SUBURBAN RAIL LOOP EAST

SRL East Draft Structure Plan | Box Hill

Ecology and Arboriculture Technical Report

More Homes For Victorians

VICTORIA State Government

Suburban Rail Loop

PREPARED FOR SUBURBAN RAIL LOOP AUTHORITY

SRL EAST DRAFT STRUCTURE PLAN – ECOLOGY AND ARBORICULTURE TECHNICAL REPORT - BOX HILL

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Appendices

Glossary and abbreviations

TERM	DEFINITION
AJM-JV	Aurecon Jacobs Mott MacDonald Joint Venture
DCCEEW	Department of Climate Change, Energy, the Environment and Water (Commonwealth)
DEECA	Department of Energy, Environment and Climate Action (formerly DELWP)
DELWP	Department of Environment, Land, Water and Planning (DELWP) is a former government department in Victoria, Australia (now referred to as DEECA or DTP).
DTP	Department of Transport and Planning
EPBC Act	*Environment Protection and Biodiversity Conservation Act 1999*
EPR	Environmental Performance Requirement
ESO	Environmental Significance Overlay
EVC	Ecological Vegetation Class
FFG Act	*Flora and Fauna Guarantee Act 1988*
the Guidelines	*Guidelines for the removal, destruction of lopping of native vegetation* (DELWP, 2017)
ha	Hectare(s)
km	Kilometre(s)
LGA	Local Government Area
m	Metre(s)
MNES	Matters of National Environmental Significance
NVIM	Native Vegetation Information Management System
Plan Melbourne	*Plan Melbourne 2017-2050*
PMST	Protected Matters Search Tool
PPRZ	Public Park and Recreation Zone
Project Land	The Project Land describes the approval area which has been identified within the *Suburban Rail Loop East Incorporated Document (August 2022).* The Project Land includes the areas in which the Suburban Rail Loop East (the Project) components would be contained, including both permanent structures and temporary construction areas (both above and below ground).
PSA	Planning scheme amendment
SLO	Significant Landscape Overlay
SRL	Suburban Rail Loop
SRLA	Suburban Rail Loop Authority
SRL East (the Project)	Suburban Rail Loop East
VBA	Victorian Biodiversity Atlas
VPO	Vegetation Protection Overlay
WSUD	Water sensitive urban design

Executive summary

As part of the Suburban Rail Loop (SRL) East project, Draft Structure Plans (Structure Plans) are being prepared for the neighbourhoods surrounding the new underground stations at Cheltenham, Clayton, Monash, Glen Waverley, Burwood and Box Hill.

The Structure Plans will set a vision and framework to guide growth and change in each neighbourhood, while protecting and preserving the character and features people love about them now.

This technical report will inform the development of the Draft Box Hill Structure Plan (Box Hill Structure Plan).

The report describes the existing ecology and arboricultural values in the Structure Plan Area.

It identifies issues and opportunities that should be considered when developing the Box Hill Structure Plan and makes recommendations to improve and enhance ecology and arboricultural values.

Existing Conditions

ECOLOGY

The Structure Plan Area is heavily modified and dominated by infrastructure, buildings and residential areas. A significant portion is exclusively concrete and hard impervious surfaces with no native vegetation, so there are limited habitat opportunities for native flora and fauna. The Structure Plan Area is unlikely to contain areas of remnant native vegetation, with much of it comprising areas dominated by non-indigenous species. As there is very little remnant vegetation, future use and development will unlikely impact native vegetation.

The Structure Plan Area is unlikely to support listed *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) and *Flora and Fauna Guarantee Act 1988* (FFG Act) threatened ecological communities. Planted trees and potential habitat in Surrey Park in the south of the Structure Plan Area may provide temporary refuge opportunities for two EPBC Act and FFG Act-listed fauna: Gang-gang Cockatoo and Grey-headed Flying Fox. While these species may occasionally occur in or fly over the Structure Plan Area, they are not considered to depend on the planted trees that they may occasionally utilise.

ARBORICULTURE

The Structure Plan Area supports 15 per cent tree canopy cover. Residential properties and streetscapes supports 16 per cent canopy cover in the Structure Plan Area and commercial and industrial land supports 4.5 per cent canopy cover.

Twenty-three parcels of land in the Structure Plan Area are subject to a Vegetation Protection Overlay (Schedules 1, 3 and 5) and contain a tree (or trees) considered significant under the Whitehorse Planning Scheme.

A significant portion of the Structure Plan Area is subject to protection under the Significant Landscape Overlay Schedule 9 (SLO9) that applies to all residentially zoned land in the Structure Plan Area as part of the Whitehorse Planning Scheme. This is an interim control that will cease to have effect from 23 December 2024.

Notable and mature tree plantings, in addition to trees on land affected by SLO9, generally within public land managed by Whitehorse City Council includes areas such as Box Hill Gardens, Surrey Park in Box Hill, Surrey Drive in Box Hill, Whitehorse Road service roads and the central median between Middleborough Road and

Nelson Road in Box Hill, Bolton Park in Box Hill, and Kingsley Gardens in Mont Albert. These sites support significant canopy cover in the Structure Plan Area.

Issues and Opportunities

ECOLOGY

Challenges for increasing biodiversity and open spaces include the high proportion of developed areas and paved impervious surfaces, increasing population pressures and development, a heavy reliance on motor vehicles, limited biodiversity values in the existing open space network, the dominance of non-native and European street trees, and a lack of large mature trees. There is limited cover of understorey vegetation and connected habitat.

Opportunities for biodiversity include planting climate change-resilient native trees and understorey in the open space network to improve habitat and enhance habitat links and corridors, and the establishment of habitat corridors in the Structure Plan Area. Any initiatives should align with the *Whitehorse Urban Biodiversity Strategy* initiatives and partnerships with the City of Whitehorse could help identify potential extension areas for regenerating bushland.

Two scenic lakes, located beside the Surrey Park Aquatic Centre in the Structure Plan Area, could be rehabilitated by planting fringing native vegetation to manage erosion, discourage weeds and create aquatic habitat for fauna. Opportunities to expand and connect scattered waterbodies could also be considered.

Additional controls and overlays may also be considered to protect recreated habitat, planted trees and new dispersal corridors and links.

ARBORICULTURE

Development has potential to remove existing trees and reduce canopy cover, as well as reduce future opportunities to plant new trees. Rezoning and intensification of development will likely require the removal of SLO9 where intensity of development will fundamentally change the treed landscape character protected by the control, thereby creating potential conflicts between the landscape character objectives of SLO9 and the required growth outcomes of the Structure Plan. More intense development on residential land also has potential to remove trees and reduce opportunity for planting trees. Infrastructure works such as road upgrades and providing vehicle access could also impact arboricultural values. This will create challenges for achieving the Whitehorse City Council target of 30 per cent tree canopy cover by 2050.

Opportunities to protect and enhance tree canopy and the urban forest include considering green infrastructure, green roofs and canopy trees in private open space and Water Sensitive Urban Design to support new tree growth and biophilic design in new development. Initiatives to enhance growing conditions for trees on public land could be implemented, such as providing structured soils and incorporating Water Sensitive Urban Design features into new developments. Supporting the implementation of municipal street and public open space planting strategies could also help protect and add to the tree canopy.

Recommendations

1. Promote the concept of habitat corridors to link new and existing open spaces within the Structure Plan Area to support Victorian Government's Plan Melbourne 2017-2050: *Direction 6.5 and Policy 6.5.1* and City of Whitehorse Urban Biodiversity Strategy. It is recommended that habitat corridors consider the surrounding environment, including habitat toward Gardiners Creek within the Structure Plan Area.

Habitat corridors require the support of private landholders and public land managers to include private land and associated streetscapes.

a. As depicted in the below figure, the proposed habitat corridors have been developed based on a logical path that incorporates areas of existing and proposed open spaces, remnant vegetation and habitat corridors in proximity to the Structure Plan Area.

b. It is recommended that the habitat corridors are enhanced for biodiversity through the planting of native trees, particularly flowering natives, and understorey that provides a diversity of flowering plants at a variety of heights.

2. Explore opportunities with City of Whitehorse and Melbourne Water to protect, expand and restore the creek naturalisation of Gardiners Creek to extend habitat corridors between Blacks Walk Reserve and open public spaces within the Structure Plan Area. Gardiners Creek is the most significant habitat corridor in the landscape and this measure would support the City of Whitehorse Urban Biodiversity Strategy.

3. Existing and proposed open green spaces are recommended to be enhanced with native plantings (particularly flowering trees and a diversity of nectivorous species) to support *Direction 6.4* of Plan Melbourne 2017-2050 City of Whitehorse Urban Biodiversity Strategy and Urban Forest Policy, to increase biodiversity and provide cooler and greener urban forests. Refer to the below table that includes and summarises potential activities in new and existing open spaces.

a. Native plant selection in these areas should consider and prioritise drought-tolerant, long-lived and flowering species for their biodiversity values.

4. Align activities with *Whitehorse Urban Biodiversity Strategy* initiatives (i.e. tree planting, bushland regeneration and development of biodiversity corridors) and work with the City of Whitehorse to improve open space, streetscapes and community areas, including with a tree planting program to improve canopy cover and planting that links habitat between open spaces enhanced for biodiversity, as well as ensuring a diversity of tree species selected for climate change resilience.

5. As per the City of Whitehorse Biodiversity Principles and Objectives "*increase the focus of replenishing and supplementing indigenous plantings"*, it is recommended to enhance proposed and existing open spaces with indigenous plantings and revegetate understorey ground layer with flowering native species to promote native wildlife. The table below lists recommendations for biodiversity improvements to the open space network, including selecting native plant species that are drought-tolerant, long-lived and flowering with various heigh structures. These locations are identified in the figure below.

RECOMMENDATIONS FOR BIODIVERSITY IN PUBLIC OPEN SPACE

LOCATION	STATUS	PROPOSED CLASSIFICATION AND APPROX. SIZE	RECOMMENDATION FOR BIODIVERSITY IMPROVEMENTS
Surrey Park	Existing open space	Function: Sports Park Size: 160,910 m^2	• Retain all trees in the open space. • Revegetate Surrey Park Lake to provide greater habitat for common avifauna and frogs (floating wetlands). • Include additional plantings of native trees that provide nectar resources for birds. • Revegetate understorey flowering vegetation for pollinators that replace non-native lawn. • Add fauna nest boxes where possible.

LOCATION	STATUS	PROPOSED CLASSIFICATION AND APPROX. SIZE	RECOMMENDATION FOR BIODIVERSITY IMPROVEMENTS
Box Hill Gardens	Existing open space	Function: Community Park Size: 67,073 m^2	• Retain all trees in the open space. • Revegetate the Scenic Pond with surrounding understorey wetland plants that provide habitat for common avifauna and frogs. • Include additional plantings of native trees that provide nectar resources for birds. • Revegetate understorey flowering vegetation for pollinators that replaces non-native lawn. • Add fauna nest boxes.
Kingsley Gardens	Existing open space	Function: Sports Park Size: 24,781 m^2	• Retain all trees in the open space. • Include additional plantings of native trees that provide nectar resources for birds. • Revegetate understorey flowering vegetation for pollinators that replaces non-native lawn. • Add fauna nest boxes.
Brougham Street Reserve	Proposed (enhanced open space)	Function: Community Park Size: 1554 m^2	• Include plantings of native trees that provide nectar resources for birds, and understorey flowering vegetation for pollinators. • Revegetate site to consider and include patches of diverse native plantings.
Surrey Drive Reserve	Proposed (enhanced open space)	Function: Linear Park Size: 1974 m^2	• Include plantings of native trees that provide nectar resources for birds, and understorey flowering vegetation for pollinators. • Revegetation site to consider and include patches of diverse native plantings.
Court St and Watt St, Box Hill (offset)	Future opportunity (temporary open space to be made permanent)	Function: Neighbourhood park. Size: 2750 m^2 – size is fixed.	• If the future opportunity is realised, include plantings of native trees that provide nectar resources and consider inclusion of areas of diverse native plantings.
Temporary open space – Ellingworth Parade, Box Hill (offset)	Future opportunity (temporary open space to be made permanent)	Function: Community park. Size: 3500 m^2 – size is fixed.	• If the future opportunity is realised, include plantings of native trees that provide nectar resources and consider inclusion of areas of diverse native plantings.

6. Support existing and new tree plantings to increase canopy cover in accordance with the *Whitehorse Urban Forest Strategy 2021-2031* and *Living Melbourne,* endorsed by the City of Whitehorse. Ensure development includes integrated water management interventions that address green infrastructure assets, provides adequate irrigation for trees and other plantings, and optimises permeable surfaces to enhance tree growth.

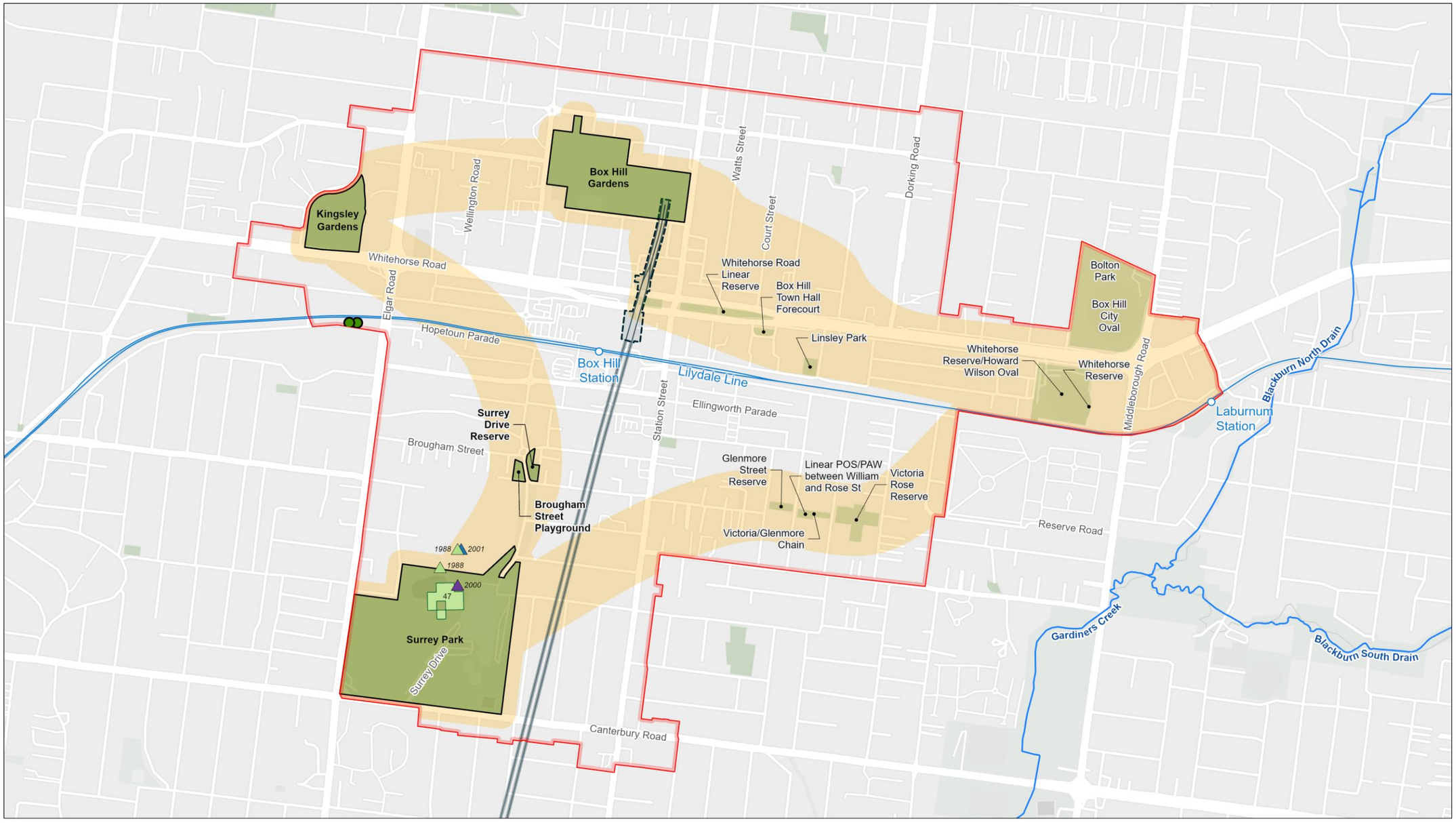
Other opportunities

- Align with *Whitehorse Urban Biodiversity Strategy* initiatives and works with the City of Whitehorse to improve open space, streetscapes and community areas – this includes investigating potential to expand areas of bushland regeneration, working with other authorities to improve biodiversity, and contributing to the development of a Biodiversity Corridor Plan.

- Support City of Whitehorse public open space and street planting strategies to meet canopy coverage targets, as well as ensuring a diversity of tree species selected for climate change resilience.

- Ensure significant trees protected by the Vegetation Protection Overlay are protected and integrated into new development.

- Consider additional planning controls and overlays to protect recreated habitat, planted trees and new dispersal corridors and links.
- Consider expanding the green streets initiative by removing non-porous surfaces and replacing Whitehorse Road median strip with natural swales and native vegetation that extends and connects with Gardiners Creek.
- Improve blue infrastructure by rehabilitating two waterbodies in the Structure Plan Area (Surrey Park and Box Hill Gardens) with planting of fringing native vegetation to manage erosion, reduce weeds and create aquatic habitat for fauna, and consider opportunities to expand and connect scattered waterbodies.
- Private landholders within the mapped corridor are to be encouraged and supported in contributing native trees and understorey plantings. It is considered that the Structure Plan Area wide habitat corridor will require local government and community support.



SRL East Structure Plan Area
SRL East Station Box
SRL East Alignment
Existing Metro Station
Existing Metro Line
Existing Public Open Space
Indicative Habitat Corridor
Watercourse

Ecology Data

Native Scattered Trees (AJM Data)
Native Scattered tree

Modelled Ecological Vegetation Class (DEECA)
47 Valley Grassy Forest

Victorian Biodiversity Atlas (VBA) Threatened Fauna (DEECA)
Gang-gang Cockatoo
Growling Grass Frog
Silver Perch

Data Sources:
AJMJV 2024
Esri 2024
SRLA 2024
VicMap (DEECA) 2024

SUBURBAN RAIL LOOP

Suburban Rail Loop
Box Hill
Indicative Habitat Corridor

Drawing Number:			Revision:
SRL-301-AJM-TPWD-MAP-PPG-PWD-508304			A.7
Drawn By:	Approved By:	Date:	Map Size:
L. Tily	R. Ffrost	14/10/2024	A3

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Metres
Coordinate System: GDA2020 MGA Zone 55

AJM Joint Venture
aurecon Jacobs MOTT MACDONALD

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INDICATIVE HABITAT CORRIDORS IN THE BOX HILL STRUCTURE PLAN AREA

1 Introduction

The Suburban Rail Loop (SRL) is a transformational project that will reshape Melbourne's growth in the decades ahead. It will better connect Victorians to jobs, retail, education, health services and each other – and help Melbourne evolve into a 'city of centres'.

SRL will deliver a 90-kilometre rail line linking every major train service from the Frankston Line to the Werribee Line via Melbourne Airport.

SRL East from Cheltenham to Box Hill will connect major employment, health, education and retail destinations in Melbourne's east and south east. Twin 26-kilometre tunnels will link priority growth suburbs in the municipalities of Bayside, Kingston, Monash and Whitehorse.

SRL East Structure Plan Areas will surround the six new underground stations at Cheltenham, Clayton, Monash, Glen Waverley, Burwood and Box Hill.

1.1 Purpose of this report

This technical report will inform the development of the Draft Box Hill Structure Plan (Box Hill Structure Plan) to guide land use planning and development in the Structure Plan Areas of SRL East.

The report describes the existing ecology and arboricultural values in the Structure Plan Area and the surrounding area.

Issues and opportunities relating to ecology and arboriculture that impact planning for the development of the Structure Plan Area are identified.

Recommendations to consider when developing the Box Hill Structure Plan are made, with the objective to avoid, minimise or manage potential negative impacts of change, and to maximise potential for positive change.

1.2 Project context

Construction of the SRL East underground stations is underway at Box Hill, Burwood, Glen Waverley, Monash, Clayton and Cheltenham. This provides an opportunity to enhance the surrounding neighbourhoods. SRL East will support thriving and sustainable neighbourhoods and communities that offer diverse and affordable housing options, with easy access to jobs, transport networks, open space, and community facilities and services.

A Precinct Vision has been developed in consultation with the community and stakeholders for the Structure Plan Area and surrounds. The visions set out the long-term aspirations for these areas, ensuring they are ready to meet the needs of our growing population.

Figure 1.1 shows SRL East in the context of the entire SRL project and Melbourne's rail network.

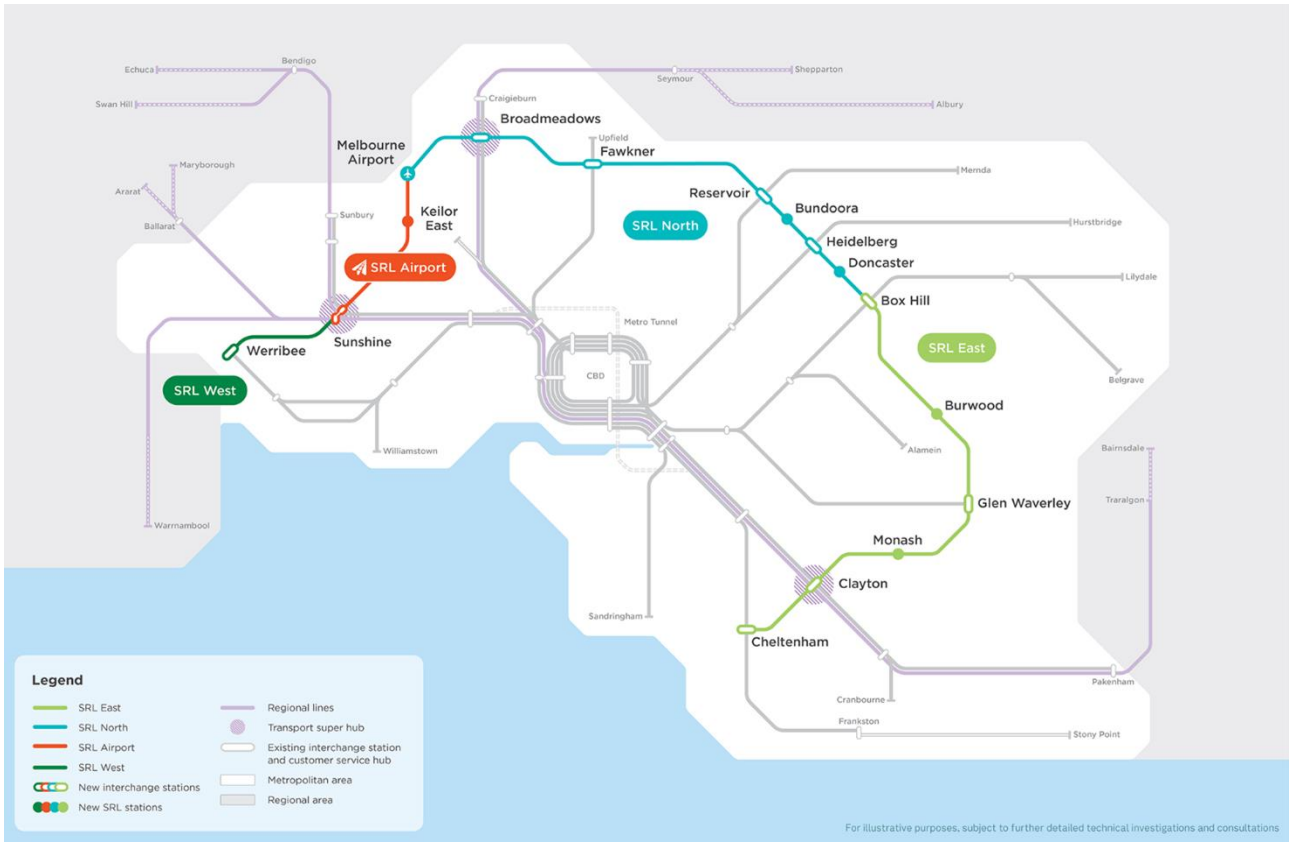

FIGURE 1.1 SRL EAST CONTEXT IN MELBOURNE'S RAIL NETWORK

1.3 Structure planning

Draft Structure Plans (Structure Plans) have been prepared for defined areas surrounding the new SRL East stations to help deliver the Precinct Vision developed for each SRL East neighbourhood.

