Maroondah Vegetation Strategy 2020-2030

Working towards a clean green and sustainable community

2040 MAROONDAH

Maroondah City Council

Acknowledgement of Country

Maroondah City Council acknowledges the people of the Kulin Nation as traditional owners of the land that now forms the municipality of Maroondah, and we pay our respect to Elders past, present and emerging. The people of the Kulin Nation have lived with and provided custodianship of the land, water, plants, and animals of this area for many thousands of years and maintain cultural connections to this day.

March 2020

Front cover image - Ellie V Pullin Pre-school students, Abigail and Annabelle, discover nature as part of the Bush Kinder program.

Working towards a clean green and sustainable community

Contents

Preface

The Maroondah Vegetation Strategy establishes Council and the community's vision for protecting, enhancing, restoring, and creating vegetation in Maroondah's natural and urbanised areas. The Strategy contains actions in areas including: vegetation management and conservation, policy and planning controls, advocacy, education, and support to community.

Vision

"In 2040, more people are deriving the health and wellbeing benefits, and more plants and animals are deriving the habitat benefits, of living amongst abundant and diverse vegetation in Maroondah".

Council's Mission

"Through direct action, strategic partnerships, and developing a community culture of stewardship, Council will lead and coordinate collaborative action to protect and expand the area of vegetation to support healthier life for people, plants, and animals in a changing Maroondah".

Please refer to Appendix 1 Information Base for more detail on the extensive community engagement, detailed research, and robust evidence base that have informed the draft Maroondah Vegetation Strategy.

Introduction

Council is committed to stewarding a 'nature-loving' Maroondah, where vegetation and nature is experienced and appreciated in its many forms by the people who live, work, and play here.

People are innately affiliated with other living things - people are a part of nature and nature is important for people and their wellbeing - and Council seeks to foster a culture of stewardship of nature that will build prosperous, healthy, and sustainable communities.

The prospect of having more native fauna, from Blue-banded Bees to Powerful Owls living in, and moving through, Maroondah is highly valued. We want to make Maroondah more liveable, where people's health and wellbeing is improved through their experiences and stewarding of the natural environment.

Maroondah's vegetation is the living greenery that includes trees, shrubs, wetland, and ground layer plants, both planted and remnants of pre-settlement vegetation. Maroondah's vegetation is diverse, as are the places it is found - bushland reserves, creeks and drainage lines, public parks big and small, nature strips, private and public gardens, even on the roofs and walls of buildings.

All vegetation captures carbon dioxide, water, and the energy from sunlight and converts these into oxygen and stored chemical energy in the form of organic compounds such as carbohydrates.

Rainbow Lorikeet in eucalypt tree

Indigenous vegetation is critical for Maroondah's indigenous plants and animals, and the ecosystems that these plants and animals form provide 'services' that maintain our air and water quality, recycle waste, pollinate our gardens and crops, and many more. Different native animal species are adapted to, and require, different habitat conditions for their survival. They need the right food, places to shelter from predators and the weather, and in many cases special places to breed and raise their young. Vegetation is fundamental to providing the habitat needs - the 'goods and services' - for our native animals, from food in the form of seeds, fruit, nectar, and foliage, to shelter in the form of tree hollows, dense shrubs, leaf litter, fallen logs, and grass and sedge tussocks. Many insects and other small animals that take food and shelter from these habitats, are in turn food for larger animals. Streams and wetlands are also critical for animals such as fish, frogs, platypus, water birds, and many invertebrates.

For animals to survive in the long-term, they need patches of habitat large enough to support their local populations, and these need to be connected in ways that allow individual animals to move through the landscape in response to the seasons and so that local populations can interbreed.

Vegetation and nature are also important for human wellbeing. Visual and physical contact with nature helps reduce stress, anxiety, blood pressure and muscle tension, improves self-esteem, encourages positive feelings, and helps us recover from mental illness.

A network of safe and pleasant walking and cycling routes that provide access to green spaces in an urban environment also encourages physical activity and the obvious benefits this brings to physical health. Indigenous Australians relied on food, medicine and materials from vegetation and have a deep culture of caring for nature. The practice of 'forest bathing' in Japan, doctors providing 'green space' prescriptions in the UK, and 'bush kinders' in Victoria, all recognise and reap the health benefits of vegetation.

In an increasingly urbanised setting like Maroondah, vegetation makes the places we live, more liveable. Plants provide pleasure for our senses, not only to look at, but also smell, feel and taste. Trees provide shade and vegetation improves the air we breathe and cools our urban areas. Natural green spaces encourage social interaction, provide tranquil places for relaxation, calm traffic on streets and improve walkability of neighbourhoods. Exposure to natural environments can also assist mental health, wellbeing, and childhood development. Vegetation and access to nature and green spaces make neighbourhoods more appealing places to live.

Vegetation, in particular the canopy cover of trees, is also a major contributor to the character of neighbourhoods in Maroondah. "The character of Maroondah is intrinsically linked to its natural landscape and vegetation cover. These elements are cherished by the local community, provide environmental, aesthetic and health benefits, and unify the otherwise diverse residential neighbourhoods" (Maroondah Neighbourhood Character Study 2019).

Our vegetation can be seen as 'green infrastructure' providing a range of benefits and services for our plants, animals, and us. As with other infrastructure, it needs to be:

- **Planned for** to ensure it takes account of expected growth and other changes into the future
- **Designed** to ensure it is providing the right services where they are needed most,
- **Installed/built** to high standards to ensure effectiveness and longevity
- **Maintained** to ensure it retains a healthy condition and continues to provide the services
- **Renewed** when it reaches the end of its useful life.

Maroondah City Council is committed to a 'clean, green and sustainable community' as set out in Maroondah 2040: Our future together, and our vegetation provides the 'green' element.

"In 2040, Maroondah will be a vibrant and diverse city with a healthy and active community, living in green leafy neighbourhoods which are connected to thriving and accessible activity centres contributing to a prosperous economy within a safe, inclusive and sustainable environment" Community Vision, Maroondah 2040.

Background

Policy context

In addition to Council's existing policies and strategies, Maroondah is also influenced by a range of key Victorian Government policies and plans, and regional strategies it has signed up to. The specific policies and plans that have a clear alignment with one or more actions in this strategy are outlined in Appendix 2.

Maroondah context

Prior to European settlement, people of the Kulin Nation lived with, and cared for the land that is now Maroondah, and actively managed the native vegetation that it supported. The use of fire, and the harvesting of plants and animals, were conducted in ways that reflected a deep understanding of ecology and ensured food and other resources were provided sustainably over thousands of years. As it has ever since European settlement, Maroondah continues to change. From its early settlement days as farmland, Maroondah has evolved and is now an urbanised part of a growing metropolitan Melbourne. Evidence of the past remains in the landscape, for example, as remnants of the original vegetation, or historic orchards as relics of a farming past. For residents, their observed changes to Maroondah began when they first arrived, and the longer they have been in Maroondah, the more change they will have observed. What is less apparent to them is that their own arrival contributed to a changing Maroondah that perhaps only those before them may have observed.

Population growth

At the time of publication (source: profile.id.com.au):

- Maroondah was home to 117,498 residents occupying 44,227 households
- Maroondah hosted 9,000 businesses that employed 36,000 people
- Maroondah's population was growing steadily by an average of 1,526 people per year, and was expected to continue to grow to 146,335 by 2041
- The number of dwellings in Maroondah was forecast to increase by an average of 618 dwellings per annum to 60,161 in 2041

Climate change

Climate projections for the eastern region of Melbourne suggest that by 2055 the average annual surface temperature will increase by between 0.8^{0}C -1.5^{0}C, and the average annual rainfall will reduce by between 5.1% to 7.5%. In addition, droughts are expected to be more severe and last longer, the number of hot days is expected to increase, and although expected to be fewer in number, rainfall events are expected to be more extreme with more intense floods (Source: CSIRO (2013) Climate Futures for Eastern Melbourne - study for the Eastern Alliance for Greenhouse Action's Bushland and Urban Biodiversity Management in a Changing Climate project).

More hot days will exacerbate existing health risks, increasing pressure on hospitals and emergency services. The urban heat island will add to heat stress. Vulnerable groups may need assistance to manage extreme heat and flooding. More frequent extreme weather events and impacts on the economy and jobs may affect the community's mental health.

These changes are expected to amplify the existing threats to flora and fauna, including changes to habitat (such as drying of soils), and changing dynamics of weed and pest animal species.

The Maroondah Climate Change Risk and Adaptation Strategy 2018/19-2021/22 establishes a plan of action enabling Council to prepare for the long-term risks of climate change. It is guiding Council's efforts to integrate climate change risk management and adaptation.

Challenges to existing vegetation

Maroondah's vegetation competes for space alongside urban development, the associated services infrastructure (e.g. roads, footpaths, electricity supply, water, and sewerage), and community assets for recreation and other purposes.

This is evident in recent analyses of Maroondah's substantial tree canopy cover.

Maroondah boasts one of the highest tree canopy cover levels of all the Melbourne metropolitan municipalities.

The *Living Melbourne: Our Metropolitan Urban Forest Strategy* (April 2019) estimated the overall tree canopy cover for metropolitan Melbourne at 15.4% and shrub cover at 15.1% using remote sensing data from 2015. For the Maroondah municipality, the estimates were much higher than average with 29% tree canopy cover and 18.9% shrub cover.

The *Maroondah Canopy and Landscape Analysis 2011 to 2016* supported this finding of high canopy cover by estimating Maroondah's tree canopy cover in 2011 as 26.2% and in 2016 as 27.1% (using the i-Tree statistical sampling method).

The Maroondah analysis also estimated changes in cover of tree canopy, shrub, grass/bare earth, and hard surfaces between 2011 and 2016, and found that between 2011 and 2016, Maroondah experienced a small (0.8%) increase in overall tree canopy cover. However, the dynamic nature of canopy cover was revealed in that gains were made in some locations but losses were identified elsewhere. It is assumed that much of the gains are likely to be existing canopy trees growing older and increasing the size of their crowns rather than an increased number of canopy trees in the ground. The canopy cover losses are most likely to be the result of the death and/or removal of canopy trees rather than reductions in living tree crowns.

It also found that the greatest losses occurred in grass/bare earth areas, which were converting mainly to hard surfaces and not to shrub or tree cover.

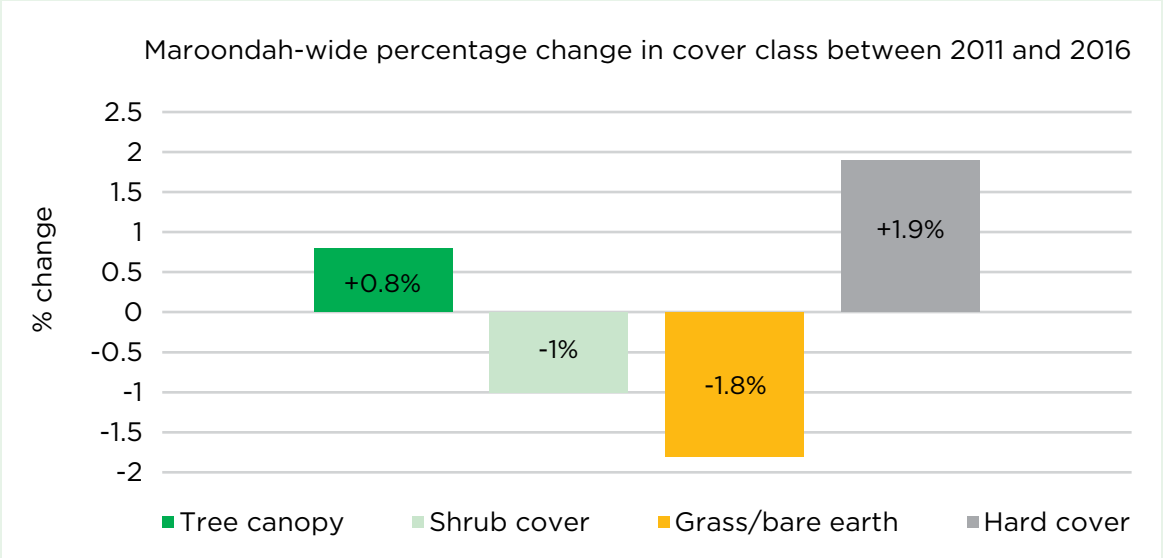
Although the Maroondah-wide net retention of canopy cover result is good news, these results also suggest that we are drawing down on the stock of next generation canopy trees (assuming some of the 'shrub' cover includes young canopy trees).

The increasing cover of hard surfaces equates to a corresponding reduction in area of 'permeable' land surface. This is compromising our ability to supply and sustain the next generations of canopy trees and shrubs as the soil and space they need to grow in is being lost and less of the water needed to sustain them is able to infiltrate into the soil.

Our existing canopy trees will not live forever. Without an adequate tree renewal program to provide replacement canopy cover as existing trees approach the end of their life, Maroondah's overall canopy cover will reach a tipping point whereby canopy will begin to decline and could do so quite rapidly.

Percentage change in cover class between 2011 and 2016

% change



Kaspar, J. (2018) Maroondah Canopy and Landscape Analysis 2011 to 2016

The primary factors leading to tree canopy losses in Maroondah include:

- Removal of trees to manage risk (real and perceived) and nuisance (e.g. fire, safety, tree death, building and infrastructure damage)
- Cut and fill of land for developments on slopes resulting in much wider impact than the building footprint
- Removal of trees for new construction
- Drying of naturally wet soils, and lowering of water table, due to changes in drainage and less rain
- Death and decline of stringybark eucalypt species

There is also growing competition for land used as public open space. The City of Maroondah is currently home to 650 ha of open space enjoyed by the community in the form of 430 reserves including conservation areas, regional parks, trails, sporting fields, neighbourhood parks and more. Whilst this has grown from 540 ha in 2005, there continues to be more residents, workers and visitors needing to use these spaces, and new developments to accommodate residential growth. Open space contributions from these developments need to be strategically targeted to support Council's open space acquisitions and capital improvements program consistent with its policy.

Maroondah's Open Space Policy 2016 makes several policy position statements, including:

Open Space Planning will:

- deliver diversity in recreational activities and sporting opportunities through well planned public open spaces which contribute to improved community health, physical activity, and neighbourhood connection.
- establish an integrated network of trails across the municipality that provides connectivity for travel purposes as well as for recreational use.
- identify opportunities for strategic land acquisitions which would improve the accessibility, connectivity, natural environment, and functionality of Maroondah's open spaces.

Open Space Development will:

- seek to preserve and rehabilitate natural bushland environments, wildlife corridors and remnant vegetation to nurture a sustainable environmental system.

Open Space Management will:

- actively protect and nurture the health of natural environments containing significant trees, waterways and native flora, fauna, and habitat.

Biodiversity decline

Biodiversity is in decline globally and locally.

At the global scale, up to 1 million species of the total number of animal and plant species on Earth, estimated at 8 million, are threatened with extinction, many within decades.

Over 500,000 of the world's estimated 5.9 million terrestrial species don't have enough habitat for long term survival without habitat restoration.

Much of this is put down to human actions that have caused habitat loss and deterioration, climate change, and an increase in numbers of invasive alien species (Source: Global assessment report on biodiversity and ecosystem services - Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services (May 2019)).

