Urban Biodiversity Strategy 2018 - 2028

Connecting the Community with Nature

CITY OF MONASH

Acknowledgement of Country

Monash Council acknowledges and recognises the Kulin Nation as the traditional owners of the land now known as Monash. On behalf of citizens of the municipality, Council pays respect to indigenous elders, past and present and values the lessons of indigenous experience.

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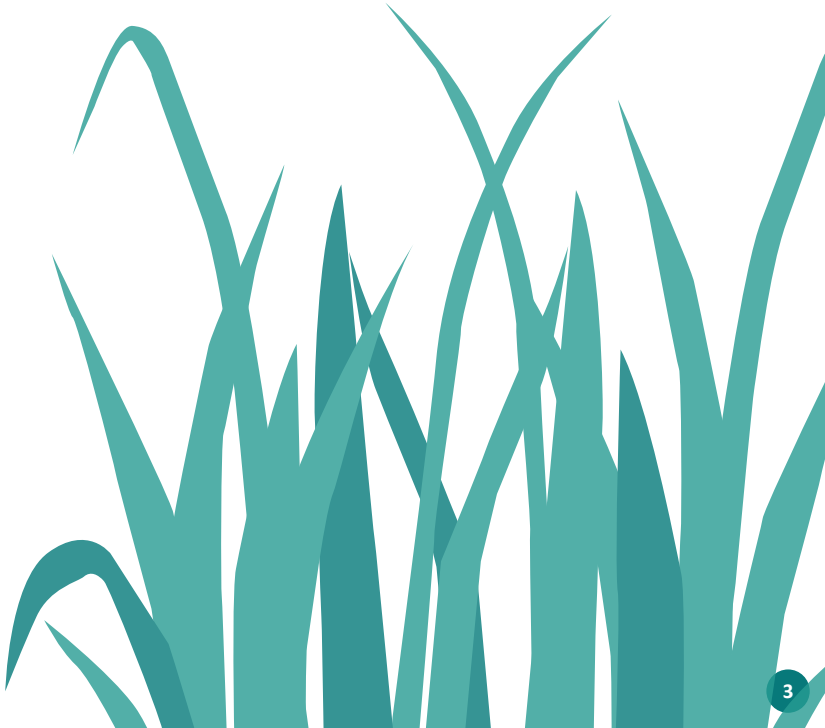


About this strategy

For over 30 years, Council and the community have initiated programs to improve biodiversity quality and habitat connectivity in our urban environment and bushlands through revegetation and weed control while promoting environmental awareness and increased community participation. These initiatives have enhanced biodiversity throughout Monash and have provided an environment that we all can enjoy and depend upon.

Although a largely urbanised environment, Monash is home to a broad range of significant bushland reserves, wetlands and waterways with high biodiversity value that offers natural places to enjoy and explore while providing essential ecosystems functions. Biodiversity in Monash is also vulnerable to a range of threats such as habitat loss or bushland fragmentation, pest plants and animals, population increase, climate change and impacts to water quality and availability to bushland. This Strategy identifies opportunities to enhance biodiversity and a range of initiatives to minimise these threats.

This strategy sets out biodiversity management directions for the next 10 years and is supported by an implementation plan, which is to be reviewed every three years. Council's vision for biodiversity is:

1. Thriving indigenous vegetation communities
2. Stable and sustainable refuges for native bird and other fauna
3. Resilient ecosystems that can adapt to environmental changes
4. An active and engaged community that participates in ongoing biodiversity protection

The key objectives outlined in this strategy that support Councils vision for biodiversity includes:

1. Increase community understanding, active engagement and appreciation of biodiversity
2. Enhance biodiversity through revegetation and protection of remnant vegetation
3. Collaborate with other public land managers to create broad-scale biodiversity gain
4. Proactively reduce biodiversity threats
5. Identify ecological baseline and indicators to monitor and assess environmental conditions
6. Strengthen Biodiversity Policy and Legislation

This Biodiversity Strategy builds upon the recommendations for Urban Ecology, which is a key priority of Council's Environmental Sustainability Strategy 2016-2026. Urban Ecology is the facilitation of ecological processes within an urban environment and is instrumental to the strategic vision of Monash becoming 'An innovative and environmentally sustainable garden city: resilient, diverse and thriving.'

It is our aim that the goals and objectives of this strategy will lead to tangible gains for biodiversity, increased awareness of the natural environment and active engagement by the community, as well as a practical framework to monitor the health and improvements to Monash's bushland reserves over time.

Underpinning Council's efforts to restore natural environmental values and enhance biodiversity is an appreciation that a healthy environment is a central element of a liveable community.

Contents

1. Introduction

Biodiversity encompasses all components of the living world: the number and variety of plants, animals and other living things, including fungi and micro-organisms, across our land, rivers, coast and ocean. It includes the diversity of their genetic information, the habitats and ecosystems within which they live, and their connections with other life forms and the natural world.

Source Protecting Victoria's Environment – Biodiversity 2037

There is increasing scientific evidence that large scale global extinctions will have significant health implications including impacts on agriculture and global food resources. In addition to social benefits, well managed ecosystems can reduce the impact of many natural disasters including flooding, landslides and storm surges. Australia has experienced one of the largest declines in biodiversity of any continent over the past 200 years, according to extinction listings under the Environmental Protection and Biodiversity Conservation Act 1999.

The City of Monash supports significant areas of biodiversity including remnant vegetation, revegetation, waterways and open space that sustain a diverse range of native plants, birds and animals. The challenge for the City of Monash is to balance urbanisation with protecting and enhancing biodiversity. This means strengthening and implementing planning mechanisms to protect and enhance biodiversity and the garden city character. Council itself is a land manager with many bushland reserves, especially along our waterways. Council also manages the street treescapes and other landscaping initiatives. The City of Monash aims to demonstrate leadership in environmental sustainability by increasing the habitat connectivity across the municipality, increasing the habitat quality of land it manages and to increase the tree canopy cover across the whole municipality.

The Urban Biodiversity Strategy is the first overarching biodiversity strategy for the City of Monash, built on over 30 years of dedicated on ground works, community engagement programs and strategic planning to maintain and enhance our reserves.

The relevant objectives and actions under the ESS are:

2.1. A strategic approach to landscape planning is established which recognises biodiversity, habitat connectivity and builds ecosystem resilience.

2.1.2 Enhancing biodiversity values and habitat connectivity across the municipality.

This includes the development of a Biodiversity Action Plan based on baseline ecological and habitat corridor data and undertakes ecological assessments to record baseline data for conservation reserves under Council management and to identify habitat corridors across the municipality and at the catchment level.

2.2. Long term biodiversity outcomes are achieved on Council owned and manager conservation reserves.

2.2.1. Continue to manage Council's conservation reserves in accordance with best practice conservation and land management principles.

This includes on reviewing and updating Council Conservation Reserve Management plans, ground works; and investigating the impacts of climate change on local biodiversity values and the resilience of the ecological sites.

2.3. Increase community understanding of and participation in urban ecology and local biodiversity stewardship is achieved.

This Urban Biodiversity Strategy is informed and supported by three significant pieces of background work. These are:

- The Biodiversity Background Report – which identified a range of significant biodiversity values within Monash at a local and region scale.
- The Monash Bushland Reserves Management Monitoring Framework – which provided a suite of suitable tools to effectively monitoring changes in local biodiversity, and
- The Monash Bushland Reserves Assessment and Monitoring Report – which provided detailed baseline ecological data using the framework developed in the previous report, assessing 16 high priority reserves within Monash.

Although a largely urbanised environment, the background research confirmed that Monash is home to a broad range of significant bushland reserves with high biodiversity value that offers natural places to enjoy and explore while providing essential ecosystems functions for our fauna and flora. A summary of the Monitoring Framework is provided in Appendix 4.

Busland Reserve Network

Council Bush crew manages 42 bushland reserves

http://gis.monash.vic.gov.au/maps/

Gardens for Wildlife (schools, community and early learning)

Gardening forums and plantings to promote use of native plants

www.monash.vic.gov.au/events

Bird Watching Walks and bush crew

Supported by Birds Australia

www.monash.vic.gov.au/events

Gardens for Wildlife (schools, community and early learning)

Gardening forums and plantings to promote use of native plants

www.monash.vic.gov.au/events

Work Parties in Valley Reserve

Coordinated by the Freiends of Scotchman's Creek and Valley Reserve.
10-12 events per year.

http://scotchmanscreekfriends.org.au/

Working Bees in Damper Creek Reserve

Monthly events Coordinated by the Friends of Damper Creek Reserve Inc.

http://www.friendsofdampercreek.org.au

2. Understanding Our Local Environment

2.1 Our Natural Assets

The City of Monash manages over 260 hectares of bushland for its core biodiversity values which are incorporated largely into 42 bushland reserves across the municipality. Within these Council managed bushland reserves, approximately 17% of the area is remnant vegetation, a further 41% consists of revegetation, that is representative (in part) of its pre-European condition and the remainder is general revegetation, pathways and open space. The bushland reserves accounts for less than 3.2% of total land area in the municipality of Monash.

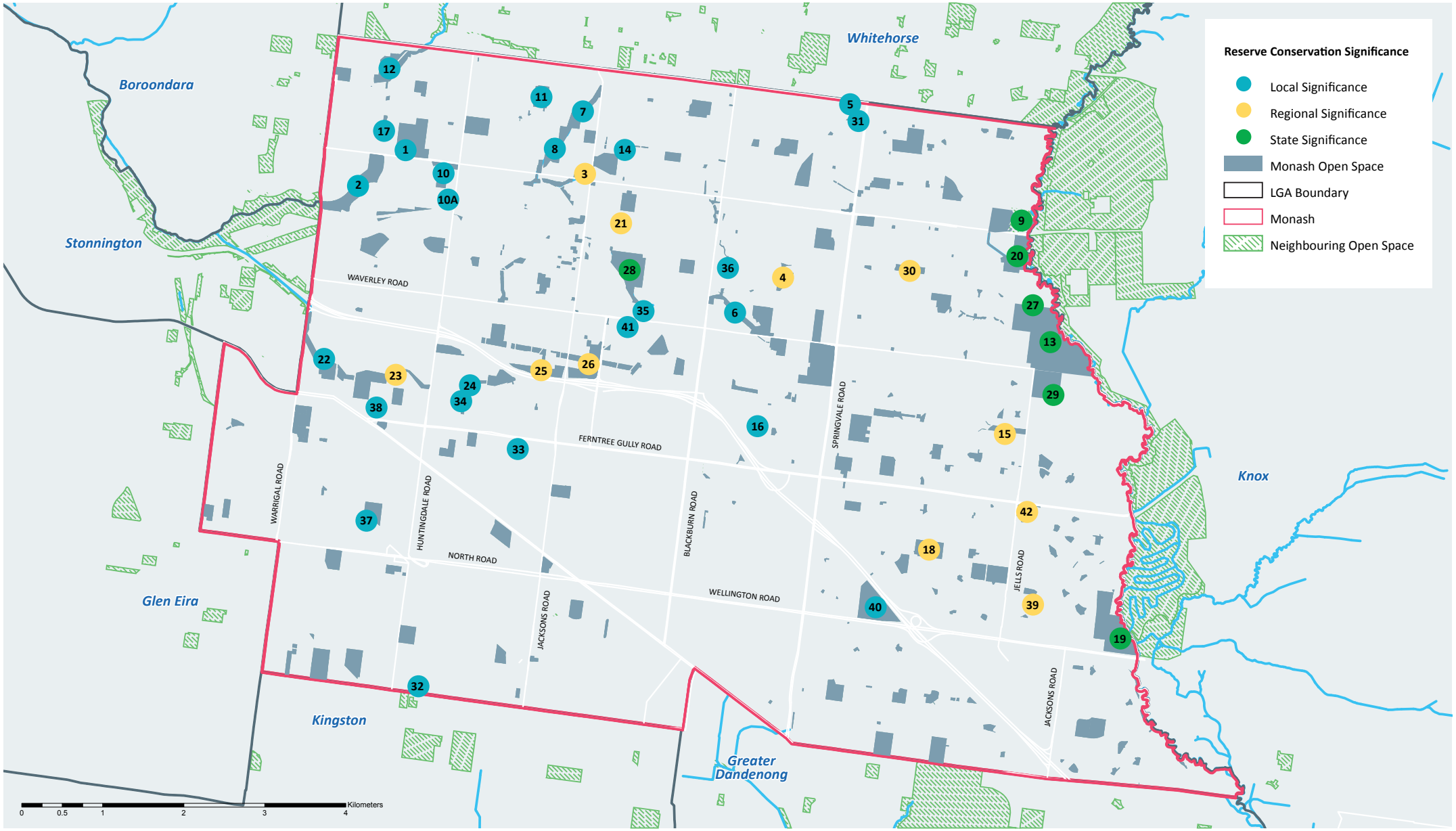
Many of the bushland reserves are located in the following catchments which flow into Port Phillip Bay:

- Dandenong Creek Catchment – including Bushy Park Wetlands, Shepherds Bush, Jells Park and Dandenong Valley Parklands.

- Yarra Valley catchment - including Scotchmans Creek, Gardiner Creek and Damper Creek.

Parks Victoria and Melbourne Water are responsible for large areas of public land that border council land in these catchments and make a substantial contribution to biodiversity in the local region. Council works in partnership with these and other government agencies to manage the conservation value of the region.

Figure 1 illustrates the locations of the 42 reserves and Appendix 1 provides a summary of each reserve. Seven of the reserves have State conservation significance and 10 have regional reserve conservation significance.



1 Ashwood College Wetlands
2 Ashwood Jingella and Holmesglen Reserve
3 Bellbird Corner
4 Bogong Reserve
5 Crabapple Reserve
6 Crosby Drive
7 Damper Creek Reserve North
8 Damper Creek Reserve South
9 Drummies Bridge Reserve
10 Tooronga Court Reserve
10 Electra Reserve
11 Federal Reserve
12 Gardiners Reserve
13 Glen Waverley GC
14 Gordon Road Reserve
15 Heatherlea and Sunnybrook Drive Reserve
16 Herriotts Boulevard Wetland Reserve
17 Kooyongkoot Wetlands
18 Lum Reserve
19 Mulgrave Reserve
20 Napier Park
21 Portsmouth Reserve
22 Scotchmans Creek Reserve (1 of 5)
23 Scotchmans Creek Oakleigh GC (2 of 5)
24 Scotchmans Creek Reserve (3 of 5)
25 Scotchmans Creek Reserve (4 of 5)
26 Scotchmans Creek Reserve (5 of 5)
27 Shepherds Bush Reserve
28 Valley Reserve
29 Waverley Reserve
30 Hinkler Reserve
31 Highview Park
32 Talbot Park
33 F E Hunt Reserve
34 Osborne Avenue West Reserve
35 Regent Street Reserve
36 Fiander Avenue Reserve
37 Haughton Road Reserve
38 Brickmakers Park Reserve
39 Whalley Drive Reserve
40 Freeway Reserve
41 Forster Road East Reserve
42 Monash Art Gallery

2.2 Biodiversity Values in Urban Environments

While the reserves managed under Council, Melbourne Water and Parks Victoria holds the key biodiversity values in Monash, secondary biodiversity values in modified landscapes also play an important role including:

Urban environments that support some foraging resources for indigenous fauna (in the form of private cultivated gardens and street trees), particularly surrounding properties (public and private) that back onto Council managed reserves

The urban environments that maintains indigenous and introduced plants (remnant, planted or naturalised).

