEVANT TO BIODIVERSITY STRATEGY
Community groups and networks	
31 Landcare / Friends groups	Some groups have developed their own strategic or local action plans that include biodiversity components and some groups/networks have biolink plans they are implementing through on-ground action.
Upper Campaspe Landcare Network	2014 Strategic Plan Cobaw and Coliban Biolink Plans Spotlight on Species monitoring program
Upper Deep Creek Landcare Network	Strategic Plan (2009) – being revised Delivered five Property Management Plan Courses in 2016-17 Held land management workshop in 2017 to engage new, absentee, and small-acreage landholders Monument Creek project
Jacksons Creek EcoNetwork	2009-2011 Strategic Plan
Macedon Ranges Wildlife Network	A group of local wildlife rescuers and wildlife shelters that aim to bring awareness to local wildlife issues and how to create more wildlife and resident compatibility.
Federation of Environment and Horticulture in the Macedon Ranges	Acts as an umbrella group providing a forum for Environmental and Horticultural groups to meet and plan projects and events that benefit the environment, and passive enjoyment for the Macedon Ranges.
Biolinks Alliance	Framework for Action for Connecting Landscapes in Central Victoria Melbourne Ark Landscape Project Glideways Project
Wombat Forestcare	Conservation Values of the Wombat Forest and Macedon Region
Macedon Ranges Koala Project	Macedon Ranges Koala Project has been formed to gather information and knowledge about local koala populations
State government agencies and public land managers	
Parks Victoria	Manages Macedon Regional Park, Lerderderg State Park (Pyrete Range), Mount Charlie, Mount Teneriffe, T Hill, Goldie and Conglomerate Gully Lauriston Nature Conservation Reserves. Good Neighbour Program
Department Environment, Land, Water and Planning	Protecting Victoria's Environment – Biodiversity 2037 Flora and Fauna Guarantee Act Manages the Wombat and Cobaw State Forest and various small crown land reserves Responsible for implementation of Victorian Biodiversity Strategy and the Victorian Biodiversity Atlas. NatureKit - displays information on Victoria's flora and fauna distribution Oversees the Land for Wildlife program across private land. Statewide planning policies and modelling regarding native vegetation Victorian Landcare Program, including Victorian Landcare Grants & Landcare Funds Landcare Facilitator positions (two positions hosted by Landcare Networks in Shire) Funds on-ground works, e.g. Biodiversity Response Planning, Biodiversity On-ground Action Grants
North Central Catchment	Regional Catchment Strategy 2013-2019 identified two priority biodiversity assets: CVU1: Daylesford/Wombat, and CVU3: Kyneton Woodlands.

Management Authority	Manages landscape scale projects for biodiversity protection on private land including: Caring for Campaspe, Upper Coliban Integrated Catchment Plan Coordinates Regional Waterwatch Landcare programs including funding for Landcare and friends group projects.
Port Phillip and Westernport Catchment Management Authority	Regional Catchment Strategy sets priorities for biolinks around Cobaw Range to Mount Macedon Biolink, Cobaw to Mount Disappointment, and along the Maribyrnong River. Landcare funding (both Australian & Victorian Government) for Landcare and friends group projects.
Trust for Nature	Statewide Biodiversity Strategy. A 100% rate rebate is provided to those properties that have a TfN covenant in Macedon Ranges Shire.
Country Fire Authority	Fire management
Melbourne Water	Implements works for improving the health of water ecosystems with assistance to landholders to restore vegetation along waterways. Program include: Corridors of Green, Stream Frontage Program, Waterwatch, Rural Land Program Healthy Waterways Strategy 2018-2028
Coliban Water & Western Water	Manages land at sites of water supply and treatment. Water recycling and offset programs
VicTrack	Manages rail reserves
VicRoads	Manages certain roadsides
Department of Justice	Landmate prison crew program
DEDJTR	Agriculture Victoria
VEAC	Undertaking assessment of crown land in the Macedon Ranges
Traditional Owners	
Dja Dja Wurrung	Caretakers and custodians of land to the north west of shire. Dhelkunya Dja Country Plan 2014-2034
Taungurung	Caretakers and custodians of land to the north east of shire. Taungurung Country Plan TCAC Strategic Plan
Wurundjeri	Caretakers and custodians of land to the south of shire. Manages Wil-im-ee Moor-ing (Mount William quarry) Wurundjeri Country Plan