The Structure Plans cover defined SRL East Structure Plan Areas that can support the most growth and change. These areas cover a walkable catchment that extends from the SRL station entrances. Additional places are included within each defined area as required to make planning guidance more robust and effective, and to align with each community's aspirations and current and future needs.

A Structure Plan is a blueprint to guide how an area develops and changes over a period of time. Structure Plans describe how future growth within the area will be managed in an appropriate and sustainable way to achieve social, economic and environmental objectives. The plans cover a wide range of matters, such as transport connections and car parking, housing and commercial development, community infrastructure, urban design, open space, water and energy management, climate resilience and sustainability.

By tailoring planning decisions to reflect the needs of a defined area, Structure Plans give effect to the policies and objectives set for these areas and cater for changing community needs. They also provide certainty for residents, businesses and developers by identifying the preferred locations and timing of future land uses, development and infrastructure provision.

Structure Plans take a flexible and responsive approach that enables places to evolve over time.

A planning scheme amendment will be required to implement the Box Hill Structure Plan into the planning scheme of the City of Whitehorse.

1.4 Structure of this report

- **Section 1** provides the background and context of the technical assessment.
- **Section 2** explains the methodology for the technical assessment.
- **Section 3** defines the Structure Plan Area.
- **Section 4** summarises legislation, policies and other documents relevant to the assessment.
- **Section 5** describes the existing ecological and arboricultural conditions in the Structure Plan Area.
- **Section 6** sets out the findings of the assessment. It identifies the issues, challenges and opportunities relating ecology and arboriculture that will impact land use planning and development in each Structure Plan Area.
- **Section 7** sets out the recommendations to consider when developing the Structure Plan Area.

2 Methodology

The methodology for the ecology and arboriculture technical assessment involved:

- Study area for the technical assessment was identified. For this assessment the study area is the same area as the Structure Plan Area (see Section 3.1).
- Legislation, policies and documents relevant to the assessment, and to land use planning and development in the Structure Plan Area was reviewed (see Section 4).
- The existing ecology and arboricultural values in the Structure Plan Area were identified (see Section 5). This included a desk top review of the Structure Plan Area and a search radius of 5 kilometres from its boundary.
- Issues, challenges and opportunities relating to ecology and arboriculture and land use planning and development in the Structure Plan Area was identified (see Section 6).
- Based on the assessment, recommendations were developed to avoid, minimise or manage potential negative impacts of change relating to ecology and arboriculture, and to maximise potential for positive change in the Structure Plan Area (see Section 7).

2.1 Methodology for ecology existing conditions

The desktop study to assess existing ecology in the Structure Plan Area involved:

- **Previous reports** prepared for SRLA relevant to ecology and arboriculture were reviewed.
- **Database searches** to identify threatened flora, fauna and ecological communities protected under the *Environment Protection and Biodiversity Act 1999* (EPBC Act) and the *Flora and Fauna Guarantee Act 1999* (FFG Act).
- **A likelihood of occurrence analysis** of threatened flora, fauna and ecological communities in the Structure Plan Area.

More information on these activities is provided below.

2.1.1 PREVIOUS REPORTS

Previous reports prepared for SRLA reviewed for this assessment were:

- *SRL East Environment Effects Statement Technical Appendix G.1 Ecology Existing Conditions* (AJM-JV 2021a October 2021).
- *SRL East Environment Effects Statement Technical Appendix G.2 Ecology Impact Assessment* (AJM-JV 2021b October 2021).

Information in these reports relevant to this assessment is summarised in Section 5.1.3.

2.1.2 DATABASE SEARCHES

Database searches were undertaken on 1st October 2024 to understand the likely existing conditions of the Structure Plan Area. The database search area comprised the Structure Plan Area and a radius of 5 kilometres from its boundary. This is referred to as the 5-kilometre search area in this report. Database searches identified a shortlist of potential flora, fauna and ecological communities that may occur in the Structure Plan Area.

Database records reviewed for the 5-kilometre search area were:

- Protected Matters Search Tool (PMST) of the Australian Government Department of Climate Change, Energy, the Environment and Water (DCCEEW) for matters protected by the EPBC Act (DCCEEW 2024a, See Appendix A)
- The Victorian Biodiversity Atlas (DEECA 2024a) for records of listed threatened flora and fauna species.

The following information was also reviewed:

- The Victorian Native Vegetation Information Management System (NVIM) (DEECA 2024b)
- NatureKit (DEECA 2024c)
- VicPlan (DTP 2024a)
- Publicly available aerial imagery (dated 2024).

2.1.3 LIKELIHOOD OF OCCURRENCE ANALYSIS

Each species identified in the database search was considered against the suitability, condition and extent of suitable habitat in the Structure Plan Area and broader landscape to determine their likelihood of occurrence in the Structure Plan Area. The likelihood of a species occurring in the Structure Plan Area was classified as 'Negligible', 'Low', 'Moderate' or 'High' based on consideration of the:

- Presence or absence of previous records in the search region (as identified in the database search)
- Known habitat requirements and distribution of the species
- Suitability of habitat in the Structure Plan Area (based on the findings of the field assessment and previous reports).

The likelihood of ecological communities occurring in the Structure Plan Area was considered and is discussed in Section 5.1.2.3.

The criteria to rank the likelihood of threatened flora and fauna occurring in the Structure Plan Area is defined in Table 2.1 and Table 2.2 respectively. Species determined to have a high to moderate likelihood of occurring in the Structure Plan Area are discussed in Section 5.1.2.1 and 5.1.2.2.

TABLE 2.1 LIKELIHOOD OF OCCURRENCE CRITERIA FOR THREATENED FLORA SPECIES

LIKELIHOOD OF OCCURRENCE	CRITERIA
High	Recent records of the species in the local vicinity (in the last 10 years).
	Known to occur in the area based on site observations, database records or expert advice and/or the Structure Plan Area contains high-quality habitat.
Moderate	Previous reputable records of the species in the local vicinity and/or the Structure Plan Area contains moderate quality habitat

LIKELIHOOD OF OCCURRENCE	CRITERIA
Low	Limited previous records of the species in the local vicinity; and/or the Structure Plan Area contains poor or limited habitat. May also be considered low if other environmental factors are present such as fragmented or isolated habitat.
Negligible	No suitable habitat and/or the Structure Plan Area falls outside the known species range.

TABLE 2.2 LIKELIHOOD OF OCCURRENCE CRITERIA FOR THREATENED AND MIGRATORY FAUNA SPECIES

LIKELIHOOD OF OCCURRENCE	CRITERIA
High	Known resident in the area based on site observations, database records or expert advice.
	Recent reputable records (in 5 years) of the species in the local area.
	The Structure Plan Area contains the species' preferred habitat.
Moderate	The species is likely to visit the Structure Plan Area regularly (at least seasonally).
	Previous reputable records of the species in the local area.
	The Structure Plan Area contains some characteristics of the preferred habitat of the species.
Low	The species is likely to visit the Structure Plan Area occasionally or opportunistically while en-route to more suitable sites.
	There are only limited or historical records of the species in the local area (more than 20 years old).
	The Structure Plan Area contains few or no characteristics of the preferred habitat of the species.
Negligible	No previous records of the species in the local area.
	Previous records of the species exist in the local area (but records are more than 30 years old).
	The species may fly over the area when moving between areas of more suitable habitat.
	Out of the known range of the species.
	No suitable habitat in the Structure Plan Area.
	Species is known to be regionally extinct.

2.2 Methodology for arboriculture existing conditions

The arboriculture existing conditions assessment comprised a review of previous relevant reports prepared for SRLA as well as other relevant planning and strategy documents. Aerial imagery of the Structure Plan Area and surrounds was also reviewed.

2.2.1 PREVIOUS REPORTS

Previous reports prepared for SRLA reviewed for this assessment were:

- *SRL East – Arboriculture and Urban Forest Existing Conditions*. TA D.1 Arbor EC (AJM-JV 2021c Revision 01 October 2021)
- *SRL East – Arboriculture and Urban Forest Impact Assessment*. TA D.2 Arbor IA (AJM-JV 2021d October 2021)

Other relevant documents reviewed for the assessment were:

- Whitehorse Planning Scheme – Schedule 9 to the Significant Landscape Overlay – Schedules 1, 3 and 5 to the Vegetation Protection Overlay

- *Whitehorse City Council Urban Forest Strategy 2021–2031*
- VPO1 – City of Whitehorse statements of tree significance, 2005
- VPO3 – City of Whitehorse statements of tree significance, 2006
- *City of Whitehorse Significant Tree Study*, 2016
- *Living Melbourne: our metropolitan urban forest* (The Nature Conservancy and Resilient Melbourne 2019)
- *Plan Melbourne 2017–2050 (*DELWP 2017b).

Information from these reports relevant to this assessment is summarised in Section 5.2.

2.3 Assumptions and limitations

The following assumptions and limitations apply to this technical assessment:

- The assessment was based on desktop research. No fieldwork, site assessments, consultation or engagement was undertaken.

Assumptions and limitations specific to the ecology assessment are:

- Information from the desktop research is limited to the time the data was obtained (1st October 2024) and so should be considered as indicative only. No field assessment was completed to verify the results of the desktop assessment.
- Victorian Biodiversity Atlas (VBA) data relating to threatened species varies depending on the number of previous surveys undertaken and the ability to readily observe species. In the case of fauna, species move around the landscape and can be in hidden or cryptic locations, so while they potentially use a site, they may often not be observed during surveys. A lack of species records for a given search area may reflect a simple lack of survey effort at a location rather than demonstrating the absence of species. This is particularly true for aquatic species as survey efforts are typically less than for terrestrial areas.

Assumptions and limitations specific to the arboriculture assessment are:

- Existing tree canopy cover spatial data is sourced from Vicmap Vegetation Tree Extent (2020). The dataset defines tree cover as woody vegetation greater than 2 metres high, which is likely to over-state existing canopy cover, which is usually measured at 3 metres high or greater. Derived canopy polygons were not manually checked or corrected for the technical assessment.
- The arboriculture assessment is based on a desktop review and should not be considered an authoritative review, which would require fieldwork and an assessment of individual trees.

2.4 Interactions with other technical reports

2.4.1 URBAN DESIGN

In response to the SRL Urban Design Framework, AJM-JV prepared the *SRL East Draft Structure Plan - Urban Design Report - Box Hill* (AJM-JV 2025a), which outlines the recommended urban design strategies and initiatives for the Structure Plan Area.

In relation to ecology, this includes identifying how the Structure Plan Area aligns with the SRL Urban Design Objectives, including increasing tree canopy cover and other landscaping, and optimising green and blue infrastructure in existing and new streets and open spaces.

Recommendations this report makes consider the recommended initiatives of the Urban Design Report (AJM-JV 2025a), in particular using existing and proposed open spaces and Green Streets identified in the Public Realm Framework. As defined in the SRL Urban Design Framework, Green Streets are a broad classification for a local street that may be enhanced to support a range of opportunities including pedestrian connectivity and access to recreation facilities, enhanced environmental and biodiversity outcomes, and the potential to accommodate cycle and bus routes. Green Streets provide a valuable opportunity to increase habitat and dispersal corridors for biodiversity.

More detail is provided in the *SRL East Draft Structure Plan - Urban Design Report - Box Hill* (AJM-JV 2025a).

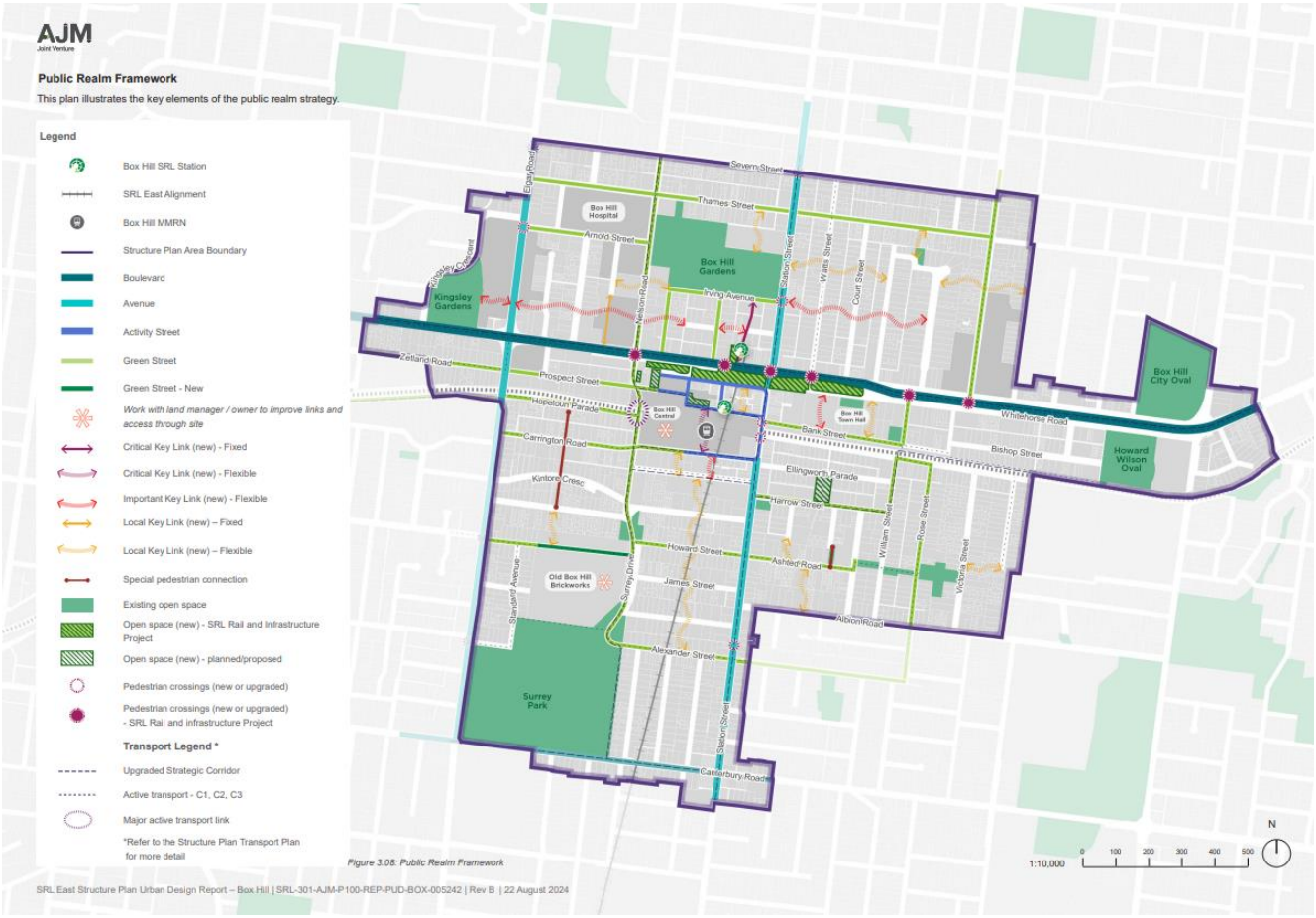

Figure 3.08: Public Realm Framework

SRL East Structure Plan Urban Design Report – Box Hill | SRL-301-AJM-P100-REP-PUD-BOX-005242 | Rev B | 22 August 2024

FIGURE 2.1 PUBLIC REALM FRAMEWORK SHOWING OPEN SPACE AND GREEN STREETS (AJM-JV 2025b)

2.4.2 LANDSCAPE HERITAGE

Trees subject to protection under the Heritage Overlay, including sites on the Victorian Heritage Register, are included in the *SRL East Draft Structure Plan – Historical Heritage Technical Report* (AJM-JV 2025b). This report identifies Box Hill High School, located at 1180 Whitehorse Road, Box Hill, as subject to Heritage Overlay 248 (HO248), which includes tree controls.

2.4.3 FLOODING AND WATER MANAGEMENT

Water sensitive urban design (WSUD) has a role to support new tree growth and biophilic design in new development and is considered in greater detail in the *SRL East Structure Plan – Integrated Water Management Strategy* (AJM-JV 2025c).

Specific WSUD opportunities relating to the Structure Plan Area are outlined in Section 6.2.2, and recommendations for the implementation of Integrated Water Management as Structure Plan Objectives are outlined in *SRL East Draft Structure Plan - Climate Response Plan – Box Hill* (AJM-JV 2025d).

2.4.4 SUSTAINABILITY AND CLIMATE CHANGE

The *SRL East Draft Structure Plan - Climate Response Plan – Box Hill* (AJM-JV 2025d) recognises the challenges in declining urban tree canopy cover, including population increases, urbanisation and climate change increasing pressures in the health and extent of urban forest.

The Box Hill Climate Response Plan provides detailed assessments and recommendations for tree canopy coverage targets and green infrastructure for new developments.

2.4.5 OPEN SPACE ASSESSMENT

There are 18 public open space areas in the Structure Plan Area covering a combined area of 351,070 m^2. These open space areas are listed in Table 2.3. Notably, the majority of these open public spaces support recreational facilities, grassed areas and parks and comprise little to no native vegetation or ecological values considered to provide high quality habitat for native flora and fauna.

These open spaces provide opportunities to enhance and/or transform these spaces to encourage and facilitate biodiversity and increased tree canopy cover.

Open spaces outlined in this report consider the recommended initiatives of the *SRL East Draft Structure Plan - Open Space Technical Report* (AJM-JV 2025e) and may be subject to change.

TABLE 2.3 STRUCTURE PLAN AREA OPEN SPACE CLASSIFICATIONS

PUBLIC OPEN SPACE	CURRENT CONDITION AND PRESENT VALUES	AREA (M^2)
Ashted Reserve	Linear Park supporting a mixture of non-native planted trees over mown grass. No understorey native vegetation present.	793
Bolton Park	Community Park with a mixture of non-native planted and indigenous trees. No understorey vegetation present.	11,422
Box Hill City Oval	Sports Park with no vegetation.	37,400
Box Hill Gardens	Community Park primarily dominated by European flora over mown grass. The area contains some scattered planted non-indigenous native trees.	67,073
Box Hill Town Hall Forecourt	Civic. No native vegetation present.	1062
Brougham Street Playground	Community Park with a mixture of non-native planted street trees over mown grass. No understorey native vegetation present.	1554
Glenmore Street Reserve	Linear Park supporting a mixture of planted vegetation over mown grass. Small patches of understorey vegetation occur in this location.	1344
Graham Bend Park	Community Park with no trees and supporting an understorey of planted vegetation and mown grass.	1129
Harrow Park (Pioneer Park)	Civic Space supporting maintained garden beds and planted understorey vegetation with mown grass.	1214
Kingsley Gardens	Community Park with high abundance of exotic planted trees over mown grass.	24,781

PUBLIC OPEN SPACE	CURRENT CONDITION AND PRESENT VALUES	AREA (M^2)
Linear POS/PAW between William and Rose St	Linear Park supporting a mixture of planted vegetation over mown grass. Small patches of understorey vegetation occur in this location.	1662
Linsley Park	Community Park supporting native planted trees over mown grass.	1747
Surrey Drive Reserve	Linear Park of planted native trees over bare ground and mown grass.	1974
Surrey Park	Sports Park supporting a landscape of planted trees over mown grass. This public open space includes Surry Park Lake, a large waterbody with surrounding vegetation. This waterbody has the potential to attract and support biodiversity. Patches of remnant Valley Grassy Forest (EVC 47) are modelled to occur in this location.	160,910
Victoria Rose Reserve	Community Park supporting a mixture of planted vegetation over mown grass. Small patches of understorey vegetation occur in this location.	6840
Victoria/Glenmore Chain	Linear Park supporting a mixture of planted vegetation over mown grass. Small patches of understorey vegetation occur in this location.	49
Whitehorse Reserve	Sports Park supporting planted native trees over bare ground and mown grass.	346
Whitehorse Reserve/Howard Wilson Oval	Sports Park supporting mown grass.	23,423
Whitehorse Road Linear Reserve	Linear Park supporting a row of planted street trees over mown grass.	7131
Total		**351,863**

As documented in the *SRL East Draft Structure Plan - Open Space Technical Report* (AJM-JV 2025e), in addition to retaining the current areas of open space in the Structure Plan Area, six sites comprising new and/or enhanced open spaces and pedestrian links have the potential to provide additional biodiversity benefits in the Structure Plan Area. These sites are summarised in the *SRL East Draft Structure Plan - Open Space Technical Report* (AJM-JV 2025e).

3 Structure Plan Area

This section defines the Structure Plan Area in the Box Hill SRL East neighbourhood.

3.1 Box Hill Structure Plan Area

The Box Hill Structure Plan Area surrounds the SRL station at Box Hill in the City of Whitehorse.

It is generally bordered by Severn Street and McKean Street to the north, Clota Avenue and Laburnum Street to the east, slightly west of Elgar Road to the west and Canterbury Road to the south.