The 2018 Victorian State of the Environment Report tells a similar tale for Victoria: "Victoria's biodiversity – the number of animal and plant species our environment supports – has seriously decreased over the past two centuries. The loss has come from land clearing, fire, pest plants and animals, land development, river regulation, water pollution, and more recently, reduced resilience under climate change. Many of our native species are now threatened, and native vegetation continues to be lost".

Declines in biodiversity occur through the disappearance of species, communities, or genetic variants. Loss of species has been happening at varying rates in Maroondah ever since European settlers began clearing the land. It has also been happening on a more localised scale in each of Maroondah's patches of natural and semi-natural habitat. The comprehensive report "Biodiversity in Maroondah 2020" makes this explicit.

Indigenous Plant Diversity

Of the 566 plant species (including named hybrids and subspecies) recorded for Maroondah, 78 species are now presumed to be locally extinct, with another 177 species considered to be critically endangered locally.

Thirty-nine species (out of 93) of orchid have been lost, with another 34 species considered critically endangered locally.

Eleven of the 45 indigenous plant species that are specially adapted to winter-sodden/summer-dry floodplains have also been lost, with the remaining 34 species all considered critically endangered locally.

Indigenous animal diversity

Of the 203 indigenous vertebrate animal (mammals, birds, reptiles, frogs, and fish) species recorded for Maroondah, 32 species are not expected to return in the foreseeable future (in effect, locally extinct), with another 12 species not recorded for at least 20 years.

An additional 10 indigenous bird species have seen a major decline in records since 1997. Conversely eight indigenous bird species have arrived or seen a major increase in records since 1997.

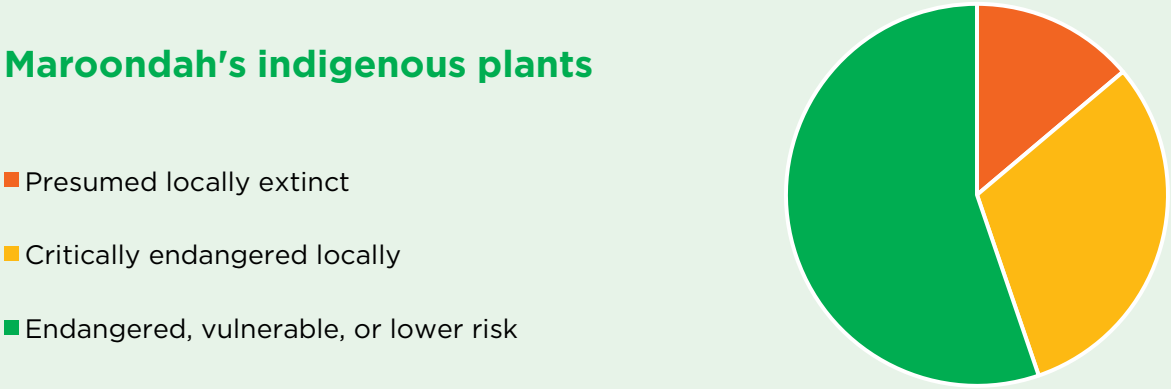
Of 22 indigenous butterfly species recorded, all but two are in decline or have died out.

The primary factors leading to biodiversity losses in Maroondah include:

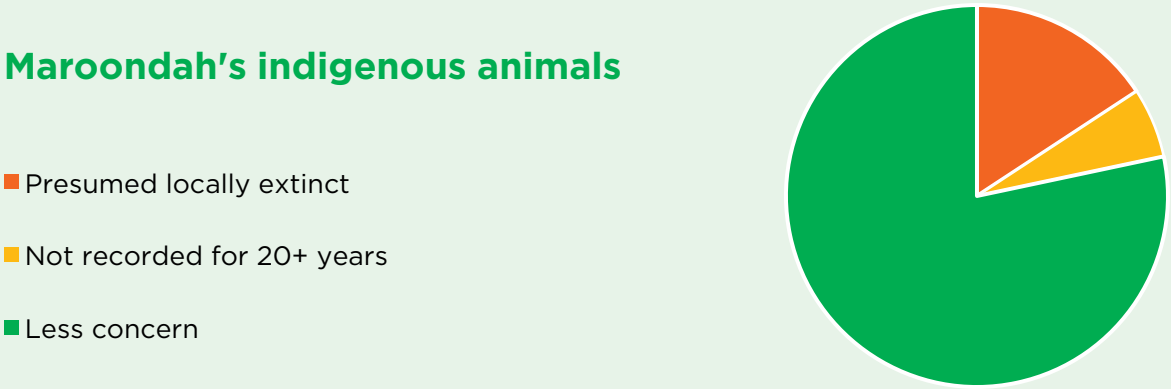
Loss of habitat

- Removal of habitat (typically native vegetation) for new construction
- Removal of native vegetation habitat to modify landscapes (private gardens and public open space)
- Removal of native vegetation habitat to manage risk (eg fire, safety, building and infrastructure damage).

Maroondah's indigenous plants



Maroondah's indigenous animals



Data source: Lorimer, G. (2019) Biodiversity in Maroondah - Volume 1

Isolation of habitat

- Fragmentation of habitat – leading to increased isolation
- Specialist species losing critical dependencies – eg pollinators, fungi, hollows

Decline in habitat condition (less species or structural diversity)

- Drying of naturally wet soils, and lowering of water table, due to changes in drainage and less rain
- Competition and displacement by key non-indigenous species (environmental weeds)
- Offsite impacts of development – runoff, erosion, pollution, domestic pets, increased people traffic impacting on adjacent habitat
- Death and decline of stringybark eucalypt species - causing loss of important habitat structural elements.

Natural habitats are the physical, chemical, and biological systems that support our biodiversity. More simply put, habitats are the places where these organisms live.

As a result of changing land uses from farming to residential and commercial development, the original natural habitats that once covered Maroondah, have been reduced to scattered small pockets of remnant vegetation.

Victorian Government Land Use Planning Reforms

Several new land use planning reforms have been introduced in recent years by the Victorian Government that have relevance for vegetation.

In December 2017, the Victorian Government introduced Amendment VC138 to implement state-wide changes to Victoria's native vegetation removal regulations.

In July 2018, the Victorian Government introduced Amendment VC148 which represents a significant overhaul of the Victorian Planning Provisions. Designed to modernise and simplify the Victorian Planning System, Amendment VC148:

- Introduces a new Planning Policy Framework (PPF).
- Enables the future introduction of a Municipal Planning Strategy (MPS).
- Simplifies the VPP structure by:
  - restructuring particular provisions
  - integrating VicSmart into applicable zones, overlays, and particular provisions
  - consolidating operational and administrative provisions.
- Amends specific zones, overlays and particular provisions to improve their structure and operation, and to support the future translation of Local Planning Policy Frameworks (LPPFs) to the MPS and PPF.

In October 2018, the Victorian Government introduced Amendment VC154 Stormwater Management to implement integrated water management reforms.

In April 2019, the Victorian Government introduced Amendment VC136 Better Apartments Design Standards that implements state-wide planning requirements for apartment developments.

These amendments represent significant changes, and as they require Maroondah to update key sections of its planning scheme they present key opportunities to refine and improve Maroondah's planning controls that relate to vegetation. A well-informed community and well-prepared Council staff can support the smooth introduction of significant changes.

Community input

The future provision of a substantial, healthy, and inter-connected 'green and leafy environment' for our community is fundamental to maintaining the essential services vegetation can and does provide the Maroondah community.

Through consultation undertaken by Council in development of this strategy, people have said that they highly value Maroondah's vegetation and the services it provides them. The top three responses collected at Café Consult in 2017 for why they value vegetation where *"Native plants and animals"*, *"Clean air"*, and *"Shade and cooling"*.

Council have also heard from the community that it is important for vegetation to be managed to prevent degradation from weeds and pests, to prevent trees dying, to prevent trees causing damage to buildings and paths, to manage safety risks, and to protect waterways.

Community feedback on the Maroondah Vegetation Review: Issues and Options Paper released in February 2019 helped Council understand what the community saw as the main issues for vegetation, and their preferred options for Council to pursue. Community feedback on the draft Maroondah Vegetation Strategy released in August 2019 revealed support for the direction Council was proposing, and suggestions for modifying or adding priority actions.

There are numerous opportunities for Maroondah to navigate the coming changes and create the green and leafy future Maroondah we desire. Grasping these opportunities, and creating more, require a partnership approach between Council, businesses, developers, residents, and the wider community - to join forces in elevating the importance of vegetation, establishing a culture of collaboration and stewardship, and together finding new and innovative ways of doing things, facilitated by a willingness to innovate, change, and adapt.

Community consultation on vegetation at Café Consult 2017

Strategy Vision, Mission, and Outcomes

Based on the wide range of evidence collected, this strategy sets the following vision for vegetation in Maroondah, and Council's mission for achieving three outcomes towards the vision.

Vision

"In 2040, more people are deriving the health and wellbeing benefits, and more plants and animals are deriving the habitat benefits, of living amongst abundant and diverse vegetation in Maroondah"

Council's Mission

"Through direct action, strategic partnerships, and developing a community culture of custodianship, Council will lead and coordinate collaborative action to protect and extend the foundation of vegetation that supports healthier life for people, plants, and animals in a changing Maroondah"

To achieve the vision, and fulfil Council's mission, three key outcomes will direct action to help create a greener and leafier Maroondah for health, wellbeing, childhood development, community resilience, ecosystem services, amenity, and biodiversity, as detailed below:

Outcome 1: A more liveable Maroondah

That is, more vegetation, especially an extensive canopy of trees connecting bush and urban environments, providing shade, cooling, pleasant and tranquil green spaces, water absorption, and habitat elements, that supports community health, wellbeing, and childhood development by helping people connect with nature, avoid heat-related illnesses, reduce anxiety and stress, mitigate flooding risk, and engage in outdoor physical activity (walking/riding/playing).

Outcome 2: More nature throughout Maroondah

That is, more vegetation, in the form of a well-connected network of indigenous trees, shrubs and understorey plants providing a wide range of habitat elements such as the food, shelter, and opportunities to move through the landscape that indigenous flora and fauna in Maroondah need to flourish, and simultaneously create more opportunities for people to encounter and connect with nature close to where they live, work and play.

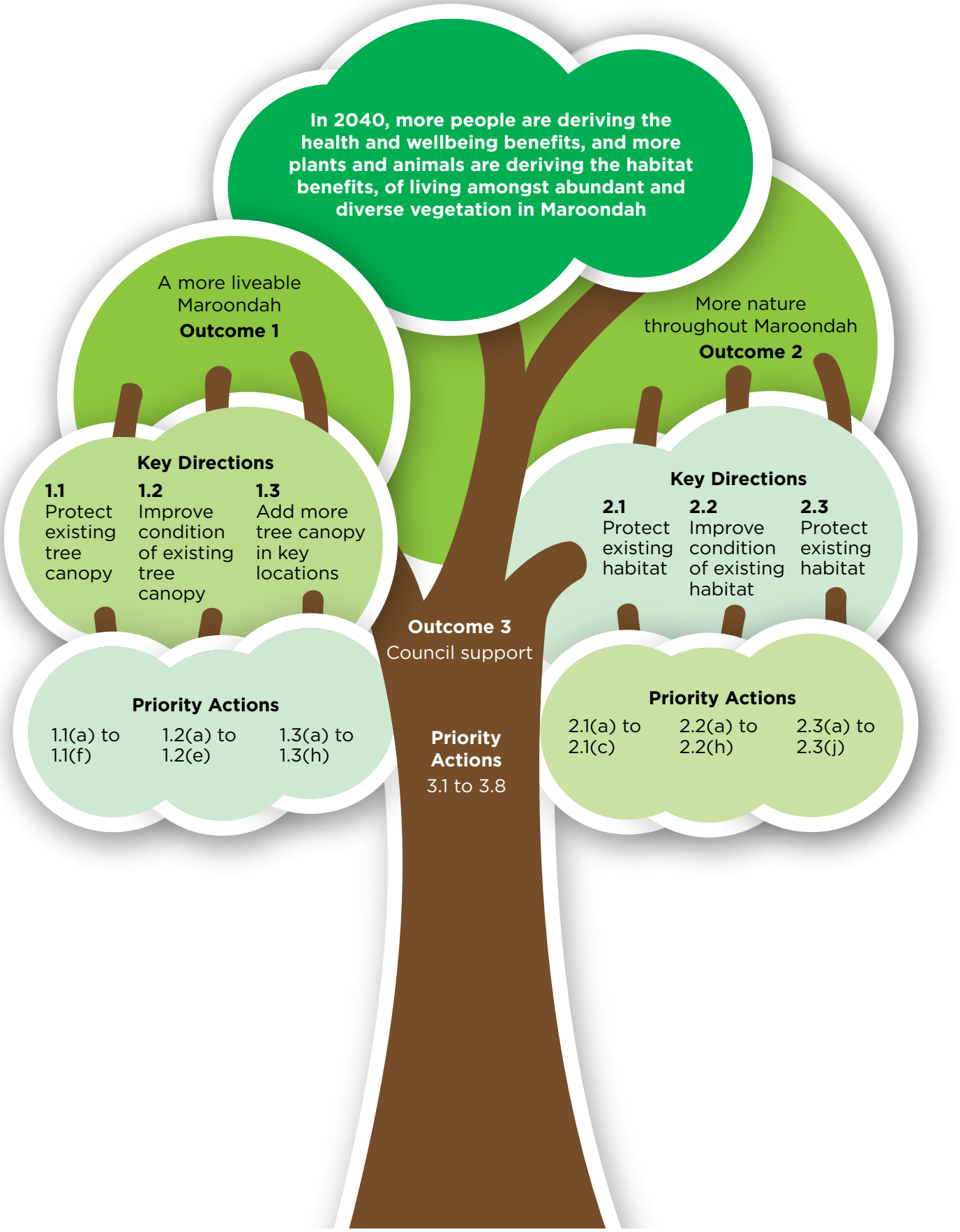
Outcome 3: Council support

That is, Maroondah City Council is supporting implementation of this Strategy with vegetation policy and direction that provides clarity of purpose, organisational arrangements that facilitate collaboration both internally and externally, and measurable targets coupled with monitoring and reporting of progress that drive action.

All types of vegetation play a role in achieving these outcomes, and Council has responsibilities that influence vegetation management in four key areas:

1. Planning and management of vegetation public assets and open spaces.
2. Administration of the planning scheme that guides Maroondah's ongoing growth and development.
3. Providing information and support to guide community action.
4. Leadership and influence.

Strategy Framework



A focus for engagement

Although the Maroondah municipality is highly urbanised, it still retains numerous, relatively small patches of remnant vegetation that provide important habitat for indigenous flora and fauna. It is also bounded by larger areas of key habitat supporting even more indigenous flora and fauna in neighbouring municipalities.

This provides the real opportunity to attract and spread more indigenous flora and fauna throughout Maroondah if we can provide the range of habitat elements, and the habitat connectivity, that different species need to survive and disperse.