Appendix 2: Threatened Flora and Fauna Species

Threatened Fauna

Conservation status

<i>Australia (EPBC Act 1999)</i>	
EX	Extinct
CR	Critically Endangered
EN	Endangered
VU	Vulnerable
P	Poorly known
<i>Victorian status (FFG Act)</i>	
EW	Extinct in Wild
RX	Regionally Extinct
CR	Critically Endangered
EN	Endangered
VU	Vulnerable
NT	Near Threatened
DD	Data Deficient

Common name	Scientific name	Conservation status		
		Vic	FFG	EPBC
Threatened Birds				
Australasian Bittern	<i>Botaurus poiciloptilus</i>	EN	listed	EN
Australian Bustard	<i>Ardeotis australis</i>	CR	listed	
Australasian Shoveler	<i>Anas rhynchos</i>	VU		
Azure Kingfisher	<i>Alcedo azurea</i>	NT		
Baillon's Crake	<i>Porzana pusilla palustris</i>	VU	listed	
Barking Owl	<i>Ninox connivens</i>	EN	listed	
Black Falcon	<i>Falco subniger</i>	VU		
Blue-billed Duck	<i>Oxyura australis</i>	EN	listed	
Brolga	<i>Grus rubicunda</i>	VU	listed	
Brown Treecreeper	<i>Climacteris picumnus victoriae</i>	NT		
Bush Stone-curlew	<i>Burhinus grallarius</i>	EN	listed	
Crested Bellbird	<i>Oreoica gutturalis</i>	NT	listed	
Diamond Firetail	<i>Stagonopleura guttata</i>	NT	listed	
Eastern Great Egret	<i>Ardea modesta</i>	VU	listed	
Freckled Duck	<i>Stictonetta naevosa</i>	EN	listed	
Grey Falcon	<i>Falco hypoleucos</i>	EN	listed	
Grey Goshawk	<i>Accipiter novaehollandiae novaehollandiae</i>	VU	listed	
Hardhead	<i>Aythya australis</i>	VU		
Hooded Robin	<i>Melanodryas cucullata</i>	NT	listed	
Intermediate Egret	<i>Ardea intermedia</i>	EN	listed	
Latham's Snipe	<i>Gallinago hardwickii</i>	NT	nominated	
Lewin's Rail	<i>Rallus pectoralis</i>	VU	listed	
Little Egret	<i>Egretta garzetta nigripes</i>	EN	listed	

