

DRAFT TREE CANOPY STRATEGY

2022–2042





Acknowledgements

Yarra Ranges Council is proud to acknowledge the Wurundjeri people and their rich cultural heritage and spiritual connection to the land.

We recognise and extend our appreciation for the Wurundjeri people as the Traditional Custodians of these lands. We pay our respects to leaders and elders, past, present and emerging, for they hold the memories, the traditions, the culture and the hopes of the Wurundjeri people.

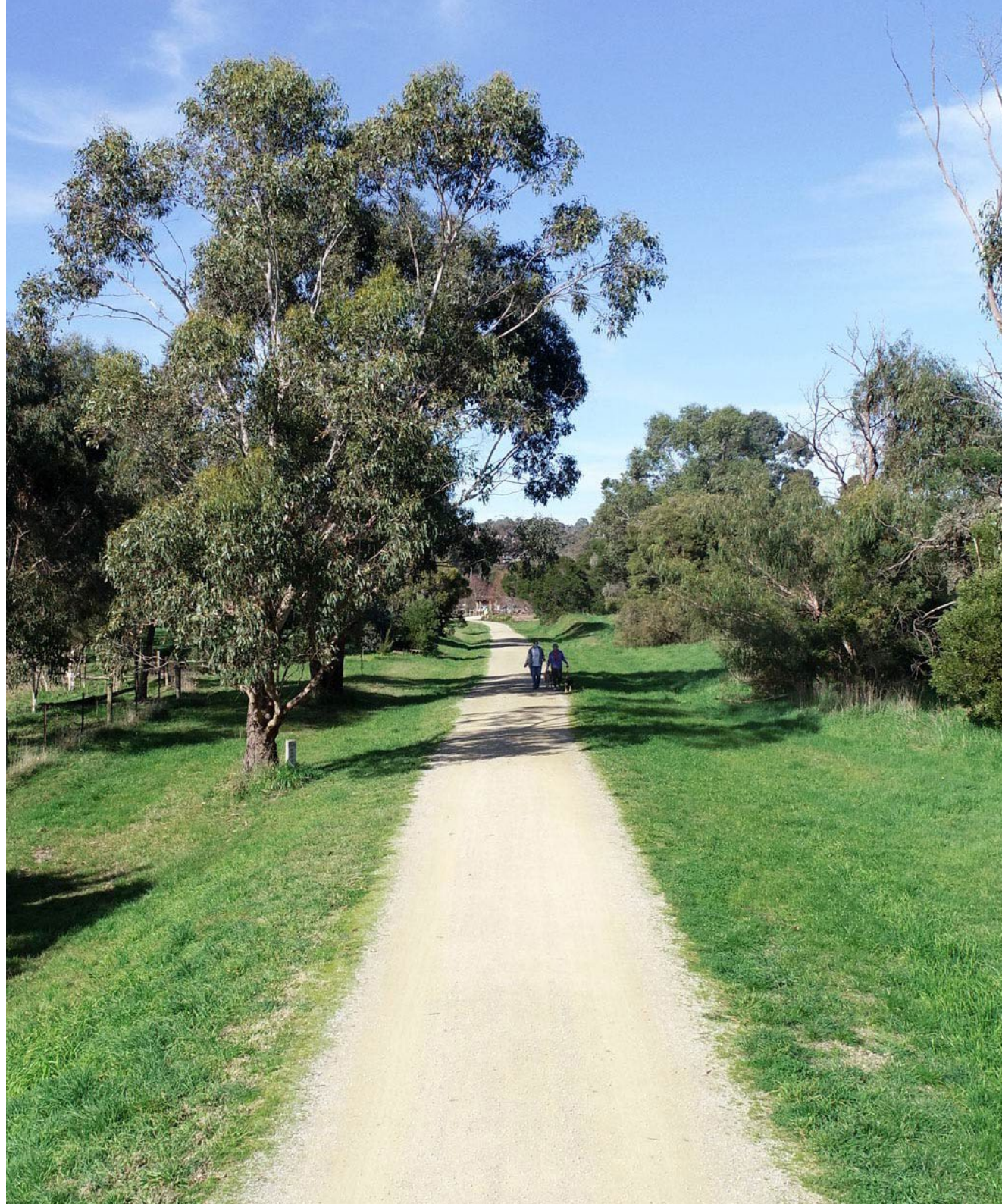
We express our gratitude in the sharing of these lands, and our sorrow for the personal, spiritual and cultural costs of that sharing. Our hope is that we may walk forward together in harmony and in the spirit of healing.

Many people have contributed information and ideas presented within this document, including the Yarra Ranges Environmental Advisory Committee (YREAC), the Yarra Ranges Indigenous Advisory Committee (IAC), Lilydale & District Historical Society (LDHS), Department of Environment, Land, Water and Planning (DELWP), Living Melbourne, Uncle David Wandin (Wurundjeri Elder), Meg Caffin (Urban Forest Consulting) and Yarra Ranges Council staff.

Vegetation and heat data presented in this report was provided by © State of Victoria (Department of Environment, Land, Water and Planning).

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FOREWORD

Trees are extremely important to our people, the Wurundjeri. Our name is derived from ‘wurun’ meaning Manna Gum, which is common along ‘Birrarung’ (the Yarra River) and her estuaries. ‘Djeri’ is the name of the grub that lives in the Manna Gum and makes unique marks on the underside of bark. These markings are important identifying features of Wurundjeri shields and canoes. They hold great significance for our people and our identity.

Trees play an important part in our cultural life. The leaves of Manna Gum are used in smoking ceremonies to welcome people to Country. Trees direct our people to, and indicate, significant places. We consider the tree canopy to be sacred and protected—it is within the canopy that many of our ancestors and spirits live.

Trees help us to understand and read Country. They tell us about the soil, and in doing so what plants, food, medicine, insects, and animals should reside in that Country. Trees tell us what land management practices to undertake, such as the correct time to burn or when not to burn. They are a source of food, fibre and medicine, and are important for making tools such as spears, canoes, and shields. While we carve and harvest parts of trees, we do this respectfully to protect them from getting sick.

Parent tree is a term used for trees that have grown large and old. They are an important part of our Country, too often missing from today’s landscape. Parent trees should shade and connect our Country, helping to keep it cool. Too much hot fire has killed our parent trees, allowing the sun to penetrate and dry out the soil. Too much hot fire has turned our Country upside down and made it very sick. Without parent trees, healing Country is difficult. We need to look after our trees and help them grow old, so we can have a healthy Country again.

Uncle David Wandin

Wurundjeri Elder

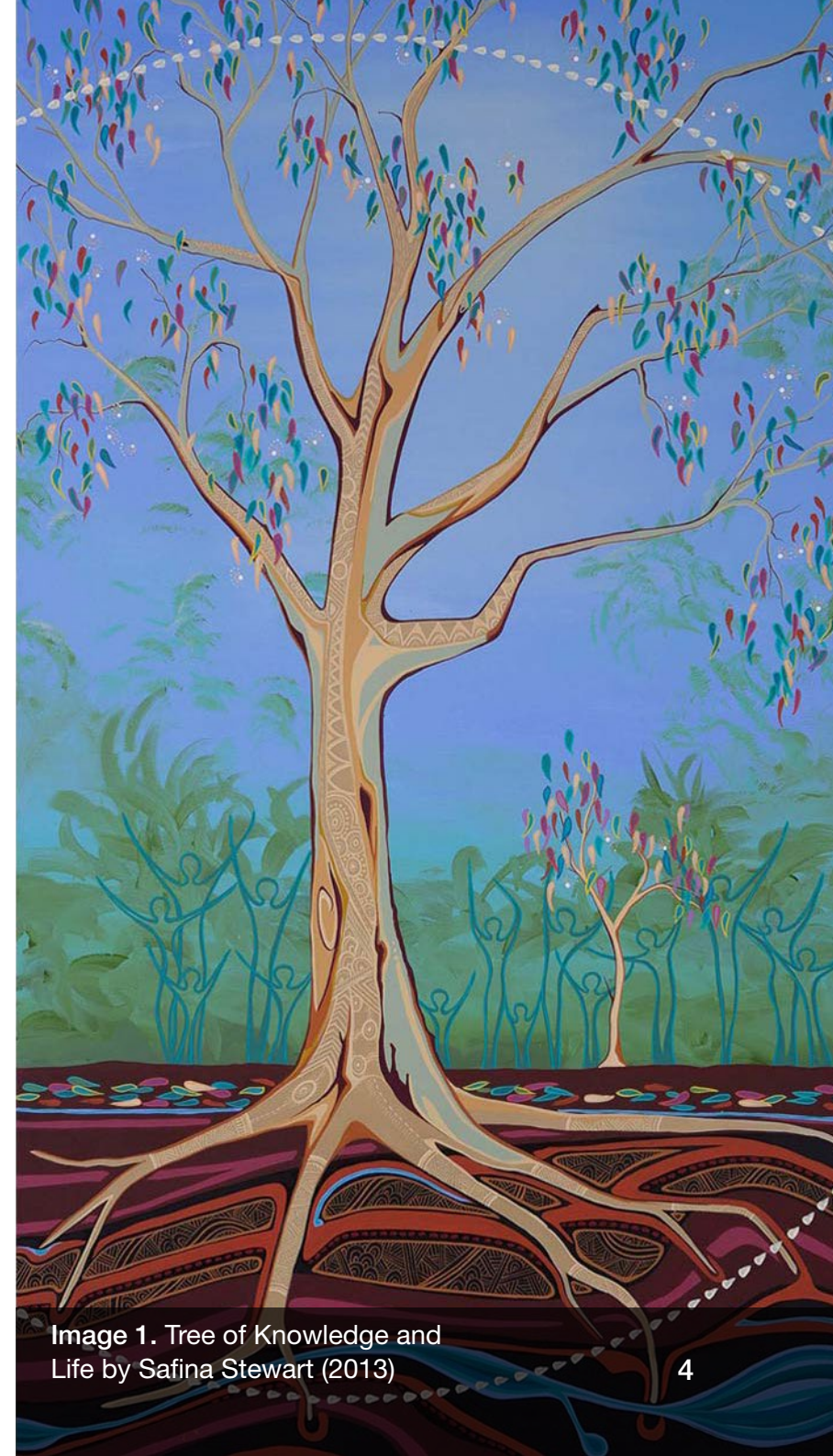


Image 1. Tree of Knowledge and Life by Safina Stewart (2013)



Image 2. Firestick burning undertaken as part of the National Indigenous Firestick Workshop in Barmah, Victoria (2019).

Credit: Timothy Neale

EXECUTIVE SUMMARY

Trees are fundamental to the story of Yarra Ranges, shaping our cultures, values and communities. They are a prominent feature in our landscape, providing benefits to our health and wellbeing, community and culture, the environment, ecology and economy.

‘Tree canopy’ is our way of referring to Yarra Ranges’ diverse tree population and is a way to consider the collective benefits of our trees. As the climate changes, and our cities and communities evolve, our tree canopy is in decline. This means less trees, but also unhealthier trees and increasing challenges for tree management. Issues contributing to this trend include the urban heat island effect, extreme weather, climate change, poor tree diversity and performance, inadequate tree planting, urban development, and competing infrastructure. Understanding these issues provides us with an opportunity to take action to reverse tree canopy decline.

This Strategy sets our objectives and targets for the long-term protection, management and planting of trees in Yarra Ranges. Our tree planting will prioritise the urban parts of Yarra Ranges in built up areas where canopy cover is low or declining. By taking a strategic approach to protecting, managing and planting trees, we will maximise the benefits of our tree canopy and minimise tree risks, particularly tree risks associated with bushfires and storms, which are significant factors in Yarra Ranges.

VISION

Yarra Ranges Council will conserve and enhance our leafy character, culturally significant landscapes and unique biodiversity through the protection, management and planting of trees. Our tree canopy will improve liveability, support community health and wellbeing, maintain ecosystems and enhance local tourism.

OBJECTIVES

This Strategy sets a foundation to:



1. Value, protect and manage trees



2. Grow a healthy tree canopy



3. Conserve culturally significant trees and enhance local tourism



4. Improve tree canopy resilience to climate change



5. Support and enhance community health and wellbeing



6. Apply best practice tree management

TARGETS

Yarra Ranges Council will aim to achieve the following by 2042:



Our community will...

- ✓ Have a greater understanding of the role, function and importance of trees
- ✓ Have greater knowledge and appreciation of our culturally significant trees.