Whether it includes Blue-banded Bees or Sugar Gliders, Swampy Woodland or Tufted Blue-lilies, a suite of indigenous animals and plants that occur in and/or around Maroondah and have a diverse range of habitat needs means that when we provide their habitat needs, we are providing for many other species at the same time. By selecting a suite of recognisable species that we have a realistic chance of spreading further throughout Maroondah, and that people will want to seek out and take delight in discovering, can provide a valuable focus for effort and for engaging community in implementation of this strategy.

Where there are not enough suitable tree hollows, nest boxes can substitute as nesting and roosting for many species, including Sugar Gliders - photo credit Russell Jones

Key Directions and Actions

Outcome 1: A more liveable Maroondah

That is, more vegetation, especially an extensive canopy of trees connecting bush and urban environments, providing shade, cooling, pleasant and tranquil green spaces, water absorption, and habitat elements, that supports community health, wellbeing, and childhood development by helping people connect with nature, avoid heat-related illnesses, reduce anxiety and stress, mitigate flooding risk, and engage in outdoor physical activity (walking/riding/playing).

To achieve this, we aim to provide more tree canopy cover and other vegetation that is healthy, long-lived, and is the right vegetation in the places it is needed most for reducing heat vulnerability, alleviating stress, mitigating flooding, encouraging outdoor activity, and other liveability benefits.

This requires us to protect the existing tree canopy and other beneficial vegetation whilst accommodating residential growth, ensure its health and longevity, and add new vegetation at a rate greater than foreseeable losses, with a focus on the locations where their community health and wellbeing benefits are most needed.

Key Directions

1.1 Strengthen protection of existing beneficial vegetation, especially tree canopy cover

1.2 Ensure the health and longevity of existing beneficial vegetation, especially tree canopy cover

1.3 Increase the extent of beneficial vegetation, especially tree canopy cover, in key locations

Retention of trees as part of a residential redevelopment in Ringwood mean they continue to provide their benefits to the new dwelling

Key Direction 1.1: Strengthen protection of existing beneficial vegetation, especially tree canopy cover

Trees and other vegetation on private land provide a large proportion of Maroondah's beneficial vegetation, especially our highly valued tree canopy cover. However, this vegetation is also highly vulnerable to residential development pressures as Maroondah's population continues to grow. Accordingly, there is a need to minimise vegetation loss by strengthening protection of existing vegetation, especially tree canopy cover, in ways that still allow Maroondah to accommodate increased residential growth and commercial development. It also means we need to minimise losses of beneficial vegetation on public land when public open space and associated facilities are being maintained or upgraded.

Land with a focus on commercial or industrial use is more intensively developed and has a lower proportion of tree canopy cover than most other parts of Maroondah, with much of the existing vegetation, especially canopy trees, often found in carparks. Carparks and the space they occupy are also prime targets for new commercial developments. Commercial areas are places where people congregate, and the protection and provision of tree canopy and other vegetation cover in commercial area carparks presents a key opportunity for providing liveability benefits of vegetation to the people they attract.

Outside of the sites of biological significance identified in "Biodiversity in Maroondah" (2020), Significant Landscape Overlays (SLOs) currently protect much of the existing tree canopy on residential land by requiring a permit for the vegetation removal.

Planning scheme protection of canopy trees and other vegetation on residentially-zoned land may be best served by retention of the SLOs, but with strengthening of the associated schedules and decision-guidelines. Planning scheme protection of canopy trees and other vegetation in commercial and industrial areas can be served by extending the coverage of Maroondah's planning provisions into these areas.

Priority Action: 1.1(a)

Amend the planning scheme to strengthen planning controls that protect canopy trees and other beneficial vegetation on private residential and commercial land.

Council, just like private landowners, must obtain planning approval, and comply with associated permit conditions, to remove trees or vegetation on public land. However, this requirement could be exempted if removal is in accordance with a documented and publicly available program of planned tree removal and replacement for street trees and trees in public open spaces, that is based on Safe Useful Life Expectancy (SULE) assessments of these trees (refer Priority Action 1.3 (c)).

Priority Action: 1.1(b)

Amend exemptions under the planning scheme to enable Council to only require planning approval to remove trees or vegetation on public land where the planned removal is not scheduled in the documented and publicly available 10-year street and park tree masterplan and renewal program proposed in Priority Action 1.3 (d).

There are occasions when trees and other vegetation are removed illegally. In such situations penalties may be applied, and to protect against the practice becoming more commonplace, these penalties need to provide strong discouragement to others. The current monetary penalties under the Planning and Environment Act 1987 for a planning infringement notice (PIN) are set by the Treasurer each financial year, and for the 2019-20 financial year the value of one penalty unit was $165.22. A PIN can require five penalty units for an individual and ten penalty units for a body corporate, along with requirements to make amends for the offence. The process for Council to secure such a penalty involves considerable resources.

Priority Action: 1.1(c)

Work with other Councils to advocate to the Victorian Government for the setting of appropriate penalties that present a major discouragement for the illegal removal of trees and other vegetation protected by planning schemes.

The value of vegetation is not necessarily well understood, and planning provisions and rules around vegetation protection can be a source of frustration for those wishing to develop their land. When they consider the importance of retaining beneficial vegetation, especially trees and indigenous vegetation, early in their design thinking, prospective applicants can alleviate this frustration. By talking through their development ideas and objectives with Council planning officers well before advancing their development designs and submitting an application, provides the opportunity to resolve potential issues and find solutions that meet the objectives of both parties. Finding satisfactory solutions through negotiation early in the process can also mean avoiding costly arbitration through the VCAT process. Council is encouraging applicants to voluntarily incorporate sustainability objectives into their designs through the Sustainable Design Assessment in the Planning Process (SDAPP). Pre-application discussions framed around the Urban Ecology sections of either the SDAPP or the online Built Environment Sustainability Scorecard (BESS) can help with the design and planning permit process in relation to incorporation of trees, vegetation, and green infrastructure.

Priority Action: 1.1(d)

Provide early and clear messaging to landowners and developers around the expectation that proposed designs will need to demonstrate that retention of existing trees and other beneficial vegetation has been fully considered in all design efforts. Increase promotion of Council's availability to hold pre-application meetings early in the design process to identify potential issues and facilitate responsive design solutions that retain desirable vegetation, and incorporate other vegetation considerations in the design, as part of the SDAPP process.

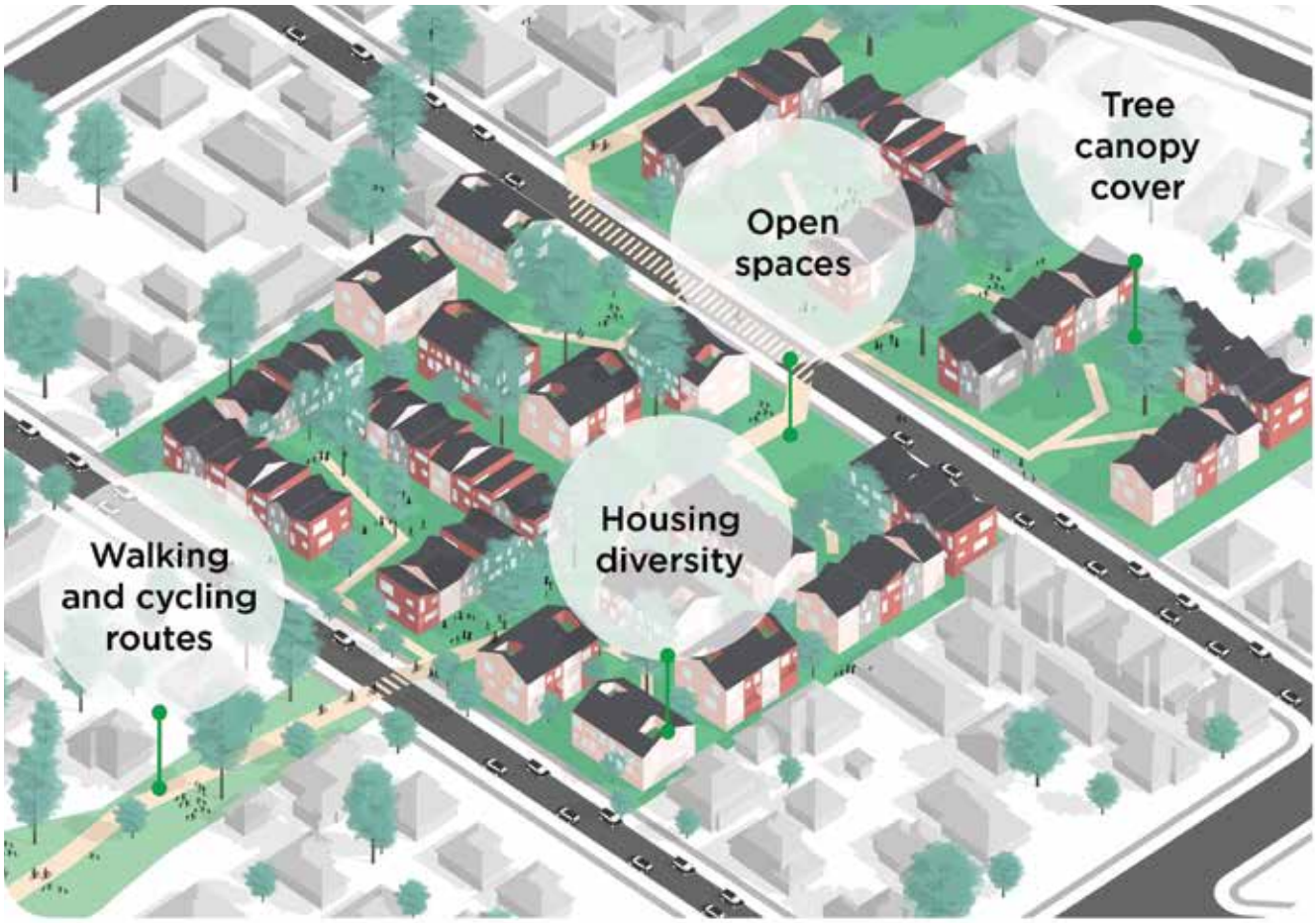
Residential redevelopment largely occurs on a lot-by-lot basis, as and when dwellings become old and outdated, and owners are ready to make a change. Typically, this does not occur in a strategic or coordinated manner often leading to ad hoc and inefficient use of land, both public and private, including space available for tree canopy and other beneficial vegetation.

Significant opportunities for vegetation protection and expansion open up if residential redevelopment can be planned at a precinct scale where landowners can work together to get larger scale and more sustainable redevelopment outcomes including greater flexibility for retention of existing vegetation values (e.g. tree canopy) and provision of new vegetation and accommodating the redevelopment where it is more suited.

The "Greening the Greyfields" project that Maroondah is piloting in two locations in partnership with the Centre for Urban Transitions at Swinburne University, the CRC for Low Carbon Living, FrontierSI, and the Department of Environment, Land, Water and Planning (DELWP), has developed 'playbooks' to help landowners, developers and local governments to do just this.

Priority Action: 1.1(e)

Identify precincts where significant redevelopment is expected to occur in the near future, and facilitate collaborative precinct planning to protect and increase tree canopy and other desirable vegetation cover, preserve permeability and improve walk/ride networks, whilst enabling redevelopment and lot consolidation.



Greening the Greyfields brings landowners together to plan redevelopment at a precinct scale - image credit Swinburne University

Numerous trees across Maroondah are notable in terms of their historic significance, scientific interest, habitat value, rarity, size, age, or beauty. As such they offer themselves up as distinguished examples that the Maroondah community can be proud of, and that in turn can support efforts to build a community culture that values and cares for trees and other vegetation. Establishing clear categories and contemporary criteria for 'notability' and engaging community in the nomination process, coupled with appropriate measures for protection and support for sustaining health of listed trees, can facilitate this. Different planning overlays offer a choice of protective controls that can be tailored to the different values such notable trees may hold, including ecological function, landscape contribution, and heritage significance. Previous work commissioned by Council (Notable Trees of Maroondah, 1996) and significant trees identified by Heathmont History Group and Croydon Conservation Society provide a sound basis to build on.

Priority Action: 1.1(f)

Design a process to engage the community in building a contemporary 'Notable Trees of Maroondah' inventory and provide listed trees with appropriate levels of protection from removal, and monitoring and landowner support to sustain tree health.

One notable tree in Maroondah is the 160-year-old, heritage-listed, Algerian Oak in Eastfield Park, Croydon

Key Direction 1.2: Ensure the health and longevity of existing beneficial vegetation, especially tree canopy cover

For trees and other vegetation to flourish, grow and age, they need air, water, sunlight, space, and good soil to support them. Active monitoring and maintenance can also enhance their health and extend their life.

Providing for these needs in an urban setting can be challenging as urbanisation brings with it extensive areas of impervious surfaces and stormwater drainage systems that rapidly channel rainwater away, restrict natural water infiltration, and in some locations create flooding risks in high rainfall events. Access to sunlight can also become restricted.

As Maroondah has become increasingly urbanised, the area of impervious (non-permeable) surfaces has also increased. In a warming and drying climate, maintaining high levels of permeability becomes more important for allowing rainfall to be absorbed into the soil, with trees and other vegetation more likely to be able to meet their watering needs from soil moisture rather than from reticulated drinking water supplies.

In a redevelopment situation, the ability to retain and/or plant vegetation, especially canopy trees, is affected by the space available to plant and sustain them, which in turn is affected by the ratio of permeable land to hard, impervious surfaces. The current Rescode baseline minimum permeability requirement is 20% of the area of a lot, however with recent changes to the Victorian Planning Provisions (Amendment VC148) there are opportunities to prescribe minimum permeability percentages (to restrict area of impervious surfaces) as well as maximum site coverage percentages (area covered by buildings) in schedules to residential zones that can be tailored to different situations. DELWP's Better Apartment Design Guidelines also provides standards for the provision of deep soil to support canopy trees, as well as solar access to communal outdoor open space.

Priority Action: 1.2(a)

Amend the planning scheme to strengthen planning controls for the preservation of higher levels of permeability on private residential land.

Water Sensitive Urban Design (WSUD) is an approach to planning and design of urban areas to make use of stormwater as a resource and reduce the harm it causes to our rivers and creeks. By maximising on-site infiltration where rain falls, before it enters the drainage system, WSUD enables natural filtration of water, potential reduction in flooding, slowing and treatment of stormwater, and mitigation of the impacts of high intensity flows such as erosion. By increasing moisture in soils, it supports the health and longevity of nearby trees and other vegetation.

The introduction of Amendment VC154 Stormwater Management including the new *Clause 53.18 - Stormwater management in urban development* supports Council in achieving current best practice performance stormwater management objectives for works on public land (i.e. those covered by Public Use Zone and Public Park and Recreation Zone), as well as non-residential development in residential zones (i.e. Residential Growth Zone, Neighbourhood Residential Zone and General Residential Zone). WSUD works require ongoing maintenance to ensure they function efficiently, so creating opportunities to provide WSUD works at larger scales is expected to increase their cost-effectiveness. For Council, major road upgrades present a key opportunity to incorporate WSUD elements such as vegetated swales that can increase infiltration of water into soils that support street trees and other vegetation.

