NATURE STRATEGY

PROTECTING YARRA'S UNIQUE BIODIVERSITY 2020–2024

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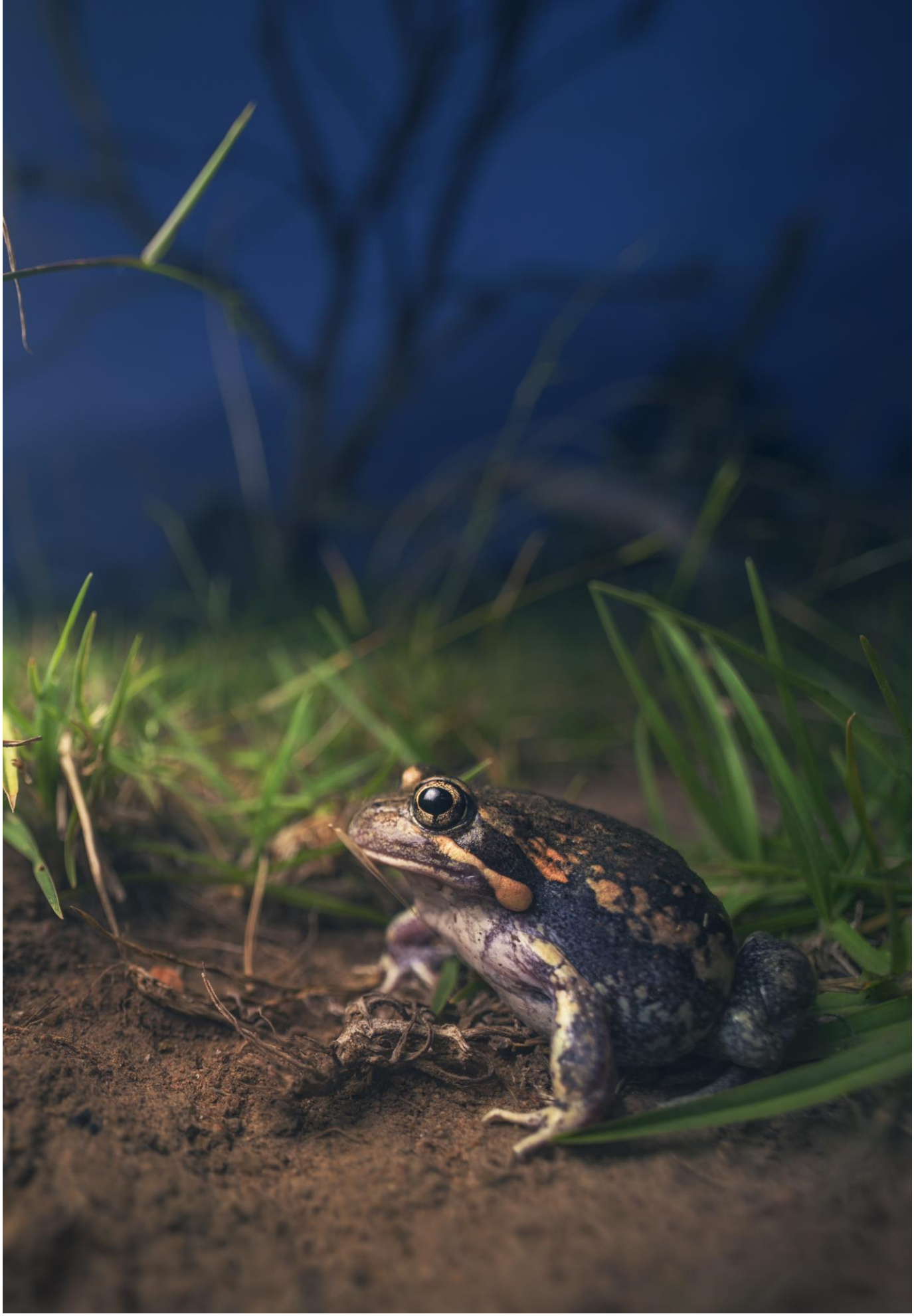
Acknowledgement of country

Yarra is deeply proud of its connection to the Aboriginal community and acknowledges the Wurundjeri Woi Wurrung people as the true sovereigns, caretakers and custodians of the land now known as Yarra. Prior to the colonisation of Melbourne, the area known as Yarra held significant and cultural importance to the Wurundjeri Woi Wurrung people, and this connection still exists today. The spiritual connection to places within Yarra's municipal boundaries, like the Yarra River, and the confluence of the Yarra River and Merri Creek, extends back thousands of years to the Dreamtime. Since the early 1900s, Victoria's Aboriginal community has flocked to Yarra, to find the sense of community that is the strength of Aboriginal people. The City of Yarra is committed to keeping this sense of connection alive, and over a number of years has forged an increasingly robust relationship with the local Aboriginal community.

Mural by Tom Civil and Wurundjeri Woi Wurrung Council artist, Dights Falls.



The Eastern Banjo Frog or Pobblebonk Frog can be easily identified by its 'bonk' call that sounds like a banjo string being plucked. Photograph from Getty Images.

Vision and goals

The land within the City of Yarra supports a natural environment that is diverse, connected and resilient. Its custodians, the Wurundjeri Woi Wurrung people, continue to care for Country as is their traditional lore. Yarra's residents and visitors appreciate and enhance the natural and cultural values of the land and water, contributing to benefits for all.

Goal 1

Increase the diversity, connectivity and resilience of Yarra's natural environment

Goal 2

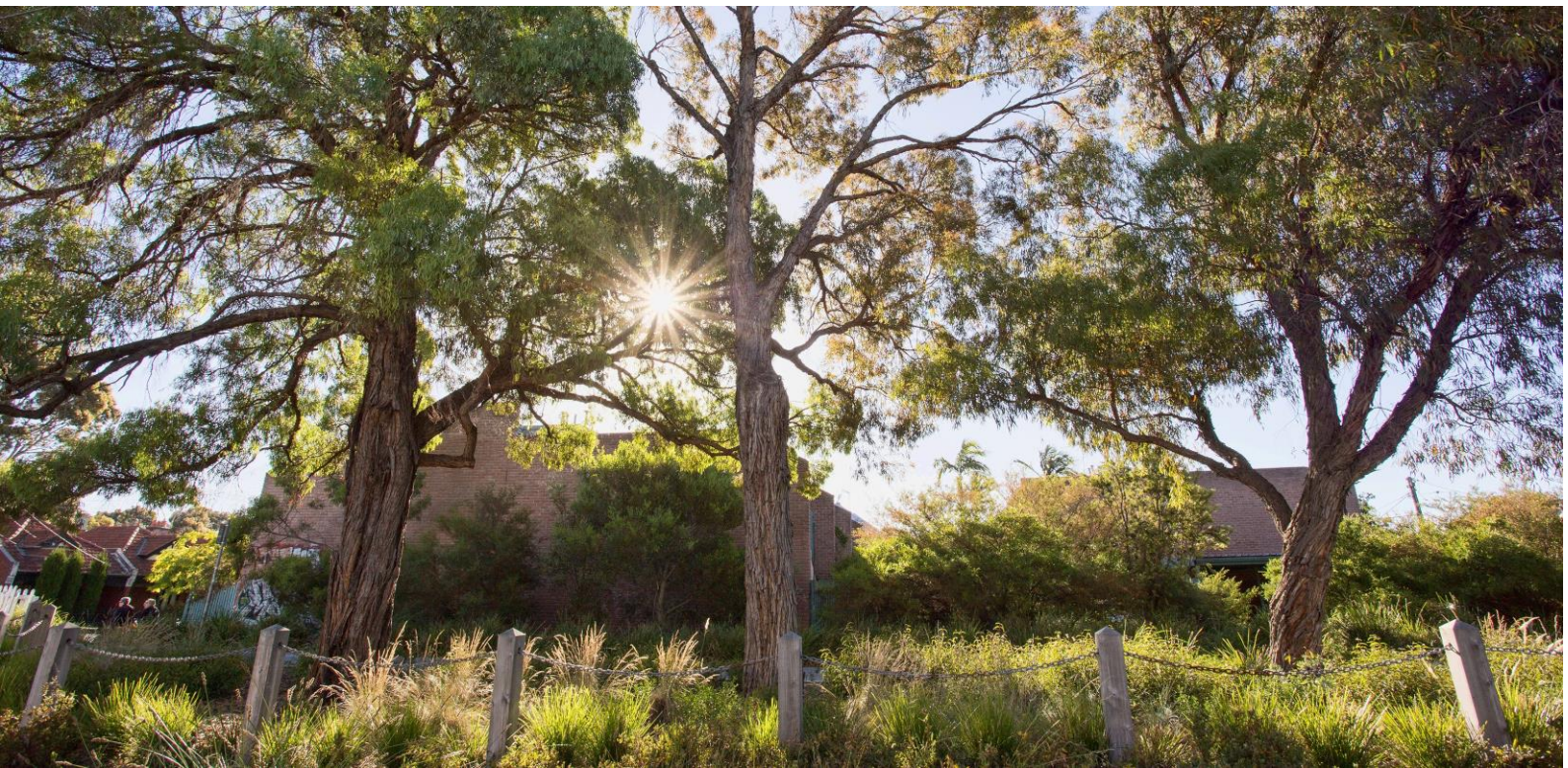
Encourage people to further appreciate and actively enhance Yarra's natural landscape

Goal 3

Embed nature at the core of Yarra's business practices

Goal 4

Make innovation, communication and collaboration the cornerstones of Yarra's nature-focussed programs



Why have a Nature Strategy?

"One touch of nature makes the whole world kin" - William Shakespeare

Nature is valuable

Nature is life and includes everything from the land, soil, rocks, groundwater, waterways and every living thing, to the atmosphere and beyond. It provides our landscape and sets the scene of every day, providing everything we need to live and to be comfortable. It underpins the economy, climate, and the health and wellbeing of all humans. Nature includes all the variety of life (biodiversity) that makes up the non-human, non-built world.

Nature is important to every Australian no matter where we live. It is everywhere throughout our rural, urban and even industrial landscapes, not just in national parks or the bush.

Our feelings about nature are often formed through childhood experiences of being outdoors and enjoying the simplicity and beauty of the open space surroundings. Connection to and caring for nature and country are fundamental to Aboriginal and Torres Strait Islander culture and existence. A lot of us identify with aspects of nature that are unique to Australia such as the Eucalypt trees dominating the Australian bush, the laugh of a kookaburra, picnics in parks, walks along babbling rivers, white sandy beaches, turquoise oceans and rugged outback landscapes.

There are many and diverse reasons why Australians care for nature, from the intrinsic belief that nature is beautiful and has a right to exist, through to recognition of the services nature provides. Known as 'natural capital' or 'eco-system services', these services include food, drinking water, fibre, building and manufacturing materials, and other, less direct services like carbon storage, filtering air and water, pollination, protection from storms and floods, and places for rest and recreation.

If we want to understand how nature benefits us, we can consider the ecosystem services that are provided by nature (**Figure 1**).

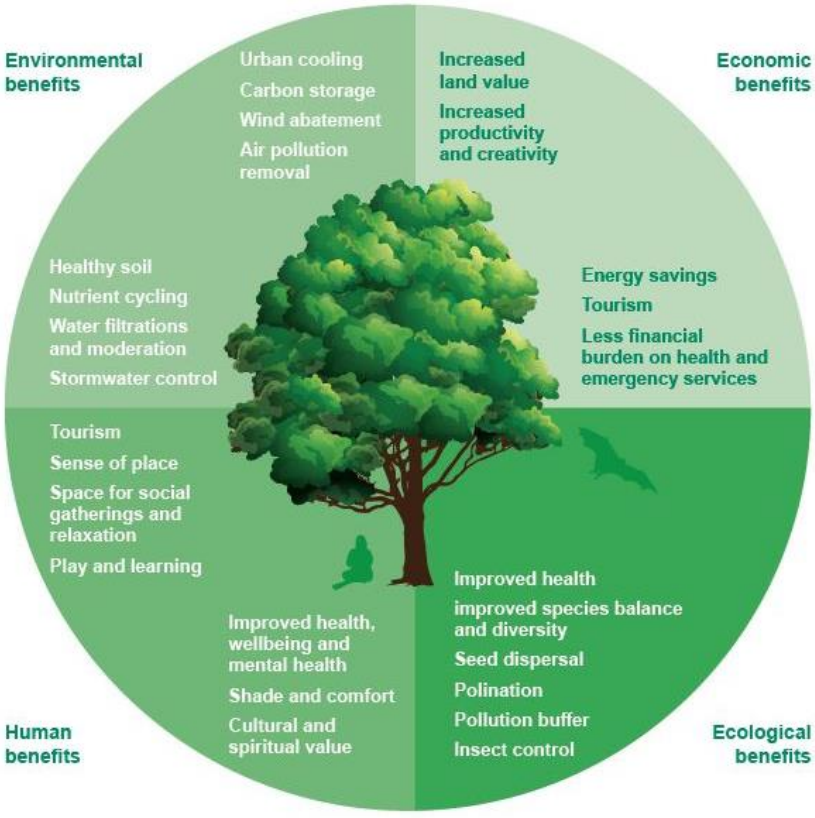


Figure 1 The ecosystem services that biodiversity can provide to the City of Yarra community.

Nature is our home

The landscape and waterways shape the municipality, providing the structure for the plants, animals and other elements of nature that form our home. Traditionally, this land is the home of the Wurundjeri Woi Wurrung people of the Woi-Wurrung language group, of the Kulin nation.

Nature is essential to our health, wellbeing and quality of life

Whether you live in the city or rural Australia, nature provides the building blocks for our very survival, such as clean air, water and shelter. Beyond providing for our fundamental needs, nature also provides more subtle benefits to people and communities. Both traditional knowledge accumulated over thousands of years and contemporary research show that spending time in nature is good for our mind and body. Contact with nature has positive effects on our ability to concentrate, learn, solve problems and be creative. It boosts immune systems and helps us relax. Our health is improved by traditional and modern medicines that originate from nature. Nature also provides opportunities for social interaction, important for connection with other people and healthy communities.

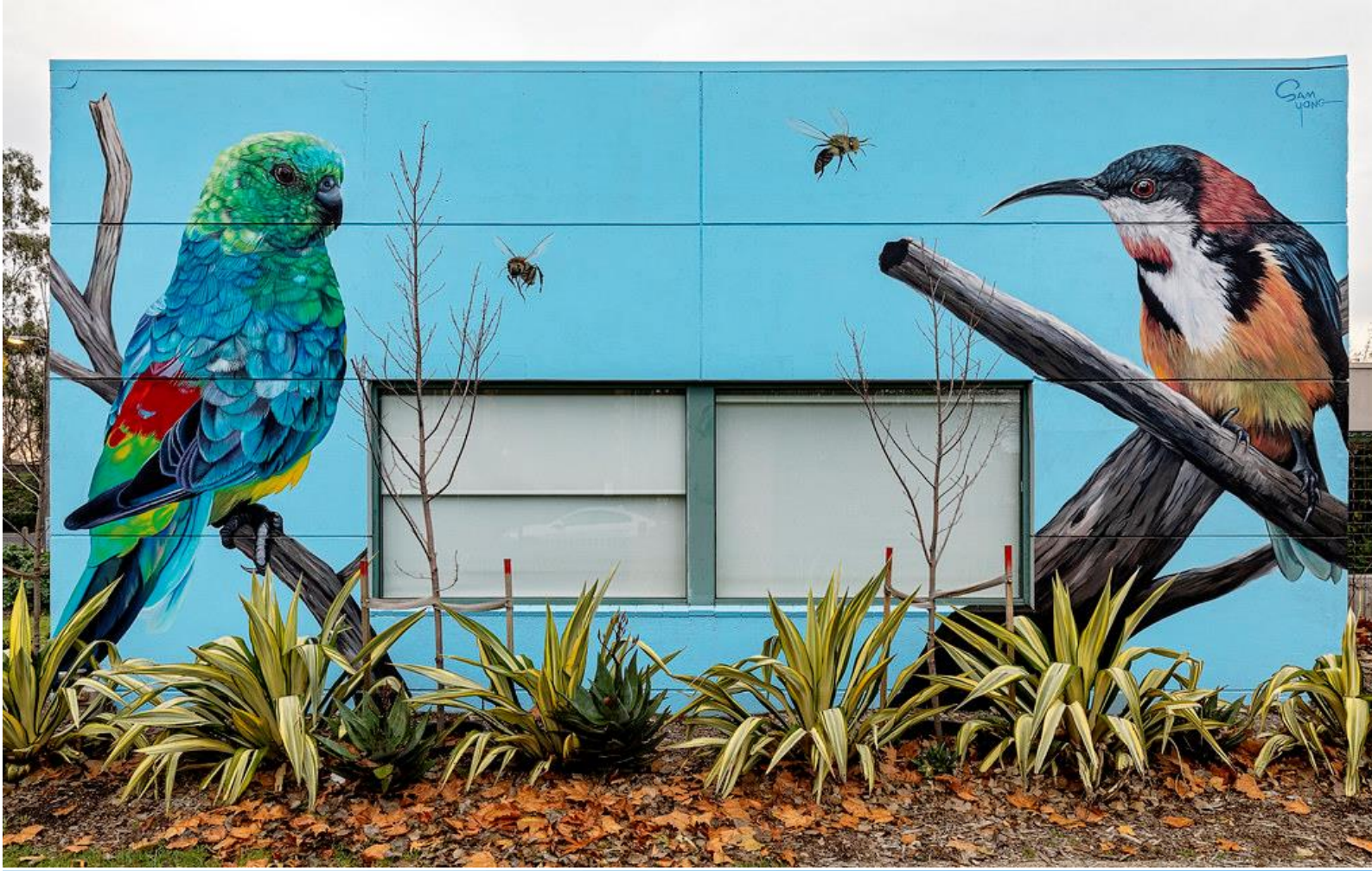
Nature has an iconic status in Australian life that is celebrated in many ways, in literature and paintings, popular music, films, foods and our favourite sports and pastimes. Our epic natural and cultural landscapes, unique wildlife and way of life feature strongly in our sense of identity and underpin our sense of place. Aboriginal and Torres Strait Islander people, in particular, have a special relationship with nature, based on a profound spiritual connection that guides cultural practices.

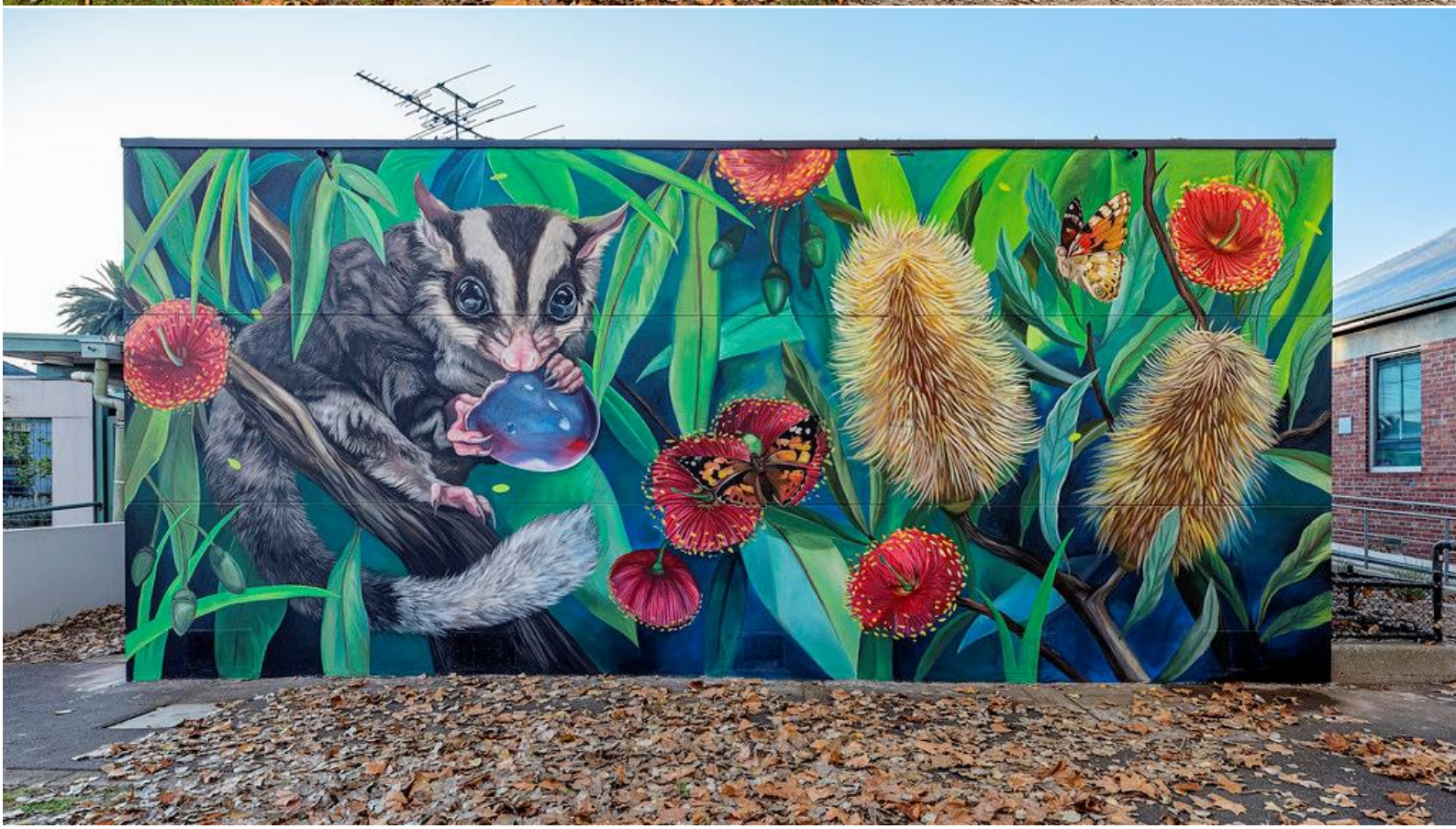
Nature and COVID-19

The Nature Strategy has been developed during a time of unprecedented uncertainly around the world – the Coronavirus pandemic. In the midst of this pandemic, many of us have turned to nature to reduce stress levels, improve mental health and stay physically active. A growing body of research, including research by International conservation scientists, points to a direct link between the destruction of nature and disease outbreaks, highlighting the role of protecting and restoring nature in preventing future pandemics.

During the Coronavirus pandemic, greater contact between humans and their environment has been one of the most important responses to the crisis, from a mental health perspective. As we respond to the pandemic, the attraction of nature (parks, reserves, gardens, green open spaces, waterways and the bush) for improving well-being cannot be under estimated. Science has long established that access to urban green areas such as parks and waterways has positive impacts on health, typically due to improved air quality, increased physical activity, social cohesion, and stress reduction. It has also been shown that interaction with nature helps us to better recover from stress.

The Coronavirus pandemic has given the world an opportunity to reassess its relationship with nature and get on track to a more sustainable future. Right now, probably more than any other time in human habitation of earth, the value of nature is being recognised.





Local artist Sam Yong is has created a stunning mural that reflects the Biodiversity Arts Project that Yarra Senior Citizens are undertaking in 2020. The vibrant artwork showcases some of Yarra's native flora and fauna. Photographs by Unknown.

Nature in Yarra: What did the area look like in the past?

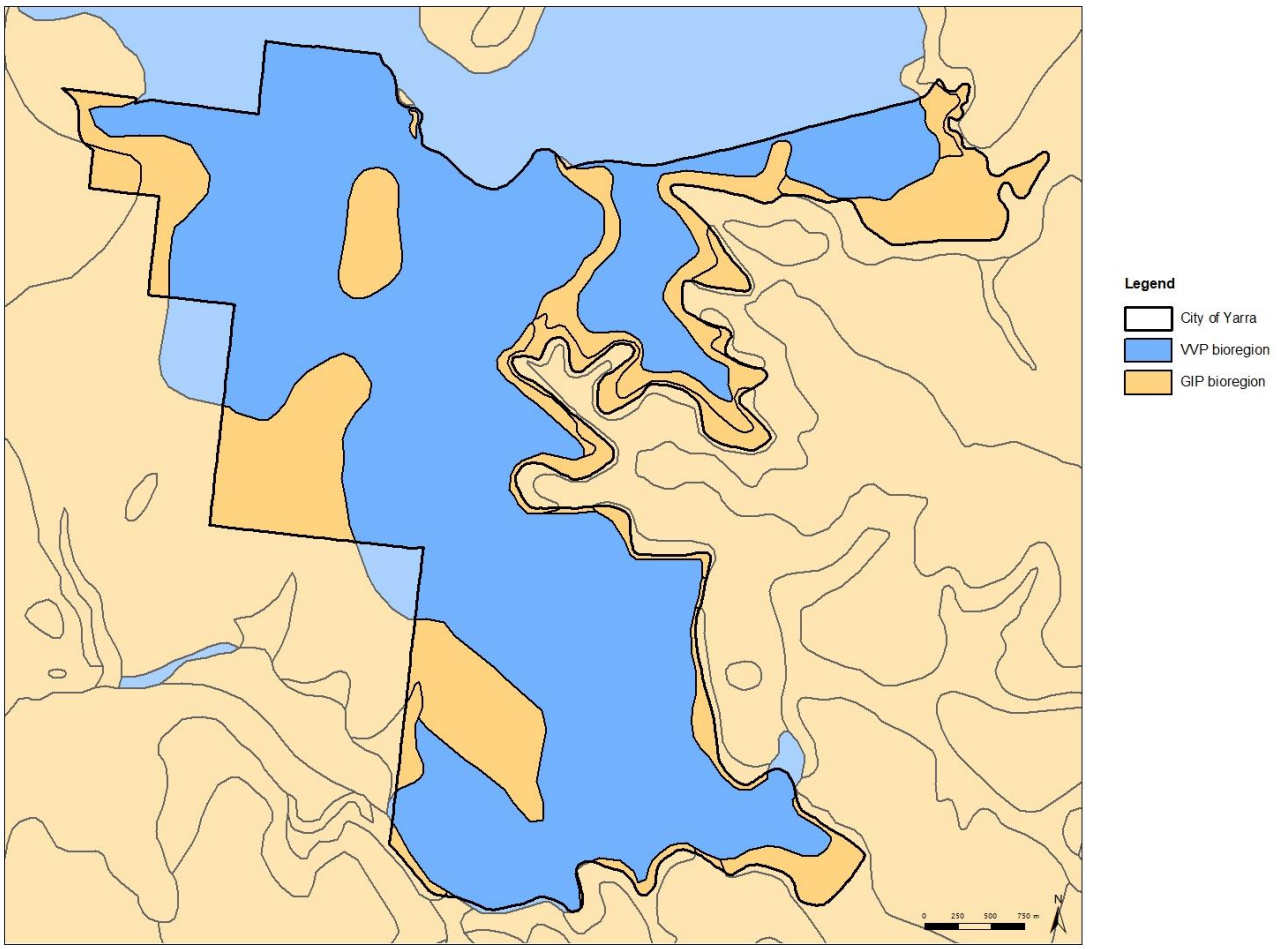
Geology

The landscape of Yarra has been shaped by its geology. It sits at the junction of two distinctly different geological regions that in this case also geographically align with two bioregions (**Map 1**). These bioregions are generally separated by the Yarra River:

- The Victorian Volcanic Plains (VVP) Bioregion, characterised by its basaltic rock and clay soils, formed by volcanic eruptions to the west of Melbourne covering the majority of the municipality; and
- The Gippsland Plains (GP) Bioregion: associated with sedimentary, layered geology of Silurian siltstones, Tertiary aged sandstones and Quaternary aged basalt. Each of these layers is much older than the western plains basalt and is derived from times when Victoria sat within a deep ocean basin.

The majority of Yarra's topography is gently undulating, which is characteristic of the Volcanic Plains. Subtle changes in topography are evident at Richmond Hill, where the elevation facilitates great views across the municipality, formerly attracting some of the district's first grand homes and churches. Conversely the lower areas, formerly known as the Fitzroy, Collingwood and Richmond 'Flats,' include the wet and swampy ground which was formerly part of the Yarra River floodplain.

The waterway corridors provide the most significant variation in topography across the City of Yarra, with areas of the Darebin Creek, Merri Creek and the Yarra River deeply incised at various locations. Of course, much of the natural topography has been modified with the urban development of the area.



Map 1 Distribution of the Victorian Volcanic Plains (VVP) and Gippsland Plains (GP) bioregions around Yarra.

Past vegetation cover and type

In the past, Yarra was mostly covered by Plains Grassy Woodland, which also dominated much of the surrounding landscape (**Map 2**). This vegetation community consisted of a low density of large trees, mostly River Red Gums *Eucalyptus camaldulensis,* with an understorey of some small shrubs, but covered mostly by grasses and herbaceous species.