Biodiversity values in other open space areas such as freeway reserves, schools, railways, golf courses, Council managed parks and Monash University Parklands.

2.3 Ecological and Cultural Significance

Biodiversity protection and enhancement in Monash is important for a range of ecological and cultural reasons including:

Ecological

- Remnant vegetation, planting indigenous species (revegetation) and water catchments provide critical refuges for a range of fauna not suited to more urbanised environments.

- Remnant vegetation and natural spaces also provides habitat for local plant and animal species.

- Monash includes 8 Ecological Vegetation Classes (EVC) that are endangered or vulnerable across the Gippsland Plains Bioregion including:

  EVC 56 Floodplain Riparian Woodland (endangered)
  EVC 55 Plains Grassy Woodland (endangered)
  EVC 83 Swampy Riparian Woodland (endangered)
  EVC 47 Valley Grassy Forest (vulnerable)
  EVC 175 Grassy Woodland (endangered)
  EVC 127 Swampy Riparian Complex endangered)
  EVC 937 Swampy Woodland (endangered)
  EVC 127 Valley Heathy Forest (endangered).

- The diversity and connectivity of vegetation and fauna habitats provide essential ecosystem functions such as flood mitigation, erosion control, clean water and adaptability to environmental change.

Cultural

Australian culture (traditional and inherited) is closely linked to our natural surroundings and our sense of identity, appreciation and dependence on biodiversity.

Monash lies within the Port Phillip and Westernport region, the traditional country of the Wurundjeri, Boon Wurrung and Wadawurrung people, all part of the Kulin Nation. These people have lived in and been connected to the land, water, plants and animals of this area for many thousands of years. The Wurundjeri, Boon Wurrung and Wadawurrung people are acknowledged as the Traditional Owners of this land. There are many lessons that can be learnt from the traditional land owners such as the controlled use of fire to manage biodiversity, food sources provided by native plants and animals and sustainable land use practices.

Biodiversity protection is valuable for cultural reasons because it:

- Represents the natural history of the local area and is closely tied with traditional land use
- Provides opportunities to connect with nature through recreation and through artistic and spiritual inspiration
- Creates awareness and educational opportunities through engagement with regional experts, public land managers and traditional owners of the land
- Can support a range of employment opportunities
- Builds healthy ecosystems which are critical to human health and sustainability.

2.4 Regional Strategic Context

The City of Monash is bound by various forms of environmental legislation at both State and Federal levels including:

- Commonwealth Environment Protection and Biodiversity Conservation Act 1999
- Flora and Fauna Guarantee Act 1988
- The Catchment and Land Protection Act 1994
- Victorian Wildlife Act 1975
- Victorian Planning and Environment Act 1987 and the Monash Planning Scheme

Appendix 4 provides further detail on the above Acts.

The Victorian Government has also released ***Protecting Victoria's Environment – Biodiversity 2037 in April 2017***, a new long-term plan to protect our environment. It builds on work already underway to review Native Vegetation Clearing Regulations and reform the Flora and Fauna Guarantee Act 1988, ensuring that Victoria has an effective approach to protecting its biodiversity.[1]

According to this strategy, 'Biodiversity is all components of the living world: the number and variety of native plants, animals and other living things across our land, rivers, coast and ocean. It includes the variety of their genetic information, their habitats and their relationship to the ecosystems within which they live'.

Native plants and animals are not limited by council boundaries so it is important that Council work in partnership with our neighbours and state to create a healthy environment across Victoria. This strategic work in biodiversity should also align with regional environment related strategies and programs such as:

- the Metropolitan Urban Forest Strategy[2]
- Melbourne Waterway Corridor Guidelines for Greenfield Development[3]
- The Port Philip and Western Port Catchment Management Authority Living Links Program
- Biodiversity activities and education at Monash University and Holmesglen.

The City of Monash is committed to biodiversity protection and is one of eight Councils that are a member of the Eastern Alliance for Greenhouse Action (EAGA). The EAGA in collaboration with the University of Melbourne and the Royal Botanic Gardens Victoria developed a Framework for Biodiversity Monitoring in Melbourne's East. This Biodiversity Strategy, in part, builds on the principles of this Framework.

1 www.environment.vic.gov.au/biodiversity/biodiversity-plan
2 www.resilientmelbourne.com.au/strategy-actions
3 www.melbournewater.com.au/sites/default/files/Waterway-corridors-Greenfield-development-guidelines.pdf

Musk Lorikeet

Photography Ian Moodie

Why is biodiversity monitoring important?

The EAGA identifies several reasons for biodiversity monitoring and protection within the eastern suburbs of Melbourne:

- Increasing urbanisation and gradual degradation of biodiversity habitat
- Due to climate change, Eastern Melbourne is predicted to get hotter and drier with increased frequency of heatwaves
- Climate change is also likely to trigger increased intensity of rainfall events in summer and autumn
- Climate change is likely to lead to decline of certain species, but will benefit others
- Many species and Ecological Vegetation Classes (EVC's) are of particular concern
- While Councils are taking actions to manage biodiversity in response to climate changes, monitoring is required to determine if actions are effective.

In addition to the above principles, Monash Council endeavours to improve its monitoring procedures as a means to better understand the relationship between management approaches, resourcing and improvements in biodiversity overtime. Although many Council reserves support a rich diversity of flora including revegetation which has successfully integrated with terrestrial bushland and riparian zones, until the development of this strategy, there has been limited centralised information on the flora and fauna across the municipality.

2.5 Local Strategic Planning

Strategic planning across Council provides the opportunity to identify sites of biodiversity value, areas for improvement and for setting long-term goals. Council strategies and management operations also align with relevant Federal, State and Local regulations outlined in 2.4 and in Appendix 4.

In addition to the EAGA Framework, this plan is intended to align with other Council policies and strategies including:

- Environmental Sustainability Strategy 2016-2026
- Street Tree Strategy 2016
- Open Space Strategy 2018
- Monash Urban Landscape and Canopy Vegetation Strategy 2018
- Gardens for Wildlife Program Booklet

In particular, the Environmental Sustainability Strategy outlines the importance of the natural environment. Of the seven broad strategic priorities contained in this strategy, Urban Ecology is identified as a key priority.

A series of actions have been identified in the Environmental Sustainability Strategy, including:

- Undertaking ecological assessments to record baseline data for conservation reserves under Council management and to identify habitat corridors across the municipality and at the catchment scale

- Developing and implementing a municipal wide Biodiversity Action Plan from the baseline ecological and habitat corridor data

- Managing Council's conservation reserves using best practice conservation and land management principles

- Investigating, researching and monitoring indicators that will demonstrate potential impacts of climate change on local biodiversity values, health of local indigenous flora and fauna, and the resilience of ecological sites

- Reviewing, updating and implementing Council's conservation reserve management plans and procedures to support the delivery of important on ground works.

Key biodiversity plans and strategies for Monash Council

2000	*The Indigenous Corridors Conservation and Management Plan 2000* First dedicated municipal conservation plan
2006	*Bushland Reserve Management Strategy (BIOSIS)* This was the starting point for investigating Councils reserve management system, it identifies ecological values and options for management, monitoring and expansion
2007-2014	Development of 14 dedicated Bushland Management Plans for priority reserves as recommended in the Bushland Reserve Management Strategy Detailed ecological assessments and monitoring frameworks developed for this strategy are to be integrated with existing and future management plans Bushland Management Plans for other reserves are currently being considered
2011	*Monash Environmental Sustainability Road Map 2011-2015* The Road Map aims for an environmental, economic and socially sustainable city by identifying measurable sustainability targets for energy, water, natural environment, waste and food
2012	*City of Monash Bushland Reserves: Nest Box Survey and Assessment (Biosis 2012)* Provides information on fauna utilising nest boxes in Council Bushland Reserves
2015	*EAGA Biodiversity Monitoring Project (Eastern Alliance for Greenhouse Action)* Outlines a regional approach to biodiversity monitoring in eastern Melbourne that underpins the Monitoring Framework developed for this strategy
2015	*Monash Gardens for Wildlife Booklet and education program* A publication on garden design using local native plants and management of weeds
2016	*Monash Environmental Sustainability Strategy 2016-26* Provides the key priorities for management of Urban Ecology and identifies the next steps towards the development of a dedicated Biodiversity Strategy
2016	*Street Tree Strategy* Providing guidance on the planting and management of street trees to maintain consistent streetscape character and maintain tree health
2018	*Open Space Strategy* Providing guidance on how council manages its active and passive open space including bushland reserves
2018	*Monash Urban Landscape and Canopy Vegetation Strategy* Providing guidance for residents to support a consistent landscape which supports the local character or complements nearby bushland reserves and maintains canopy cover.

Sugar Glider : Photography Ian Moodie

Gang-Gang Cockatoo : Photography Ian Moodie

2.6 Biodiversity value of Monash

Overview of biodiversity value

The Background research highlighted a range of biodiversity values within Monash that are significant at a local and regional scale including:

- Eight Ecological Vegetation Classes (EVC) that are endangered or vulnerable within the context of the Port Phillip and Westernport Bioregion.
- 742 native flora species being present or previously recorded within the municipality.
- 309 native fauna being present or previously recorded within the municipality.
- Important habitat for a broad range of aquatic bird species that rely on the various wetlands, swamps and watercourses.
- Species-rich reserves providing home to rare or threatened local provenance terrestrial plants, including orchids and grasses, and the Powerful Owl.
- Home to several populations of Yarra Gum Eucalyptus yarraensis and Veined Spear Grass Austrostipa rudis, both considered rare in Victoria.
- A network of vegetation types (terrestrial, ephemeral and in stream) provide essential ecosystem functions such as flood mitigation, erosion control, clean water and adaptability to environmental change.

Biodiversity values in terrestrial environments

- The City of Monash is home to several small yet significant bushland reserves ranging between 1 and 15 hectares in size. As mentioned earlier, the EVCs contained within these reserves are listed as endangered or vulnerable within the bioregion. Monash is home to flora of state significance such as Veined Spear Grass (Austrostipa rudis ssp. australis) and Yarra Gum Eucalyptus yarraensis (both listed as rare in Victoria). Bushland reserves also provide habitat to rare and endangered fauna species such as the Powerful Owl (Ninox strenua).

- Despite many of these reserves being mown or subject to differing amounts of clearing during the early settlement period, much of the original vegetation has persisted at these sites. In particular, the removal of tractor mowing, in the early 1990s, allowed the vegetation to substantially recover and expand. This has been coupled with strategic planting of key flora species known to be missing or depleted from the sites, and this forms the backbone of the rare examples of pre-European vegetation that persist to this day.

- Some terrestrial environments under Council management are associated with stream corridors and a network of interconnected reserves where fauna species and native plants (through seed production) can disperse across the landscape. Other terrestrial environments are small 'island' reserves surrounded by urban development where species dispersal is limited. These reserves often support small populations of species that may be unviable in the long term without concerted management intervention or with opportunity to expand its means of dispersal (e.g. through further revegetation and creation of green corridors).

- These reserves have been critical in saving local provenance of flora and protecting Monash's biodiversity as well as providing a seed source for revegetation across the municipality. The larger established plantings have formed mature stands of forest or woodland which also provide many fauna species with invaluable refuge and over recent times, greater habitat connectivity, allowing dispersal of some fauna from these islands, such as the Sugar glider (Petaurus breviceps).

- However, it is important to note that many barriers still persist and will provide ongoing challenges within these environments. Barriers to habitat connectivity, reserve size, loss or reduction of key floral populations and the absence of key environmental indicators within EVCs, are among many factors which need to be considered in managing these bushland sites.

Biodiversity values in aquatic and riparian environments

- Aquatic and riparian environments represent one of the few areas within urban environments that are unsuitable for development. Therefore, these environments provide opportunities to enhance flora and fauna habitats and improve connectivity between riparian corridors. These environments are less likely to be directly impacted by future development, or associated land uses.

- In Monash, significant creek corridors that aquatic lifeforms depend on include the Dandenong Creek, Scotchmans Creek, Damper Creek, Gardiners Creek and Mile Creek.

- Drainage lines, billabongs, swamps and wetlands (both natural and modified) support a wealth of aquatic lifeforms including waterbirds, fish, crustaceans, amphibians and aquatic insects.

- A network of Council managed bushland reserves includes a suite of wetlands and waterways that have high biological and amenity values. These systems also support a range of aquatic plants, including reeds, sedges, floating and submerged vegetation which provides aquatic fauna with a food source and protective cover for nesting and breeding.

- A broad range of terrestrial fauna also depend on wetland and riparian environments for foraging including arboreal mammals (Possums, Flying-foxes and Micro bats), reptiles (snakes and lizards) and birds (migratory/marine birds, ground dwelling birds and birds of prey).

Tawny Frogmouth

Photography Ian Moodie

2.7 Baseline Data from Indicator Reserves

Of the 42 bushland reserves being maintained to conserve biodiversity, 16 were designated as high priority (Indicator) reserves. The baseline assessment identified that Monash possesses a wealth of significant bushland reserves that should be held in high regard and be protected, including:

- 10 reserves are considered high to very high conservation significance due to conservation status of EVCs combined with extent and quality of remnant bushland vegetation.
- 6 reserves are considered moderate to high conservation significance due to EVC conservation status, diversity of revegetation and habitat connectivity across the broader landscape.
- 293 indigenous plant species were observed as either remnant populations (prior to European settlement) or re-established through planting.
- Remnant vegetation and revegetation provide critical refuges and foraging resources for a range of native fauna including a predicted 250 species that occur in Monash.
- A total of 44 bird species were observed during a series of brief bird census surveys over 2 seasons within the 16 indicator reserves.

Despite high biodiversity values across numerous bushland reserves, a range of threats to biodiversity still persist within the municipality and were confirmed during recent surveys, including:

- A total of 282 introduced species (planted or naturalised) recorded within reserves with at least 50% of these considered invasive and highly detrimental to native vegetation.
- The confirmed presence of pest animals in numerous reserves including Foxes, Indian Myna and Feral Cats.