Whitehorse Road / Maroondah Highway and the existing Belgrave / Lilydale Line intersect the centre of the Structure Plan Area in an east-west alignment. The main road corridors include Whitehorse Road, Elgar Road and Station Street.

The Structure Plan Area is shown in Figure 3.1.

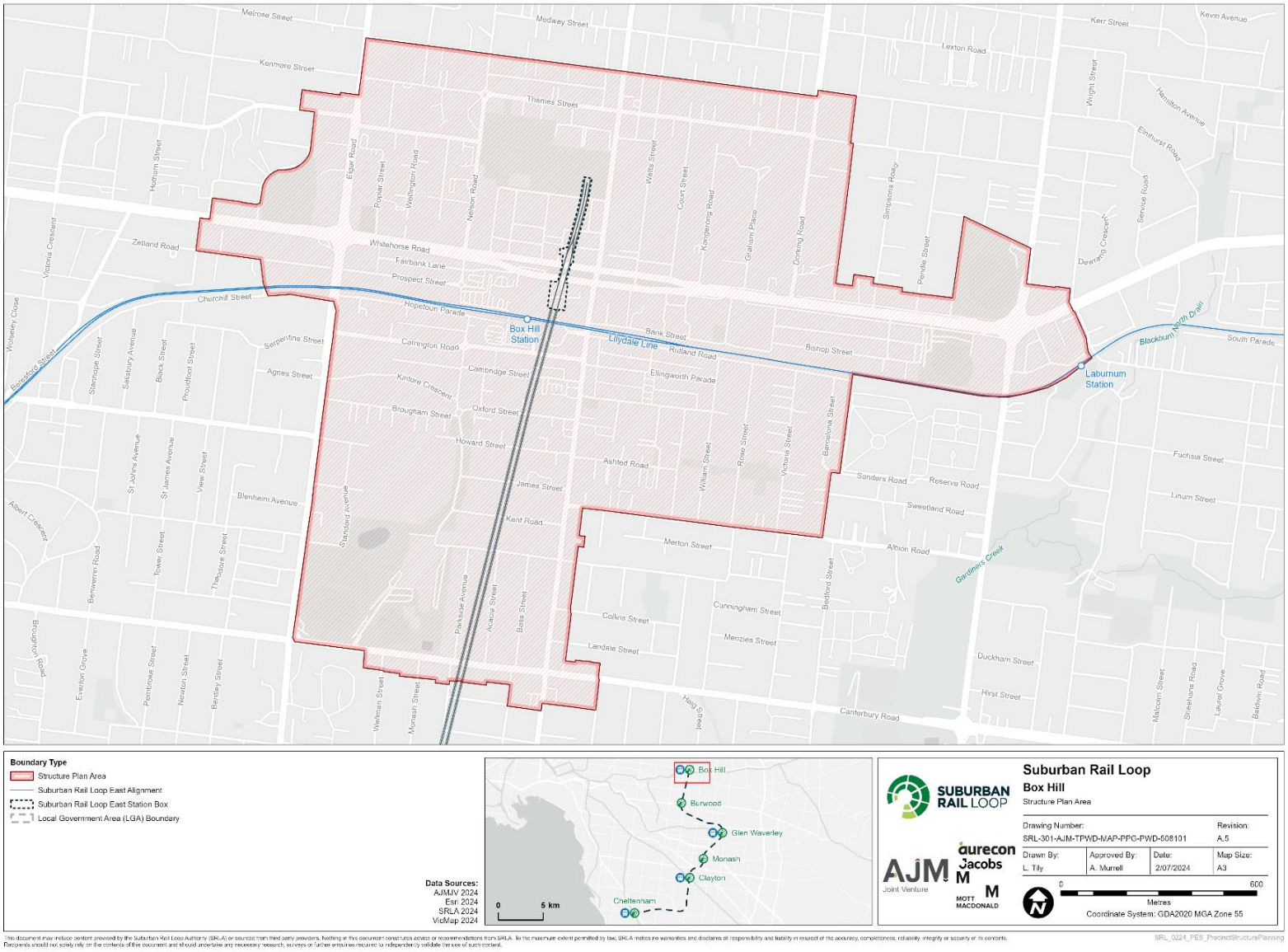

FIGURE 3.1 BOX HILL STRUCTURE PLAN AREA

4 Legislative and policy context

This section summarises legislation, polices and other documents relevant to the technical assessment, and to land use planning and development in the Structure Plan Area.

4.1 National

4.1.1 ENVIRONMENT PROTECTION AND BIODVIERSITY CONSERVATION ACT 1999

The *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) is Commonwealth legislation that provides a legal framework to protect and manage nationally and internationally important flora, fauna, ecological communities and heritage places, termed Matters of National Environmental Significance (MNES).

Under the EPBC Act, an action that has, will have, or is likely to have, a significant impact on a MNES must be referred to the Commonwealth Minister for the Environment. The Minister will then determine whether the proposed action requires formal assessment and approval under the EPBC Act.

4.2 State

4.2.1 FLORA AND FAUNA GUARANTEE ACT 1988

The *Flora and Fauna Guarantee Act 1988* (FFG Act) is the key Victorian legislation for the conservation of threatened species and communities and for the management of potentially threatening processes. Under the FFG Act a permit is required from the Department of Energy, Environment and Climate Action (DEECA) to take (kill, injure, disturb or collect) threatened or protected flora species from public land.

4.2.2 PLANNING AND ENVIRONMENT ACT 1987 (VIC)

The *Planning and Environment Act 1987* establishes a framework for planning the use, development and protection of land in Victoria. It sets out procedures for preparing and amending the Victoria Planning Provisions and planning schemes. Each municipality is required to have a planning scheme which includes the Planning Policy Framework (which sets out state and regional policies) and the Local Planning Policy Framework (that is specific to each municipality), zones, overlays and particular and general provisions. Refer to Section 4.3.1 for relevant information from the Whitehorse Planning Scheme.

4.3 Local

4.3.1 WHITEHORSE PLANNING SCHEME

4.3.1.1 Relevant state and local policies

Clause 12.01-1S (Protection of Biodiversity) seeks to protect and enhance Victoria's biodiversity. Of relevance to the Structure Plan Area is the need to support land use and development that contributes to protection and enhancing habitat for indigenous plants and animals in urban areas.

Clause 12.01-2S (Native vegetation management) aims to ensure that there is no net loss to biodiversity as a result of the removal, destruction or lopping of native vegetation.

Under Clause 21.01 (Municipal Profile of the Local Planning Policy Framework), trees are identified as an integral aspect of the City and are a key determinant of the character of the residential areas of the city. Environment is one of the key strategic directions under Clause 21.05 of the Local Planning Policy Framework.

The key objectives are set out under Clause 21.05-3 of relevance to ecology and arboriculture include:

- To facilitate environmental protection and improvements to known assets including water, flora and fauna and biodiversity assets
- To develop main thoroughfares as attractive boulevards with improved advertising, signage, landscaping and building design
- To protect and enhance tree canopy cover in residential areas of the municipality.

Strategies to achieve this include:

- Requiring the planting of upper canopy trees and other vegetation that enhances the character of the area
- Ensure that where applicable, the contribution of land towards any public open space requirements can assist in the protection of sites of environmental value identified as having high conservation significance.

These strategies are implemented by the application of relevant overlays and policies. These are outlined below:

- Applying a Significant Landscape Overlay to all remaining residential areas in the municipality
- Applying a Vegetation Protection Overlay to identified significant vegetation
- Ensuring that all tree removal, tree replanting and development complies with the Tree Conservation Policy at Clause 22.04
- Strongly encouraging the planting of indigenous species where appropriate.

The relevant objectives of Clause 22.04 Tree Conservation are to:

- Improve the tree canopy cover in residential areas across the municipality
- Assist in the management of the City's tree canopy by ensuring that new development minimises the loss of significant trees.

4.3.1.2 Relevant planning zones

The typical planning zone that affects public open space and reserves in the Structure Plan Area is the Public Park and Recreation Zone (PPRZ).

4.3.1.2.1 Public Park and Recreation Zone

The primary purposes of the PPRZ are to:

- Recognise areas for public recreation and open space
- Protect and conserve areas of significance where appropriate
- Provide for commercial uses where appropriate.

No vegetation removal permit triggers are within zones. The occurrences of most threatened flora and fauna species mapped for the Structure Plan Area are located in reserves in the PPRZ. Any planning permit for buildings and works on PPRZ land must be accompanied by written consent from the public land management.

4.3.1.3 Relevant planning overlays

Overlays in planning schemes are the primary instrument for the protection of native and non-native vegetation in a municipal planning scheme.

In the City of Whitehorse these are primarily implemented through the Significant Landscape Overlay (SLO), and Vegetation Protection Overlay (VPO). No land in the Structure Plan Area is affected by the Environmental Significance Overlay.

Trees subject to tree controls in the schedule to the Heritage Overlay are considered in the *SRL East Draft Structure Plan - Historical Heritage Technical Report* (AJM-JV 2025b).

4.3.1.3.1 Vegetation Protection Overlay

Trees included in various significant City of Whitehorse tree studies are covered by Schedules 1, 3 and 5 to the VPO. While these overlays apply to entire parcels of land, the scope of the overlay generally applies to one or two trees in each parcel, as identified in the incorporated documents that support each of the three schedules.

Trees subject to protection under the VPO have been assessed against a set of criteria generally in accordance with the criteria for assessing significant trees as developed by the National Trust of Australia (Victoria), and so are identified as of cultural heritage significance, including, potentially, Aboriginal cultural heritage.

In accordance with the VPP Practice Note PPN07 *Vegetation protection in urban areas* (PPN07), the VPO is specifically designed to protect significant native and exotic vegetation in an urban or rural environment and can be applied to individual trees, stands of trees or areas of significant vegetation.

The purposes of the VPO are to:

- Protect areas of significant vegetation
- Ensure development minimises loss of vegetation
- Preserve existing trees and other vegetation
- Recognise vegetation protection areas as locations of special significance, natural beauty, interest and importance
- Enhance habitat and habitat corridors for indigenous fauna

- Encourage the regeneration of native vegetation.

The VPO does not include buildings and works or subdivision requirements. The VPO is the appropriate tool for identifying and protecting vegetation where buildings and works or subdivision are not important considerations.

Under the provisions of each schedule, a permit is required to remove, destroy or lop vegetation included in the incorporated document referenced in each of the three schedules to the VPO.

4.3.1.3.2 Significant Landscape Overlay

Schedule 9 to the Significant Landscape Overlay (SLO9) applies to trees in residential zones of the Structure Plan Area. SLO9 seeks to:

- Retain and enhance the canopy tree cover of the Garden and Bush Suburban Neighbourhood Character Areas
- Encourage the retention of established and mature trees
- Provide for the planting of new and replacement canopy trees
- Ensure that development is compatible with the landscape character of the area.

In accordance with PPN07, the function of SLO9 is to identify and conserve the character of a significant landscape and is appropriate when vegetation is primarily of aesthetic or visual importance in the broader landscape. SLO9 should be used where vegetation is identified as an important contributor to the character of an area.

SLO9 also includes permit requirements for building and works which can be applied where appropriate to assist in vegetation protection.

SLO9 applies to residential precincts in the Structure Plan Area, but not the majority of commercial or industrially zoned land, nor trees in nominated road zones.

Under SLO9, a permit is required to remove, destroy or lop a tree, unless that tree is less than 5 metres high and has a single trunk circumference of 1 metre or less at a height of 1 metre above ground level.

This overlay is an interim control that will cease to have effect after 23 December 2024. The extension to the expiry of SLO9 enables the control to be in effect while the Department of Transport and Planning (DTP) develops consistent statewide tree protection provisions in response to *Plan Melbourne* Action 91: Cooling and greening Melbourne. This includes consideration of the Victorian Government's commitment to meet housing supply targets and support *Victoria's Housing Statement: The decade ahead 2024-2034*.

4.3.1.4 Relevant Particular Provisions

4.3.1.4.1 Clause 52.17 Native vegetation

Clause 52.17 (Native Vegetation) requires that the removal of native vegetation results in no net loss in the contribution made by native vegetation to Victoria's biodiversity, and that this is achieved by applying the three-step approach outlined in the Victorian *Guidelines for the removal, destruction or lopping of native vegetation* (DELWP 2017a):

- **Avoid** the removal, destruction or lopping of native vegetation.
- **Minimise** impacts from the removal, destruction or lopping of native vegetation that cannot be avoided.

- Provide an **offset** to compensate for the biodiversity impact if a permit is granted to remove, destroy or lop native vegetation.

4.3.2 WHITEHORSE URBAN FOREST STRATEGY 2021-2031

The *Whitehorse Urban Forest Strategy* has been developed to provide a municipal-wide tree canopy target of 27 per cent by 2031, and 30 per cent by 2050, from a baseline of 18 per cent in 2018.

The Strategy seeks to address declining canopy cover in the municipality, develop an urban forest better suited to cope with climate change and enhance the liveability of the municipality, including by reducing the urban heat island effect and its impacts on an ageing demographic and increasing biodiversity and ecosystem services (such as water capture and carbon sequestration).

The Strategy sets five objectives to meet the tree canopy targets:

1. Protect the urban forest
2. Expand the urban forest to adapt to climate change
3. Enhance biodiversity
4. Build community capacity to learn from each other, protect and enhance the urban forest
5. Build on Council's knowledge base.

4.3.3 WHITEHORSE INTERIM URBAN FOREST POLICY AND TREE MANAGEMENT PLAN

The *Whitehorse Interim Urban Forest Policy and Tree Management Plan* provides clarity and direction for the ongoing management of trees in the municipality, replacing the previous *Streetscape Policy and Strategy* (2002). The Plan relates to trees on public land, owned and managed by Council including street trees and park trees.

The Plan provides guidelines for tree planting and establishment, pruning and maintenance, as well as policies for tree removal on public land managed by Council. It also includes specific management directives for managing tree risk, liability, infrastructure damage caused by trees and guidelines for the management of significant streetscapes.

4.3.4 WHITEHORSE URBAN BIODIVERSITY STRATEGY

The *Whitehorse Urban Biodiversity Strategy* has been developed to address biodiversity conservation and management actions undertaken by Council. The strategy considers the significance of indigenous flora and fauna within a modified suburban landscape to maintain and encourage biodiversity.

The Strategy outlines key initiatives and one-off management actions to be undertaken by Council that will contribute to biodiversity knowledge, planning and species management across the municipality. Key management actions that are relevant for the Structure Plan Area include:

- Development of a canopy management policy – specific tree management guidelines
- Identification of potential extension areas of bushland regeneration – bushland expansion and regeneration to support native and indigenous species
- Working with other authorities to improve biodiversity – develop working relationships with authorities to foster positive biodiversity outcomes

- Development of a biodiversity corridors plan – map all recorded biodiversity assets and urban habitat and create linkages
- Tree planting program – replenish and improve canopy cover
- Listing biodiversity hotspots – identification and categorisation of biodiversity assets in the urban environment.

4.3.5 PLAN MELBOURNE 2017–2050

Plan Melbourne is the Victorian Government's long-term metropolitan planning strategy. Of particular relevance to the urban forest is Outcome 6 *Melbourne is a sustainable and resilient city*.

Direction 6.4 *Make Melbourne cooler and greener* seeks to create urban forests throughout the metropolitan area by:

- Assembling and disseminating spatial data on the green space network, existing tree cover and surfaces. This data will be the baseline for modelling future greening strategies and their impacts on amenity of our urban areas including cooling effects
- Working with local government to establish greening targets for each of the metropolitan regions
- Liaising with water corporations to identify opportunities for use of alternative water supply to support greening strategies
- Supporting development of municipal urban forest strategies using a coordinated approach with Department of Transport, private road operators and other public land owners and managers
- Preparing greening strategies for state-owned public land, including schools, parkland, road, rail and utility corridors, achieving an appropriate balance between asset protection and urban greening
- Investigating a targeted grants program to support innovation and actions for greening neighbourhoods
- Investigating demonstration projects including green roofs, green walls and landscapes
- Preparing new guidelines and regulations that support greening new subdivisions and developments via landscaping, green walls, green roofs and increase the percentage of permeable site areas in developments.

This requires a 'whole-of-government approach to cooling and greening Melbourne'.

Direction 6.5 *Protect and restore natural habitats* recognises that as Melbourne grows there is the potential for habitat loss and waterway degradation that can impact native flora and fauna.

Policy 6.5.1 *Create a network of green spaces that support biodiversity conservation and opportunities to connect with nature* recognises the importance of protecting existing green spaces and that new green spaces need to be created to improve landscape connectivity and resilience. By mapping the network of green spaces there is opportunity to identify where the network could be improved and support the development of the metropolitan urban forest strategy as identified above.

4.3.6 LIVING MELBOURNE

The *Living Melbourne: our metropolitan urban forest* policy was developed by Resilient Melbourne, hosted by the City of Melbourne as part of the Global Cities Resilience Network. Living Melbourne is a strategy for a greener, more liveable Melbourne to respond to urban challenges with nature.

The vision of Living Melbourne is that our urban forest protects human health, nurtures abundant nature, and strengthens natural infrastructure.

Victorian Government departments and local governments have endorsed the Living Melbourne policy, including City of Whitehorse.

4.3.7 PROTECTING VICTORIA'S ENVIRONMENT – BIODIVERSITY 2037

Protecting Victoria's Environment – Biodiversity 2037 is the Victorian Government's plan to stop the decline of native biodiversity and improve the natural environment.

Priorities and initiatives relevant to this assessment are:

- Increase opportunities for all Victorians to have daily connections with nature:
  - » Promote additional greening in established urban areas through broadening standards for public open-space.
- Increase opportunities for all Victorians to act to protect biodiversity:
  - » Promote programs to raise awareness to protect and care for biodiversity
  - » Implement and promote programs to increase engagement with community groups that protect biodiversity
  - » Link opportunities to connect with nature with on-the ground biodiversity management needs.
- Help to create more liveable and climate adapted communities:
  - » Implementation of Plan Melbourne.
- Deliver excellent in management of all land and waters:
  - » Better understand and respond to key threats and opportunities for biodiversity conservation (control of weeds and pest animals, fore regimes, disease, apex predators and climate change)
  - » Reduce degradation of environments through practical threat management action, informed by science
  - » Develop partnerships with public land managers and Traditional Owners in managing biodiversity.

5 Existing conditions

This section describes the existing conditions relevant to ecology and arboriculture in the Structure Plan Area.

5.1 Ecology

The Structure Plan Area encompasses approximately 315 hectares of high-density urban space. The Structure Plan Area is heavily modified from its natural state, with much of the Structure Plan Area supporting transport infrastructure, commercial areas, residential housing and open public parks and gardens.

Previous disturbance means the Structure Plan Area is cleared of almost all remnant vegetation, with a mix of planted Australian native and introduced species primarily occurring today. Previous records for threatened species and current modelled distributed of native vegetation in the 5-kilometre search area are mapped in Figure 5.1 and discussed below.

Based on an aerial photography review, there are two small and isolated waterbodies in the Structure Plan Area: one in Box Hill Gardens and another in Surrey Park. These are small scenic lakes and do not connect to adjoining rivers or waterways surrounding Box Hill.

5.1.1 NATIVE VEGETATION

Four main pre-1750 vegetation communities are modelled in and surrounding the Structure Plan Area (DEECA 2024b): Valley Grassy Forest (EVC 47); Valley Heathy Forest (EVC 127); Swampy Riparian Complex (EVC 126); and Creekline Herb-rich Woodland (EVC 164).

The current (2005) modelled vegetation layer for the Structure Plan Area showed the site has been almost exclusively cleared of remnant native vegetation (DEECA 2024b) (as shown in Figure 5.2). This was supported by a review of aerial imagery which confirmed the majority of the Structure Plan Area is heavily modified as a result of human activities, development and urbanisation. Based on current residential and commercial land use of the Structure Plan Area today, it is considered much of the vegetation identified in aerial reviews consists of non-native street plantings, rehabilitated public parks comprising indigenous and non-indigenous native plants, and well-maintained private and public gardens.

Despite the heavily modified nature of the Structure Plan Area, a small patch of Valley Grassy Forest (EVC 47) was identified in the Surrey Park public open space (DEECA 2024b) (shown in Figure 5.2). Based on the review of the predicted vegetation modelling, this EVC is limited to the scenic lake located beside the Surrey Park Aquatic Centre. Surrounding terrestrial vegetation immediately adjacent to the pond is not included in the EVC native vegetation modelling.

Based on the review of desktop information and historical aerial imagery of the isolated Surrey Park waterbody, it is considered this area may contain remnant native vegetation (DELWP 2017a). The type, extent and quality of potential vegetation in this area would require determination through a field-based ecological assessment.