Along the waterways, the Floodplain Riparian Woodland, Riparian Woodland, and Steam Bank Shrubland communities thrived. These areas were also likely dominated by River Red Gums, perhaps with some Swamp Gums *Eucalyptus ovata*, *Acacia* species, and a rich understorey of shrubs, sedges, rushes, herbs, and grasses. Much of the areas around the waterways would have been subject to seasonal variations in water level, and changed throughout the year.

The area around Yarra would have supported a vast aray of wildlife including Quolls, Plains Wanderers, Bandicoots, Bettongs, and perhaps even Diprotodon, a large wombat-like marsupial the size of a hippopotamus, until their extinction about 60,000 years ago.

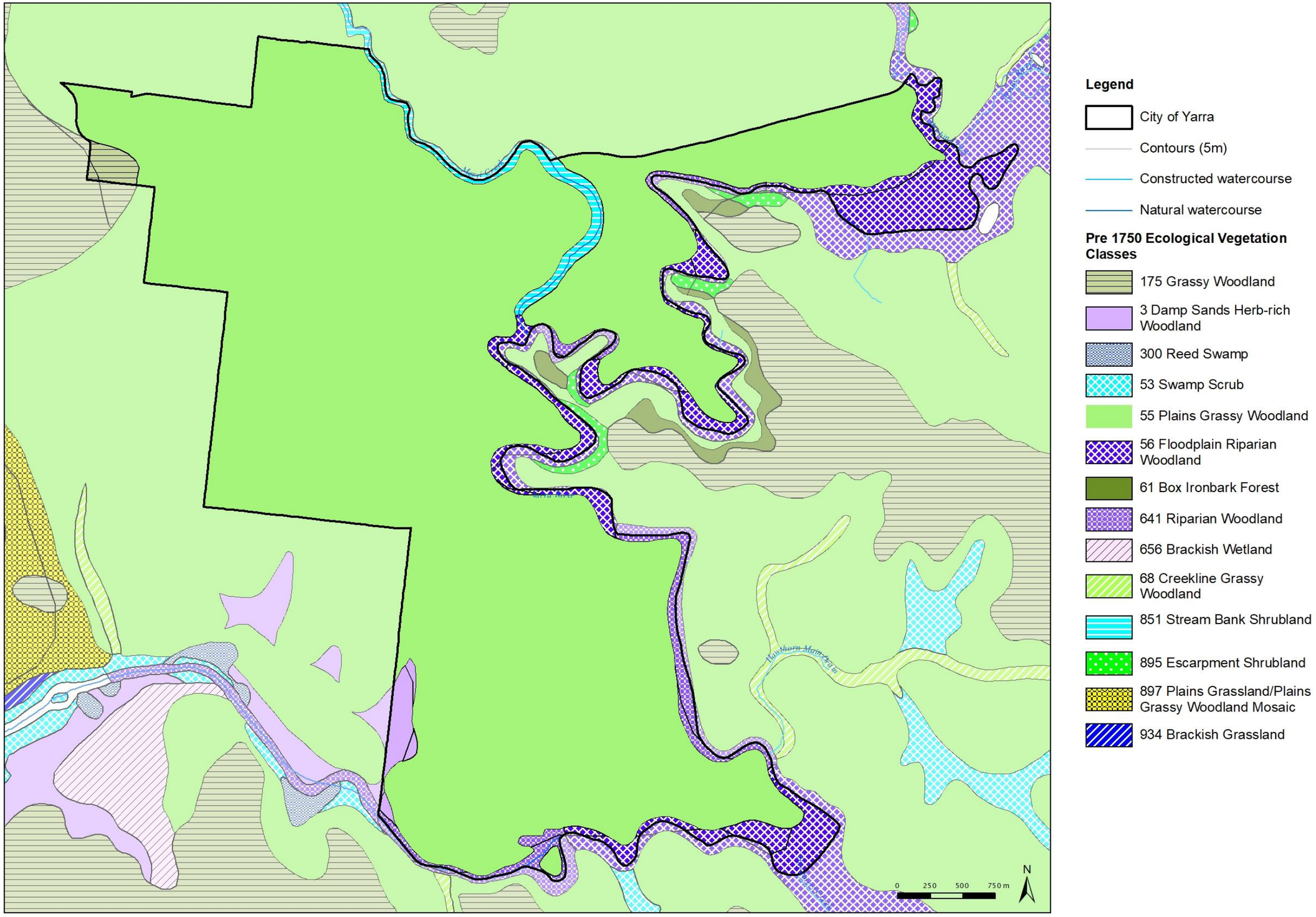
While much of this diversity is now lost, some still remains within pockets of Yarra, and this knowledge can provide inspiration for restoration practices into the future.

‘Native’ and ‘indigenous’ vegetation

The terms ‘native vegetation’ and ‘indigenous vegetation’ are often colloquially used interchangeably possibly due to the lack of distinction in planning law language. Typically “native vegetation” refers to Australian plant species though the language in the Victorian Planning Scheme often associates the term towards plant species only found in Victoria.

When ecologists implement vegetation assessments to address planning law criteria their methodologies need only align to those state wide based and interchangeable definitions. However, the prevailing definition of ‘indigenous vegetation’ for practitioners from the science community is that species are of local genetic provenance, and reside within the same bioregion.

Therefore, with the context of this Strategy, viewed through a scientific lens, ‘indigenous vegetation’ means plants that are local to the Yarra area, and “native vegetation” means plants from Australia.



Map 2 Pre-European native vegetation (Ecological Vegetation Classes) throughout Yarra.

Seasons of Wurundjeri Woi Wurrung Country

Traditional owners have developed a deep understanding of natural systems and processes through more than 40,000 years of experience and connection to country, with an example being understanding of seasons.

Like many Traditional owner groups around Australia, the Wurundjeri Woi Wurrung people have a detailed, local understanding of the seasons and the environment. Each season is marked by the movement of the stars in the night sky and changes in the weather, coinciding with the life cycles of plants and animals. Seasons were also defined not only by temperature and the amount of rainfall, but also by more subtle distinctions related to patterns of rainfall and the types of events. Reading this seasonal rhythm helped maximise the availability of food and shelter. When food was plentiful there were opportunities to carry out ritual responsibilities and ceremonial gatherings.

In Melbourne and surrounds, there are seven annual seasons alongside two non-annual seasons: flood and fire seasons. Flood season is likely to occur on average about every 28 years, and fire season occurs on average about every seven years. (Aboriginal Victoria)

Lifestyle depended very much on the rhythm of the seasons. Traditional owners moved over their extensive territories in regular cycles, maximising the availability of food and shelter. When food was plentiful there were opportunities to carry out ritual responsibilities and opportunities for ceremonial gatherings.

They were always mindful of the seasons in selecting the localities in which to spend their time, taking into account not only the natural features of the ground, but the facilities for obtaining food.

Much was known about the stars and the seasons. People could read the sky. For example, they would know that when a particular constellation appeared it was time to hunt a particular animal, or dig up a particular plant. The flowering of particular plants was often used to mark seasonal events. Even today, fisherman use the flowering of the Coast Tea-tree in early November to mark the entry of Snapper into Port Phillip Bay.

7 Seasons of the Wurundjeri Woi Wurrung Country

Museums Victoria have named the seasons after the Woi Wurrung language names for eels, wombats, and orchid, tadpoles and grass, but it is not known if these names were used by the Woi Wurrung. According to Museums Victoria;

“The Kulin have a detailed local understanding of the seasons and the environment. Each season is marked by the movement of the stars in the night sky and changes in the weather, coinciding with the life cycles of plants and animals.”

Their calendar has seven seasons:

Guling Orchid Season, (August) and it is marked by orchids flowering, the silver wattle bursting into colour and male koalas bellowing at night.

Poorneet Tadpole Season, (September and October) is when temperatures rise, rain continues and the pied currawongs call loudly. The days and nights are of equal length.

Buath Gurru Grass Flowering Season, (November) is warm and it often rains. (A good thing to remember as we start planning picnics.)

Kangaroo-Apple Season, (December) is marked by its changeable, thundery weather, longer days and shorter nights.

Biderap Dry Season, (January and February) has high temperatures and low rainfall.

Luk (Eel) Season, (March) is when the hot winds stop and the temperatures cool, while the manna gums flower and the days and nights are again equal in length.

Waring Wombat Season, (April-July) has cool, rainy days and misty mornings, with our highest rainfall and lowest temperatures.

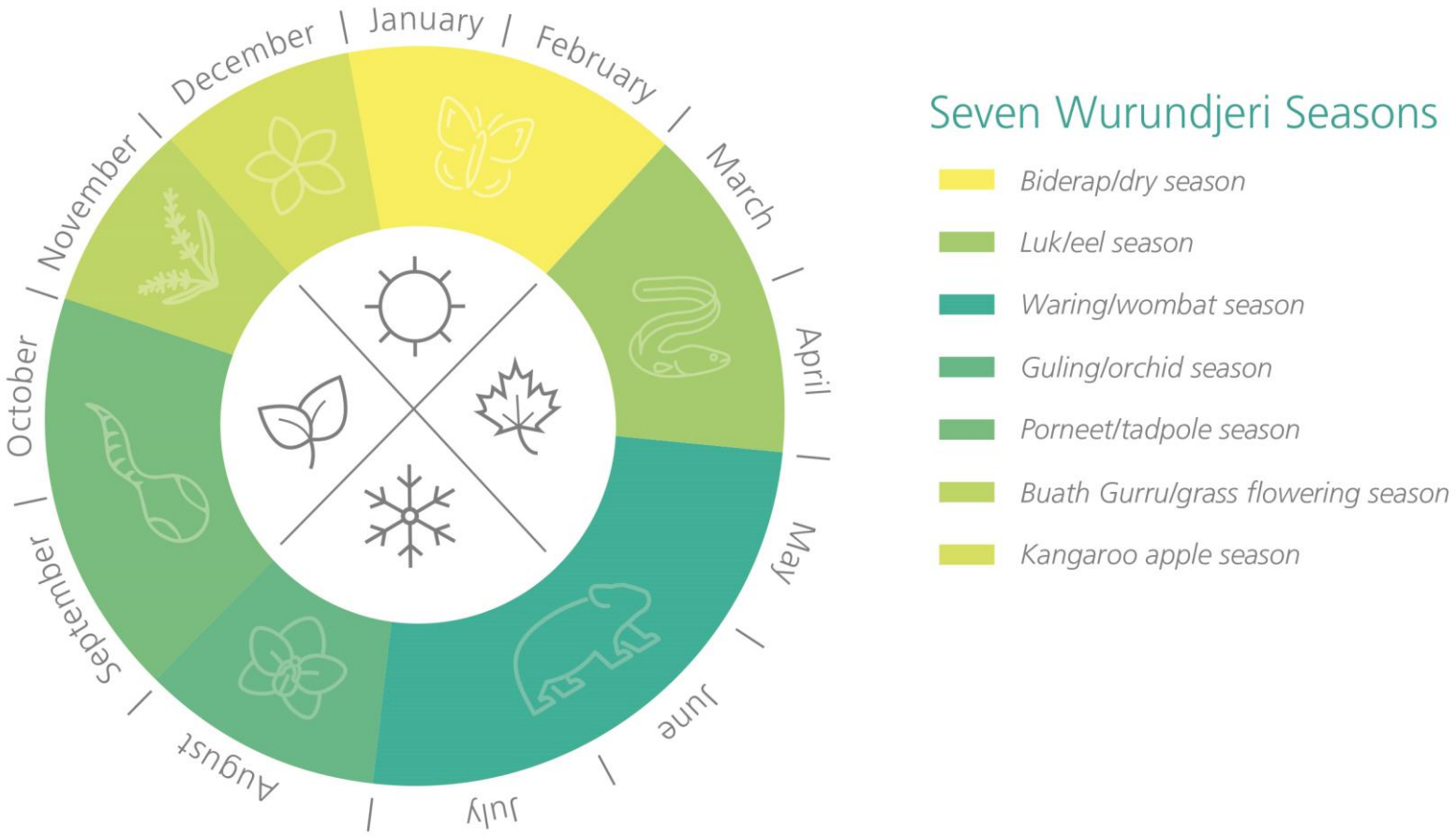


Figure 2 7 Seasons of Wurundjeri Woi Wurrung Country.

Nature in Yarra: What does the area look like now?

The Biodiversity Health Survey – an inventory of Yarra's natural values

The Biodiversity Health Survey (BHS) was a two-year study that aimed to develop an inventory of the biodiversity values present across the open space areas within the City of Yarra.

The project involved a comprehensive survey of various open space areas across the municipality. This included 30 open space reserves such as Hall Reserve, Edinburgh Gardens and Alphington Park Wetland; 10 pocket parks including Flockhart Reserve, Holden Byrne Park and Dame Nellie Melba Park; and 12 streetscapes including Heidelberg Road, Hoddle Street and Pigdon Street. An important aspect of the study was the inclusion of areas not typically considered to be associated with the presence of native plants and animals.

The survey methods **(Figure 3**) used as part of the study aimed to capture the broad array of primarily native animals and also plants still existing within the City of Yarra. The survey included the use of:

- Database resources from CSIRO Entomology Dept., Birdlife & Victorian Biodiversity Atlas to name a few,
- Assessment methods ascribing ecological vegetation types and functional coverage,
- identification of land cover and vegetation types,
- assessment of fauna habitat values: leaf litter, significant habitat trees (**Figure 4**) and hollow abundance,
- documentation of plant species diversity, including indigenous plants and weeds,
- daytime (diurnal) and night-time (nocturnal) bird surveys,
- frog and reptile surveys,
- microbat surveys using specialised bat detector devices, and
- wildlife camera trap surveys.

Figure 3 Fauna survey methods used during the Biodiversity Health Survey in 2016. Photographs by Practical Ecology

What are significant habitat trees?

- **Indigenous trees (originate from the local area) that also qualify as Large Old Trees under the *Habitat Hectare* method, large dead stags, or trees that support a number of hollows.**
- **Australian native or exotic trees that provide shelter (hollows or canopy to nest in) and/or important food resources (flowers, fruits, seeds, and insects) for fauna in the local environment.**
- **Larger trees which provide stepping stones for fauna movement, patches of trees connecting bushland canopy that links fauna to water, food and sheltering opportunities. The most valuable significant trees harbour multiple sized hollows, retain bark furrows and have extensive connected canopy cover which provides nesting real estate and predation security.**

Figure 4 This large old River Red Gum provides excellent habitat value and is a prime example of a significant habitat tree. Photograph by Craig Lupton

Yarra has large areas of valuable bushland

- Significant areas of bushland were mapped at Burnley Park, and Hall, Kevin Bartlett & Rushall Recreation Reserves; providing great habitat for native plants and animals.

Yarra has a high diversity of plants and animals

- 430 plant species were recorded with 209 indigenous to Yarra.
- A diversity of animals recorded including a number of birds, mammals, reptiles, frogs and insects.
- Diversity of bat species was high, largely microbats (7 species), including Eastern False Pipistrelle (pictured) and Yellow-bellied Sheathtail Bat.
- National and state significant animals were recorded including Grey-headed Flying Fox and Nankeen Night-heron.

Yarra contains a number of important wetland habitats

- Alphington Park Wetland, and McConchie Reserve & its surrounds ('Burnley Harbour') provide habitat for a varierty of wetland plant and animal species.
- Wetlands were a hotspot of bird and microbat activity.

Yarra is connected with wildlife corridors and urban stepping stones

- Wildlife corridors were identified along the Merri Creek, Yarra River, and the Park Street Linear reserves.
- Urban parks such as Edinburgh Gardens and Darling Gardens provide 'stepping stones' across the Yarra landscape between larger areas of fauna habitat.

Yarra has a variety of significant habitat trees

- Significant River Red Gums and Sugar Gums were mapped in Burnley Park and Kevin Bartlett Reserve.
- Other hollow-bearing native trees and larger canopy trees including non-native species like Oaks were mapped across the municipality.

Current vegetation cover and type

Across the City of Yarra open space and sporting reserves, exotic vegetation patches (mostly lawns) and planted tree canopy cover (combining non-local native and exotic scattered trees and tree patches) were the dominant land cover types. This was followed by indigenous vegetation patches and garden beds (**Figure 5**). There was also a reasonably high cover of scattered indigenous trees. This suggests there are considerable opportunities to increase plantings of midstorey shrubs, and groundstorey grasses and herbaceous species in Yarra's reserves.

In total, the City of Yarra includes 263.4 hectares (ha) of publically accessible open space, with an additional 85.3 ha of 'restricted access' open space, namely sporting ground/s or golf courses (Thompson Berril Landscape Design 2016), shown in **Map 3** on **Page 25**.

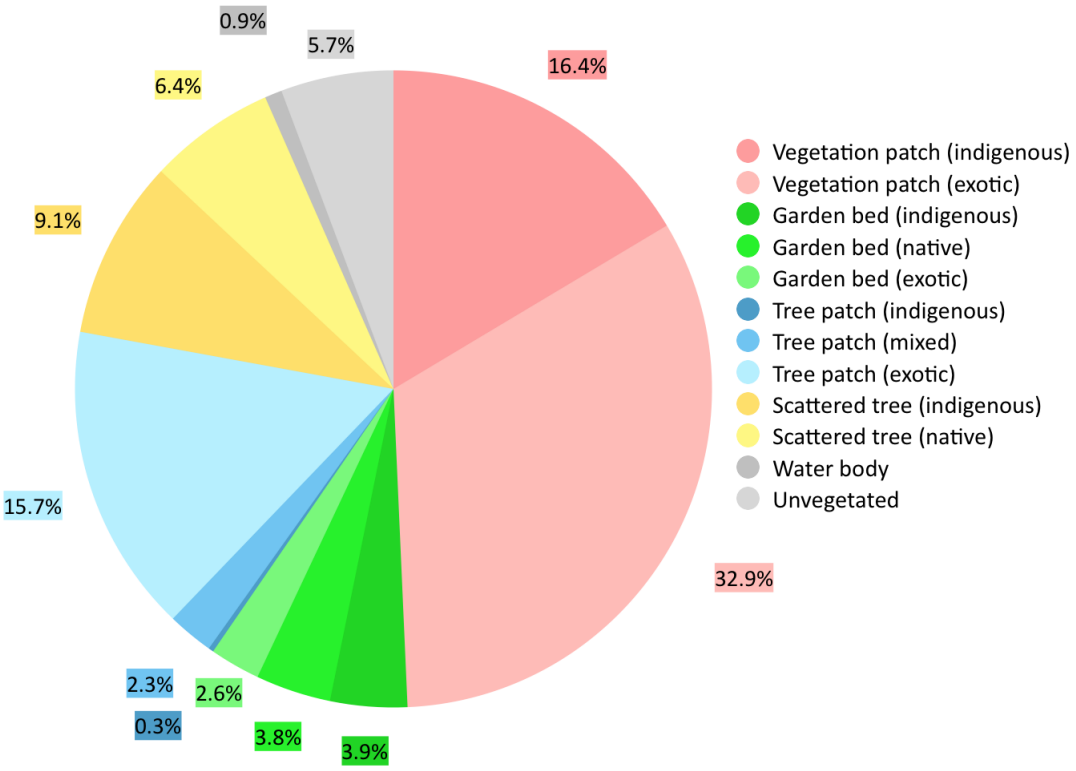


Figure 5 Vegetation cover across the City of Yarra's municipal reserve system

When compared with neighbouring municipalities (**Figure 6**), a relatively high proportion of the City of Yarra landscape is attributable to native vegetation cover. This is almost as high as the City of Banyule, with its much less urbanised landscape. Of Yarra's native vegetation cover, 6% occurs within public land, leaving approximately 5% cover within private land. While this provides a good base from which to work, this is well below recommended percentages for landscape vegetation cover and there are good opportunities for increasing the cover of native vegetation within council's open spaces. It is recommended that a benchmark of 20% native vegetation cover is the accepted amount to sustain woodland bird communities.

While most natural areas of open space - largely located within Yarra Bend Regional Park - are managed by Parks Victoria, the City of Yarra manages 94 open space reserves or parks, covering over 157 ha (see **Map 3** on **Page 25**). The City of Yarra-managed open space reserves range from approximately 24 ha (Kevin Bartlett Reserve, Burnley) to fewer than 0.1 ha (Chestnut Street Reserve, Cremorne). The larger reserves are generally situated along waterways, while the smaller reserves mostly fall within the urban development matrix.

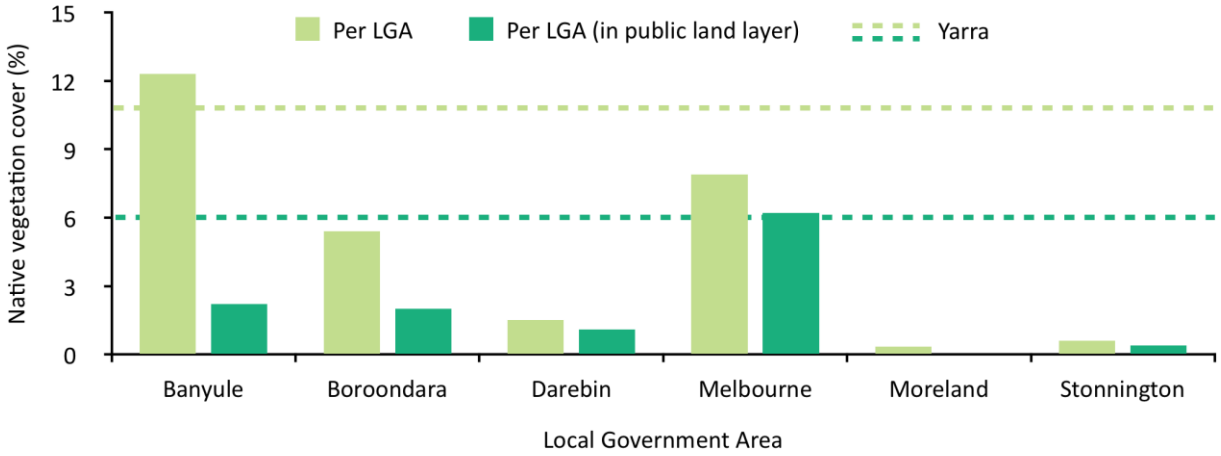


Figure 6 Comparison of native vegetation cover between adjoining municipalities

The City of Yarra is home to many sites of natural significance, which are primarily linked with the waterway corridors, especially the Yarra River. The vast majority of remnant native vegetation located on public land (**Map 4** on **Page 26**).

During the BHS, areas of vegetation that met a set of criteria using the 'Habitat Hectare' methodology as per the *Native Vegetation Assessment Method* (DSE 2004) were mapped as 'Habitat Zones', and classified into individual 'vegetation communities'. In total, six different vegetation communities were recorded, which covered 27.25 ha across Yarra. For representative images see **Figure 7** to **Figure 11**, and for the distribution of these communities see **Map 4** on **Page 26**. The reserves with the greatest number of vegetation communities were Burnley Park (6), Hall Reserve (5), Alphington Park Wetland (5), Rushall Recreation Reserve (5), Park Street Linear Reserves (4), and Coulson Reserve/Knott Reserve (4).

Small areas of wetland vegetation comprising the Aquatic Herbland and Tall Marsh communities are restricted to locations within Alphington Wetland and McConchie Reserve.

Gould's wattle bats roost most commonly in tree hollows, particularly in River Red Gums. They are one of the first bats to emerge from their hollows after sunset. Photograph by Bill Jackson.

Figure 7 Aquatic Herbland, Alphington Wetlands.

Figure 8 Floodplain Riparian Woodland at Rudder Grange, Alphington.

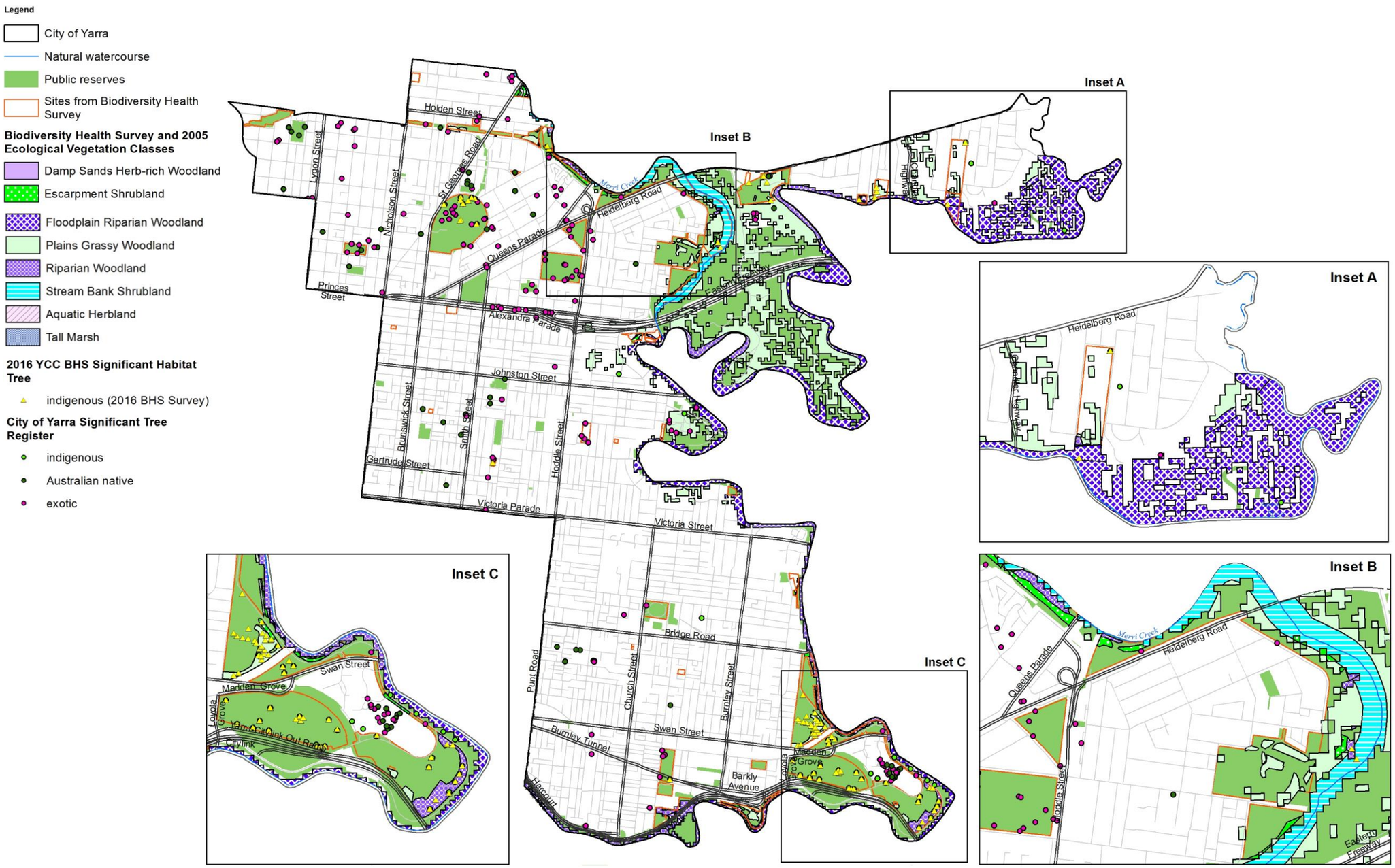
Figure 9 Escarpment Shrubland between the Yarra River and Yarra Boulevard, Burnley.

Figure 10 Plains Grassy Woodland at Coate Park, Alphington.

Figure 11 Tall Marsh at McConchie Reserve, Burnley.

White-striped freetail bat. Their call can be heard distinctly at night as a regular metallic 'Ting, ting, ting'. Photograph by Bill Jackson.

Map 3 Existing Yarra Open Space. [Placeholder Map – Update Map in line with Final YOSS, make A3 pull for printing**]**



Map 4 Distribution of indigenous vegetation and significant habitat trees in Yarra.

Significant habitat trees

Large significant habitat trees act as 'stepping stones' across the landscape for birds, bats and arboreal mammals. They are distributed broadly throughout the municipality (**Map 5** on **Page 31**), either as single trees or positioned along streets. However, in some key areas significant habitat trees occur in relatively high densities (e.g. Edinburgh Gardens and Darling Gardens). A number of animal species such as Ringtail and Brushtail Possums, and the Powerful Owl can use tall trees for shelter and foraging.

During the Biodiversity Health Survey (BHS), significant indigenous habitat trees were recorded when they were encountered in each patch of native vegetation (habitat zone) and as incidental observations within reserves and streetscapes that were surveyed.

Generally, large indigenous hollow-bearing trees are scarce across the municipality. A high proportion of the assessed indigenous trees in the municipality are young and not large enough for the development of hollows. A large proportion of the older trees across the municipality are species that are less likely to form hollows. This includes both planted exotic and introduced native species. Exotic trees in reserves such as Edinburgh Gardens rarely provide a wide range of hollow sizes suitable for a diversity of native fauna. These tend to be utilised by introduced/non-indigenous and/or urban tolerant bird species (e.g. Rainbow Lorikeets, Galahs, and Corellas) and Brushtail Possums.