3. Challenges for Biodiversity Conservation

As Monash is an urban Council, there will always be a range of issues that compete with the objectives of biodiversity conservation. Therefore, the aim for biodiversity protection in Monash is based on the principle of building ecological resilience. The resilience of ecosystems in Monash has and continues to be threatened by a number of factors including:

- Habitat loss, degradation and fragmentation
- Changes to water quantity and quality within the aquatic environment
- Pressure from population increase and increased visitor numbers in reserves
- Altered fire regimes, both regulatory and environmentally
- Invasive species including pest plants and animals
- Climate change leading to altered species distribution and possible extinction
- Conflict between open space recreational activities (negative impact)
- Loss of green corridors as a result of changes to the built environment

Loss or decline of biodiversity in Monash is attributable to both past land management practices and present threats. Typical features within ecosystems that are absent or compromised in modified landscapes include:

- Loss of large hollow bearing trees and mature canopy trees on public and private land
- Loss of green space, trees and established gardens on private land
- Key fauna species such as apex predators, grazing mammals, diggers, fungi and soil distributors
- Forests and woodlands with a grassy and/or shrubby understorey
- Organic litter and coarse woody debris
- Riparian corridors and associated swamps, wetlands and billabongs etc.
- Adjoining habitats connecting one environment type to another
- Soil and water quality suitable to sustain the desired diversity of lifeforms.

Even in well managed reserves, many of these habitat components are deficient, and in some cases, these components are difficult to replace. As outlined below, a range of threats associated with urban environments potentially contribute to further decline of biodiversity. Monash City Council has some influence on reducing these threats at a local scale, but also requires the support of the community and other land management authorities to achieve broader scale threat reduction.

Weed Invasion

The Biodiversity Background Report reveals that 434 introduced plant species have been found within Monash. While many of these are benign, at least 50% are invasive to some degree and around 20% are considered highly invasive. Weed invasion includes declared ‘noxious’ and high threat environmental weeds, naturalised pasture species which may spread in a number of ways such as:

- Planted garden specimens that naturalise on adjacent public lands (i.e. garden escapes)
- Mowing regimes may lead to the transportation of weed seeds by equipment, or prevent naturalisation due to timing and frequency
- Weed seeds spread by animals and people
- Illegal dumping of garden waste and litter
- Soil disturbance
- High-nutrient stormwater or that contaminated with chemicals
- Inappropriate drainage and runoff into remnant areas
- Water borne infestation from higher upstream in catchment (due to flood events).

3.1 Pest Animals

The Biodiversity Background Report reveals that 306 fauna species (including birds, fish, mammals and invertebrates) have been found within Monash. While there are fewer introduced fauna species compared to plant species, they are still significant and are vulnerable to:

- Predation on native fauna by feral and residential cats and foxes
- Impact of competition by introduced animals (Indian Myna, Blackbirds, Starlings, Rabbits) or overabundance and grazing of native animals (such as Noisy Miner, Currawongs, Possums)
- Relocation of possums from private land by possum removal companies is causing pressure on bushland, is illegal and may endanger the relocated possum
- Colonisation and predation of invertebrates such as the European Wasp and Bee, Argentinean Ant and Fire Ant
- Predatory fish species (e.g. mosquito fish, carp) which compete with native aquatic life.

3.2 Impact to Waterways

Quality and quantity of waterways both within Monash and the broader region are severely compromised without sufficient protection measures including revegetation and water sensitive urban design principles. Unmitigated urban stream flows typically lead to:

- Nutrient rich run-off or pollution into wetlands and streams that is incompatible to water life and favourable to a broad range of weeds
- Increase of erosion and sediment input into wetlands and watercourses due to high flow storm water events
- Reduced water quality due to pollutants, litter, sedimentation, fertilisers and waste.

Urban stormwater, hard surfaces and drains may divert water away from bushland and waterways.

3.3 Environmental Impacts

Where natural systems are modified and fragmented, there is less capacity for these systems to cope with environmental changes. Environmental impacts to biodiversity include but are not limited to:

- Climate change leading to altered species distribution and possible extinction
- Absence or alteration of fire regimes which many flora species and vegetation communities rely upon
- Storm events leading to flood damage, loss of vegetation and erosion.

3.4 Other Factors

- Loss of canopy trees due to the built environment and Eucalypt Dieback
- Compaction in the form of roads and paving which reduce root absorption from nearby trees
- Light pollution within or adjacent to natural spaces that impacts on the biology and behaviour of nocturnal fauna species such as birds, bats and possums
- Uncontrolled access by humans or dogs within sensitive conservation areas
- Illegal relocation of possums into reserves resulting in overgrazing of vulnerable areas.

4. Recent Success in Biodiversity Management

Since settlement, biodiversity loss in Monash has been incremental and significant. Approximately 90% of the original landscape in Monash has been developed into an urban landscape. The majority of the urbanised landscape can only accommodate limited fauna and flora populations and species compared to those that originally occurred.

Although Monash has experienced significant biodiversity loss since European settlement, Council and community members have made significant gains in the past 25 years through conserving and enhancing the remaining biodiversity values within the network of public opens spaces, which have included extensive revegetation and enhancement of habitat corridors.

Summary of resourcing achievements to date in Monash

- Replanting of more than 100,000 trees, grasses and shrubs each year.
- 42 dedicated bushland reserves under Council management with community input.
- 8 regionally endangered ecological vegetation classes protected within Council managed reserves.
- Re-establishment and preservation of remnant vegetation.
- A team of 14 full-time Council staff dedicated to local seed production, propagation and bushland management.
- 3 active long-established Friends Groups that conduct ongoing revegetation and conservation works.
- Collaborative relationships with Port Phillip and Westernport Catchment Management Authority (through Living links), Parks Victoria and Melbourne Water who manage neighbouring conservation reserves.
- Development of a range of environment/open space plans and strategies that provide critical ecological and land use information that informs on-ground management works.

Brush Tailed Possum : Photography Ian Moodie

Great Egret : Photography Ian Moodie

4.1 The Journey So Far

Despite significant biodiversity loss and alteration over the last 150 years, the City of Monash, its residents and stakeholders have made concerted efforts to arrest biodiversity decline over the past 25 years. The City of Monash still retains 42 bushland reserves and numerous green corridors and waterways that provide habitat connectivity.

Recent surveys and conservations with management staff have confirmed that a range of threats still persist (particularly high threat weeds and pest animals), however, conservation initiatives in the past 25 years have demonstrated that significant ecological gains in most bushland reserves including:

- A reduced cover and impact of high threat weeds.
- A greater diversity and cover of native plant species (through revegetation and natural regeneration)
- A greater diversity of habitats for native fauna including vegetated wetlands and terrestrial areas and more connectivity between suitable habitats.

From a Council perspective, interest in bushland management and revegetation began in the early 90's. At this time, two full time staff were employed as specialised bushland managers and resources were mostly centred on management and revegetation of Valley Reserve in Mount Waverley and along Damper Creek.

Since this time, the Council bushland and wetlands team has expanded to 14 full time staff, which collectively manages 42 reserves for biodiversity values (both remnant bushland and revegetation). Seasonal agency bushland managers also provide assistance during peak management periods.

To varying degrees, there have been a range of Council and community management initiatives that have assisted with protection and improvement of biodiversity values in Monash including:

- Undertaking management works to reduce the impact of weed and pest bird and animal invasion.
- Moving away from tractor mowing towards hand mowing to selectively retain patches of native vegetation and promote natural regeneration and organic litter within budgets.
- Encouraging natural recruitment and diversity of plant life across all lifeforms (grasses, herbs, ferns, groundcovers, orchids, climbers, shrubs and trees).
- Undertaking extensive revegetation works to increase extent and diversity of native vegetation and fauna habitat with a particular focus on recreation of specific EVCs.
- Undertaking community education and engagement programs to foster awareness of biodiversity protection and threatening processes.
- Limiting recreational activity (e.g. with fencing or signage) where it adversely impacts on sensitive flora and fauna habitats
- Extensive rock stabilisation of creek bed and banks along Damper Creek.
- Wetland creations, vegetated swales and other water sensitive urban design elements to mitigate the impacts of erosion, siltation and storm water pollution.
- Gardens for Wildlife residential program, schools and preschools to create stepping stones of indigenous habitat between reserves.

Brickmakers Park

4.2 Council Investment

Monash bushland reserves are managed for their biodiversity values which range from small habitat 'nodes' less than 1 hectare to significant core habitats and biolinks greater than 10 hectares. Protecting this network of reserves is critical to sustaining flora and fauna populations across the Council area. Open space reserves, gardens and street trees provide supplementary (sub-optimal) habitat that contribute to biodiversity values across the municipality.

A key component of Council's investment into biodiversity is annual planting of at least 100,000 trees, shrubs and groundcovers for revegetation. These works are mostly undertaken by Council with assistance of Friends Group members and sometimes local schools. Annual budget allocation also provides ongoing employment of the 14 dedicated bushland and wetland staff who undertake weed control and regeneration works in addition to revegetation.

One full-time nursery person is employed to carry out local seed collection, maintaining a local provenance seed bank, to support the propagation of indigenous plants. Most plants are grown under privately run nurseries, however, Monash still propagates the more rare or delicate species (orchids, lilies etc.) in the nursery at the Monash Operations Centre.

Most of the revegetation and bushland management works are funded by Council, although grant money is sought to support weed control, ground works and revegetation.

To support biodiversity outcomes, Council's *Urban Landscape and Canopy Vegetation Strategy* and *Street Tree Strategy* have both identified several key objectives to enhance biodiversity throughout Monash including:

- Creation of a 400m wide habitat corridor associated with creek lines to increase connectivity between core habitat areas
- Strengthening habitat corridors and indigenous landscape character along waterways
- Incorporating green corridors to encourage walking and cycling and more connection to biodiversity
- Increase canopy tree cover across public and private land from 22% to 30% by 2040.

4.3 Local Community Investment

Three key community environment groups have a long history of protecting and enhancing biodiversity in Monash in partnership with Council's dedicated bushland and wetlands team. These groups include the *Friends of Damper Creek Reserve*, the *Friends of Scotchmans Creek and Valley Reserve* and the *Friends of Dandenong Valley Parklands*. These groups formed over the past few decades and are active in preservation of Monash bushland reserves through planting and weeding. Depending on annual funding opportunities, both groups plant between 6,000-9,000 plants per year.

Both groups also hold events on Clean Up Australia Day, National Tree Day, and coordinate their own Waterwatch programs with Melbourne Water. In addition to on-ground works, both groups provide advocacy to government organisations in relation to local or regional concerns such as waste management, open space planning, waterway and biodiversity protection and sustainable living. Each group also produce a monthly newsletter, which inform and educate group members and the public.

The Friends Groups work in partnership with the expertise of the Monash bush crew to guide the plant selection and ordering for revegetation works. All revegetation plants are indigenous and are propagated from local provenance seed collected by Council staff. The Friends Group also have a Waterwatch team also does monthly testing of the waterway at designated monitoring locations within the reserves.

Funding sources for working bees that sustain both groups include Monash Council, Melbourne Water, Parks Victoria Community Grants, the National Heritage Trust and Planet Ark. Some capital works funded and undertaken by Council/Melbourne Water such as bank stabilisations, willow removal and rock beaching also enable friend's groups to follow up with revegetation works.

Friends of Damper Creek Reserve

The Friends of Damper Creek Reserve Inc. formed in April 1993. The Friends Group works in conjunction with Monash Council to undertake staged restoration and maintenance work within the Damper Creek Reserve which includes 13.3 hectares of riparian vegetation, swamps and wetlands.

The Friends have concentrated efforts on the planting of tube stock to encourage the development of upper and middle storey growth and ground covers for soil stabilisation. In more recent years the planting has been more directed to understorey planting now that the upper and middle storey is maturing.

The Friends have established a Water Watch monitoring program in Damper Creek. The program includes the distribution of a newsletter to households in the Damper Creek Catchment identifying ways to improve water quality in the creek (funded by a Melbourne Water Grant).

Friends of Scotchmans Creek and Valley Reserve
Initially separate groups, the Valley Reserve Friends group formed 60 years ago, while the Friends of Scotchmans Creek was formed by local residents in 1998, both working in co-operation with the Monash City Council and Melbourne Water. The Groups amalgamated in 2001 to form the Friends of Scotchmans Creek and Valley Reserve.

Most of the recent activity is focussed on Valley Reserve where 'work party' sessions are held on the last Saturday of each month except December and January. They have also made a significant contribution to Fairway Reserve (5.7 hectares) over 17 years including planting over 100,000 plants. The organisation also helps maintain and enhance the reserves along Scotchmans Creek, including Fiander reserve, Crosby reserve, Regent Street reserve, Mount Waverley Wetlands. The Friends group's Waterwatch team does monthly testing at monitoring locations within these reserves.

The organisation also hosts several events annually for local schools.

Friends of Dandenong Valley Parklands

Friends of Dandenong Creek are located near Shepherd bush. Since 1989, this community group has worked with Parks Victoria to conserve and protect the natural environment of the Dandenong Valley parklands which including reserves in Monash such as Bushy Park Wetlands, Nortons Park and Shepherds Bush.

They meet several times a month for 2-3 hours working on planting, developing their native gardens, propagating indigenous plants in their nursery, monitoring Dandenong Creek for water quality, weeding and other activities to suit people of all interests and ages.

5. Taking Action to Protect and Enhance Biodiversity in Monash

Biodiversity in Monash provides essential ecosystem functions as well as enhancing the Garden City character and providing natural places for the community to enjoy.

We believe that the development and implementation of this strategy is a vital step towards creating a more sustainable future for the City of Monash. As a local government body, we are committed to:

1. Protecting and enhancing biodiversity within Council managed reserves
2. Reducing environmental impacts of urban development and land use
3. Educating and inspiring the community to participate in biodiversity related programs
4. Maintaining and creating resilient ecosystems that are adaptable to climate change
5. Biodiversity outcomes that extend beyond Council management boundaries through collaboration with other land management authorities in the region

Background research undertaken to support this strategy has identified a diverse range of ecological communities, fauna habitats and regionally threatened species. Numerous challenges and environmental threats have also been identified to highlight the areas that need further attention and resourcing.

This Biodiversity Strategy includes recommendations to implement the monitoring framework, introduce new Council and community-based programs and to investigate potential opportunities to further enhance biodiversity outcomes and community participation in addition to Councils existing biodiversity management. To this end, the strategy is considered to be a living document that is to be reviewed every few years so that these initiatives can be refined.

While there have been significant gains made in the past 25 years, biodiversity protection requires ongoing management to maintain and enhance our bushlands to reverse the historical impacts of clearing and urbanisation and address the causal impacts of environmental weeds, pest animals, erosion and pollution.

Monash has developed a team of expert operational staff, strong relationships with Friends groups and other stakeholders and ongoing budget allocation that has undoubtedly improved the quality and extent of biodiversity and strengthened long-term ecological resilience.

A strong foundation has been formed between Council and community members, however the future of biodiversity heavily depends on continued funding, community participation, innovation and adaptive management.