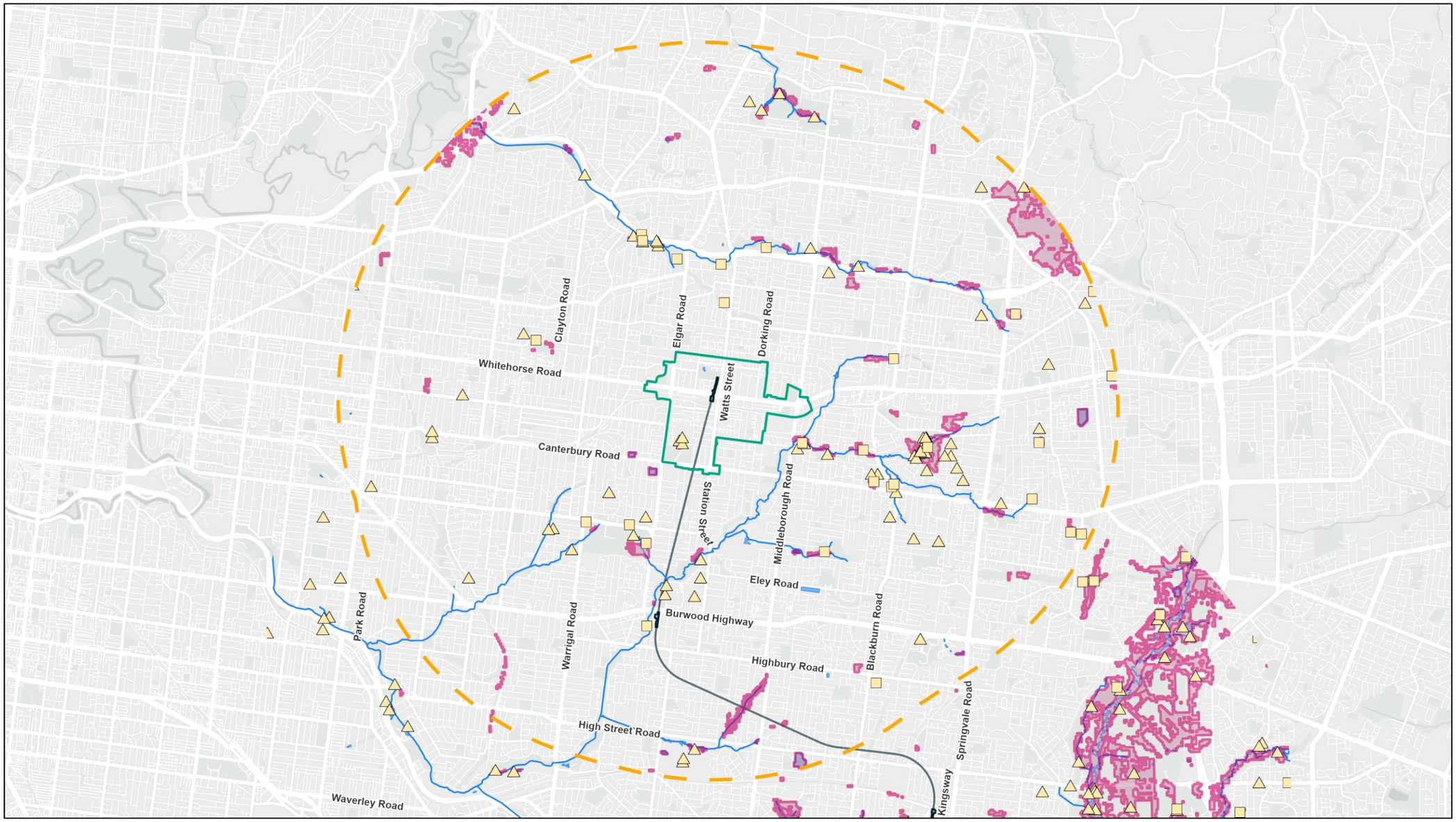

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FIGURE 5.1 SUMMARY OF ECOLOGICAL VALUES (NATIVE VEGETATION AND LISTED THREATENED SPECIES) IN 5-KM SEARCH AREA FROM THE STRUCTURE PLAN AREA

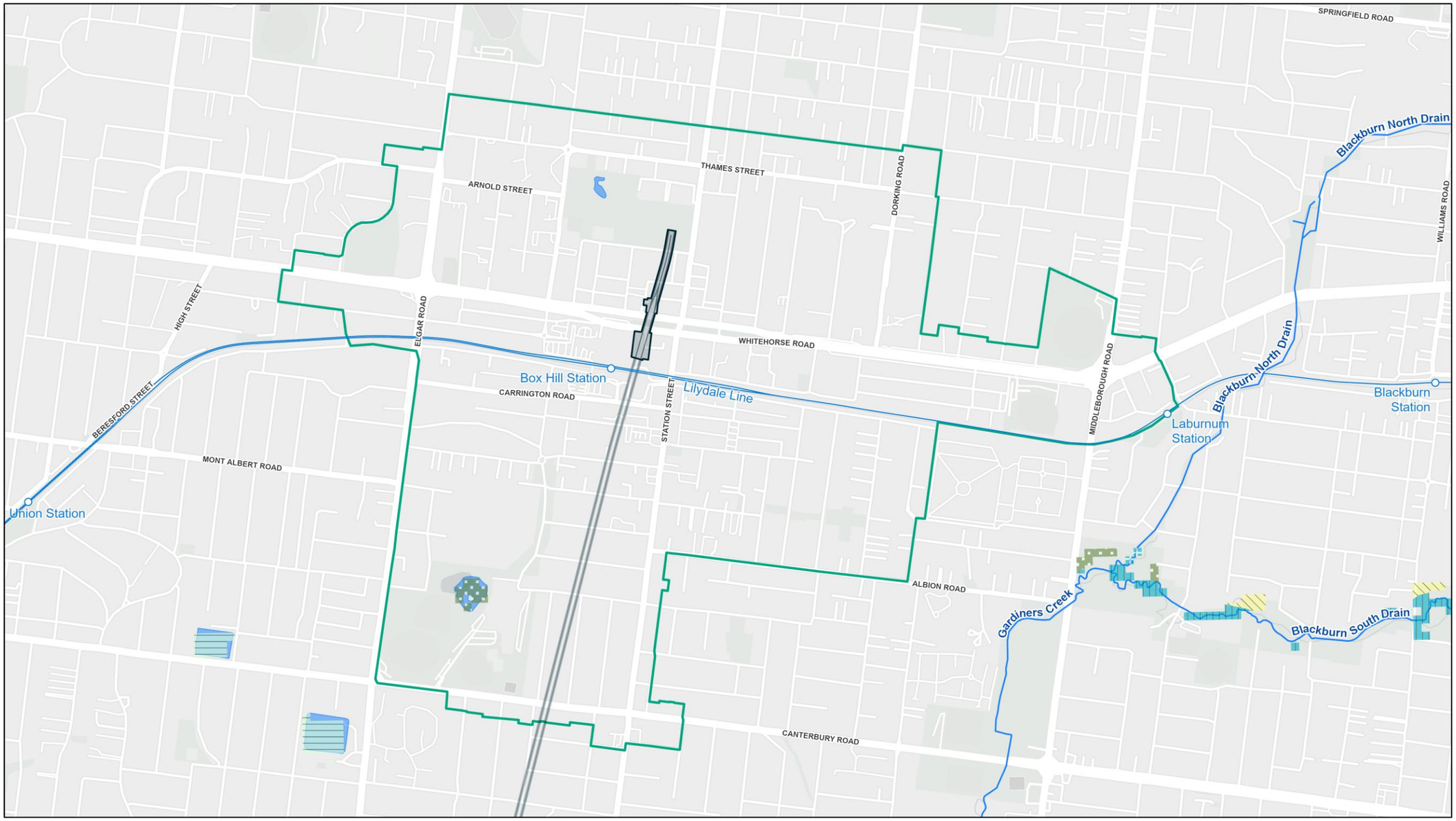

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FIGURE 5.2 MODELLED NATIVE VEGETATION IN THE STRUCTURE PLAN AREA

5.1.2 THREATENED SPECIES AND COMMUNITIES

5.1.2.1 Threatened flora

The review of the relevant databases (PMST and VBA) identified 35 listed threatened flora species, 23 of which have previously been recorded in the 5-kilometre search area. Details of the habitat requirements of each species and analysis of their likelihood of their occurrence in the Structure Plan Area is provided in Appendix B. Threatened flora previously recorded in the Structure Plan Area is mapped in Figure 5.3.

The database search identified eight threatened flora species as occurring in the last 5 years in the 5-kilometre search area. These species were: Spotted Gum (*Corymbia maculata*); Giant Honey Myrtle (*Melaleuca armillaris subsp. armillaris*); Mugga (*Eucalyptus sideroxylon subsp. sideroxylon*); Red Bloodwood (*Corymbia gummifera*); Snowy River Wattle (*Acacia boormanii*); Rock Wattle (*Acacia rupicola*); Melbourne Yellow Gum (*Eucalyptus leucoxylon subsp. connata*); and Dandenong Wattle (*Acacia stictophylla*). Despite these species records, it is considered that all threatened flora species are likely planted, given the location is outside the natural distribution of these species, in addition to the modified condition and current land use in the Structure Plan Area.

No EPBC Act or FFG Act threatened flora species are considered to have a moderate or high likelihood of occurrence in the Structure Plan Area due to previous disturbance and the lack of suitable habitat features in the Structure Plan Area.

5.1.2.2 Threatened fauna

The review of the relevant database (PMST and VBA) identified 62 threatened and/or migratory fauna species in the 5-kilometre search area, including three amphibians, 42 birds, three frogs, five fish, four invertebrates, eight mammals and four reptiles. Details of each species habitat requirements as well as an analysis of their likelihood of occurrence in the Structure Plan Area is provided in Appendix B. Of the 66 threatened fauna species considered to occur in the Structure Plan Area, 41 have previously been recorded in the 5-kilometre search area.

Previous records of threatened fauna in the Structure Plan Area are mapped in Figure 5.3.

Overall, the likelihood of occurrence analysis for fauna species identified that preferred fauna habitat is unlikely to be present for the majority of species in the Structure Plan Area. This includes those species with historical records documented in Figure 5.3.

Based on the assessment in Appendix B, two EPBC Act and/or FFG Act-listed fauna species have a moderate to high likelihood of occurring in the Structure Plan Area due to potentially suitable habitat in the Surrey Park scenic lake and surrounding planted vegetation. Of the species identified as potentially occurring, both are flying species. Fauna species considered as potentially occurring in the Structure Plan Area are listed in Table 5.1.

TABLE 5.1 LISTED THREATENED FAUNA SPECIES WITH A MODERATE TO HIGH LIKELIHOOD OF OCCURRENCE IN THE STRUCTURE PLAN AREA

SCIENTIFIC NAME	COMMON NAME	CONSERVATION STATUS		HABITAT PREFERENCE	LIKELIHOOD OF OCCURRENCE
		EPBC ACT	FFG ACT		
Callocephalon fimbriatum	Gang-gang Cockatoo	EN		During summer, the Gang-gang Cockatoo is found in tall mountain forests and woodlands, with dense shrubby understoreys. In winter, Gang-gangs will move to lower altitudes into drier, more open	Moderate

SCIENTIFIC NAME	COMMON NAME	CONSERVATION STATUS		HABITAT PREFERENCE	LIKELIHOOD OF OCCURRENCE
		EPBC ACT	FFG ACT		
				forests and woodlands. At this time, they may be seen by roadsides and in parks and gardens of urban areas. They require tall trees for nest hollows.	
Pteropus poliocephalus	Grey-headed Flying-fox	VU	VU	Requires foraging resources and roosting sites. The primary food source is blossom from Eucalyptus and related genera but commonly forages on fruit trees in urban areas. Two known Flying Fox camps occur in the greater Melbourne region including one at Yarra Bend and one at Doveton.	Moderate

Legend CR = critically endangered, EN = endangered, VU = vulnerable

Results of the ecology assessment identified the potential presence of two threatened fauna species in Structure Plan Area: Gang-gang Cockatoo and Grey-headed Flying-fox (Appendix B). Although the majority of threatened fauna records are confined to the intact woodland in surrounding environments along Gardiners Creek, Wattle Park and Blackburn, Gang-gang Cockatoo and Grey-headed Flying-fox can also use street trees and planted areas of vegetation for foraging, resting and occasional breeding. Given an aerial review of the Structure Plan Area, it is considered these fauna species may temporarily fly over or rest in planted trees throughout the Structure Plan Area. It is not considered there is any significant habitat in the Structure Plan Area that would encourage or provide long-term breeding and/or refuge for threatened species.

Despite the presence of two waterbodies in the Structure Plan Area, it is unlikely that threatened aquatic birds, frogs and fish listed in Appendix B and documented in Figure 5.3 occur within or use the isolated and degraded aquatic habitat. Given the lack of suitable habitat features and great separation of the Structure Plan Area from suitable waterbody habitat in the Orchard Grove Reserve and the Blackburn Lake Sanctuary (approximately 3 kilometres east of the Structure Plan Area) it is considered that waterbodies in the Structure Plan Area are unlikely to provide permanent or long-term habitat for threatened waterbirds.

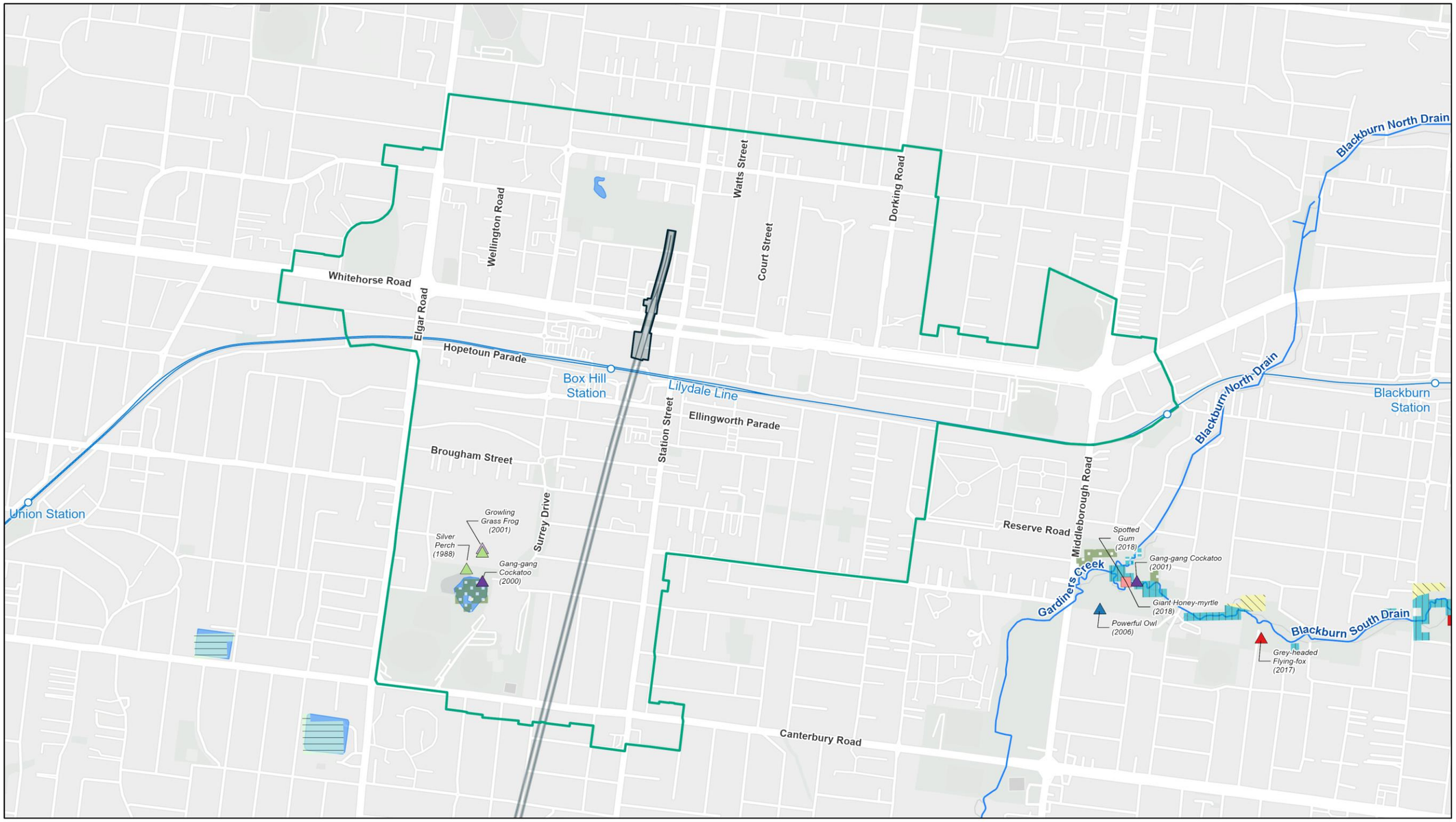

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FIGURE 5.3 THREATENED FLORA AND FAUNA RECORDS IN THE STRUCTURE PLAN AREA

5.1.2.3 Threatened ecological communities

EPBC Act-listed ecological communities

Two EPBC Act-listed threatened ecological communities were listed in the PMST as known or likely to occur in the 5-kilometre search area (DCCEEW 2024a): Natural Damp Grassland of the Victorian Volcanic Coastal Plains; and White Box-Yellow Box Blakely's Red Gum Grassy Woodland and Derived Native Grassland. An assessment against the listing criteria for each EPBC Act-listed threatened ecological community is provided in Table 5.2.

TABLE 5.2 ASSESSMENT OF LIKELIHOOD OF OCCURRENCE OF EPBC ACT-LISTED THREATENED ECOLOGICAL COMMUNITIES IN STRUCTURE PLAN AREA

EPBC ACT-LISTED ECOLOGICAL COMMUNITY	LIKELIHOOD OF OCCURRENCE IN STRUCTURE PLAN AREA
Natural Damp Grassland of the Victorian Volcanic Coastal Plains – listed as Critically Endangered	This community is characterised by a native grassland ranging to an open grassy woodland on seasonally damp waterlogged soils. This community is dominated by a ground layer comprising native tussock species and herbaceous flora, with a sparse presence of trees and shrubs (DSE 2015). The desktop and aerial review of the Structure Plan Area suggests the site does not support any areas of native grassland or woodland, because much of the ground layer has been entirely cleared of native vegetation and replaced by infrastructure. Areas where vegetation exists is primarily comprised of slashed fields and parks, likely dominated by introduced grasses. As no suitable habitat features or diagnostic characteristics were noted during the desktop assessment, **it is considered this community is unlikely to occur in the Structure Plan Area.**
White Box-Yellow Box Blakely's Red Gum Grassy Woodland and Derived Native Grassland – listed as Critically Endangered	This community is characterised by a species-rich understorey of native tussock grasses, herbs and scattered shrubs, and dominance of White Box, Yellow Box or Blakely's Red Gum trees (TSSC 2016). While the desktop review noted one record of Blakely's Red Gum in the 5-km search area, the singular record is dated 1997 and suggests that the individual was likely planted. Similarly, many recent records of Yellow Box trees occur in the 5-km search area. Given the location and long-term modification of the Structure Plan Area in metropolitan Melbourne, it is considered that these records are likely planted trees and therefore not considered to form part of this community. Given the lack of historical species records, the lack of suitable modelled vegetation and the current site condition, **it is considered this community is unlikely to occur in the Structure Plan Area.**

FFG Act-listed ecological communities

Based on the heavily modified site condition and lack of modelled native vegetation within and surrounding Box Hill, it is considered unlikely that any FFG Act-listed ecological communities occur in the Structure Plan Area.

5.1.3 PREVIOUS REPORTS

Previous ecological field assessments limited to discrete locations in the Structure Plan Area determined it features a highly built-up environment comprising heavily modified streetscapes, commercial and residential properties, hard concreted surfaces and carparking infrastructure. While the Structure Plan Area includes many open grassy fields and parks primarily used for recreation and sporting activities, vegetation is primarily characterised by a mix of native and non-native planted amenity trees and non-native garden beds.

Commonly planted specimens in the Structure Plan Area include Brush Box (*Lophostemon confertus*), London Plane (*Lophostemon confertus*), English Oak (*Quercus robur*) and Callery Pear (*Pyrus calleryana*), all of which are considered to provide occasional and opportunistic feeding resources for common fauna species and threatened fauna including the Grey-headed Flying Fox and Swift Parrot (AJM-JV 2021a: AJM-JV 2021b).

Native vegetation recorded and mapped from previous ecological field assessments is limited to the occurrence of two small scattered native trees located outside the rail corridor to the west of the Structure Plan Area: Manna Gum (*Eucalyptus viminalis*); and Mealy Stringybark (*Eucalyptus cephalocarpa s.s*.) have been mapped and included in Figure 5.4. No other areas in the Structure Plan Area for previous assessments were considered to support native vegetation assessable under the *Guidelines for the removal, destruction or lopping of native vegetation* (DELWP 2017a).

While one groundwater dependent ecosystem was identified in Box Hill Gardens, the site is considered to support minimal ecological values based on the lack of remnant native vegetation and current land use (AJM-JV 2021a).

All ecological assessments that have considered the area covering Structure Plan Area determined that no EPBC Act MNES or FFG Act threatened species have a high likelihood of occurrence, so development in the Structure Plan Area is unlikely to impact listed matters.

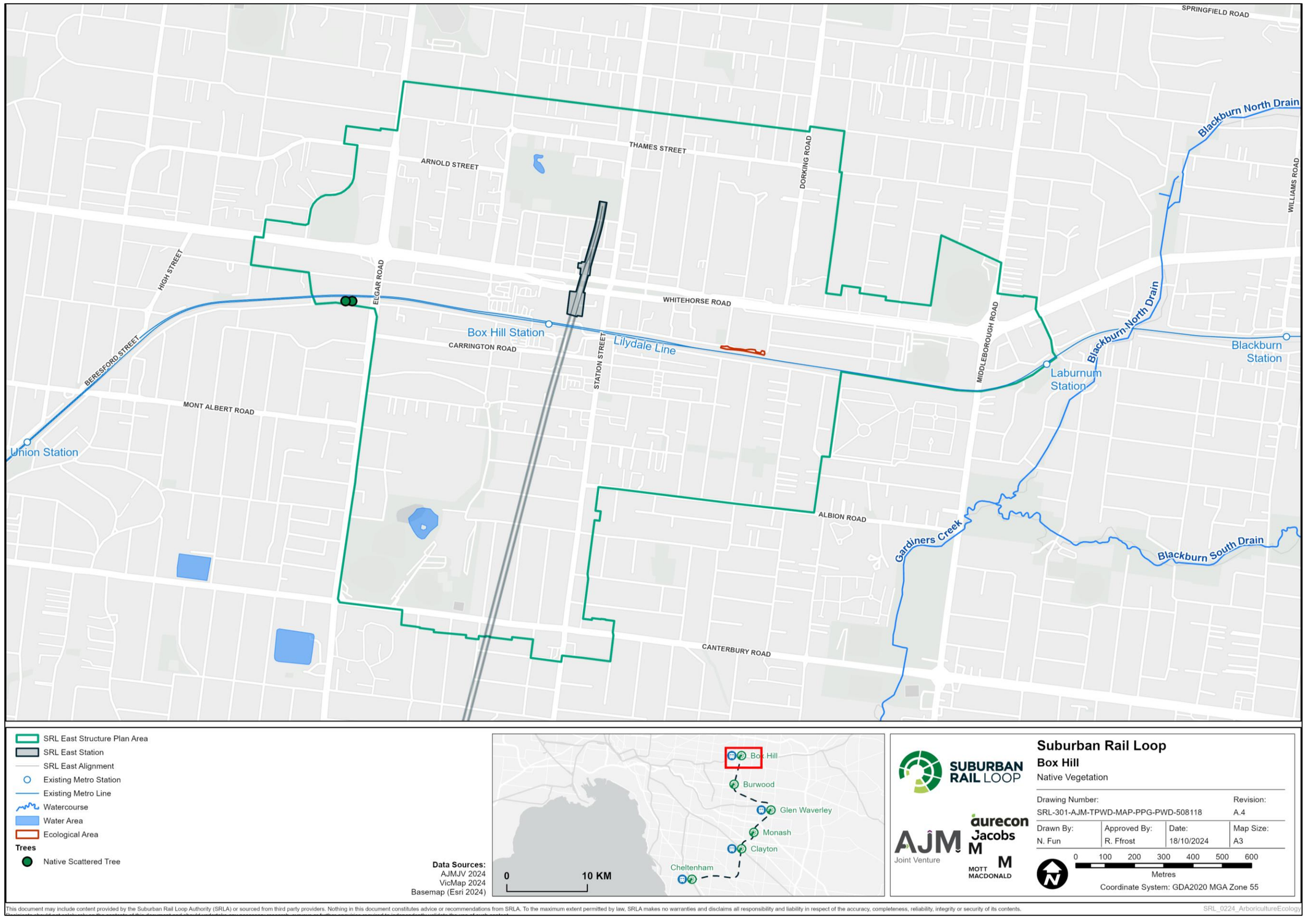


FIGURE 5.4 NATIVE VEGETATION PREVIOUSLY RECORDED IN THE STRUCTURE PLAN AREA

5.1.4 PLANNING ZONES AND OVERLAYS

A review of the database records identified in Figure 5.2 and Figure 5.3 against planning scheme zones and overlays was completed to determine whether previously recorded ecological values are protected by local planning controls. This review is separate from the likelihood of occurrence assessment of threatened species and communities in Section 5.1.2.