The majority of hollow-bearing trees recorded in the BHS were either very large old River Red Gums (which were sparse), or in exotic Elm or Oak trees. Regardless of the origin of the tree species, hollow-bearing trees should be protected wherever possible, as they are a key habitat resource which can take many human lifetimes and sometimes hundreds of years to replace naturally.

The Grey-headed flying-fox roosts at Yarra Bend Park in a colony of up to 30,000 individuals. It is the only fruit bat that lives in Yarra. Photograph from Getty Images

Bird usage and tree habitat values

During the BHS bird censuses conducted along the streetscapes, native street trees were assessed as providing greater habitat values for bird species than exotic trees, particularly for honeyeaters, lorikeets and insectivores (**Figure 12)**. These trees may also provide occasional habitat for endangered bird species such as the Swift Parrot. Insectivorous birds were expected to use a greater number of exotic street trees.

Both native and exotic tree species provide flowering resources for honeyeaters and lorikeets, and the appropriate canopy structure and tree trunks for foraging insectivorous species. Native trees are expected to provide greater numbers and size ranges of hollows that can be potential nesting and/or breeding sites. Frugivorous bird species would be mainly limited to foraging in native fruit-bearing trees (or backyard fruit trees, which were not assessed as part of the BHS). The streetscape along Pigdon Street provides nesting habitat for Cockatoos in the Canary Island Date Palm trees. Other resources for Cockatoos occur along Stawell Street where Sheoak and Hakea species are present. All the mapped significant habitat trees and street trees provide 'stepping stones' across the landscape for bird movement.

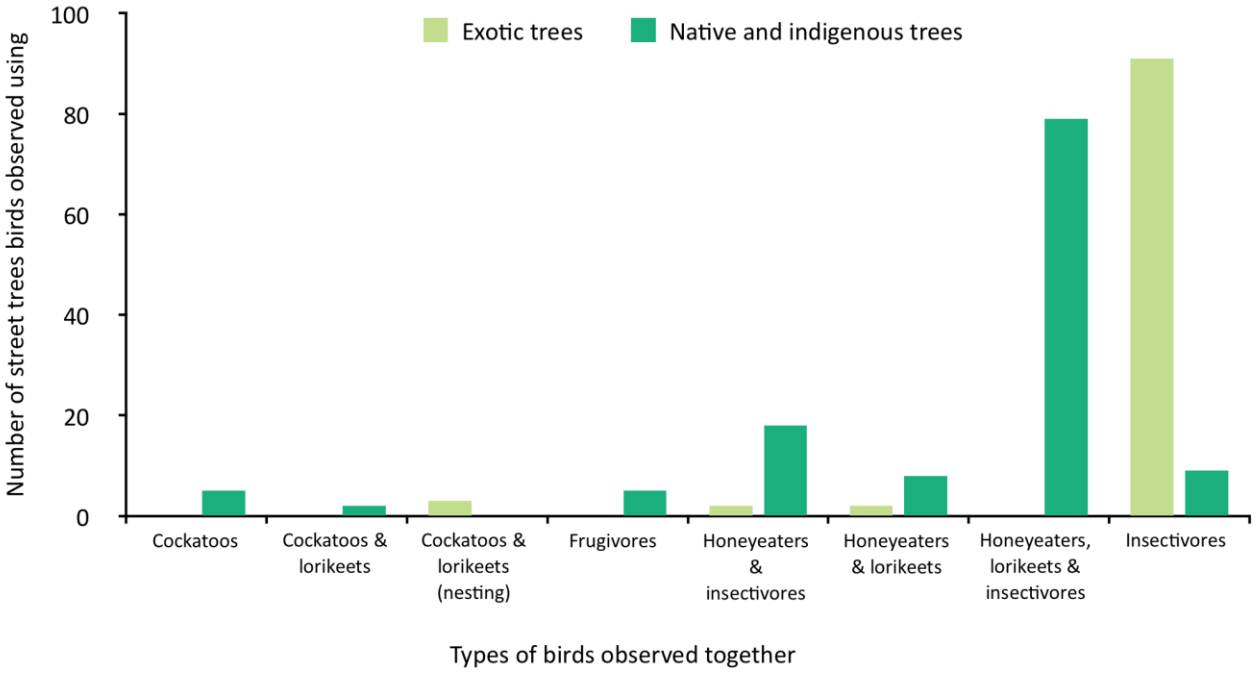


Figure 12 Usage of street trees by various birds.

The location and type (exotic, native or indigenous) of tree species will influence the range of bird species likely to inhabit the trees present. The exotic trees across the City of Yarra tend to generally be older, and whilst they do provide some refuge and nesting opportunities, it is only for a small suite of urban tolerant bird species.

Native and/or indigenous tree species provide a wider range of habitat values across the full spectrum of bird species recorded in the municipality. Although many of these tree species are yet to reach their maturity, there are clear indications their resilience to drought and adaptability present a longer term option to sustain ecological function through the Climate Emergency in addition to providing a broader spectrum of shelter and foraging activities for birds, than those provided by exotic tree species.

Critical habitat, ecosystems and habitat corridors

During the Biodiversity Health Survey a number of locations of Critical Habitat were identified within the municipality. These were primarily for wetland and waterway dependent species in and around the Yarra River and its wetlands. Further from the immediate waterway areas, critical habitat is provided in other locations for woodland species. This is sometimes on the basis that significant habitat trees or other key habitat features are present. Areas of Critical Habitat are shown in **Map 5**.

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Synthesis of the results of the Biodiversity Health Survey assisted in creating an Ecosystem Model that can be used to plan and measure management actions (**Figure 13**). This model includes animals that can be considered as focal species, as their needs align with a series of important habitat features. Therefore, if this type of animal is healthy and reproducing, it can be derived that there are satisfactory levels of critical elements (food, water, and shelter) indicating the focal species' requirements are being fulfilled. It is recommended that this ecosystem model is promoted internally and to the community. Additionally, these animals are recommended for use when planning and designing habitat links or enhancing existing areas of critical habitat.

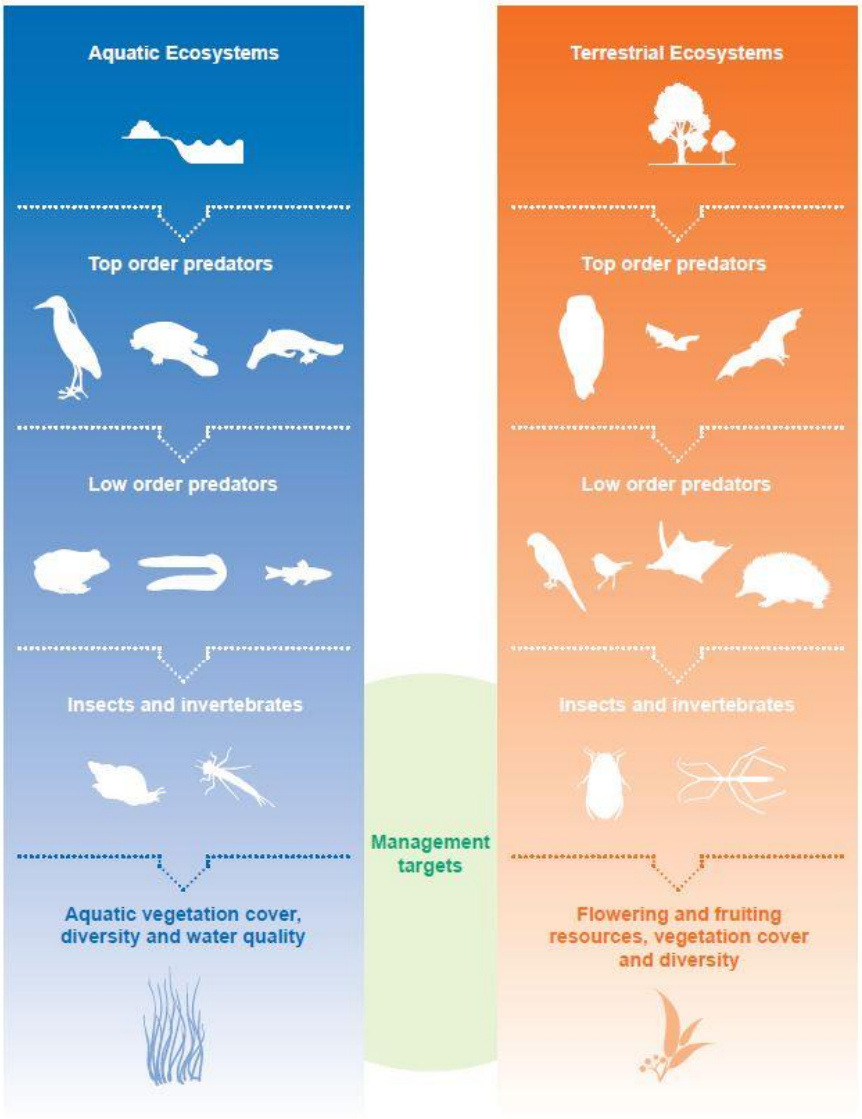
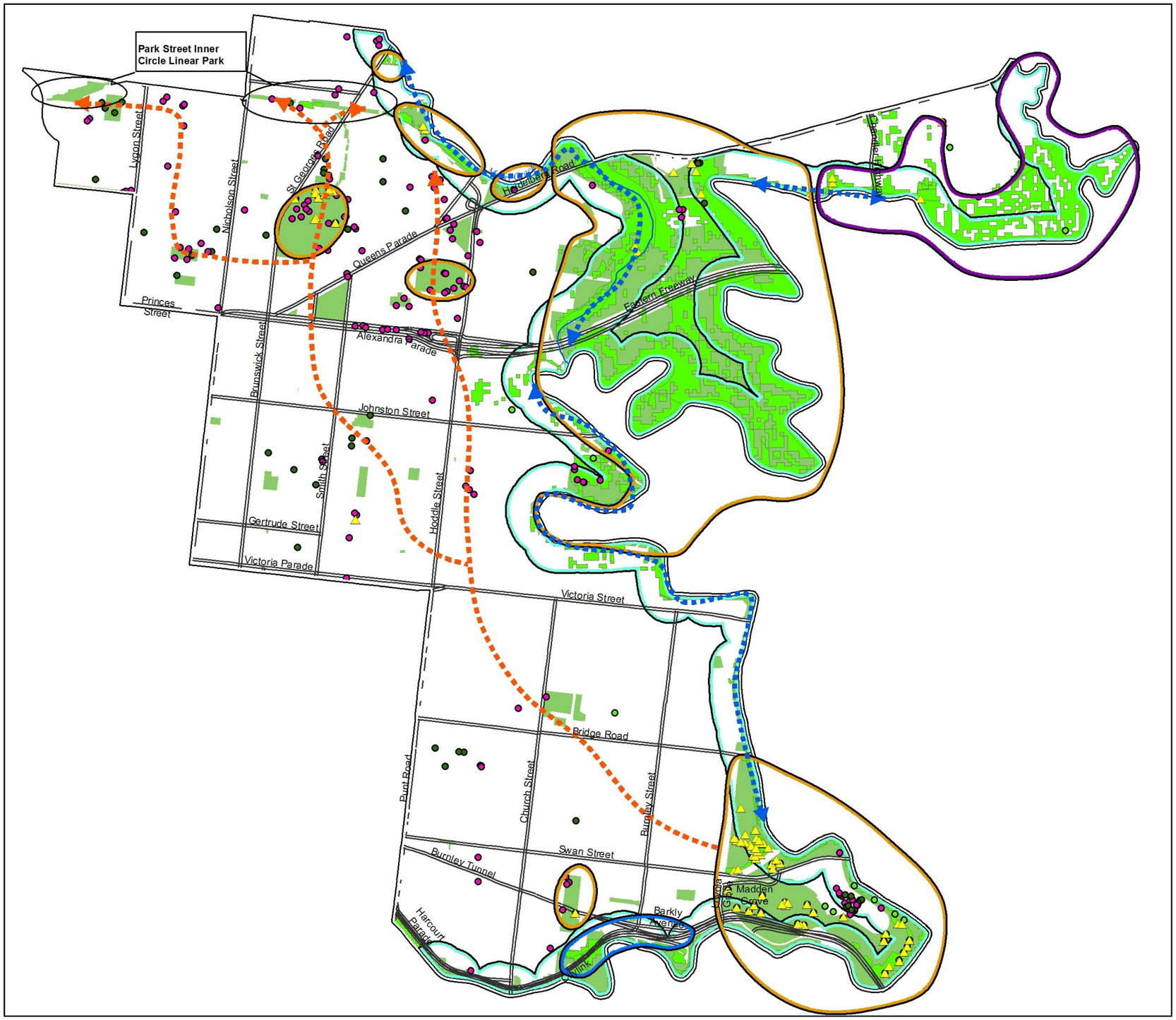


Figure 13 Ecosystem model for the City of Yarra.

Habitat corridors or links differ from critical habitat in that they provide fewer habitat resources for fauna to complete their life cycle. Corridors provide the basic habitat elements to enable animals to move safely across the landscape, sometimes between two or more areas of critical habitat. There are several important corridors for fauna movement within the City of Yarra, and further corridors that could be created. These are shown in **Map 5**.



Map 5 Opportunities for strengthening and creating habitat links across the City of Yarra

Could sugar-gliders fly across Yarra's skies?

The Yarra River corridor is known to support populations of Sugar Gliders (*Petaurus breviceps*); small gregarious creatures that creep out and soar between trees as the sun goes down.

While there are only a few official records of these animals locally, a recent study in the City of Boroondara found populations that live just to the east of Yarra. As they're now known to live so close, it's likely they're in the City of Yarra as well.

While we don't know exactly how many Sugar Gliders live locally, we can encourage more of them to move in! It might take a while to eventually see them soaring above Carlton, but not if we really try!

Would you like to see Sugar Gliders gliding in the Yarra skies? This is how can we make it happen:

- **They live in small tree hollows that have developed in older trees, so if there aren't lots of old trees with hollows, we can help by putting up nest boxes or creating artificial hollows.**
- **More trees could be planted so that they too would eventually become large and old with their own hollows.**
- **Retain as many large old trees as possible. Undertake interventions to prolong tree life (cabling and other stability works).**
- **Implement a program of person-made chainsaw hollows in suitable large trees along the waterways and adjacent park areas.**
- **They love to eat nectar, insects and fruit. And they especially love feasting on the sap of Wattles, their favourite treat. So we'd need to plant plenty of the types of trees and food plants that they like. Again this would include indigenous trees like Yellow Box and Manna Gums as well as wattles, in clusters near the trees.**
- **They like to live in family groups called clans of around seven animals, so for them to live in one place together they would need enough room for everyone.**
- **They can glide, they need tall trees within a distance that they can safely reach (up to 90 metres apart, but preferably closer). And for them to feel safe, they need trees with good canopy cover.**
- **Start a community next box program on Council and private land. Engage qualified arborists/tree climbers to install boxes and the community can use wireless nest box cameras to monitor how many Sugar Gliders use the boxes as homes.**

Sugar Glider in a nest box. Photograph by Craig Lupton

Current policy and strategy relating to nature

The maintenance and enhancement of natural values are relevant to a cross organisation focus and has close relationships with a broad range of other council policies and strategies. The most closely related strategies and policies are shown in **Figure 14**. Further detail on each of these policies, strategies and how they relate to the Nature Strategy is provided in **Appendix 1**. Further information on the legislative context for the Nature Strategy is provided in **Appendix 2.**

Figure 14 Plans, policies and strategies relevant to the Yarra Nature Strategy

What does Yarra do to support nature?

There is a suite of direct and indirect actions/approaches that Council implements that have positive impacts on nature conservation and engagement, including:

Staff resources:

The City of Yarra currently allocates approximately 1.6 FTE to nature conservation outcomes, providing oversight and coordination of strategic biodiversity and operational bushland management outcomes.

Management and restoration of natural values:

- Bushland management work focuses on 31 Core Bushland sites with additional and substantial native plant restoration programs at Alexandra Parade (0.78Ha) , Burnley Golf Course (12Ha) and the Burnley Circus Site (1.5Ha) to name a few.
- The City of Yarra's reserves that are primarily native vegetation cover an extent of 33.6 hectares with another 4.4Ha indirectly managed through a Parks Victoria and Merri Creek Management Committee partnership.
- The 38Ha bushland management program is delivered by a team of professional bushland management contractors via a structured program of management.
- Each of the reserves with bushland values have been mapped, and bushland areas allocated into a series of management categories that align with an adapted version of the *Society for Ecological Restoration Australasia (SERA) National Standards for Ecological Restoration*.
    - The bushland management team are employed on a long-term contract. This requires that they meet set KPIs associated with monitoring data linked to the adapted SERA standards including: percentage cover for weeds and native vegetation; including grasses, herbs, shrubs and trees – that are monitored via regular transects
    - Bushland management work includes weed management, vegetation planting, mulching, slashing, rubbish removal and other miscellaneous tasks.
    - An annual audit that appraises the site condition of habitat zones with reference to the relevant vegetation community (EVC), management standard required and species diversity
- A monitoring program is completed by a separately contracted ecological consultant to measure progress towards long and short-term management goals, which mainly focus on seeking improvements in native vegetation cover and reduction in weed cover.
- A program of revegetation work is completed annually and this is largely targeted towards areas of existing vegetation, as well as extending patches of native vegetation, and filling gaps. An average of 15,000 – 20,000 indigenous ground cover, understory and trees are planted annually.
- The City of Yarra is a member body of the Merri Creek Management Committee (MCMC) and the Darebin Creek Management Committee (DCMC) and contributes financially towards supporting these two organisations in areas of Planning and Coordination, Ecological Restoration and National Tree Day, Community Education and Waterwatch events.
- City of Yarra also partners with Parks Victoria to deliver bushland restoration work in Yarra Bend Park to achieve biodiversity outcomes across boundaries. City of Yarra expands MCMC's capacity to improve the Merri Creek by facilitating a partnership with Parks Victoria and deliver the on ground bushland restoration funding component in Yarra Bend Park.
- An annual grant is received from Melbourne Water through the 'Corridors of Green' Grants program, to deliver the Yarra River Escarpment Remnant EVC Restoration Project. This is an ongoing project that aims to reinstate the Yarra River riparian corridor.
- Additional funding is offered by Melbourne Water through their 'Corridors of Green' Grants program for which council has been regularly successful applicant. The Yarra River Loy's Paddock Escarpment EVC Restoration Project is one such ongoing project that aims to reinstate the Yarra River riparian corridor.
- In its own projects in council managed land, the City of Yarra engages suitably qualified consultants to inspect trees/vegetation for wildlife prior to tree removal. If wildlife is identified, the consultant will minimise stress and ensure the safety of wildlife that are displaced during tree removal in line with the Governor in Council Order (2003), under the Wildlife Act 1975.

- The City of Yarra has implemented a range local and regional fox control programs to comply with the Catchment and Land Protection Act 1994 (CaLP) noting the Red Fox is declared as an "Established Pest Animal" in Victoria.
- Council provides advice on techniques to exclude exotic birds from resident's gardens such as the Common or Indian Myna.
- In addition to activities associated with the direct removal of red foxes, reduction in habitat disturbance and fragmentation is likely to reduce predatory-prey interactions. The Bushland maintenance program will continue to improve the coverage of indigenous vegetation to support those species predisposed to fox predation.

Water management:

Council has installed and maintains over 100 Water Sensitive Urban Design (WSUD) features in council managed land. More than half are rain gardens and collectively these assist in delivering:

- Reduced volume of stormwater entering the Yarra River and Merri Creek, leading to an improved aquatic environment.
- Reduced minerals and nutrients enter waterways that improves water quality in the Yarra River and Merri Creek, and Port Phillip Bay.
- Reduced velocity of stormwater flows assisting in the mitigation of flash flooding events.
- Improved biodiversity as a result of the green space provided by rain gardens, especially where local native plants are used.
- Decreased urban heat island effect as a result of increased green space.

An Integrated Water Management Plan has been drafted and following a period of community consultation, is due to be presented to Council for adoption in September 2020. This plan will deliver a range of actions to ensure that water is used wisely and sustainably to keep our environment and community healthy. The plan will complement the Yarra Nature Strategy.

Streetscape management:

Council manages over 2200 (approx. 34,000m^2) traffic garden beds under contract which equates to more than 4 Ha of green space. Many traffic garden beds have native plants and managed for biodiversity outcomes with some specific planting of indigenous grasses, ground covers and shrubs which provides food for local birds and insects. Traffic gardens beds are also used as seed banks when planted with local provenance plant species.

Creating an Urban Forest:

The vision for the Urban Forest Strategy is for: a more liveable city supported by a healthy and growing urban forest.

Objectives of the Urban Forest Strategy (UFS) include:

- To enhance Yarra's healthy and growing urban forest, improving liveability and mitigating the impacts of the urban heat island effect
- To manage current and future tree-stock through best practice urban tree management using evidence-based planning and decision making, together with cross-organisational implementation and innovation
- To engage and support community involvement in the development of a flourishing and unique urban forest

Implementation of the UFS intends to include the development of a 10-year Priority Plan. In this plan, planting locations will be decided based on primary drivers including significant areas of biodiversity and areas identified as important linkages for fauna, including tree canopy corridors and understorey linkages to address the Climate Emergency.

Another action associated with the Urban Forest program will be to develop support materials to embed urban forest principals into capital works and open space programs to realise outcomes that benefit natural-values.

Council plants between 800-1000 trees per annum in streetscapes.

Urban Agriculture:

The City of Yarra Urban Agriculture Strategy 2018 – 2023 helps promote sustainable local food systems and build community resilience. Sustainable local food systems improve the management of the food cycle from production through processing, distribution, access, consumption and resource and waste recovery. Whether it be growing a few herbs on a balcony, a roof top farm, developing a market garden or

contributing to a thriving community growing space, urban agriculture is becoming increasingly popular. On a systems level, urban agriculture adds to the multifunctionality of the urban fabric, by facilitating a wide range of benefits to urban communities, including recreational social and cultural benefits as well as environmental (urban greening, climate regulation, biodiversity, nutrient recycling).

A key urban agriculture action is to develop educational material with partners to enhance community understanding of traditional foods and agricultural practices.

Urban Agriculture (UA) systems have the ability to increase the biodiversity of urban landscapes. UA systems offer an extensive, varied, and undervalued resource for enhancing urban biodiversity and improving connectivity across the larger landscape. Furthermore, biodiversity supported by UA can increase the quality and quantity of ecosystem services delivered across the urban sphere. (The future of urban agriculture and biodiversity-ecosystem services: Challenges and next steps: Brenda B. Lina, Stacy M. Philpottb, Shalene J. hac, 8/1/2015)

OS Design (YOSS - Open Space Design and Management Guidelines):

These guidelines aim to support the core guiding principles and directions for open space as set out in the Yarra Open Space Strategy (in prep.) Existing Council policies and best practice inform these guidelines. The guidelines are to be referred to in relation to the future design and management for all open space in the City of Yarra.

Guidelines related to nature/biodiversity are principally addressed in:

6.2 Climate change/urban greening

- 6.2.1 Protecting mature canopy trees
- 6.2.3 Vegetation selection

6.3 Biodiversity values and natural character in open space

- 6.3.1 Open space with nature conservation values
- 6.3.2 Biodiversity values in other areas of open space

Embedding Green Infrastructure Guidelines:

The Embedding Green Infrastructure Best Practice Toolkit has been developed by the City of Yarra with input from multiple councils to create a tool applicable for all Victorian Local Government.
This toolkit will help Council's assess their own practices against best practice green infrastructure guidance. It also provides a resource manual to help the implementation of green infrastructure become streamlined, cost effective, and business as usual.

Green infrastructure refers to trees, shrubs, grasses and Water Sensitive Urban Design (WSUD) in urban environments. Green infrastructure addresses a direct and important link between greening and water management. Healthy trees and vegetation rely on the provision of soil moisture to thrive and flourish, while vegetated areas play a key role in absorbing, treating and controlling stormwater runoff in urban areas.

Green infrastructure improves the environmental and social quality of an area and contributes to improving the long-term liveability of our cities and communities. Our cities face a number of pressures including population growths, increased urban development, and the effects of climate change, such as rising temperatures and extreme weather. Creating green, cool, climate adapted spaces will be key to responding to these pressures and emphasises the importance of local governments embedding green infrastructure into the planning, design and function of our cities.

The Toolkit consists of:

- Best Practice Review
- Case Studies
- Self Assessment Tool
- Economic Framework
- Design Guidelines

‘Embedding Green Infrastructure Best Practice Toolkit’ is the result of the Victorian Climate Change Grant from the Department of the Environment, Water, and Planning (DELWP).

The City of Yarra is the lead Partner in this project, with other Project Partners being Cities of Melbourne, Brimbank and Moreland, the Green Infrastructure Research Group, and the Northern Alliance for Greenhouse Action.

Yarra Community Grants:

The City of Yarra annual grants provide financial and in-kind support for community initiatives and projects.

In 2020 this program will invest over $900,000 in programs which support and enrich the Yarra community. The funded programs will address a wide variety of local needs and promote connectedness and well-being across Yarra. The Annual Grants are split into a number of different streams. Some of these streams also have sub-categories. These are:

Arts and Culture, Community Development, Community Housing Family, Youth and Children, Sports and Recreation, Sustainability and Youth-Led Grants

Sustainability Stream
The Sustainability Stream seeks to support initiatives that engage and empower the community to take environmental action at a local level. This is in line with Council’s Yarra Environment Strategy and other sustainability commitments.
Council encourages grant applications that seek to address these climate, waste and resource use priorities. Council also has commitments and programs to enhance urban agriculture, sustainable transport and biodiversity and welcomes applications that respond to these areas.
There are two project categories: Partnering for Sustainability and General Sustainability Grant.

General Sustainability Grant
The General Sustainability Grant supports a diverse range of smaller projects to deliver sustainability outcomes. Projects may be broad and holistic or may focus on any particular aspect of environmental sustainability. Project management, promotional, on-ground and capacity building activities are all eligible. Infrastructure and equipment may be funded as long as they are part of a holistic project that benefits and engages the community.

Partnering for Sustainability
This category seeks to support community projects that are larger and more complex in nature, the priorities for this funding stream are:

- Partnerships
- Legacy
- Reach
- Innovation

Cats in the urban environment – a challenge for native wildlife management

Cats are a deeply entrenched part of many people’s lives, often considered a core part of the family. However, the threat they pose to native animals is not trivial, and is vital to pragmatically address.

Cats hunt throughout the day; their exceptional night vision offers a distinct advantage for nocturnal predation to target native wildlife sleeping or active in a cat’s perceived ‘territory’. CSIRO have acknowledged the devastation both feral and domestic felines wreak on biodiversity and have investigated various mitigation measures designed to hinder cat hunting ability, including desexing to reduce wandering and nuisance behaviours.

While containment and revising regulations governing cat ownership aim to reduce cat densities, further consideration to prohibit cat ownership around conservation areas has been a long adopted strategy by some urban fringe councils. Yarra’s Domestic Animal Management Plan and the Wildlife Management Plan make reference to

the cat predation problem and their review in the coming years will need to consider recent data about Victoria's species extinction rates.

While Council's direct management of cats is largely undertaken by Yarra's Compliance and Parking Services Team, this Strategy aims to further articulate the impact of cat predation through the development of a Literature Review, to support further collaboration across the several departments and surrounding councils and collaborating with the Communications and Engagement Unit to develop a communications plan to educate and promote responsible cat ownership and keeping cats inside at night.

Opportunities and challenges for nature

Essential to this strategy's development, has been the stakeholder engagement process that involved the Wurundjeri Woi Wurrung Council, community group members, experts in flora, fauna and land management policy, adjoining land managers, regional authorities and City of Yarra staff. This invaluable process identified the following opportunities and challenges which shaped the basis to draft a strategy:

Wurundjeri Woi Wurrung

- The Wurundjeri Woi Wurrung Council are key partners in the management and appreciation of natural values in the City of Yarra, as many or all of the natural values are also cultural values. Engagement and involvement of the Wurundjeri Woi Wurrung Council to ensure their values and stories are honoured and conserved is integral to this Nature Strategy. This Strategy includes actions that seek opportunities to work with the Wurundjeri Woi Wurrung Council in recognition of their heritage and custodianship of the land. This may be done in partnership with other areas of council, for example Urban Agriculture or Community Partnerships.