Priority Action: 1.2(b)

In locations where benefits such as passive irrigation of street trees or reduction of localised flooding are necessary and can be achieved, apply WSUD within public works as practicable.

The water sensitive redesign of Knaith Road, Ringwood East enables stormwater runoff from the road to passively water vegetation in the nature strip

Reaping the benefits of green, leafy suburbs also means putting time and effort into planting, watering, pruning, weeding, and cleaning up leaves. It means understanding and sensitively managing some of the risks that trees and other vegetation may present such as falling limbs and fire hazard, and perceived risks such as attracting snakes and spiders, whilst protecting the vegetated landscape we cherish.

Living, growing plants and trees need to be maintained and managed. Careful pruning and disease management can extend the life of a tree and help manage unwanted impacts such as lifted footpaths or shading of solar panels. Avoiding actions that may affect the health of a tree, such as root damage, soil compaction, and bark damage are also key factors in allowing a tree to flourish, grow old and large, and contribute to a sustained tree canopy cover for Maroondah.

Cultivating a community culture of valuing and caring for trees and other vegetation will build community understanding and support for broader vegetation protection measures.

Priority Action: 1.2(c)

Provide information and advice to landowners so that they can better understand the value, and manage the health, of trees and other vegetation on their property.

Street trees and trees in public open spaces are also a major component of Maroondah's tree canopy cover. To maximise the benefits each tree provides and to provide the care and maintenance they need to thrive into old age, Council proactively manages the street tree population through regular inspections and remediation of any tree health concerns. Council currently undertakes regular checks of the health of street trees, with a cycle that sees each tree inspected every two years.

Priority Action: 1.2(d)

Monitor street tree health by maintaining current inspection cycle of two years, continue a proactive street tree maintenance program to ensure the health and longevity of the street tree asset, and gradually expand the program to include trees in reserves and public open space areas.

Over the past 20 years, there has been a noticeable decline in the condition of numerous eucalypt trees in our bushland reserves, in particular indigenous stringybark species such as Red Stringybark, White Stringybark, and Messmate Stringybark. There is evidence to suggest that this is not limited to Maroondah. Many different causes have been speculated on, and Council is working with the University of Melbourne to investigate the cause(s) of the declines in Maroondah's bushland areas with the aim of determining appropriate management responses. Trials of phosphite treatment and possum banding of trees has commenced to test some of the potential causes identified to date.

Priority Action: 1.2(e)

Continue to investigate cause(s) of stringybark decline and determine how best to respond (address cause or adapt).

Collecting street tree data in Wicklow Avenue, Croydon

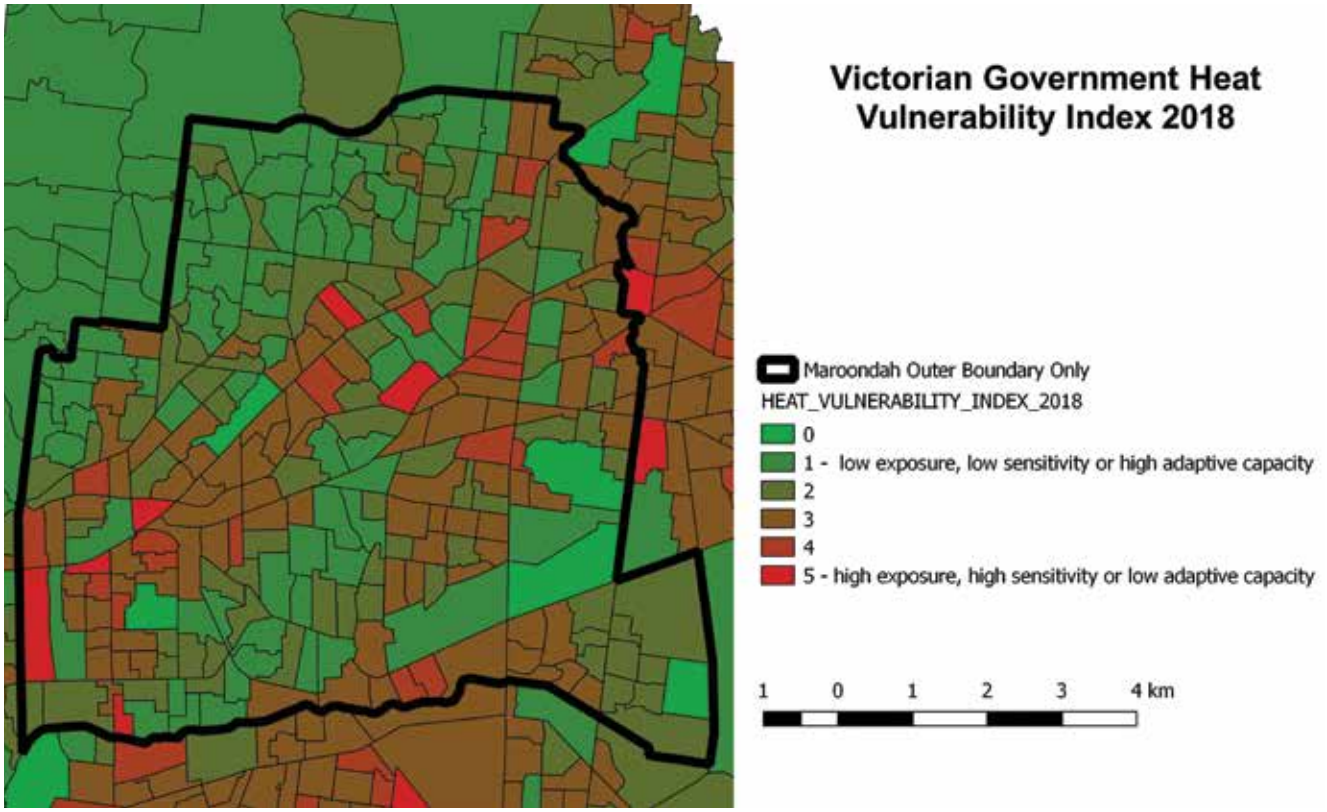
Key Direction 1.3: Increase the extent of beneficial vegetation, especially tree canopy cover, in key locations

In addition to protecting the existing tree canopy and other beneficial vegetation, there is opportunity to extend beneficial vegetation, especially canopy cover, into places where their benefits are most needed in Maroondah. These include areas of high heat vulnerability (to reduce incidence of heat-related illnesses), medical precincts (to help alleviate stress), in and around schools and kindergartens (to encourage outdoor activity and connection to nature), locations where localised flooding occurs (to reduce flooding damage and stress), areas of high pedestrian activity and along walking and bike-riding routes (to encourage outdoor physical activity and alternatives to using a car).

It takes many years however, for a newly planted tree to get big enough to provide canopy cover benefits. Consequently, long-term planning to identify where and when these next generations of canopy trees should be planted is important to mitigate the loss of canopy when older canopy trees reach the end of their life and need to be removed.

In commercial areas where the opportunities for increasing tree canopy cover are limited largely to streetscapes and carparks, innovative approaches such as green roofs and walls provide alternative ways of introducing the liveability benefits of vegetation.

In 2017, Council adopted Environmentally Sustainable Design (ESD) policy and guidelines for Council buildings and has commenced development of an ESD policy for incorporation into the Maroondah Planning scheme. ESD aims to reduce the impact of construction and building use on the natural environment to secure today's living standards, help future-proof communities against rising energy,



The Victorian Government has created heat vulnerability index mapping based on indicators of community exposure, sensitivity and adaptive capacity to heat waves

water, and waste disposal costs, and reduce the impact of climate change. The ESD policy and the associated planning provisions offer opportunities for requiring more vegetation across all land uses.

Recent changes to the Victorian Planning Provisions (Amendment VC148) provide opportunity to require the provision of canopy trees and other landscaping, and the space and solar access needed for these, in schedules to different residential zones.

Priority Action: 1.3(a)

Amend the planning scheme to strengthen planning controls to require the planting of canopy trees and other beneficial vegetation, and the provision of the associated growing conditions they need to flourish and grow old and large (such as sufficient soil volume and depth, canopy growing space, solar access, and passive and active irrigation).

In almost all development approvals, a landscaping plan is required to mitigate impacts of the development on amenity, habitat and/or tree canopy cover. With all permitted tree removals, replacement trees are required to restore the lost contribution to canopy cover. The intent of these requirements however, takes a long time to be realised (e.g. replacement trees are large enough to form part of the canopy cover).

Priority Action: 1.3(b)

Prepare a business case to enable monitoring of ongoing compliance with landscaping and tree replacement requirements.

There is a need for Maroondah's street and park tree planting program to be planned for the long term. With the regular monitoring of the health of Maroondah's street trees, Council is now able to forecast when street trees are expected to reach the end of their safe useful life, meaning we can schedule new tree plantings to more than offset the expected losses of trees. It is currently estimated that 25% of Maroondah's street tree population are likely to reach the end of their useful lives within the next 10-15 years.

To compensate for this loss, Council will need to actively plan for both vacant site in-fill planting as well as actively removing trees that are beyond their useful lives and replace with new trees.

Establishment of a long-term program of planned street tree removals and replacements will facilitate the required budget forecasting, as well as streamlining the permit requirements that Council currently abides by. Extending the tree inspection and renewal program into Council-managed parks and reserves will better enable targeted provision of trees to increase canopy cover on public land in the locations where the benefits are most needed, and inform strategic planning of our green infrastructure.

It is noted that as Maroondah's population continues to grow and urban development is required to accommodate this growth, the contribution of street trees and public open space to the overall provision of beneficial vegetation will become increasingly important. The design of landscaping can also play a role in crime prevention. Victoria Police advocate the use of the design guidelines "Crime Prevention through Environmental Design".

Priority Action: 1.3(c)

Identify key locations for providing additional liveability benefits from vegetation, especially in areas of heat vulnerability, health precincts, schools, nature play spaces (e.g. bush kinders), local flooding, key walk/ride routes and other locations where people congregate, and prioritise these locations for new street tree, car park and open space plantings.

Priority Action: 1.3(d)

Prepare business case to develop and resource a rolling 10-year street and park tree masterplan and renewal program based on tree inspection data that aims to gradually increase tree canopy cover on public land and includes:

- **priority locations to target for increasing tree canopy cover**
- **where and when vacant street tree sites can be filled**
- **where and when renewal of trees nearing the end of their useful life expectancies will be needed**
- **a two-year establishment program for watering and formative pruning**
- **long-term budget forecasting for planned removal, renewal, and establishment costs.**

In general, larger tree species offer greater environmental and wellbeing benefits than an equivalent number of smaller species, but they can create problems in a suburban garden setting. Indigenous species offer more biodiversity benefits than native species, which in turn offer more than non-native species. With our changing climate the suitability of different species of tree and other vegetation for climatic conditions of the future will need to be considered. The challenges of maintaining vegetation in a drying climate are evident even today, with the emerging need to sustain street trees through active watering. Given that newly planted trees will be in our landscape for decades, due diligence needs to be given to the selection of species being planted now such that they will survive and flourish into the expected future climate, are still fit for purpose, and optimise the derived benefits.

Priority Action: 1.3(e)

Research appropriate tree and vegetation species mixes for Maroondah that can provide the desired biodiversity and liveability services tailored to different locations and are suited for the predicted future climate.

Green roofs and walls have been around in a basic form for a long time, however the modern versions are a relatively new technology and are continuing to evolve. Green roofs are more expensive to install and require establishment and maintenance. However, they return benefits such as reducing runoff and improving storm water quality, thermal insulation that conserves energy, cooling that mitigates the urban heat island, UV protection that increases longevity of roofing membranes, acoustic insulation that reduces noise, and carbon dioxide absorption that sequesters carbon.

In locations such as commercial areas and activity centres with higher density development where canopy cover is relatively low, and the opportunities to plant additional canopy trees are limited, green roofs and walls provide an alternative means for providing beneficial vegetation where the canopy would otherwise be.

Maroondah's tree crew remove a damaged street tree in Andrew Street, Ringwood

To stimulate wider adoption of a relatively new technology with upfront costs, it needs high quality local examples that can be used to demonstrate how the installation and maintenance challenges can be addressed, as well as the return benefits and savings.

Priority Action: 1.3(f)

Identify opportunities in forthcoming building projects (small or large) to design in demonstration green roofs and/or green walls, ideally in locations where canopy cover is low and opportunity for additional canopy trees is limited (e.g. commercial areas, new public buildings).

Priority Action: 1.3(g)

Evaluate options for incentivising the provision of green roofs and green walls in private developments, in terms of benefits, issues, and acceptable circumstances.

Yarra Valley Grammar in Ringwood has installed a rooftop garden on one of their buildings

In an urban setting such as Maroondah, street trees compete for space alongside 'grey' infrastructure needed for essential utility services such as electricity, telephone, drinking water, storm water and sewerage. Roads and footpaths also occupy significant space.

Electricity cables servicing residential areas are typically strung between poles as overhead cables down one side of a street. This severely limits the overhead space available for street trees to grow large and provide good canopy cover, meaning that either no trees are planted down one side of a street, or trees under the cabling are small and/or severely pruned to avoid interference with the cabling. Underground services that run beneath permeable surfaces such as nature strips also restrict opportunities for planting street trees, especially larger species. Renewal of roads and footpaths, and planning redevelopment at a precinct scale (see Priority Action 1.1(c)), present opportunities for both innovative re-design, and relocation of services, to provide more space and permeability for providing and sustaining more and larger street trees. Examples include undergrounding of overhead cables or aerial bundled cabling and relocating underground services from beneath nature strips to under roads footpaths and driveways.

Priority Action: 1.3(h)

With an emphasis on the locations identified through Priority Action 1.3(c), advocate for service providers and developers to act on opportunities to relocate services such as electricity, phone, water, and sewer to enable tree canopy potential (e.g. improved water and soil access, and overhead space for large trees) without impacting on existing vegetation.

These trees in Pratt Street, Ringwood illustrate the competition for space between street trees and overhead power lines

Outcome 2: More nature throughout Maroondah

That is, more vegetation, in the form of a well-connected network of indigenous trees, shrubs and understorey plants providing a wide range of habitat elements such as the food, shelter and opportunities to move through the landscape that indigenous flora and fauna in Maroondah need to flourish, and simultaneously create more opportunities for people to encounter and connect with nature close to where they live, work and play.

To achieve this, we aim to provide more of the right vegetation that is healthy and in the places where it can optimise habitats for indigenous flora and fauna and provide new opportunities for people to connect to nature, with a focus on enabling key species to spread through Maroondah.

Natural habitats are the physical, chemical, and biological systems that support our biodiversity. More simply put, habitats are the places where our indigenous plants and animals live. Vegetation can support nature by providing critical elements of natural habitat in the form of the food, shelter and opportunities to move through the landscape that indigenous flora and fauna in Maroondah needs.

As a result of changing land uses from farming to residential and commercial development, the original natural habitats that once covered Maroondah have been reduced to scattered small pockets of remnant vegetation. This fragmentation of natural habitat increases the degrading pressures on the remaining habitat patches and their increased isolation disconnects populations of indigenous plants and animals.

Responding to these problems requires protecting the existing habitat, ensuring its health and longevity, and creating new habitat with a focus on the locations adjacent to existing habitat or where habitat linkages are most viable. To create opportunities for more people to experience and connect to nature as part of their everyday living, there is a need to provide habitat close to where people live, work and play.