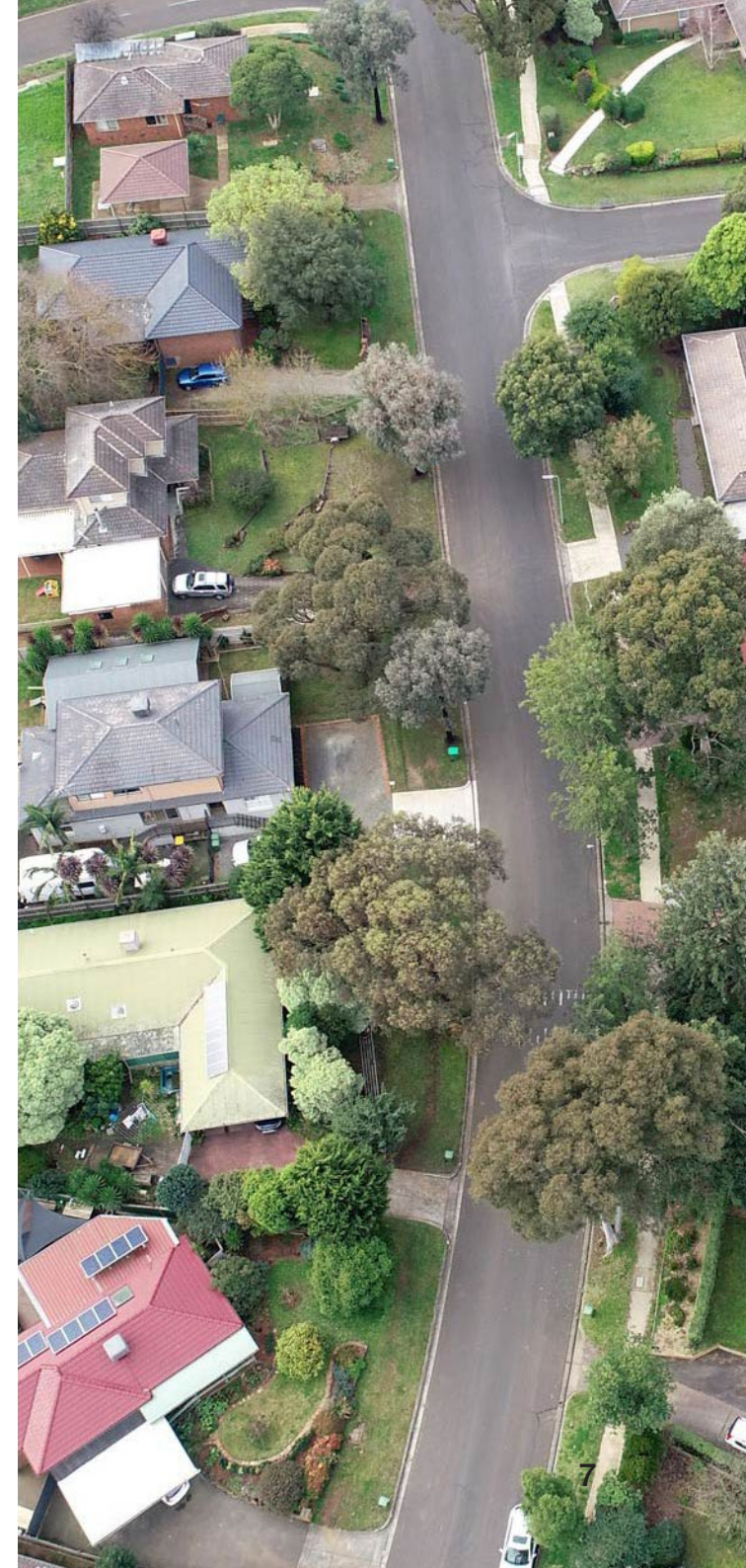
Our tree planting will...

- ✓ Increase tree canopy cover from 31.68% to 35% at maturity on public land in built up areas
- ✓ Be more fairly distributed across public land, providing a minimum of 25% canopy cover for all suburbs and towns in built up areas
- ✓ Increase tree canopy cover across all activity centres
- ✓ Increase tree canopy cover along key pedestrian routes, such as paths and trails
- ✓ Increase tree species diversity.



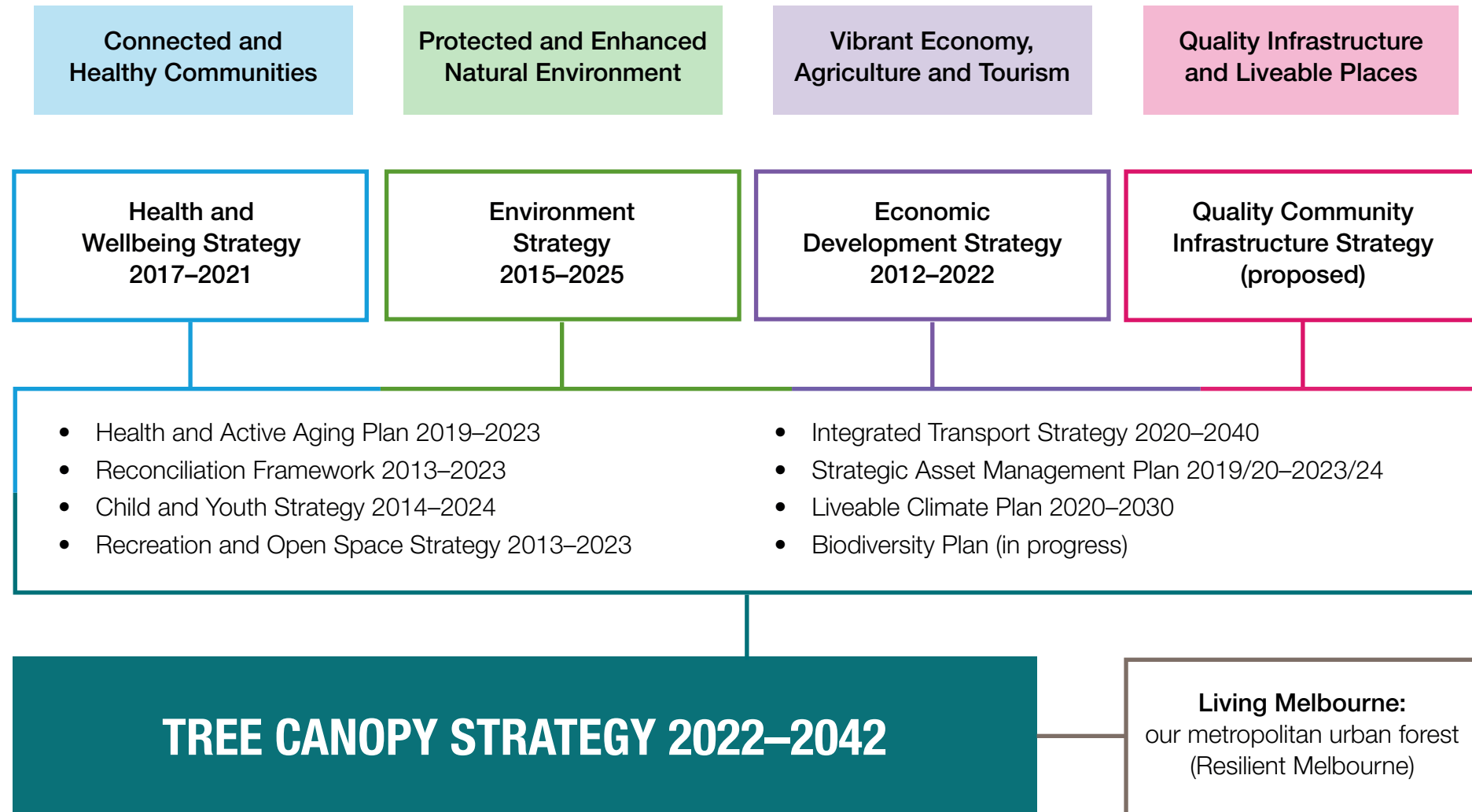
Our tree management will...

- ✓ Reduce hazardous trees along roadsides for bushfire preparedness
- ✓ Achieve a minimum 95% establishment rate for new street tree plantings
- ✓ Establish all new street tree plantings with formative pruning
- ✓ Incorporate a monetary valuation method and policy for trees on public land.



STRATEGIC CONTEXT

Council's Key Strategic Objectives



INTRODUCTION

The Yarra Ranges is highly valued for its leafy character and culturally significant landscapes, with over 4.5 million tourists attracted to the region each year.¹ Trees are a storied part of our landscape and have shaped the cultures, values and communities of today. They are a prominent feature of our suburbs, towns, roadsides and trails.

Trees are commonly valued for their colour, scent, texture and shade, or as habitat and food for fauna. However, researchers are beginning to understand and quantify the significant environmental, economic and social benefits of trees. Increasingly, trees are viewed as critical infrastructure that improves the *liveability* of our communities.² Healthy trees are one of the most efficient and cost-effective solutions to support communities that are safe, resilient, healthy, inclusive and socially well connected. For these reasons, trees are valuable assets to be protected, managed and enhanced.

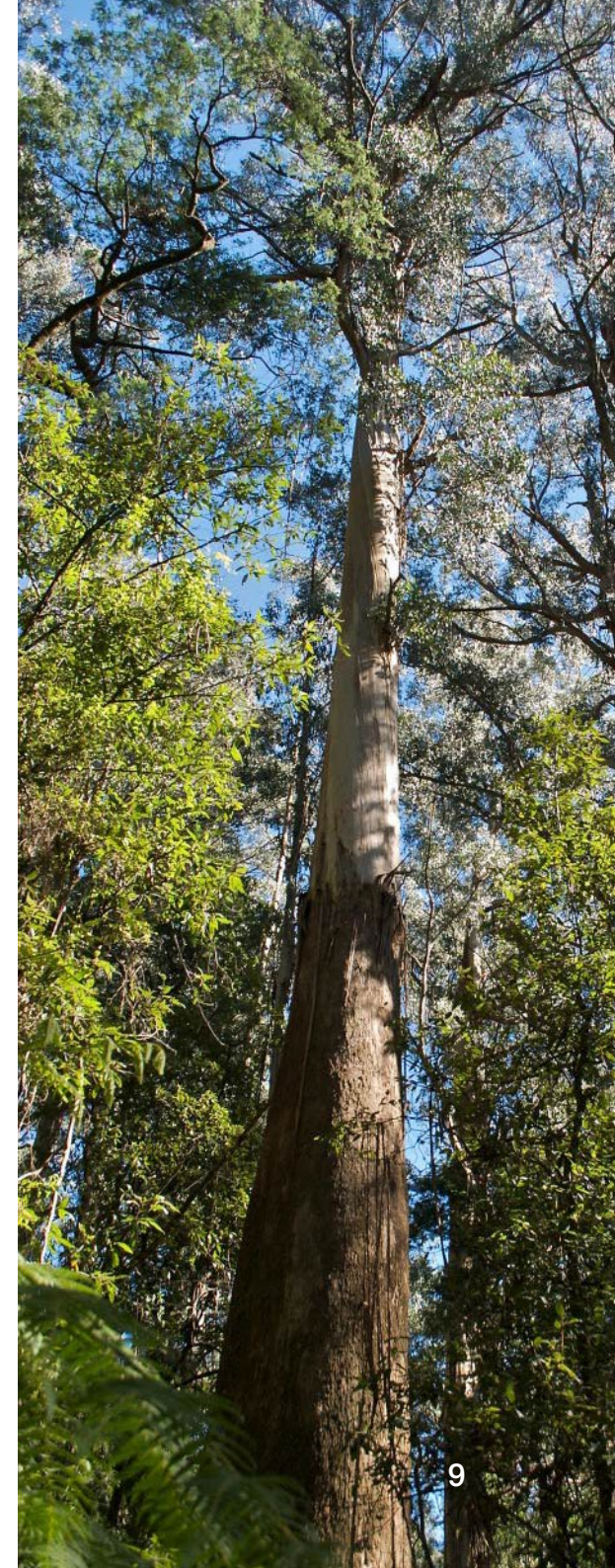
What is tree canopy?

‘*Tree canopy*’ is our way of referring to Yarra Ranges’ tree population, and includes trees of all types and sizes across public and private land. Tree canopy is a way to consider the collective benefits of our diverse tree population.

Looking holistically at our tree canopy allows for deeper consideration of local issues and opportunities related to trees, such as community perceptions, *urban heat island effect*, *extreme weather*, *climate change*, tree diversity and performance, tree planting, urban development, competing infrastructure, infrastructure projects, culture, large trees, and *best practice tree management*.

The management of the tree canopy is often considered a local government responsibility but frequently extends well beyond that. Neighbourhoods, schools, community groups, developers, business, industry and State and Federal Government all have important roles to play. Every part of the community contributes in some way to the tree canopy as a whole.

This Strategy is the first of its kind for Yarra Ranges Council, and will provide the foundation for the development and implementation of best practice tree management, to maximise the benefits of our tree canopy and to minimise risk.