Biodiversity values

- The Yarra River and its parklands form a substantial and significant base of critical habitat along the eastern border of the municipality upon which to build further biodiversity values.
- The Merri and Darebin Creeks provide two important northern habitat links, which link to the Yarra. These waterways are well loved, accessible and comprise a myriad of natural values. These areas can be strengthened, connected and form the anchor points for terrestrial links.
- The Biodiversity Health Survey, completed in 2016 provides a solid resource to base future work on and the ecosystem model is useful from an ecological perspective. However, there is more information that is known by local experts (land managers, Wurundjeri Woi Wurrung Council, community groups, indigenous nurseries and academics) that needs to be considered. Examples include: locations of high small bird diversity known only to long-term bird observers; locally rare plants that may become lost; and culturally significant areas for the Wurundjeri Woi Wurrung.
- Recognising and surveying for other 'urban significant' species such as, frogs, echidnas or sugar gliders. Certain species guilds may have niche habitat requirements that are not identified as having high biodiversity values via scientific measures. Nevertheless, these species may be useful for engaging the community with nature-based programs, as they are 'likeable critters' and easier for the community to identify with than an obscure bird species. This can be in addition to more abundant species such as the common ringtail and brushtail possums, which are widely known to the public, though still face their own challenges in urban environments.

Council

- Within council, natural affinity exists between the conservation of and engagement with nature and the areas of Open Space, Environment and Sustainability, Urban Forestry, Heritage, Water Management, Planning and Urban Agriculture. There would be a benefit to seeing each of these teams better linked and interacting to achieve better outcomes for nature in the City of Yarra. The Nature Strategy will need to acknowledge and interact with the strategies and objectives of these other teams, seeking synergies and opportunities for positive outcomes.
- The impacts associated with new development and higher density urban areas has been emphasised as both an opportunity and a threat. There are biodiversity opportunities that have been identified via use of the planning scheme as well as supporting guidance for planners and applicants to see better outcomes in the

private realm. Additionally the possibility of introducing a development levy for nature has also been suggested more than once during stakeholder engagement.

Water management

- Water quality and water infrastructure, including stormwater management are integral to ensuring the health of natural systems in the City of Yarra. Waterways and wetlands are also indicated as being of cultural importance to the Wurundjeri Woi Wurrung Woi Wurrung. This needs to be reflected back through all areas of council and via partnerships with other relevant agencies, i.e. Melbourne Water, Wurundjeri Woi Wurrung Woi Wurrung Council and water service providers.

Community

- The community (residents and visitors) of the CoY can take action and contribute, and will also benefit via higher quality natural values in all areas of the municipality. The City of Yarra has been relatively conservative in resourcing community engagement in nature compared to other Councils. Community groups are currently acting as a conduit for community engagement. This could be built on but should be complemented by investment in staff resources as well as augmenting relationships with existing community groups, recognising the work that they currently do and assisting them to build on that.
- The community has emphasised the importance of ongoing ecological knowledge, innovation and trials in implementing more sophisticated approaches to on-ground biodiversity management. This could involve:
    - annual review of elements of ecological function
    - planning for ecological outcomes based on natural systems, species outcomes and corridors rather than by park/reserve
    - consideration of senescent (aging) vegetation and on ground management techniques to replace vegetation, possibly through natural recruitment
    - provision for trials and innovation in on-ground management and reintroductions
    - continuity in management and preserving/documenting ecological knowledge
    - coordination of land management across all land managers i.e. Parks Victoria and Melbourne Water
- The Yarra Environment Strategy community engagement process has demonstrated that there is an appetite for integrating nature-focussed elements and habitat features into the private, streetscape and neighbourhood-scale realm. Community members believe this will result in benefits for health, wellbeing and amenity over and above the ecological benefits.
    - Priority 1. Everyday nature / greenscaping
    - Priority 2. Community engagement and capacity building, education and youth
    - Priority 3. Thriving neighbourhoods
    - Priority 4. Take urgent action towards climate neutrality and zero waste
    - Priority 5. Council leadership
    - Priority 6. Support business sustainability
- Urban Agriculture programs and activities which are already well established in the City of Yarra contributes to positive natural values outcomes and there are natural synergies which should be explored and strengthened through both this strategy and the Urban Agriculture strategy. Good working relationships will see improved outcomes in each complementary area.

Communication

- A dedicated communication program for nature-focussed news, initiatives and interactions is required. This would also serve to build trust with the community, that council are managing natural values in an informed and timely way. In particular the community were interested to see greater transparency around what is being done/where/why? One suggestion was for council to develop a semi-accessible online platform for the community to observe progress of land management and to contribute to it.

Adjacent councils

- Other councils have implemented initiatives and set standards that can be adopted by the City of Yarra. Many examples exist that could be easily adopted, thereby enabling council to benefit from the learning's of others. One example is City of Melbourne's native street garden planting palate and urban nature planting guide that is available on the City of Melbourne's website.
- There is goodwill and enthusiasm for cooperation between staff from adjoining municipalities to work across-borders on projects that will benefit all.

Relationships with other institutions

- The City of Yarra is very well placed to engage with academic institutions who are actively involved in urban ecology research. Melbourne University's Burnley Campus lies within the municipality and already completes projects within council reserves. Other institutions like RMIT also have an interest in urban ecology and could assist with collaborative research and other initiatives as they have with other urban municipalities.

The Platypus currently inhabits the waters of the Yarra River and Merri Creek. Photograph from Getty Images

The Powerful Owl uses the vegetation of the Yarra River, Merri and Darebin Creek corridors to forage and shelter. Photograph Craig Lupton

Extinction crisis – an opportunity for action

Biological diversity is messy. It walks, it crawls, it swims, it swoops, it buzzes. But extinction is silent, and it has no voice other than our own. Paul Hawken, journalist, philanthropist.

In May, 2019, the United Nations Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services (IPBES) panel released the most comprehensive report yet on the state of global ecosystems, highlighting that up to one million plant and animal species face extinction, many within decades, because of human activities.

Without drastic action to conserve habitats, the rate of species extinction — already tens to hundreds of times higher than the average across the past ten million years — will only increase, says the analysis.

The loss of species and habitats poses as much a danger to life on Earth as climate change does, stated a summary of the work, released on 6 May 2019.

Anne Larigauderie, IPBES executive secretary stated that "Biodiversity should be at the top of the global agenda alongside climate. We can no longer say that we did not know".

Along with the Climate Emergency, this extinction crisis presents a real challenge for every person and particularly every organisation in a place of influence, such as the City of Yarra. It also provides a compelling reason to act.

Nature in Yarra: The way forward

This Nature Strategy is being developed at a time when the value of nature is being recognised; and as the effects of increasing urbanisation and climate change are hitting urban environments and an awareness of the plight of nature is becoming heightened.

This is the first Nature Strategy for the City of Yarra and while it includes a strong focus on the conservation of nature and on engaging the community with natural values, importantly, it also seeks to strengthen internal processes and resources to ensure that natural values are considered as core council business. This is being undertaken with the overall aim that the City of Yarra will lead via its nature conservation activities, like Yarra has for many years on other important issues like sustainability and climate action.

There is significant opportunity to improve habitat and reinstate local plant species in Yarra which can in turn support further wildlife. This is one opportunity to address the current Extinction Crisis, while creating a more adaptable urban environment in the face of the Climate Emergency. Where opportunities exist in lawn areas, and under tree canopies where appropriate, the reinstatement of indigenous midstorey and understorey vegetation should be considered as a part of future open space management objectives and outcomes.

Conservation of nature

In 1982 the *World Charter for Nature* was adopted by United Nations member nation-states. It proclaims five "principles of conservation by which all human conduct affecting nature is to be guided and judged."

1. Nature shall be respected and its essential processes shall not be impaired.
2. The genetic viability on the earth shall not be compromised; the population levels of all life forms, wild and domesticated, must be at least sufficient for their survival, and to this end necessary habitats shall be safeguarded.
3. All areas of the earth, both land and sea, shall be subject to these principles of conservation; special protection shall be given to unique areas, to representative samples of all the different types of ecosystems, and to the habitats of rare or endangered species.
4. Ecosystems and organisms, as well as the land, marine and atmospheric resources that are utilized by man, shall be managed to achieve and maintain optimum sustainable productivity, but not in such a way as to endanger the integrity of those other ecosystems or species with which they coexist.
5. Nature shall be secured against degradation caused by warfare or other hostile activities.[1]

Yarra's role in valuing and conserving nature

In recognition of themes that are associated with the UN Charter for Nature and similar agreements, the City of Yarra's key roles in conserving and improving nature are:

- To ensure that the City of Yarra actively seeks the conservation of its natural values through its own management and leadership.
- To ensure Wurundjeri Woi Wurrung values and interests are included and integrated in nature conservation and engagement activities, seeking methods to involve Wurundjeri Woi Wurrung in decisions and custodial activities.
- To work with local, municipal and regional networks to promote natural values and to seek methods to progress positive outcomes for nature.
- To provide education, support and engagement opportunities to residents and visitors through a dedicated engagement and communications program.

Limitations of this strategy

This strategy is designed to be focused and realistic with clear aims and objectives. As the first Nature Strategy for the City of Yarra, there are many items that are new for council, requiring leadership and commitment of new resources.

This strategy also focuses on building networks and processes in recognition that the governing processes for natural values sit across many different council teams. Indeed, most council teams will be relevant to seeing the success of this strategy. Similarly, collaboration will also need to extend to all neighbouring municipalities and land managers.

This strategy is a stepping stone, it aims to build the foundations of processes and programs to see better outcomes for the natural values in the City of Yarra while maintaining some flexibility to be responsive to any future/new opportunities that may arise.

The timeframe of four years applied to the strategy is intentionally short in recognition that this policy area is rapidly evolving and that regular revision will ensure it stays relevant.

Monitoring and evaluation

Monitoring will be integral to ensuring the success of the strategy. It will be required at various levels and for a variety of purposes. These include:

- Progress against management priorities and actions. This includes reporting annually across all relevant teams on key implementation actions, particularly those which have short or ongoing timeframes.
- Onsite results in bushland and weed management against current or revised standards.

To maintain the relevance of this strategy: priority actions, resources and training requirements will be determined annually, following a review of the following performance measures towards achieving its objectives:

- Reports on actions outlined in this Strategy will be provided to council annually.
- This strategy includes provisions for periodic review and adjustment.
- This will occur via annual internal and external progress reviews. These review processes will be informed by consultation with other stakeholders and the community.
- A detailed report and review will take place at the end of the four year period.

Nature Action Plan 2020-2024

This action plan provides a summary of the actions and targets that are proposed to meet each of the four goals. Details are provided on proposed timing, internal collaboration and external partnership opportunities and what level of impact action delivery will have on the business. For example, actions will be delivered through business as usual processes, capital works, new initiative bids/business case and/or external funding. All actions are subject to the Council annual budget cycle, and approval process and service delivery priorities. Unless otherwise stated, the Biodiversity and Urban Agriculture Team, City Works Branch, will be responsible for delivery of the Nature Action Plan 2020-24.

Further detail for each of these actions is provided in **Appendix 3 Nature Action Plan context**.

Goal 1: Increase the diversity, connectivity and resilience of Yarra's natural environment

Management Principle	Actions	Target	Priority/Timeframe	Collaboration/Partnerships
1.1 Consolidate and grow areas of high quality, diverse habitat	Consolidate and increase the condition of all patches of current indigenous vegetation.	Indigenous vegetation understorey score in all current native vegetation patches increased by 20% by Year 3.	Medium Year 1 – 3	Contractors, community groups and Universities, Wurundjeri Woi Wurrung Council Narrap Team
	Review all indigenous vegetation patches in the context of their role as habitat within a corridor and their contribution to ecological function. Adjust management approach accordingly, following collaboration with the Wurundjeri Woi Wurrung Woi Wurrung Council Narrap Team to consider adopting traditional practices in Yarra.	Management planning for bushland areas includes consideration of ecological function for key indicator species and consideration of threatening processes by end of Year 2. This is documented and monitored.	Medium Year 2	Ecological consultants, contractors, community groups and Universities, Wurundjeri Woi Wurrung Council Narrap Team
	Prioritise some areas for enhancement and identify locations for linking, while engaging with the Wurundjeri Woi Wurrung Woi Wurrung Council to consider works in culturally important areas.	Increase indigenous vegetation understorey extent (at >25% cover) within Open Space by 0.5 ha annually.	High Year 1 - 4	Open Space Planning, Open Space Maintenance Community Groups, General Community, Parks Victoria, Local Government, Melbourne Water and Wurundjeri Woi Wurrung Council Narrap Team

Management Principle	Actions	Target	Priority/Timeframe	Collaboration/Partnerships
1.2 Increase flora and fauna diversity	Establish monitoring locations targeting higher quality habitat and also low-quality areas for key indicator fauna groups. Fauna recommended to include: • Pollinator insects, butterflies • Birds (diverse range of guilds) • Micro-bats Collaborate with the Wurundjeri Woi Wurrung Woi Wurrung Council Narrap Team to consider alternative indicators of ecosystem health.	Net positive flora and fauna diversity by end Year 3 resulting in an appropriate increase in each of the faunal groups listed.	Medium Year 2 - 3	Community Groups, Universities, Ecological Consultants, Local Government, DELWP, Conservation Groups (FNVC), Bird Australia, Wurundjeri Woi Wurrung Council Narrap Team
	Design and deliver a monitoring program that measures diversity in fauna focussing on key indicator fauna groups (above). Involve public/citizen science where possible.	Monitoring conducted at relevant intervals (as determined by method). Data is useful, interpreted and made publicly available in an engaging way.	Medium Year 2 - 4	Communications and engagement Unit, Yarra CityLab Community Groups, Universities, Ecological Consultants, Local Government, DELWP, Conservation Groups including Field Naturalists Club of Victoria (FNCV), BirdLife Australia, Wurundjeri Woi Wurrung Council Narrap Team
	Where deemed appropriate, initiate re-introductions, particularly for flora in key locations.	Optional target: a 5% increase in indigenous flora diversity within bushland reserves.	Low Year 2 - 4	Victorian Indigenous Nursery Cooperative (VINC), Ecological contractors, Wurundjeri Woi Wurrung Narrap Team
	Collaborate with the Communications and Engagement Unit to develop a communications plan to educate and promote responsible cat ownership and keeping cats inside at night.	To reach the owners of all registered cats in Yarra.	Medium Year 2 - 3	Communications and Engagement Unit and Compliance and Parking Services Team

Management Principle	Actions	Target	Priority/Timeframe	Collaboration/Partnerships
	Develop a literature review related to the impact of cats in Yarra, to be used as a potential 'Justification Paper' for the development of further policies.	An easily interpreted and implemented set of recommendations is created.	Medium Year 2 - 3	Universities (literature review), Compliance and Parking Services Team
1.3 Protect and celebrate significant habitat trees and their values	Building on the trees documented via the Biodiversity Health Survey, document and map all large old trees and others that provide significant habitat. Include a description of their habitat values, including hollows.	Maintain the number of hollow bearing trees. Implement programs to see an increase of 5% annually including planting of indigenous trees, creating artificial hollows and retaining dead trees where it is safe to do so. All significant habitat trees added to the Significant Tree register.	High Year 1	GIS/Spatial Unit Ecological/Arboriculture Consultant, Wurundjeri Woi Wurrung Council
	Engage with Wurundjeri Woi Wurrung Council to ensure Large Old tree values that are culturally significant are adequately considered in the City of Yarra (and its land management partners) policy and practice. This action may align with the Heritage Strategy which aims to engage the community in identifying areas of Natural Heritage value.	All trees identified by Wurundjeri Woi Wurrung Council protected via the appropriate mechanism (such as the Aboriginal Heritage Act 2006 or the Yarra Planning Scheme) if/where this is culturally appropriate and sensitive. Procedures and training in cultural heritage awareness and practice are up to date for all relevant staff.	High Year 1	Statutory and Strategic Planning, City Heritage, Community Partnerships Wurundjeri Woi Wurrung Council
	Ensure local laws protocols are in place to protect all significant habitat trees.	No significant habitat trees removed on streets or open space that is managed by the City of Yarra.	Medium Year 2	Open Space Maintenance, Statutory, Planning, Compliance and Parks Services

Management Principle	Actions	Target	Priority/Timeframe	Collaboration/Partnerships
	Promote significant habitat trees, and their values in an online forum. Encourage public interaction.	The City of Yarra resident's survey indicates increased awareness of significant habitat trees and their values.	Medium Year 2	Communications and engagement Unit
1.4 Understand and conserve habitat refuge areas for plants and animals	Commission a project in recognition of Yarra's Climate Emergency Plan to advise on council's role in providing nature refuge areas (for species affected by climate change) and actions that it can implement.	Climate refuge study complete by end Year 2. Any resulting recommendations funded in Year 3.	Medium Year 1 -3	Sustainability Unit Ecological Consultant
1.5 Conserve locally rare or threatened flora and fauna	Establish a 'local legends' working and networking group. Key stakeholders include VINC, Parks Victoria, Wurundjeri Woi Wurrung Council and staff from adjoining councils and land managers e.g. Merri Creek Management Committee (MCMC), Darebin Creek Management Committee (DCMC).	No new local extinctions in flora or fauna	High Year 1	VINC, Parks Victoria, Wurundjeri Woi Wurrung Council, Local Government and staff and land managers
	Invest in a project that focuses on the long-term sustainability of locally rare flora and fauna. For example flora seed conservation, seed orchards and plantings with the option to encourage residents to grow a seed orchard for a rare plant at their home.		Low Year 1 - 4 (a four year project)	In House Horticulture Team VINC, Community Groups, Local Community
	Investigate and document locally rare plants and animals. Promote this information via online opportunities and seek engagement from the community.		Low Year 2 - 4	Communication and Engagement Unit Universities, Community Groups, Ecological Contractors

Management Principle	Actions	Target	Priority/Timeframe	Collaboration/Partnerships
1.6 Conserve state and federally significant flora and fauna	Collaborate with other land and water managers to enhance habitat and the conservation status of all confirmed State and nationally-threatened flora and fauna.	No local extinctions of state or nationally threatened fauna in the City of Yarra.	Medium Year 2	Land and Waterway Managers, Community Groups, Universities, local community, Conversation Groups
	Conduct targeted fauna surveys that build on the Biodiversity Health Survey work to confirm a baseline level for threatened fauna within the municipality. Collaborate with other land managers as required, e.g. Melbourne Water for aquatic animals. Parks Victoria and Birdlife Australia (Swift Parrot) as necessary.	Extent of state or nationally threatened fauna is known and documented.	Medium Year 2	Melbourne Water, Parks Victoria, DELWP, FNCV, Birdlife Australia, Universities
	Complete further research to confirm or otherwise, the occurrence of state or Nationally-threatened flora.	Extent of state or nationally threatened flora is known and documented.	Medium Year 2	Melbourne Water, Parks Victoria, DELWP, Universities
1.7 Increase habitat connectivity	Research and develop connectivity plans for keystone or character species for at least 3 habitat links with at least one being a new terrestrial link.	At least 3 connectivity projects delivered in 4 years, focussing on waterways (2) and terrestrial priorities (1). Utilise the priorities established in the City of Yarra Integrated Waterways Plan (see Action 1.9) to align with the objectives of the YRSP.	Medium Year 1 - 4	Strategic Planning, Open Space Planning Adjacent Land Managers, Wurundjeri Woi Wurrung Council, Community Groups, Local Community, Land and Waterway Managers
	Host community consultation meetings during the planning of each connectivity project.	At least 3 connectivity projects delivered in 4 years, focussing on waterways (2) and terrestrial links (1).	Medium Year 2	Communications and Engagement Unit Adjacent Land Managers, Wurundjeri Woi Wurrung Council, Community Groups, Local Community

Management Principle	Actions	Target	Priority/Timeframe	Collaboration/Partnerships
1.8 Increase integrity and innovation in biodiversity management.	Establish a working group of bushland management experts to inform council on its on-ground management and associated programs. Also to collaborate on cross-tenure projects. Include experts such as Merri Creek Management Committee, Darebin Creek Management Committee, VINC, the Narrap team, Melbourne Water, Parks Victoria, land managers from adjoining councils and council contractors. This group may be best implemented as a larger inner-Melbourne working group allowing for information sharing and time efficiencies.	Working group established by end Year 1 and meeting 6 monthly thereafter.	High Year 1	Merri Creek Management Committee, Darebin Creek Management Committee, VINC, the , Wurundjeri Woi Wurrung Council Narrap team, Melbourne Water, Parks Victoria, land managers from adjoining councils and council contractors
1.9 City of Yarra Integrated Waterway Corridors Plan	Contribute to the preparation of a specific integrated waterway corridors plan for Yarra that brings together all the strategic directions and provides an overall single coordinating plan of action.	To acknowledge the YRSP objectives and the need to assess the opportunities locally and across boundaries with partners to deliver the YRSP commitments and to generate plausible strategic waterways restoration projects to access available funding.	High Year 1 - 2	Strategic Planning, and Open Space Planning

Goal 2: Encourage people to appreciate and actively enhance Yarra's natural landscape

Management Principle	Actions	Target	Priority/Timeframe	Collaboration/Partnerships
2.1 Encourage and support 'nature-focussed' initiatives on private land and throughout streetscapes at the neighbourhood-scale	Establish a 'nature in the neighbourhood' reference group. Consider if/where it is possible to combine with Urban Agriculture and/or Environment Advisory Committee where relevant.	'Nature in the neighbourhood' Action Plan developed in consultation with reference group by the end of Year 1.	High Year 1	Sustainability Unit, Urban Agriculture, Waste Management, Communications and Engagement Unit, Community partnerships, YAC, RMIT, Wurundjeri Woi Wurrung Council, Local Community, Community Groups, Local Government, Gardens for Wildlife Victoria
	Work with the reference group to plan initiatives that include a focus on increasing nature in the private and streetscape realm. This may include integration with Urban Agriculture and indigenous cultural initiatives.		High Year 1	Sustainability Unit, Urban Agriculture, Waste Management, Communications and Engagement Unit, Community partnerships, YAC, RMIT, Wurundjeri Woi Wurrung Council, Local Community, Community Groups, Local Government, Gardens for Wildlife Victoria
	Fund and implement the abovementioned action plan.	500 households in the City of Yarra participating in a nature in the neighbourhood initiative by end of Year 4. One streetscape initiative implemented by the end of Year 4 that aims to introduce nature-focussed elements into a neighbourhood, resulting in wellbeing and community benefits.	Medium Year 2 - 4	
2.2 Invest in nature engagement	Identify resource to deliver community engagement initiatives.	Engage resources to deliver community engagement initiatives.	High Year 1	Human Resources

Management Principle	Actions	Target	Priority/Timeframe	Collaboration/Partnerships
	Scope and deliver a number of nature engagement initiatives. Seek to collaborate with other councils that have run successful programs.	Nature engagement program involving at least two new initiatives in place by end Year 2, with one of the programs being Gardens for Wildlife. Engagement program including Actions 2.1, 2.3 implemented by end Year 2.	High Year 1 - 2	Communications and Engagement Unit, Urban Agriculture, Sustainability Unit. Gardens for Wildlife Victoria, Local Government, VINC, Local Community, Community Groups, Wurundjeri Woi Wurrung Council, Parks Victoria
2.3 Establish a nature in Yarra communications program	Design and implement online communication program for nature-focussed news, initiatives and interactions. Seek to integrate with existing communication mechanisms used in environmental, sustainability and urban agriculture projects.	Engaging nature-based content on the City of Yarra website and other council communications channels throughout the year from when new program commences. Regular engagement via social media.	High Year 1	Communications and Engagement, Urban Agriculture, Sustainability Unit. Communications Consultant, Universities Wurundjeri Woi Wurrung Council
	Trial an online program which allows the City of Yarra to share information about its on-ground management activities and allows the community to assist/contribute to it.		Low Year 2	Communications and Engagement Unit, Urban Agriculture, Sustainability Unit

Goal 3: Embed nature at the core of Yarra's business practices

Management Principle	Actions	Target	Priority/Timeframe	Collaboration/Partnerships
3.1 Ensure nature is considered as core Council business.	Planning and reporting to consider and address natural values.	City of Yarra's processes explicitly recognise nature as a component of Environment in the quadruple bottom line approach. Nature is one of the 'implications' to be considered within Council Reports. Annual plan includes a dedicated budget line for biodiversity or nature-focussed programs and projects. Ensure Yarra Annual Grants has a separate for category for Nature/Biodiversity enhancement projects.	High Year 1	Governance, Community Grants
3.2 Encourage more natural spaces in the private realm via planning mechanisms.	Provide resourcing to support delivery of strategic biodiversity/natural values requests and projects.	Resourcing support provided	High Year 1	Human Resources, Statutory Planning
	Implement requirement for landscaping plans for permit applications for 2+ lot subdivisions and above.	Increased incidence of indigenous landscaping and habitat components in developments. Shown in Landscaping Plans and monitored by audit of 10%.	Low Year 2	Statutory Planning, Open Space Planning, Urban Design
	Develop pre-application information for planning permits that includes preferences around use of indigenous plants and habitat components.		Low Year 2	Statutory Planning, Open Space Planning, Urban Design
3.3 Consider options for new planning tools to see more nature-focussed outcomes.	Include nature based policy in the draft local planning policies for the Yarra Planning Scheme	Include policy that seeks to protect and enhance natural environments and seek to increase the quality and quantity of the city's biodiversity.	Low Year 3	Strategic Planning

Management Principle	Actions	Target	Priority/Timeframe	Collaboration/Partnerships
3.4 The City of Yarra leads by example	In order to meet the multiple objectives associated with Environment, Sustainability, Nature and Water Infrastructure, seek expert advice on all in-house projects for their 'green infrastructure' credentials, including nature-focussed elements.	All council-led projects to include green infrastructure and demonstrably consider nature and habitat elements in their design and implementation.	High Year 2 - 3	Lead Sustainability Unit, supported by City Works Branch
	The City of Yarra recognises that green infrastructure includes nature-focussed elements and updates process and design practice accordingly.		Medium Year 2	Sustainability Unit

Goal 4: Make innovation, communication and collaboration the cornerstones of Yarra's nature-focussed programs

Management Principle	Actions	Target	Priority/Timeframe	Collaboration/Partnership
4.1 Collaborate with others who share common goals.	Participate in networks with other municipalities, organisations and institutions who are working on similar issues around urban ecology.	Staff role descriptions and time allocations provided to relevant staff for participation in relevant networks.	High Year 1 - 4	Local and State Government, Community Groups, Universities, Wurundjeri Woi Wurrung Council
	Support partnership projects that result in mutual benefits for nature.	Council management acknowledges optional funding for partnership projects as relevant.	Medium Year 1 - 4	Local and State Government, Community Groups, Universities, Wurundjeri Woi Wurrung Council
4.2 Develop working partnerships with academic institutions	Actively collaborate with an educational institution on at least one new project each year.	At least one project per year is implemented in partnership with an educational institution.	Medium Year 1- 4	Universities and TAFEs
	Develop a list for a series of projects that include student monitoring of council reserves or encourage teaching and learning in these reserves. The results of this will be fed back to the City of Yarra.	A working partnership to encourage student field studies in council reserves is established by end Year 1 and active by Year 2. Results are useful for all parties involved.	High Year 1	Universities and TAFEs
4.3 Use Smart City technology to assist in conserving natural values	In conjunction with CityLab, scope one project to deliver annually with relevance to nature in the City of Yarra. Option to work collaboratively with other urban councils.	One project is scoped and delivered annually with the assistance of CityLab.	Low Year 2 - 4	CityLab, Sustainability, Communications and Engagement Unit

Glossary

Alien (species): Not native (also referred to as exotic).

Anthropogenic: Resulting from or produced by human beings.

Biodiversity: A word derived from biological diversity. The variety of all life forms: the different plants, animals and micro-organisms, their genes, and the communities and ecosystems of which they are part. Biodiversity is usually recognised at three levels: genetic diversity, species diversity and ecosystem diversity.

Bioregion: A landscape-scale approach to classifying the environment using a range of attributes such as climate, geomorphology, geology, soils and vegetation. There are 28 bioregions identified within Victoria.

Biosphere: The part of the Earth system comprising all ecosystems and living organisms in the atmosphere, on land (terrestrial biosphere) and in the oceans (marine biosphere). It includes derived dead organic matter, such as litter, soil organic matter and oceanic detritus.

Biota: All the plants, animals and micro-organisms of a particular region.

Canopy: Layer of vegetation elevated above the ground, usually of tree branches and epiphytes. In tropical forests, the canopy may be more than 100 feet above the ground.

Canopy tree: A mature tree (i.e. it is able to flower) that is greater than 3 metres in height and is normally found in the upper layer of the relevant vegetation type.

Climate: The average weather in a region over a long period of time. Average weather may include average temperature, precipitation, wind patterns, ultraviolet (UV) levels and other physical measurements.

Climate change: Any long-term significant change in the 'average weather' that a given region experiences. In recent usage, the term 'climate change' often refers to changes in modern climate due to global warming.

Community or Ecological community: A naturally co-occurring biological assemblage of species that occurs in a particular type of habitat.