Key Directions

2.1 Strengthen protection of existing habitat

2.2 Ensure the health and longevity of existing habitat

2.3 Restore/create new habitat in key locations

Key Direction 2.1: Strengthen protection of existing habitat

The best available natural habitat for indigenous flora and fauna in Maroondah are the remnants of the original vegetation. These cannot be replicated through revegetation, and to even get close is a long-term and costly endeavour. Therefore, protecting the patches that remain is critical to enabling more nature to disperse through Maroondah. Restoration of degraded remnant vegetation patches offers more habitat potential than reconstructed versions.

The patches of existing habitat that remained in Maroondah were first identified as Sites of Biological Significance by Dr Graeme Lorimer in 1997 and were afforded protection through the planning scheme with the application of Vegetation Protection Overlays (VPO) that control the removal of vegetation. Changes in planning law and state government guidelines have meant these protective measures require review. In 2017, Council again engaged Dr Lorimer to provide a contemporary analysis of the sites of biological significance in Maroondah. After the planning controls Council introduced based on the 1997 study, the Victorian Government has also introduced planning controls designed to protect biodiversity more effectively, including the Environmental Significance Overlay (ESO) that can be applied directly to sites of biological significance as well as adjacent areas that act as buffers, to ensure development is compatible with identified environmental values. DELWP's Planning for Biodiversity: Guidance (December 2017) explains the ESO has broader applicability than the VPO and is the preferred overlay when seeking to achieve biodiversity outcomes.

Priority Action: 2.1(a)

Amend the planning scheme to strengthen controls that protect existing habitat, including application of ESOs and other planning controls to protect and buffer currently recognised Sites of Biological Significance (Biodiversity in Maroondah 2020) - e.g. from direct removal, non-conservation land uses, clearing for fire risk, sediment from runoff, hydrological impacts (such as reduction in water infiltration), excessive vehicle and/or pedestrian traffic.

Options for ensuring the long-term security of existing habitat on private land include the landholder entering an on-title protective agreement with Council (Section 173 Agreement) or, for habitat of very high significance, with Trust for Nature (Conservation Covenant) over the parts of their property that hold important habitat values. The transferral of the land into public ownership for management as a conservation asset is also an option. There are still a small number of patches of high value remnant vegetation that occur on private land without that security, and therefore potentially at risk from current and future owner land use aspirations
that don't have habitat protection as the highest priority.

Priority Action: 2.1(b)

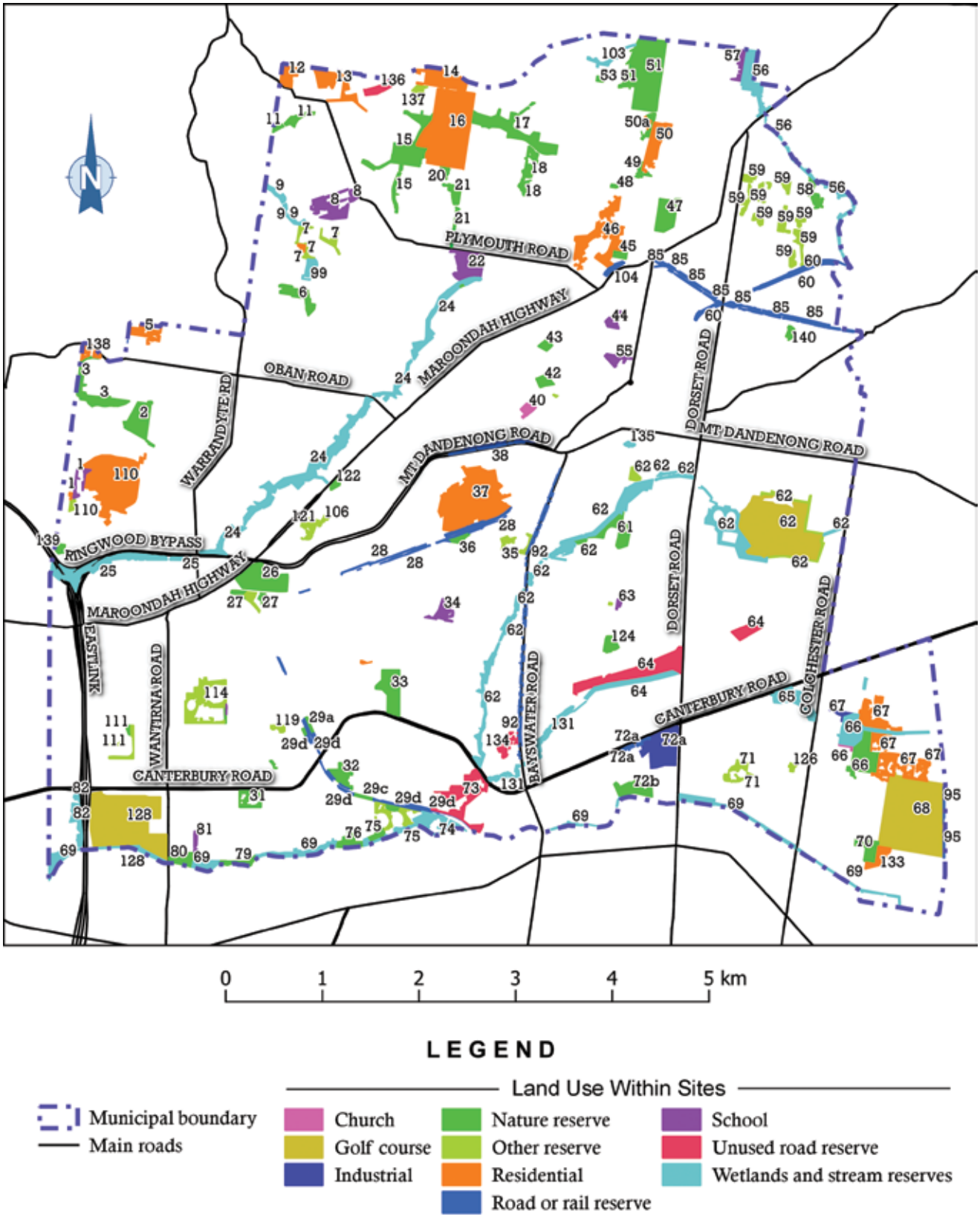
Identify, evaluate and raise awareness of options for protecting high value habitat still in private ownership

Parts of Maroondah are covered by the Bushfire Management Overlay (BMO) that has been applied to land that may be significantly affected by a bushfire based on mapping by the state government. Properties within the BMO are exempted under the 10/50 rule from needing a permit to clear certain vegetation that represents a bushfire hazard.

As Maroondah has continued to urbanise, there are likely to be places where the BMO is no longer applicable and the associated ability to remove vegetation without a permit no longer justifiable.

Priority Action: 2.1(c)

Negotiate with the CFA and DELWP for removal of BMO where it is no longer justifiable.



Overview map of Sites of Biological Significance in Maroondah - source: Lorimer, G. (2020)
(Note: numbers refer to individual sites described in Volume 2) Biodiversity in Maroondah - Volume 1

Key Direction 2.2: Ensure the health and longevity of existing habitat

Due to its fragmentation, and the effects from surrounding urban land uses, the health and condition of existing patches of remnant vegetation, and their capacity to function as habitat, requires ongoing active management. Competition from environmental weeds is a major and sustained threat. For swampy vegetation, the drying climate and increasing cover of impervious surfaces is reducing the levels of natural infiltration of rainfall into soils, preventing the wetting and drying cycles this type of vegetation needs for survival.

Largely through specialised weed control works, Council has been successful in improving and maintaining the condition of the most important sites of biological significance on Council-owned land that were originally identified in 1997. However due to the large number of sites, the remaining lower quality sites of biological significance on Council-owned land are treated for weeds on an occasional basis with the use of external contractors. On occasions additional areas of important habitat deserving of specialist management to improve their condition emerge. They may be revealed through discovery of rare species, be created through community plantings, be acquired through transferral to Council, or be earmarked for their strategic importance such as future habitat corridors.

Priority Action: 2.2(a)

Prepare business case to enable habitat condition improvement of more areas of important indigenous vegetation.

Waterways and their adjacent land offer great potential to function as habitat corridors through an urban environment, as well as providing semi-natural recreational spaces that encourage outdoor physical activity and opportunities for people to experience and connect to nature. They are also important cultural places for Aboriginal people as they were vital as sources of water, food, and places to live and meet, and consequently can also play an important role in engaging people in and embracing Aboriginal culture.

For example, the Mullum Mullum Creek flows through Maroondah, including the Ringwood Major Activity Centre, but for much of its length its condition as natural habitat is poor. To realise its potential as a habitat corridor and popular recreational and cultural space, and therefore a multi-functional green infrastructure asset, will require significant investment and collaboration across many organisations over a long period of time.

Priority Action: 2.2(b)

Advocate for major investment into restoring natural and cultural waterway and riparian condition along waterways such as Mullum Mullum Creek, to improve habitat corridor function, and passive recreational access and use.

Community volunteers contributing their time towards improving the condition of habitat in Council bushland reserves, creek reserves, road reserves, nature strips and schools is a highly valued extension to the work of Council in managing habitat. Supporting community-led biodiversity initiatives empowers and builds a stewardship culture amongst community. In recognition of this, Council has redirected resources to supporting the growing number of volunteers. The beneficial contributions of volunteers can be increased through recruitment of more volunteers and developing their bushland management knowledge and skills. Regular community events that promote local biodiversity and develop habitat management skills are a proven method for doing this but require ongoing resources to deliver.

Priority Action: 2.2(c)

Prepare business case for sustained provision of support, direction and oversight for volunteers working in bushland reserves and delivery of community events and activities focussed on biodiversity and capacity building.

Sustaining the ongoing condition of Council's bushland reserves provide a critical foundation for the maintenance of biodiversity in Maroondah. Effective management of biodiversity in bushland reserves requires specialist knowledge and skills to assess biodiversity values and habitat condition at the reserve scale. Site-specific decisions for management of individual bushland reserves are best based on, and responding to, systematic assessment of condition and changes to biodiversity at the reserve scale.

Priority Action: 2.2(d)

Prepare business case to enable systematic specialist assessment of habitat condition and monitoring of biodiversity change at reserve level designed to inform management decisions.

As a consequence of their fragmentation and isolation, and the surrounding urbanisation, our patches of remnant vegetation are missing many of the ecological processes that contribute to sustaining their condition and diversity. These include the absence of different animals that would have kept foliage growth in check, turned over and aerated the soil, pollinated certain plant species, controlled the numbers of certain animal species, and the absence of different plants that would have provided critical food or shelter requirements for certain animal and plant species. There are also many Aboriginal practices now absent, for example traditional cool burning, that would have influenced the condition of habitat.

Finding ways to reintroduce or replicate some of these elements and processes can be important contemporary management methods for

The Mullum Mullum Creek and reserve through Ringwood offers significant opportunities for walking and cycling trails, and wildlife movement corridors

Following a change in the mowing regime, a number of indigenous plant species, including the Salmon Sun-orchid, put on a flower display along the railway verge in Heathmont - photo credit Olwyn Smiley

improving the health and condition of our remaining habitats and the biodiversity they support. Examples include biomass reduction that replicates lost grazing regimes, restoration of traditional burning practices, enrichment and threatened species planting to diversify habitat or strengthen dwindling populations.

Conversely, the ecological integrity of some of the smaller, less intact patches of remnant vegetation (that in some cases include species rare in Maroondah), or patches of planted indigenous vegetation, within Council parks and not under specialist bushland management can be better protected and enhanced through relatively minor changes to maintenance regimes (e.g. frequency and timing of mowing, use of herbicides).

Priority Action: 2.2(e)

Further investigate and trial innovative and traditional bushland management techniques for increasing biodiversity and habitat condition.

Priority Action: 2.2(f)

Review, and adapt where appropriate, park maintenance practices, where there is remnant or planted indigenous vegetation patches within Council parks.

In Victoria, a native vegetation offset is generally required when an approval or permit to remove native vegetation is granted under the state-wide planning controls. An offset compensates for biodiversity losses arising from native vegetation removal. Offset owners secure and manage offset sites to improve native vegetation condition. All offset sites need to be secured on title under one of the following:

a) An agreement with the Secretary to DELWP under section 69 of the *Conservation, Forests and Lands Act 1987*

b) An agreement with Maroondah City Council under section 173 of the *Planning and Environment Act 1987*

c) An agreement with Trust for Nature to register an offset covenant under the *Victorian Conservation Trust Act 1972.*

As a result of permitted clearing in Maroondah, 85 offset sites have been established. The significant majority of these are located outside of Maroondah but within the Port Phillip and Western Port region. Most of these sites fall under the agreement approaches a) and c) above and would be subject to ongoing management obligations for the purposes of biodiversity preservation, with the small number of offset sites that are located on private land within Maroondah subject to Section 173 Agreements between the landholder and Council.

A native vegetation offset is a legal requirement under Victorian law, and distinct from any landscaping or revegetation designed to function as habitat that Council may require as part of a planning permit (see also Priority Action 1.3(b))

Priority Action: 2.2(g)

Prepare a business case to undertake regular audits of existing offset sites, with an initial focus on vegetation offset sites under Section 173 Agreements within Maroondah, to determine extent and condition, any compliance concerns, and provide support for restoring condition where required.

Prior to European settlement, approximately one quarter (25%) of Maroondah's land area was covered by vegetation associated with streams, wetlands, and swampy floodplains. Many of the streams and wetlands are assumed to have been shallow and temporary in that they did not have open or flowing water all year round, but all of this vegetation would typically be associated with high levels of soil moisture through the winter seasons.

As Maroondah has urbanised, the increasing area of impervious surfaces has resulted in more of the rain that falls being rapidly transported away through stormwater drains and into streams, and less soaking into and hydrating soils. Compounded by drought and climate change reducing the amount of rainfall, this has led to the loss of plant species that are reliant on soils that are typically sodden in winter and dry over summer, and erosion issues in some stream channels.

Water for Victoria sets out the Victorian Government's commitment to resilient and liveable cities including improving 'stormwater management for greener environments' and working 'across government for healthy and resilient urban landscapes'.

Nature-based solutions including Water Sensitive Urban Design (WSUD) treatments such as wetlands, raingardens and pervious landscapes are options available for Council-managed land that would contribute to achieving a green infrastructure network.

Recently adopted Victoria-wide planning provisions requiring best practice stormwater objectives and controls for subdivision, buildings and works, and construction will lead to application of more WSUD measures on private land. This holistic response will enable much greater use of local rainfall to support vegetation whilst reducing flow rates and pollutants damaging our waterways.

Where WSUD works are proposed in lower lying areas of Maroondah that historically supported swampy floodplains and wetlands, such works have real potential to add moisture to soils that swampy vegetation needs. Conversely, when designing WSUD works, attention needs to be given to any potential for causing the water table to be lowered which is a serious threat to habitat on flood plains. Provided that drainage and water treatment function and maintenance are not compromised, the use of indigenous swamp and wetland plant species in WSUD treatments can add habitat values to the product.