Six main objectives have been identified to underpin and guide action this biodiversity strategy:

1. Increase community understanding, active engagement and appreciation of biodiversity.
2. Enhance biodiversity through revegetation and protection of remnant vegetation
3. Collaborate with other public land managers to create broad-scale biodiversity gain.
4. Proactively reduce biodiversity threats.
5. Identify ecological baseline and indicators to monitor and assess environmental conditions.
6. Strengthen Biodiversity Policy and Legislation.

An Implementation plan is outlined below for each of these objectives and considers the following:

- Council activities that are currently in place with opportunity for expansion.
- Recommendations for new initiatives to be developed in the next 12 months and implemented over the next 3 years and beyond.
- Potential options for other initiatives subject to investigation in the next 12 months and a clear plan or policy direction within the next 3 years.
- Timing of implementation of suggested actions will be dependent on dedicated budget allocation and the type of staff resourcing required. The plan will be reviewed every 3 years.

5.1 Objective 1 – Increase community understanding, active engagement and appreciation of biodiversity

The key focus of this objective is to involve local residents of all age groups by directly engaging them through education and participation in actions such as planting, weeding and biodiversity monitoring.

Increased participation not only makes an important biodiversity contribution, it also provides a range of social and learning opportunities for the community, and can enhance community appreciation of their local environment.

Providing targeted education and engagement with community, schools and developers is essential to build appreciation of bushland and green space. Promotion of planting days and other biodiversity themed events may not involve everybody the first time around or captivate participants in the long-term. Therefore, Council should invest in marketing, educational opportunities, community incentive schemes and provision of online resources to further engage community interest in biodiversity.

Private land plays an important role in providing biodiversity corridors throughout Monash. While there is a preference for increasing local indigenous species, exotic and introduced vegetation still has a role to play in supporting local wildlife. Therefore Council would encourage a gradual transition to indigenous species, to continue to provide habitat for biodiversity.

Objective 1 – Implementation Plan

Item	Action	Timing
1.1	Promote more biodiversity themed events, activities and working bees to encourage greater community opportunities.	Ongoing
1.2	Investigate a range of incentives for landowners and consider other models adopted by Councils in the eastern region for both weed eradication and creation of new habitats on private land.	2019/2020
1.3	Develop and enhance programs with schools, early learning centres and community groups to initiate improvements in biodiversity on Council reserves or on school grounds, especially those next to existing bushland. Build on the current Gardens for Wildlife program and Planting on Nature strip guidelines. - Education on the value of trees in the urban environment.	2019
1.4	Investigate opportunities for new 'Bush Kinders', through engagement with Bush Kinder service providers, gauge the level of local interest and potentially allocate a reserve space for Bush Kinder sessions.	2019/2020
1.5	Investigate the introduction of Community Incentive Schemes including: - A weed disposal program with free (or reduced) tipping fees. - Rate discounts or other incentives for creating wildlife friendly gardens. - Arborist support to retain trees for vulnerable residents. - Review incentive-based programs in other Councils and then gauge how a similar model may work in Monash.	2019-2021
1.6	Provide biodiversity information to the community that is engaging and easy to access. Update the website with a dedicated space for biodiversity information. Build web-based information, photos and maps on Council's website including maps, natural history of Monash, and lists of indigenous flora and fauna, guidance on planting in private land, and weed identification and an interactive biodiversity atlas. Provide information to assist the community to better understand the difference between native, indigenous, exotic and weed species and their impact on the local biodiversity. This may be supported by social media or online Gardens for Wildlife information. - Create a biodiversity@monash.vic.gov.au email address, for residents to provide a feedback and information loop between Council and the community. - Provide information on local indigenous nurseries that are available to the public (such as in the Monash Gardens for Wildlife booklet or articles in local newspaper). - Consider mail-outs with specific biodiversity information for residential properties adjoining reserves. - Define the personal benefits of biodiversity and the value of bush land to the broader community through online and hard copy communications and fact sheets.	2019
1.7	Encourage Community to be involved in Citizen Science Contributions	2019-2020
1.8	Facilitate and support the creation of new Friends Groups or community groups to support action on the ground (Skink Link or Green Shoots) to create interest in urban bushland and biodiversity.	2019-2020

5.2 Objective 2 - Enhance biodiversity through revegetation and protection of remnant vegetation

Remnant areas and areas which have undergone revegetation both play an important role in providing high value indigenous vegetation which supports biodiversity in the City of Monash. Protection of remnant vegetation is the most significant aspect of vegetation management because it usually represents the most important habitat, the most diverse flora composition and with best practice management, it will continue to regenerate and adapt favourably to environmental changes.

However Monash has only small pockets of remnant vegetation, so revegetation provides a critical support role by creating corridors for remnant vegetation to link one remnant to another or to improve an existing remnant that is depleted due to long-term impacts from urban settlement. Furthermore, revegetation has proved to be successful in its own right in degraded areas where there is little opportunity for natural ecological recovery. Revegetation has played a major part of ecosystem restoration in the past 30 years in Monash and will continue to be a core part of our Biodiversity Strategy in years to come.

Objective 2 – Implementation Plan

Item	Action	Timing
2.1	Enhance and expand revegetation areas and improve degraded areas using local provenance plants with a focus on establishing understory species. - Prioritise sites where habitat connectivity and corridors can be enhanced, which may include current lawn areas. - Incorporate water sensitive urban design principles (i.e. wetlands, swales, litter traps, sediment traps, rain gardens) to increase access to water and improve quality. - Plant a broad range of species to provide diversity in the face of climate change or other environmental impacts. - Utilise plant species that are appropriate to the relevant EVC, through local seed collection and propagation programs. - Re-establish locally extinct or rare plants through propagation and individual management plans.	Ongoing
2.2	Maintain and improve remnant vegetation. - Manage environmental weeds and allow natural ecological processes. - Use supplementary planting within remnant vegetation to increase diversity and natural recruitment. - Consider the development of a significant tree register. - Protect hollow bearing trees including retention of dead trees with hollow bearing capacity (typically trees greater than 90cm circumference). - Identify, protect and enhance native habitat values - Investigate opportunities for improved biodiversity values where appropriate, including golf courses and recreation reserves.	Ongoing
2.3	Install nest boxes for hollow dependant species in locations where limited nesting opportunities exist due to tree loss.	2019-2021
2.4	Interpretive signage – to highlight the significance of bushland areas, remnant vegetation and reasons for retaining dead trees (such as habitat and tree hollows).	2020-2021

5.3 Objective 3 - Collaborate with other public land managers to create broad-scale biodiversity gain

Biodiversity enhancement programs are most effective when implemented across different land tenures. Public ownership of open space is shared among different authorities in Monash including Council, Parks Victoria, Department of Environment Land Water and Planning (DELWP), Port Phillip and Westernport Catchment Management Authority (PPWCMA), Melbourne Water, Vic Roads and VicTrack. There is great potential for Council to work with other land managers to work collaboratively and effectively to combat pest animals, environmental weeds and improve biodiversity through revegetation and community awareness. This also provides an opportunity to develop paths and corridors for humans and wildlife across Monash. Increasing access to the urban bushland may increase community appreciation and awareness as well as providing positive mental health and well-being benefits.

Objective 3 – Implementation Plan

Item	Action	Timing
3.1	Develop management initiatives between Monash Council and other public land authorities such as: - Converting open drains (e.g. Heany St (MG) Electra Reserve and Osborne Ave), and daylighting creek lines where appropriate (e.g. Mile Creek and Gardiners Creek). - Other forms of 'naturalising' waterways (e.g. Levee Bank Filtering Systems that favour Dwarf Galaxia, wetland creation and vegetated swales). - Identify funding opportunities that complement biodiversity initiatives with other programs (such as the PPWCMA Living Links program along within the Dandenong Creek, or Melbourne Water's Corridors of Green funding). - Share resources and knowledge to facilitate a 'regional' approach. - Improve increase green space and biodiversity connections (for wildlife and humans) in partnership with neighbouring councils and other public land owners.	Planning and investigation 2019 and progressing over 2020-2021.
3.2	Explore multi-tenure land management programs such as targeted pest and weed control, and stream enhancement works.	2019
3.3	Consider transfers in land ownership where it is likely to result in an improved land management outcome.	2019
3.4	Identify biodiversity enhancement opportunities that complement other funded programs (i.e. Bike Tracks, Level Crossing Removal Programs, new sporting facilities).	Ongoing
3.5	Consider fencing to protect vulnerable areas and recognising conservation status.	2019
3.6	Evaluate the possibility of increasing bushland on reserves/parks; purchasing land for conservation; or providing incentives for retaining mature trees.	2020-21

5.4 Objective 4 – Proactively reduce biodiversity threats

Effective management of biodiversity threats will require ongoing funding and resourcing of existing operations as well as undertaking new initiatives.

High impact weeds are a primary threat to biodiversity and should be controlled at their source wherever feasible (e.g. in some cases, there may be one or two locations of a significant weed that provides the primary source for reproduction and dispersal into nearby lands). This may be the case with some species of woody weeds or scrambler/climber weeds. It is less likely to be the case with high threat grassy or herbaceous weeds of which many are widespread throughout Monash and therefore, strategies for their control are best focused on the most significant conservation areas.

Appendix 2 provides a summary of the top 40 high impact weeds in Monash. These include species that are high impact due to their current distribution and other weeds that have occurred in only a few locations but are likely to become a high impact if not diligently controlled. Although many of the listed weeds will always have a strong presence in the landscape, weed management actions aim to reduce their impact in areas of conservation significance.

However, where a weed is considered to have a localised occurrence (see Appendix 3), Council should then consider a Council-wide approach to controlling these weeds, which is likely to involve the cooperation of other land management authorities.

Objective 4 – Implementation Plan

Item	Action	Timing
4.1	Continue to resource capacity for the Monash Bush Crew.	Ongoing
4.2	Development weed management programs across different land tenures, particularly within the Dandenong Creek Corridor in partnership with Authorities (such as Melbourne Water and Willow removal). - Identify and manage (if not eliminate) the highest impact weeds that displace remnant vegetation (refer to Appendix 2). - Develop broad strategies for the highest impact weeds. Map or identify their distribution and create targets for their control. - Reduce overall cover and diversity of invasive ground storey species. - Eliminate Large Woody Weeds. - Coordinate ongoing weed control programs between Council, sub-contractors, Friends Groups and other land managers.	Ongoing Set specific and measurable targets in the next 12 months and implement a 10-year plan. Ongoing
4.3	To identify and manage (if not eliminate) the high impact pest animals that displace local fauna that utilises remnant vegetation such as fox control, and address dumping of non-council possum boxes by removal companies.	2020
4.4	Investigate options for ecological burns that reduce the likelihood of fire while promoting biodiversity and natural regeneration.	
4.5	Consider additional reserves to be included under the 'no dogs off -leash' policy (Mulgrave and Damper) and ensure they are properly signed.	2019-2020
4.6	Investigate planting approaches to reduce the impact of light pollution and human activities at night for our most vulnerable such as Valley and Damper Reserves.	2019-2021

5.5 Objective 5 – Identify ecological baseline and indicators to monitor and assess environmental conditions

Well managed data collection and monitoring processes inform evidence-based decision making that reinforces management decisions and program development. A monitoring framework developed for this strategy has included the compilation of flora records for each of the indicator bushland reserves in addition to documentation of ecological vegetation classes, vegetation quality assessments (quadrats, habitat hectare assessments and ground storey cover mapping) and bird surveys. This baseline information can be used as a starting point to develop a comprehensive inventory and monitoring system across the municipality to document vegetation and habitat quality to quantify any improvements or decline overtime.

The monitoring framework developed to inform this strategy is an adoption of biodiversity monitoring recommendations of the Eastern Alliance for Greenhouse Action (EAGA). This framework aims to address four key biodiversity indicators:

Vegetation extent	Local bird communities
Vegetation change	Phenology (natural seasonal lifecycle)

The monitoring framework that underpins this strategy builds on core recommendations outlined in the Monash Environmental Sustainability Strategy including:

> Action 2.1.2a - Undertake ecological assessments to record baseline data for conservation reserves under Council management and to identify habitat corridors across the municipality
>
> Action 2.2.1b - Investigate, research and monitor indicators that will demonstrate potential impacts of climate change on local biodiversity values and the resilience of ecological sites.

Frequency of Monitoring

As identified in the implementation plan, repeat surveys of quadrats, habitat hectare assessments and ground storey cover mapping would only be required every 2-3 years to reflect gradual changes in vegetation quality.

Birdlife is a major indicator of ecological condition of the local environment. Bird census monitoring requires more regular monitoring (ideally one survey per season) in order to provide sufficient data on bird populations. Community participation in bird census monitoring is a great way to engage local residents with their local environment. Ongoing bird monitoring provides comprehensive data for evaluation including:

- What species of climate-affected birds are occurring or disappearing in Monash over time?
- What species of urban sensitive bird are occurring or disappearing in Monash over time?
- Is the abundance or phenology of these species changing over time?

This information then be used to take action and promote or create suitable habitats for vulnerable bird populations.

In addition to this, it is important to consider monitoring populations of frogs, bats and other species to understand the overall health of the local environment.

Objective 5 – Implementation Plan

Item	Action	Timing
5.1	Monitor four (4) key biodiversity indicators: vegetation extent, vegetation change, local bird communities, Phenology (natural seasonal lifecycles) on a regular basis. The Monitoring Framework and recent surveys undertaken provides the means to assess these indicators including: - Re-assess areas or remnant vegetation and revegetation. - Re-assess survey quadrats, ground storey cover mapping, and habitat hectare assessments. - Repeat Bird census within monitoring plots.	Ongoing
5.2	Develop and update reserve management plans: - Assess plant diversity in remnant vegetation and revegetation areas. - Identify significant weeds and management strategies.	Revise and update - 1-2 per year.
5.3	Undertake additional monitoring in Council reserves such as: - Record extent and distribution of flora and fauna (especially rare species) to help determine population viability. - Map trees with significant values - large or hollow bearing trees / locally significant populations i.e. Yarra Gum. Monitor and document natural recruitment (or replacement planting) of these populations to ensure ongoing succession. - Document and map significant weeds and their frequency and distribution to assist with weed management strategies.	Investigate options in the next 2 years.
5.4	Maintain database of survey results undertaken for this strategy and for follow-up surveys including: - All data collected as a part of the Ecological Monitoring Framework. - Locations of previously documented flora and fauna species of conservation significance. - Include biodiversity spatial data into Council Geographic Information (GIS) Systems. - Update and validate biodiversity data for all previous surveys and compare with baseline data.	Within the first 3 months then ongoing as new data is collected.

5.6 Objective 6 - Strengthen Biodiversity Policy and Legislation

Long-term strategic planning also plays an important role in planning for biodiversity protection and complements on ground management works. Although various government Acts and plans provide guidance on environmental protection and decision making, a range of operational procedures and planning controls can be initiated in Monash to increase biodiversity protection and legal security of significant sites or zones.