Connectivity: The extent to which particular ecosystems are joined with others of similar kind; the ease with which organisms can move across the landscape. Also applies to the extent to which populations of a species are able to interact with each other through gene flow (interbreeding.)

Corridor (for wildlife): A strip of habitat of varying width that facilitates animal movement between otherwise isolated patches of habitat.

Diameter at Breast Height (DBH): The diameter of the main trunk of a tree measured over bark at 1.3 metres above ground level. The diameter is the circumference (in centimetres) of the tree divided by π (3.14).

Dispersal: The movement of organisms from one place to another. This differs from migration, which is a cyclical event due to seasonal changes in resources.

Disturbance (ecological): A temporary change in average environmental conditions that causes a pronounced change in an ecosystem. Outside disturbance forces often act quickly and with great effect, sometimes resulting in the removal of large amounts of biomass. Ecological disturbances include fires, flooding, windstorm, insect outbreaks, as well as anthropogenic disturbances such as forest clearing and the introduction of exotic species. Disturbances can have profound immediate effects on ecosystems and can, accordingly, greatly alter the natural community. Because of these and the impacts on populations, these effects can continue for an extended period of time.

Driver: A process that changes the trajectory of a species or ecosystem. Most ultimate drivers of biodiversity loss in Australia are human activities associated with consumption or development.

Ecological community: see Community.

Ecological processes: Actions or events that shape ecosystems. Understanding ecological processes – whether they are natural disturbances like fire, or ongoing processes like nutrient cycling or carbon sequestration – is the key to the development and implementation of sustainable ecological management.

Ecological Vegetation Class (EVC): An indigenous vegetation type classified on the basis of a combination of its floristics, lifeforms, and ecological characteristics. Ecology: The scientific study of the distribution and abundance of life on Earth, and the interactions between organisms and their environment.

Ecosystem: An ecosystem is a dynamic complex of plant, animal and micro-organism communities, and the non-living (abiotic) environment (water, soil, climate, etc.), interacting as a functional unit. Humans can be an integral part of ecosystems. Ecosystem processes: The physical, chemical and biological actions or events that link organisms and their environment. They include decomposition, production (of plant matter), nutrient cycling, and fluxes of nutrients and energy.

Ecosystem services: The benefits people obtain from ecosystems (e.g. food, renewable resources, water supply, recreational opportunities, oxygen, carbon sequestration, erosion control).

Endemic (noun: endemism): Occurring only in the stated area.

Environment: The place in which an organism lives, and the circumstances under which it lives. Environment includes measures like moisture and temperature, as much as it refers to the actual physical place where an organism is found.

Exotic (species): Introduced (see alien).

Extinction: The global disappearance of an entire species (as distinguished from extirpation).

Extinction debt: Describes the condition where a threatening process, e.g. fragmentation or climate change, leads to environmental conditions in which certain species will inevitably become extinct.

Extirpation: Local extinction.

Fire regime: The combination of fire frequency, intensity, interval and season. Different fire regimes can have different effects on ecosystems, e.g. frequent, low-intensity, cool-season fires can result in different combinations and abundances of plants and animals compared with infrequent, high-intensity, summer fires.

Flora and Fauna Assessment – is an assessment of the flora and fauna recorded during the field site surveys as well as background searches for any rare or threatened species.

Food chain: The feeding relationships between species within an ecosystem. Organisms in a food chain are grouped into trophic levels based on how many links they are removed from the primary producers (plants). The pathways of the food and/or energy within the whole system are called a food chain or a food web.

Fragmentation: Removal (usually by land clearing) of large parts of a natural area, resulting in the retention of only small fragments (or remnants).

Genera: See genus.

Genus (plural genera): A taxonomic category ranking below a family and above a species, and generally consisting of a group of species exhibiting similar characteristics. In taxonomic nomenclature the genus name is used – either alone or followed by a Latin adjective or epithet – to form the name of a species. The scientific name of a species is usually written 'genus name' then 'species name', e.g. the scientific name for humans is Homo sapiens; Homo is the name of the genus and sapiens is the specific epithet, i.e. it describes the species within that genus. There is only one living species of Homo (although some scientists have suggested that chimpanzees and bonobo should be included in Homo), while Eucalyptus includes several hundred species.

Global warming: The increase in the average temperature of the Earth's near-surface air and oceans since the mid-20th century, and its projected continuation. The Fourth Assessment Report of the Intergovernmental Panel on Climate Change concluded: 'Warming of the climate system is unequivocal.' 'Most of the observed increase in globally averaged temperatures since the mid-20th century is very likely due to the observed increase in anthropogenic greenhouse gas concentrations' ('very likely' in IPCC terminology means 'the assessed likelihood, using expert judgment, is over 90%').

Guild: A functional group of species that exploit the same class of environmental resources in a similar way and between which competition can be expected.

Habitat: The locality or natural home in which a particular plant, animal or group of closely associated organisms lives.

Habitat hectare assessment: is an assessment of indigenous vegetation to determine its condition, extent (in hectares) and EVC. The assessment must be completed by an accredited native vegetation assessor following methodology described in Native vegetation: sustaining a living landscape.

Habitat hectares: A site-based measure of biodiversity value that is calculated by multiplying the extent of native vegetation by its condition score. Habitat hectares = extent × condition score.

Indigenous: Originating or occurring naturally in a particular locality; not introduced; native.

Large tree: A native canopy tree with a Diameter at Breast Height (DBH) greater than or equal to the large tree benchmark for the relevant bioregional EVC. A large tree can be either a large scattered tree or a large tree contained within a patch.

Litter: Leaf litter, or forest litter, is the detritus of fallen leaves and bark which accumulate in forests.

Monitoring: Sampling and analysis designed to ascertain the extent of change from an expected or defined norm, or from past conditions.

Monotremes: One of three groups of living mammals, monotremes lay eggs rather than giving birth to live young. While fossil evidence suggests that the group was once more common and widespread, only five species exist today: two species in Australia (platypus and short-beaked echidna) and three species of long-beaked echidnas in New Guinea.

Native vegetation: Native vegetation is defined in Clause 72 of the Victoria Planning Provisions and all local planning schemes as 'plants that are indigenous to Victoria, including trees, shrubs, herbs and grasses.

Natural selection: The process by which heritable traits that are favourable in a particular environment become more common in successive generations of a population of reproducing organisms, and unfavourable heritable traits become less common. Over time, this process can result in adaptations that specialise organisms for particular ecological niches and may eventually result in the emergence of new species (see fitness).

Naturalised: An alien (introduced) species that has become established in the wild.

Nocturnal: Active only at night.

Niche: The total range of conditions within which a species can survive, grow and produce viable offspring. The 'fundamental niche' defines the potential distribution of a species without any interactions with other organisms, while the 'realised niche' is the area actually occupied because of limitations due to other organisms such as competitors, predators, etc.

Nutrient: Any element or simple compound necessary for the health and survival of an organism. This includes air and water, as well as food.

Organism: An individual form of life, such as a plant, animal, bacterium, protist or fungus.

Patch: A patch of native vegetation is an area of vegetation where at least 25 per cent of the total perennial understorey plant cover is native, or any area with three or more native canopy trees where the drip line of each tree touches the drip line of at least one other tree, forming a continuous canopy, or any mapped wetland included in the Current wetlands map, available in DELWP systems and tools.

Phytophthora: A genus of water moulds, many species of which damage plants. Phytophthora infestans was the infective agent of the potato blight that caused the Great Irish Famine (1845–1849). Several species of Phytophthora have been introduced to Australia, the most damaging of which is P. cinnamomi, which causes root rot and which may cause the death of the plant due to water stress (the disease is sometimes referred to as dieback).

Placental (mammals): A derivation of 'placenta', an organ of the foetus of most mammals that attaches to the wall of the mother's uterus (womb), and provides for foetal nourishment and elimination of waste products. The other groups of mammals –monotremes (e.g. echidna, platypus) and marsupials – do not have a placenta.

Pollinator: Animal which carries pollen from one seed plant to another, unwittingly aiding the plant in its reproduction. Common pollinators include insects, especially bees, butterflies, and moths, birds, and bats.

Population (biological): The collection of individuals of a particular species in a stated area; they may or may not interact with other populations (see gene flow). Refugium (plural: refugia): An area that has escaped or will escape changes occurring elsewhere and so provides a suitable habitat for relict species. Resistance: The degree to which a system does not respond to a shock (as opposed to resilience, which describes the extent to which it changes).

Predator: Organism which hunts and eats other organisms. This includes both carnivores, which eat animals, and herbivores, which eat plants.

Prey: Organism hunted and eaten by a predator.

Restoration: renewing a degraded, damaged or destroyed ecosystem through active human intervention.

Riparian: Having to do with the edges of streams or rivers.

Salinity: A measure of the salt concentration of water. Higher salinity means more dissolved salts.

Scattered tree – A native canopy tree that does not form part of a patch. Scattered trees are considered lost if construction encroaches more than 10% in the Tree Protection Zone. In this instance, the tree must be offset.

Seed bank: The collective name for seeds, often dormant, that are stored within the soil of many terrestrial ecosystems. Spatial/Spatially (scale): Pertaining to area.

Species: A species is usually defined as a group of organisms capable of interbreeding and producing fertile offspring. While in many cases this definition is adequate, more precise or differing measures are often used, such as those based on similarity of morphology or DNA. Presence of locally adapted traits may further subdivide species into subspecies.

Stress (ecological): Factor(s) that reduce ability of an organism or ecosystem to thrive, e.g. drought, lack of nutrients, high temperature.

Substrate: "Supporting surface" on which an organism grows. The substrate may simply provide structural support, or may provide water and nutrients. A substrate may be inorganic, such as rock or soil, or it may be organic, such as wood.

Symbiotic: A situation where two organisms (symbionts) live together in a close, mutually beneficial relationship. Taxa: See taxon.

Taxon (plural: taxa): A taxonomic category or group, such as a phylum, order, family, genus, species or subspecies.

Temperate: Region in which the climate undergoes seasonal change in temperature and moisture. Temperate regions of the earth lie primarily between 30 and 60 degrees latitude in both hemispheres.

Temporal (scale): Pertaining to time.

Threatened (species): Likely to become extinct, threatened with extinction. A threatened ecological community is one that is likely to be destroyed. In the IUCN Red List of Threatened Species, threatened is a collective term including, from most to least threatened with extinction: critically endangered, endangered and vulnerable. This terminology is widely used in Australia.

Threatening process: Actions, either human or otherwise induced, that threaten the survival, abundance or evolutionary development of a species, population or ecological community, e.g. land clearing, introduced predators, weeds, pollution, fishing by catch.

Traits: Characteristics or properties of an entity. In biology it refers to a distinct phenotypic character of an organism that may be inherited, environmentally determined or somewhere in between. Transformation: See resilience.

Tree Protection Zones: Diameter at Breast Height multiplied by 12 (measured in metres). The minimum that a TPZ can be is 2 metres and the maximum is 15 metres.

Vertebrate: An animal with a backbone (spinal column). A member of the subphylum Vertebrata of the phylum Chordata. Vertebrates comprise sharks and rays, bony fish, amphibians, reptiles, birds and mammals (including humans).

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The Brown thornbill is a small woodland bird that uses the cover of thick understory vegetation to forage, shelter, and make nests. Photoraph from Getty Images

Appendix 1 Summary of Council and state policies and strategies related to Nature

Related strategy/policy	Connection to Yarra Nature Strategy (YNS)	Direction for the Nature Strategy
Council plans, policies and strategies		
Council Plan	Two key objectives are directly relevant to the Nature Strategy: • Key objective 1. Community health, safety and wellbeing are a focus in everything we do • Key objective 3. Council leads on sustainability and protects and enhances its natural environment And two are relevant to the goals of the Nature Strategy: • Key objective 4. Development and growth are managed to maintain and enhance the character and heritage of the city • Key objective 7. Transparency, performance and community participation drive the way we operate Council's Municipal Health and Wellbeing Plan is now expressed through the Council Plan and there are themes for the Nature Strategy which result from requirements such as: Open space that meets community requirements; community resilience and connection; mental and physical health and wellbeing; opportunities for connection with their community.	The Council Plan provides high level guidance in the areas of protection and enhancement of natural environment; and community health and wellbeing. The Nature Strategy is an action from Key Objective 3 and will be a vehicle for the City of Yarra to 'protect and enhance its natural environment'.

Related strategy/policy	Connection to Yarra Nature Strategy (YNS)	Direction for the Nature Strategy
Yarra Environment Strategy (YES)	The Yarra Environment Strategy (draft) community engagement process has shown that natural values and greening the city were the highest priority The Yarra Environment Strategy 2013-17 provided direction and actions required to integrate sustainable practices into council's operations. Its themes included urban greening, climate adaptation, climate mitigation, and stormwater and water quality. In particular, Pathway 2 (Urban Ecology and Natural Environment) aimed to improve biodiversity and ecosystem health in parks, waterways and open spaces.	Pathway 2, Urban Ecology and Natural Environment from the former Yarra Environment Strategy is now addressed in detail via the Nature Strategy. The Nature Strategy has considered the community's input to the YES renewal process and taken them onboard, aiming to reflect their intent. The Nature Strategy will function under the umbrella of the Yarra Environment Strategy but will deliver on its own vision and goals independently, contributing to Yarra's wider Environment and Sustainability charter.
Climate Emergency Action Plan (Draft under development)	Yarra City Council recognises that the climate emergency presents an unprecedented challenge – both globally and locally. Our planet's climate is already too hot, with dangerous heatwaves, droughts, storms and flooding becoming more intense and destructive. Effectively responding to the climate emergency requires society-wide changes at emergency scale and speed to rapidly reduce carbon emissions, drawdown carbon, drastically change the way ecological resources are used and foster resilience to living in a climate-impacted world. It will require a collective effort across all levels of government, business and the local community. Yarra's first Climate Emergency Plan (currently in development) sets the strategic direction for the next four years to accelerate carbon emission reductions, plan and build a climate adapted city and support and engage our community. Creating a climate resilient city involves greater use of water sensitive design to retain moisture in our landscapes; investing in natural cooling solutions; protecting and enhancing our ecological assets; and adapting our land and vegetation management practices as the climate changes.	While the detail of the Climate Emergency Plan is yet to be confirmed, there are many actions outlined in the draft Nature Strategy that the City of Yarra could undertake in recognition of its stewardship of areas that can provide natural refuges for flora and fauna.

Related strategy/policy	Connection to Yarra Nature Strategy (YNS)	Direction for the Nature Strategy
Yana Ngargna Plan	Yana Ngargna Plan 2020-2023 is guided by five priority areas, which will determine council's ongoing work with the community. These priorities include: 1. Community connection - Council will support Aboriginal community connection to Fitzroy and other historically significant places in Yarra, and continue to develop its own connection to the Aboriginal community. 2. Culture - Council will promote Aboriginal culture to ensure a greater understanding of and respect for Aboriginal people, culture, traditions and history in Yarra. 3. Employment - Council will increase employment opportunities for Aboriginal people at council and broker Aboriginal employment opportunities in the broader community. 4. Events - Council will promote Aboriginal calendar events and other significant Aboriginal community events. 5. Advocacy and Responsiveness - Council will promote relevant policy changes and emerging issues to the Aboriginal community and respond, with permission from the community, on behalf of the community	Priority 1 aims to see more community connection to Fitzroy and other historically significant places in Yarra, and continue to develop its own connection to the Aboriginal community. While most annual action plans do not make specific mention of the natural values of Yarra that are also culturally significant, particularly to the Wurundjeri Woi Wurrung people, this is an area that will be recognised via the Nature Strategy. It is recommended that recognition of community connection to the natural values in Yarra is included in future years of the Aboriginal Partnerships Plan. Other priorities in the APP have relevance. The Nature Strategy can seek to involve the Aboriginal community in any resulting actions, events, employment opportunities and also to seek partnership projects.

Related strategy/policy	Connection to Yarra Nature Strategy (YNS)	Direction for the Nature Strategy
Yarra Open Space Strategy	The Technical Report that will form the basis of the Open Space Strategy (in draft) provides in-depth analysis of background information to support the future direction for open space strategy. Analysis of current demographics and predicted changes indicates a strong need for more open space, especially in areas that have under-representation and will experience growth. Options for acquisition of new open space areas are a focus for implementation of the Open Space Strategy. This includes options for reviewing portions of currently inaccessible land such as the Burnley Golf Course. Many of the objectives from the Yarra Open Space Strategy, 2006 are likely to be reflected in the revised strategy. Objectives of particular relevance to the Nature Strategy are: • Continue to protect and improve the diversity of indigenous vegetation values in open space reserves adjoining the waterways. • Incorporate best practice principles in the ongoing management and design of open space including water use, energy use and waste management practices. • Increase the provision of indigenous vegetation in the linear open space reserves (additional to the waterway corridors) including the former Outer Circle Railway reserve and, where appropriate, along the railway corridors. Including: improving ecological values of other reserves; improving ecological values in the links between open space reserves • Manage open space that adjoins the waterway to protect and, where appropriate, improve native fauna habitat values • Protect and enhance both the environmental values and cultural heritage values in open space • Improve access to open space in the City to overcome some inherent inequity in open space distribution across Yarra. • Understand, protect and improve, where appropriate, both indigenous and nonindigenous cultural heritage values.	The Biodiversity Health Survey identified that there is opportunity within Yarra's open space for increased areas for nature, including along waterways, within parkland of all types and throughout streetscapes. The former and new Open Space Strategy identify that the community of Yarra will require more open space in the coming decades. In the decade of the former OSS, a number of new open spaces have been created, but the new OSS identifies the need for many more, especially in areas that have gaps and will see increased population density. While the detail around how this will best occur is to be confirmed, new open space provides opportunities to incorporate more natural features and habitat value than has traditionally been seen in Yarra. There are also many opportunities to see improved outcomes in streetscapes and existing open spaces as opportunities for enhancement or renewal plantings arise. The OSS objectives have included many of the same objectives as the Nature Strategy including protecting, enhancing and linking environmental values in open space, including cultural heritage values. This objective also aligns with the Nature Strategy, particularly the conservation of indigenous cultural heritage values.

Related strategy/policy	Connection to Yarra Nature Strategy (YNS)	Direction for the Nature Strategy
Yarra Urban Forest Strategy, 2017	The vision for the Urban Forest Strategy is for: a more liveable city supported by a healthy and growing urban forest. Objectives of the Urban Forest Strategy (UFS) include: • To enhance Yarra's healthy and growing urban forest, improving liveability and mitigating the impacts of the urban heat island effect • To manage current and future tree-stock through best practice urban tree management using evidence-based planning and decision making, together with cross-organisational implementation and innovation • To engage and support community involvement in the development of a flourishing and unique urban forest The UFS highlights opportunities to increase biodiversity through new management protocols for street and park vegetation that prioritises habitat value. Emphasis is given to a strategic approach to minimise the impact of tree and canopy loss at one point in time. It recommended that council's street and park tree planting program carefully consider species selection and placement of trees in connecting streets to improve biodiversity and connectivity outcomes. Aligned with the UFS, the *Inner Melbourne Action Plan* (IMAP) is collaboration between the Cities of Melbourne, Yarra, Maribyrnong, Port Phillip and Stonnington. Yarra's UFS directly aligns with Strategy 4.2 of the IMAP Action Plan (2006): *We will work together to integrate water sensitive landscapes, substantial tree canopies, biodiversity and habitat into the design of all parks and public space (i.e. streets) areas right across Inner Melbourne.*	Implementation of the UFS intends to include the development of a 10-year Priority Plan. In this plan, planting locations will be decided based on primary drivers including areas of biodiversity need or significance and areas identified as important linkages for fauna, including corridors and understorey linkages. Another action associated with the Urban Forest program will be to develop support materials to embed urban forest principals into capital works and open space programs to realise outcomes that benefit natural-values.

Related strategy/policy	Connection to Yarra Nature Strategy (YNS)	Direction for the Nature Strategy
City of Yarra Urban Wildlife Management Plan 2009	This plan identifies areas of fauna habitat, addresses threats to fauna, identifies opportunities for habitat improvement and reviews control methods for pest animal species. The plan made several recommendations, many of which include measures to identify, protect, enhance and connect fauna habitat. In addition, an emphasis was placed on protecting waterway fauna habitat, and to improve water quality in whole catchment. Strategically, the plan recommended improving connectivity throughout the municipality, and retaining hollow bearing trees and stags, as well as terrestrial and in-stream habitat with large woody debris.	Some of the recommendations from the UWMP are taken on board in the Nature Strategy, particularly around connectivity and habitat for fauna adjoining waterways and inland. Other initiatives that can be pursued through activity associated with the Nature Strategy include: • Permanently fence areas of fauna habitat such as wetlands and temporarily fence those areas of rehabilitation and revegetation; • Undertake control and monitor for pest animals in conjunction with other stakeholders; • Create dog-exclusion zones around fauna habitat, such as wetlands. All other areas of fauna habitat dogs 'on-leash' only; • Promote and encourage environmental awareness through education campaigns; and • Install fauna friendly lighting in and adjacent to all areas of fauna habitat.
Yarra Waste Minimisation and Resource Recovery Strategy 2018-2022	The long-term ambition of the Waste Minimisation and Resource Recovery Strategy is to move the community towards zero waste to landfill. It will be delivered through a large suite of actions around five priority objectives: 1. Valuing our resources 2. Delivering high quality, accessible services and programs 3. Encouraging community pride through clean public spaces 4. Ensuring Yarra has access to the programs, infrastructure and technology to meet its targets 5. Collaborate, partner and advocate for better outcomes	Objective 3 that focus on reducing litter in public spaces will have a direct impact on Yarra's habitat, especially via reductions in litter entering waterways. All other elements of the strategy will benefit the natural world in less direct ways and some, such as objective 5 offer opportunities for collaboration, possibly leading to dual messaging around issues of mutual interest. For example, banning plastic straws to assist the waterway and marine fauna.

Related strategy/policy	Connection to Yarra Nature Strategy (YNS)	Direction for the Nature Strategy
Urban Design Strategy	Future developments in Yarra reinforce a coherent, harmonious and appealing urban environment with an opportunity for continuity and change, focusing on achieving design excellence and a high-quality public domain. Key Objectives The key objectives of the Urban Design Strategy to achieve this vision are: 1. Enhanced quality of Yarra's urban form and character 2. Effective management of growth and change 3. Design excellence in new developments 4. Quality public domain and public spaces in Yarra 5. Processes and practices that promote good design	

Related strategy/policy	Connection to Yarra Nature Strategy (YNS)	Direction for the Nature Strategy
Yarra Heritage Strategy	The Heritage Strategy (under review) has traditionally focussed largely on the built environment and the cultural environment (non-indigenous and indigenous). The 2015-18 Heritage Strategy focussed on four strategic directions: 1. Knowing our heritage 2. Protecting and managing our heritage 3. Supporting our heritage, and 4. Promoting and celebrating our heritage. The first strategy associated with Strategic Direction 2, states: *focus on conserving the identity and uniqueness of Yarra that includes …, natural assets such as the Yarra River and the extensive parklands that border it*. The draft Heritage Strategy will focus on similar themes but seeks to formally include and address 'natural heritage' in the revised strategy. Two key actions are planned: Strategy Action No. 8: Introduce a process/project for public to identify areas of natural heritage in the city for potential listing on appropriate lists. Measure: Places of natural heritage significance identified, mapped and listed on an appropriate register - to be determined. Strategy Action No. 30: Achieve recognition of heritage value within other strategies dealing with the natural environment. Measure: All related strategies recognise human attachment to the natural environment and cross-reference to the heritage strategy. Note: Recognise that this is the 'people' value of natural heritage – not 'nature for nature's sake' (as managed under other strategies).	Opportunity to define and develop Natural Heritage values will receive a stronger focus in the revised Heritage Strategy. Actions 8 and 30 set direction for the identification of natural heritage values, establishment of a register and potentially for their formal recognition via an appropriate planning mechanism. Action 30 asks for each relevant Strategy to reference the abovementioned process. This Nature Strategy does so here and also in reference to Management Action 1.3.

Related strategy/policy	Connection to Yarra Nature Strategy (YNS)	Direction for the Nature Strategy
Water Management	Yarra is also considering developing an Integrated Water Management Plan that will cover the following topics: • Environmental benefits of water • Water use by council for buildings, open space and for marquis locations • Improving water quality for the Yarra • WSUD, Rain Gardens and Stormwater harvesting; • Other infrastructure i.e. Gross Pollutant Traps; • Technology to improve water quality • Education and awareness	The management of water is imperative to maintaining natural values, especially throughout the waterways. The Nature Strategy recognises this and supports the development of a Water Strategy that addresses the breadth of water-related issues and opportunities. It recommends that the water strategy consider natural values associated with the waterways and beyond as a priority.
Yarra Planning Scheme (review in progress, almost complete)	MSS, policies, planning tools (Zones, overlays, local policy) and provisions. Provided in more detail in Appendix 2 Legislative context.	The revision of the Planning Scheme has occurred recently. There has been limited update of the scheme in relation to nature-related themes. The creation of this Nature Strategy aims to raise the profile of natural values within council and in the future see this reflected through greater and stronger representation within formal planning structures.
State or regional plans, policies and strategies		

Related strategy/policy	Connection to Yarra Nature Strategy (YNS)	Direction for the Nature Strategy
State Biodiversity Plan	Protecting Victoria's Environment - Biodiversity 2037 is Victoria's plan to address the decline of biodiversity and achieve overall biodiversity improvement over 20 years. The Plan presents a long-term vision supported by two general principles. These being: • Victorians value nature; and • Victoria's natural environment is healthy In its implementation to date, the State Government has developed the following: • A Monitoring, Evaluation and Reporting Framework to track the progress of achieving the plan's goals and targets. • An Implementation Framework which identifies 20 Priority areas and 83 corresponding actions for the first 4 years of the Plan. The priorities and actions are varied and include some that will be of relevance to the City of Yarra. • State Biodiversity Grants that target a range of community-based and regional, strategic projects and programs. • Some new online tools for purposes such as identifying what the state government considers to be Strategic Management Prospects, i.e. locations supporting natural values that provide a good case for investment.	There is the potential for local government to contribute to delivery of the Plan and vice versa. Preliminary discussions have been held regarding options for this. The Nature Strategy has taken direction from the State Biodiversity Plan, considered stakeholder engagement with Department of Environment, Land, Water and Planning staff and aims to align with the vision, principles and priorities of the Plan.

Related strategy/policy	Connection to Yarra Nature Strategy (YNS)	Direction for the Nature Strategy
Yarra Strategy (draft) and Yarra River Action Plan (2017)	In 2017, the *Yarra River Protection (Wilip-gin Birrarung murron) Act* (the Act) passed through the Victorian Parliament, enshrining in law the protection of the Yarra River. The Act identifies the Yarra River and its corridor as 'one living, integrated natural entity for protection and improvement' and recognises Traditional Owners' custodianship and intrinsic connection to the river. The Yarra River Action Plan was launched in February 2017. Key actions of most relevance include: • Melbourne Water is assigned as the lead agency and tasked with more responsibilities including recommending referral authority for amenity issues along the Yarra and delivering the Yarra Strategy • Greater Yarra Urban Parklands (one living and integrated natural entity) • Establishment of the Birrarung Council • the Commissioner for Environmental Sustainability to report on the condition of Yarra River land In early 2018, the Wurundjeri Woi Wurrung developed their vision for the Birrarung in a policy titled *Nhanbu narrun ba ngargunin twarn Birrarung* (Ancient Spirit and Lore of the Yarra). This policy defines the Wurundjeri Woi Wurrung's aspirations for planning, policy and decision-making to enhance the integrity of the Yarra Strategic Plan.	The Draft Yarra Strategy identifies a suite of actions for the Lower Yarra section that include focus on habitat links along the Yarra waterway and extending this focus into adjoining private land. Habitat corridors are also mooted for a terrestrial link that may be similar in its intent to corridors that are proposed within the Nature Strategy. Involvement of the Wurundjeri Woi Wurrung Council in the development and governance of the Yarra Strategy aligns with the objectives of the City of Yarra and of the Nature Strategy.
Melbourne Water, Healthy Waterways Strategy (2018-2028)	Melbourne Water is responsible for the waterways within the municipality and has responsibilities associated with stormwater, water quality and drainage. Melbourne Water has priority work areas and operations that are directed by its Healthy Waterway Strategy and Capital Investment Plan and operations plans. It provides grants for waterway related activities and is an active partner in weed-related management for the City of Yarra.	A collaborative relationship is integral to management of adjoining areas of land along waterways for the benefit of the entire ecosystem and for residents. The City of Yarra has responsibility for some of the infrastructure and landscape within the urban environment which influences stormwater quality and quantity. Priority areas of focus in the Healthy Waterways Strategy and Capital Investment Plan would ideally align with City of Yarra's natural values priorities. An example being Dights Falls where updates to the fish ladder are a current priority project.