Table 5.3 identifies the planning scheme zone and overlays that affect the land containing modelled native vegetation and threatened species and communities in the Structure Plan Area.

TABLE 5.3 PLANNING ZONE AND OVERLAYS FOR LAND WITH MODELLED NATIVE VEGETATION AND THREATENED SPECIES AND COMMUNITIES IN THE STRUCTURE PLAN AREA

MODELLED NATIVE VEGETATION AND THREATENED SPECIES AND COMMUNITIES	ADDRESS / NAME / OWNERSHIP	PLANNING ZONE	ENVIRONMENT AND LANDSCAPE PLANNING OVERLAYS
Valley Grassy Forest (EVC 47) native vegetation	354 Elgar Road, Box Hill Surrey Park	Public Park and Recreation	N/A
Gang-gang Cockatoo	354 Elgar Road, Box Hill Surrey Park	Public Park and Recreation	N/A

Table 5.3 confirms the modelled native vegetation area and threatened species and communities are not affected by environment or landscape planning overlays that could otherwise afford vegetation/tree removal protection. It is common for land located in a Public Park and Recreation Zone (PPRZ) to not be affected by such overlays due to the 'public' purpose of the zone. As outlined in Section 4.3.1.4.1, Clause 52.17 is also a planning tool for protection of native vegetation.

Land ownership details are not known at the time of this assessment.

5.2 Arboriculture

The Structure Plan Area includes extensive areas of well-treed residential precincts, surrounding the Box Hill Central Activity Centre along Whitehorse Road and surrounding the existing Box Hill Station.

5.2.1 CANOPY COVER

The Structure Plan Area supports 435,420 m^2 of tree canopy, which equates to 15 per cent tree canopy cover, less than the 18 per cent canopy cover for the municipality cited in the *Whitehorse Urban Forest Strategy 2021–2031* (measured in 2018). The existing tree canopy of the Structure Plan Area is shown at Figure 5.5.

A comparison of land in the Structure Plan Area that is broadly zoned for residential use against land zoned for commercial and industrial use reveals that residential properties and streetscapes support over three times more canopy. Land zoned as residential supports 16 per cent of canopy compared with just 4.5 per cent of commercial and industrial land. Other land uses in the Structure Plan Area including parks and gardens, schools, cemeteries and land in the road zone support slightly over 18 per cent canopy cover.

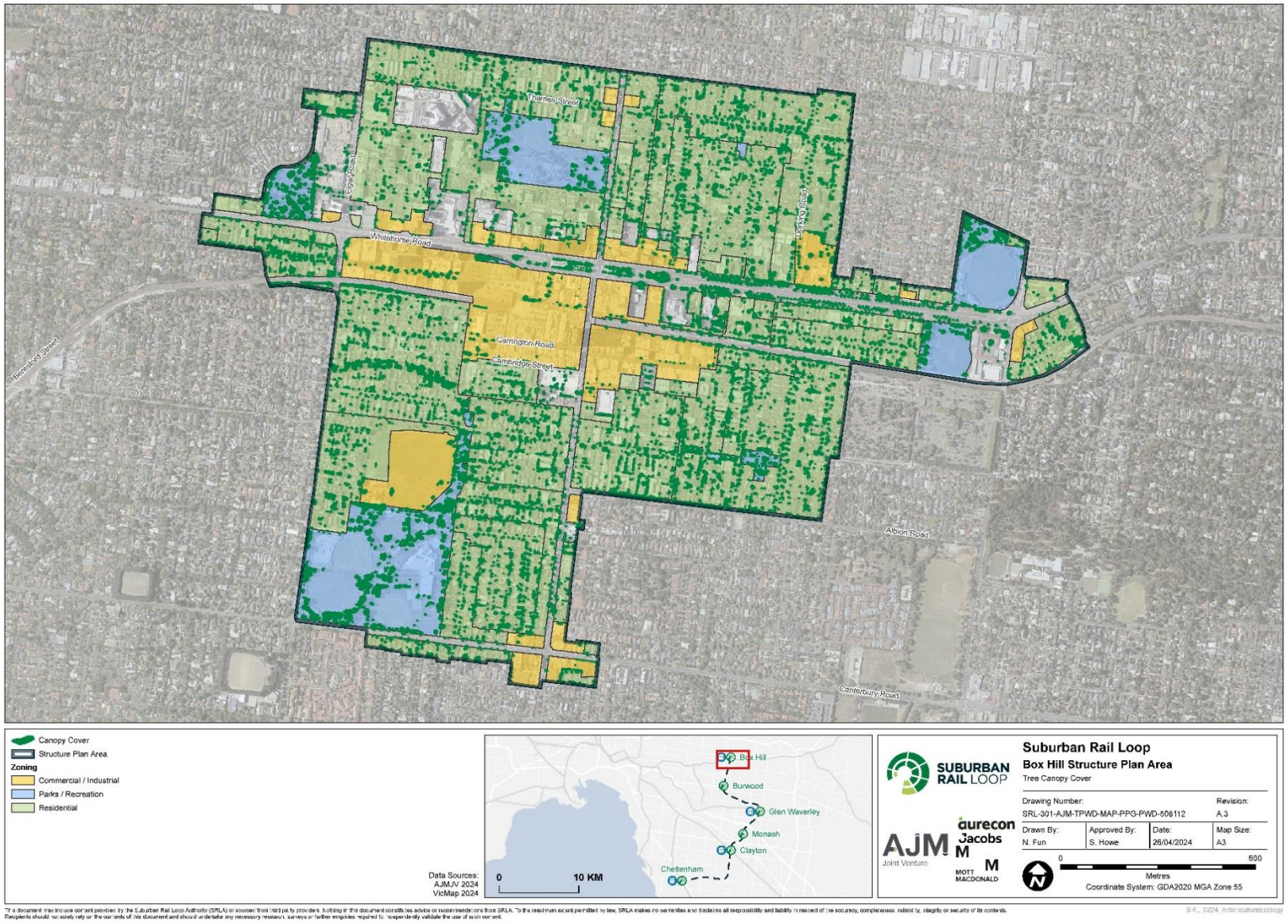


FIGURE 5.5 TREE CANOPY COVER IN STRUCTURE PLAN AREA

5.2.2 IDENTIFICATION OF SIGNIFICANT TREES

Twenty-three parcels of land in the Structure Plan Area are subject to a VPO and contain a tree (or trees) considered significant under the Whitehorse Planning Scheme:

- Eight sites are subject to VPO1
- 14 sites are subject to VPO3
- One site is subject to VPO5.

Three separate significant tree studies were undertaken by the City of Whitehorse in 2005, 2006 and 2016 and provide the evidence to support the application of these VPOs. The locations of the land parcels subject to the VPO is shown at Figure 5.6, with significant trees listed in Table 5.4.

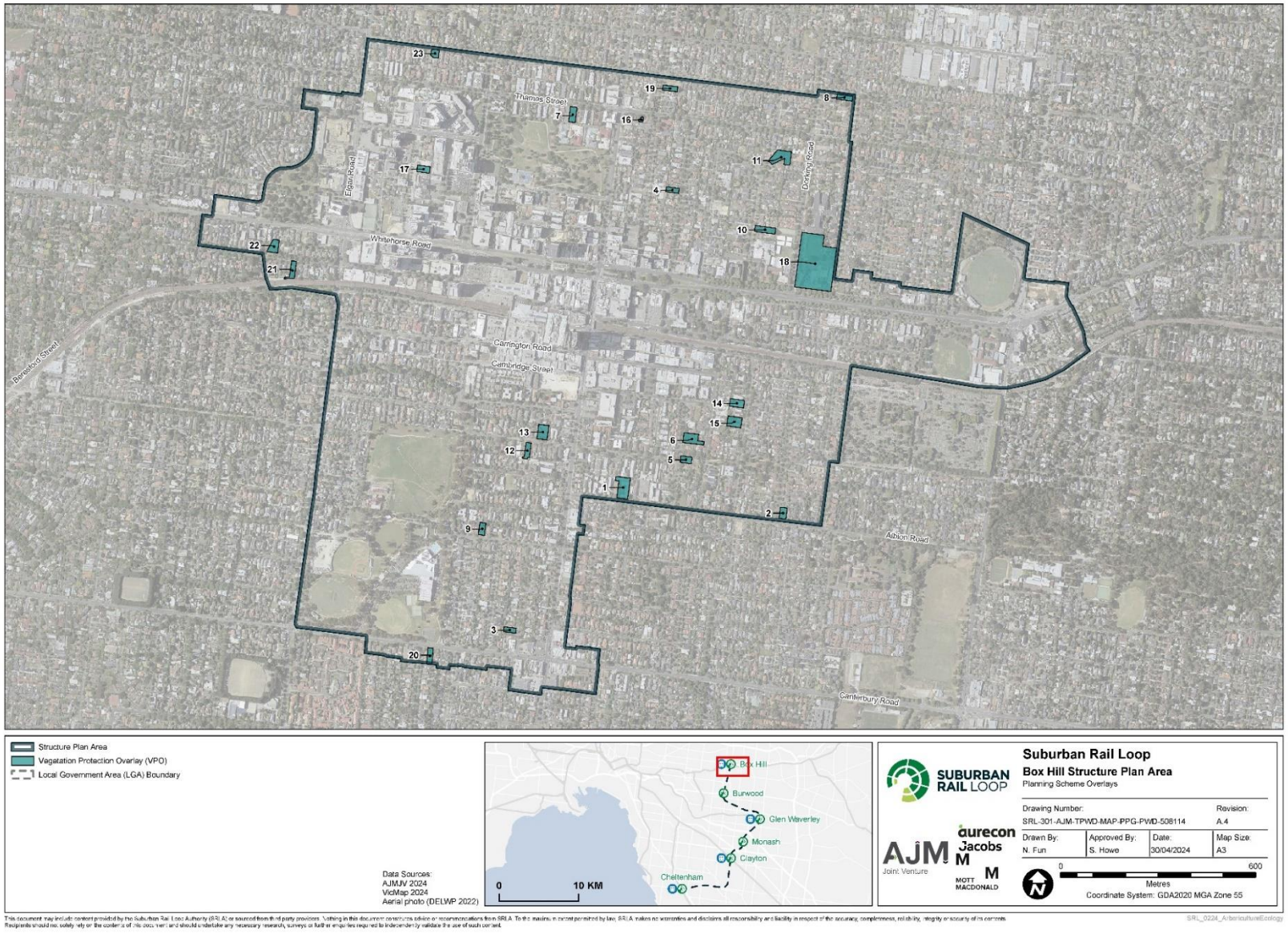


FIGURE 5.6 SITES SUBJECT TO THE VPO IN THE STRUCTURE PLAN AREA

TABLE 5.4 SIGNIFICANT TREES IN THE STRUCTURE PLAN AREA SUBJECT TO THE VPO

SCHEDULE	MAP ID	TAXON	COMMON NAME	NOTES	ADDRESS
VPO1	1	*Eucalyptus viminalis*	Manna Gum		23-25 ALBION ROAD BOX HILL 3128
VPO1	2	*Eucalyptus sideroxylon*	Red Ironbark		73 ALBION ROAD BOX HILL 3128
VPO1	3	*Quercus palustris*	Pin Oak		9 BASS STREET BOX HILL 3128
VPO1	4	*Quercus robur*	English Oak		25 COURT STREET BOX HILL 3128
VPO1	5	*Magnolia grandiflora*	Bull Bay Magnolia		18 GLENMORE STREET BOX HILL 3128
VPO1	6	*Corymbia maculata*	Spotted Gum		24 GLENMORE STREET BOX HILL 3128
VPO1	7	*Ulmus procera*	English Elm		75 THAMES STREET BOX HILL 3128
VPO1	8	*Eucalyptus melliodora*	Yellow Box		15 REGAN STREET BOX HILL NORTH 3129
VPO3	9	*Eucalyptus melliodora*	Yellow Box		22 ALEXANDER STREET BOX HILL 3128
VPO3	10	*Corymbia maculata*	Spotted Gum	Two specimens	12 GRAHAM PLACE BOX HILL 3128
VPO3	11	*Unknown*	Exotic Tree		36 GRAHAM PLACE BOX HILL 3128
VPO3	12	*Ulmus glabra 'Camperdownii'*	Weeping Elm		15 HOWARD STREET BOX HILL 3128
VPO3	13	*Eucalyptus saligna*	Sydney Blue Gum		8-10 HOWARD STREET BOX HILL 3128
VPO3	14	*Eucalyptus melliodora*	Yellow Box	Two specimens	37-39 ROSE STREET BOX HILL 3128
VPO3	15	*Quercus robur*	English Oak		31 ROSE STREET BOX HILL 3128
VPO3	16	*Quercus cerris*	Turkey Oak		51 WATTS STREET BOX HILL 3128
VPO3	17	*Eucalyptus sideroxylon*	Red Ironbark		26 WELLINGTON ROAD BOX HILL 3128
VPO3	18	*Ficus macrophylla*	Moreton Bay Fig		1087 WHITEHORSE ROAD BOX HILL 3128
VPO3	19	*Quercus palustris*	Pin Oak		66 WATTS STREET BOX HILL NORTH 3129
VPO3	20	*Quercus sp.*	Oak		822 CANTERBURY ROAD BOX HILL SOUTH 3128
VPO3	21	*Quercus robur*	English Oak		56 ZETLAND ROAD MONT ALBERT 3127
VPO3	22	*Corymbia citriodora*	Lemon-scented Gum	Two specimens	51 ZETLAND ROAD MONT ALBERT 3127
VPO5	23	*Corymbia citriodora*	Lemon-scented Gum		103 SEVERN STREET BOX HILL NORTH 3129

5.2.3 NEIGHBOURHOOD CHARACTER AREAS

All land zoned for residential purposes in the Structure Plan Area is subject to protection under the interim SLO9 (Neighbourhood Character Areas). The extent of SLO9 is shown in Figure 5.7.

SLO9 is a broad-scale control that seeks to retain and enhance the canopy tree cover of the Garden and Bush Suburban Neighbourhood Character Areas by providing blanket protection to trees on private land over a certain size threshold to maintain the overall leafy garden and bushy character of the City of Whitehorse.

5.2.4 OTHER NOTABLE AVENUE PLANTATIONS/PARKS AND GARDENS

In addition to trees in SLO9 land, notable and mature tree plantings are noted in the following locations, located on public land:

- Box Hill Gardens – a formal garden featuring predominantly exotic trees, many of which date from the late 19th century, including several notable and mature examples of Oak (*Quercus robur, Q. canariensis* and hybrids of these). The eastern portion of the gardens is located in the Structure Plan Area

- Surrey Park, Box Hill – extensive parklands around playing fields and the Aqualink Box Hill recreational facility, the parklands contain extensive plantings of indigenous and Australian native Eucalypts (*Eucalyptus* sp)

- Surrey Drive, Box Hill – located between residential properties to the east and the *Former Standard Brickworks* site to the west (HO3), Surrey Drive extends northwards from Surrey Park and features a broad road reserve planted with a range of mature Eucalypts, including some notably large Sugar Gums (*E. cladocalyx*)

- Whitehorse Road service roads and the central median between Middleborough Road and Nelson Road, Box Hill – Whitehorse Road is well treed with a formal avenue of mature London Planes (*Platanus ×acerifolia*) and Brush Box (*Lophostemon confertus*) between Middleborough Road to Box Hill Town Hall. As the road reserve widens further to the west, the central median features mature plantings of Lemon-scented Gum (*Corymbia citriodora*), English Oak (*Quercus robur*) and English Elms (*Ulmus procera*)

- Bolton Park, Box Hill – located to the north of Box Hill City Oval, Bolton Park features numerous mature, locally indigenous and Australian Eucalypts planted in groups and as lawn specimens throughout the parkland

- Kingsley Gardens, Mont Albert – Kingsley Gardens features well established perimeter plantings of Eucalypts, with a predominantly exotic landscape character in the central and Whitehorse Road sections, comprised of mature broadleaf and coniferous.

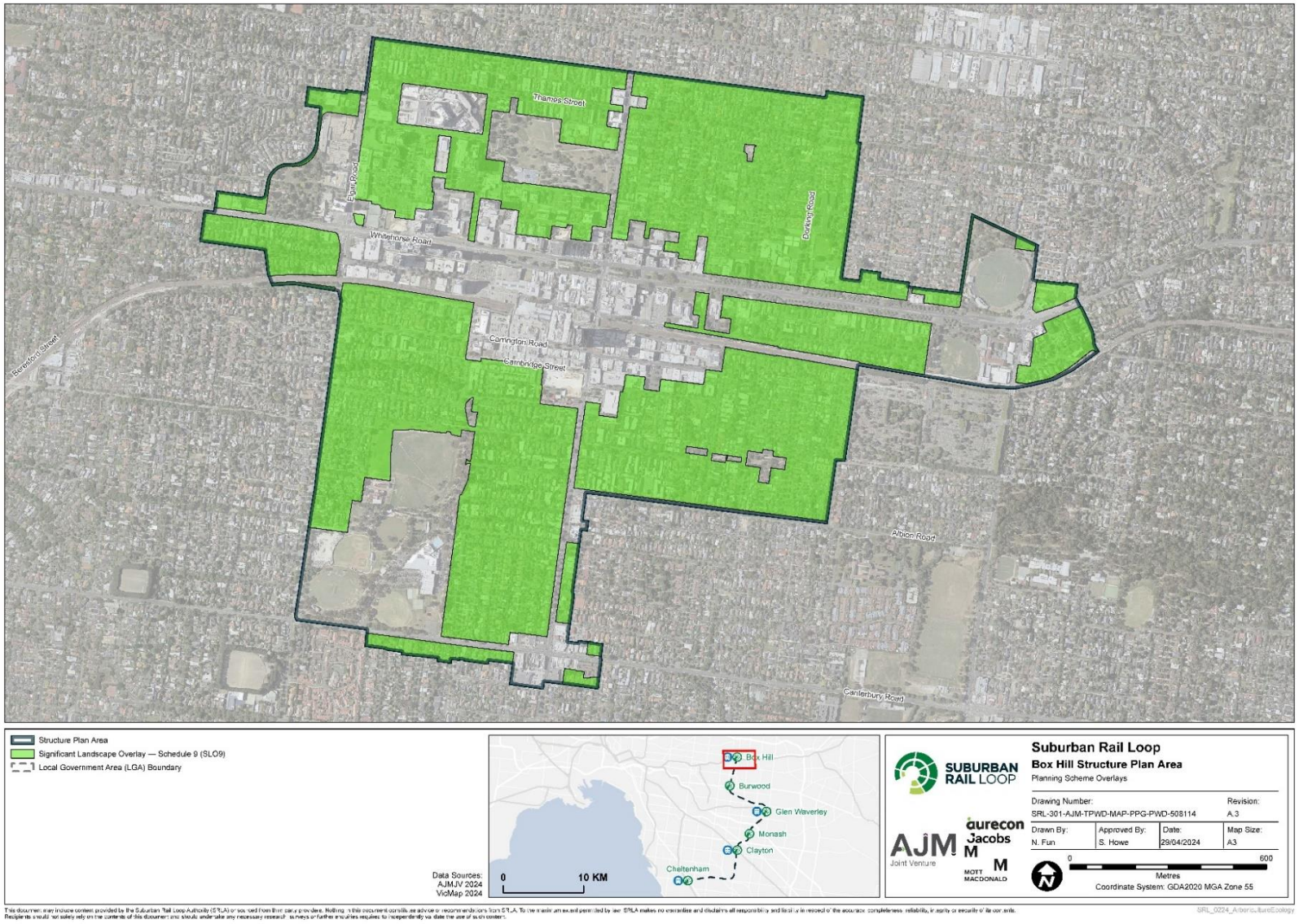


FIGURE 5.7 LAND SUBJECT TO SLO9 IN THE STRUCTURE PLAN AREA

5.3 Committed projects

Initial and early works that were subject to SRL East approved rail scope have removed trees, and further tree removals have been undertaken as part of the main works associated with the construction of the Box Hill Station.

Environmental Performance Requirements (EPRs) developed for SRL East include provisions for the protection of trees proposed (EPR AR3), as well as implementation of a Tree Canopy Replacement Plan to mitigate against loss of canopy cover (EPR AR4).

In recognition that SRL East will require some tree removal and subsequent loss of canopy cover, EPR AR4 requires that double the amount of tree canopy cover (m^2) removed in each local government area is replaced by 2050. The Tree Canopy Replacement Plan has been developed in consultation with municipal and other land managers and prioritises tree planting on Project Land to provide canopy cover for pedestrian and hard paved areas.

6 Findings

This section sets out the results relating to ecology and arboriculture that impact land use planning and development in the Structure Plan Area as follows:

- A summary of the issues for improving ecology and potential opportunities are listed in Section 6.1
- A summary of the issues for arboriculture and potential opportunities are listed in Section 6.2.

6.1 Ecology

The Structure Plan Area is a heavily modified environment, distinguished by infrastructure, housing and recreational parks. The Structure Plan Area is unlikely to contain or support areas of significant habitat for EPBC Act and FFG Act-listed threatened species or threatened ecological communities.

The Structure Plan Area does not contain any connected habitat corridors or linked habitat to and from adjacent landscapes to encourage the movement and dispersal of threatened native fauna identified in the desktop assessment into the Structure Plan Area.

While development in the Structure Plan Area would present low risk of impacts to ecological values, there are opportunities to enhance ecological values and overall biodiversity in existing and new open spaces.