Objective 6 – Implementation Plan

Item	Action	Timing
6.1	Implement the Urban Biodiversity Strategy in the Monash Planning Scheme by considering the following: - Strengthening objectives and strategies in the Municipal Strategic Statement about biodiversity, and giving local direction to State policies. - Determine the right mix of planning overlays to protect the biodiversity in important areas and precincts, such as Environmental Significance and Vegetation Protection Overlays (VPOs), and whether it may need to be expanded. - Determine the right mix of planning controls for high priority reserves and waterways, including minimum building setbacks, environment and landscape overlays, and/or incorporated plans. - Apply local planning policy to guide decision making in areas covered by environment and landscape overlays. - Review the zones of public land used primarily for conservation purposes in consultation with the relevant Committees of Management and/or landowner, especially the most vulnerable and significant, and allocate Conservation reserve status.	Investigate options in the next 12 months.
6.2	- Investigate areas of regional and state significance to be considered in the States modelled mapping used for native vegetation protection under clause 52.17. - Complete mapping of biodiversity protection under the Victorian planning Control: Clause 52.17 and the incorporated Guidelines for the removal, destruction or lopping of Native Vegetation (DELWP 2017). - Consider local planning controls that may enhance biodiversity protection beyond this clause (i.e. schedules to clause 52.17).	Investigate options in the next 12 months.
6.3	Establish an operational framework within Council departments to protect biodiversity in open space planning: - Review internal operational procedures across open space tenures (i.e. mowing, establishment of recreational facilities). - Continue to align program and objectives with other Council related strategies and plans both environmental including the Monash Street Tree Strategy, Open Space Strategy, Integrated Water Strategy, Waste Management Strategy and the Environmental Sustainability Strategy, and non-environmental, such as Community Safety Framework 2015-2020 strategy, the Domestic Animal Management Plan, and A Healthy and Resilient Monash: Integrated Plan 2017-2021. - Review tree protection policy for all wards across private land. - Plan for open spaces that accommodate projected population growth i.e. one third increase in 20 years. - Integrate biodiversity protection at all levels of open space planning in a way that educates and engages park users, while avoiding adverse ecological impacts such as damage due to trampling.	Ongoing
6.4	Coordinate landscape planning training for planners, developers and architects to encourage and support biodiverse plantings and preservation of natural vegetation and canopy on private properties.	2020

5.7 Staff Resourcing

Many of the objectives and underlying recommendations above are not part of current Council operational roles at the present time. Department managers should consider the current staff roles and assess how these objectives may be resourced. Creation of new roles or re-allocation of staff positions will more effectively deliver the objectives outlined above. Dedicated roles and skills within Council may include:

- An Environment Engagement and Liaison role(s) to engage with the community and strategic partners and oversee implementation plan
- Review of current bushland and wetland staff activities to ensure that they are sufficiently resourced to address these objectives on the ground
- Dedicated Environmental Assessment staff to undertake the recommended monitoring and data collection
- A Strategic Planning role dedicated to strengthening biodiversity outcomes and development of planning controls that protect biodiversity.

A core component of the implementation plan in the first 12 month is to investigate the feasibility, resources and costs of implementation for these new initiatives. The implementation plan should be reviewed and further developed within 1-2 years.

Resourcing the Monitoring Framework

It is important to realise that biodiversity surveys are most useful where surveys can be repeated over time so that biodiversity gain or loss is able to be tracked and measured. A limited number and range of biodiversity surveys have been undertaken to date which provide baseline data for comparative surveys.

Plans for follow up surveys in the same area or new plans to establish baseline data should be planned so that there is adequate funding and resourcing to follow through with biodiversity monitoring over a ten-year period.

Apart from Bird Monitoring Surveys, which should be undertaken annually, follow-up vegetation monitoring (quadrats, ground storey quality monitoring and habitat hectares) every 2-4 years for each reserve will suffice as significant changes are generally not detectable within a shorter timeframe.

Coronidium Scorpioides, Everlasting Button : Photographer Mary Trigger

Australian Painted Lady Butterfly : Photographer Vanessa Kershaw

Appendix

1. Council Management - Bushland Reserves

Council Bushland Reserves

No.	Reserve	Status	EVC (s)	Area (Ha)	Remnants (Ha)
1	***Ashwood College Wetlands***	Non-indicator Reserve	N/A	3.97	N/A
2	***Ashwood Jingella and Holmesglen Reserve***	Non-indicator Reserve	N/A	16.8	N/A
3	***Bellbird Corner***	Non-indicator Reserve	Creek Herb rich woodland, Valley Heathy forest	1.63	0.65
4	***Bogong Reserve***	Indicator Reserve	Valley Heathy Forest	4.29	1.6
5	***Crabapple Reserve***	Non-indicator Reserve	Valley Heathy Forest	0.55	0.15
6	***Crosby Drive***	Non-indicator Reserve	Swampy Riparian Complex, Valley Heathy Forest	4.97	1.86
7	***Damper Creek Reserve North***	Indicator Reserve	Swampy Riparian Complex, Valley Grassy Forest / Valley Heathy Forest	5.32	0.7
8	***Damper Creek Reserve South***	Non-indicator Reserve	Swampy Riparian Complex, Valley Grassy Forest / Valley Heathy Forest	7.98	3.59
9	***Drummies Bridge Reserve***	Indicator Reserve	Swampy Riparian Woodland, Swampy Woodland	8.82	N/A
10	***Electra Reserve***	Non-indicator Reserve	N/A	4.9	N/A
10A	***Tooronga Court Reserve***	Non-indicator Reserve	N/A	0.49	N/A
11	***Federal Reserve***	Non-indicator Reserve	Grassy Forest	4.47	TBA
12	***Gardiners Reserve***	Non-indicator Reserve	N/A	13.1	0.2
13	***Glen Waverley Golf Course***	Indicator Reserve	Swampy Riparian Woodland, Swampy Woodland	60.3	0.5
14	***Gordon Road Reserve***	Non-indicator Reserve	Grassy Woodland	0.5	0.24
15	***Heatherlea and Sunnybrook Drive Reserve***	Indicator Reserve	Valley Heathy Forest	0.38	0.29
16	***Herriotts Boulevard Wetland Reserve***	Non-indicator Reserve	N/A	4.32	N/A
17	***Kooyongkoot Wetlands***	Non-indicator Reserve	N/A	1.83	0.13
18	***Lum Reserve***	Non-indicator Reserve	Grassy Woodland	6.85	1.33
19	***Mulgrave Reserve***	Indicator Reserve	Swampy Riparian Woodland, Swampy Woodland Valley Heathy Forest Aquatic Herbland Swamp Scrub Tall Marsh Aquatic Rushland	13.12	0.35

No.	Reserve	Status	EVC (s)	Area (Ha)	Remnants (Ha)
20	***Napier Park***	Indicator Reserve	Swampy Riparian Woodland, Swampy Woodland	11.1	N/A
21	***Portsmouth Reserve***	Indicator Reserve	Grassy Woodland	0.32	0.32
22	***Scotchmans Creek Reserve (1 of 5)***	Non-indicator Reserve	Plains Grassy Woodland	6.78	
23	***Scotchmans Creek Oakleigh GC***	Indicator Reserve	Floodplain Riparian Woodland, Plains Grassy Woodland	7.3	0.3
24	***Scotchmans Creek Reserve (3 of 5)***	Non-indicator Reserve	Swampy Riparian Complex, Valley Heathy Forest	12	
25	***Scotchmans Creek Reserve 4***	Indicator Reserve	Swampy Riparian Complex, Valley Heathy Forest	5.7	0.39
26	***Scotchmans Creek Reserve 5***	Indicator Reserve	Swampy Riparian Complex, Valley Heathy Forest	9.23	0.76
27	***Shepherds Bush Reserve***	Indicator Reserve	Swampy Woodland, Valley Heathy Forest	0.88	N/A
28	***Valley Reserve***	Indicator Reserve	Swampy Riparian Complex, Valley Heathy Forest	14.77	13
29	***Waverley Road Reserve***	Non-indicator Reserve	N/A	113	57.32
30	***Hinkler Reserve***	Indicator Reserve	Valley Heathy Forest	3.69	1.6
31	***Highview Park***	Non-indicator Reserve	N/A	2.61	N/A
32	***Talbot Park***	Non-indicator Reserve	N/A	3.25	N/A
33	***F E Hunt Reserve***	Non-indicator Reserve	N/A	0.91	N/A
34	***Osborne Avenue West Reserve***	Non-indicator Reserve	N/A	0.93	N/A
35	***Regent Street Reserve***	Non-indicator Reserve	Swampy Riparian Woodland, Valley Heathy Forest	1.23	N/A
36	***Fiander Avenue Reserve***	Non-indicator Reserve	Swampy Riparian Complex	0.47	N/A
37	***Haughton Road Reserve***	Non-indicator Reserve	N/A	5.82	N/A
38	***Brickmakers Park Reserve***	Non-indicator Reserve	Plains Grassy Woodland	2.93	N/A
39	***Whalley Drive Reserve***	Indicator Reserve	Valley Heathy Forest	1.67	0.48
40	***Freeway Reserve***	Non-indicator Reserve	N/A	15.1	0.07
41	***Forster Road East Reserve***	Non-indicator Reserve	N/A	1.84	N/A
42	***Monash Art Gallery***	Indicator Reserve	Grassy Woodland	3.47	0.46

2. The 40 Most Significant Weeds in Monash

Guide to Table

Origin

# denotes native species extended beyond natural range

- denotes exotic species

Status

(C) Regionally Controlled

(R) Restricted

(WONS) Weed of National Significance

Origin	Scientific Name	Common Name	Type	Current Distribution	Status
-	***Anthoxanthum odoratum***	Sweet Vernal-grass	Grassy Weed	Widespread and high impact	
-	***Cenchrus clandestinus***	Kikuyu	Grassy Weed	Widespread and high impact	
-	***Dactylis glomerata***	Cocksfoot	Grassy Weed	Widespread and high impact	
-	***Ehrharta erecta var. erecta***	Panic Veldt-grass	Grassy Weed	Widespread and high impact	
-	***Ehrharta longiflora***	Annual Veldt-grass	Grassy Weed	Widespread and high impact	
-	***Holcus lanatus***	Yorkshire Fog	Grassy Weed	Widespread and high impact	
-	***Nassella neesiana***	Chilean Needle-grass	Grassy Weed	Minimal occurrences with potential high impact	R (WONS)
-	***Nassella trichotoma***	Serrated Tussock	Grassy Weed	Local occurrences with potential high impact	C (WONS)
-	***Paspalum distichum***	Water Couch	Grassy Weed	Widespread occurrences with potential high impact	
-	***Phalaris aquatica***	Toowoomba Canary-grass	Grassy Weed	Widespread and local occurrences with high impact	
-	***Watsonia meriana var. bulbillifera***	Bulbil Watsonia	Herbaceous Weed	Local occurrences with potential high impact	C
-	***Allium triquetrum***	Angled Onion	Herbaceous Weed	Widespread and high impact	R
-	***Alternanthera philoxeroides***	Alligator Weed	Herbaceous Weed	Minimal occurrences with potential high impact	
-	***Oxalis pes-caprae***	Soursob	Herbaceous Weed	Widespread and high impact	R
-	***Ranunculus repens***	Creeping Buttercup	Herbaceous Weed	Widespread and high impact	
-	***Hedera helix***	English Ivy	Scrambler or climber	Local occurrences and high impact	
-	***Lonicera japonica***	Japanese Honeysuckle	Scrambler or climber	Local occurrences and high impact	
-	***Rubus fruticosus spp. agg.***	Blackberry	Scrambler or climber	Widespread and high impact	
-	***Tradescantia fluminensis***	Wandering Jew	Scrambler or climber	Local occurrences and high impact	
-	***Vinca major***	Blue Periwinkle	Scrambler or climber	Local occurrences and high impact	
#	***Acacia longifolia subsp. longifolia***	Sallow Wattle	Woody Weed	Local occurrences and high impact	
-	***Crataegus monogyna***	Hawthorn	Woody Weed	Local occurrences and high impact	C
-	***Fraxinus angustifolia***	Desert Ash	Woody Weed	Local occurrences and high impact	

Origin	Scientific Name	Common Name	Type	Current Distribution	Status
#	***Pittosporum undulatum***	Sweet Pittosporum	Woody Weed	Local occurrences and high impact	
-	***Salix sp***	Willow	Woody Weed	Local occurrences and high impact	C (WONS)
-	***Chrysanthemoides monilifera***	Boneseed	Woody Weed	Local occurrences and high impact	C (WONS)
-	***Erica lusitanica***	Spanish Heath	Woody Weed	Local occurrences and high impact	
-	***Genista linifolia***	Flax-leaf Broom	Woody Weed	Local occurrences and high impact	C (WONS)
-	***Genista monspessulana***	Montpellier Broom	Woody Weed	Local occurrences and high impact	C (WONS)
-	***Ulex europaeus***	Gorse	Woody Weed	Local occurrences and high impact	
-	***Silybum marianum***	Milk thistle	Herbaceous Weed	Local occurrences and high impact	
-	***Elymus repens***	Couch	Grassy Weed	Local occurrences and high impact	
-	***Agrostis capillaris***	Brown top bent	Grassy Weed	Local occurrences and high impact	
-	***Arctotheca calendula***	Cape weed	Herbaceous Weed	Local occurrences and high impact	
-	***Hypochaeris radicata***	Cats ear	Herbaceous Weed	Local occurrences and high impact	
-	***Fumaria officinalis***	Fumaria	Herbaceous Weed	Local occurrences and high impact	
-	***Galium aparine***	Cleaver	Herbaceous Weed	Local occurrences and high impact Local occurrences and high impact	
-	***Galium aparine***	Cleaver	Herbaceous Weed	Local occurrences and high impact	
-	***Typha orientalis***	Typha/ Bull rush	Herbaceous Weed	Local occurrences and high impact	
-	***Cotoneaster sp.***	Willow herbs	Woody weed	Widespread and high impact	
-	***Ligustrum lucidum***	Privet	Woody weed	Widespread and high impact	

3. Biodiversity Legislation

Key Biodiversity Legislation

Legislation	Federal	State	Local
Commonwealth Environment Protection and Biodiversity Conservation Act 1999	✓		
Flora and Fauna Guarantee Act 1988		✓	
The Catchment and Land Protection Act 1994		✓	
Victorian Wildlife Act 1975		✓	
Victorian Planning and Environment Act 1987, and the Monash Planning Scheme		✓	✓

Commonwealth Environment Protection and Biodiversity Conservation Act 1999

The Environment Protection and Biodiversity Conservation Act 1999 (EPBC Act) protects matters of National Environmental Significance. Under the EPBC Act, actions that are likely to have a significant impact on a matter of National Environmental Significance are subject to a detailed assessment and approval process. A proponent must refer proposed actions that may require approval to the Commonwealth Environment Minister (or delegate). The Minister then decides which assessment and reporting option is applied. The Minister may approve a 'controlled action' allowing the development to proceed provided conditions are applied to mitigate significant impacts protected by this act.