Related strategy/policy	Connection to Yarra Nature Strategy (YNS)	Direction for the Nature Strategy
Resilient Melbourne	Melbourne is one of the first 32 cities to become a member of the 100 Resilient Cities network. Resilient Melbourne, a joint project of 32 metropolitan Melbourne councils, Melbourne's academic, business and community sectors, and the Victorian Government sets out the first resilience strategy for Greater Melbourne. This strategy seeks to respond to future challenges associated with climate change and its impacts amongst other challenges. One of the first flagship actions, the delivery of a Metropolitan Melbourne Urban Forest Strategy, *Living Melbourne, Our Metropolitan Urban Forest* was delivered in March 2019, with the primary aim to "Extend and link existing urban greening, reforestation and nature initiatives across Melbourne, to improve wellbeing and reduce our exposure to hazards such as heatwaves and flooding".	*Living Melbourne, Our Metropolitan Urban Forest* strongly links together nature and urban forest outcomes. Its eight actions strongly align with the goals and many of the actions of the Nature Strategy.
Port Phillip and Westernport Catchment Management Authority, Regional Catchment Strategy	The Regional Catchment Strategy sets targets for environmental assets that are identified as being of particular importance to the ecological health and resilience in the Port Phillip and Western Port region – native vegetation, native animals, waterways and wetlands, hinterland, coasts and the bays. For each of these 'environmental assets' it assigns objectives, priorities and management measures. Of most relevance to the City of Yarra are the objectives for native vegetation, native animals, waterways and wetlands.	The RCS sets targets for animal diversity and other measures such as key indicator species which may be of interest to the City of Yarra. It provides an umbrella strategy which may be useful to use as an opportunity to collaborate with other land managers on partnership projects.

Appendix 2 Legislative context

Environmental Protection and Biodiversity (EPBC) Act 1999

The Environment Protection and Biodiversity Conservation Act 1999 (EPBC Act) applies to sites where proposed developments or projects may have a significant impact on matters of National Environmental Significance.

There are currently seven matters of National Environmental Significance, which include nationally listed threatened species; including the Matted Flax-lily, and listed fauna includes the Swift Parrot, Macquarie Perch, Grey-headed Flying-fox and Australian Grayling; ecological communities (*Grassy Eucalypt Woodland of the Victorian Volcanic Plains* being the most likely), and listed migratory species.

Under the EPBC Act, any action that may have a significant impact on matters of national environmental significance must involve a referral to the Australian Government to seek approval.

The removal or modification of habitat on private or public land for these species may trigger requirements under the EPBC Act. However, careful planning to avoid development or activities from occurring within areas of critical habitat for these species (including movement corridors), could remove the need to refer any council actions or future developments to the Minister.

Yarra River Protection (Wilip-gin Birrarung murron) Act 2017

In 2017, the *Yarra River Protection (Wilip-gin Birrarung murron) Act* (the Act) passed through the Victorian Parliament, enshrining in law the protection of the Yarra River. The Act identifies the Yarra River and its corridor as 'one living, integrated natural entity for protection and improvement' and recognises Traditional Owners' custodianship and intrinsic connection to the river.

The Act, provides for the preparation of an unprecedented, holistic Yarra River Strategic Plan (YRSP) to coordinate 15 public entities that operate along the river corridor, to guide future use and development and identify areas for protection within the Yarra corridor. Objectives for the first 10 years of the YRSP:

YRSP (in preparation), driven by a Yarra River 50 Year Community Vision, responds to the Act and will enable responsible agencies to protect the Birrarung, Yarra River

As one of the 15 managing authorities that has statutory obligations to deliver the objectives of the YRSP over the first 10 year period, the City of Yarra is committed to complying with the YRSP plan objectives and actions.

This YRSP will set out the first 10 years of action to contribute to the delivery of the Yarra River 50 Year Community Vision.

1. A healthy river and lands - YRSP will improve the water quality of the Birrarung and protect its land, floodplains and billabongs to achieve greater biodiversity.
2. Greater Yarra Urban Parkland - YRSP will seek to protect and improve the river's parklands in order to support the Yarra River 50 Year Community Vision.
3. A culturally diverse river corridor - YRSP will acknowledge, protect and commemorate the rich heritage of the Birrarung.
4. Protecting the natural beauty of the Birrarung - YRSP will seek to respect the significance of the Birrarung's landscapes. Where we build, we will protect and celebrate the river's natural beauty, landscapes and views.

Flora and Fauna Guarantee (FFG) Act 1988

The *Flora and Fauna Guarantee Act 1988* (FFG Act) was legislated to ensure the continued survival of all Victorian species of flora and fauna. The FFG Act lists threatened taxa, communities of flora or fauna and potentially threatening processes. The Department of Environment, Land, Water and Planning (DELWP) is the referral authority for matters under the FFG Act. Public authorities have a responsibility to ensure that their operations have regard to the objectives of the Act. Species listed under the FFG Act that have been recorded in the City of Yarra and that have the potential to occur include a suite of waterbirds and wetland-dependent species and one bat species. Potential impacts to these species should be considered early in the planning phase of any development.

Catchment and Land Protection (CaLP) Act 1997

The CaLP Act provides clear provisions relating to spread of noxious weeds on private and public land. Under section 20 of the CaLP Act, all land owners, including public authorities, must, in relation to their land, take all reasonable steps to avoid causing or contributing to land degradation, eradicate regionally prohibited weeds, prevent the growth and spread of regionally controlled weeds on their land, and prevent the spread of, and as far as possible, eradicate established pest animals.

Wildlife Act 1975 and Wildlife Regulations 2013

There may be an avenue to achieve greater protection of significant habitat trees in the City of Yarra by invoking the *Wildlife Act 1975* (the Act), as there is the potential for fauna to be harmed when large trees are removed. The Act provides for the protection and conservation of native wildlife (fauna) within Victoria. Under the Act a person must not hunt, take or destroy endangered, notable or protected wildlife; this includes all native vertebrate animals. Applying the principles of the Act to protect fauna using large trees may overcome any existing limitations in tree protection under the current local laws of the City of Yarra or under other State regulations.

The Wildlife Regulations 2013 provide further detail relating to the Act, including that a person not to damage, disturb or destroy any wildlife habitat, although this does not apply if the person is authorised to do so under any other Act such as the *Planning and Environment Act 1987*.

Planning and Environment Act 1987

The Planning and Environment Act 1987 establishes the framework for planning the use, development and protection of land in Victoria in the present and long-term interests of all Victorians. This includes providing the structure for and administering the implementation of Planning Schemes in each municipality through the Victorian Planning Provisions (VPPs). Planning Schemes are legal instruments outlining provisions for land use, development and protection. They are constructed and sourced from the VPPs.

State Planning Policy Framework

Clause 12 Environmental and Landscape Values - recognises that planning:

- should help to protect the health of ecological systems and the biodiversity they support (including ecosystems, habitats, species and genetic diversity) and conserve areas with identified environmental and landscape values.
- must implement environmental principles for ecologically sustainable development that have been established by international and national agreements.
- should protect sites and features of nature conservation, biodiversity, geological or landscape value.

Clauses of particular relevance include:

- Clause 12.01-1 Protection of biodiversity
- Clause 12.01-2 Native vegetation management
- Clause 12.05 'Yarra River Protection' requires that that building height is below the natural tree canopy and all development is set back a minimum of 30 metres, or greater, from the banks of the river;
- Clause 14.02-1 'Catchment planning & management' stipulates the need to retain natural drainage corridors with vegetated buffer zones at least 30 metres wide along each side of a waterway to maintain the natural drainage function, stream habitat and wildlife corridors and landscape values, to minimise erosion of stream banks and verges and to reduce polluted surface runoff from adjacent land uses.
- Clause 52.17 Victoria's Native Vegetation Management, A Framework for Action

  Under Clause 52.17 a permit is required to remove, destroy or lop native vegetation on land which together with all contiguous land in one ownership, has an area of at least 0.4 hectares (exemptions apply). Clause 52.17 requires a planning permit for the removal of native vegetation (exemptions apply). The purpose of the clause (amongst others) is to minimise impacts on Victoria's biodiversity from the removal of native vegetation and to manage native vegetation to minimise land and water degradation. Referral to DELWP

under Clause 66.02 may be required for an application to remove native vegetation; e.g. if clearing is greater than 0.5 ha or the application follows the high-risk pathway. Exemptions apply on land less than 0.4 hectares to remove native vegetation, and so significant habitat trees will not be protected under Clause 52.17.

Given that there are few sites in the City of Yarra that would support >0.4 ha of native vegetation, Clause 52.17 is unlikely to be invoked when assessing new developments within the municipality. However, under Clause 52.17, scattered indigenous trees also require protection and offsetting if proposed to be removed. The removal of significant trees is also regulated by council exercising its local law for significant tree protection. That is, any tree >40 cm diameter at breast height has to be inspected by a qualified arborist before removal. This provision is likely to protect large trees that are more likely to contain hollows and high canopy cover; that is, important fauna habitat.

- Clause 53.18 Stormwater management in urban development. Provides stormwater management requirements for new developments.
- Clause 58.03 Site layout for apartments. Includes a series of requirements for new apartment developments including considerations for layout of communal space. Objectives for landscaping include:
    - To encourage development that respects the landscape character of the area.
    - To encourage development that maintains and enhances habitat for plants and animals in locations of habitat importance.
    - To encourage appropriate landscaping.
    - To encourage the retention of mature vegetation on the site.
    - To promote climate responsive landscape design and water management in developments that support thermal comfort and reduces the urban heat island effect.

Zoning and Overlays

Several planning instruments and mechanisms exist to protect and enhance biodiversity within the City of Yarra.

Zoning: The most appropriate way to secure fauna habitat in the long term is through zoning and/or the use of overlays. All publicly managed open space in the municipality is zoned as Public Park and Recreation Zone (PPRZ), except for Alphington Wetlands which is zoned as Public Conservation and Resource Zone (PCRZ). Land zoned as Public Park and Recreation Zone does not have a primary focus of conservation and consideration in the long-term could be given to rezoning areas of high biodiversity value to Public Conservation and Resource Zone (PCRZ) to give a higher level of security and protection to these sites. This measure would apply to areas identified as critical habitat and movement corridors in the City of Yarra (see **Map 5** on **Page 31**).

Overlays:

Significant Landscape Overlay and Environmental Significance Overlay

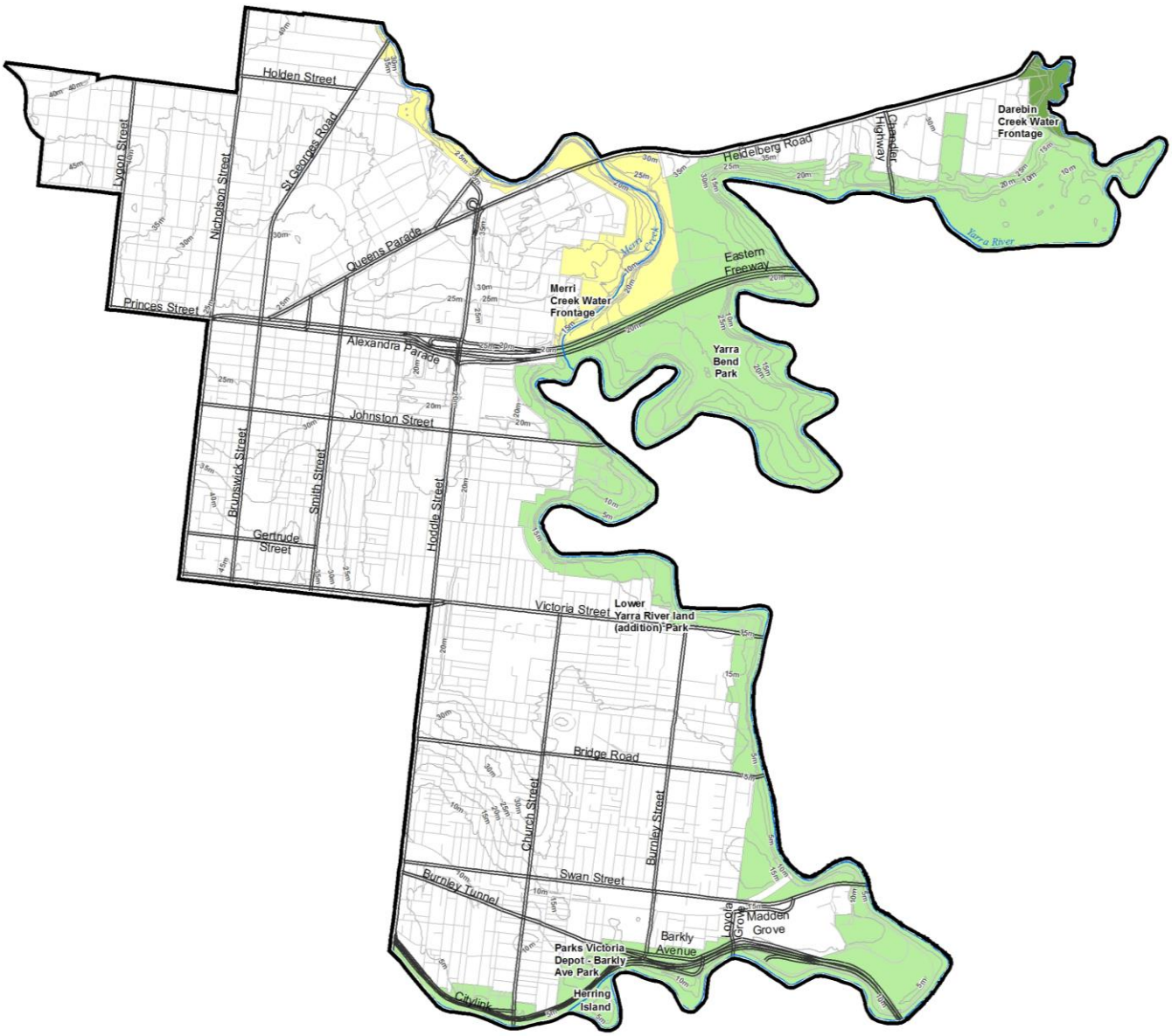
The Yarra River Corridor is covered by a Significant Landscape Overlay while Merri and Darebin Creeks are covered by an Environmental Significance Overlay (ESO2 and ESO3, respectively; **Map 6**).

These overlays consider a broad-scale vision for the landscape's vegetation and character, with aspirations for biodiversity protection. Environmental Significance Overlays are applied to areas on the basis of the location and type of remnant riparian and other indigenous vegetation, which in these tributaries to Yarra River may include biodiversity and habitat values. The application of the ESO's in this instance is strategically applied to capture an appropriate area where ecological values have been identified and require ongoing protection, such as critical habitat or movement corridors. In the Yarra Planning Scheme, under ESO2 and ESO3 it is policy that areas of remnant vegetation are not disturbed and disturbance to non-remnant vegetation minimised. The protection of ecological values along the Yarra River is provided by SLO1. Under the SLO1 a Landscape Plan is required that includes details around design features that are compatible with the landscape; vegetation to be planted and protected; weed and erosion management; stormwater management.

Additionally, an application to remove, destroy or lop vegetation must be accompanied by a written explanation justifying the removal of the vegetation supported by a suitably qualified arborist.

- A description and accurate site plan denoting the position, height, number, trunk circumference, branch spread, slope of land and species of any vegetation to be removed.
- Plan details of the location of proposed replanting.

For instance, consideration could be given to applying an ESO over the Park Street Linear Reserve, which encompasses both critical habitat and an ecological corridor.



Map 6 Location of the Environment Significance Overlay and Significant Landscape Overlay in Yarra

Design and Development Overlay (DDO-Schedule1) - applies to the Yarra River corridor, Merri and Darebin Creeks and some adjoining land. Links to the Yarra River Corridor Urban Design Guidelines Local Planning Policy.

This DDO will be updated when Amendment C66 is included in the Yarra Planning Scheme.

The new overlay recognises four sub-areas of the River Corridor and there are specific Design Objectives and buildings and works provisions for the whole corridor and for each sub-area. For some of the sub-areas the buildings and works provisions nominate heights and setbacks for new development.

Public Acquisition Overlay (PAO2) - the overlay indicates the intention of the State Government to acquire land to create a continuous linear park/trail system adjacent to waterways. Sections of this overlay are present along the Yarra River (south of Gipps Street) and the lower section of the Darebin Creek.

Environmentally Sustainable Development – Local Policy in Yarra Planning Scheme (22.17) Planning Permit Considerations. Under this local policy, Clause 22.17-2 includes objectives that support the protection of urban biodiversity:

- To protect and enhance biodiversity within the municipality.
- To provide environmentally sustainable landscapes and natural habitats, and minimise the urban heat island effect.
- To encourage the retention of significant trees.
- To encourage the planting of indigenous vegetation.
- To encourage the provision of space for productive gardens, particularly in larger residential developments.

Sustainable Management Plans are detailed sustainability assessments of a proposed building design required with planning permit applications. Within the City of Yarra, there are ten key sustainable building categories that must be addressed in applications for large buildings, comprising of 10 or more residential dwellings or more than 1000m2 of non-residential Gross Floor Area (GFA). Two categories that apply to biodiversity include Urban Ecology (see objectives listed above), and stormwater management, which aims to reduce the impact of stormwater runoff by improving water quality, by implementing water sensitive urban design principles. Implementing Melbourne Water storm water management best practice around wetland sites may achieve this.

City of Yarra Street Tree Policy

Council supports an increase in the quality and quantity of trees in its streets and is committed to the prioritisation of street trees through integrated streetscape design. Council recognises the benefits of healthy and diverse street trees and promotes biodiversity values across the Municipality. Native and indigenous species are preferred as street trees to build on their ecological value and provide valuable habitat that accommodates a range of wildlife. The aim of the policy is to provide a policy framework to guide street tree planning, planting, maintenance removal and replacement in the City of Yarra that will increase the benefits provided by trees in the urban landscape. Specific objectives of the policy relating to biodiversity include a net increase in the number of street trees and overall street tree canopy, improvements in the quality of street trees, and to increase the diversity of street tree species

Appendix 3 Nature Action Plan context

Goal 1: Increase the diversity, connectivity and resilience of Yarra's natural environment

Management Principle 1.1. Consolidate and grow areas of high quality, diverse habitat

Actions:

- ***Consolidate and increase the condition of all patches of current native vegetation.***
- ***Review all native vegetation patches in the context of their role as habitat within a corridor and their contribution to ecological function. Adjust management approach accordingly.***
- ***Prioritise some areas for enhancement and identify locations for linking.***

Targets:

- **Native vegetation understorey score in all mapped current native vegetation patches increased by 20% by Year 3.**
- **Management planning for bushland areas includes consideration of ecological function for key indicator species and consideration of threatening processes by end of Year 2. This is documented and monitored.**
- **Increase native vegetation understorey extent (at >25% cover) within Open Space by 0.5 ha annually**

Context:

The Biodiversity Health Survey assessed open space reserves to identify and map patches of native vegetation. A *Habitat Hectare* assessment was undertaken to determine the condition of areas of native vegetation, including areas of planted vegetation. This methodology is outlined in *Vegetation Quality Assessment Manual-Guidelines for Applying the Habitat Hectares Scoring Method* (DSE 2004). The *Habitat Hectare* method involves making visual and quantitative assessments on various characteristics of individual native vegetation patches, according to established criteria that are set against an optimum benchmark.

The mapped habitat zones and EVC distribution are shown previously in **Map 4** on **Page 26**. Patches of native vegetation are relatively fragmented. In particular, along the waterway corridor and linear trail that extends along Park Street there are ample opportunities to extend existing patches and to link between patches, providing a much more continuous habitat corridor.

Compared with pristine bushland, Yarra's native vegetation scored particularly poorly in the categories of large old trees (measured by the number of large trees per ha, large trees are defined as those above a certain predefined size for different vegetation types), weed cover, recruitment, and logs (**Figure 15)**. Understorey, organic litter, and canopy cover scores are what would be expected levels of condition within urban bushland remnants.

The Landscape Context score was also determined as part of assessments and represents a combined assessment of the native vegetation patch size, the proximity to large core habitat patches (>50 ha in size), and the amount of native vegetation within the immediate surrounding landscape. As Yarra is an urbanised area, it inevitably scored relatively poorly due to the fragmented nature of the surrounding landscape (**Figure 15**).

The results from the *Habitat Hectare* assessment show that there is ample opportunity for improving the condition of the native vegetation within the reserve system, and provides a framework with which we can conceptualise management principles.

Increase understorey extent (at >25% cover) within Open Space by 0.5 ha annually at locations that are unsafe to maintain under existing regimes (sleep slope), strategically link habitat and widen existing waterway corridors, in line with design principals of the YOSS.

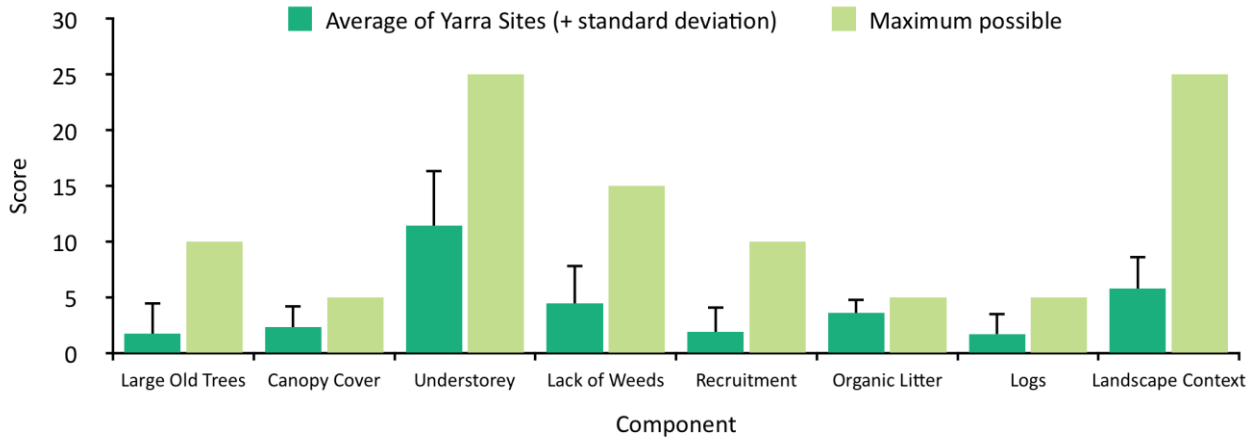


Figure 15 Average 'Site Condition' components and 'Landscape Context' scores across all habitat zones

Management Principle 1.2. Increase flora and fauna diversity

Actions:

- ***Establish monitoring locations targeting higher quality habitat and also low-quality areas for key indicator fauna groups.***

  Fauna recommended to include:

  - ***Pollinator insects, butterflies***
  - ***Birds (diverse range of guilds)***
  - ***Bats***
- ***Design and deliver a monitoring program that measures diversity in fauna focussing on key indicator fauna groups (above). Involve public/citizen science where possible.***
- ***Where deemed appropriate, initiate re-introductions, particularly for flora in key locations.***
- ***Collaborate with the Communications and Engagement Unit to develop a communications plan to educate and promote responsible cat ownership and keeping cats inside at night***
- ***Develop a literature review related to the impact of cats in Yarra, to be used as a potential 'Justification Paper' for the development of further policies.***

Targets:

- **Net positive flora and fauna diversity by end Year 3 resulting in an appropriate increase in each of the faunal groups listed above.**
- **Monitoring conducted at relevant intervals (as determined by method).**
- **Data is useful, interpreted and made publicly available in an engaging way.**
- **Optional target: a 5% increase in indigenous flora diversity within bushland reserves.**
- **To reach the owners of all registered cats in Yarra.**
- **An easily interpreted and implemented set of recommendations is created.**

Context:

The Biodiversity Health Survey included a comprehensive fauna census in 2014-2016 which used a range of survey techniques to detect vertebrate fauna species.

953 new fauna observations were made over the course of the Biodiversity Health Survey. The majority of records were for bird and mammals species, with smaller numbers of records for reptiles, amphibians, invertebrates, and fish (**Figure 16**).

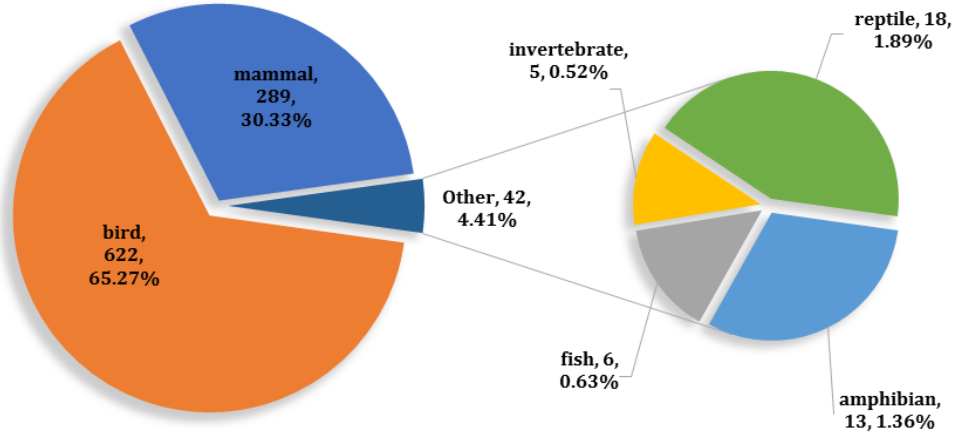


Figure 16 Fauna taxon composition across all 2014-2016 BHS observations.

Bird species abundance and diversity across Yarra varied across the surveyed reserves. The common native species included the Australian Magpie, Noisy Miner, Red Wattlebird, Rainbow Lorikeet, Silver Gull, Magpie-lark, and Galah. Common introduced bird species included Spotted Turtle-dove, Common Myna, Rock Dove, and Common Starling. The Common Myna and Rock Dove accounted for a large number of individual bird species observed, while the Rainbow Lorikeet was the most abundant native bird species by a considerable margin.

Fauna monitoring opportunities:

The BHS established a series of fauna census areas for a number of fauna groups. This allows future surveys to occur which can be compared with the current results for tracking the progress in biodiversity improvement programs and general biodiversity values across the municipality. A number of councils (e.g. City of Whitehorse) undertake regular annual bird surveys in nominated bushland reserves in an effort to monitor biodiversity health across the municipality.

Regular monitoring is important to provide a reliable picture of the fauna diversity within an area and can provide key insights into the health of ecological systems. Key insights can allow for adaptive management actions to be implemented, to reduce declines in fauna populations. However they can also be utilised to observe positive outcomes for fauna and ecosystems, through biodiversity improvement works. Bird and microbat surveys are probably the best indicators fauna groups for achieving these insights, as they utilise and respond to a wide range of habitat resources and attributes and play important roles in ecosystems function such as pollination, seed dispersal, and regulation of insect populations (lerps, scales, mosquitos etc.). Both species can also utilise both bushland habitat and scattered significant tree 'stepping stone' habitat.

Insects likely comprise a significant proportion of the fauna diversity with the City of Yarra. This fauna group can be used as indicators of general ecosystem health, particularly of soil and microhabitat health as they respond strongly to the diversity, structure, and health of the groundstorey vegetation.

Flora

The Biodiversity Health Survey contributed a significant amount of data to the knowledge base for the City of Yarra. Prior to this survey; 961 flora taxa had been recorded from 5374 records. During the survey, new flora species records were compiled during the completion of habitat zone flora lists for each of the 59 mapped habitat zones and in establishing 16 flora quadrats across several council reserves. Accordingly, the survey resulted in a total of 3174 new flora records.

As database searches revealed only 498 flora records existed for council reserves, this amounts to a substantial increase in flora records for the council reserve system. New records included 211 introduced flora species, 209 indigenous, and 20 naturalised native species. The proportions recorded in these surveys reflect the results and proportions of indigenous versus exotic and introduced flora species in the wider council area and surrounds. It should be noted that of the flora species observed, the diversity was relatively low, which reflects the surrounding urban environment, and the history of land modification.

On this basis, there is significant opportunity for improving plant diversity, particularly focussing on higher quality locations as a first priority. The locations of the ten quadrats that were established during the Biodiversity Health Survey would provide a good first batch of sites and quadrat monitoring would then assist in gauging the success of improving plant diversity.

Chocolate lilies observed during the Biodiversity Health Survey

Management Principle 1.3 Protect and celebrate significant habitat trees and their values

Action: Building on the trees documented via the Biodiversity Health Survey, document and map all large old trees and others that provide significant habitat. Requires a description of their habitat values, including hollows.

Targets:

- **Maintain the number of hollow bearing trees. Implement programs to see an increase of 5% annually including planting of indigenous trees, creating artificial hollows and retaining dead trees where it is safe to do so.**
- **All significant habitat trees added to the Significant Tree register.**

Action: Engage with Wurundjeri Woi Wurrung Council to ensure Large Old tree values that are culturally significant are adequately considered in the City of Yarra (and its land management partners) policy and practice.