6.1.1 ISSUES

The Structure Plan Area contains extensive areas of planted vegetation comprising a mix of native, non-indigenous and introduced flora. Significant urban pressures present several challenges for the improvement of biodiversity and habitat, including:

- Limited space for existing natural environments, with population pressures and development reducing the availability and quality of open space for biodiversity to thrive long term, with larger open spaces prioritised for community and recreation.
- Heavy reliance on motor vehicles increasing the risk of road kill and injury to wildlife, and limiting opportunities for wildlife corridors.
- Dominance of non-native and/or European street trees that do not provide adequate foraging resources for Australian native wildlife including pollinators.
- Lack of large mature trees for breeding, habitat and refuge that are decreasing over time due to public safety risk and increased development from rezoning of the Structure Plan Area, which may impact on local council policies to protect existing tree canopy cover and biodiversity and impact the ability to further increase biodiversity and create habitat corridors.
- Ground cover primarily paved with impervious surfaces, comprising non-native plantings and/or extensive areas supporting mown grass that provides no ecological value for biodiversity.
- Limited tree canopy cover connectivity, particularly native Victorian or Australian species, and very limited or no understorey habitat.

- Limited state or local planning controls exist to protect open spaces that may be enhanced for biodiversity values and connectivity.

- Further loss of trees, green spaces and biodiversity through rezoning residential land to commercial or industrial land may negatively impact council goals and objectives to increase biodiversity and native tree canopy cover and state government objectives to enhance and connect green and open spaces in urban areas. Particularly the biodiversity goals and objectives outlined in the *Whitehorse Urban Biodiversity Strategy.*

- There is the potential that future development within the Structure Plan Area will conflict with the City of *Whitehorse Urban Biodiversity Strategy* that aims to conserve and maintain biodiversity habitat.

6.1.2 OPPORTUNITIES

While the findings of the existing conditions assessment noted the limited amount of native vegetation, flora and fauna, the assessment noted opportunities to enhance biodiversity in the Structure Plan Area include:

- Existing public open spaces provide opportunities to meet Whitehorse and State Government policy to increase biodiversity and the community's connection with nature through increasing the cover of native vegetation, including native canopy trees and native understorey to provide habitat for biodiversity.

- Proposed new open spaces recommended for the Structure Plan Area, provide an opportunity to increase the cover and abundance of native trees and understorey.

- Opportunity to support the *Whitehorse Urban Biodiversity Strategy* to link new and potential open spaces through habitat corridors within the Structure Plan Area. This should include private properties that occur between open spaces.

- Existing waterbodies could be identified to improve biodiversity and native vegetation through increasing native vegetation and wetland habitat features.

- While not in the Structure Plan Area, Gardiners Creek provides the most significant habitat corridor in the landscape. Habitat corridors within the Structure Plan Area could be aligned to the direction of Gardiners Creek. There is an opportunity to support City of Whitehorse and Melbourne Water with the naturalisation of Gardiners Creek within close proximity to the Structure Plan Area.

6.2 Arboriculture

The Structure Plan Area comprises substantial residential areas that along with parks, gardens and schools support the greater proportion of trees and canopy cover. In contrast, commercial and industrial land is comparatively sparsely treed.

Substantial tree cover in residential precincts is protected by the interim SLO9, that recognises the importance of trees in contributing to the Garden Suburban and Bush Suburban neighbourhood character. This is further reinforced by local policies in the Planning Policy Framework. SLO9 does not apply to commercial or industrial land in the Structure Plan Area.

Individually significant trees in the Structure Plan Area are protected by the VPO.

Trees on Council-managed land, including parks and gardens and public roads are managed in accordance with the *City of Whitehorse Interim Urban Forest Policy and Tree Management Plan*. While SLO9 also covers

many local roads, removal of trees on public land or in the road reserve does not require a permit when removed by, or on behalf of, the Council.

Public open space is not covered by landscape or environment planning overlays in the Structure Plan Area. However, it is noted this is common practice throughout metropolitan Melbourne due to the public purpose of the PPRZ.

6.2.1 ISSUES

Potential impacts to trees and canopy cover from development in the Structure Plan Area include:

- Loss of individually-listed significant trees listed in the VPO
- Loss of urban tree canopy with the re-zoning of residential land to commercial or industrial uses, and the intensification of land use and change in building typology for residential land (such as multi-unit developments replacing multiple single dwelling lots and commensurate loss of trees)
- Impacts to street trees and loss of canopy cover due to activities such as reconfigured road networks, infrastructure upgrades and parcel access.

Intensification of development will likely require the removal of SLO9 where intensity of development will fundamentally change the treed landscape character protected by the control and there may be conflicts between the landscape character objectives of SLO9 and the required growth outcomes of the Structure Plan.

While development will unlikely change public parks and other land uses such as schools that support higher canopy cover, Council-managed trees in streetscapes may be directly at risk from works such as changes to road functional layouts and vehicle crossings, and indirectly from construction activities on private land.

The potential overall loss of trees in the private and public realms will place additional challenges in achieving the City of Whitehorse tree canopy target of 27 per cent by 2031, and 30 per cent by 2050.

6.2.2 OPPORTUNITIES

Opportunities to protect and enhance the tree canopy and urban forest in the Structure Plan Area include:

- Consider green infrastructure, green roofs and canopy trees in private open space (where possible) and water sensitive urban design (WSUD) to support new tree growth and biophilic design in new development
- Provide for enhanced growing conditions (such as structured soils and WSUD) for trees on public land to be implemented as part of new development
- Support implementation of municipal street and public open space planting strategies that seek to increase urban tree canopy cover to improve the overall amenity and environmental values, and to increase species diversity in tree and plant selection to improve resilience, especially in consideration of climate change.

With loss of trees on private property, especially on residential land where the building typology may change from single dwelling to multi-unit development, there will be an increased reliance on trees in the public realm to support urban tree canopy targets. Measures to enhance public tree planting conditions, in addition to planting more trees in the public realm, will assist in compensating for loss of canopy cover on private land.

7 Recommendations

Recommendations for enhancing ecology and arboricultural values when developing the Box Hill Structure Plan are set out below. Recommendations include those to be considered in the structure planning process (Section 7.1) and other opportunities to be considered within the Structure Plan Area (Section 7.2).

7.1 Structure planning

1. Promote the concept of habitat corridors to link new and existing open spaces within the Structure Plan Area to support Victorian Government's Plan Melbourne 2017-2050: *Direction 6.5 and Policy 6.5.1* and City of Whitehorse Urban Biodiversity Strategy. It is recommended that habitat corridors consider the surrounding environment, including habitat toward Gardiners Creek within the Structure Plan Area. Habitat corridors require the support of private landholders and public land managers to include private land and associated streetscapes.

    a. As depicted in Figure 7.1 below, the proposed habitat corridors have been developed based on a logical path that incorporates areas of existing and proposed open spaces, remnant vegetation and habitat corridors in proximity to the Structure Plan Area.

    b. It is recommended that the habitat corridors are enhanced for biodiversity through the planting of native trees, particularly flowering natives, and understorey that provides a diversity of flowering plants at a variety of heights.

2. Explore opportunities with City of Whitehorse and Melbourne Water to protect, expand and restore the creek naturalisation of Gardiners Creek to extend habitat corridors between Blacks Walk Reserve and open public spaces within the Structure Plan Area. Gardiners Creek is the most significant habitat corridor in the landscape and this measure would support the City of Whitehorse Urban Biodiversity Strategy.

3. Existing and proposed open green spaces are recommended to be enhanced with native plantings (particularly flowering trees and a diversity of nectivorous species) to support *Direction 6.4* of Plan Melbourne 2017-2050 City of Whitehorse Urban Biodiversity Strategy and Urban Forest Policy, to increase biodiversity and provide cooler and greener urban forests. Refer to Table 7.1 that includes and summarises potential activities in new and existing open spaces.

    a. Native plant selection in these areas should consider and prioritise drought-tolerant, long-lived and flowering species for their biodiversity values.

4. Align activities with *Whitehorse Urban Biodiversity Strategy* initiatives (i.e. tree planting, bushland regeneration and development of biodiversity corridors) and work with the City of Whitehorse to improve open space, streetscapes and community areas, including with a tree planting program to improve canopy cover and planting that links habitat between open spaces enhanced for biodiversity, as well as ensuring a diversity of tree species selected for climate change resilience.

5. As per the City of Whitehorse Biodiversity Principles and Objectives "*increase the focus of replenishing and supplementing indigenous plantings"*, it is recommended to enhance proposed and existing open spaces (see locations identified in Figure 7.1) with indigenous plantings and revegetate understorey ground layer with flowering native species to promote native wildlife. Table 7.1 lists recommendations

for biodiversity improvements to the open space network, including selecting native plant species that are drought-tolerant, long-lived and flowering with various heigh structures.

TABLE 7.1 RECOMMENDATIONS FOR BIODIVERSITY IN PUBLIC OPEN SPACE

LOCATION	STATUS	PROPOSED CLASSIFICATION AND APPROX. SIZE	RECOMMENDATION FOR BIODIVERSITY IMPROVEMENTS
Surrey Park	Existing open space	Function: Sports Park Size: 160,910 m^2	• Retain all trees in the open space. • Revegetate Surrey Park Lake to provide greater habitat for common avifauna and frogs (floating wetlands). • Include additional plantings of native trees that provide nectar resources for birds. • Revegetate understorey flowering vegetation for pollinators that replace non-native lawn. • Add fauna nest boxes where possible.
Box Hill Gardens	Existing open space	Function: Community Park Size: 67,073 m^2	• Retain all trees in the open space. • Revegetate the Scenic Pond with surrounding understorey wetland plants that provide habitat for common avifauna and frogs. • Include additional plantings of native trees that provide nectar resources for birds. • Revegetate understorey flowering vegetation for pollinators that replaces non-native lawn. • Add fauna nest boxes.
Kingsley Gardens	Existing open space	Function: Sports Park Size: 24,781 m^2	• Retain all trees in the open space. • Include additional plantings of native trees that provide nectar resources for birds. • Revegetate understorey flowering vegetation for pollinators that replaces non-native lawn. • Add fauna nest boxes.
Brougham Street Reserve	Proposed (enhanced open space)	Function: Community Park Size: 1554 m^2	• Include plantings of native trees that provide nectar resources for birds, and understorey flowering vegetation for pollinators. • Revegetate site to consider and include patches of diverse native plantings.
Surrey Drive Reserve	Proposed (enhanced open space)	Function: Linear Park Size: 1974 m^2	• Include plantings of native trees that provide nectar resources for birds, and understorey flowering vegetation for pollinators. • Revegetation site to consider and include patches of diverse native plantings.
Court St and Watt St, Box Hill (offset)	Future opportunity (temporary open space to be made permanent)	Function: Neighbourhood park. Size: 2750 m^2 – size is fixed.	• If the future opportunity is realised, include plantings of native trees that provide nectar resources and consider inclusion of areas of diverse native plantings.
Temporary open space – Ellingworth Parade, Box Hill (offset)	Future opportunity (temporary open space to be made permanent)	Function: Community park. Size: 3500 m^2 – size is fixed.	• If the future opportunity is realised, include plantings of native trees that provide nectar resources and consider inclusion of areas of diverse native plantings.

6. Support existing and new tree plantings to increase canopy cover in accordance with the *Whitehorse Urban Forest Strategy 2021-2031* and *Living Melbourne,* endorsed by the City of Whitehorse. Ensure development includes integrated water management interventions that address green infrastructure assets, provides adequate irrigation for trees and other plantings, and optimises permeable surfaces to enhance tree growth.

7.2 Other opportunities

- Align with *Whitehorse Urban Biodiversity Strategy* initiatives and works with the City of Whitehorse to improve open space, streetscapes and community areas – this includes investigating potential to expand areas of bushland regeneration, working with other authorities to improve biodiversity, and contributing to the development of a Biodiversity Corridor Plan.

- Support City of Whitehorse public open space and street planting strategies to meet canopy coverage targets, as well as ensuring a diversity of tree species selected for climate change resilience.

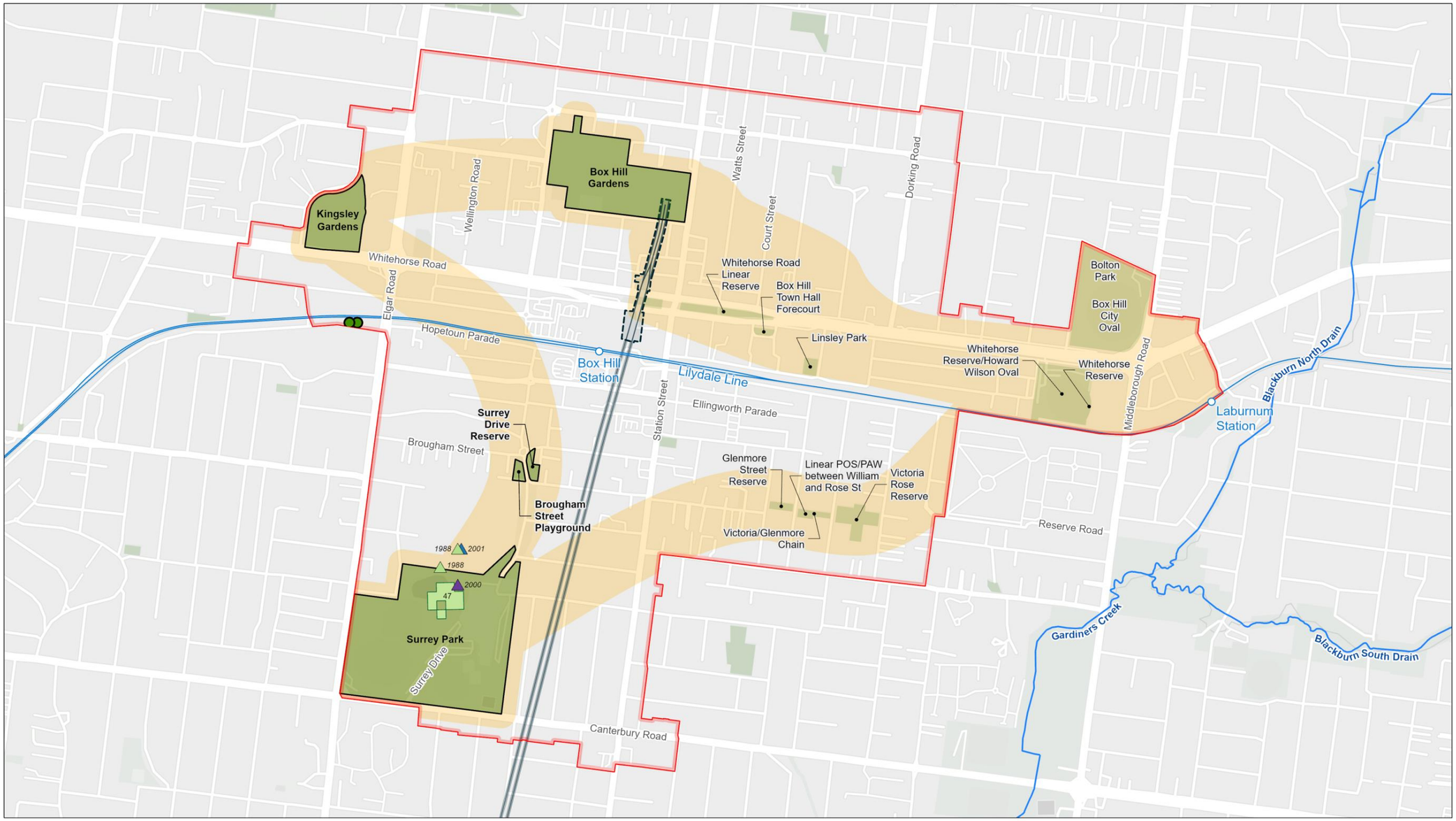
- Ensure significant trees protected by the Vegetation Protection Overlay are protected and integrated into new development.

- Consider additional planning controls and overlays to protect recreated habitat, planted trees and new dispersal corridors and links.

- Consider expanding the green streets initiative by removing non-porous surfaces and replacing Whitehorse Road median strip with natural swales and native vegetation that extends and connects with Gardiners Creek.

- Improve blue infrastructure by rehabilitating two waterbodies in the Structure Plan Area (Surrey Park and Box Hill Gardens) with planting of fringing native vegetation to manage erosion, reduce weeds and create aquatic habitat for fauna, and consider opportunities to expand and connect scattered waterbodies.

- Private landholders within the mapped corridor are to be encouraged and supported in contributing native trees and understorey plantings. It is considered that the Structure Plan Area wide habitat corridor will require local government and community support.



SRL_0224_ArboricultureEcology

FIGURE 7.1 INDICATIVE HABITAT CORRIDORS IN THE STRUCTURE PLAN AREA

References

AJM-JV 2021a *SRL East Environment Effects Statement Technical Appendix G.1 Ecology Existing Conditions* (Revision 01 October 2021)

AJM-JV 2021b *SRL East Environment Effects Statement Technical Appendix G.2 Ecology Impact Assessment* (Revision 01 October 2021)

AJM-JV 2021c *SRL East Environment Effects Statement Technical Appendix D.1 Arboriculture and Urban Forest Existing Conditions* (Revision 01 October 2021)

AJM-JV 2021d *SRL East Environment Effects Statement Technical Appendix D.2 Arboriculture and Urban Forest Impact Assessment* (Revision 01 October 2021)

AJM-JV 2025a *SRL East Draft Structure Plan - Urban Design Report - Box Hill* (Revision 01 February 2025)

AJM-JV 2025b *SRL East Draft Structure Plan – Historical Heritage Technical Report* (Revision 01 February 2025)

AJM-JV 2025c *SRL East Draft Structure Plan – Integrated Water Management Strategy* (Revision 01 February 2025)

AJM-JV 2025d *SRL East Draft Structure Plan - Climate Response Plan – Box Hill (*Revision 01 February 2025)

AJM-JV 2025e *SRL East Draft Structure Plan - Open Space Technical Report* (Revision 01 February 2025)

City of Whitehorse. Incorporated Document No. 10. VPO1. *City of Whitehorse statements of tree significance*. 2005.

City of Whitehorse. Incorporated Document No. 11. VPO3. *City of Whitehorse statements of tree significance*. 2006

City of Whitehorse. *Interim Urban Forest Policy and Tree Management Plan*. 2020

DCCEEW 2024a, Department of Climate Change, Energy, the Environment and Water (DCCEEW), EPBC Act Protected Matters Report. Department of Climate Change, Energy, the Environment and Water (DCCEEW), Canberra, ACT, generated 1st October 2024, <http://www.environment.gov.au/webgis-framework/apps/pmst/pmst.jsf>

DEECA 2024a, Victorian Biodiversity Atlas, Government of Victoria, Department of Energy, Environment and Climate Action, Victoria, viewed 1st October 2024, <https://www.environment.vic.gov.au/biodiversity/victorian-biodiversity-atlas>

DEECA 2024b, Native Vegetation Information Management System (NVIM), Government of Victoria, Department of Energy, Environment and Climate Action, Victoria, <https://www.environment.vic.gov.au/native-vegetation/native-vegetation-information-management>

DEECA 2024c, NatureKit, Government of Victoria, Department of Energy, Environment and Climate Action, Victoria, viewed 1st October 2024, <http://maps.biodiversity.vic.gov.au/viewer/?viewer=NatureKit>

DELWP 2017a, *Guidelines for the removal, destruction or lopping of native vegetation*, Government of Victoria, Department of Environment, Land Water and Planning, now Department of Energy, Environment and Climate Action, Melbourne.

DELWP 2017b, *Plan Melbourne 2017-2050*. Department of Environment, Land, Water and Planning, Melbourne.

Department of Environment 2013, Matters of National Environmental Significance - Significant Impact Guidelines 1.1. Department of the Environment (now Department of Climate Change, Energy, the Environment and Water (DCCEEW), Canberra.

Department of Infrastructure 1999, *VPP Practice Notes. Vegetation protection in urban areas* VP09. Department of Infrastructure [former], Melbourne.

Department of Sustainability and Environment 2004, Native Vegetation: sustaining a living landscape, Vegetation Quality Assessment Manual – guidelines for applying the Habitat Hectare scoring method (Version 1.3), Department of Sustainability and Environment, now Department of Energy, Environment and Climate Action, East Melbourne, Victoria

Department of Sustainability and Environment 2015, *Approved Conservation Advice (including listing advice) for the Natural Damp Grassland of the Victorian Volcanic Plains,* Canberra: Department of the Environment. Available from*:* <http://www.environment.gov.au/biodiversity/threatened/communities/pubs/133-conservation-advice.pdf>

DTP 2024a, VicPlan. Government of Victoria, Department of Transport and Planning, Melbourne, Victoria, viewed 1st October 2024, https://mapshare.vic.gov.au/vicplan/

Homewood Consulting 2016. *City of Whitehorse significant tree study*. 2016.

The Nature Conservancy and Resilient Melbourne 2019. *Living Melbourne: Our Metropolitan Urban Forest*. The Nature Conservancy and Resilient Melbourne, Melbourne

TSSC 2016, *Commonwealth Listing Advice on White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland.* Threatened Species Scientific Committee. Canberra. Available from: http://www.environment.gov.au/biodiversity/threatened/communities/box-gum.html

AJM
Joint Venture

Appendix A

Protected Matters Search Tool Report

EPBC Act Protected Matters Report

This report provides general guidance on matters of national environmental significance and other matters protected by the EPBC Act in the area you have selected. Please see the caveat for interpretation of information provided here.

Report created: 01-Oct-2024

Summary

Matters of National Environment Significance

This part of the report summarises the matters of national environmental significance that may occur in, or may relate to, the area you nominated. Further information is available in the detail part of the report, which can be accessed by scrolling or following the links below. If you are proposing to undertake an activity that may have a significant impact on one or more matters of national environmental significance then you should consider the Administrative Guidelines on Significance.

World Heritage Properties:	None
National Heritage Places:	1
Wetlands of International Importance (Ramsar	1
Great Barrier Reef Marine Park:	None
Commonwealth Marine Area:	None
Listed Threatened Ecological Communities:	3
Listed Threatened Species:	78
Listed Migratory Species:	41

Other Matters Protected by the EPBC Act

This part of the report summarises other matters protected under the Act that may relate to the area you nominated. Approval may be required for a proposed activity that significantly affects the environment on Commonwealth land, when the action is outside the Commonwealth land, or the environment anywhere when the action is taken on Commonwealth land. Approval may also be required for the Commonwealth or Commonwealth agencies proposing to take an action that is likely to have a significant impact on the environment anywhere.

The EPBC Act protects the environment on Commonwealth land, the environment from the actions taken on Commonwealth land, and the environment from actions taken by Commonwealth agencies. As heritage values of a place are part of the 'environment', these aspects of the EPBC Act protect the Commonwealth Heritage values of a Commonwealth Heritage place. Information on the new heritage laws can be found at https://www.dcceew.gov.au/parks-heritage/heritage

A permit may be required for activities in or on a Commonwealth area that may affect a member of a listed threatened species or ecological community, a member of a listed migratory species, whales and other cetaceans, or a member of a listed marine species.