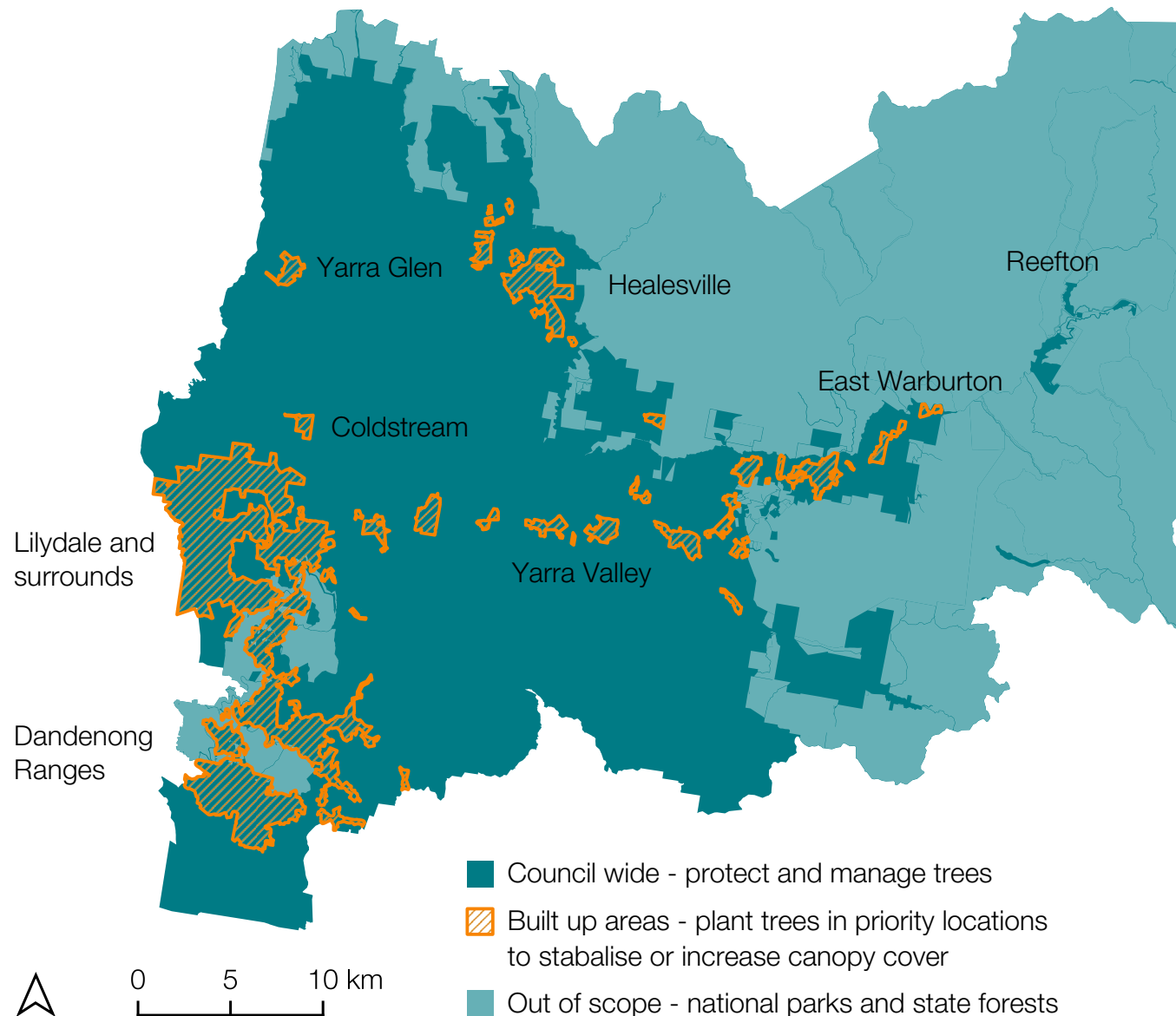
SCOPE

The Tree Canopy Strategy sets a foundation for the protection and management of trees across our municipality. This includes trees along roadsides, in parks and reserves, along trails and those on private land.

The Strategy also sets Council's direction for the planting of trees to stabilise or increase *canopy cover* on public land in *built up areas*. This includes identifying and planting priority locations where canopy cover is low or declining across Lilydale and its surrounding suburbs as well as the urban parts of Yarra Glen, Healesville and towns in the Dandenong Ranges and Yarra Valley.

The Strategy does not address the protection, management or planting of trees on land managed by other agencies, such as national parks and state forests.

Map 1. Areas within scope of the Tree Canopy Strategy



THE PAST

The Wurundjeri are a First Nations People, in the Kulin alliance, they are the Traditional Custodians of Yarra Ranges. Their ancestors have cared for the Yarra Valley and its waterways for millennia. Trees are central to the identity of the Wurundjeri people and their connection to Country. The term Wurundjeri is an association of place. In the Woi wurrung language the word 'wurun' means Manna Gum (*Eucalyptus viminalis*) and 'djeri' is the grub that lives in or is found near the tree. The ancestral lands are therefore the place where the Manna Gum and its associated grub occur.³

Trees have a profound and powerful connection to the spirituality and culture of the Wurundjeri. This connection can be partly understood in the way groups of tree species are affectionately referred to as 'mobs', a colloquial term for groups of people. There are mobs of Stringybark and Messmate, mobs of Gum, Ironbark mobs and sometimes mobs growing together such as Gums and Stringybark. Just like our diverse communities, different mobs of trees require different approaches to ensure their health and wellbeing. The tree canopy is sacred and protected—it is within the canopy that many Wurundjeri ancestors and spirits live.

Trees provide a wealth of resources for the Wurundjeri people's way of life, including food, fibre, medicine and materials for making tools such as spears, canoes and shields. Tree materials are carved and harvested respectfully to protect trees from getting sick. These cultural practices are the region's first example of sustainable timber usage.

Yarra Ranges is home to Mountain Ash (*Eucalyptus regnans*), one of the tallest flowering plants in the world. For this reason, following European arrival, the region was used as a main source of timber for Melbourne. The Victorian gold rush of the 1850s and 1860s increased the demand

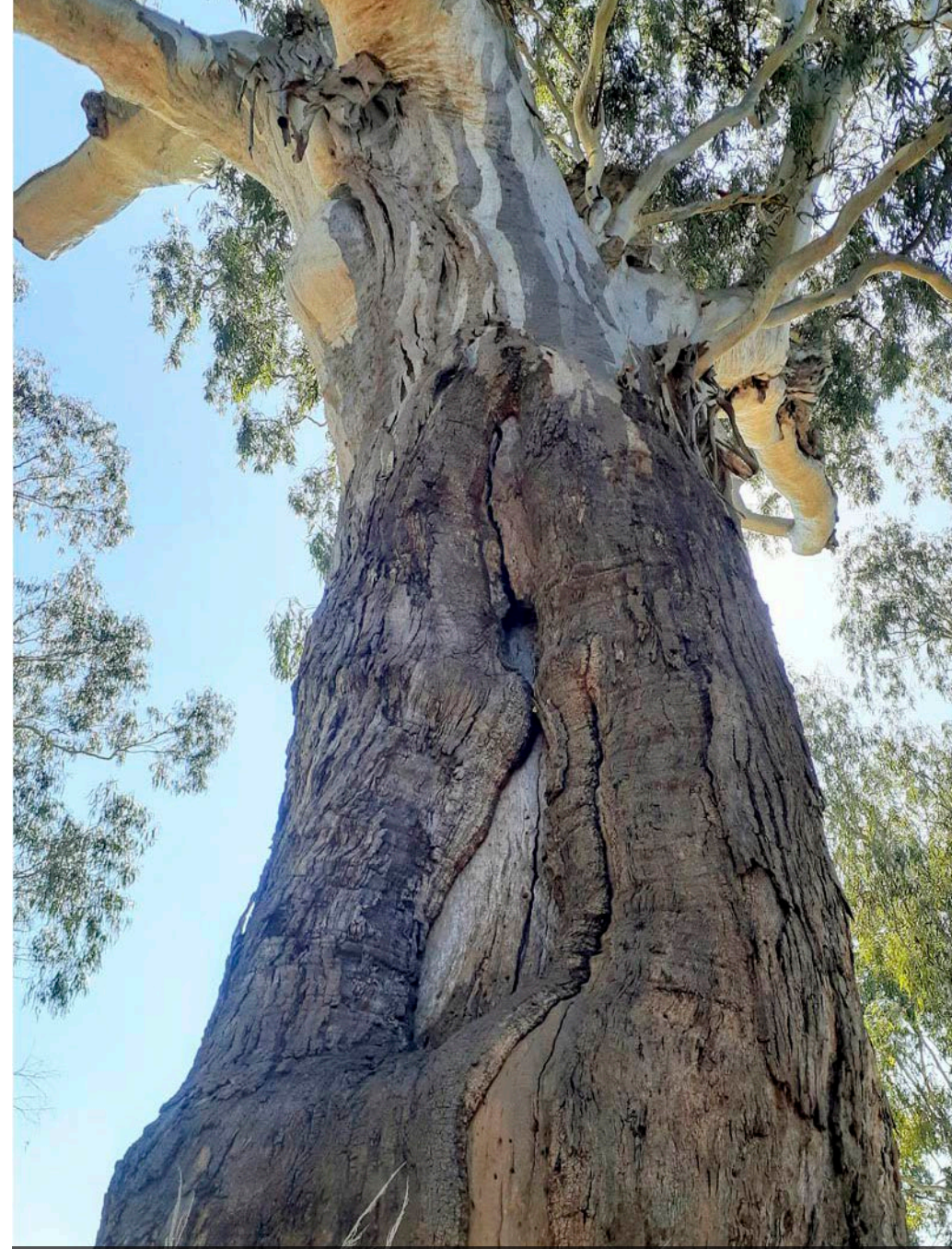


Image 3. A Wurundjeri scar tree known as Yingabeal (Yinga meaning sing or song and beal is an Indigenous name for a redgum).

Credit: Nicholas Magree

for timber, resulting in large areas of the Yarra Ranges being opened up for harvesting. In 1901 the railway line was extended to Warburton to support the growing timber industry. Sawmills and timber tramways were constructed throughout the area. Timber mills provided work for many people, and towns such as Powelltown sprang up around the mills. The timber industry has shaped towns, communities and landscapes across the Yarra Ranges and is a rich part of our story.⁴

In Australia, commemorative trees have been planted in public places since the late nineteenth century, and stand as living connections to the past. From 1892-1920 the Lilydale Arbor Day committee organised an annual date where all other work ceased and the community gathered to plant trees. Planted in 1897, the Queen Victoria Jubilee Avenue in Lilydale, was one of the first commemorative tree avenues planned by the Arbor Day committee. Many of the original trees across Lilydale remain today, lining streets including Main Street, Cave Hill Road, Anderson Street, Castella Street and Clarke Street.⁵

During and after the First World War, avenues of trees were planted along streets to commemorate fallen soldiers. The Wandin North Avenue of Honour is one example that still stands in commemoration today. Officially opened in the 1920s, it comprises a row of Red-flowering Gums along the Warburton Highway and Beenak Road.⁶

Tourism emerged as a key industry in the 1920's with Healesville and the Dandenong Ranges famed for their natural beauty and forests. This led to an increase in permanent residents, who established stylised and exotic trees and gardens. Many of these trees and gardens draw tourists to the region today.



Image 4. Castella Street, Lilydale (1908)
Credit: Lilydale & District Historical Society Inc.



Image 5. Castella Street, Lilydale (2020)

THE PRESENT

In 2019, Yarra Ranges Council endorsed the *Living Melbourne: our metropolitan urban forest*, a strategy for a greener, more liveable Melbourne. Among its six recommended actions, the strategy includes regional targets for increasing tree canopy cover.

Following this, Council endorsed the *Liveable Climate Plan 2020-2030*, it envisages our suburbs and towns as leafy, green places, providing summer shade, year round beauty and walkable neighbourhoods. A key action of the Liveable Climate Plan is to prepare a strategy for growing healthy and *resilient trees*, and increasing tree canopy cover.

Yarra Ranges houses one of the most expansive tree populations across *metropolitan Melbourne*.⁷ The majority of this tree canopy cover is provided by national parks and state forests. These are ecologically important areas that support habitat for a wide range of indigenous plants, animals and fungi, including the Victorian state emblems, the Leadbeater's Possum and Helmeted Honeyeater. In contrast, the Yarra Valley areas have the lowest tree canopy cover in the region. However, these areas are dominated by agriculture, vineyards and wineries, and are important for the local economy and tourism.



TREE CANOPY COVER DATA

A study undertaken by the Department of Environment, Land, Water and Planning (DELWP) in partnership with RMIT University, CSIRO, and the Clean Air and Urban Landscapes (CAUL) mapped and analysed vegetation, land use, and urban heat across Melbourne in 2014 and 2018.⁸