Note: This action may align with the Heritage Strategy which aims to engage the community in identifying areas of Natural Heritage value.

Targets:

- **All trees identified by Wurundjeri Woi Wurrung Council protected via a formal planning mechanism if/where this is culturally appropriate and sensitive.**
- **Procedures and training in cultural heritage awareness and practice are up to date for all relevant staff.**

Action: Ensure local laws protocols are in place to protect all significant habitat trees.

Target: No significant habitat trees removed on streets or open space that is managed by the City of Yarra.

Action: Promote significant habitat trees, and their values in an online forum. Encourage public interaction.

Target: The City of Yarra resident's survey indicates increased awareness of significant habitat trees and their values.

Context:

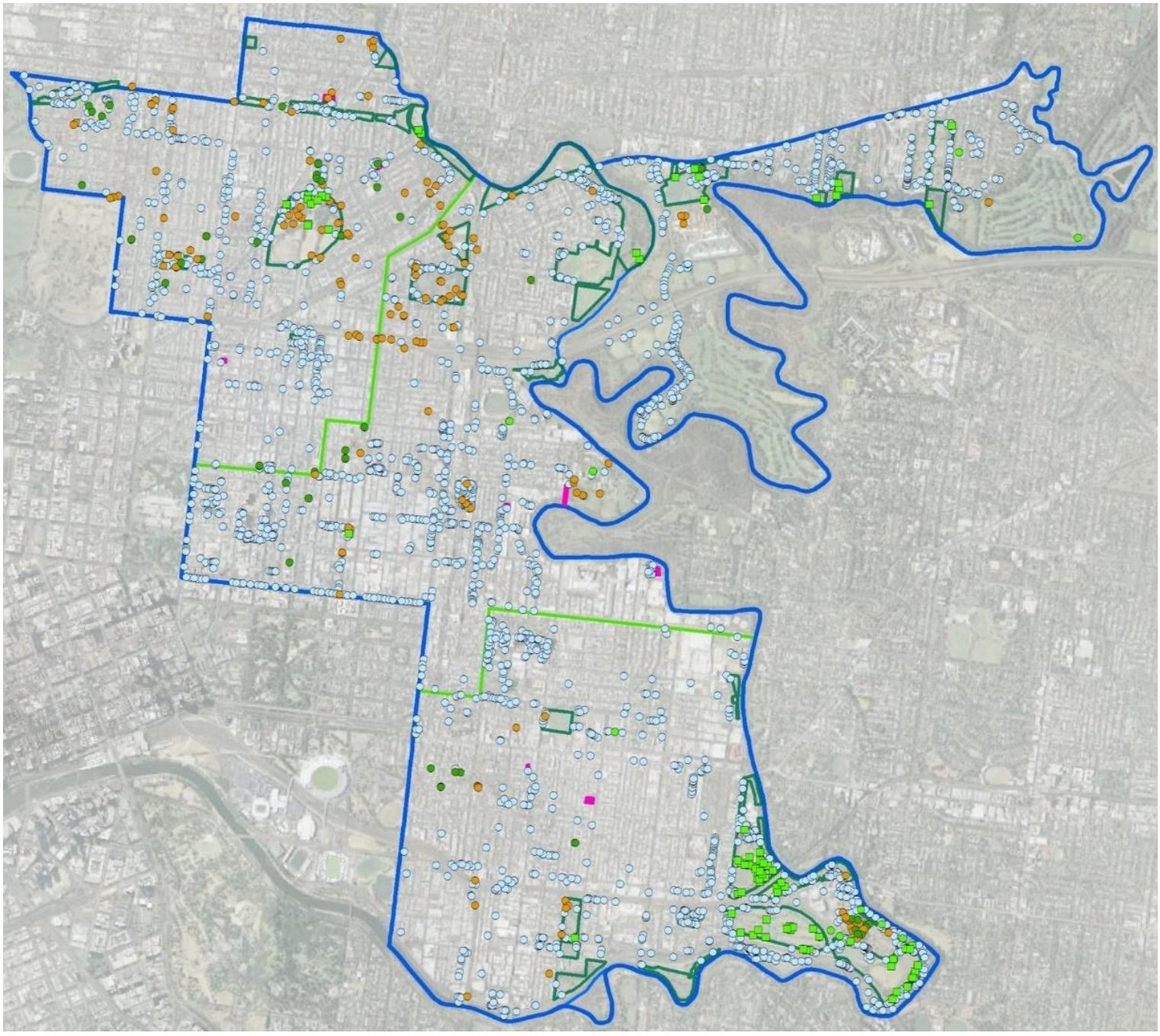
Large indigenous trees (**Figure 17** and **Figure** 18) are keystone structures for birds and arboreal mammals in urban parks (Stagoll et al. 2012), and contribute to overall biodiversity. Large old trees need to be managed for long-term sustainability and it is vital they be retained in new developments (Ikin et al. 2015). Increasing the cover of flowering eucalypt trees by at least 40% of the current extent in the municipality would significantly increase the probability of foraging occupancy by the Rainbow Lorikeet, although nesting occupancy would be reliant on the availability of tree hollows (Shukuroglou and McCarthy 2006).

An indication of where other significant trees may be present was investigated during the BHS using remote sensing LIDAR (Light Detection and Ranging) imaging, which uses light from a pulsed laser on an aircraft to measure the height of vegetation. Using this technique, point locations of trees estimated to be greater than 15m in height were identified to infer the potential location of additional significant trees across both public and private land in the City of Yarra.

Analysis of Lidar Images

Collectively, all trees are important within a landscape through their contribution to total canopy cover. Total landscape habitat cover has been shown to have a strong influence on bird abundance, diversity, and species composition. The relative cover of eucalypt and exotic trees also influences bird community structure, with eucalyptus forest birds more likely to persist where a eucalypt canopy is present, and a unique urban bird community where exotic trees dominate. Gaps in forest canopy and habitat connectivity can also have a strong influence of fauna persistence within an urban matrix (Chace and Walsh 2006: Fischer and Lindenmayer 2007: Radford et al. 2005: Tremblay and St Clair 2011).

Some large trees across open space reserves and council land are captured within the City of Yarra Significant Tree Register, but not all. The Large Old Trees that were identified during the BHS would be added as a first step (shown as green squares in **Map 7**). Further investigation should include engagement with the Wurundjeri Woi Wurrung Council, as well as survey of the other trees recorded in open spaces (small blue circles in **Map 7**).



Map 7 Habitat trees observed and inferred via LIDAR mapping

Figure 17 Large Manna Gum on private land in Princes Hill. Photograph by Yasmin Kelsall

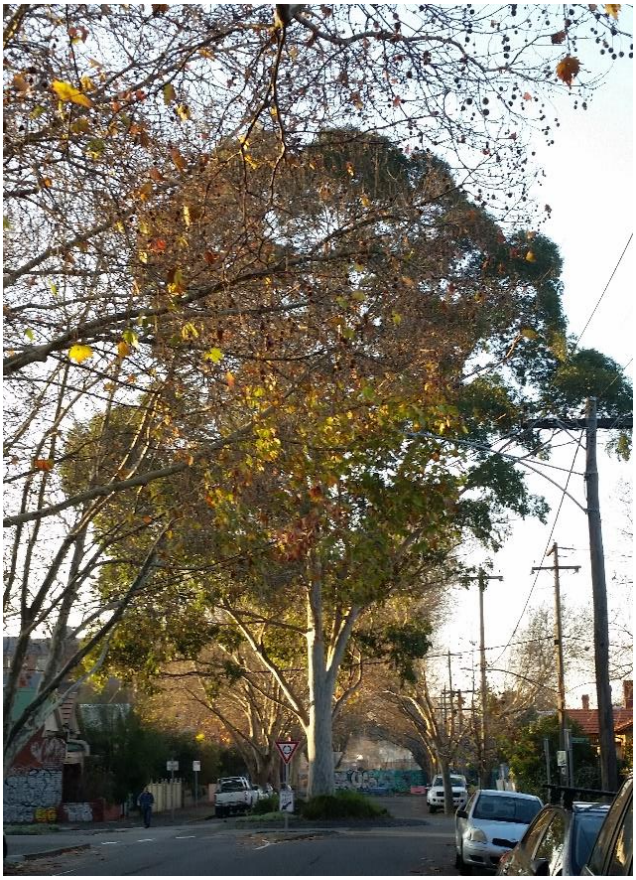


Figure 18 Eucalypt with a native understorey planting provides a contrast to Plane Trees on a street in Fitzroy. Photograph by Yasmin Kelsall

1.4 Understand and conserve habitat refuge areas for plants and animals

Action: Commission a project in recognition of Yarra's Climate Emergency Plan to advise on council's role in providing nature refuge areas (for species affected by climate change) and actions that it can implement.
Target: Climate refuge study complete by end Year 2. Any resulting recommendations funded in Year 3.

Context:

The City of Yarra has joined hundreds of organisations across the world in recognising the serious threat of climate change by declaring a climate emergency and accordingly, developing a Climate Emergency Plan.

The myriad effects of climate change are expressing themselves locally through altered weather, rainfall and effects on plants and animals. These effects have been recognised locally by naturalists and land managers, expressed in the form of new weed species emerging, altered flowering and fruiting cycles for well-known species such as Blackberry, new fauna movement patterns, some fauna species now residing permanently outside of their former range (Red-rumped Parrots, Cormorants, even Eastern Koels), loss of local flora, and increasingly stressed flora and fauna.

The VicNature2050 alliance brings together Victoria's universities in combination with government departments and non-government organisations, working to explore and address the impacts of climate change upon Victoria's nature. A document resulting from a symposium in 2017 (Jordan, R. & Hoffman, A. 2017), summarised the threat to Victorian nature:

"Climate change is currently one of the greatest emerging threats to our natural systems. Ongoing climate change in combination with other stressors that are degrading landscapes is expected to create stressful environments for biota across Australia. These stressful conditions threaten natural processes and are expected to drive major losses in biodiversity in the next few decades (Dunlop, M. et.) Al. 2012; 2017). In Victoria, the past century has seen conditions become hotter and drier (CSIRO and Bureau of Meteorology, Australia: 2016), a trend that is projected to continue together with increases in the incidence of extreme weather events involving heat, drought, fire and flooding. Climate change in combination with landscape fragmentation and land use change is already impacting natural systems (Scheffers, B. R. et al. 2016). A range of ecological processes are being affected including species distributions contracting in some areas and expanding in others, and flowering and migration times shifting in response to recent climate change (Scheffers, B. R. et al. 2017; Parmesan, C. 2016; Moritz, C. & Agudo, R. 2013).

The need to promote adaptability within our natural systems is now recognised (Victoria's Climate Change Adaptation Plan 2017-2020; Protecting Victoria's Environment – Biodiversity 2036 (Todd, J. 2017))."

The City of Yarra has many landscape features that make it a natural 'hub for nature' and recommend its waterways and near-waterway environments as places that can provide features that may assist as refuges for plants and animals, especially in times of higher temperatures and lower rainfall. The municipality sits at the confluence of four waterways, and it includes the meeting of two geology types. Other natural features include its habitat trees, wetlands and relatively large areas of open space adjoining the waterways.

In support of the municipality's intention to take urgent action on the climate emergency, there are many actions (outlined in this Strategy) that the City of Yarra could undertake in recognition of its stewardship of areas that can provide natural refuges for flora and fauna.

Red-rumped Parrot, a species that has moved to the city in recent decades. Image from Getty Images.

1.5 Conserve locally rare or threatened flora and fauna

Actions:

- ***Establish a 'local legends' working and networking group. Key stakeholders include Victorian Indigenous Nurseries Co-op, Parks Victoria, Wurundjeri Woi Wurrung Council and staff from adjoining councils and land managers e.g. Merri Creek Management Committee, Darebin Creek Management Committee.***
- ***Invest in a project that focuses on the long-term sustainability of locally rare flora and fauna. For example flora seed conservation, seed orchards and plantings with the option to encourage residents to grow a seed orchard for a rare plant at their home.***
- ***Investigate and document locally rare plants and animals. Promote this information via online opportunities and seek engagement from the community.***

Target:

- **No new local extinctions in flora or fauna.**

Context:

While there is a duty of care and legislative requirement to conserve state or nationally threatened flora and fauna, it is important to also recognise and conserve plants and animals that are locally rare or threatened.

Some of those reasons outlined by Lorimer (2010) in his report on locally threatened plants in Manningham include:

- As the number of species in any domain of interest reduces, the ecological system loses complexity and the web of interactions weakens;

- The extinction of a species from a jurisdiction represents a contraction of that species' range and thereby contributes to the extinction process at the global scale;
- Some species possess important genetic variation between jurisdictions, and it is desirable to conserve the full range of genetic variability;
- There is a philosophical viewpoint that we, as individuals, communities, organisations or governments, have a duty of care to do what is within our own sphere of influence to look after the environment, and not rely on others (such as another state) to compensate for environmental deterioration in our own jurisdiction.

Lorimer states that "*Each of these principles applies to local government as much as to states or nations. Indeed, the first of the three concerns listed above becomes more serious as one focuses on smaller areas. The loss of even a small number of species from a municipality or district can have significant consequences and lead to a cascade of adverse flow-on effects. For example, the collapse of mistletoe numbers in Melbourne's eastern fringe over the past five years due to drought has led to a collapse in dependent species such as the Mistletoe bird and Imperial White Butterfly, and flow-on effects such as reduced pollination by butterflies and reduced pest control by Mistletoe birds. It is impossible to know to what extent the consequences have spread through the web of interactions that maintains the ecosystem in a productive and dynamically stable state.*

Some species play more important or fundamental ecological roles than others, but in general, the greater the diversity of species that can be retained at the local or municipal scale, the better.

Sadly, the importance of this is rarely recognised and it has been generally overlooked by governments at all levels.

In Victoria, state government policies, legislation and regulation related to protection of native flora and fauna recognise species that are threatened with extinction throughout the state but not at smaller scales".

In the City of Yarra there are a number of plants that were formerly common that are now noted to be 'disappearing'. These have been noted by the local indigenous plant nursery, Victorian Indigenous Nurseries Co-operative (VINC), who have developed specialised 'seed production areas' with the aim of propagating plants from some of the last locally available seed.

Running Postman, a plant that is now locally rare. Photograph by Craig McGrath

1.6 Management Principle: Conserve state and federally significant flora and fauna

Actions:

- ***Collaborate with other land and water managers on projects to actively enhance habitat and conservation values for all State and Nationally-threatened flora or fauna.***
- ***Conduct targeted fauna surveys that build on the Biodiversity Health Survey work to confirm a baseline level for threatened fauna within the municipality. Collaborate with other land managers as required, e.g. Melbourne Water for aquatic animals. Parks Victoria and Birdlife Australia (Swift Parrot) as necessary.***
- ***Complete further research to confirm or otherwise, the occurrence of state or Nationally-threatened flora.***

Target:

- **Extent of state or nationally threatened fauna is known and documented. By Year 2.**
- **Extent of state or nationally threatened flora is known and documented. By Year 2.**
- **No local extinctions of state or nationally threatened fauna in the City of Yarra.**

Context:

The Biodiversity Health Survey, while ambitious, was not designed to confirm or provide a baseline status for species which are recognised as being rare or threatened at the state or national level.

A sound understanding of threatened species distributions, movements, and habitat use across the City of Yarra is crucial to managing threatening processes such as predation by foxes and cats, disturbance by domestic dogs, weed invasion, loss of hollow bearing trees, and other threatening processes as listed the Victorian *Flora and Fauna Guarantee Act 1988* (FFG Act) and the Commonwealth *Environment Protection and Biodiversity Conservation (EPBC) Act 1999*.

The BHS involved extensive searches of relevant flora and fauna databases and a shortlist was created of significant flora and fauna that were determined to have a medium or high likelihood of persisting in the City of Yarra based on habitat availability, years since the last record, and total number of records within the surrounding landscape.

This shortlist includes 9 flora and 20 fauna species.

Flora:

- Austral Tobacco
- Fragrant Saltbush (likely only planted specimens)
- Rosemary Grevillea (likely only planted specimens)
- Matted Flax-lily
- Native Peppercress
- Leafy Twig-sedge
- Slender Bindweed
- Studley Park Gum
- Melbourne Yellow-Gum

The Matted Flax-lily is the only EPBC-listed species with potential to occur. The remaining species are state-significant and listed either under the FFG Act or the *Advisory List of Rare or Threatened Plants in Victoria* (DELWP 2014).

The Leafy Twig-sedge was recorded in McConchie Reserve during the BHS flora surveys, although this species was planted during habitat restoration at the site. Eucalypts that were unconfirmed as Melbourne Yellow Gum were observed in Coate Park in Alphington and Studley Park Gum is recorded locally.

There is also an unconfirmed sighting of Austral Tobacco from McConchie Reserve in 1987. Native Peppercress was recorded in Alphington Park Wetland in 2003. There is little potential for isolated remnant plants or populations of Fragrant Saltbush or Rosemary Grevillea and recent records are likely to be planted specimens.

Undetected remnant threatened flora populations are most likely to occur along the Yarra River and Merri Creek corridors, especially where remnants (EVCs) of indigenous vegetation occur around the escarpment (e.g. Escarpment Shrubland) or within off-stream wetlands (e.g. Aquatic Herbland).

Fauna:

Five nationally threatened species are likely to make use of habitat within the City of Yarra and immediately adjoining waterways and bushland. These species include the Critically Endangered Swift Parrot, the Endangered Macquarie Perch and Regent Honeyeater, and the Vulnerable Grey-headed Flying-fox and Australian Grayling.

A further fifteen state-threatened species are considered likely to make regular use of habitat within or immediately adjoining the City of Yarra. These include the Eastern Great Egret, Azure Kingfisher, Nankeen Night Heron, Pied Cormorant, Hardhead, Clamorous Reed Warbler, Rufous Fantail, Powerful Owl and Golden Perch. Other threatened or migratory species recorded within the City of Yarra may also make some sporadic use of habitat for migration, dispersal, and foraging.

Most of these species are restricted to aquatic environments or adjacent riparian habitats; and all are likely to depend on riparian and aquatic habitats along the Yarra River and the Merri, and Darebin Creek corridors for foraging, dispersal, and/or migration. Stands of Yellow Gum, Yellow Box, and Mugga Ironbark within the City of Yarra and adjoining areas (Yarra Bend Parklands) could provide occasional food resources for the Swift Parrot during its summer and winter migrations between its breeding habitat with Tasmania and summer foraging areas in south-eastern Australia.

The Grey-headed Flying-fox has a large established population within the City of Yarra and adjoining areas, and likely makes significant use of habitat resources across the Yarra reserve system, and urban environments including flowering eucalypts and fruit trees. The Nankeen Night Heron is resident at a number of locations along the Yarra River and observed on a number of occasions during the 2014-2016 censuses.

Further targeted surveys for significant fauna should focus on species likely to be resident or make significant use of the study area such as: the Nankeen Night Heron, Eastern Great Egret, and Azure Kingfisher. Many of the threatened fauna species within the City of Yarra are aquatic or aquatic-dependent fauna, meaning they could be targeted together as a group.

Future microbat monitoring would provide verification of Yellow-bellied Sheathtail Bat records made in this study and provide a better understanding of the species distribution and use of habitat across the City of Yarra.

Other species may require further research to determine their presence or otherwise within the municipality.

1.7 Increase habitat connectivity

Actions:

- ***Research and develop connectivity plans for keystone or character species for at least 3 habitat links with at least one being a new terrestrial link.***
- ***Involve community in the planning of each connectivity project.***

Target:

- **At least 3 connectivity projects delivered in 5 years, focussing on waterways (2) and terrestrial priorities (1)**

Context:

Maintaining and enhancing habitat connectivity is key to improving and safeguarding the flora and fauna within the City of Yarra and its environs. The majority of current habitat value is provided along the Merri Creek and Yarra River corridors, but other large reserves such as the Edinburgh Gardens play a key role as 'stepping stones' for birds, bats and other fauna across inner northern Melbourne. Large significant canopy trees also play an important role in the movement of fauna and providing food and shelter resources.

Habitat links

Habitat corridors or links differ from critical habitat in that they provide fewer habitat resources for fauna to complete their life cycle. Corridors provide the basic habitat elements to enable animals to move safely across the landscape, sometimes between two or more areas of critical habitat. There are several important corridors for fauna movement present within the municipality:

Waterway corridors:

- The Yarra River corridor, considered to be of National and International Treaty Significance (Brereton et al. 2004). Provides a link between significant areas of critical habitat including in the east, around Yarra Bend Park, Dights Falls and Burnley Park.

  Key linkages for focus along the Yarra include between Alphington and Yarra Bend area, and from Dights Falls to Burnley.

- Merri Creek corridor - provides a link for the movement of terrestrial and aquatic fauna between habitat patches to the north, and south to the Yarra River corridor.

  The Merri Creek Corridor provides a great opportunity as a high priority habitat corridor project.

- Darebin Creek corridor – provides another north-south habitat link to the Yarra River.

Terrestrial corridors:

- Park Street Linear Reserve - provides an east-west habitat corridor, comprised mainly of ground and shrub cover, and some habitat trees, potentially linking the Merri Creek corridor with Royal Park, Princes Park and Moonee Ponds Creek.

  This corridor, already partly established requires further enhancement and strengthening, particularly in the west.

- Terrestrial link(s) from the Yarra to large habitat patches in the west such as Royal Park.

  There is ample opportunity for the provision of fauna habitat corridors across the landscape away from the waterways. These corridors would focus on indigenous canopy species, supplemented by small plantings of mid and groundstorey. Opportunities such as replacement of street trees, new street tree plantings, new or refurbished parkland and private land should all be investigated.

  A number of strategic opportunities based on preliminary analysis of the Yarra landscape are provided in **Map 5** on **Page 31**. These would require a full scoping study to confirm one or two key corridors for implementation; and would involve collaboration and close alignment with Urban Forest and Open Space priorities.

  Terrestrial corridors provide a great opportunity to also link with the community of Yarra and inspirational ideas and messaging will be important elements of successful implementation. On this basis the Sugar

Glider is promoted as the focal species for planning and implementing terrestrial corridors. Secondary species include birds, butterflies, microbats and pollinators.

Adjoining areas:

- The locations next to any area of fauna habitat, including locations of critical habitat or corridors are important to include in an overall plan for enhancing and linking for natural values in the City of Yarra.
- Locations to target for education and programs that encourage habitat creation for nature are shown in **Map 5** on **Page 31** as a 200 metre buffer along all waterways. Additional areas would include a similar buffer applied to any overland or terrestrial fauna links including the Park Street Linear Park.

  Within the waterway buffer areas, species such as Pobblebonk Frogs and small woodland birds including Brown Thornbill could be used as focal species to include in community engagement programs.

  Terrestrial areas that form a buffer to terrestrial corridors, could create habitat for the same species associated with the terrestrial corridors themselves, i.e. Sugar Gliders and birds, butterflies, microbats and pollinators.

Opportunities to Reconnect the Landscape

The reserve system within the City of Yarra provides an opportunity to sustain important flora and fauna populations and this could be greatly enhanced with some key additions via extra habitat introduced within the urban matrix either via parkland, streetscapes or on private land.

In all cases it is recommended that the vegetation used for revegetation aim to recreate the former vegetation type as closely as possible.

The City of Yarra could create some planting guides for common vegetation types that can be easily accessed and used by both the community, internal staff and contractors. The City of Melbourne's Urban Nature Planting Guide could form a useful base.

There are several areas that are strategically positioned within or close to potential corridors, that are presently unvegetated (no EVCs), have overstorey but no shrub layer, or offer little fauna habitat. Revegetation via plantings of canopy (trees, tall shrubs), mid-storey (medium and small shrubs, climbers) and groundstorey plants (grasses, wildflowers and herbs) would promote connectivity especially for birds, pollinators including butterflies; and would be valuable 'stepping stones' to assist these animals to move across the landscape. These locations include smaller parks and reserves that contain canopy cover but do not presently support much understorey cover.

Small parks like Cambridge Park in Fitzroy could benefit from plantings of a greater diversity of vegetation providing more structure beneath canopy trees. Photograph by Yasmin Kelsall

1.8 Increase integrity and innovation in biodiversity management.

Actions:

- ***Establish a working group of bushland management experts to inform council on its on-ground management and associated programs. Also, to collaborate on cross-tenure projects.***
- ***Include experts such as Merri Creek Management Committee, Darebin Creek Management Committee, VINC, the Narrap team, Melbourne Water, Parks Victoria, land managers from adjoining councils and City of Yarra contractors. This group may be best implemented as a larger inner-Melbourne working group allowing for information sharing and time efficiencies.***

Target:

- **Working group established by end Year 1 and meeting 6 monthly thereafter.**

Context:

The stakeholder engagement process for the development of this Strategy involved a workshop of technical experts, where the value of bringing this group of experienced bushland managers to discuss on-ground management issues, achievements and challenges was evident. Therefore, the creation of future opportunities for this group to meet is recommended, to promote discussion that will ideally result in better on-ground outcomes, shared project ideas and new learning's.

While there is no key action relating to the City of Yarra supporting or delivering any project ideas, trials or education materials that resulted from the discussions, should be encouraged, and it is anticipated that once the group is operational there will be more clarity around its purpose, areas of interest and likely outcomes.

1.9 City of Yarra Integrated Waterway Corridors

Actions:

- ***Contribute to the preparation of a specific integrated waterway corridors plan for Yarra that brings together all the strategic directions and provides an overall single coordinating plan of action***

Target:

- **To acknowledge the Yarra River Strategic Plan (YRSP) objectives and the need to assess the opportunities locally and across boundaries with partners to deliver the YRSP commitments and to generate plausible strategic waterways restoration projects to access available funding.**

Context:

In 2017, the *Yarra River Protection (Wilip-gin Birrarung murron) Act (the Act)* passed through the Victorian Parliament, enshrining in law the protection of the Yarra River. The Act identifies the Yarra River and its corridor as 'one living, integrated natural entity for protection and improvement' and recognises Traditional Owners' custodianship and intrinsic connection to the river.

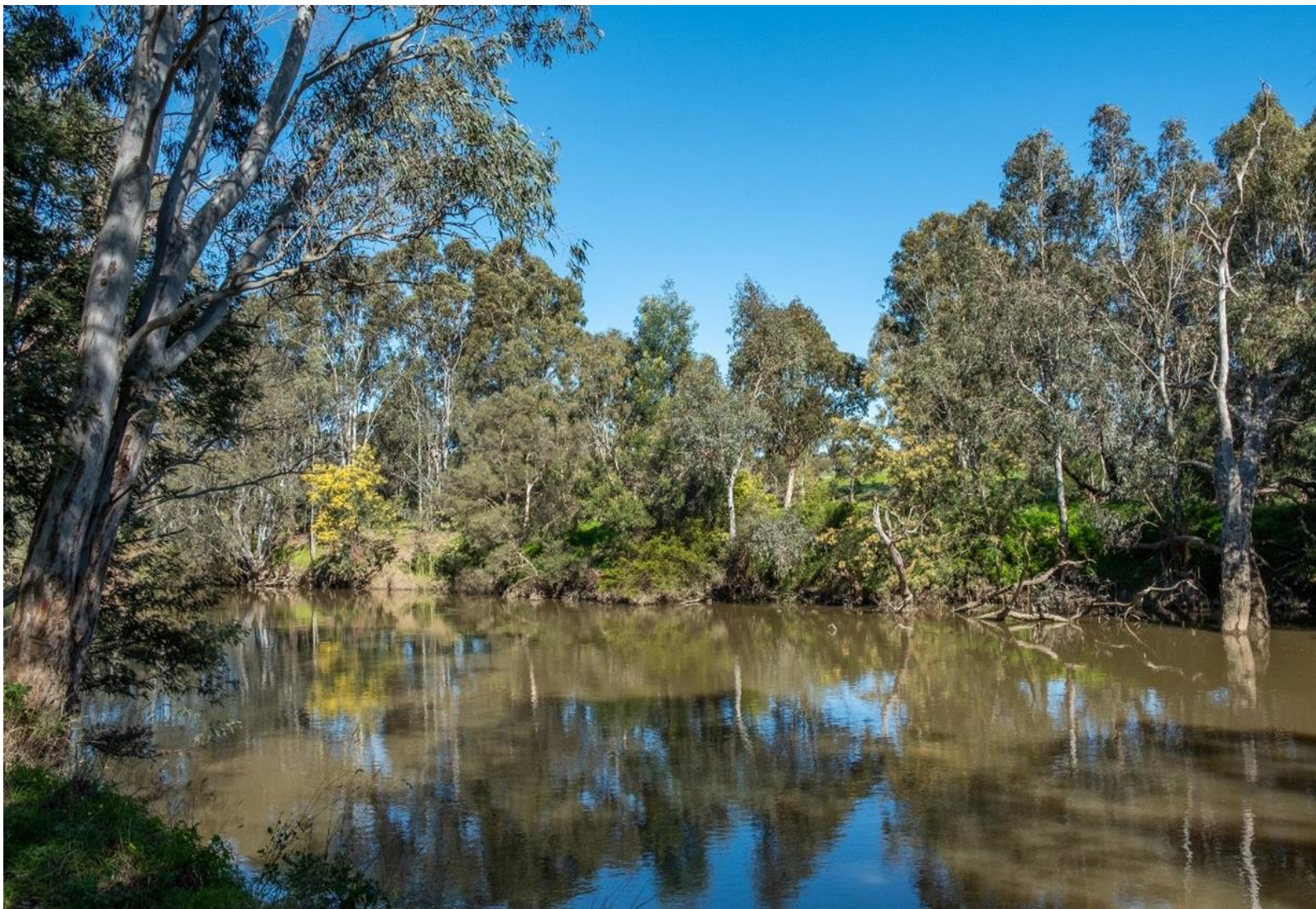
In early 2018, the Wurundjeri Woi Wurrung developed their vision for the Birrarung in a policy titled Nhanbu narrun ba ngargunin twarn Birrarung (Ancient Spirit and Lore of the Yarra). This policy defines the Wurundjeri Woi Wurrung's aspirations for planning, policy and decision-making to enhance the integrity of the Yarra Strategic Plan.