The Act identifies seven matters of national environmental significance including: World Heritage properties, National heritage places, Wetlands of international importance (Ramsar wetlands[4]), Threatened species and ecological communities, Migratory species, Commonwealth marine areas and Nuclear actions (including uranium mining).

Potential EPBC matters within Monash are likely to be limited to any proposal that impacts habitat of a listed threatened species. Although there are few recent records of EPBC listed species, the Dandenong creek corridor provides suitable habitat for listed species such as the Growling Grass Frog, Australian Painted Snipe, Australasian Bittern and Eastern Dwarf Galaxias. Various stands of Eucalypts are also likely to provide occasional foraging habitat for the Swift Parrot and Grey-headed Flying-fox.

Victorian Flora and Fauna Guarantee 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 and all Victorian communities of plants and animals. The FFG Act provides a number of ways to help achieve its objectives including:

- listing of threatened taxa, communities of flora or fauna and potentially threatening processes, and creation of Action Statements and Management Plans for all listed taxa communities of flora or fauna and processes

- declaration of a Critical Habitat if the habitat is critical for the survival of a species or a community of flora or fauna. If listed as Critical Habitat, the Minister for Environment may then make an Interim Conservation Order (ICO) to conserve the Critical Habitat

- protection of flora and fauna through listing offences such as penalties relating to not following an ICO and taking, trading in, keeping, moving or processing protected flora without a licence. Although this does not apply to taking listed flora species from private land

- The Department of Environment, Land, Water and Planning is the referral authority for matters under the FFG Act.

4 Ramsar Convention, is an intergovernmental treaty that provides the framework for national action and international cooperation for the conservation and wise use of wetlands and their resources. www.ramsar.org

A public authority must have regard to the flora and fauna conservation and management objectives of the FFG Act. The act only provides legal protection for species or habitat located on Public Land. Council Officers making decisions to clear indigenous vegetation on public land are expected to refer to the Protected Flora List and any relevant Action Statements for Flora, Fauna or Ecological Communities that are listed under the Act.

In addition to relevant fauna species listed under the EPBC Act (as discussed above), the Dandenong Creek corridor and adjoining swamps provide suitable habitat for a range of FFG listed bird species such as the Intermediate Egret, Eastern Great Egret, Lewin's Rail, Blue-billed Duck, Baillon's Crake and the Caspian Tern, all of which have been previously recorded in Monash.

Mapping of threatened FFG listed communities occur along the Dandenong Creek network and smaller sections of Scotchmans Creek and Damper Creek. These listed FFG communities are:

- Herb-rich Plains Grassy Wetland (West Gippsland);
- Sedge-rich Eucalyptus camphora Swamp.

While EVCs along these corridors include Swampy Woodland and Swampy Riparian Complex (which are similar equivalents to the FFG communities) the presence, extent or absence of these communities would need to be confirmed.

The Catchment and Land Protection Act 1994

The Catchment and Land Protection Act 1994 (CaLP Act) intends to manage land degradation including detrimental environmental or economic impacts of declared noxious weeds and pest animals.
Under section 20 of the (Catchment and Land Protection Act 1994) CaLP Act, all land owners, including the Crown, public authorities and licensees of Crown lands, must, in relation to their land, take all reasonable steps to:

- avoid causing or contributing to land degradation which causes or may cause damage to land of another land owner;
- eradicate regionally prohibited weeds;
- prevent the growth and spread of regionally controlled weeds on their land;
- prevent the spread of, and as far as possible, eradicate established pest animals.

Monash City Council harbours numerous weeds and pest animals that are declared noxious under the Catchment and Land Protection (CaLP) Act 1994. Species on this list are known to or have the potential to result in detrimental environmental or economic impact.

Noxious Weeds

Under the CaLP Act, declared noxious weeds are categorised into four groups depending on their known and potential impact and specific circumstances for each region. These categories are:

- State Prohibited Weeds (S) are either currently absent in Victoria or are restricted enough to be eradicated. The Victorian Government is responsible for their control.

- Regionally Prohibited Weeds (P) in the Port Phillip Catchment Management Authority (CMA) area these weeds are not necessarily widespread but have the potential to become widespread. It is expected that weeds that meet these criteria can be eradicated from the region. For weeds considered to be Regionally Prohibited it is the responsibility of the landowner to control these weeds on their land but not on adjacent roadside reserves.

- Regionally Controlled Weeds (C) are usually widespread but it is important to prevent further spread. It is the responsibility of the landowner to control these weeds on their property and on adjacent roadside reserves.

- Restricted Weeds (R) include plants that pose unacceptable risk of spreading in the State or other Australian states and are considered to be a serious threat to primary production, Crown land, the environment and/or community health if they were traded in Victoria. Trade in these weeds and their propagules, either as plants, seeds or contaminants in other material is prohibited.

Pest Animals

'Established invasive animals' are, by definition of the CaLP Act, widespread, established and beyond eradication from the whole of Victoria. Established invasive animals include foxes, rabbits, feral pigs and feral goats and their effect may be seen on public and private land across the state.

Under the CaLP Act, all landowners have a legal duty to prevent the spread of, and as far as possible eradicate, established pest animals. Recommended management of established invasive animals is based on the approach that the most cost-effect control strategy is to manage and minimise their impact on selected high-value agricultural and environmental assets (Agriculture Victoria).

Victorian Wildlife Act 1975

Although this Act is mainly appears used to enforce regulations relating to legal or illegal capture or husbandry of fauna species. However, a breach of the Act includes:

A person must not wilfully damage, disturb or destroy any wildlife habitat.

if vegetation is removed and is considered habitat for species protected under the Wildlife Act then they may be in breach of the Act. Likely breaches of the Wildlife Act for vegetation removal would be where vegetation was removed that contained known habitat for protected wildlife including nests, nesting hollows, or actual animals. Council conducting its own works or the review of works by third parties must ensure compliance with the Act. Therefore, it is important to have a habitat assessment of any vegetation proposed to be removed.

Victorian Planning and Environment Act 1987

All municipalities in Victoria are covered by land use planning controls which are prepared and administered by State and local government authorities. The legislation governing such controls is the Planning and Environment Act 1987 as amended in 2000.

Planning schemes set out policies and provisions for the use, development and protection of land for an area. Each municipality in Victoria is covered by a planning scheme. These are legal documents prepared by the local council or the Minister for Planning and are approved by the Minister.

Planning Zones

Two key Planning Zones relevant to Biodiversity Conservation objectives are applied within areas of Monash; they are:

- Public Conservation and Resource Zone (PCRZ);
- Public Park and Recreation Zone (PPRZ).

<u>Public Conservation and Resource Zone (PCRZ)</u>

The stated purpose of this zone is to:

- To protect and conserve the natural environment and natural processes for their historic, scientific, landscape, habitat or cultural values.

- To provide facilities which assist in public education and interpretation of the natural environment with minimal degradation of the natural environment or natural processes.

- To provide for appropriate resource based uses.

This zoning is generally effective for prioritising biodiversity protection under the planning system. While a range of recreational land uses are permitted, most buildings and works require a permit and must meet the objectives of the zoning of which natural processes, landscapes, habitats etc. are some of the foremost priorities.

Public Park and Resource Zone (PPRZ)

The stated purpose of this zone is to:

- To recognise areas for public recreation and open space
- To protect and conserve areas of significance where appropriate
- To provide for commercial uses where appropriate.

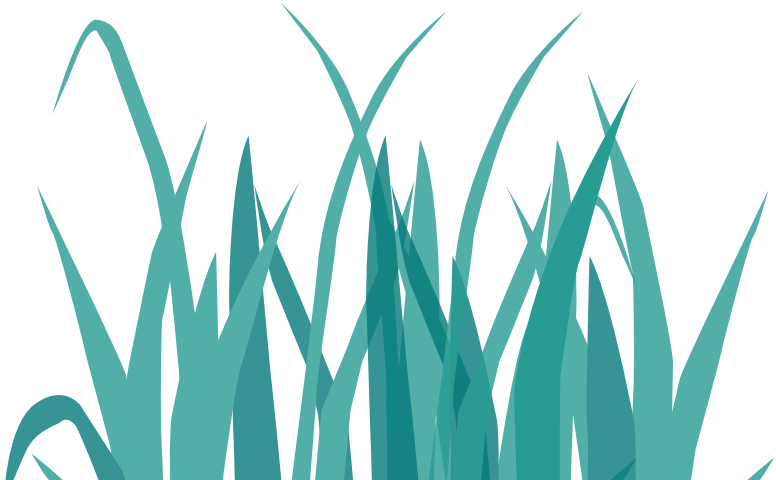
Vegetation Protection Overlay (Schedule 1)

As shown on the planning scheme map as VPO1, this overlay refers to Tree Protection Areas. The overlay recognises the importance of canopy trees (both native and introduced) as a significant part of the urban character and a stated requirement for any new development is retention of existing canopy trees.

Under the VPO1, a permit is required to remove or destroy any vegetation that:

- Has a trunk circumference greater than 500mm (160mm diameter) at 1200mm above ground level, and
- Is higher than 10 metres.

Proposed removal of trees in this category must be accompanied by detailed plans and adequate justification for its removal. While the purpose of this overlay appears to be for maintaining natural amenity, this planning control does serve to protect significant trees that contribute to biodiversity across the landscape (both for floristic diversity and habitat provision). The VPO currently protects one third of the municipality.



4. Biodiversity Monitoring Framework

The Monitoring Framework Report proposes 'five biodiversity monitoring methods' to be adopted in selected Council bushland reserves:

1. **Flora species list**
2. **Habitat hectare assessments**
3. **Quadrants**
4. **Bird Census**
5. **Indigenous Ground Storey Cover Mapping**

The monitoring framework is consistent with the Eastern Alliance Greenhouse Action's (EAGA's) Biodiversity Monitoring Framework methodology (EAGA 2011, EAGA 2014).

EAGA is a formal collaboration of eight Councils in Melbourne's eastern metropolitan region, including the City of Monash, allowing for consistent monitoring of biodiversity in the Eastern Metro Melbourne. The five monitoring methods identified in this strategy are outlined below:

1. Flora Species Lists

This involves recording all flora (indigenous, Australian native and exotic) within a given site. Ongoing flora surveys (every 2-3 years) indicate the pattern of plant species overtime including those that may naturalise or disappear from a site overtime.

2. Quadrats

Quadrat surveys establish baseline data for indigenous ground storey (cover abundance and diversity) within a defined area. Follow up surveys within the same quadrat allow comparisons to the baseline data and provide an indication of improvement or decline overtime.

3. Indigenous Ground storey Cover Mapping

Unlike quadrats, this monitoring method is applied broadly across a given bushland area to identify patterns of indigenous plant cover in comparison to weed cover. This method provides a useful guide to determine broad management priorities areas within bushland reserves. Follow up surveys allow comparisons to the baseline data and show improvements to bushland management overtime.

4. Habitat Hectare Assessments

Habitat hectare assessments evaluate vegetation condition and overall habitat quality. In addition to indigenous plant diversity and weed cover, these assessments evaluate natural recruitment, canopy cover and health, large tree and log cover, organic litter and landscape connectivity.

5. Bird Census

A standard Bird Census is a defined area of 2 hectares where bird surveys are undertaken for a 20 minute period. Surveys are undertaken at least once a year (preferably in the same season). However, multiple surveys throughout the year provide a more comprehensive account on the distribution and abundance of bird species. Bird surveys provide a snapshot of bird life within bushland reserves and indicate whether certain bird species or bird types are increasing, decreasing or remaining consistent within a reserve. This method is consistent with Birdlife Australia (www.birdlife.org.au).

Glossary

Term	Definition
Biodiversity	The variety of all living things; the different plants, fungi, animals and micro-organisms, the genetic information they contain, their inter-relationships and the ecosystems they form.
Biolinks	Biolinks are parts of the landscape where the functional ecological connectivity for biodiversity is enhanced and / or restored to provide habitation for species through natural processes including: dispersal; re-colonisation, regeneration and restoration of ecological function.
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.
Catchment	A natural drainage area which collects water, especially rainfall.
Conservation Reserves	Reserves with the purpose of conserving native flora and fauna.
Creek Daylighting	The goal of daylighting is to restore a stream to a more natural state of a waterway that has previously been modified into an artificial system (e.g. an aqueduct or culvert).
Eastern Alliance for Greenhouse Action {EAGA)	EAGA is a formal collaboration of seven Councils in Melbourne's east, working together on regional programs that reduce greenhouse gas emissions and facilitate regional adaptation
Ecological Vegetation Class (EVC)	EVC is a system of classifying vegetation and is used to describe and map local patterns of vegetation diversity. An EVC represents one or more floristic (plant) communities that occur in a similar environmental niche determined by factors such as geology, soil type, aspect, rainfall and other features.
Ecological Resilience	The ability of an ecosystem to recover from, and maintain its function after, disturbance events such as fire or long-term pressures such as temperature increases.
Ecosystem	A community of living organisms interacting organisms and their physical environment.
Environmental Sustainability	The ability and capacity of an environment to allow all living things to live well, maintain diversity and prosper now and into the future.
Eucalypt Dieback	This may be caused by fungal pathogens, insect attack and possum browsing, which are all exacerbated by reduction of available habitat.
Flora	Plant life occurring in a particular location, region or habitat type.
Fauna	Animal life occurring in a particular location, region or habitat type.
Ground Truthing	Gathering information onsite by direct observation in present circumstances rather than relying on mapping, modelling or historical references,
Habitat Connectivity	The interconnectedness of habitat within a landscape. Important for the flora and fauna within a fragmented landscape.
Habitat Hectares	A measure of the quality of a habitat. It is a method that has been developed to allow an assessment of the real health of an ecosystem that goes beyond simply measuring the physical area of habitat. Habitat hectare assessments rely on comparison of remnant native vegetation to a benchmark for the same vegetation type in a mature and long-undisturbed state.
Indigenous	This refers to endemic native species whose normal distribution includes the Monash area. It does not include native (Australian) species that have not traditionally been found in the Monash area.
Invasive Species	Plant or animal species which occur outside their natural distribution. This altered distribution often threatens species naturally found in that region. Commonly invasive species are from overseas but can also be species from other regions of Australia.