Similarly, identifying and implementing opportunities to divert stormwater to hydrate areas that support swampy vegetation could provide benefits for many of Maroondah's 'Critically Endangered' plant species.

Priority Action: 2.2(h)

In locations that currently, or once, supported swampy vegetation, and with due attention to groundwater levels, redirect stormwater and/or utilise indigenous species where practicable in WSUD applications for public works.

Key Direction 2.3: Restore/create new habitat in key locations

The fragmented nature of our remaining patches of remnant vegetation, and the challenges for indigenous plants and animals to spread through the less hospitable areas that surround these patches, means movement through the Maroondah landscape is severely limited for many species. Creating new habitat based on the habitat needs of a suite of focal fauna and flora species and groups, in locations that extend existing habitat and improve connectivity along strategic habitat corridor routes, can enable these and other species to persist and more readily spread through Maroondah. This in turn increases the opportunities for people to encounter and connect with nature near where they live, work, go to school, or play in Maroondah. Habitat connectivity does not necessarily need to be continuous bands of habitat - patches of habitat that are close enough to each other can act as important habitat 'stepping stones' that still allow some fauna movement between them.

A suite of recognisable animals and plants that can potentially be encountered more often in Maroondah if their habitat needs are provided, and recognisable examples of our nature that people will want to seek out, connect to, and take delight in discovering, offer a valuable lens through which to focus effort and engage the community in habitat protection and provision.

The choice of animal species to focus on is ideally based on a mix of indigenous species that currently occur within or near Maroondah, that collectively have habitat needs that would serve a much wider range of species, and that we have a realistic chance of attracting further into and around Maroondah. The choice of plant species or groups is ideally based on reducing the risk of indigenous plant species dying out in Maroondah.

As a precursor to selecting the focal species, a set of criteria will need to be developed to assess candidate species and groups against. This is expected to include aspects such as presence of local populations as sources from which dispersal can originate, feasibility of providing essential habitat needs, feasibility of managing any major threats to dispersal, and potential for unintended consequences.

Priority Action: 2.3(a)

Work with experts and interested community members to identify a suite of indigenous plant and animal species and vegetation communities that can provide a focus and profile for restoring and creating new habitat in Maroondah.

In 2005, Council released the Habitat Corridors Strategy that provided the rationale for a network of habitat links connecting larger areas of remnant vegetation to protect and enhance biodiversity within and beyond the City of Maroondah.

With Council's intention to focus on a suite of focal indigenous flora and fauna species, the habitat requirements of these species will be assessed against the potential corridor routes to ensure important corridor routes are afforded protection, and their capacity to function as habitat corridors is gradually developed as opportunities present, to enable these species to further disperse throughout Maroondah.

Priority Action: 2.3(b)

Review the 2005 Habitat Corridor Strategy to confirm priority linkage routes and align with this strategy's focus on habitat for a suite of 'focal' species, and accurately depict their spatial extent and arrangement on Council's GIS system.

The creation and establishment of a network of functioning corridors will take decades, so once the priority corridor routes are known, protecting their long-term corridor potential against incompatible and irreversible actions is desirable. The Environmental Significance Overlay (ESO) is a planning control that can be used for this purpose and can also be used to gradually build habitat corridor function of priority routes by encouraging actions that add habitat elements such as landscaping with suitable species.

Priority Action: 2.3(c)

Identify locations where the ESO is a sound and logical tool for ensuring that changes to use or development of priority routes enhance and do not prejudice their current and future capacity to function as habitat corridors.

Many priority habitat corridor routes are likely to follow creeks and roads and pass through public open spaces and even private land in some locations. Where they run along or across roadsides managed by Council, their ability to function as corridors will be improved through the use of indigenous tree species for street tree planting. Similarly, nature strips present an opportunity for providing important understorey habitat elements such as native grasses and herbs, leaf litter and even logs.

Priority Action: 2.3(d)

Where practical use indigenous species for street tree plantings and re-create and increase complexity of habitat with indigenous plantings in public spaces, where these are within or next to sites of biological significance, and/or along important habitat corridor routes.

Priority Action: 2.3(e)

Evaluate the potential for utilising nature strips in key locations to contribute to habitat corridor function (beyond street trees).

This nature strip in Allens Road, Heathmont has been planted with indigenous species providing habitat values that extend the habitat on neighbouring private land

Maroondah has a number of waterways that provide relatively continuous linear stretches of open space through the landscape that are well suited for development as habitat corridors, less so where the waterway has been channelled through underground pipes.

In 2018 Melbourne Water completed 'daylighting' of 0.8km of Dandenong Creek along the Maroondah boundary under their 'Enhancing Our Dandenong Creek' project, and under their 'Reimagining Tarralla Creek' project is preparing concept plans to do the same for about 1 km of Tarralla Creek through Croydon. Such projects are complex and costly and need collaborative support and investment.

The 're-naturalising' of our urban creeks offers significant opportunities for attracting, supporting and dispersing more nature throughout Maroondah, however potential negative impacts (for example risk of drawdown of surrounding groundwater levels) need to be considered in the planning of such works to prevent unintended consequences.

Priority Action: 2.3(f)

Where they are part of important corridor routes, and with due attention to groundwater levels, advocate for more daylighting and re-naturalising of creek sections that are currently piped to improve their capacity to function as habitat corridors.

Prior to European settlement much of Maroondah was low-lying and covered by swampy vegetation. Under the vegetation classification system used in Victoria that groups vegetation into Ecological Vegetation Classes (EVCs), much of this vegetation is classified as Swampy Woodland EVC. A feature of the swampy landscape would have been numerous scattered shallow wetlands with gentle gradients at their margins, many filling for only part of each year. All of Maroondah's original wetlands

Dandenong Creek through Heathmont was 'daylighted' in 2018 providing improved habitat for nature

appear now to have been lost due to drainage works and urbanisation. Wetlands by their nature, offer many resources providing valuable habitat for many different species, and can also serve as 'stepping stone' habitats that enables many species to disperse through a landscape.

Stage 2 of Melbourne Water's 'Enhancing Our Dandenong Creek' collaborative project is focusing on enhancing Parklands, Floodplains, Billabongs and Wetlands in the middle-Dandenong Creek catchment, which includes around half the area of the municipality of Maroondah.

Priority Action: 2.3(g)

Identify locations, especially in lower lying areas of public open space (e.g. Swampy Woodland EVC), where there is potential to create wetlands that replicate features of Maroondah's past wetlands.

In locations along important habitat corridor routes where development density is relatively high, such as commercial areas and activity centres, green roofs that ideally use indigenous species and replicate understorey habitats can provide habitat 'stepping stones' for smaller mobile species that are reliant on understorey (e.g. insects and small birds). Green roofs and walls provide multiple benefits ranging from biodiversity, stormwater retention and liveability benefits. Where indigenous species aren't suited to the unique growing conditions of green roofs and walls, non-indigenous plant species with similar habitat function can be considered.

If these locations are also where many people congregate (e.g. activity centres), the opportunities for people to encounter nature increase.

Priority Action: 2.3(h)

Identify future building projects in locations of strategic importance within habitat corridor routes and evaluate biodiversity benefits to be gained and/or demonstrated through designing in demonstration green roofs (small or large) that feature indigenous plant species and replicate understorey habitat elements.

Private residential land that is part of or adjacent to a site of biological significance, and/or lies within a strategic habitat corridor route, is well-placed to make important contributions to Maroondah's biodiversity. Where this occurs, the opportunities for voluntarily incorporating habitat are largely dependent on the understanding, willingness and capacity of individual landholders to design in, and use, indigenous plants and other habitat elements in their own gardens. There are several existing programs in Victoria designed to encourage and support this, such as Boroondara's Backyard Biodiversity program, Knox's Gardens for Wildlife program (now being adopted by several other councils across metropolitan Melbourne), and biodiversity-focussed grant and rate rebate schemes. Such programs have potential to provide habitat elements in highly urbanised landscapes, as well as help connect people to nature and build a culture of biodiversity custodianship in the community.

Each of these programs require resourcing and time to design, establish and maintain. An understanding of critical components for effectiveness, and their comparative returns in terms of enhanced biodiversity and community custodianship, is needed to inform decisions on how best to increase habitat on private land in Maroondah.

Planning controls may also offer opportunities for requiring the use of indigenous species to provide habitat elements in redevelopments that occur adjacent to sites of biological significance and/or within important habitat corridor routes.

Priority Action: 2.3(i)

Evaluate the options for engaging and supporting landholders to increase habitat provision on private land within or next to sites of biological significance, and/or along important habitat corridor routes, in order to support biodiversity and help build a community culture supportive of biodiversity.

In Victoria, a native vegetation offset is generally required when an approval or permit to remove native vegetation is granted under the state-wide native vegetation planning controls. An offset compensates for biodiversity losses arising from native vegetation removal. First party offsets are on land owned by the holder of the permit to remove vegetation. Third party offsets are on land owned by another party, where permit holders can buy native vegetation credits from other landowners to meet their offset requirements.

Except under specific circumstances, offsets cannot be provided on publicly-owned land and must be on land in private ownership.

The Department of Environment, Land, Water and Planning has specific requirements around native vegetation offsetting and provides accreditation for a range of independent offset providers that broker arrangements between a permit holder and a landowner willing to provide the matching offset. The Australian Government's Department of the Environment and Energy also have an environmental offsets policy under their Environmental Protection and Biodiversity Conservation Act 1999.

Some Victorian councils have secured accreditation as an offset broker to assist permit holders find the offsets they need, and to help find suitable offset sites within their own municipality that enable the offsets to benefit their local environments and biodiversity.

Priority Action: 2.3(j)

Investigate potential for inhouse vegetation offset brokering program in accordance with Australian and Victorian Offset requirements

The addition of shrubs, water, logs and leaf litter to existing mature trees have increased the habitat value of this private residential garden

Outcome 3: Council support

That is, Maroondah City Council is supporting implementation of this Strategy with vegetation policy and direction that provides clarity of purpose, organisational arrangements that facilitate collaboration both internally and externally, and measurable targets coupled with monitoring and reporting of progress that drive action.

The European Union defines Green Infrastructure as a 'strategically planned network of natural and semi-natural areas with other environmental features designed and managed to deliver a wide range of 'ecosystem services'. Vegetation provides several ecosystem services that can help deliver on the objectives of many different sectors of Council. By viewing vegetation as a form of essential 'green infrastructure' providing the desired services, Council's planning and decision-making for vegetation protection and provision, particularly in the context of strategic planning for public open space, can help coordinate and integrate achievement of many different objectives across Council.

Priority Action: 3.1

Establish internal and external arrangements that offer opportunity for coordinating decision-making to achieve multiple benefits from green infrastructure.

Seizing real opportunities to trial collaborative green infrastructure planning, design and implementation in a practical way can provide staff across Council the experience and lessons that will build their skills and confidence to apply a green infrastructure approach more widely.

In partnership with the community, the preparation of structure plans present ideal opportunities for trialling and gaining experience in collaborative green infrastructure planning.

Priority Action: 3.2

Use the preparation of structure plans for activity centres to trial collaborative green infrastructure planning, design, and implementation approaches.

There are several actions in this strategy that involve amendment of the Maroondah Planning Scheme to introduce new planning provisions. The Victorian Government has also introduced several new planning provisions related to vegetation. Strong, clear, integrated, and supportive high-level planning policy statements will best serve these new provisions.

In July 2018, the Victorian Government introduced a new Planning Policy Framework (PPF) through Amendment VC148. The new PPF enables the future introduction of a Municipal Planning Strategy that replaces the Municipal Strategic Statement that sits atop the local section of each council's planning scheme, providing the opportunity to incorporate clear policy statements (existing and new) in support of the proposed vegetation planning provisions. Such policy statements should include the importance of:

- connecting people with nature
- streams, wetlands, and waterway corridors as habitat
- protecting locally threatened plants and animals
- permeability for hydrating soils and mitigating local flooding
- living vegetation for shade and urban cooling
- vegetated spaces for health and wellbeing.

Amendment VC148 also requires Councils to translate the content of local planning policies currently in their planning scheme into an integrated policy framework that is in keeping with the recent reforms, is clear and unambiguous in its application and intent, and avoids repetition between local and state policies.

With any major changes to the planning scheme arising from this strategy and new policies introduced by the Victorian Government, their smooth introduction will be well served by ensuring the Maroondah community is aware of the changes and their implications and Council staff are well-equipped with an understanding of, and supporting tools for, implementing the new provisions, as well as key knowledge to support their effective implementation (e.g. plant identification, hydrology, and vegetation management).

Priority Action: 3.3

Incorporate into a new Maroondah Municipal Planning Strategy (requirement of VC148) clear supporting policy statements, objectives and strategies around biodiversity and vegetation (including its health, habitat, and neighbourhood character benefits), the importance of streams, wetlands, permeability and WSUD for vegetation, and the importance of connecting people with nature. Through the planning scheme review, investigate opportunities for greater integration of green infrastructure policies.

Priority Action: 3.4

Provide clear and accessible information, and support Council's statutory planners with training and clear decision guidelines, standard conditions, and peer support arrangements to enable smooth introduction and implementation of any new vegetation planning provisions.

Monitoring of the effectiveness and impact of this strategy requires suitable indicators that can be used to establish measurable targets and cost-effective mechanisms for collecting the data to enable monitoring and reporting of progress over time towards those targets. Finding suitable indicators to determine whether we are achieving the desired outcomes of "A more liveable Maroondah", and "More nature throughout Maroondah" will be a challenge.

In the interim, it is proposed that we aim to establish measurable targets for tree canopy cover on the assumption that more tree canopy cover will contribute to increased liveability, and for habitat extent and condition on the assumption that more habitat will contribute to more nature.

The Living Melbourne: Our Metropolitan Urban Forest Strategy has set targets for different regions of metropolitan Melbourne to increase tree canopy and shrub cover over time. Maroondah falls in the Eastern Region, which also includes the municipalities of Knox, Manningham, Monash, Whitehorse, and Yarra Ranges. Targets are set for each of 2030, 2040 and 2050. These targets provide a sound basis for setting targets for Maroondah to increase our own tree canopy and shrub cover over time, and in turn make a fair and equitable contribution to achieving the Eastern Region targets and wider targets for metropolitan Melbourne.

The baseline and proposed tree canopy and shrub cover targets for the Eastern Region for 2040 are:

- Existing 2015: Total tree canopy cover - 25%; Total tree and shrub cover - 44%
- Target 2040: Total tree canopy cover - 29%; Total tree and shrub cover - 50%

The setting of targets needs to be accompanied by sound indicators and repeatable methods for monitoring progress towards their achievement. The i-Tree statistical analysis used for the Maroondah Canopy & Landscape Analysis 2011 to 2016 offers one method, but emerging methods such as analysis of LiDAR (Light Detection and Ranging) remote sensing data, the 'Tree Ledger' machine learning technology and CSIRO's Urban Monitor project that can recognise trees from aerial imagery, have the potential to provide more accurate measures of tree numbers and canopy cover.

Priority Action: 3.5

Establish a reliable and cost-effective method for ongoing monitoring of tree and shrub cover, starting with trialling of the suitability of 'Tree Ledger', and set Maroondah-wide tree canopy and shrub cover targets that are aligned with the Living Melbourne strategy.