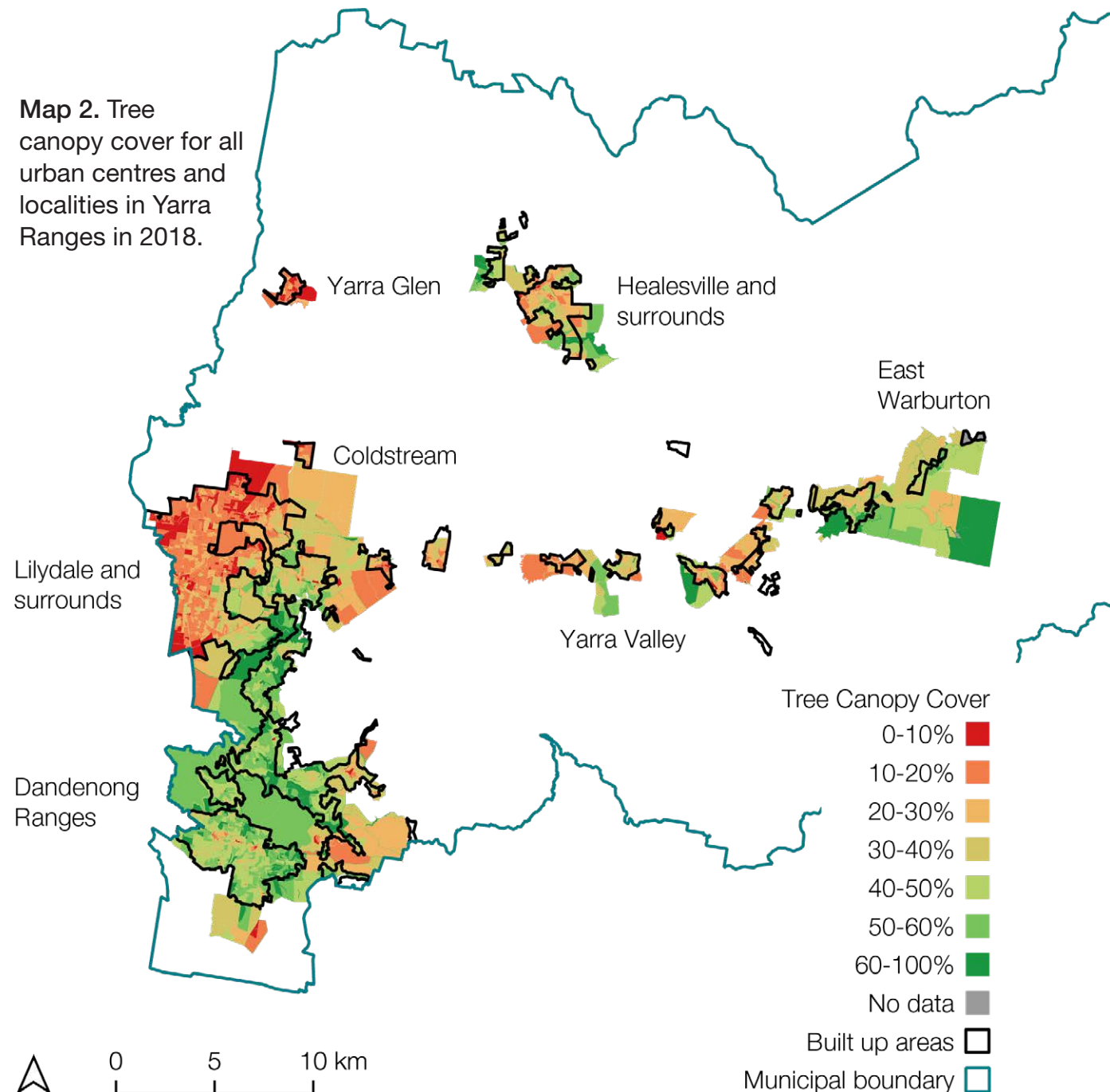
Following a major storm event in June 2021 that devastated communities across the Dandenong Ranges, Council mapped and analysed tree canopy cover before and after the storm.

The data associated with these studies have given us a detailed understanding of our tree canopy cover, along with its distribution and change over time.

What are built up areas?

Built up areas are places where the majority of our community reside. These include Lilydale and surrounds, Yarra Glen, Healesville and towns in the Dandenong Ranges and Yarra Valley. These are areas where people interact and connect with trees, and where trees make a vital contribution to the liveability of our communities. It is estimated that Council manages over 150,000 trees in streets and parks in built up areas.

Map 2. Tree canopy cover for all urban centres and localities in Yarra Ranges in 2018.



Public land

As at 2018, our tree canopy cover on public land in built up areas was 31.68% — the highest within metropolitan Melbourne. However, tree canopy cover across built up areas in suburbs and towns is not evenly distributed. A closer look at these areas reveals the suburbs of Chirnside Park (12.35%) and Mooroolbark (18.12%) have our lowest canopy cover, closely followed by Lilydale-Coldstream (20%) and Kilsyth (21.83%). On the other hand, towns in the Dandenong Ranges have considerable tree canopy cover (>40%).

Identifying areas of low canopy cover is an important step in understanding areas most in need of new tree plantings, in order to grow a more fairly distributed tree canopy.

Private land

Trees on private land, in people's front and backyards, comprise over three quarters (77%) of our tree canopy cover within our built up areas.

Tree canopy cover on private land in our built up areas tends to closely follow that of public land, with private land generally slightly higher. Recognising the significant contribution of trees on private land to our total tree canopy cover, highlights the importance of private trees to the broader community.

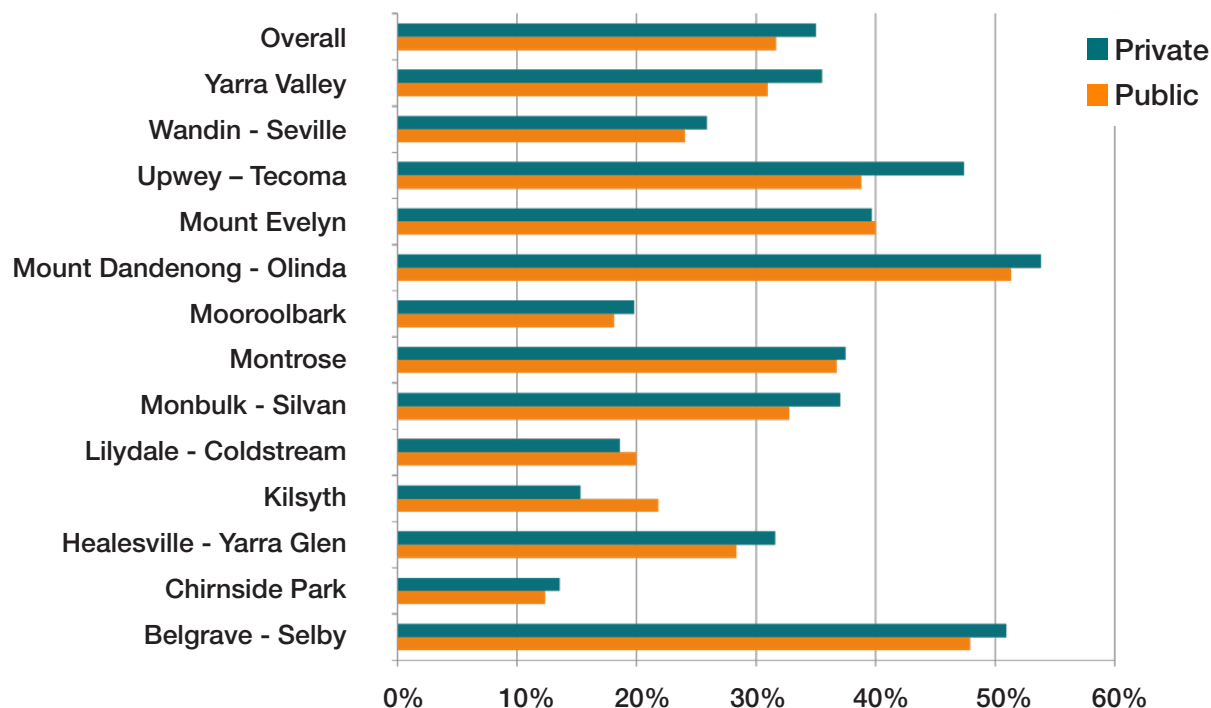


Figure 1. Tree canopy cover by locality for public and private land in 2018.

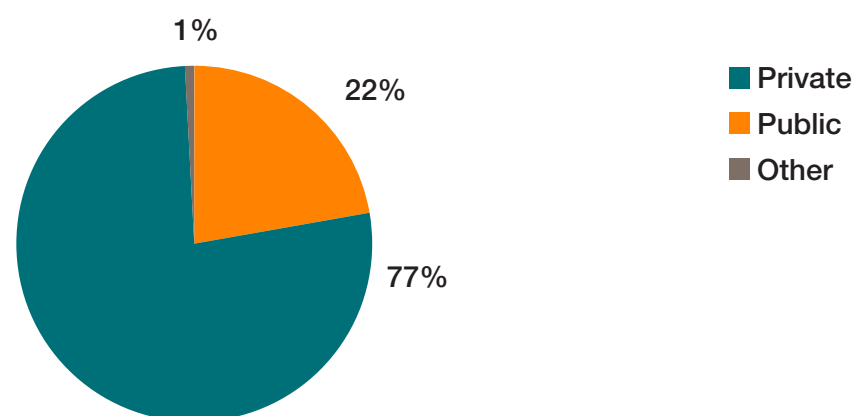
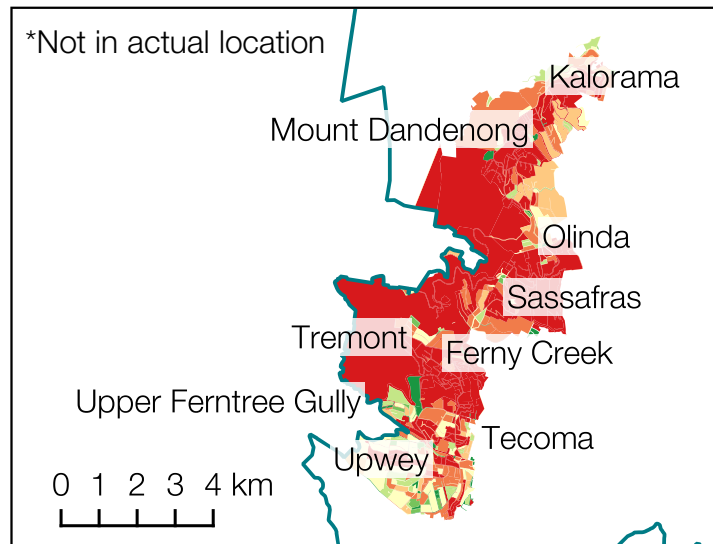


Figure 2. Tree canopy cover distribution between public and private land in 2018.

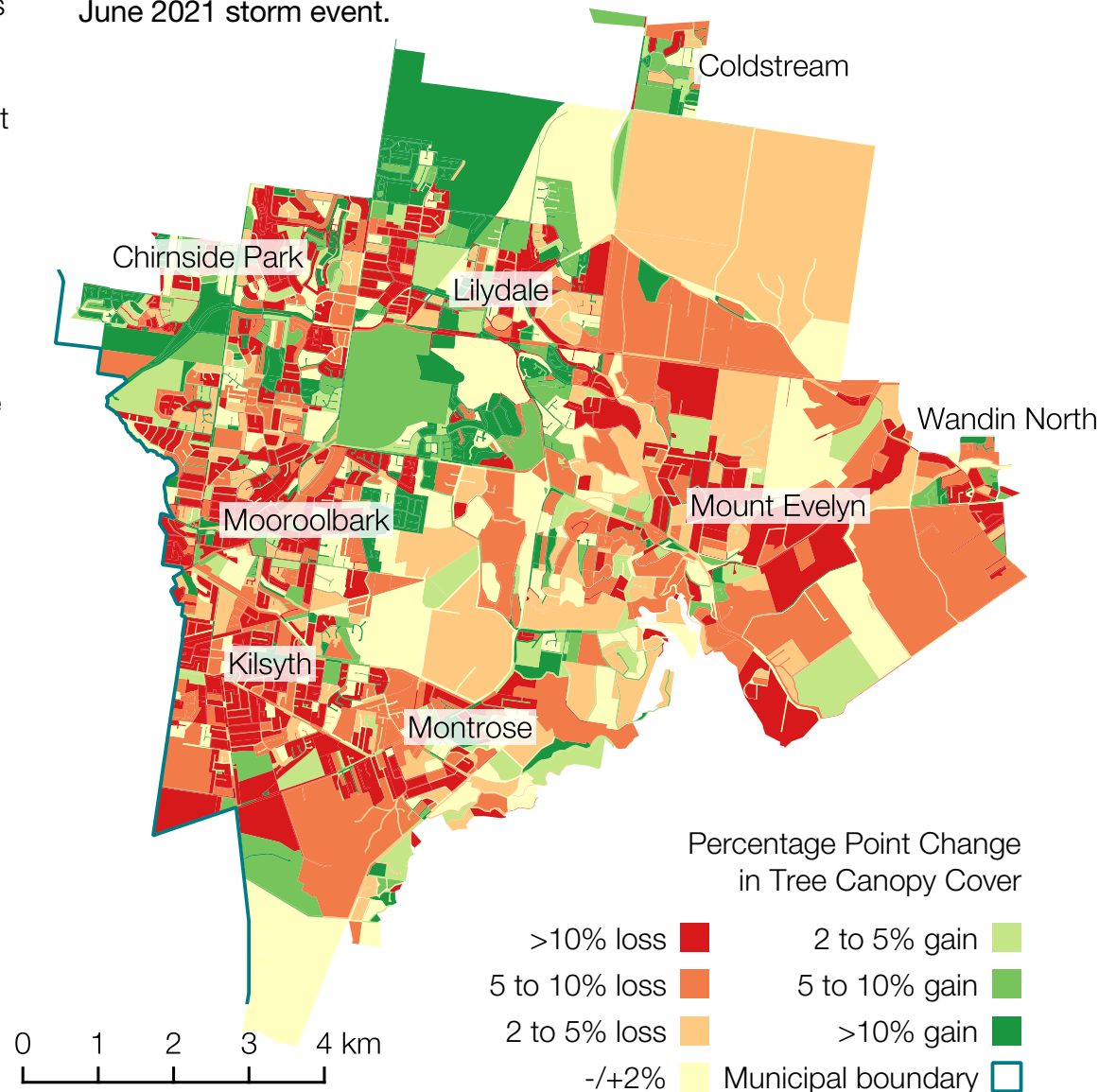
TREE CANOPY COVER CHANGE

Between 2014 and 2018, our tree canopy cover in built up areas declined 2.92 *percentage points* (33.73% to 30.81%). This loss equates to 186 hectares of tree canopy cover—roughly the equivalent size of 104 Melbourne Cricket Grounds. It is important to note that the 2014 data for this study only included partial coverage of our built up areas and did not include Yarra Glen, Healesville or most of the towns in the Yarra Valley. Areas of greatest loss were seen in the Dandenong Ranges, while Mount Evelyn, Mooroolbark, Chirnside, Kilsyth and Montrose also experienced less uniform, but notable, tree canopy cover loss.