Common name	Scientific name	Conservation status		
Masked Owl	<i>Tyto novaehollandiae novaehollandiae</i>	EN	listed	
Musk Duck	<i>Biziura lobata</i>	VU		
Nankeen Night Heron	<i>Nycticorax caledonicus</i>	NT		
Painted Honeyeater	<i>Grantiella picta</i>	VU	listed	
Pied Cormorant	<i>Phalacrocorax varius</i>	NT		
Plains-wanderer	<i>Pedionomus torquatus</i>	CR	listed	
Powerful Owl	<i>Ninox strenua</i>	VU	listed	
Red-chested Button-quail	<i>Turnix pyrrhoroax</i>	VU	listed	
Regent Honeyeater	<i>Xanthomyza phrygia</i>	CR	listed	
Royal Spoonbill	<i>Platalea regia</i>	NT		
Speckled Warbler	<i>Chthonicola sagittata</i>	VU	listed	
Spotted Harrier	<i>Circus assimilis</i>	NT		
Spotted Quail-thrush	<i>Cinclosoma punctatum</i>	NT		
Square-tailed Kite	<i>Lophoictinia isura</i>	VU	listed	
Swift Parrot	<i>Lathamus discolor</i>	EN	listed	EN
Whiskered Tern	<i>Chlidonias hybridus</i>	NT		
White-throated Needletail	<i>Hirundapus caudacutus</i>	VU		
Threatened Mammals				
Brush-tailed Phascogale	<i>Phascogale tapoatafa</i>	VU	listed	
Common Dunnart	<i>Sminthopsis murina</i>	VU		
Eastern Pygmy-possum	<i>Cercartetus nanus</i>	NT		
Fat-tailed Dunnart	<i>Sminthopsis crassicaudata</i>	NT		
Eastern Barred Bandicoot	<i>Perameles gunnii</i>	EW	listed	EN
Eastern Quoll	<i>Dasyurus viverrinus</i>	RX	listed	
Greater Glider	<i>Petauroides volans</i>	VU		
Leadbeater's Possum	<i>Gymnobelideus leadbeateri</i>	EN	listed	EN
Southern Brown Bandicoot	<i>Isoodon obesulus obesulus</i>	NT	listed	EN
Southern Myotis	<i>Myotis macropus</i>	NT		
Spot-tailed Quoll	<i>Dasyurus maculatus maculatus</i>	CR	listed	
Threatened fishes				
Australian Grayling	<i>Prototroctes maraena</i>	VU	listed	
Bluenose Cod (Trout Cod)	<i>Maccullochella macquariensis</i>	CR	listed	
Flat-headed Galaxias	<i>Galaxias rostratus</i>	VU	listed	
Golden Perch	<i>Macquaria ambigua</i>	NT	listed	
Macquarie Perch	<i>Macquaria australasica</i>	EN	listed	
Murray Cod	<i>Maccullochella peelii</i>	VU	listed	
Yarra Pygmy Perch	<i>Nannoperca obscura</i>	VU	listed	
Threatened reptiles & amphibians				
Brown Toadlet	<i>Pseudophryne bibronii</i>	EN	listed	
Growling Grass Frog	<i>Litoria raniformis</i>	EN	listed	EN
Southern Toadlet	<i>Pseudophryne semimarmorata</i>	VU		
Tussock Skink	<i>Pseudemoia pagenstecheri</i>	VU		
Threatened Invertebrates				
Golden Sun Moth	<i>Synemon plana</i>	CR	listed	EN

Threatened Flora

Conservation status

Australia (EPBC Act 1999)	
EX	Extinct
CR	Critically Endangered
EN	Endangered
VU	Vulnerable
P	Poorly known
Victorian status (FFG Act)	
L	FFG Listed
x	Presumed extinct
e	Endangered
v	Vulnerable
r	Rare
k	Poorly known