Commonwealth Lands:	4
Commonwealth Heritage Places:	None
Listed Marine Species:	52
Whales and Other Cetaceans:	8
Critical Habitats:	None
Commonwealth Reserves Terrestrial:	None
Australian Marine Parks:	None
Habitat Critical to the Survival of Marine Turtles:	None

Extra Information

This part of the report provides information that may also be relevant to the area you have

State and Territory Reserves:	1
Regional Forest Agreements:	None
Nationally Important Wetlands:	None
EPBC Act Referrals:	10
Key Ecological Features (Marine):	None
Biologically Important Areas:	4
Bioregional Assessments:	None
Geological and Bioregional Assessments:	None

Details

Matters of National Environmental Significance

National Heritage Places [Resource Information]

Name	State	Legal Status	Buffer Status
Historic			
HMVS Cerberus	VIC	Listed place	In buffer area only

Wetlands of International Importance (Ramsar Wetlands) [Resource Information]

Ramsar Site Name	Proximity	Buffer Status
Edithvale-seaford wetlands	Within 10km of Ramsar site	In feature area

Listed Threatened Ecological Communities [Resource Information]

For threatened ecological communities where the distribution is well known, maps are derived from recovery plans, State vegetation maps, remote sensing imagery and other sources. Where threatened ecological community distributions are less well known, existing vegetation maps and point location data are used to produce indicative distribution maps.
Status of Vulnerable, Disallowed and Ineligible are not MNES under the EPBC Act.

Community Name	Threatened Category	Presence Text	Buffer Status
Natural Damp Grassland of the Victorian Coastal Plains	Critically Endangered	Community likely to occur within area	In feature area
Seasonal Herbaceous Wetlands (Freshwater) of the Temperate Lowland Plains	Critically Endangered	Community likely to occur within area	In buffer area only
White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland	Critically Endangered	Community may occur within area	In buffer area only

Listed Threatened Species [Resource Information]

Status of Conservation Dependent and Extinct are not MNES under the EPBC Act.
Number is the current name ID.

Scientific Name	Threatened Category	Presence Text	Buffer Status
BIRD			
Anthochaera phrygia			
Regent Honeyeater [82338]	Critically Endangered	Breeding known to occur within area	In feature area
Aphelocephala leucopsis			
Southern Whiteface [529]	Vulnerable	Species or species habitat may occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Ardenna grisea Sooty Shearwater [82651]	Vulnerable	Species or species habitat may occur within area	In buffer area only
Botaurus poiciloptilus Australasian Bittern [1001]	Endangered	Species or species habitat known to occur within area	In feature area
Calidris acuminata Sharp-tailed Sandpiper [874]	Vulnerable	Species or species habitat may occur within area	In feature area
Calidris canutus Red Knot, Knot [855]	Vulnerable	Species or species habitat known to occur within area	In feature area
Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	Species or species habitat may occur within area	In feature area
Callocephalon fimbriatum Gang-gang Cockatoo [768]	Endangered	Species or species habitat known to occur within area	In feature area
Charadrius leschenaultii Greater Sand Plover, Large Sand Plover [877]	Vulnerable	Species or species habitat likely to occur within area	In feature area
Climacteris picumnus victoriae Brown Treecreeper (south-eastern) [67062]	Vulnerable	Species or species habitat may occur within area	In feature area
Diomedea antipodensis Antipodean Albatross [64458]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area	In buffer area only
Diomedea antipodensis gibsoni Gibson's Albatross [82270]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area	In buffer area only
Diomedea epomophora Southern Royal Albatross [89221]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area	In buffer area only

Scientific Name	Threatened Category	Presence Text	Buffer Status
Diomedea exulans Wandering Albatross [89223]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area	In buffer area only
Diomedea sanfordi Northern Royal Albatross [64456]	Endangered	Foraging, feeding or related behaviour likely to occur within area	In buffer area only
Falco hypoleucos Grey Falcon [929]	Vulnerable	Species or species habitat likely to occur within area	In feature area
Gallinago hardwickii Latham's Snipe, Japanese Snipe [863]	Vulnerable	Species or species habitat known to occur within area	In feature area
Grantiella picta Painted Honeyeater [470]	Vulnerable	Species or species habitat likely to occur within area	In feature area
Hirundapus caudacutus White-throated Needletail [682]	Vulnerable	Species or species habitat known to occur within area	In feature area
Lathamus discolor Swift Parrot [744]	Critically Endangered	Species or species habitat known to occur within area	In feature area
Limosa lapponica baueri Nunivak Bar-tailed Godwit, Western Alaskan Bar-tailed Godwit [86380]	Endangered	Species or species habitat likely to occur within area	In feature area
Macronectes giganteus Southern Giant-Petrel, Southern Giant Petrel [1060]	Endangered	Species or species habitat may occur within area	In buffer area only
Macronectes halli Northern Giant Petrel [1061]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area	In buffer area only
Melanodryas cucullata cucullata South-eastern Hooded Robin, Hooded Robin (south-eastern) [67093]	Endangered	Species or species habitat may occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Neophema chrysostoma Blue-winged Parrot [726]	Vulnerable	Species or species habitat known to occur within area	In feature area
Numenius madagascariensis Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat may occur within area	In feature area
Pachyptila turtur subantarctica Fairy Prion (southern) [64445]	Vulnerable	Species or species habitat known to occur within area	In feature area
Pedionomus torquatus Plains-wanderer [906]	Critically Endangered	Species or species habitat may occur within area	In feature area
Phoebetria fusca Sooty Albatross [1075]	Vulnerable	Species or species habitat likely to occur within area	In buffer area only
Pterodroma leucoptera leucoptera Gould's Petrel, Australian Gould's Petrel [26033]	Endangered	Species or species habitat may occur within area	In buffer area only
Pycnoptilus floccosus Pilotbird [525]	Vulnerable	Species or species habitat may occur within area	In buffer area only
Rostratula australis Australian Painted Snipe [77037]	Endangered	Species or species habitat likely to occur within area	In feature area
Stagonopleura guttata Diamond Firetail [59398]	Vulnerable	Species or species habitat likely to occur within area	In feature area
Sternula nereis nereis Australian Fairy Tern [82950]	Vulnerable	Species or species habitat known to occur within area	In feature area
Thalassarche bulleri Buller's Albatross, Pacific Albatross [64460]	Vulnerable	Species or species habitat may occur within area	In buffer area only

Scientific Name	Threatened Category	Presence Text	Buffer Status
Thalassarche bulleri platei Northern Buller's Albatross, Pacific Albatross [82273]	Vulnerable	Species or species habitat may occur within area	In buffer area only
Thalassarche carteri Indian Yellow-nosed Albatross [64464]	Vulnerable	Species or species habitat likely to occur within area	In buffer area only
Thalassarche cauta Shy Albatross [89224]	Endangered	Foraging, feeding or related behaviour likely to occur within area	In buffer area only
Thalassarche chrysostoma Grey-headed Albatross [66491]	Endangered	Species or species habitat may occur within area	In buffer area only
Thalassarche impavida Campbell Albatross, Campbell Black-browed Albatross [64459]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area	In buffer area only
Thalassarche melanophris Black-browed Albatross [66472]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area	In buffer area only
Thalassarche salvini Salvin's Albatross [64463]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area	In buffer area only
Thalassarche steadi White-capped Albatross [64462]	Vulnerable	Foraging, feeding or related behaviour known to occur within area	In buffer area only
Thinornis cucullatus cucullatus Eastern Hooded Plover, Eastern Hooded Plover [90381]	Vulnerable	Species or species habitat known to occur within area	In feature area
Tringa nebularia Common Greenshank, Greenshank [832]	Endangered	Species or species habitat likely to occur within area	In feature area
FISH			

Scientific Name	Threatened Category	Presence Text	Buffer Status
Nannoperca obscura Yarra Pygmy Perch [26177]	Endangered	Species or species habitat may occur within area	In feature area
Prototroctes maraena Australian Grayling [26179]	Vulnerable	Species or species habitat likely to occur within area	In feature area
Seriolella brama Blue Warehou [69374]	Conservation Dependent	Species or species habitat known to occur within area	In buffer area only
FROG			
Litoria raniformis Southern Bell Frog,, Growling Grass Frog, Green and Golden Frog, Warty Swamp Frog, Golden Bell Frog [1828]	Vulnerable	Species or species habitat likely to occur within area	In feature area
INSECT			
Synemon plana Golden Sun Moth [25234]	Vulnerable	Species or species habitat may occur within area	In feature area
MAMMAL			
Antechinus minimus maritimus Swamp Antechinus (mainland) [83086]	Vulnerable	Species or species habitat may occur within area	In feature area
Dasyurus maculatus maculatus (SE mainland population) Spot-tailed Quoll, Spotted-tail Quoll, Tiger Quoll (southeastern mainland population) [75184]	Endangered	Species or species habitat may occur within area	In feature area
Eubalaena australis Southern Right Whale [40]	Endangered	Species or species habitat known to occur within area	In buffer area only
Isoodon obesulus obesulus Southern Brown Bandicoot (eastern), Southern Brown Bandicoot (south-eastern) [68050]	Endangered	Species or species habitat may occur within area	In feature area
Petauroides volans Greater Glider (southern and central) [254]	Endangered	Species or species habitat may occur within area	In buffer area only
Petaurus australis australis Yellow-bellied Glider (south-eastern) [87600]	Vulnerable	Species or species habitat likely to occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Pseudomys novaehollandiae New Holland Mouse, Pookila [96]	Vulnerable	Species or species habitat may occur within area	In feature area
Pteropus poliocephalus Grey-headed Flying-fox [186]	Vulnerable	Foraging, feeding or related behaviour known to occur within area	In feature area
PLANT			
Amphibromus fluitans River Swamp Wallaby-grass, Floating Swamp Wallaby-grass [19215]	Vulnerable	Species or species habitat known to occur within area	In feature area
Dianella amoena Matted Flax-lily [64886]	Endangered	Species or species habitat likely to occur within area	In feature area
Glycine latrobeana Clover Glycine, Purple Clover [13910]	Vulnerable	Species or species habitat likely to occur within area	In feature area
Lachnagrostis adamsonii Adamson's Blown-grass, Adamson's Blowngrass [76211]	Endangered	Species or species habitat may occur within area	In buffer area only
Lepidium aschersonii Spiny Peppercress [10976]	Vulnerable	Species or species habitat may occur within area	In feature area
Pimelea spinescens subsp. spinescens Plains Rice-flower, Spiny Rice-flower, Prickly Pimelea [21980]	Critically Endangered	Species or species habitat may occur within area	In buffer area only
Prasophyllum spicatum Dense Leek-orchid [55146]	Vulnerable	Species or species habitat likely to occur within area	In feature area
Pterostylis chlorogramma Green-striped Greenhood [56510]	Vulnerable	Species or species habitat may occur within area	In feature area
Pterostylis cucullata Leafy Greenhood [15459]	Vulnerable	Species or species habitat likely to occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Senecio macrocarpus Large-fruit Fireweed, Large-fruit Groundsel [16333]	Vulnerable	Species or species habitat may occur within area	In feature area
Senecio psilocarpus Swamp Fireweed, Smooth-fruited Groundsel [64976]	Vulnerable	Species or species habitat likely to occur within area	In feature area
Thelymitra epipactoides Metallic Sun-orchid [11896]	Endangered	Species or species habitat may occur within area	In feature area
Xerochrysum palustre Swamp Everlasting, Swamp Paper Daisy [76215]	Vulnerable	Species or species habitat likely to occur within area	In feature area
REPTILE			
Aprasia parapulchella Pink-tailed Worm-lizard, Pink-tailed Legless Lizard [1665]	Vulnerable	Species or species habitat may occur within area	In buffer area only
Caretta caretta Loggerhead Turtle [1763]	Endangered	Species or species habitat known to occur within area	In buffer area only
Chelonia mydas Green Turtle [1765]	Vulnerable	Species or species habitat may occur within area	In buffer area only
Delma impar Striped Legless Lizard, Striped Snake-lizard [1649]	Vulnerable	Species or species habitat may occur within area	In buffer area only
Dermochelys coriacea Leatherback Turtle, Leathery Turtle, Luth [1768]	Endangered	Species or species habitat known to occur within area	In buffer area only
Lissolepis coventryi Swamp Skink, Eastern Mourning Skink [84053]	Endangered	Species or species habitat likely to occur within area	In feature area
SHARK			
Carcharodon carcharias White Shark, Great White Shark [64470]	Vulnerable	Species or species habitat known to occur within area	In buffer area only

Listed Migratory Species			[Resource Information]
Scientific Name	Threatened Category	Presence Text	Buffer Status
Migratory Marine Birds			
Apus pacificus Fork-tailed Swift [678]		Species or species habitat likely to occur within area	In feature area
Ardenna carneipes Flesh-footed Shearwater, Fleshy-footed Shearwater [82404]		Foraging, feeding or related behaviour likely to occur within area	In feature area
Ardenna grisea Sooty Shearwater [82651]	Vulnerable	Species or species habitat may occur within area	In buffer area only
Diomedea antipodensis Antipodean Albatross [64458]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area	In buffer area only
Diomedea epomophora Southern Royal Albatross [89221]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area	In buffer area only
Diomedea exulans Wandering Albatross [89223]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area	In buffer area only
Diomedea sanfordi Northern Royal Albatross [64456]	Endangered	Foraging, feeding or related behaviour likely to occur within area	In buffer area only
Macronectes giganteus Southern Giant-Petrel, Southern Giant Petrel [1060]	Endangered	Species or species habitat may occur within area	In buffer area only
Macronectes halli Northern Giant Petrel [1061]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area	In buffer area only
Phoebetria fusca Sooty Albatross [1075]	Vulnerable	Species or species habitat likely to occur within area	In buffer area only

Scientific Name	Threatened Category	Presence Text	Buffer Status
Sternula albifrons Little Tern [82849]		Species or species habitat may occur within area	In buffer area only
Thalassarche bulleri Buller's Albatross, Pacific Albatross [64460]	Vulnerable	Species or species habitat may occur within area	In buffer area only
Thalassarche carteri Indian Yellow-nosed Albatross [64464]	Vulnerable	Species or species habitat likely to occur within area	In buffer area only
Thalassarche cauta Shy Albatross [89224]	Endangered	Foraging, feeding or related behaviour likely to occur within area	In buffer area only
Thalassarche chrysostoma Grey-headed Albatross [66491]	Endangered	Species or species habitat may occur within area	In buffer area only
Thalassarche impavida Campbell Albatross, Campbell Black-browed Albatross [64459]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area	In buffer area only
Thalassarche melanophris Black-browed Albatross [66472]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area	In buffer area only
Thalassarche salvini Salvin's Albatross [64463]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area	In buffer area only
Thalassarche steadi White-capped Albatross [64462]	Vulnerable	Foraging, feeding or related behaviour known to occur within area	In buffer area only
Migratory Marine Species			
Caperea marginata Pygmy Right Whale [39]		Species or species habitat may occur within area	In buffer area only

Scientific Name	Threatened Category	Presence Text	Buffer Status
Carcharias taurus Grey Nurse Shark [64469]		Species or species habitat may occur within area	In buffer area only
Carcharodon carcharias White Shark, Great White Shark [64470]	Vulnerable	Species or species habitat known to occur within area	In buffer area only
Caretta caretta Loggerhead Turtle [1763]	Endangered	Species or species habitat known to occur within area	In buffer area only
Chelonia mydas Green Turtle [1765]	Vulnerable	Species or species habitat may occur within area	In buffer area only
Dermochelys coriacea Leatherback Turtle, Leathery Turtle, Luth [1768]	Endangered	Species or species habitat known to occur within area	In buffer area only
Eubalaena australis as Balaena glacialis australis Southern Right Whale [40]	Endangered	Species or species habitat known to occur within area	In buffer area only
Lagenorhynchus obscurus Dusky Dolphin [43]		Species or species habitat may occur within area	In buffer area only
Lamna nasus Porbeagle, Mackerel Shark [83288]		Species or species habitat likely to occur within area	In buffer area only
Megaptera novaeangliae Humpback Whale [38]		Species or species habitat may occur within area	In buffer area only
Migratory Terrestrial Species			
Hirundapus caudacutus White-throated Needletail [682]	Vulnerable	Species or species habitat known to occur within area	In feature area
Motacilla flava Yellow Wagtail [644]		Species or species habitat likely to occur within area	In feature area
Migratory Wetlands Species			

Scientific Name	Threatened Category	Presence Text	Buffer Status
Actitis hypoleucos Common Sandpiper [59309]		Species or species habitat likely to occur within area	In feature area
Calidris acuminata Sharp-tailed Sandpiper [874]	Vulnerable	Species or species habitat may occur within area	In feature area
Calidris canutus Red Knot, Knot [855]	Vulnerable	Species or species habitat known to occur within area	In feature area
Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	Species or species habitat may occur within area	In feature area
Calidris melanotos Pectoral Sandpiper [858]		Species or species habitat may occur within area	In feature area
Charadrius leschenaultii Greater Sand Plover, Large Sand Plover [877]	Vulnerable	Species or species habitat likely to occur within area	In feature area
Gallinago hardwickii Latham's Snipe, Japanese Snipe [863]	Vulnerable	Species or species habitat known to occur within area	In feature area
Limosa lapponica Bar-tailed Godwit [844]		Species or species habitat known to occur within area	In feature area
Numenius madagascariensis Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat may occur within area	In feature area
Tringa nebularia Common Greenshank, Greenshank [832]	Endangered	Species or species habitat likely to occur within area	In feature area

Other Matters Protected by the EPBC Act

Commonwealth Lands [Resource Information]

The Commonwealth area listed below may indicate the presence of Commonwealth land in this vicinity. Due to the unreliability of the data source, all proposals should be checked as to whether it impacts on a Commonwealth area, before making a definitive decision. Contact the State or Territory government land department for further information.

Commonwealth Land Name	State	Buffer Status
Defence		
Defence - Airport Builidng [21422]	VIC	In buffer area only
Defence - MOORABBIN AERO RESEARCH [20014]	VIC	In buffer area only
Defence - SANDRINGHAM TRAINING DEPOT [20990]	VIC	In buffer area only
Defence - SANDRINGHAM TRAINING DEPOT [20989]	VIC	In buffer area only

Listed Marine Species [Resource Information]

Scientific Name	Threatened Category	Presence Text	Buffer Status
Bird			
Actitis hypoleucos			
Common Sandpiper [59309]		Species or species habitat likely to occur within area	In feature area
Apus pacificus			
Fork-tailed Swift [678]		Species or species habitat likely to occur within area overfly marine area	In feature area
Ardenna carneipes as Puffinus carneipes			
Flesh-footed Shearwater, Fleshy-footed Shearwater [82404]		Foraging, feeding or related behaviour likely to occur within area	In feature area
Ardenna grisea as Puffinus griseus			
Sooty Shearwater [82651]	Vulnerable	Species or species habitat may occur within area	In buffer area only
Bubulcus ibis as Ardea ibis			
Cattle Egret [66521]		Species or species habitat may occur within area overfly marine area	In feature area
Calidris acuminata			
Sharp-tailed Sandpiper [874]	Vulnerable	Species or species habitat may occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Calidris canutus Red Knot, Knot [855]	Vulnerable	Species or species habitat known to occur within area overfly marine area	In feature area
Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	Species or species habitat may occur within area overfly marine area	In feature area
Calidris melanotos Pectoral Sandpiper [858]		Species or species habitat may occur within area overfly marine area	In feature area
Chalcites osculans as Chrysococcyx osculans Black-eared Cuckoo [83425]		Species or species habitat likely to occur within area overfly marine area	In feature area
Charadrius leschenaultii Greater Sand Plover, Large Sand Plover [877]	Vulnerable	Species or species habitat likely to occur within area	In feature area
Diomedea antipodensis Antipodean Albatross [64458]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area	In buffer area only
Diomedea antipodensis gibsoni as Diomedea gibsoni Gibson's Albatross [82270]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area	In buffer area only
Diomedea epomophora Southern Royal Albatross [89221]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area	In buffer area only
Diomedea exulans Wandering Albatross [89223]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area	In buffer area only

Scientific Name	Threatened Category	Presence Text	Buffer Status
Diomedea sanfordi Northern Royal Albatross [64456]	Endangered	Foraging, feeding or related behaviour likely to occur within area	In buffer area only
Gallinago hardwickii Latham's Snipe, Japanese Snipe [863]	Vulnerable	Species or species habitat known to occur within area overfly marine area	In feature area
Haliaeetus leucogaster White-bellied Sea-Eagle [943]		Species or species habitat known to occur within area	In feature area
Hirundapus caudacutus White-throated Needletail [682]	Vulnerable	Species or species habitat known to occur within area overfly marine area	In feature area
Lathamus discolor Swift Parrot [744]	Critically Endangered	Species or species habitat known to occur within area overfly marine area	In feature area
Limosa lapponica Bar-tailed Godwit [844]		Species or species habitat known to occur within area	In feature area
Macronectes giganteus Southern Giant-Petrel, Southern Giant Petrel [1060]	Endangered	Species or species habitat may occur within area	In buffer area only
Macronectes halli Northern Giant Petrel [1061]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area	In buffer area only
Merops ornatus Rainbow Bee-eater [670]		Species or species habitat may occur within area overfly marine area	In feature area
Monarcha melanopsis Black-faced Monarch [609]		Species or species habitat may occur within area overfly marine area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Motacilla flava Yellow Wagtail [644]		Species or species habitat likely to occur within area overfly marine area	In feature area
Myiagra cyanoleuca Satin Flycatcher [612]		Species or species habitat known to occur within area overfly marine area	In feature area
Neophema chrysostoma Blue-winged Parrot [726]	Vulnerable	Species or species habitat known to occur within area overfly marine area	In feature area
Numenius madagascariensis Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat may occur within area	In feature area
Pachyptila turtur Fairy Prion [1066]		Species or species habitat known to occur within area	In feature area
Phoebetria fusca Sooty Albatross [1075]	Vulnerable	Species or species habitat likely to occur within area	In buffer area only
Rhipidura rufifrons Rufous Fantail [592]		Species or species habitat known to occur within area overfly marine area	In feature area
Rostratula australis as Rostratula benghalensis (sensu lato) Australian Painted Snipe [77037]	Endangered	Species or species habitat likely to occur within area overfly marine area	In feature area
Sterna striata White-fronted Tern [799]		Foraging, feeding or related behaviour likely to occur within area	In feature area
Sternula albifrons as Sterna albifrons Little Tern [82849]		Species or species habitat may occur within area	In buffer area only