A major storm event devastated the Dandenong Ranges in June 2021. Analysis of tree canopy cover data from before and after the storm shows that 229 hectares of canopy cover were lost in the Dandenong Ranges—roughly the equivalent size of 128 Melbourne Cricket Grounds.



Maps 3 and 4. Tree canopy cover change by percentage points between 2014 and 2018. This mapping excludes data collected after the June 2021 storm event.



Public land

Tree canopy cover change on public land between 2014 and 2018 was an overall loss of 1.96 percentage points (30.38% to 28.42%), with the Dandenongs experiencing the greatest losses, while Mount Evelyn, Monbulk-Silvan and Kilsyth experienced minor losses. In contrast, some of our more urbanised areas such as Mooroolbark, Montrose and Lilydale-Coldstream experienced minor increases in tree canopy cover.

Identifying areas of tree canopy cover loss on public land is another important step in understanding areas where trees could be managed or planted to maintain and increase canopy cover.

Private land

Tree canopy cover change on private land between 2014 and 2018 was an overall loss of 3.23 percentage points (34.7% to 31.47%), with Belgrave-Selby the only area experiencing a minor increase. The significant loss of tree canopy cover on private land highlights the need to educate private landowners on the importance of trees, and to offer them incentives to protect, maintain and plant trees.

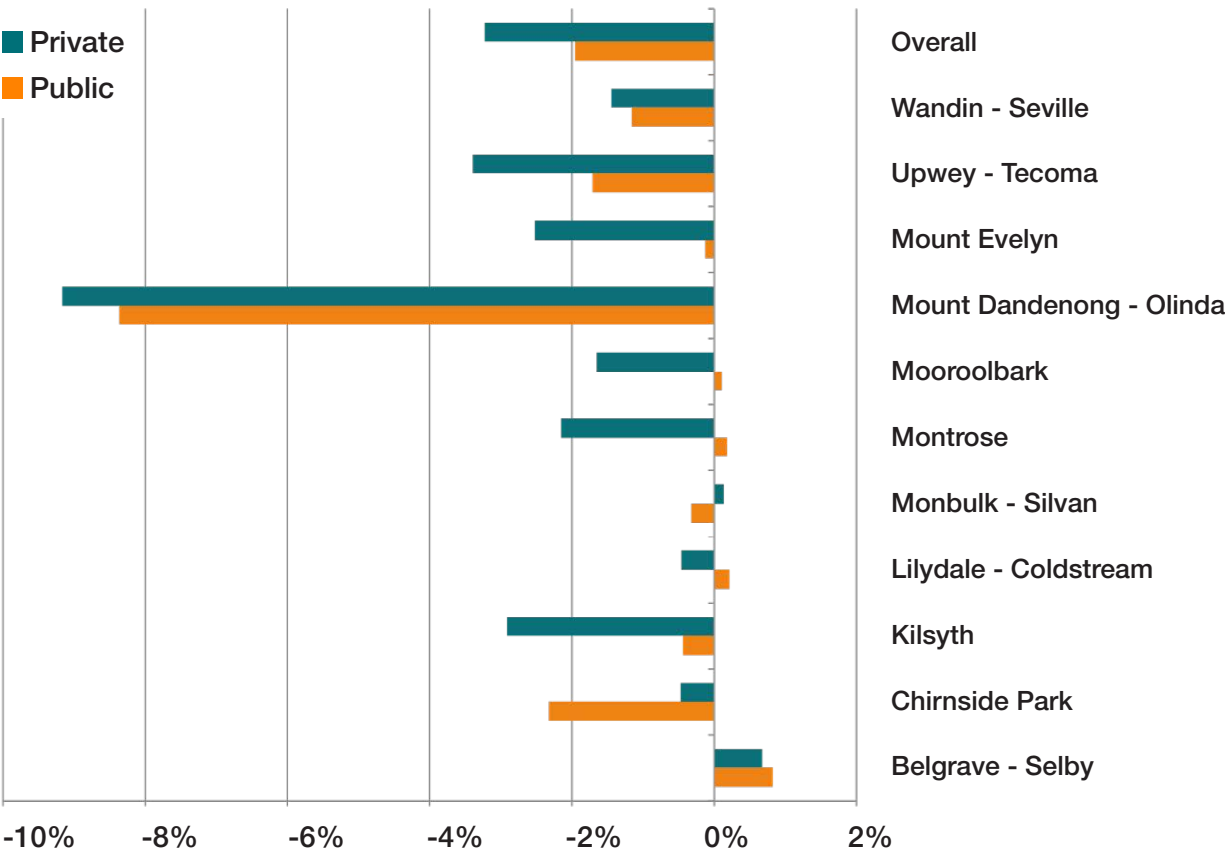


Figure 3. Tree canopy cover change (percentage points) by locality for public and private land between 2014 and 2018.

COUNCIL'S TREE MANAGEMENT

Council currently has robust tree management programs that respond to a range of guiding documents (see page 40), used to inform work practices and meet community expectations.

Current tree management programs include:

Trees on public land

Risk management

- Tree inspections and works in response to requests from customers, staff and public authorities
- Tree inspections and works to provide adequate clearance for road users
- *Proactive* tree inspections and works in parks, and around buildings, managed by Council
- Auditing trees and undertaking works to maintain clearance space around electric lines in *declared areas*
- *Fuel management* of vegetation along roadside reserves with high bushfire risk
- Coordinating with public authorities and utility service providers regarding tree inspections and works.

Tree protection

- Providing advice relating to tree retention/removal for Council projects
- Providing advice for the protection of trees potentially impacted by Council projects, in accordance with the AS 4970-2009 *Protection of trees on development sites*
- Working with road authorities and utility service providers to minimise conflicts between trees and infrastructure
- Biosecurity programs to reduce the threat of pests and diseases on the region's agricultural and horticultural industries.

Street tree planting

- Tree planting in response to customer requests
- Reviewing landscape plans and certifying tree installation and maintenance for new *greenfield subdivisions*.

Trees on private land

Planning applications

- Assessing trees on land subject to a planning application and providing advice relating to:
 - Tree removal/retention
 - Tree protection and management during development
- Fee-for-service tree inspections to establish permit exemption status.



BENEFITS OF TREES



Environmental

- Clean air
- Captures air pollution
- Carbon storage
- Cooling and shading
- Wind abatement
- Reduced stormwater flows
- Improved stormwater quality



Community & Culture

- Cultural heritage
- Connection to country
- Social connection and cohesion
- Sense of place
- Traffic calming

Ecological



- Biodiversity
- Habitat and food for fauna
- Water cycling
- Soil nutrient cycling
- Other ecosystem services

Economic



- Increased property prices
- Eco-tourism
- Energy savings
- Job creation

Health & Wellbeing



- Improved mental health
- Increased physical activity
- Shade and comfort

Trees are fundamental to the story of Yarra Ranges, shaping our cultures, values and communities. They are a prominent feature in our landscape, providing benefits to our health and wellbeing, community and culture, the environment, ecology and economy.^{9,10,11}

ISSUES AND OPPORTUNITIES

In setting a future direction for our tree canopy, we first need to understand the key issues and recognise the opportunities within Yarra Ranges.

1. COMMUNITY PERCEPTIONS

Our community lives, works and plays amongst trees in our streets, parks and reserves, and are often the first to notice when a tree needs attention. However, public perceptions of trees are complex, varied and not always positive.^{12,13} Building capacity and understanding of the role, function and importance of trees, is crucial for trees to become an accepted and valued part of our urban environments.

Community engagement programs involve, collaborate with, and empower the community and stakeholders in decision making. Councils throughout Australia have successfully adopted this approach for tree planting projects, partnering with the local communities to develop a shared vision for trees on public land.

Council has the opportunity to address the community's perceptions of trees through:

- Informing the community on the role, function and importance of trees
- Engaging with the local community on tree planting projects
- Involving the community in tree planting days.

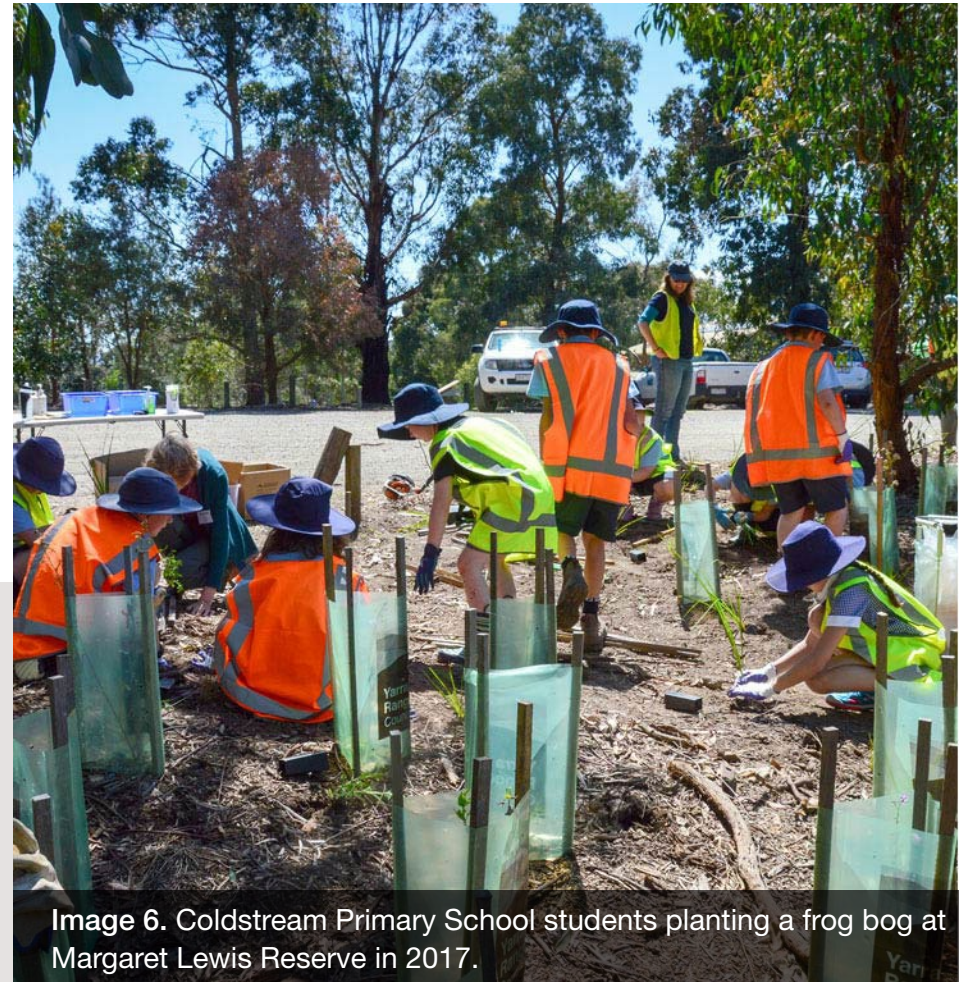


Image 6. Coldstream Primary School students planting a frog bog at Margaret Lewis Reserve in 2017.

2. URBAN HEAT

The urban heat island (UHI) effect refers to warmer temperatures experienced in urbanised areas as compared to surrounding rural areas. UHI is primarily driven by the type of materials covering land surfaces, particularly hard surfaces such as asphalt, concrete and brick. Human activities such as traffic, industry, and electricity usage also generate heat that contributes to the UHI effect.¹⁴

Urban heat can increase the duration and intensity of heat waves, as hard surfaces absorb heat during the day and release it during the night. Higher night time temperatures provide less respite and limit the recovery of those suffering from *heat stress*. This can have a significant effect on vulnerable members of our community, such as young children, the elderly, or those with medical conditions.¹⁵

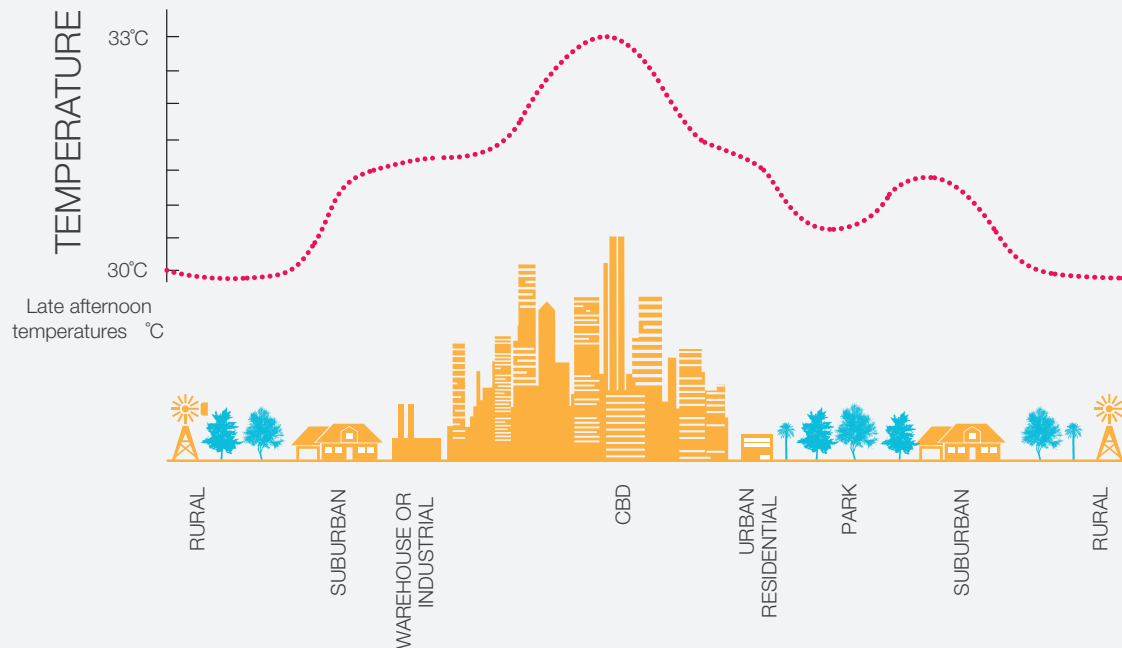


Figure 4. The urban heat island effect across different land use types.