Oxalidales		
Elaeocarpaceae		
<i>Tetradlea stenocarpa</i>	Long Pink-bells	r
Brassicales		
Brassicaceae		
<i>Cardamine tenuifolia</i>	Slender Bitter-cress	P
<i>Ballantinia antipoda</i>	Southern Shepherd's Purse	EN en L
Fabales		
Polygalaceae		
<i>Comesperma polygaloides</i>	Small Milkwort	vu L
Mimosaceae		
<i>Acacia nano-dealbata</i>	Dwarf Silver Wattle	r
<i>Acacia howittii</i>	Sticky Wattle	r #
<i>Acacia leprosa</i> var. <i>uninervia</i>	Large-leaf Cinnamon-wattle	r
<i>Acacia rostriformis</i>	Bacchus Marsh Wattle	vu L
<i>Acacia williamsonii</i>	Whirrakee Wattle	r X
Fabaceae		
<i>Glycine latrobeana</i>	Clover Glycine	VU vu L
<i>Bossiaea cordigera</i>	Wiry Bossiaea	r
<i>Bossiaea bracteosa</i>	Mountain Leafless Bossiaea	r
<i>Desmodium brachypodum</i>	Large Tick-trefoil	vu
<i>Pultenaea reflexifolia</i>	Wombat Bush-pea	r
<i>Platylobium montanum</i> subsp. <i>prostratum</i>	Mountain Flat-pea	k
<i>Bossiaea heterophylla</i>	Variable Bossiaea	r
<i>Pultenaea weindorferi</i>	Swamp Bush-pea	r X
Myrtales		
Myrtaceae		
<i>Eucalyptus aggregata</i>	Black Gum	VU en L
<i>Eucalyptus yarraensis</i>	Yarra Gum	r X
<i>Eucalyptus falciformis</i>	Western Peppermint	r
<i>Eucalyptus brookeriana</i>	Brooker's Gum	r
<i>Eucalyptus crenulata</i>	Buxton Gum	EN en L #
<i>Eucalyptus polybractea</i>	Blue Mallee	r
Asterales		
Asteraceae		
<i>Xerochrysum palustre</i>	Swamp Everlasting	VU vu L

<i>Celmisia tomentella</i>	Silver Snow-daisy	r
<i>Olearia frostii</i>	Bogong Daisy-bush	r
<i>Senecio psilocarpus</i>	Swamp Fireweed	VU vu
<i>Microseris scapigera</i> s.s.	Plains Yam-daisy	vu
<i>Senecio cunninghamii</i> var. <i>cunninghamii</i>	Branching Groundsel	r
<i>Olearia phlogopappa</i> subsp. <i>flavescens</i>	Dusty Daisy-bush	r
<i>Coronidium gunnianum</i>	Pale Swamp Everlasting	vu
<i>Senecio campylocarpus</i>	Floodplain Fireweed	r
Stylidiaceae		
<i>Stylidium soboliferum</i>	Grampians Triggerplant	r
<i>Stylidium armeria</i> subsp. <i>pilosifolium</i>	Hairy-leaf Triggerplant	en L
Campanulaceae		
<i>Hypsela tridens</i>	Hypsela	k
Santalales		
Santalaceae		
<i>Thesium australe</i>	Austral Toad-flax	VU vu L
Malpighiales		
Picodendraceae		
<i>Pseudanthus orbicularis</i>	Tangled Pseudanthus	r
Proteales		
Proteaceae		
<i>Grevillea micrantha</i>	Small-flower Grevillea	r
<i>Grevillea repens</i>	Creeping Grevillea	r
<i>Grevillea rosmarinifolia</i>	Rosemary Grevillea	P #
<i>Persoonia arborea</i>	Tree Geebung	vu X
Lamiales		
Orobanchaceae		
<i>Euphrasia scabra</i>	Rough Eyebright	en L
<i>Euphrasia collina</i> subsp. <i>trichocalycina</i>	Purple Eyebright	r
<i>Euphrasia collina</i> subsp. <i>speciosa</i>	Purple Eyebright	ex
Lamiaceae		
<i>Prostanthera saxicola</i> var. <i>bracteolata</i>	Slender Mint-bush	r
Ericales		
Ericaceae		
<i>Leucopogon microphyllus</i> var. <i>pilibundus</i>	Hairy Beard-heath	r
Asparagales		
Orchidaceae		
<i>Diuris punctata</i>	Purple Diuris	vu L
<i>Calochilus imberbis</i>	Naked Beard-orchid	r
<i>Thelymitra exigua</i>	Short Sun-orchid	k
<i>Diuris</i> X <i>palachila</i>	Broad-lip Diuris	r
<i>Pterostylis agrestis</i>	Sutton Grange Greenhood	en
<i>Caladenia clavescens</i>	Castlemaine Spider-orchid	vu L
<i>Diuris behrii</i>	Golden Cowslips	vu
<i>Caladenia</i> sp. aff. <i>concolor</i> (Midlands)	Midlands Spider-orchid	vu
Hemerocallidaceae		
<i>Dianella amoena</i>	Matted Flax-lily	EN en L
<i>Dianella callicarpa</i>	Swamp Flax-lily	r #
Poales		
Cyperaceae		
<i>Isolepis wakefieldiana</i>	Tufted Club-sedge	r
<i>Gahnia microstachya</i>	Slender Saw-sedge	r
Blechnales		
Aspleniaceae		