The Draft Yarra Strategy identifies a suite of actions for the Lower Yarra section that include focus on habitat links along the Yarra waterway and extending this focus into adjoining private land. Habitat corridors are also mooted for a terrestrial link that may be similar in its intent to corridors that are proposed within the Nature Strategy

It is proposed that Council prepare a waterways corridor plan for the City of Yarra, which integrates all strategic directions of the Yarra River Strategic Plan (YRSP) and provide a single coordinating plan of action. This would achieve the following:

- reinforce and confirm the YRSP,

- identify opportunities locally and across municipal boundaries with partners,
- deliver on YRSP commitments, and
- generate robust strategic waterways restoration projects that will attract funding.



Goal 2: Encourage people to appreciate and actively enhance Yarra's natural landscape

2.1 Encourage and support 'nature-focussed' initiatives on private land and throughout streetscapes at the neighbourhood-scale

Actions:

- **Establish a 'nature in the neighbourhood' reference group. Consider if/where it is possible to combine with Urban Agriculture and/or Environment Advisory Committee where relevant.**
- **Work with the reference group to plan initiatives that include a focus on increasing nature in the private and streetscape realm. This may include integration with Urban Agriculture and indigenous cultural initiatives.**
- **Fund and implement the abovementioned action plan.**

Target:

- **'Nature in the neighbourhood' Action Plan developed in consultation with reference group by the end of Year 1.**
- **500 households in Yarra participating in a 'nature in the neighbourhood' initiative by end of Year 3.**
- **One streetscape initiative implemented by the end of Year 3 that aims to introduce nature-focussed elements into a neighbourhood, resulting in wellbeing and community benefits.**

Context:

The City of Yarra has a diverse community and an equally diverse urban matrix. All areas are seeing significant change and in general trajectories are for more population and higher density living. The Open Space Strategy has identified that based on these trajectories, there is a need for increased access to open space to address a variety of needs including contact with natural areas. As well as the creation of greener, more natural areas in the public realm, there are opportunities that council can support to increase nature and natural areas in the private realm, and within streetscapes and other community spaces that make up the various neighbourhoods within Yarra.

Dr Sarah Bekessy, a Professor of Design and Social Context at RMIT, encouraged Melbourne to think big during Sustainable Design Week 2019 and take on board ideas that could see the greater Melbourne region follow in the footsteps of London, in declaring itself a national park city. Dr Bekessy said "*It's about rewilding the very urban fabric, using streetscapes and roundabouts and green walls and green roofs and courtyards in the city, school yards … [and] having core areas of green, where you can have connected pathways for native plants and animals to exist and to come back into the city*".

Ideas that could see Dr Bekessy's vision achieved would include a suite of activities on private and public land with objectives including:

- increasing the canopy cover of Melbourne by 20 per cent over the next ten years,
- creating habitat in Melbourne's private and public spaces for 10 native species, and literally bring them back into the city.
- ensuring that every single resident of Melbourne has within 200 metres, a rich biodiversity experience.

Plant-covered walls and roofs can lower a building's internal temperature by ten degrees. Image: RMIT

Support and opportunities:

Community representatives have expressed a desire for more urban greening within the fabric of the community. This has included participants in the engagement process for the revised Yarra Environment Strategy identifying nature as the highest priority for focus. The priorities identified were:

Priority 1. Everyday nature / greenscaping

Priority 2. Community engagement and capacity building, education and youth

Priority 3. Thriving neighbourhoods

Priority 4. Take urgent action towards climate neutrality and zero waste

Priority 5. Council leadership

Priority 6. Support business sustainability

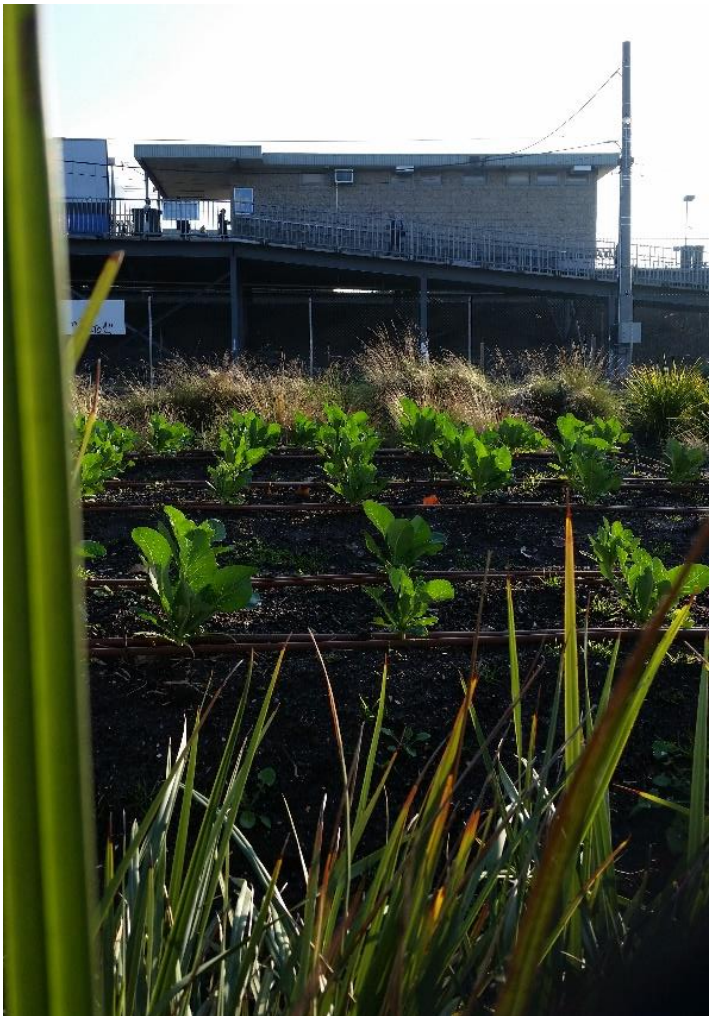
Involvement of the community in nature-focussed initiatives will assist the City of Yarra in meeting its wider environmental goals around climate action, sustainability, water management, urban agriculture, waste management and community engagement and wellbeing, as well as improving natural values.

Urban Agriculture and other Sustainability and Environmental initiatives have already achieved much via engaging the community resulting in visible benefits to the community themselves as well as for the environment and natural world. There are many initiatives that each of these areas are already undertaking that the inclusion of natural values and habitat elements would complement.

For example, Urban Agriculture - encouraging people to engage in their own food growing activities - encourages more urban greening and more conscious use of resources, nutrient and water management. All plants provide habitat for native animals and insects including birds, bats and butterflies. And there are some native and indigenous plants that are also food, fibre and medicine plants. Urban Agriculture systems can offer opportunities for enhancing urban nature and improving connectivity. Varied vegetative structure, increased plant diversity, and increased permeability of surfaces are key features of Urban Agriculture (UA) systems that contribute to natural systems, supporting ecosystem services such as pollination, pest control, and climate resilience.

Within the municipality there are already many examples of the community integrating food growing combined with habitat creation, with potential for plenty more, including:

- Community engagement work (events, social media, newsletters etc.)
- Behaviour change (influencing land management practices on private land)
- Educational programs (workshops etc.)
- Partnerships (i.e. the Wurundjeri Woi Wurrung Council, the Collingwood Children's Farm, Neighbourhood Houses etc.)
- Shared advocacy



Indigenous habitat provided by Flax-lillies, Tussock-grasses and Spiny-headed Flax-lily shares the space in a community food garden in Collingwood

2.2 Invest in nature engagement

Actions:

- ***A nature engagement officer to be appointed***
- ***Scope and deliver a number of nature engagement initiatives. Seek to collaborate with other councils that have run successful programs.***

Target:

- **A nature engagement officer to be appointed by the end Year 1**
- **Nature engagement program involving at least two new initiatives in place by end Year 2.**
- **Engagement program including Actions 2.1, 2.3 and 2.4 partially implemented by end Year 1.**

Context:

There is a demonstrated appetite for urban greening and nature engagement, which has been clearly expressed by the community.

Providing opportunities for the community to participate in nature-based activities will assist the City of Yarra to meet many of its own objectives relating to habitat creation, plant and animal monitoring, community connectedness, wellbeing and health.

Other municipalities and organisations have established programs for their residents that encourage them to become more involved in nature-based activity with some success, including:

- Gardens for Wildlife Program – now implemented by five other Victorian municipalities and with over 20 affiliate councils and organisations, this program, pioneered in Victoria by Knox City Council provides support, information and resources for local residents to introduce more habitat features into their own space.
- Backyard Biodiversity Program – run by the City of Boroondara, an annual learning and incentive program that targets key neighbourhoods that sit closer to priority areas for natural values.
- Incentives program for residents, schools and other organisations – this could include plant vouchers at a local indigenous nursery, such as the City of Boroondara's buy one get one free offer, garden planning assistance from a landscape architect, provision of other expert advice or inspiration, or volunteer labour.

Others encourage more activity and engagement via learning or creative means. These include:

- Education programs and opportunities - the Merri Creek Management Committee is currently engaged by the City of Yarra to deliver some education and engagement programs, particularly to local schools. Other programs that exist locally include a Nature Stewards program, launched in 2018 which provides a structured training course for participants to develop their skills as naturalists, leading to application of these skills in the future.
- Environmental leadership programs - other municipalities run programs that combine environmental, sustainability and nature-focussed learning with a resulting project or program that is delivered by the participants. An example is the Hume Enviro Champions program.
- Competitions and awards – a dedicated award or suite of awards could be developed to raise awareness of nature and the activities that are being undertaken in the municipality. Competitions could also be run annually that are nature-focussed. For example, an art competition.
- Citizen Science - there are many opportunities for linking to existing citizen science programs or creating a new one. Some existing opportunities include:
    - Aussie Backyard Bird Count – an annual event run by Birdlife Australia that encourages participants to observe and record birds during the month of October.
    - Wild Pollinator Count – run twice a year (Autumn and Spring) by a small group of volunteers, it encourages the community to observe and record insects and their behaviour.

- The City of Melbourne has held its own citizen science projects including BioBlitz, Waterbug Blitz and Urban Forester Program. These initiatives can provide learning's and also opportunities to even team up or support these programs in the neighbouring municipality.

Backyard bird species include Eastern Spinebill (above) and Spotted Pardalote (below). Photographs from Getty Images.

2.3 Establish a nature in Yarra communications program

Action: Design and implement online communication program for nature-focussed news, initiatives and interactions. Seek to integrate with existing communication mechanisms such as environment, sustainability and urban agriculture.

Targets:

- **Engaging nature-based content on the City of Yarra website and other council communications channels throughout the year from when new program commences.**
- **Regular engagement via social media.**

Action: Trial an online program which allows the City of Yarra to share information about its on-ground management activities and allows the community to assist/contribute to it.

Target:

- **Trial completed by end Year 2.**

Context:

Our community's strong interest in nature and nature-focussed initiatives remains largely untapped. A communication and engagement program focussing on nature and nature-focussed initiative is envisaged to change this. The success of similar programs for sustainability and urban agriculture has been demonstrated; and a similar focus for nature will result in higher levels of awareness and involvement that have been achieved in these complementary areas.

To this end, it is envisaged that regular communication on nature-related news will become a regular feature of council communications, largely via existing channels such as Yarra Environment e-news and council's social media. Additionally, a dedicated webpage for Nature in Yarra will be developed.

The development of this web and social-media based communications program could take direction from similar initiatives by other municipalities and although modest targets are proposed should not preclude a higher level of activity. Other options include creating education or engagements either in hardcopy or online; partnership projects with creative artists; films; podcasts or apps.

Interactive online engagement option:

- Community feedback during the development of this strategy indicated an appetite to know more about what the City of Yarra is doing towards caring for nature and its rationale for doing so. An example of where this has worked is Melbourne Water, which have shared that they now enjoy improved interaction with the community. They have an interactive map on their website showing 'local projects' and also encourage more interaction via Facebook and social media.
- There are many options for enabling online community engagement, particularly using a map as the basis for this. A recent example was an online mapping tool used during the development of the Yarra Action Plan to gather community input on issues that mattered to people
- This style of online mapping engagement tool could be one method for sharing information with the community regarding works of any kind that the City of Yarra is undertaking, and to receive information back from the community. This could have wider applicability than only to share information on nature-related work or observations.

Online mapping tool used in the 'Reimagine the Yarra' engagement process. Source: https://the-hive.com.au/features/participation-apps/social-map.

Goal 3: Embed nature at the core of Yarra's business practices

3.1 Management Principle: Ensure nature is considered as core council business.

Action: Councillor planning and reporting to consider and address natural values.

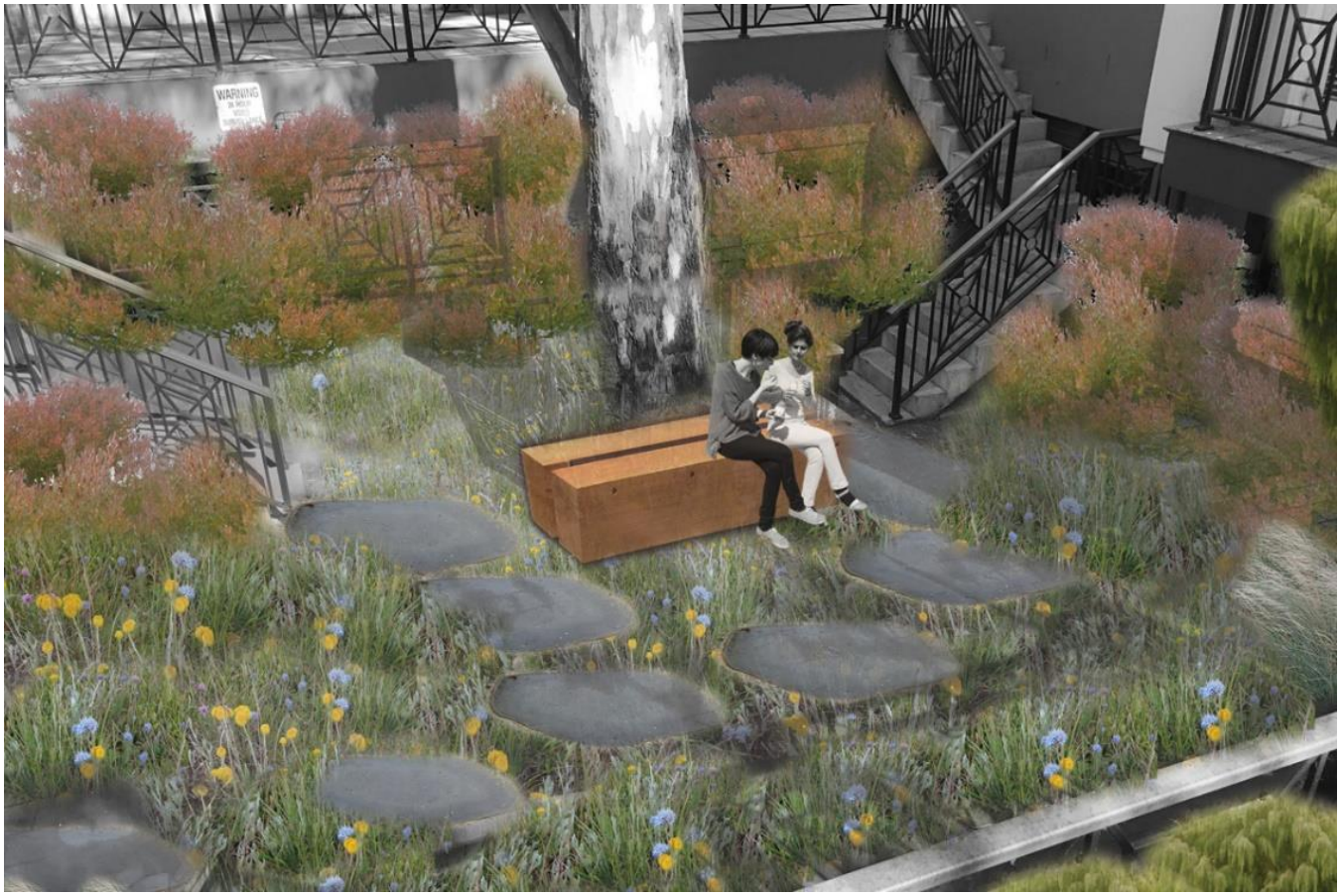
Targets:

- **City of Yarra's processes explicitly recognise nature as a component of Environment in the quadruple bottom line approach.**
- **Nature is one of the 'implications' to be considered within council reports.**
- **Annual plan includes a dedicated budget line for biodiversity or nature-focussed programs and projects.**
- **Ensure Yarra Annual Grants has a separate for category for Nature/Biodiversity enhancement projects.**

Context:

It is important that Yarra Council processes reflect the objectives and direction of its plan. Conservation of natural values is explicitly identified in Key Objective 3 of the Council Plan and directly contributes to elements of Health and Wellbeing.

With the development of the Nature Strategy clearly providing clear direction in the form of Goals, Management Principles, Actions and Targets requiring increased resources, the need for more formal accountability and recognition is required via the Council Action Plan and for Councillor awareness and accountability.



[Placeholder Image] Example: Greening Howlett Street – a green infrastructure retrofit that will include a wildflower garden communal meeting space. AKAS Architects, c/o City of Melbourne, 2019. ***Seeing permission for use.***

3.2 Management Principle: Encourage more natural spaces in the private realm via planning mechanisms.

Action:

- ***Provide resourcing to support delivery of strategic biodiversity/natural values requests and projects.***
- ***Implement requirement for landscaping plans for permit applications for 2+ lot subdivisions and above.***
- ***Develop pre-application information for planning permits that includes preferences around use of indigenous plants and habitat components.***

Targets:

- **Natural Values Planner employed by end Year 1.**
- **Increased incidence of indigenous landscaping and habitat components in developments. Shown in Landscaping Plans and monitored by audit of 10%.**

Context:

The City of Yarra, like many other urban municipalities, is experiencing increased levels of growth and development, placing further demands on its staff, management and governance teams to ensure a diversity of issues and community expectations are met.

Planning expertise relevant to natural values is required in many areas of council. This includes expert response and oversight, sometimes requiring specialist subcontractor involvement. To date there has been limited in-house capacity to adequately meet requirements which include:

- Reviewing and responding to planning permit applications, particularly in locations affected by ESO and SLOs;
- Advising and reviewing landscape plans;
- Ensuring the City of Yarra meets its legislative and planning scheme requirements, particularly those associated with significant species and communities, but also associated with weed management and wildlife welfare issues amongst others;
- Participating in processes involving new large high-density developments or precincts;
- Advising on nature-related matters relevant to city works, infrastructure planning and implementation;
- Advising on and in some cases, directly contributing to strategic planning processes;
- Auditing compliance with planning permit conditions and internal capital project delivery that relate to natural values; and
- Grant application assistance.

Dedicated in-house capacity to deliver on these requirements is limited and in light of this, other areas of council have aimed to cover these areas, sometimes with limited information.

The City of Yarra would benefit from improved processes and resources in the form of decision-making guidelines and information as well as increased, dedicated expert staff to support planning decisions.

Examples of guidelines that have been developed by other municipalities include:

- City of Manningham Landscape Plan Guidelines (March 2010). This booklet provides advice for applicants who need to develop a landscape plan as a requirement of their planning permit. It includes a flow chart of the process, a tick-list to make sure their plan contains everything and also provides examples of suitable landscape plans for higher density scenarios including townhouses and units.

In-house support documents would include:

- Species and planting lists for the most common types of native vegetation (Ecological Vegetation Classes) that are normally encountered in the City of Yarra in its development areas. Such as Plains Grassy Woodland outside of the waterway corridors. This would include examples drawn by landscape architects and designers that demonstrate how these plants could be used in common urban landscape scenarios. For example:

single-fronted home front yard / courtyard; townhouse; apartment common area/green roof/wall/balcony; laneway; carpark; café or warehouse.

- Information on common weed species that shouldn't ever form part of a landscape plan.
- Information for staff that summarises council's requirements to ensure that any in-house projects or works follow processes that ensure all legislative requirements regarding natural values (threatened species, ecological communities, wildlife and cultural heritage values) are met.
- A summary lookup document that provides common responses to planning permit queries.

Habitat creation in urban areas including laneways and via a rooftop garden in a private residence. Photographs from © Coolth Inc. .

Habitat creation exhibit at the Melbourne International Flower and Garden Show, 2019. Photograph from Coolth Inc..

3.3 Management Principle: Consider options for new planning tools to see more nature-focussed outcomes.

Actions:

- ***Scope and work up options for one or more overlays that seek to see ecological benefits in the future.***
- ***Instigate a project to investigate and document Natural Heritage values within the municipality in line with Actions from the Heritage Strategy.***

One or more planning scheme tools are introduced to assist in:

- **Delivering more habitat value such as green roofs**
- **Protecting and encouraging habitat elements for a specific species or group of species;**
- **Recognition and conservation of areas of natural heritage.**

Context:

Overlays: The Yarra River Corridor is covered by a Significant Landscape Overlay (SLO1) while Merri and Darebin Creeks are covered by an Environmental Significance Overlay (ESO2 and ESO3, respectively).

The application of the ESOs in this instance is strategically applied to capture an appropriate area where ecological values have been identified and require ongoing protection, such as critical habitat or movement corridors.

Consideration should be given to applying an ESO over any other significant habitat or fauna movement corridors. The Park Street Linear Reserve is an example, which encompasses both critical habitat and an ecological corridor.

Possible overlay considerations include:

- A Design and Development Overlay that requires new developments to include green roofs and vertical gardens.
- An ESO that is developed to recognise habitat values for certain species including fauna movement corridors.
- An ESO that protects locations of locally significant species.
- A suitable planning tool, possibly a Heritage Overlay that protects areas of indigenous cultural heritage significance.

3.4 Management Principle: The City of Yarra leads by example in its own projects.

Actions:

- ***In order to meet the multiple objectives associated with Environment, Sustainability, Nature and Water Infrastructure, support the creation of a senior expert role to advise on and approve all in-house projects for their 'green infrastructure' credentials, including nature-focussed elements.***
- ***City of Yarra recognises that green infrastructure includes nature-focussed elements and updates process and design practice accordingly.***

- **Target: All council-led projects to include green infrastructure and demonstrably consider nature and habitat elements in their design and implementation by end Year 2.**

Context:

The Sustainability and Environment team has developed an 'Embed Green' framework and process which is designed to enable any council to better include green infrastructure planning and implementation into all of their in-house projects. Broadly speaking green infrastructure would generally consider reducing impacts on natural values and also to innovation that would benefit nature. For example, water-sensitive urban design such as rain gardens or pollutant treatments have dual benefits for nature: they reduce the flow of nutrients and pollutants into waterways.

However, the 'embed green' framework should be updated to include specific consideration of habitat values and ensuring green infrastructure considers impacts to nature.

In recognition of the importance that the City of Yarra is placing on its sustainability initiatives, climate response, water management, and valuing nature, it is proposed that creating a role for overseeing and accrediting all in-house projects would be the most efficient way to ensure accountability around achieving nature-related objectives.

Note: In recognition of its direct relevance, the position is flagged in this Nature Strategy, but it is recognised that it will be requested via the Yarra Environment Strategy.

Goal 4: Make innovation, communication and collaboration the cornerstones of Yarra's nature-focused programs

4.1 Collaborate with others who share common goals.

Actions:

- ***Participate in networks with other municipalities, organisations and institutions who are working on similar issues around urban ecology.***
- ***Support partnership projects that result in mutual benefits for nature.***

Targets:

- **Staff role descriptions and time allocations provided to relevant staff for participation in relevant networks.**
- **Council management acknowledges optional funding for partnership projects as relevant.**

Context:

There are a range of networks and forums that would be beneficial for the City of Yarra to participate in, to see better nature-focussed outcomes within the municipality and beyond its boundaries. Examples of other inner-urban local government networks focussed on nature-based outcomes:

- The City of Yarra participates in multi-organisational networks on a range of issues including Urban Forestry (Inner Melbourne Action Plan); Climate Resilience (Resilient Melbourne and more); Yarra River Strategy and the Biodiversity Planners Network among others.
- Particularly amongst inner-urban and neighbouring municipalities there is an interest in sharing experiences, learning's and opportunities that are common to each relevant to nature conservation.

Network of land-management policy staff:

In recognition that the City of Yarra sits at a pivotal location in the landscape, as a hub for waterway values, large areas of parkland and important indigenous cultural heritage with many neighbouring land managers to liaise with, a regular forum for policy staff land managers relevant to the City of Yarra and its neighbours and partners is recommended.

This would include but not be limited to policy staff from all adjoining municipalities; Parks Victoria; Melbourne Water; Wurundjeri Woi Wurrung Council; Port Phillip and Westernport Catchment Management Authority and possibly others. Discussion could centre on sharing and alignment of relevant policy, strategy and programs. It could provide options for shared projects and grants, and the sharing of ideas and learning's.

4.2 Develop working partnerships with academic institutions

Actions:

- ***Participate in networks with other municipalities, organisations and institutions who are working on similar issues around urban ecology.***
- ***Support partnership projects that result in mutual benefits for nature.***
- ***Actively collaborate with an academic institution on at least one new project each year.***
- ***Develop a list of projects that include student monitoring of council reserves or encourage teaching and learning in these reserves. The results of which will be fed back to the City of Yarra.***

Targets:

- **At least one project per year is implemented in partnership with an academic institution.**
- **A working partnership to encourage student field studies in council reserves is established by end Year 1 and active by Year 2. Results are useful for all parties involved.**

Context:

The City of Yarra is very well placed to engage with academic institutions who are actively involved in urban ecology research. Melbourne University's Burnley Campus lies within the municipality and already completes projects within council reserves. Other institutions like RMIT also have an interest in urban ecology and could assist with collaborative research and other initiatives as they have with other urban municipalities.

- An early example may be to work with Melbourne University to adopt the streetscapes project, first piloted in the City of Melbourne.
- Other options include trials of green roofs and green walls; or sponsoring a design for a large urban development that includes habitat features.

4.3 Use the Smart City technology to assist in conserving natural values

Actions:

- ***In conjunction with CityLab, scope one project to deliver annually with relevance to nature in the City of Yarra. Option to work collaboratively with other urban councils.***

Targets:

- **One project is scoped and delivered annually with the assistance of CityLab beginning Year 2.**

Context:

The City of Yarra is implementing a smart monitoring network to better monitor and manage its assets and services. This is in-line with international and national approaches to management of urban environments and services.

Current examples of its capacity include monitoring air quality and requirements around rubbish collection. There are other opportunities to ensure that the current plans for this technology best works to support the natural values within the landscape.

Examples include: smart lighting that is wildlife friendly, i.e. in parkland that is particularly good habitat for wildlife, or lights are fitted with motion sensors to reduce 'light pollution' that is known to affect the natural behaviour and navigation of some wildlife.

Other options to consider include:

- Aiming to reduce noise pollution adjoining natural areas and open space through increased use by council of electric vehicles and other electric powered machinery.
- Wildlife monitoring options using remote cameras that could stream and automatically process imagery.
- Use of drones or other technology for wildlife or plant monitoring and perhaps in the future for more intricate activities.
- Use of soil moisture detectors to monitor revegetation and identify if any irrigation is required. Particularly for any high priority plantings.
- Smart lighting that is wildlife friendly, i.e. in parkland that is particularly good habitat for wildlife, or lights are fitted with motion sensors to reduce 'light pollution' that is known to affect the natural behaviour and navigation of some wildlife.