CORE BODY TEMPERATURE

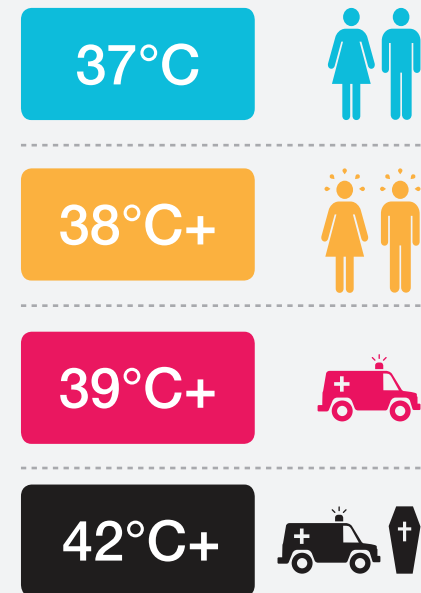


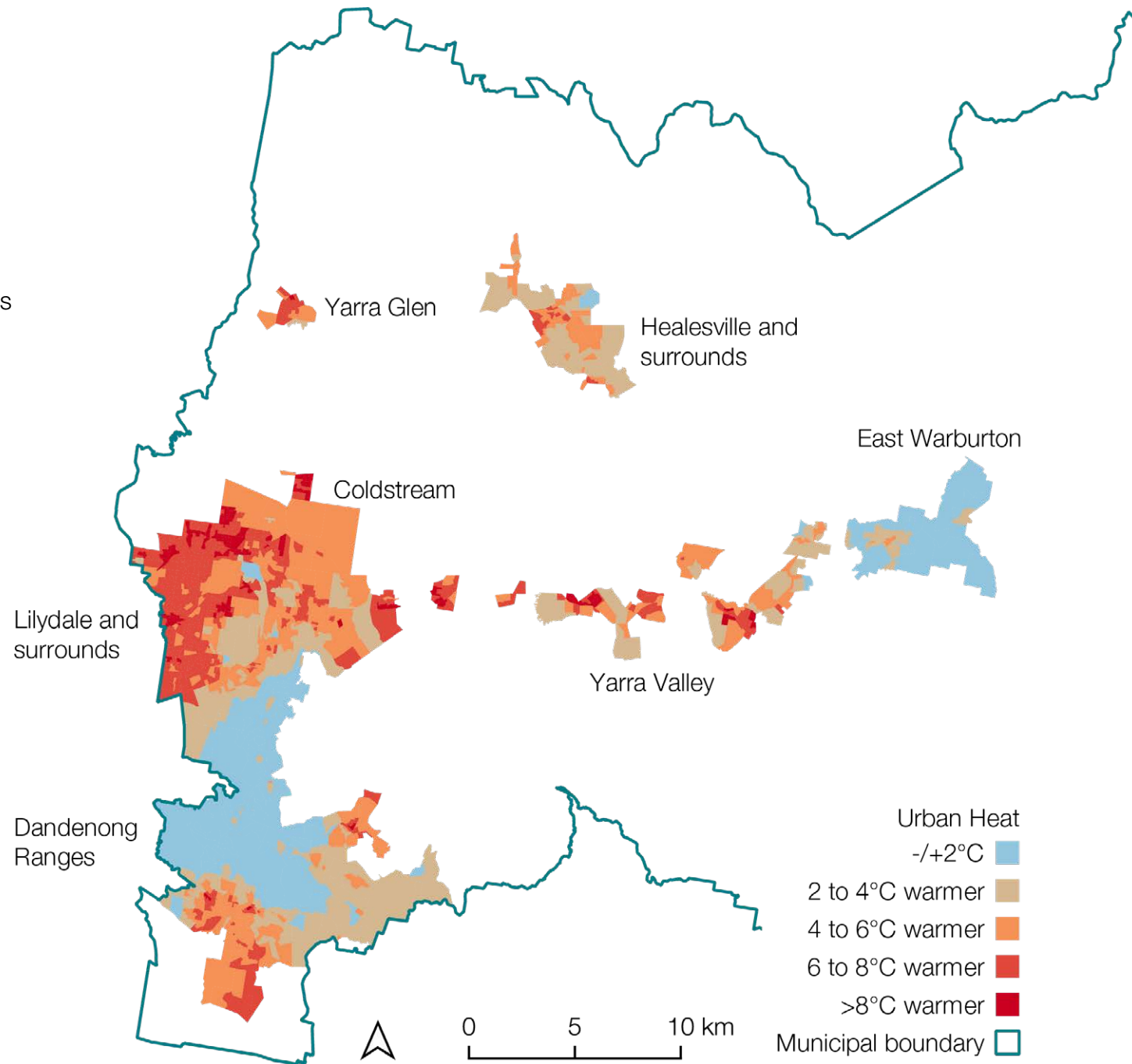
Figure 5. The impacts of heat stress on core body temperature (Hughes and McMichael 2011).

Credit: © Commonwealth of Australia (Department of Climate Change and Energy Efficiency)

Urban heat data

Thermal satellite data captured by the State Government during summer 2018 shows urbanised areas of Yarra Ranges experiencing the UHI effect. Lilydale, for example, had daytime *land surface temperatures* 6.9°C above the non-urban baseline, with some areas experiencing up to 10.6°C of urban heat.

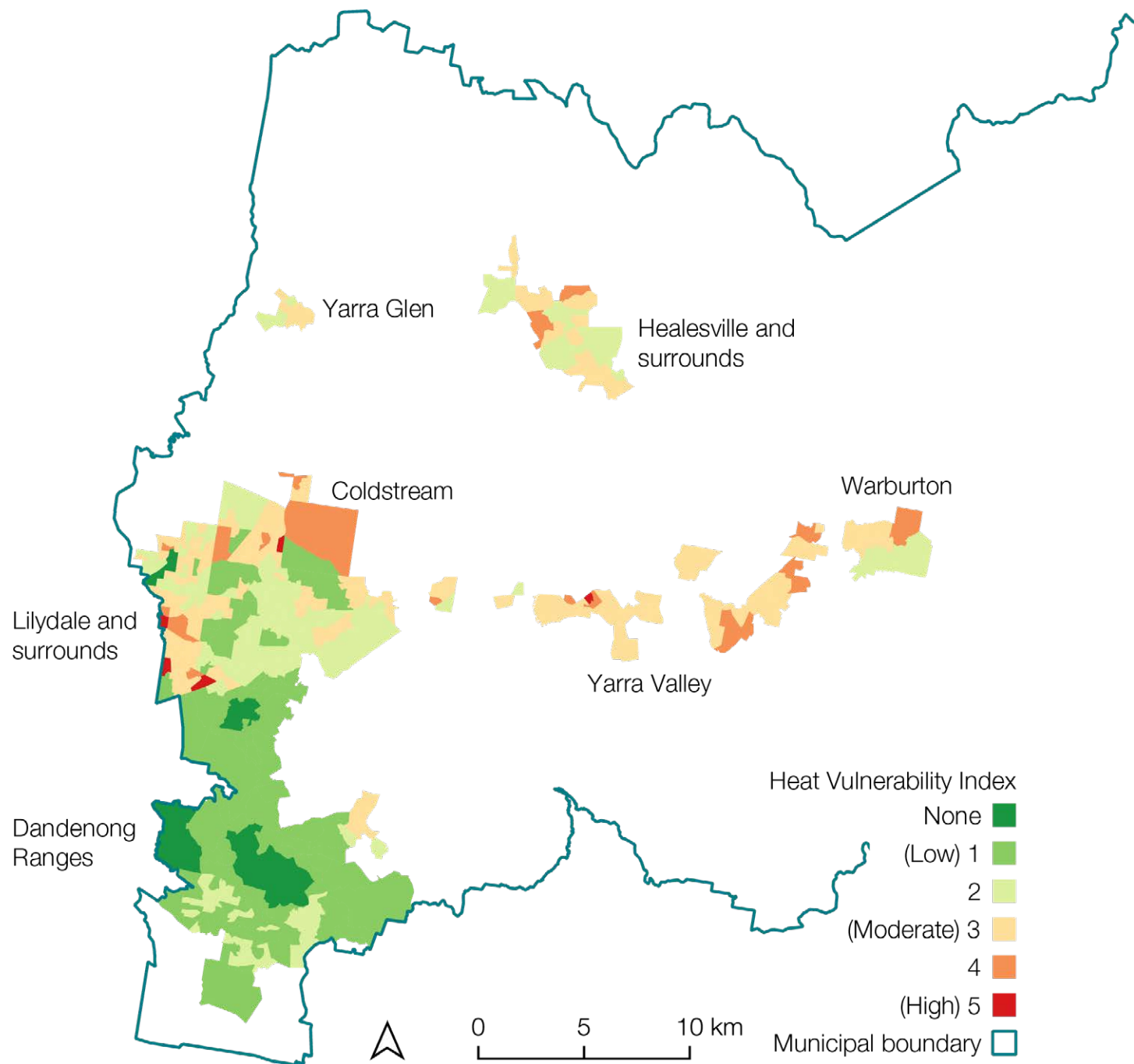
Map 5. Urban heat data (°C above the non-urban baseline) for all urban centres and localities in Yarra Ranges in 2018.



Heat vulnerability data

A heat vulnerability index (HVI) is a rating that indicates how vulnerable different parts of the community are to the effects of urban heat. HVI typically consists of three indicators: heat exposure, sensitivity to heat, and adaptive capability. A HVI developed by DELWP rated heat vulnerability on scale from 1 (low vulnerability) to 5 (high vulnerability).¹⁶ The data shows some areas of Lilydale, Mooroolbark and Kilsyth as having moderately high (4) to high (5) heat vulnerability.

Map 6. Heat vulnerability indices for all urban centres and localities in Yarra Ranges in 2018.



Trees are cool

Vegetation can play an important role in reducing the urban heat island effect. Leafy tree canopies cool their surroundings by shading hard surfaces and *transpiring*.¹⁷ Scientific studies conducted in inner Melbourne have demonstrated that street trees can reduce daytime summer air temperatures by between 1.5°C and 4°C.^{18,19}

Council can take action to reduce urban heat and improve liveability by:

- Valuing, protecting and managing existing trees to maintain healthy canopy cover
- Developing criteria to identify priority areas for *tree renewal* and planting
- Selecting the right tree for the right place to maximise the cooling benefit
- Planting trees in priority areas to increase canopy cover.



3. EXTREME WEATHER & CLIMATE CHANGE

Extreme weather events include heat waves, bushfires, storms, flooding and drought. In Australia, heatwaves and hot weather are responsible for the greatest number of deaths from any type of *natural disaster*, and contribute significantly to morbidity, particularly among the elderly.²⁰

Trees are inextricably linked to the impacts of extreme weather, in particular in Yarra Ranges bushfires and storms are a significant risk. These events often result in *tree failures*, hazardous trees, property damage and sometimes the loss of life. Extreme weather cannot be controlled, but the risks posed to our communities can be managed to lessen the impact of these events.

Climate modelling suggests extreme weather events are likely to become more frequent and more severe, along with higher average annual temperatures and less rainfall during winter and spring.²¹ These changes in climate will place persistent and widespread strain on our communities and landscapes.

Research suggests that many native and indigenous tree species are unlikely to cope with the increase in average temperatures.^{22,23,24} With these changing conditions, there is also an increased risk of pest and pathogen incursions that will affect the health of trees in our landscapes.



Increasing maximum and minimum daily temperatures.



Increases in daily maximum temperature of 0.8 to 1.6°C by the 2030s.



Rainfall is likely to decline, but this effect may vary across the seasons.



Extreme rainfall events will become more intense on average.



Melbourne's climate may be more like Wangaratta by the 2050s.

Figure 6: Climate regional projections (Clarke et al. 2019)

Credit: © State of Victoria (Department of Environment, Land, Water and Planning)

Council can assist the community to adapt to the impacts of extreme weather and climate change by:

- Managing hazardous trees along roadsides for bushfire preparedness
- Renewing poorly performing trees
- Actively monitoring for outbreaks of pests and pathogens
- Increasing tree diversity and planting trees better suited to a future climate
- Taking extreme weather into account when selecting and planting trees
- Incorporating *water sensitive urban design (WSUD)* principles into tree planting projects.

4. TREE DIVERSITY & PERFORMANCE

Council collected a street tree inventory in 2002, which contains the details of 29,500 trees within the suburbs of Chirnside Park, Kilsyth, Lilydale and Mooroolbark. Analysis of this dataset indicates a tree canopy with low resilience, that lacks diversity in species and age, with a high proportion of poorly performing trees. These trends will present a significant challenge in the future, leading to increasing maintenance costs and diminishing *landscape character* and *amenity*.