Term	Definition
Native	This is used to broadly refer to species that are endemic to Australia, and may include indigenous species. Where a statement is intended to refer to species that are traditionally found in Monash, the term indigenous is used.
Naturalised	A plant or animal that establishes in a region where it is not indigenous to that region.
Natural Regeneration	The natural establishment and growth of plant life from seed or suckers produced from parent plants
Open Space	Parks, green spaces and other open areas. The areas are open to the public and range from playing fields, manicured gardens to wetlands, waterways and bushland reserves.
Pollution	Contaminants in the natural environment which have a negative impact. Examples of pollution include water and air pollution.
Remnant vegetation	Indigenous vegetation that persists naturally and has been retained since European Settlement.
Revegetation	The process of replanting formerly cleared or disturbed land. Revegetation normally refers to replanting indigenous species that originally occurred on the land (or the local area) prior to clearing or disturbance.
Stormwater	Water originating from rainfall which runs off surfaces such as roofs and pavement. Water is captured in constructed drainage systems.
Urban Environment	The trees within an urban context provide a multitude of benefits for ecosystems, the economy, and community health and wellbeing. A strategy acknowledges and builds upon urban forest benefits to ensure the best future for our city. One of the important functions of the urban forest is to provide shade and cooling. Increased canopy coverage throughout Monash will minimise the urban heat island effect and improve thermal comfort at street level for pedestrians.
Waterway	A river, creek, stream or watercourse; or a natural channel in which water regularly flows, whether or not the flow is continuous.
Wetland	Areas of land which are covered with water either all year or at certain times following rain. Wetlands can be an important natural or constructed system with benefits such as reducing the impacts of floods and absorbing pollutants.

5. Flora within Council Managed Land

Canopy Tree		
Scientific Name	**Common Name**	**Reserve Number**
Eucalyptus camaldulensis	River Red-gum	6, DC, 19, 23
Eucalyptus cephalocarpa s.l.	Mealy Stringybark	3, 4, 6, 8, 9,13, 14, 15, 18, 19,20, 21, 25, 28, 30, 39, 42
Eucalyptus dives	Broad-leaf Peppermint	4, 14, 18
Eucalyptus goniocalyx	Bundy	4, 6, 8, 9, 15, 18, 20, 25, 28, 30, 42
Eucalyptus leucoxylon	Yellow Gum	3
Eucalyptus macrorhyncha	Red Stringybark	3,6, 8, 9, 14, 25, 30, 20, 42, 15, 39
Eucalyptus melliodora	Yellow Box	3,4,6, 8, 9, 25, 14, 30, 18, 19, 23,27, 15, 28, 39
Eucalyptus obliqua	Messmate Stringybark	3,4,6, 8, 25, 14, 30, 42, 21, 15, 28
Eucalyptus ovata	Swamp Gum	3,4,6, 8, DC, 9, 25, 13, 14, 19, 20, 28
Eucalyptus polyanthemos	Red Box	9, 20
Eucalyptus radiata subsp. radiata	Narrow-leaf Peppermint	3, 4,8, 25, 14, 28, 30, 42, 18, 19, 15
Eucalyptus rubida	Candlebark	4
Eucalyptus saligna	Sydney Blue-gum	3
Eucalyptus viminalis	Manna Gum	27
Eucalyptus viminalis subsp. pryoriana	Coast Manna-gum	8, 23, 42
Eucalyptus viminalis subsp. viminalis	Manna Gum	3 ,4 ,6, 8, DC, 9, 25, 13, 19, 20, 30
Eucalyptus yarraensis	Yarra Gum	9, 13, 19, 20, 27

Understorey Trees		
Scientific Name	**Common Name**	**Reserve Number**
Acacia dealbata	Silver Wattle	6,8, DC, 9, 25, 13, 14, 9, 30, 19, 20, 23,27
Acacia implexa	Lightwood	3,6, 8, 25, 30, 18, 42, 19, 15, 28
Acacia mearnsii	Black Wattle	3,4,6, 8, DC, 9, 25, 13, 14, 15, 18, 30, 42, 19, 20, 23,21, 27, 28
Acacia melanoxylon	Blackwood	3,4,6, 8, DC, 9, 25, 13, 14, 15, 30, 18, 42, 19, 20, 23, 27, 28, 39
Allocasuarina littoralis	Black Sheoak	4,8, 25, 13, 14, 15,18, 27, 28, 30, 42
Allocasuarina spp.	Sheoak	6
Allocasuarina verticillata	Drooping Sheoak	DC
Banksia marginata	Silver Banksia	25, 23
Exocarpos cupressiformis	Cherry Ballart	4,6, 8, DC, 9, 25, 30, 18, 42, 20, 27, 15
Hakea eriantha	Tree Hakea	23
Melaleuca ericifolia	Swamp Paperbark	3,6, 8, DC, 9, 25, 13, 14, 30, 19, 20, 23,21, 27
Myrsine howittiana	Mutton-wood	DC, 19
Pomaderris aspera	Hazel Pomaderris	19

Medium to Tall Shrub		
Scientific Name	**Common Name**	**Reserve Number**
Acacia acinacea	Gold-dust Wattle	6
Acacia genistifolia	Spreading Wattle	4,6, 8
Acacia mucronata subsp. longifolia	Narrow-leaf Wattle	3
Acacia myrtifolia	Myrtle Wattle	4,8, 30, 27
Acacia paradoxa	Hedge Wattle	4,6, 8, DC, 9, 25, 30, 18, 42, 19, 20, 23,21, 27, 15, 28, 39
Acacia pycnantha	Golden Wattle	4,6, 8, 30, 9, 18, 42, 20, 23,21, 27, 15, 28
Acacia stricta	Hop Wattle	28
Acacia verticillata	Prickly Moses	6, 8, 9, 25, 30, 19, 20, 23,27, 28
Bursaria spinosa	Sweet Bursaria	3,4,6, DC, 14, 18, 30, 42, 19, 23,21, 27, 15, 8
Bursaria spinosa subsp. spinosa	Sweet Bursaria	28, 39,9, 25, 13, 20
Cassinia aculeata	Common Cassinia	6, DC, 9, 13, 30, 19, 20, 23,21, 27, 28, 4,6, 8, 25, 13, 42, 30, 19, 23,21, 27, 15, 39
Cassinia aculeata subsp. aculeata	Common Cassinia	39
Cassinia longifolia	Shiny Cassinia	8, 25, 30, 18, 42, 19
Coprosma quadrifida	Prickly Currant-bush	6, 8, DC, 9, 25, 25, 13, 30, 20, 23,27, 28, 39
Correa alba	White Correa	4
Correa glabra var. glabra	Rock Correa	4
Correa reflexa	Common Correa	8, 42, 19, 15, 30, 18, 42, 28
Davesia latifolia	Hop Bitter-pea	8, 21, 28
Daviesia leptophylla	Narrow-leaf Bitter-pea	4,8, 9, 25, 20, 28
Dodonaea viscosa	Sticky Hop-bush	30
Epacris impressa	Common Heath	8, 21, 28
Goodenia ovata	Hop Goodenia	4,6, DC, 8, 9, 13, 25, 14, 30, 18, 19, 42, 20, 23,27
Goodia lotifolia	Golden Tip	8, 13
Gynatrix pulchella	Hemp Bush	3,6, 8, DC, 9, 25, 19, 13, 20
Hakea decurrens subsp. physocarpa	Bushy Needlewood	4,8, 30, 18, 21, 28
Hakea nodosa	Yellow Hakea	6, 8, 25, 30, 19, 15, 23,28
Hakea ulicina	Furze Hakea	8
Indigofera australis	Austral Indigo	4,8, 13, 30, 18, 42, 19
Kunzea ericoides spp. agg.	Burgan	4,8, 6, 9, 25, 13, 14, 30, 42, 19, 20, 23,27, 28, 15
Leptospermum continentale	Prickly Tea-tree	3,6, 25, 30, 23,21, 15, 28
Leptospermum lanigerum	Woolly Tea-tree	6, 8, DC, 19, 23
Leptospermum myrsinoides	Heath Tea-tree	23
Leptospermum scoparium	Prickly Tea-tree	8, DC
Indigofera australis	Austral Indigo	6, 25, 23
Melaleuca squarrosa	Scented Paperbark	6, 8, 19
Melicytus dentatus	Tree Violet	6, DC, 9, 25, 13, 14, 19, 20, 23,27

Medium to Tall Shrub *continued*		
Scientific Name	**Common Name**	**Reserve Number**
Olearia lirata	Snowy Daisy-bush	6, 8, DC, 13, 14, 19, 23,21, 27
Ozothamnus ferrugineus	Tree Everlasting	8, DC, 18, 19, 27
Pomaderris racemosa	Cluster Pomaderris	8, DC, 19, DC
Prostanthera lasianthos var. lasianthos	Victorian Christmas-bush	DC, 8, 9, 13, 20, 27
Prostanthera nivea var. nivea	Snowy Mint-bush	42
Ricinocarpos pinifolius	Weeding Bush	23
Solanum aviculare	Kangaroo Apple	6, 8, DC, 13
Solanum laciniatum	Large Kangaroo Apple	4,6, 8, 25, 13, 14, 30, 19
Spyridium parvifolium	Dusty Miller	DC, 19
Viminaria juncea	Dusty Miller	4,6, 8, 25, 13

Small Shrub		
Scientific Name	**Common Name**	**Reserve Number**
Acacia aculeatissima	Thin-leaf Wattle	8, 42, 28
Bossiaea cinerea	Showy Bossiaea	6, 42, 23
Amperea xiphoclada	Broom Spurge	23
Dillwynia cinerascens	Grey Parrot-pea	4,6, 8, 9, 30, 18, 42, 19, 20, 23,21, 28
Dillwynia sericea	Showy Parrot-pea	18
Hibbertia riparia	Erect Guinea-flower	8, 30, 42
Hovea heterophylla	Common Hovea	28, 9, 20
Leucopogon virgatus	Common Beard-heath	9, 20
Pimelea humilis	Common Rice-flower	8, 21, 15, 28
Platylobium obtusangulum	Common Flat-pea	4,8, 9, 20, 21, 15, 28
Platylobium formosum	Handsome Flat-pea	18
Pultenaea gunnii	Golden Bush-pea	6
Sphaerolobium vimineum s.l.	Leafless Globe-pea	8
Tetratheca spp.	Pink Bells	9, 20

Prostrate Shrub		
Scientific Name	**Common Name**	**Reserve Number**
Acrotriche serrulata	Honey-pots	6, 8, 15, 28
Astroloma humifusum	Cranberry Heath	8, 15
Bossiaea prostrata	Creeping Bossiaea	4,8, 9, 25, 30, 20, 21, 28, 3
Einadia nutans	Nodding Saltbush	25

Climbers		
Scientific Name	**Common Name**	**Reserve Number**
Billardiera mutabilis	Common Apple-berry	4, DC, 30, 18, 21, 27, 15, 28
Billardiera scandens var. scandens	Common Apple-berry	8
Cassytha glabella	Slender Dodder-laurel	9, 13, 20
Cassytha melantha	Coarse Dodder- laurel	25, 8
Cassytha pubescens s.s.	Downy Dodder-laurel	28
Clematis aristata	Mountain Clematis	6, 8, 18, 25, 19, 21, 28
Clematis decipiens	Slender Clematis	2
Clematis microphylla	Small-leaved Clematis	4,6, 8, DC, 9, 25, 13, 14, 30, 18, 19, 20, 23,27
Pandorea pandorana	Wonga Vine	DC, 27

Ferns		
Scientific Name	**Common Name**	**Reserve Number**
Calochlaena dubia	Common Ground-fern	28, 8
Cyathea australis	Rough Tree-fern	8
Blechnum minus	Soft Water-fern	8
Hypolepis spp.	Ground Fern	8
Lindsaea linearis	Screw Fern	28
Pteridium esculentum	Austral Bracken	3,4,6, 8, DC, 25, 18, 42, 23,28, 39

Epiphyte		
Scientific Name	**Common Name**	**Reserve Number**
Amyema pendula	Drooping Mistletoe	9, 13, 20, 28, 8
Amyema spp.	Mistletoe	3

Herbs		
Scientific Name	**Common Name**	**Reserve Number**
Acaena echinata	Sheep's Burr	30, 21, 28
Acaena novae-zealandiae	Bidgee-Widgee	8, 4,6, DC, 25, 13, 23,21, 15, 28, 9, 20
Acaena ovina	Australian Sheep's Burr	4,6, 8, 25, 42, 28
Adiantum aethiopicum	Common Maidenhair	8, 25, 28
Alisma plantago-aquatica	Water Plantain	3,6, 8, DC, 9, 25, 19, 20
Alternanthera denticulata	Lesser Joyweed	19, 27
Avaena novae-zelandiae	Bidgee-widgee	19
Brachyscome multifida	Cut-leaf Daisy	4,6, 8, 30, 18, 19, 27
Brunonia australis	Blue Pincushion	8, 9, 20
Carpobrotus modestus	Inland Pigface	15
Centella cordifolia	Centella	4,21
Centrolepis spp.	Centrolepis	8
Chrysocephalum apiculatum	Common Everlasting	4, 28
Chrysocephalum semipapposum	Clustered Everlasting	6, 8, 25, 30, 23, 21, 28
Comesperma volubile	Love Creeper	9, 20, 15
Coronidium scorpioides	Button Everlasting	30, 42, 28
Craspedia sp.	Billy Buttons	19
Crassula decumbens var. decumbens	Spreading Crassula	42, 19
Crassula helmsii	Swamp Crassula	4, 8, 19, 23
Damasonium spp.	Star Fruit	8
Daucus glochidiatus	Austral Carrot	21, 28
Dawsonia supurba	Tall Dawsonia	15
Dichondra repens	Kidney-weed	6, 8, DC, 25, 9, 13, 14, 30, 42, 20, 19, 23, 21, 27, 15, 39, 28
Drosera aberrans	Scented Sundew	28, 9, 20
Drosera auriculata	Tall Sundew	28, 4,9, 25, 20, 4,8, 42, 19, 21, 15, 28
Drosera whittakeri	Scented Sundew	4,8, 25, 21, 15
Epilobium billardierianum	Variable Willow-herb	8, 15, 19, 27, 30
Epilobium billardierianum subsp. cinereum	Grey Willow-herb	25, 23
Epilobium hirtigerum	Hairy Willow-herb	4,19
Epilobium spp.	Willow Herb	6
Erodium spp.	Heron's Bill	8
Euchiton involucratus	Common Cudweed	21, 15
Euchiton sphaericus	Annual Cudweed	9, 13, 20
Gastrodia spp.	Potato Orchid	28
Geranium potentilloides	Soft Crane's-bill	4, 30, 15
Geranium solanderi	Austral Cranesbill	8, 21