In April 2017, Maroondah City Council formalised its status as a 'Regional Catchment Strategy Partner' with the Port Phillip and Westernport Catchment Management Authority, by publicly committing to the following vegetation targets:

- No net loss of the area and quality of existing native vegetation on 171 hectares of land managed by the City of Maroondah to 2040.
- Improved native vegetation quality on an additional 6.7 hectares of land managed by the City of Maroondah by 2025 and a further 13.1 hectares by 2040.
- No net loss in Council's 2016 stock of 64,200 street trees to 2040.
- No net loss of the 650 ha of open space owned by Council to 2040.

Priority Action: 3.6

Establish a reliable and cost-effective method for monitoring habitat extent and condition across Maroondah, and progress towards the Maroondah-wide native vegetation targets that were committed to as part of partnering with the PPWCMA's Regional Catchment Strategy.

This strategy seeks to create a greener and leafier Maroondah by protecting, improving, and extending vegetation throughout Maroondah. In doing so it endeavours to deliver two key outcomes that result from vegetation. In addition to measuring progress towards vegetation targets, it is important to understand whether the desired outcomes are being achieved - that is are we having the impact we set out to achieve?

The two key outcomes are:

Outcome 1. A more liveable Maroondah

That is, more vegetation, especially an extensive and connected canopy of trees providing shade, cooling, pleasant and tranquil green spaces, water absorption, and habitat elements, that supports community health and wellbeing by helping people connect with nature, avoid heat-related illnesses, reduce anxiety and stress, avoid flooding issues, and engage in outdoor physical activity (walking/riding/playing)

'Liveability' and 'community wellbeing' are influenced by many factors, of which vegetation is only part. The Maroondah Health and Wellbeing Plan 2017 - 2021 identifies numerous indicators and data sources that relate to aspects of health, wellbeing, and liveability, some of which may offer potential for measuring aspects of liveability and/ or wellbeing attributable to vegetation.

2019 aerial image

2019 aerial image overlain by Tree Ledger tree detection layer

Tree Ledger tree detection layer only

Snapshot of canopy cover mapping layer generated from a 2019 aerial image of Maroondah using the Tree Ledger machine learning product - source Player Piano Data Analytics

Outcome 2. More nature throughout Maroondah

That is, more vegetation, in the form of a well-connected network of indigenous trees, shrubs and understorey plants providing a wide range of habitat elements such as the food, shelter, and opportunities to move through the landscape that native flora and fauna in Maroondah need to flourish, and simultaneously create more opportunities for people to encounter and connect with nature close to where the live, work and play.

Biodiversity refers to the variety of all forms of life - species diversity, genetic diversity within species, and diversity of communities formed by species. Inherent in Outcome 2 is the objective of protecting, and reversing the decline of, biodiversity in Maroondah. The Eastern Alliance for Greenhouse Action (EAGA) delivered a project titled "Biodiversity Monitoring in Melbourne's East (2015)" that pioneered the development and trial of a new framework for monitoring indicators of biodiversity health in the context of a changing climate. Dr Graeme Lorimer in "Biodiversity in Maroondah - Volume 1 (2020)" discusses this and other options for monitoring changes in biodiversity in Maroondah. Citizen science also presents opportunities to involve the community in collecting data that may be useful in monitoring biodiversity changes.

Priority Action: 3.7

Investigate and evaluate potential indicators and monitoring methods for measuring the strategy's effectiveness in terms of achieving the outcomes of "A more liveable Maroondah", and "More nature throughout Maroondah".

To understand if a strategy is being effective, monitoring of action implementation helps clarify if we are doing what we said we would do, and monitoring of progress towards outcomes helps clarify if the actions are having the expected impact. Effective implementation is supported through clear and understood responsibilities, timeframes and resourcing requirements for each action, with regular progress monitoring. Achievement of strategy outcomes is supported by reviewing progress towards the outcomes well before the end of the strategy's life. Evaluation of the extent of progress and the effectiveness of actions should inform any revision and adaptation of the actions to improve the likelihood of success.

Priority Action: 3.8

Prepare an Implementation Plan for the actions in this strategy and annually monitor progress and prepare accompanying achievement reports. Complete a mid-term review of progress towards the strategy outcomes and adapt the actions and Implementation Plan as required.

Appendix 1 - information base

Extensive community engagement, detailed research, and robust evidence base have informed the draft Maroondah Vegetation Strategy.

Key research undertaken for the draft Strategy was undertaken as follows:

- Biodiversity in Maroondah - Volumes 1 and 2 (Dr Graeme Lorimer, Biosphere P/L), 2020
- Maroondah Canopy and Landscape Analysis 2011 to 2016 (Joseph Kaspar, Greenspace Consultant), 2018
- Maroondah City Council: Vegetation Planning Policy Review (Claire Scott, Claire Scott Planning), 2018

In addition, a series of fact sheets were produced as per below:

- Fact sheet 1 *"What you have told us"* (community feedback received via Café Consult in 2017)
- Fact Sheet 2 *"Seeing the woods for the trees"* (summary of tree canopy cover analysis)
- Fact Sheet 3 *"Vegetation, what is it good for?"* (summary of the range of benefits provided by vegetation in an urban setting)
- Fact Sheet 4 *"Your vegetation and your Council"* (summary of relevant policies and legal responsibilities for Council)
- Fact Sheet 5 *"Pink-bells and Blue Stars: Maroondah's Plants"* (summary of the importance of Maroondah's plants)
- Fact Sheet 6 *"Sugar Gliders and Golden Whistlers: Maroondah's Animals"* (summary of the importance of Maroondah's animals)
- Fact Sheet 7 *"The journey so far"* (summary of research, engagement and outcomes leading to draft Maroondah Vegetation Strategy)

A discussion paper was prepared and released for public comment in February 2019.

- "Maroondah Vegetation Review Issues and Options Paper" (summary of the value of our vegetation, the 'ecosystem services' it provides, and the issues facing the area)

Appendix 2 - Policy context

In addition to Council's existing policies and strategies, Maroondah is also influenced by a range of key Victorian Government policies and plans, and regional strategies it has signed up to. The following policies and plans have clear alignment with one or more actions in this strategy (refer Table 1, page 51).

Plan Melbourne 2017-2050

Plan Melbourne 2017-2050 is the Victorian Government's metropolitan planning strategy that defines the future shape of the city and state over the next 35 years. Integrating long-term land use, infrastructure and transport planning, Plan Melbourne sets out to support jobs and growth, while building on Melbourne's legacy of distinctiveness, liveability, and sustainability.

Of the seven outcomes articulated in the plan, Outcome 6 *'Melbourne is a sustainable and resilient city'* is the most relevant to this strategy, which include the directions:

- 6.4 Make Melbourne cooler and greener
- 6.5 Protect and restore natural habitats.

In addition, a separate 5-year Implementation Plan with 112 actions has been developed.

Overseen by the Department of Environment, Land, Water and Planning, the delivery of Plan Melbourne involves many implementing partners, including government departments, agencies and local councils. Metropolitan Partnerships and other groups will support the implementation of many of Plan Melbourne's actions, including the engagement with local communities about their priorities.

Plan Melbourne 2017-2050 is given statutory effect through amendments to the State Planning Policy Framework within the Victoria Planning Provisions.

Protecting Victoria's Environment – Biodiversity 2037

Protecting Victoria's Environment – Biodiversity 2037 is Victoria's plan to stop the decline of our native plants and animals and improve our natural environment so it is healthy, valued, and actively cared for. It makes the case for increased effort and defines a modern approach to managing our biodiversity.

Biodiversity 2037 has set two goals - *'Victorians value nature'* and *'Victoria's natural environment is healthy'*, and includes targets of:

- all Victorians connecting with nature
- a net gain of the overall extent and conditions of habitats across terrestrial, waterway and marine environments.

Biodiversity 2037 goes on to identify several priorities, including the following of direct relevance to this strategy:

- Priority 4. Increase opportunities for all Victorians to have daily connections with nature.
- Priority 5. Increase opportunities for all Victorians to act to protect biodiversity.
- Priority 6. Embed consideration of natural capital into decision making across the whole of government, and support industries to do the same.
- Priority 7. Help to create more liveable and climate-adapted communities.

It is supported by the *Biodiversity 2037 Implementation Framework February 2018* that identifies the key implementation actions for each of the 20 priorities of Biodiversity 2037.

Victorian Public Health and Wellbeing Plan 2015–2019

The *Victorian Public Health and Wellbeing Plan 2015–2019* sets out a long-term agenda for improving health and social outcomes in Victoria. One of the three 'platforms for change' it identifies is *'Healthy and sustainable environments'*. The plan goes on to state *"Healthy environments are critical to the health and wellbeing of the current and future generations. All levels of government, industry and the community across Victoria have a responsibility to support and maintain sustainable, diverse and safe natural and built environments"*.

It is supported by the *Implementing the Victorian Public Health and Wellbeing Plan 2015–2019: Taking action - the first two years*, which identifies key implementation actions for each of the Plan's six priorities and three platforms for change.

It is also supported by the *Victorian Public Health and Wellbeing Outcomes Framework* that identifies relevant outcomes under Domain 6: 'Victoria is liveable':Victorians belong to resilient and liveable communities.

- Victorians have access to sustainable built and natural environments.

Victoria's Climate Change Adaptation Plan 2017 - 2020

Victoria's Climate Change Adaptation Plan 2017-2020 lays out a blueprint for action that will help Victoria meet the challenges and act on the opportunities of climate change. It sets out the Victorian Government's priorities for leading and supporting the community to adapt to climate change, and explains how the Government will support adaptation and coordinate action on different scales (local, regional, and sectoral). It describes several new and ongoing actions under three priority areas for action. Under Priority Action 5.6 'Improving the resilience of our built environment', the Plan states: *"A safe and resilient built environment is essential to the wellbeing of a community"*.

Water for Victoria: Water Plan

Water for Victoria is a plan for a future with less water as Victoria responds to the impact of climate change and a growing population.

The actions set out in the plan support a healthy environment, a prosperous economy with growing agricultural production, and thriving communities.

Water for Victoria sets out nine objectives, including the directly relevant: *'Resilient and liveable cities and towns. We will help transform Victorian cities and towns into the most resilient and liveable in the world. We will include all elements of the urban water cycle in the way we plan and manage water so that Victorian communities can continue to thrive in all climates'*, for which eight actions have been identified

Healthy Waterways Strategy 2018-2028

Led by Melbourne Water, the Healthy Waterways Strategy is a shared strategy across Melbourne Water, state and local government, water corporations and the community. The Strategy provides strategic direction towards a regional vision for the health of rivers, estuaries and wetlands in the Port Phillip and Western Port region.

The Healthy Waterways Strategy was collaboratively designed, bringing together professional expertise with the lived experience of landholders, community groups, Traditional Owners, developers, and other stakeholders.

The Healthy Waterways Strategy is supported by five Co-Designed Catchment Programs that provide a flexible framework for managing waterways in each of the five main catchments of the region. Maroondah City Council was a development partner for the Catchment Programs for both the Yarra River and Dandenong Creek catchments.

These Catchment Programs describe performance objectives, key values, waterway, and vegetation conditions for the Mullum Mullum Creek, Brushy Creek, and Dandenong Creek Middle sub-catchments, and Ringwood Lake.

Port Phillip and Western Port Regional Catchment Strategy

Maroondah City Council is one of 38 local governments in the Port Phillip and Western Port region. The Port Phillip and Westernport Catchment Management Authority (PPWCMA) prepares the Port Phillip and Western Port Regional Catchment Strategy (PPW RCS) and coordinates and monitors its implementation.

The region's environmental assets are however managed by Government organisations, Councils or private landholders. The individual work of these organisations and individuals, and the collaboration between them, are key drivers of the environmental health and resilience in this region.

Local governments are invited to become PPW RCS partners by developing and agreeing on targets for the future condition of the environmental assets in their care, and to take the lead role in the efforts to achieve the targets.

In 2017 Council became a PPWC RCS partner by publicly committing to achievement of measurable targets for its vegetation, street trees and open space.

Living Melbourne: Our Metropolitan Urban Forest Strategy (2019)

The *Living Melbourne: Our Metropolitan Urban Forest Strategy* was developed by The Nature Conservancy and Resilient Melbourne with input from 32 metropolitan Melbourne councils, state government agencies, non-government, and community organisations. The Strategy describes a shared vision for an urban forest for metropolitan Melbourne – thriving and resilient communities, connected through nature.

Maroondah City Council has been an active contributor to its development, and in May 2019 formally endorsed its support for Living Melbourne's Vision, Goals, and Actions, recognising that they are well-aligned to, and supportive of, the directions in the Maroondah Vegetation Strategy.

Living Melbourne was officially launched on 5 June 2019, with Maroondah City Council one of the 30 local government endorsing partners.

The Strategy lists six high level actions that frame twenty sub-actions. One of these actions is to "Establish and implement urban forest greening targets including, as a minimum, 'tree canopy' and 'tree canopy and shrub' cover for each region". Targets are proposed for each of six metropolitan regions, based on a 2015 baseline.

Maroondah is in the 'Eastern' region along with Knox, Manningham, Monash, Whitehorse, and Yarra Ranges.

Climate Change Adaptation Roadmap for Melbourne's East (2015)

The *Climate Adaptation Roadmap for Melbourne's East* was prepared by the Eastern Alliance for Greenhouse Action (EAGA) and identifies regional priority actions to address the impacts of climate change on council operations, assets, and service delivery responsibilities. The Roadmap is informed by a regional climate change risk assessment undertaken by EAGA in August 2014.