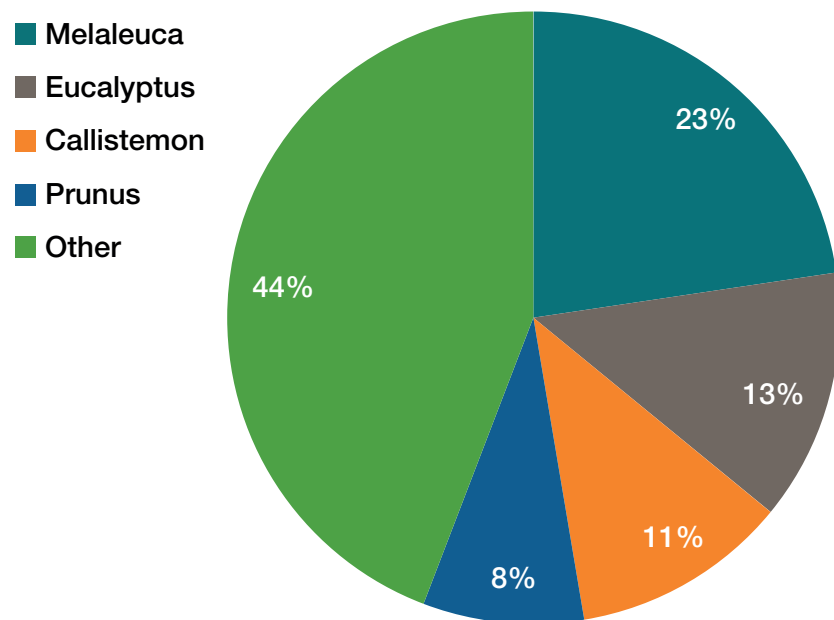


Figure 6: Tree genus diversity.

Council can reverse these trends and address tree canopy resilience issues by:

- **Renewing poorly performing trees**
- ***Formatively pruning* trees during *establishment* and semi-maturity**
- **Increasing tree diversity and planting trees better suited to a future climate**
- **Incorporating water sensitive urban design (WSUD) principles into tree planting projects.**

Table 1: Top ten tree species in the Yarra Ranges Council street tree inventory (2002).

| Botanic Name (Common Name) | Percentage of population |
|---|--------------------------|
| <i>Melaleuca linariifolia</i> (Snow-in-Summer) | 11.7% |
| <i>Melaleuca styphelioides</i> (Prickly-leaved Paperbark) | 8.7% |
| <i>Prunus cerasifera</i> cvs. (Cherry-plum) | 5.2% |
| <i>Callistemon salignus</i> (Willow Bottlebrush) | 4.4% |
| <i>Callistemon viminalis</i> (Weeping Bottlebrush) | 3.0% |
| <i>Callistemon</i> spp. (Bottlebrush) | 2.3% |
| <i>Corymbia ficifolia</i> (Red-flowering Gum) | 2.0% |
| <i>Eucalyptus leucoxyton</i> (Yellow Gum) | 1.9% |
| <i>Eucalyptus nicholii</i> (Willow-leaved Peppermint) | 1.8% |
| <i>Hakea salicifolia</i> (Willow-leaved Hakea) | 1.7% |
| Total | 42.6% |

5. VACANT STREET TREE SITES

Vacant sites are places on Council land, such as nature strips and roadsides that are suitable for a mature tree. Council's mapping of vacant sites for Lilydale and surrounds show there are over 16,000 vacant sites. Planting these vacant sites with medium sized trees would equate to over 50 hectares of additional canopy cover at maturity.

Table 2: Vacant street tree sites by suburb.

| Suburb | Vacant sites |
|--------------------|--------------|
| Chirnside Park | 2872 |
| Kilsyth | 3143 |
| Lilydale | 3344 |
| Mooroolbark | 7040 |
| Grand Total | 16399 |

Council can increase tree canopy cover by:

- Planting trees in vacant sites.



6. URBAN DEVELOPMENT

The Yarra Ranges population is expected to grow by 15.23% to 185,902 by 2041.²⁵ Residential development associated with this change will put pressure on public and private trees. For example, street trees may be damaged during construction, or require removal to allow for new crossovers or car parking. In other cases, private trees may be removed and replaced with denser housing, leaving limited space for new trees. Over-time the cumulative impact of tree loss associated with development may be significant.

The Yarra Ranges Planning Scheme sets out objectives, policies and provisions that regulate the use and development of all land in the municipality. Planning zones, overlays and provisions within the Planning Scheme specify when a planning permit is required, and criteria for Council to consider before a permit is granted.

Through the Planning Scheme, Council plays a key role in protecting, managing and increasing tree canopy across public and private land. Two examples of provisions that impact our tree canopy include:

- Significant landscape overlays (SLO) that aim to conserve and enhance the character of significant landscapes
- Particular provisions, such as Clause 55, that includes landscaping standards for developments to provide for the retention or planting of trees, where these are part of the character of the neighbourhood.



Image 7. Before (2014) and after (2020) aerial photographs of residential land in Mooroolbark that has been developed for medium-density townhouses.

Council can improve the ways trees are incorporated and protected within new developments by:

- Educating the community on the role, function and importance of trees
- Providing guidance on designing developments to support trees
- Enforcing tree protection and landscaping requirements.

7. COMPETING INFRASTRUCTURE

Urban *streetscapes* can be crowded places. That's true both above-ground with roads, parking, footpaths, street furniture power lines and trees, and below-ground with stormwater drains, power, water, sewerage, gas and telecommunication services. Planting and managing street trees amongst this competing infrastructure is challenging.²⁶

Urban environments that are paved with hard surfaces, such as concrete and asphalt, hinder the establishment and growth of trees. Hard surfaces radiate heat, are impermeable to water, and limit *soil-atmosphere gas exchange*. The soil below is often compacted, nutrient-poor and lacks biological activity. These factors often lead to poor growth and the premature death of trees. Healthy trees with shady canopies require adequate healthy soil volume and soil moisture.

The Electricity Safety (Electric Line Clearance) Regulations 2020 require trees near power lines to be pruned to specific requirements for the safety and reliability of the electricity network. This pruning can render trees of poor structure and aesthetics, and is often at odds with community expectations.

Council can grow healthy trees in our urban environments through:

- Providing adequate healthy soil volume
- Incorporating water sensitive urban design (WSUD) principles
- Selecting the right tree for the right place, considering the protection of infrastructure and buildings.
- Advocating infrastructure solutions for the coexistence of healthy trees near utility services.



Image 8. An example of poor practice tree pruning for power line clearance.

Credit: Judy Murphy

8. INFRASTRUCTURE PROJECTS

As Melbourne continues to grow, new infrastructure, upgrades and maintenance projects delivered by Council and State Government authorities (such as the Department of Transport, Major Road Projects Victoria, the Level Crossing Removal Project and Melbourne Water) will be required to accommodate the movement, work requirements and social services of the population. These projects often require tree removal and result in tree canopy cover loss. However, these projects may also provide opportunities for new landscaping and tree planting.

Council can influence tree canopy outcomes for infrastructure projects through:

- Best practice tree management and protection for Council projects
- Advocating for state-based projects to avoid tree removal and minimise tree impacts
- Collaborating with authorities to deliver new landscaping and tree planting.



Image 9. Level crossing removal works in Lilydale.
Credit: © State of Victoria (Level Crossing Removal Project)

9. MANAGING CULTURALLY SIGNIFICANT TREES

Trees have a profound and powerful connection to culture. For the Wurundjeri people, trees help to understand and read Country. They indicate what land management practices to undertake, are a source of food, fibre and medicine, and are important for making tools such as spears, canoes, and shields. The scarred trees along local waterways, left by Wurundjeri craftspeople, stand testament to this cultural connection.²⁷

Since European settlement, trees have been planted to commemorate significant or historical events. For example, from 1892-1920 the Lilydale Arbor Day committee planted trees to beautify the town and commemorate significant events.²⁸ Today, many of these trees are heritage listed and remain a defining feature of Lilydale's streets and parks.

As our cities and communities evolve, our most culturally significant trees and landscapes are too often forgotten or undervalued when confronted with the pressures of urbanisation. In Yarra Ranges, the loss of these trees will have long-term adverse impacts on our community and local tourism.

Council can conserve and enhance the value and benefits of culturally significant trees by:

- Defining and identifying culturally significant trees
- Capturing and maintaining an inventory of culturally significant trees
- Valuing, protecting and managing culturally significant trees, including renewing poorly performing trees
- Educating the community about the value of culturally significant trees.



Image 10. The Cork Oak (*Quercus suber*) at Lilydale Station was the only surviving plant from the original garden, established circa 1882. It was classified as a 'significant tree' by the National Trust in 2017. However, the impacts of encroaching transport infrastructure contributed to its decline, and it was removed in 2018.

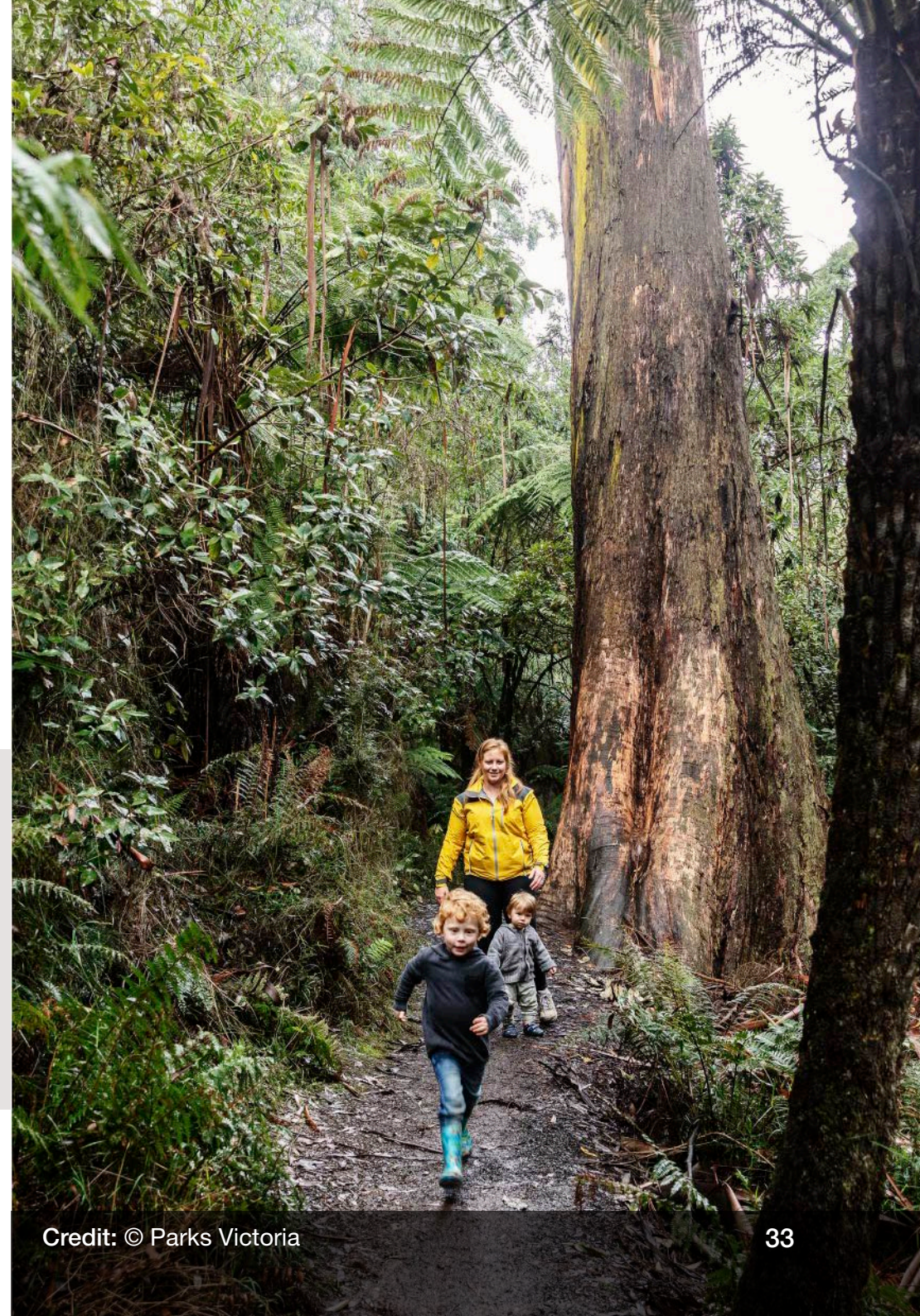
10. MANAGING LARGE HABITAT TREES

Large habitat trees occur throughout Yarra Ranges and are *keystone organisms* that support the natural systems so valued by our community and tourists. They are especially valuable because they develop hollows through a process of decay that animals can live in. Mountain Ash, such as those in the Dandenong Ranges, can take between 170-190 years to develop hollows large enough to provide habitat for animals such as possums, gliders and birds.²⁹ As large trees *senesce* and ultimately die, they continue to provide critical habitat for animals, insects and fungi. If properly managed, dead habitat trees can be retained in the landscape to provide ecosystem services for decades, or even centuries.

Due to their size, large trees have the potential to cause severe impacts to property or life when they fail or drop branches. When large trees are removed after failure, or because they pose an unacceptable risk, they are seldom replaced like for like.