Herbs *continued*		
Scientific Name	**Common Name**	**Reserve Number**
Geranium spp.	Crane's Bill	28, 8, 9, 20
Glycine clandestina	Twining Glycine	28
Gonocarpus micranthus	Creeping Raspwort	8, 9, 25, 13, 20
Gonocarpus tetragynus	Common Raspwort	4, 8, 9, 20, 21, 15, 28, 3
Hardenbergia violacea	Purple Coral-pea	6, 8, 9, 25, 30
Helichrysum luteoalbum	Jersey Cudweed	9, 13, 20, 27, 28
Helichrysum scorpioides	Button Everlasting	8
Hydrocotyle hirta	Hairy Pennywort	9, 13, 20
Hydrocotyle laxiflora	Stinking Pennywort	25
Hypericum gramineum	Small St John's Wort	8, 9, 20, 21,28
Kennedia prostrata	Running Postman	6, 8, 9, 20, 21
Lagenifera stipitata	Common Lagenifera	8
Lagenophora gracilis	Slender Bottle-daisy	28
Lemna disperma	Common Duckweed	19
Leptorhynchos tenuifolius	Wiry Buttons	28, 9
Linum marginale	Native Flax	6, 19, 28
Lobelia anceps	Angled Lobelia	3
Lythrum hyssopifolia	Mediterranean Loosestrife	8, 27
Lythrum salicaria	Purple Loosestrife	3
Marsilea drummondii	Common Nardoo	8
Marsilea sp.	Nardoo	19
Mentha australis	River Mint	4,6, 13, 27
Microseris lanceolata	Yam-daisy	8
Myriophyllum crispatum	Upright Water-milfoil	19
Opercularia ovata	Broad-leaf Stinkweed	28
Opercularia varia	Variable Stinkweed	21, 28
Oxalis corniculata s.l.	Yellow Wood-sorrel	8
Oxalis exilis	Shady Wood-sorrel	3,9, 20, 28
Pelargonium australis	Native Storkbill	27
Pelargonium inodorum	Kopata	9, 13, 20
Persicaria decipiens	Slender Knotweed	3, 4, 6, 8, DC, 9, 25, 13, 19, 20, 23, 27
Persicaria hydropiper	Persicaria	13, 27
Persicaria lapathifolia	Persicaria	25
Persicaria praetermissa	Spotted Knotweed	DC, 19
Persicaria subsessilis	Hairy Knotweed	DC
Plantago varia	Variable Plantain	8, 9, 20
Polygonum aviculare	Prostrate Knotweed	27

Herbs *continued*		
Scientific Name	**Common Name**	**Reserve Number**
Poranthera microphylla	Small Poranthera	8, 15, 21, 28, 39
Portulaca oleracea	Common Purslane	2, 3, 4, 19, 25
Potamogeton tricarinatus	Floating Pondweed	19
Pseudognaphalium luteoalbum	Jersey Cudweed	21, 23
Ranunculus inundatus	River Buttercup	19
Ranunculus lappaceus	Australian Buttercup	8
Ranunculus papulentus	Large River Buttercup	19
Ranunculus plebeius	Forest Buttercup	4
Rubus parvifolius	Small-leaf Bramble	6, 8, 9, 25, 20, 27
Rumex brownii	Slender Dock	8
Senecio glomeratus	Annual Fireweed	25, 30, 28
Senecio hispidulus s.s.	Rough Fireweed	28
Senecio minimus	Shrubby Fireweed	3,9, 13, 19, 20, 28
Senecio quadridentatus	Cotton Fireweed	4, 6, 8, DC, 25, 14, 30, 42, 19, 27, 23, 15, 28, 39
Solenogyne gunnii	Solenogyne	25, 21, 28
Stackhousia monogyna	Creamy Stackhousia	8, 9, 20
Utricularia dichotoma	Fairies' Aprons	9, 13, 20
Vellarsia reniformis	Running Marsh-flower	19
Veronica gracilis	Slender Speedwell	4, 25, 19, 39
Viola hederacea sensu Willis (1972)	Ivy-leaf Violet	28
Wahlenbergia communis	Tufted Bluebell	21
Wahlenbergia gracilis	Sprawling Bluebell	27, 4, 8, 25, 19
Wahlenbergia gymnoclada	Naked Bluebell	8
Wahlenbergia stricta subsp. stricta	Tall Bluebell	6
Xanthosia dissecta	Cut-leaf Xanthosia	8, 28

Lilies		
Scientific Name	**Common Name**	**Reserve Number**
Arthropodium milleflorum	Pale Vanilla-lily	8
Arthropodium strictum	Chocolate Lily	3, 8, 25, 18, 19, 42, 21, 15
Bulbine bulbosa	Bulbine Lily	6, 30, 18, 19, 27, 28
Burchardia umbellata	Milkmaids	4, 8, 9, 25, 20, 21, 15
Caesia calliantha	Blue Grass-lily	28
Caesia parviflora	Pale Grass-lily	28
Caesia sp	Grass-lily	3
Dianella admixta	Black-anther Flax-lily	4, 8, 13, 14, 30, 18, 42, 19, 27, 15
Dianella brevicaulis	Short-stalk Flax-lily	8
Dianella laevis	Smooth Flax-lily	6, 25, 30, 42, 19, 27, 28
Dianella longifolia	Pale Flax-lily	23,27
Dianella longifolia var. longifolia	Pale Flax-lily	4, 8, 18, 15
Dianella revoluta	Black-anther Flax-lily	3, 6, 8, 25, 23, 21, 39, 28
Dianella tasmanica	Tasman Flax-lily	4, 42, 19, 27
Lomandra filiformis	Wattle Mat-rush	3, 6, 9, 25, 13, 20, 21,27, 28
Lomandra filiformis subsp. coriacea	Wattle Mat-rush	18, 19, 3
Lomandra filiformis subsp. filiformis	Wattle Mat-rush	4, 30, 8, 18, 19, 42, 21, 15, 3
Lomandra longifolia	Spiny-headed Mat-Rush	3, 6, 9, DC, 25, 19, 13, 23, 20, 39,28, 27
Lomandra longifolia subsp. exilis	Cluster-headed Mat-rush	21
Lomandra longifolia subsp. longifolia	Spiny-headed Mat-rush	4, 8, 30, 14, 18, 42, 15
Lomandra nana	Dwarf Mat-rush	4,6, 25, 8, 42, 27, 15, 39
Hypoxis glabella/vaginata spp. agg.	Tiny/Yellow Star species aggregate	28
Hypoxis hygrometrica	Golden Weather-glass	9, 20
Hypoxis vaginata var. vaginata	Yellow Star	21
Patersonia occidentalis	Long Purple-flag	6, 23
Thelionema caespitosum	Tufted Lily	8
Tricoryne elatior	Yellow Rush-lily	4, 8, 25, 30, 42, 19, 21, 15, 28, 39
Wurmbea dioica	Common Early Nancy	4,8, 9, 42, 25, 20, 21

Orchids		
Scientific Name	**Common Name**	**Reserve Number**
Caladenia dilatata	Green-comb Spider-orchid	9, 20
Caladenia parva	Small Spider-orchid	28
Chiloglottis spp.	Bird Orchid	28
Chiloglottis trapeziformis	Broad Lip Bird Orchid	42
Cryptostylis subulata	Large Tongue-orchid	28
Diuris lanceolata	Golden Moths	9, 20
Diuris spp.	Diuris	9, 20
Microtis parviflora	Slender Onion-orchid	42, 21, 15
Microtis spp.	Onion Orchid	28, 39, 30, 9, 20, 19
Microtis unifolia	Common Onion-orchid	8
Pterostylis nutans	Nodding Greenhood	4,9, 19, 20, 21, 28
Pterostylis sp.	Greenhood	42, 27
Thelymitra pauciflora	Slender Sun-orchid	9, 25, 20
Thelymitra spp.	Sun Orchid	8, 15, 39

Grasses, Rushes and Sedges		
Scientific Name	**Common Name**	**Reserve Number**
Agrostis avenacea	Common Blown-grass	8
Agrostis capillaris	Brown-top Bent	20
Amphibromus nervosus	Common Swamp Wallaby-grass	9, 13, 20
Amphibromus sp.	Swamp Wallaby-grass	19
Austrodanthonia geniculata	Kneed Wallaby-grass	8
Austrodanthonia laevis	Smooth Wallaby-grass	8
Austrodanthonia penicillata	Slender Wallaby-grass	8
Austrodanthonia racemosa var. racemosa	Striped Wallaby-grass	8
Austrodanthonia setacea	Bristly Wallaby-grass	8
Austrodanthonia spp.	Wallaby Grass	8
Austrodanthonia tenuior	Purplish Wallaby-grass	8
Austrostipa flavescens	Coast Spear-grass	8, 6
Austrostipa mollis	Supple Spear-grass	8, 25, 42
Austrostipa pubinodis	Tall Spear-grass	6, 25
Austrostipa rudis	Veined Spear-grass	4, 6, 8, 25, 30, 18, 19, 39, 21, 28
Austrostipa scabra	Rough Spear-grass	23
Austrostipa semibarbata	Fibrous Spear-grass	6
Austrostipa spp.	Spear Grass	23, 15, 8
Baumea articulata	Jointed Twig-sedge	19
Baumea rubiginosa s.l.	Soft Twig-rush	8
Bolboschoenus caldwellii	Salt Club-sedge	8
Bolboschoenus medianus	Marsh Club-sedge	19
Carex appressa	Tall Sedge	6, 8, DC, 9, 25, 13, 19, 20, 15, 27
Carex fascicularis	Tassel Sedge	8, 19, DC
Carex gaudichaudiana	Fen Sedge	19
Carex inversa	Knob Sedge	27, 28, 19
Centrolepis aristata	Pointed Centrolepis	19
Chloris truncata	Windmill Grass	6
Cynodon dactylon	Couch	39
Cyperus lucidus	Leafy Flat-sedge	DC
Cyperus tenellus	Tiny Flat-sedge	8
Deyeuxia quadriseta	Reed Bent-grass	21, 28
Dichelachne crinita	Long-hair Plume-grass	8, 25
Dichelachne sciurea spp. agg.	Short-hair Plume-grass	42
Dichelachne sieberiana s.l.	Plume-grass	8
Ehrharta erecta var. erecta	Panic Veldt-grass	28

Grasses, Rushes and Sedges *continued*		
Scientific Name	**Common Name**	**Reserve Number**
Eleocharis acuta	Common Spike-sedge	8, DC, 19, 28
Eleocharis sphacelata	Tall Spike-sedge	4,8, DC
Elymus scaber	Common Wheat-grass	8, 25, 19, 2
Eragrostis brownii	Love Grass	21, 28
Ficinia nodosa	Knobby Club-sedge	19, 2
Gahnia radula	Thatch Saw-sedge	4,6, 8, DC, 9, 25, 13, 14, 30, 18, 19, 20, 21, 27, 15, 28
Gahnia sieberiana	Red-fruit Saw-sedge	6, 8, 19
Hemarthria uncinata var. uncinata	Mat Grass	28
Isolepis cernua var. platycarpa	Broad-fruit Club-sedge	9, 13, 20
Isolepis marginata	Little Club-sedge	19
Isolepis platycarpa	Broad-fruit Club-sedge	8
Juncus amabilis	Hollow Rush	3,6, 8, 9, 13, 20
Juncus australis	Austral Rush	4, 8
Juncus bufonius	Toad Rush	8
Juncus gregiflorus	Green Rush	8, 9, 13, 19, 20
Juncus holoschoenus	Joint-leaf Rush	8, 19
Juncus pallidus	Pale Rush	8, DC, 30, 18, 42, 19, 15
Juncus pauciflorus	Loose-flower Rush	3,6, 8, DC, 8, 9, 13, 20
Juncus prismatocarpus	Branching Rush	8
Juncus procerus	Tall Rush	4,8, DC, 25, 19
Juncus sarophorus	Broom Rush	8, DC, 9, 13, 19, 20
Juncus spp.	Rush	27
Juncus subsecundus	Finger Rush	4, 8, 30, 18, 42, 19, 21
Juncus usitatus	Billabong Rush	8, 25
Lachnagrostis filiformis	Common Blown-grass	3, 6, 25
Lachnagrostis sp.	Common Blown- grass	19
Lepidosperma gunnii	Slender Sword- sedge	25, 21, 28
Lepidosperma laterale	Variable Sword-sedge	8, 30, 42, 15
Lepidosperma lsp.	Sword-sedge	19
Isolepis inundata	Swamp Club-sedge	23
Luzula meridionalis	Woodrush	4,21
Luzula meridionalis var. densiflora	Common Woodrush	28
Microlaena stipoides var. stipoides	Weeping Grass	3, 4, 6, 8, DC, 9, 25, 30, 13, 18, 42, 19, 20, 23,21, 15, 28, 27
Oxalis perennans	Grassland Wood Sorrel	8, 21, 28
Phragmites australis	Common Reed	3, 8, DC, 9, 25, 13, 19, 23, 20, 27
Poa ensiformis	Sword Tussock-grass	8, 25, DC, 13, 27

Grasses, Rushes and Sedges *continued*		
Scientific Name	**Common Name**	**Reserve Number**
Poa labillardierei	Common Tussock-grass	39, 3, 4, 6, 8, DC, 9, 25, 13, 30, 42, 18, 19, 20, 21, 23, 27, 15
Poa labillardierei var. labillardierei	Common Tussock-grass	28
Poa morrisii	Soft Tussock-grass	4, 3, 6, 8, 30, 25, 18, 42, 21, 15, 28, 39
Poa sieberiana	Grey Tussock-grass	6, 8, 13, 9, 30, 18, 19, 20, 27
Poa spp.	Tussock Grass	23
Poa tenera	Slender Tussock-grass	9, 13, 20, 28
Rytidosperma caespitosum	Common Wallaby-grass	6, 42, 19, 27
Rytidosperma fulva	Copper-awned Wallaby-grass	4, 6, 25, 30, 42, 19, 23, 15
Rytidosperma geniculatum	Kneed Wallaby-grass	6, 42, 19, 23,21, 28
Rytidosperma laeve	Smooth Wallaby-grass	28
Rytidosperma pallidum	Silvertop Wallaby-grass	21, 15, 28
Rytidosperma penicillatum	Weeping Wallaby-grass	42
Rytidosperma pilosa	Velvet Wallaby- grass	25
Rytidosperma racemosum	Slender Wallaby-grass	6, 25, 30, 42, 19, 21, 23, 15
Rytidosperma racemosum var. racemosum	Slender Wallaby-grass	27, 28, 39
Rytidosperma setaceeum	Bristly Wallaby-grass	6, DC, 21, 27, 28, 39
Rytidosperma sp.	Wallaby-grass	39
Rytidosperma spp.	Wallaby Grass	3
Schoenoplectus tabernaemontani	River Club-sedge	4, 19, 2 DC
Schoenoplectus validus	River Club-sedge	8
Schoenus apogon	Common Bog-sedge	9, 30, 18, 42, 19, 20, 21, 15, 28
Stylidium graminifolium	Grass Trigger-plant	8, 9, 19, 20
Themeda triandra	Kangaroo Grass	3, 4, 6, 8, 9, 13, 25, 30, 18, 42, 19, 20, 23, 21, 15, 28
Triglochin procera	Common Water-ribbons	3, 4, 8, DC, 25, 19, 2
Triglochin striata	Streaked Arrowgrass	23
Typha domingensis	Narrow-leaf Cumbungi	2, 3, 6, 8, 19, 25, DC
Xanthorrhoea minor	Small Grass-tree	3, 4, 15, 8

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