<i>Pleurosorus subglandulosus</i>	Glandular Blanket-fern	k
Grimmiales		
Grimmiaceae		
<i>Racomitrium rupestre</i>	Rock Fringe-moss	k
Geraniales		
Geraniaceae		
<i>Geranium</i> sp. 1	Large-flower Crane's-bill	en L
<i>Geranium solanderi</i> var. <i>solanderi</i> s.s.	Austral Crane's-bill	vu
<i>Geranium</i> sp. 3	Pale-flower Crane's-bill	r
Pooideae		
Poeae		
<i>Poa labillardierei</i> var. (Volcanic Plains)	Basalt Tussock-grass	k
Apiales		
Pittosporaceae		
<i>Billardiera scandens</i> s.s.	Velvet Apple-berry	r
Sapindales		
Rutaceae		
<i>Zieria aspalathoides</i> subsp. <i>aspalathoides</i>	Whorled Zieria	vu L
<i>Boronia anemonifolia</i> subsp. <i>aurifodina</i>	Goldfield Boronia	r
Rosales		
Raminaceae		
<i>Discaria pubescens</i>	Hairy Anchor Plant	Vu L

Appendix 3: Ecological Vegetation Classes

Ecological Vegetation Class (2005)	Total Area in Shire (ha)	Area on Private Land (ha)	Area on Public Land (ha)	% on Public Land
ENDANGERED				
Creekline Grassy Woodland	0	0	0	15
Damp Sands Herb-rich Woodland	442	421	21	5
Escarpment Shrubland	15	15	0	0
Grassy Woodland	3169	2903	266	8
Plains Grassy Wetland	2	2	0	19
Plains Grassy Woodland	3847	3175	672	17
Plains Sedgy Wetland	28	0	28	99
Riparian Woodland	237	174	63	27
Scoria Cone Woodland	567	542	25	4
Swamp Scrub	99	62	38	38
Swampy Riparian Woodland	798	580	218	27
Wetland Formation	15	12	2	16
VULNERABLE				
Alluvial Terraces Herb-rich Woodland/Creekline Grassy Woodland Mosaic	29	26	3	11
Creekline Herb-rich Woodland	220	146	74	33
Grassy Forest	3079	2515	564	18
Montane Grassy Woodland	8		8	100
Montane Grassy Woodland/Rocky Outcrop Shrubland/Rocky Outcrop Herbland Mosaic	9		9	100
Riparian Forest	173	62	110	64
Riparian Forest/Swampy Riparian Woodland Mosaic	25	18	7	28
Stream Bank Shrubland	476	297	179	38
Valley Grassy Forest	8042	6265	1777	22
Valley Heathy Forest	110	100	10	9
DEPLETED				
Granitic Hills Woodland	73	14	59	81
Grassy Dry Forest	3167	2941	226	7
Heathy Woodland	283	14	269	95
Herb-rich Foothill Forest	16501	12176	4325	26
Sedgy Riparian Woodland	736	391	345	47
LEAST CONCERN				
Damp Forest	1139	441	698	61
Heathy Dry Forest	5171	1777	3394	66
Lowland Forest	1004	686	318	32
Shrubby Dry Forest	514	241	273	53
Shrubby Foothill Forest	7321	2314	5007	68
Wet Forest	83	54	29	35
Total Area	57380	38364	19015	