Council can address the issues facing large habitat trees by:

- Informing the community on the role, function and importance of trees
- Actively managing large habitat trees to prolong their longevity
- Managing senescing or dead habitat trees to minimise risk
- Planting large tree species for future generations.



11. BEST PRACTICE TREE MANAGEMENT

Public trees are important assets managed by Council on behalf of the community. Best practice tree management involves managing trees in a structured and coordinated way.^{30,31} Like other Council assets, such as roads and footpaths, trees can be managed to optimise their performance (benefits), risks and expenditure (costs) over their lifecycle. Tree management, such as formative pruning, can increase the life of a tree in the landscape and reduce future maintenance costs.³²

A *strategic asset management* approach to trees is necessary to ensure Council meets legislative and regulatory requirements such as the Electricity Safety Act 1998, Road Management Act 2004, Planning and Environment Act 1987, and the Local Government Act 2020.

Tree inventories are a key component of best practice tree management.³³ A tree inventory is a database that holds information on the location, species, size, age and other attributes of each tree. This data is then maintained with up-to-date information such as inspections, watering, pruning and removal.

The extensive tree population within Yarra Ranges means that collecting and maintaining a complete tree inventory would be costly and time consuming. Tree inventories can take many forms, from a complete inventory of every tree, to a partial inventory based on management criteria such as risk or significance. Tree inventory data and spatial data can also be used with tools such as iTree—a tool for quantifying the benefits and values of trees.

Council can demonstrate best practice tree management by applying strategic asset management principles through:

- **Capturing and maintaining a partial tree inventory for our built up areas**
- **Developing a tree planting and renewal program**
- **Developing a formative pruning program.**



Figure 7: Street tree mapping for Council's tree planting and renewal program.

THE FUTURE

As the Traditional Custodians of these lands, the Wurundjeri people understand that we are the trees and nature and the trees and nature are us. We are altogether part of one system that creates our place. This message moves across time and illuminates the way for the future—if we care for Country, Country will care for us.

The Tree Canopy Strategy aims to set the long-term direction for the protection, management and planting of trees in Yarra Ranges. The Strategy is structured around six objectives and a range of actions in pursuit of the vision.

VISION

Yarra Ranges Council will conserve and enhance our leafy character, culturally significant landscapes and unique biodiversity through the protection, management and planting of trees. Our tree canopy will improve liveability, support community health and wellbeing, maintain ecosystems and enhance local tourism.



OBJECTIVES



1. Value, protect and manage trees

Healthy mature trees take decades to grow and provide great benefit to the community and the environment. We will value and protect trees to minimise canopy cover loss, and manage our trees to maximise their benefits and minimise risk. Our community will be well informed and understand the role, function and importance of trees.



2. Grow a healthy tree canopy

We will strive to grow healthy and resilient trees on public land. Our tree planting will be fairly distributed, increase canopy cover and integrate with urban design and engineering.



3. Conserve culturally significant trees and enhance local tourism

Culturally significant trees are an important part of the landscape that shapes the identity of Yarra Ranges and makes it a tourism destination. We will aim to conserve and enhance culturally significant trees through best practice tree management, and enhance culture and tourism with new tree plantings.



4. Improve tree canopy resilience to climate change

Trees will play an increasingly important role as our community seeks to adapt to the effects of climate change. We will grow a more diverse and resilient tree canopy, better suited to a future climate, and investigate ways to improve landscape resilience.



5. Support and enhance community health and wellbeing

We will manage our trees to maximise their cooling benefit and enhance the liveability of our urban areas. Our tree planting will prioritise locations with low or declining canopy cover, particularly those vulnerable to heat. We will continue to implement and adapt our management practices to minimise the risks associated with extreme weather and bushfire.



6. Apply best practice tree management

We will strategically manage public trees as important community assets. We will be accountable and transparent in meeting our targets, and demonstrate best practice in delivering tree programs and projects that benefit our community.

TARGETS

Yarra Ranges Council will aim to achieve the following by 2042:



Our community will...

- ✓ Have a greater understanding of the role, function and importance of trees
- ✓ Have greater knowledge and appreciation of our culturally significant trees.



Our tree planting will...

- ✓ Increase tree canopy cover from 31.68% to 35% at maturity on public land in built up areas
- ✓ Be more fairly distributed across public land, providing a minimum of 25% canopy cover for all suburbs and towns in built up areas
- ✓ Increase tree canopy cover across all activity centres
- ✓ Increase tree canopy cover along key pedestrian routes such as paths and trails
- ✓ Increase tree species diversity.

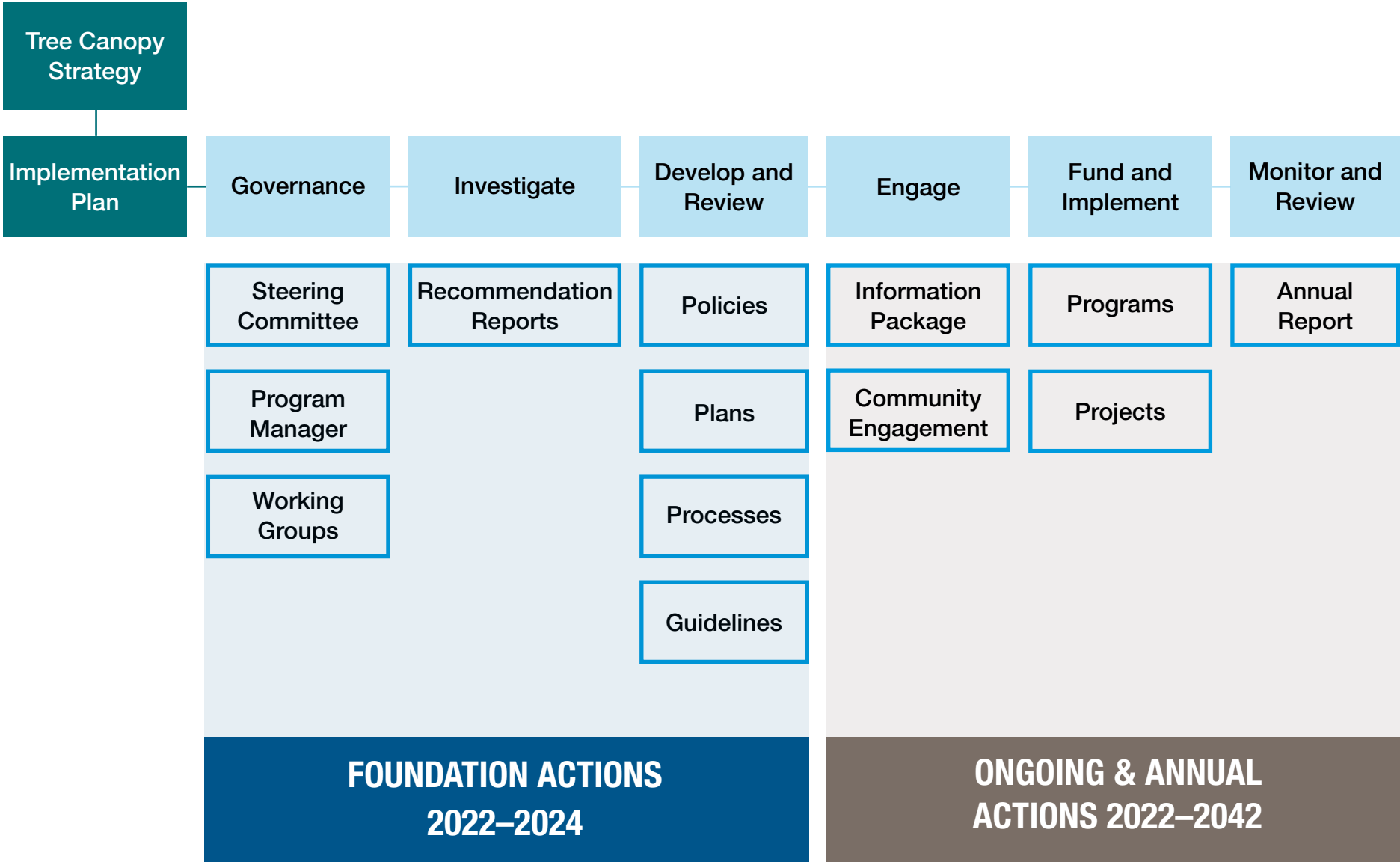


Our tree management will...

- ✓ Reduce hazardous trees along roadsides for bushfire preparedness
- ✓ Achieve a minimum 95% establishment rate for new street tree plantings
- ✓ Establish all new street tree plantings with formative pruning
- ✓ Incorporate a monetary valuation method and policy for trees on public land.



THE NEXT STEPS





GUIDING DOCUMENTS

Council currently has robust tree management programs that respond to a range of guiding documents, used to inform work practices and meet community expectations. These guiding documents include:

Legislation

- Environment Protection and Biodiversity Conservation Act 1999
- Flora and Fauna Guarantee Act 1988
- Catchment and Land Protection Act 1994
- Electrical Safety Act 1998
- Electricity Safety (Electric Line Clearance) Regulations 2020
- Planning and Environment Act 1987
- Yarra Ranges Planning Scheme
- Local Government Act 2020
- Neighbourhood Amenity Local Law 2020
- Road Management Act 2004
- Water Act 1989
- Wildlife Act 1975
- Aboriginal Heritage Act 2006
- Heritage Act 1995.

Australian standards

- AS 4970-2009 *Protection of trees on development sites*
- AS 4373-2007 *Pruning of amenity trees*
- AS ISO 31000:2018 *Risk management - Guidelines.*

Council policies and plans

- Tree Policy 2016
- Tree Management Plan 2009
- Code of Environmental Practice 2016
- Community Engagement Policy 2021
- Managing fruit fly in Victoria Action Plan 2015-2020.

GLOSSARY

Amenity: The pleasantness or attractiveness of a place.

Best practice tree management: Structured and coordinated tree management using up-to-date industry accepted methods, tools and resources.

Built up areas: An area of dense/moderately dense housing and buildings with definite boundaries. Built up areas referred to in this Strategy were derived from spatial data maintained by the Department of Environment, Land, Water and Planning.

Canopy cover: The proportion of an area covered by the vertical projection of tree crowns, typically expressed as percentage.

Climate change: A long-term change in the average weather patterns that have come to define Earth's local, regional and global climates.

Community engagement: A purposeful, planned process of working with identified groups of people, whether connected by geography, demography or interests, to inform decision making, build relationships and strengthen community.

Declared area: Urban areas declared under the Electricity Safety Act 1998, typically having a 'low' fire hazard rating as determined by the Country Fire Authority.

Extreme weather: Unexpected, unusual, severe, or unseasonal weather at the extremes of the historical distribution.

Formative pruning: The process of pruning a young tree to achieve a desired shape as it grows and matures.

Fuel management: Activities undertaken to reduce bushfire risk, such as planned burning (lighting and managing fires) and mechanical treatment (mowing, slashing, mulching and using herbicides).

Greenfield subdivisions: Real estate projects on previously undeveloped land, such as unused or agricultural land.

Hazardous tree: A tree identified as a likely source of harm.

Heat stress: When the body is unable to cool itself enough to maintain a healthy temperature.

Heatwave: When the maximum and the minimum temperatures are unusually hot over a three-day period at a location.

Keystone organisms: Organisms that help define an entire ecosystem. Without its keystone organisms, the ecosystem would be dramatically different or cease to exist.

Land surface temperature: The radiative temperature of land, typically measured by a satellite.

Landscape character: The distinct, recognisable and consistent pattern of elements in the landscape. It is these patterns that give each locality its 'sense of place', making one landscape different from another, rather than better or worse.

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 recreation possibilities.

Metropolitan Melbourne: The geographical area that defines Melbourne as a city, that includes 31 local government areas.

Natural disaster: A major adverse event resulting from natural processes of the Earth; examples include floods, hurricanes, tornadoes, volcanic eruptions, earthquakes, tsunamis, storms, and other geologic processes.

Percentage point: The simple numerical difference between two percentages. For example, moving up from 40% to 44% is a 4 percentage point increase.

Proactive: Taking action in advance of a future situation, as opposed to acting reactively.

Resilient trees: Trees that are able to tolerate or quickly recover from unfavourable environmental conditions.

Senescence: The condition or process of deterioration with age.

Soil-atmosphere gas exchange: The processes of gas exchange between soil and atmosphere. Important for tree root growth and soil microbial activity.

Strategic asset management: Approach to asset management for long-term planning of maintenance and operations.

Streetscape: The visual elements of a street, including the road, adjoining buildings, street furniture, trees and open spaces, etc, that combine to form the street's character.

Transpiration: The process of water movement through a plant and its evaporation from aerial parts, such as leaves, stems and flowers.

Tree canopy: Our term for referring to Yarra Ranges' diverse tree population, and includes trees of all types and sizes across public and private land. It is a way to consider the collective benefits of our trees

Tree establishment: The period following the transplanting of nursery stock into the landscape. A tree is considered established when its growth rates become more or less consistent from one year to the next.

Tree failure: The structural deterioration or breakage of any part of a tree, including the roots, trunk, or branches.

Tree renewal: Removing and replanting trees.

Urban heat island effect: The phenomenon where urban areas are significantly warmer compared to surrounding rural areas due to human activities.

Urban trees: Trees in urban environments including remnant and planted specimens.

Water sensitive urban design (WSUD): An approach to planning and designing urban areas to make use of water as a valuable resource and reduce the harm it causes to rivers and creeks.

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