Table 1: Alignment of actions in this strategy with Victorian and regional strategies and plans

Plan Melbourne 2017-2050	Maroondah Vegetation Strategy Priority Actions
Action 23: Redevelopment of greyfield areas. Support Councils to identify greyfield areas suitable for redevelopment for medium-density housing and lot consolidation	**1.1(e)**

Action 55: Excellence in built environmental design.
Promote excellence in how Victoria's built environment is designed and constructed by:
• embedding design review in the assessment of significant development projects to ensure the highest possible design outcomes are achieved on major public and private sector projects. This will apply to:
  • significant government or funded (including local government) projects
  • projects that impact on places on the Victorian Heritage Register
  • significant private sector projects referred by local government
• strengthening the design understanding and capabilities within all levels of government
	1.3(f); 1.3(g); 1.3(h); 2.3(h)

Action 60: Improved streetscapes. Finalise and implement a long-term metropolitan strategy for streetscapes, including boulevards, and encourage local measures to improve streetscapes, accessibility, and local amenity	**1.2(d); 1.3(c); 1.3(d)**
Action 63: Waterway corridor masterplans. Prepare waterway corridor masterplans for priority waterways to ensure that Traditional Owner and community values of waterways, such as access, amenity, and connection to nature, are protected and improved	**2.2(b); 2.3(f)**
Action 91: Whole-of-government approach to cooling and greening Melbourne. Create urban forests throughout the metropolitan area by: • assembling and disseminating spatial data on the green space network, existing tree cover and surfaces. This data will be the baseline for modelling future greening strategies and their impacts on amenity of our urban areas including cooling effects • working with local government to establish greening targets for each of the metropolitan regions • supporting development of municipal urban forest strategies using a coordinated approach with VicRoads, private road operators and other public land owners and managers • preparing greening strategies for state-owned public land, including schools, parkland, road, rail, and utility corridors, achieving an appropriate balance between asset protection and urban greening • investigating a targeted grants program to support innovation and actions for greening neighbourhoods • investigating demonstration projects including green roofs, green walls, and landscapes • preparing new guidelines and regulations that support greening new subdivisions and developments via landscaping, green walls, green roofs and increase the percentage of permeable site areas in developments	**1.1(a); 1.1(d); 1.1(e); 1.2(a); 1.3(a); 1.3(b); 1.3(c); 1.3(d); 1.3(f); 1.3(g); 2.3(h); 3.5**
Action 93: Metropolitan open space strategy. Prepare a metropolitan open space strategy that enhances recreation, amenity, health and wellbeing, species diversity, sustainable water management and urban cooling across Melbourne. The strategy will include measure to: • protect and enhance existing open spaces, underpinned by improved and accessible spatial data • plan for an increase in open space, particularly in areas identified as lacking access to open space, areas undergoing substantial population growth, and areas where the network of green spaces could be expanded or improved • enhance the role, function, and overall community value of currently underutilised public land assets (e.g. utility easements, school grounds) in contributing to the open space network • better coordinate the delivery and management of open space across state and local government, including identifying management objectives for different parts of the network and developing standard agreements to manage land • provide improved network planning and provision guidance for both state and local government	**1.3(c); 1.3(d); 2.2(b); 2.3(d); 2.3(e)**

Protecting Victoria's Environment – Biodiversity 2037 Implementation Framework

Plan Melbourne 2017-2050	Maroondah Vegetation Strategy Priority Actions
Raise the awareness of all Victorians about the importance of the state's natural environment. Action 3.3 Support the Nature Play, Bush Kinders and Outdoor Learning to enable kids to connect to nature	**1.3(c); 1.3(d); 2.2(c); 2.3(i)**
Increase opportunities for all Victorians to act to protect biodiversity. Action 5.4 Support Victoria's conservation volunteer groups such as Landcare, Coastcare and Friends Groups to continue building environmental and community resilience	**2.2(c)**
Help to create more liveable and climate-adapted communities. Action 7.1 Support the establishment of new green infrastructure to maximise the co-benefits to communities and test new approaches for connecting Victorians to nature in an urban context	**1.1(e); 1.3(c); 1.3(d); 2.2(b); 2.3(d); 2.3(e); 2.3(f); 2.3(g); 2.3(h); 3.1; 3.2**
Help to create more liveable and climate-adapted communities. Action 7.6 Prepare a metropolitan open space strategy that enhances recreation, amenity, health and wellbeing, species diversity, sustainable water management and urban cooling across Melbourne.	**1.3(c); 1.3(d); 2.2(b); 2.3(d); 2.3(e)**
Increase incentives and explore market opportunities for private landholders to conserve biodiversity. Action 11.1 Examine the suite of Victorian private land conservation mechanisms and programs to assess their complementarity and investigate the pathways with the highest potential to increase landholder participation in biodiversity protection	**2.3(i)**
Engage with Traditional Owners to include Aboriginal values and traditional ecological knowledge in biodiversity planning and management. Action 14.3 Through the implementation of Plan Melbourne 2017-2050 prepare waterway corridor master plans for priority waterways to ensure that Traditional Owner and community values of waterways, such as access, amenity, and connection to nature, are protected and improved	**2.2(b)**
Maintain and enhance a world-class system of protected areas. Action 18.1 Investigate opportunities to secure more permanently protected areas on private land	**2.1(b)**

Victorian Public Health and Wellbeing Plan 2019–2023 Action plan update	Maroondah Vegetation Strategy Priority Actions
Tackling climate change and its impact on health. Promoting community adaptation to the public health risks associated with climate change.	**1.3(c)**
Increasing active living Increase easy access to parks, open spaces and public spaces, with opportunities for physical activity where appropriate.	**1.3(c)**

Victoria's Climate Change Adaptation Plan 2017 - 2020	Maroondah Vegetation Strategy Priority Actions
Improving the resilience of our built environment. Through initiatives such as Plan Melbourne, the Government will support cooler, greener cities projects (from 2017) to support the uptake of urban greening and integrated water management	**1.1(e); 1.2(b); 1.3(c); 1.3(d); 1.3(e); 1.3(f); 1.3(g); 2.2(b); 2.2(h)**
Improving the resilience of our built environment. The Government will work with the City of Melbourne to build a large, publicly accessible green roof in Melbourne's CBD (from 2017). This project will help the community learn about the benefits of green roofs and inspire other projects	**2.3(h)**

Water for Victoria: Water Plan	Maroondah Vegetation Strategy Priority Actions
Resilient and liveable cities and towns. Action 5.1 Use diverse water sources to protect public spaces Water corporations will work with local government and other public open space managers to identify water sources to maintain community assets, such as sporting facilities, public gardens, and street trees during drought to enhance community health, wellbeing, and liveability. Water corporations, local government, catchment management authorities and community leaders will work together to enhance public spaces through integrated water management in our existing and new urban environments. This will be achieved by: • selecting priority parks, gardens, public open spaces and playing fields to look after during drought by 31 March 2017 • seeking opportunities to promote urban cooling • building a shared understanding of the costs of water restrictions to the community and community expectations about restrictions and using this to inform water supply and demand management decisions.	**1.2(b); 2.2(h)**

Healthy Waterways Strategy 2018-2028	Maroondah Vegetation Strategy Priority Actions
Co-Designed Catchment Program for the Yarra Catchment **Mullum Mullum Creek Performance Objective 1:** Establish a continuous riparian vegetated buffer (2 km, 7 ha) and maintain existing vegetation (12 km, 46 ha) along priority reaches (using EVC benchmarks to at least a level 3 vegetation quality) **Mullum Mullum Creek Performance Objective 5:** Increase access to and along waterways (about 1 km of path) by improving connections with existing path network and in conjunction with urban development **Mullum Mullum Creek Performance Objective 6:** Increase participation rates from low to high; support community groups and build capacity through citizen science and cultural engagement. Increase participation through support of inter-agency waterway improvement projects	**2.2(b)**
Co-Designed Catchment Program for the Dandenong Catchment Region **Dandenong Creek Middle Performance Objective 4:** Establish a continuous riparian vegetated buffer (12 km, 47 ha) and maintain existing vegetation (29 km, 114 ha) along priority reaches (using EVC benchmarks to at least a level 3 vegetation quality) **Dandenong Creek Middle Performance Objective 7:** Increase access to and along waterways from 51% to 58% (about 5 km) by extending and filling gaps in path network and improving crossings of major roads, and along Bungalook Creek and tributaries **Dandenong Creek Middle Performance Objective 8:** Increase participation rates from low to high; support community groups and connect with growth area communities. Increase participation in citizen science and capacity building programs as population grows	**2.3(f)**

Port Phillip and Western Port Regional Catchment Strategy	Maroondah Vegetation Strategy Priority Actions
Lead organisations are committed to achieving their native vegetation targets and arrangements are in place to monitor and report on progress and success	**3.6**

Climate Change Adaptation Roadmap for Melbourne's East (2015)	Maroondah Vegetation Strategy Priority Actions
Adaptation objective: Reduce the heat island effect through the region to mitigate projected temperature increases **Action:** Develop a Greening for a Cool East Strategy	**1.3(c); 1.3(d)**
Adaptation objective: Improve the management of biodiversity and open space under hotter and drier conditions with more extreme events. **Action:** Seek further funding for reporting and analysis of data associated with the EAGA Biodiversity Monitoring Framework.	**3.7**

Living Melbourne: Our Metropolitan Urban Forest Strategy (2019)	Maroondah Vegetation Strategy Priority Actions
Protect and restore species habitat and improve connectivity. Action 1.2 Assess the values and quality of information, to develop a list of priority areas for immediate protection	**2.1(a); 2.1(b);**
Protect and restore species habitat and improve connectivity. Action 1.3 Map existing and new areas for biodiversity connectivity at different scales, and prioritise areas for strengthening connectivity and biolinks, including responses to climate change, within each municipality and across the region	**2.3(a); 2.3(b)**
Protect and restore species habitat and improve connectivity. Action 1.4 Implement priorities for conservation, and secure and build habitat connectivity	**2.1(b); 2.1(c); 2.2(a); 2.2(b); 2.2(g); 2.2(h); 2.3(c); 2.3(d); 2.3(e); 2.3(g); 2.3(i)**
Set targets and track progress. Action 2.1 Establish and implement urban forest greening targets including, as a minimum, 'tree canopy' and 'tree canopy and shrub' cover for each region	**3.5**
Set targets and track progress. Action 2.2 Establish a measure of permeability across the regions, with the aim of implementing a permeability target for public and private land	**1.2(a)**
Set targets and track progress. Action 2.3 Establish a method for monitoring, evaluating and reporting on the improvement of the urban forest, including indicators and measures for quality and extent	**3.6**
Set targets and track progress. Action 2.4 Develop a system for consistently collecting and analysing urban forest data, and coordinate the collection and publication of data in a publicly available, comparable database	**3.5**
Scale up greening in the private realm. Action 3.1 Strengthen regulations to support greening in new subdivisions and developments – to benefit human health and wellbeing, and increase biodiversity	**1.1(a); 1.1(d); 1.1(e); 1.2(a); 1.3(a)**
Scale up greening in the private realm. Action 3.2 Strengthen regulations to protect canopy trees	**1.1(a); 1.1(c)**
Scale up greening in the private realm. Action 3.3 Encourage private landholders to protect and enhance the urban forest and expand greening activities by offering incentives for planting, installing and maintaining natural infrastructure	**1.1(f); 1.2(c); 2.2(b); 2.3(i)**
Collaborate across sectors and regions. Action 4.1 Capitalise on existing collaborations between local and state governments and the private sector	**2.2(b); 2.3(f)**
Collaborate across sectors and regions. Action 4.2 Mobilise broad community support	**1.1(a); 1.1(d); 1.1(f); 1.2(c); 2.2(c); 2.3(i)**
Collaborate across sectors and regions. Action 4.4 Foster and promote urban forest champions, in both the public and private sectors	**1.1(a); 1.1(d); 1.1(f); 1.2(c); 1.3(f); 1.3(g); 2.2(c); 2.3(i)**
Build a toolkit of resources to underpin implementation. Action 5.1 Build the capacity of public and private sector practitioners to protect, enhance and expand the urban forest	**1.1(a); 1.1(d); 1.3(c); 1.3(d); 2.2(a); 2.2(d); 2.2(e); 2.2(f); 3.2**

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- IPBES (2019) Global assessment report on biodiversity and ecosystem services of the Intergovernmental Science- Policy Platform on Biodiversity and Ecosystem Services (IPBES Secretariat)
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Glossary

Biodiversity: The diversity of all forms of life, including species, the genetic diversity within each species and the diversity of communities that species form. Biodiversity spans organisms from the smallest virus to the largest trees.

Canopy: The lateral extent of the upper layer of foliage (tree crown) of an individual tree or group of trees.

Canopy cover: The fraction of ground area covered by the vertical projection of tree crown perimeters

Green infrastructure (or blue-green infrastructure): A strategically planned network of natural and semi-natural areas with other environmental features designed and managed to deliver a wide range of 'ecosystem services' including stormwater management, climate adaptation, less heat stress, more biodiversity, food production, better air quality, sustainable energy production, clean water and healthy soils, as well as increased quality of life through recreation and providing shade and shelter in and around towns and cities.

Ecological Vegetation Classes (EVCs): Groupings of vegetation communities based on floristic, structural, and ecological features that form the central component of the state-wide vegetation classification system developed and used by the Victorian Government.

Ecosystem: The combination of an interdependent community of living things and the physical features that support it, such as climate, soil, and water.

Ecosystem services: Practical benefits that flora and fauna provide to humans, such as the shade, wind protection and air purification provided by trees or the pollination of garden plants by insects.

Environmentally Sustainable Design (ESD): The philosophy of designing physical objects, the built environment, and services to comply with the principles of ecological sustainability, such that they reduce consumption of non-renewable resources, minimise waste, and create healthy, productive environments.

Habitat: The natural home or environment of an animal, plant, or other organism. It is characterised by both physical and biological features, and is where a species can find the food, shelter, protection, and mates for reproduction it needs.

Heat vulnerability: Specific population and community characteristics that mark vulnerability to heat waves.

Human wellbeing: The human state of being comfortable, healthy, or happy. It is a complex combination of a person's physical, mental, emotional, and social health factors. Wellbeing is strongly linked to happiness and life satisfaction, and could be described as how you feel about yourself and your life.

Indigenous: A species of flora or fauna is 'indigenous' to an area if it is presumed to have occurred there prior to European colonisation. A species may be indigenous to one part of Maroondah and not to another.

Invertebrate: An animal without a backbone, e.g. an insect, spider, worm, or mollusc.

Liveability: The sum of the factors that add up to a community's quality of life; including the built and natural environments; economic prosperity; social stability and equity; educational opportunity; and cultural, entertainment and recreational possibilities.

Nature: Equivalent to the natural world, and refers to living plants and animals, geological processes, weather, physics, such as matter and energy, and other natural elements of the Earth.

Permeability: The property of a soil which permits the passage or seepage of water through its interconnecting voids

Urban Heat Island Effect: The higher temperatures experienced by urban areas compared with nearby non-urban areas resulting from the concentration of buildings and pavements absorbing more light and emitting this as heat.

Vegetation: An assemblage of plant species and the ground cover they provide. It is a general term, without reference to particular species, life forms, structure, spatial extent, or any other specific botanical or geographic characteristics.

Vertebrate: An animal with a backbone. The vertebrates indigenous to Maroondah include mammals, birds, reptiles, frogs, and fish.

Water Sensitive Urban Design (WSUD): An integrated approach to water management that integrates urban design and planning with social and physical sciences in order to deliver water services and protect aquatic environments in an urban setting. A WSUD approach could include the integration of raingardens and wetlands in an urban area to manage stormwater.

Acronyms

BESS	Built Environment Sustainability Scorecard
BMO	Bushfire Management Overlay
CFA	Country Fire Authority
CRC	Cooperative Research Centre
DELWP	Department of Environment, Land, Water and Planning
EAGA	Eastern Alliance for Greenhouse Action
ESD	Environmentally Sustainable Design
ESO	Environmental Significance Overlay
EVC	Ecological Vegetation Class
LPPF	Local Planning Policy Framework
MPS	Municipal Planning Strategy
PIN	Planning Infringement Notice
PPF	Planning Policy Framework
PPWCMA	Port Phillip and Westernport Catchment Management Authority
PPW RCS	Port Phillip and Westernport Regional Catchment Strategy
SDAPP	Sustainable Design Assessment in the Planning Process
SLO	Significant Landscape Overlay
SULE	Safe Useful Life Expectancy
VCAT	Victorian Civil and Administrative Tribunal
VPO	Vegetation Protection Overlay
VPP	Victorian Planning Provisions
WSUD	Water-sensitive urban design

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