Scientific Name	Threatened Category	Presence Text	Buffer Status
Thalassarche bulleri Buller's Albatross, Pacific Albatross [64460]	Vulnerable	Species or species habitat may occur within area	In buffer area only
Thalassarche bulleri platei as Thalassarche sp. nov. Northern Buller's Albatross, Pacific Albatross [82273]	Vulnerable	Species or species habitat may occur within area	In buffer area only
Thalassarche carteri Indian Yellow-nosed Albatross [64464]	Vulnerable	Species or species habitat likely to occur within area	In buffer area only
Thalassarche cauta Shy Albatross [89224]	Endangered	Foraging, feeding or related behaviour likely to occur within area	In buffer area only
Thalassarche chrysostoma Grey-headed Albatross [66491]	Endangered	Species or species habitat may occur within area	In buffer area only
Thalassarche impavida Campbell Albatross, Campbell Black-browed Albatross [64459]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area	In buffer area only
Thalassarche melanophris Black-browed Albatross [66472]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area	In buffer area only
Thalassarche salvini Salvin's Albatross [64463]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area	In buffer area only
Thalassarche steadi White-capped Albatross [64462]	Vulnerable	Foraging, feeding or related behaviour known to occur within area	In buffer area only
Thinornis cucullatus as Thinornis rubricollis Hooded Plover, Hooded Dotterel [87735]		Species or species habitat known to occur within area overfly marine area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Thinornis cucullatus cucullatus as Thinornis rubricollis rubricollis			
Eastern Hooded Plover, Eastern Hooded Plover [90381]	Vulnerable	Species or species habitat known to occur within area overfly marine area	In feature area
Tringa nebularia			
Common Greenshank, Greenshank [832]	Endangered	Species or species habitat likely to occur within area overfly marine area	In feature area
Mammal			
Arctocephalus forsteri			
Long-nosed Fur-seal, New Zealand Fur-seal [20]		Species or species habitat may occur within area	In buffer area only
Arctocephalus pusillus			
Australian Fur-seal, Australo-African Fur-seal [21]		Species or species habitat may occur within area	In buffer area only
Reptile			
Caretta caretta			
Loggerhead Turtle [1763]	Endangered	Species or species habitat known to occur within area	In buffer area only
Chelonia mydas			
Green Turtle [1765]	Vulnerable	Species or species habitat may occur within area	In buffer area only
Dermochelys coriacea			
Leatherback Turtle, Leathery Turtle, Luth [1768]	Endangered	Species or species habitat known to occur within area	In buffer area only

Whales and Other Cetaceans		[Resource Information]	
Current Scientific Name	Status	Type of Presence	Buffer Status
Mammal			
Caperea marginata			
Pygmy Right Whale [39]		Species or species habitat may occur within area	In buffer area only
Delphinus delphis			
Common Dolphin, Short-beaked Common Dolphin [60]		Species or species habitat may occur within area	In buffer area only
Eubalaena australis			
Southern Right Whale [40]	Endangered	Species or species habitat known to occur within area	In buffer area only

Current Scientific Name	Status	Type of Presence	Buffer Status
Grampus griseus Risso's Dolphin, Grampus [64]		Species or species habitat may occur within area	In buffer area only
Lagenorhynchus obscurus Dusky Dolphin [43]		Species or species habitat may occur within area	In buffer area only
Megaptera novaeangliae Humpback Whale [38]		Species or species habitat may occur within area	In buffer area only
Tursiops aduncus Indian Ocean Bottlenose Dolphin, Spotted Bottlenose Dolphin [68418]		Species or species habitat likely to occur within area	In buffer area only
Tursiops truncatus s. str. Bottlenose Dolphin [68417]		Species or species habitat may occur within area	In buffer area only

Extra Information

State and Territory Reserves			[Resource Information]
Protected Area Name	Reserve Type	State	Buffer Status
Ricketts Point	Marine Sanctuary	VIC	In buffer area only

EPBC Act Referrals				[Resource Information]
Title of referral	Reference	Referral Outcome	Assessment Status	Buffer Status
Controlled action				
Residential Development	2003/1278	Controlled Action	Completed	In feature area
Not controlled action				
Dingley Route Freeway Construction	2001/256	Not Controlled Action	Completed	In feature area
High Street Road Upgrade	2001/268	Not Controlled Action	Completed	In buffer area only
Improving rabbit biocontrol: releasing another strain of RHDV, sthrn two thirds of Australia	2015/7522	Not Controlled Action	Completed	In feature area
INDIGO Central Submarine Telecommunications Cable	2017/8127	Not Controlled Action	Completed	In feature area

Title of referral	Reference	Referral Outcome	Assessment Status	Buffer Status
Not controlled action				
Port Phillip Channel Deepening Project - Trial Dredge Program	2005/2164	Not Controlled Action	Completed	In buffer area only
Redevelopment of Royal Melbourne Yacht Squadron Jetty	2006/2619	Not Controlled Action	Completed	In buffer area only
Suburban Rail Loop East	2021/9101	Not Controlled Action	Completed	In feature area
Not controlled action (particular manner)				
extension of a sporting facility and upgrading of associated infrastructure	2004/1325	Not Controlled Action (Particular Manner)	Post-Approval	In feature area
INDIGO Marine Cable Route Survey (INDIGO)	2017/7996	Not Controlled Action (Particular Manner)	Post-Approval	In feature area

Biologically Important Areas [Resource Information]

Scientific Name	Behaviour	Presence	Buffer Status
Seabirds			
Ardenna tenuirostris Short-tailed Shearwater [82652]	Foraging	Known to occur	In buffer area only
Pelagodroma marina White-faced Storm-petrel [1016]	Foraging	Known to occur	In buffer area only
Pelecanoides urinatrix Common Diving-petrel [1018]	Foraging	Known to occur	In buffer area only
Thalassarche cauta cauta Shy Albatross [82345]	Foraging likely	Likely to occur	In buffer area only

Caveat

1 PURPOSE

This report is designed to assist in identifying the location of matters of national environmental significance (MNES) and other matters protected by the Environment Protection and Biodiversity Conservation Act 1999 (Cth) (EPBC Act) which may be relevant in determining obligations and requirements under the EPBC Act.

The report contains the mapped locations of:

- World and National Heritage properties;
- Wetlands of International and National Importance;
- Commonwealth and State/Territory reserves;
- distribution of listed threatened, migratory and marine species;
- listed threatened ecological communities; and
- other information that may be useful as an indicator of potential habitat value.

2 DISCLAIMER

This report is not intended to be exhaustive and should only be relied upon as a general guide as mapped data is not available for all species or ecological communities listed under the EPBC Act (see below). Persons seeking to use the information contained in this report to inform the referral of a proposed action under the EPBC Act should consider the limitations noted below and whether additional information is required to determine the existence and location of MNES and other protected matters.

Where data are available to inform the mapping of protected species, the presence type (e.g. known, likely or may occur) that can be determined from the data is indicated in general terms. It is the responsibility of any person using or relying on the information in this report to ensure that it is suitable for the circumstances of any proposed use. The Commonwealth cannot accept responsibility for the consequences of any use of the report or any part thereof. To the maximum extent allowed under governing law, the Commonwealth will not be liable for any loss or damage that may be occasioned directly or indirectly through the use of, or reliance

3 DATA SOURCES

Threatened ecological communities

For threatened ecological communities where the distribution is well known, maps are generated based on information contained in recovery plans, State vegetation maps and remote sensing imagery and other sources. Where threatened ecological community distributions are less well known, existing vegetation maps and point location data are used to produce indicative distribution maps.

Threatened, migratory and marine species

Threatened, migratory and marine species distributions have been discerned through a variety of methods. Where distributions are well known and if time permits, distributions are inferred from either thematic spatial data (i.e. vegetation, soils, geology, elevation, aspect, terrain, etc.) together with point locations and described habitat; or modelled (MAXENT or BIOCLIM habitat modelling) using

Where little information is available for a species or large number of maps are required in a short time-frame, maps are derived either from 0.04 or 0.02 decimal degree cells; by an automated process using polygon capture techniques (static two kilometre grid cells, alpha-hull and convex hull); or captured manually or by using topographic features (national park boundaries, islands, etc.).

In the early stages of the distribution mapping process (1999-early 2000s) distributions were defined by degree blocks, 100K or 250K map sheets to rapidly create distribution maps. More detailed distribution mapping methods are used to update these distributions

4 LIMITATIONS

The following species and ecological communities have not been mapped and do not appear in this report:

- threatened species listed as extinct or considered vagrants;
- some recently listed species and ecological communities;
- some listed migratory and listed marine species, which are not listed as threatened species; and
- migratory species that are very widespread, vagrant, or only occur in Australia in small numbers.

The following groups have been mapped, but may not cover the complete distribution of the species:

- listed migratory and/or listed marine seabirds, which are not listed as threatened, have only been mapped for recorded
- seals which have only been mapped for breeding sites near the Australian continent

The breeding sites may be important for the protection of the Commonwealth Marine environment.

Refer to the metadata for the feature group (using the Resource Information link) for the currency of the information.

Acknowledgements

This database has been compiled from a range of data sources. The department acknowledges the following custodians who have contributed valuable data and advice:

-Office of Environment and Heritage, New South Wales
-Department of Environment and Primary Industries, Victoria
-Department of Primary Industries, Parks, Water and Environment, Tasmania
-Department of Environment, Water and Natural Resources, South Australia
-Department of Land and Resource Management, Northern Territory
-Department of Environmental and Heritage Protection, Queensland
-Department of Parks and Wildlife, Western Australia
-Environment and Planning Directorate, ACT
-Birdlife Australia
-Australian Bird and Bat Banding Scheme
-Australian National Wildlife Collection
-Natural history museums of Australia
-Museum Victoria
-Australian Museum
-South Australian Museum
-Queensland Museum
-Online Zoological Collections of Australian Museums
-Queensland Herbarium
-National Herbarium of NSW
-Royal Botanic Gardens and National Herbarium of Victoria
-Tasmanian Herbarium
-State Herbarium of South Australia
-Northern Territory Herbarium
-Western Australian Herbarium
-Australian National Herbarium, Canberra
-University of New England
-Ocean Biogeographic Information System
-Australian Government, Department of Defence
Forestry Corporation, NSW
-Geoscience Australia
-CSIRO
-Australian Tropical Herbarium, Cairns
-eBird Australia
-Australian Government – Australian Antarctic Data Centre
-Museum and Art Gallery of the Northern Territory
-Australian Government National Environmental Science Program
-Australian Institute of Marine Science
-Reef Life Survey Australia
-American Museum of Natural History
-Queen Victoria Museum and Art Gallery, Inveresk, Tasmania
-Tasmanian Museum and Art Gallery, Hobart, Tasmania
-Other groups and individuals

The Department is extremely grateful to the many organisations and individuals who provided expert advice and information on numerous draft distributions.

Please feel free to provide feedback via the Contact us page.

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Joint Venture

Appendix B

Threatened Species Likelihood of Occurrence

TABLE B.1 LIKELIHOOD OF OCCURRENCE ANALYSIS FOR THREATENED FLORA IN THE 5 KM SEARCH AREA FOR BOX HILL

SCIENTIFIC NAME	COMMON NAME	CONSERVATION STATUS		HABITAT PREFERENCE	COUNT OF SIGHTINGS	LAST RECORD	LIKELIHOOD OF OCCURRENCE
		EPBC ACT	FFG ACT				
Thesium australe	Austral Toadflax	Vulnerable	Endangered	Once widespread across Victoria, but all recent collections are from highland areas in the vicinity of Wulgulmerang and it is believed to have become extinct across most of its Australian range due to loss of habitat and grazing. Grows in grasslands, woodlands and herbfields, usually in damp situations.	0	PMST	Negligible – no previous records and lack of suitable habitat
Lepidium hyssopifolium s.s.	Basalt Peppercress	Endangered	Endangered	Collected from scattered sites on the volcanic plain. Recent collections are from disturbed, rather weedy sites. One collection from near Port Fairy is noteworthy for its occurrence in a slightly saline estuary amongst saltmarsh and fringing sedgeland.	1	6/09/1977	Negligible - limited number of historical records and no suitable habitat in Structure Plan Area
Eucalyptus cinerea subsp. victoriensis	Beechworth Silver Stringybark		Endangered	Rare, confined to hilly country to the north and north-east of Beechworth where occurring on clay loam soils derived from granite.	1	12/09/1989	Low - likely planted and outside natural distribution
Rutidosis leptorhynchoides	Button Wrinklewort	Endangered	Endangered	Confined to basaltic grasslands between Rokewood and Melbourne where E due to loss of habitat.	2	30/04/1948	Negligible - limited number of historical records and no suitable habitat in Structure Plan Area
Caladenia flavovirens	Christmas Spider-orchid		Critically Endangered	From coastal to near-coastal habitats through to low altitude mountain forest (e.g. Mt Dandenong area), formerly common near Portland where now rare and localized, and possibly extinct in the Lorne and Marlo areas. Moderately common in upland forests of north-east Victoria. Grows among shrubs in stunted coastal scrub, often in sandy soils, or in open montane forest with a grassy understorey.	1	01/12/1889	Negligible - limited number of historical records and no suitable habitat in Structure Plan Area
Glycine latrobeana	Clover Glycine	Vulnerable	Vulnerable	Widespread but of sporadic occurrence and rarely encountered. Grows mainly in grasslands and grassy woodlands.	0	PMST	Negligible – no previous records and lack of suitable habitat
Eucalyptus bosistoana	Coast Grey-box		Endangered	Occurs mostly on loamy soils east from Woodside, around the Gippsland Lakes and near the coast, extending inland further east along the Cann and Genoa River valleys.	1	3/03/2008	Low - likely planted and outside natural distribution
Hakea decurrens subsp. platytaenia	Coast Needlewood		Endangered	Currently recorded only from windswept coastal heaths on Wilsons Promontory and in the Mallacoota area, but possibly more widespread in similar sites.	1	7/07/1995	Low – limited number of historical records and no suitable habitat in Structure Plan Area

SCIENTIFIC NAME	COMMON NAME	CONSERVATION STATUS		HABITAT PREFERENCE	COUNT OF SIGHTINGS	LAST RECORD	LIKELIHOOD OF OCCURRENCE
		EPBC ACT	FFG ACT				
Caladenia concolor	Crimson Spider-orchid	Vulnerable	Endangered	Sporadic and uncommon in dry open-forests, mostly of north-eastern Victoria, on ridges and slopes in well-drained shallow stony or skeletal soils.	0	PMST	Negligible – no previous records and limited habitat suitability
Acacia stictophylla	Dandenong Wattle		Endangered	Restricted to the Dandenong Ranges where it is often locally common in the riparian zone on hillsides in tall forest and open woodland.	1	2/10/2017	Low - likely planted and outside natural distribution
Prasophyllum spicatum	Dense Leek-orchid	Vulnerable	Critically Endangered	Grows in coastal heath and sandhills. Localised across southern Victoria in coastal heathland and near-coastal heathy forest on sandy soils. Flowers Aug.-Nov.	0	PMST	Negligible – no previous records and lack of suitable habitat
Melaleuca armillaris subsp. armillaris	Giant Honey-myrtle		Endangered	Mainly confined to near-coastal sandy heaths, scrubs slightly raised above saltmarsh, riparian scrubs, rocky coastlines and foothill outcrops eastwards from about Marlo. Occurrences to the west are naturalized from cultivated stock.	4	3/01/2018	Low - likely planted and outside natural distribution
Diuris behrii	Golden Cowslips		Endangered	Locally common in grassland and open woodland mostly in western Victoria.	2	27/09/1958	Negligible -low number of historical records and no suitable habitat in Structure Plan Area
Eucalyptus fulgens	Green Scentbark		Endangered	Occurs east from Healesville and Woori Yallock to the Latrobe Valley near Driffield.	1	5/09/1989	Low - likely planted and outside natural distribution
Pterostylis chlorogramma	Green-striped Greenhood	Vulnerable	Endangered	Apparently localised in Victoria, but exact range uncertain due to confusion with closely allied species. Grows in moist areas of heathy and shrubby forest, on well-drained soils.	0	PMST	Negligible - no previous records and lack of suitable habitat
Thelymitra orientalis	Hoary Sun-orchid	Critically Endangered	Critically Endangered	Grows in damp heathy flats and seepage areas usually in peaty white sands.	0	PMST	Negligible – no previous records and no suitable heathy habitat
Senecio macrocarpus	Large-fruit Fireweed	Vulnerable	Critically Endangered	In Victoria largely confined to remnant Kangaroo Grass grasslands on loamy clay soils derived from basalt from near Melbourne west to Skipton area. Also known from auriferous ground near Stawell.	0	PMST	Negligible - no previous records and lack of suitable habitat
Pterostylis cucullata	Leafy Greenhood	Vulnerable	Endangered	Usually found in protected areas of stabilized coastal sand dunes under open to closed scrub dominated by Coast Tea-tree (Leptospermum laevigatum), and/or Moonah (Melaleuca lanceolata), with an open ground stratum.	0	PMST	Negligible - no previous records and lack of suitable habitat

SCIENTIFIC NAME	COMMON NAME	CONSERVATION STATUS		HABITAT PREFERENCE	COUNT OF SIGHTINGS	LAST RECORD	LIKELIHOOD OF OCCURRENCE
		EPBC ACT	FFG ACT				
Prasophyllum colemaniarum	Lilac Leek-orchid	Vulnerable		Known with certainty only by the type collection (1922) from grassy woodland near Bayswater.	0	PMST	Negligible – no previous records and the Study Area is well beyond the known range of the species
Dianella amoena	Matted Flax-lily	Endangered	Critically Endangered	Lowland grasslands, grassy woodlands, valley grassy forest and creeklines of herb-rich woodlands.	0	PMST	Negligible - no previous records and lack of suitable habitat
Eucalyptus leucoxylon subsp. connata	Melbourne Yellow-gum		Endangered	The main concentration is in the Brisbane Ranges between Bacchus March and Geelong, where it grows on skeletal soils. Also grows on skeletal soils at Long Forest between Bacchus Marsh and Melton, and at Studley Park at Kew (in Melbourne) where it grows on soil derived from Silurian sandstone.	1	11/10/2017	Low - likely planted and outside natural distribution
Eucalyptus sideroxylon subsp. sideroxylon	Mugga		Endangered	In Victoria confined to the Chiltern area, northern Warby Range and south of Winton, while the other ironbark, Eucalyptus tricarpa, with its 3-budded inflorescences and larger fruit is widespread.	7	4/04/2018	Low - likely planted and outside natural distribution
Pterostylis pedoglossa	Prawn Greenhood		Endangered	Scattered in coastal and near-coastal heath and grasstree plains east of Melbourne, often on moist peaty soils.	1	1/09/1920	Negligible – no suitable habitat features and historical record
Corymbia gummifera	Red Bloodwood		Vulnerable	In Victoria on flats and low hills near the sea, east from Wingan Inlet.	2	2/01/2018	Low - likely planted and outside natural distribution
Amphibromus fluitans	River Swamp Wallaby-grass	Vulnerable		Permanent swamps, lagoons, billabongs and dams.		PMST	Negligible - no previous records and lack of suitable habitat
Acacia rupicola	Rock Wattle		Endangered	Restricted in Victoria to rocky areas around Mt Arapiles and apparently the northern parts of the Grampians.	2	11/10/2017	Low - likely planted and outside natural distribution
Pomaderris vacciniifolia	Round-leaf Pomaderris	Critically Endangered	Critically Endangered	Largely confined to moist forest and scrubs in the upper catchment of the Yarra, Plenty and Yea Rivers in an area bounded by Healesville, Marysville and Whittlesea, but also in the Tyers-Walhalla areas.	0	PMST	Negligible - no previous records and lack of suitable habitat
Acacia boormanii	Snowy River Wattle		Endangered	Restricted mostly to open-forest on rocky slopes and along banks of the Snowy River and its tributaries, with outlying populations at Mt Typo and Gapsted in the Mytleford area. Occasionally sparingly established on roadside plantings, for example between Bungal and Mt Egerton.	1	11/10/2017	Low - likely planted and outside natural distribution

SCIENTIFIC NAME	COMMON NAME	CONSERVATION STATUS		HABITAT PREFERENCE	COUNT OF SIGHTINGS	LAST RECORD	LIKELIHOOD OF OCCURRENCE
		EPBC ACT	FFG ACT				
Eucalyptus globulus subsp. globulus	Southern Blue-gum		Endangered	Recent studies of variation in Southern Blue-gums (Jordan et al. 1993) suggest that populations of typical subsp. globulus occur in Victoria only in the area south of the Strzelecki Range, e.g. Port Franklin, Wilsons Promontory, and that other populations in south Gippsland and the Otway Ranges probably represent intergrades between subsp. globulus and subsp. pseudoglobulus.	2	3/03/2008	Low - likely planted and outside natural distribution
Lepidium aschersonii	Spiny Peppercress	Vulnerable	Endangered	Mostly on heavy clay soil near salt lakes on volcanic plain, but with outlying records from near Lake Omeo (in 1940 &1981) and the Grampians (in 1893).	0	PMST	Negligible - no previous records and lack of suitable habitat
Corymbia maculata	Spotted Gum		Vulnerable	Only known in Victoria from the Mottle Range, south of Buchan.	16	12/04/2018	Low - likely planted and outside natural distribution
Acacia howittii	Sticky Wattle		Vulnerable	Endemic to Victoria. Confined to eastern Victoria from the upper Macalister River area near Mt Howitt south to near Yarram and east to near Tabberabbera. Grows in moist forest. Widely cultivated and naturalising in some areas (e.g. Daylesford, Greater Melbourne, Dandenong Ranges etc.).	4	15/05/2008	Low - likely planted and outside natural distribution
Xerochrysum palustre	Swamp Everlasting	Vulnerable	Critically Endangered	Occurs in lowland swamps, usually on black cracking clay soils, scattered from near the South Australian border north-west of Portland to Bairnsdale district, but rare due to habitat depletion.	0	PMST	Negligible - no previous records and lack of suitable habitat
Senecio psilocarpus	Swamp Fireweed	Vulnerable		Rare, restricted in Victoria to a few herb-rich winter-wet swamps throughout the south of the state, west from Sale, growing on volcanic clays or peaty soils.	0	PMST	Negligible - no previous records and lack of suitable habitat
Microtis orbicularis	Swamp Onion-orchid		Endangered	This semi-aquatic species often flowers in shallow water around the margins of swamps. It occurs in south-west Victoria (e.g. Portland, Grampians, Little Desert) and east of Melbourne on French Island, Wonthaggi area (where possibly now extinct) and Wilsons Promontory.	1	4/11/1992	Low – limited historical records and no suitable habitat in Structure Plan Area
Deschampsia cespitosa	Tufted Hair-grass		Endangered	Widely distributed throughout the world and largely confined to damp peaty sites at both low and high elevations. In Victoria, an uncommon grass of damp to wet alpine or subalpine grasslands (e.g. Bennison, Bogong, Dargo and Nunniong Plains, Omeo district) with disjunct occurrences near Woodend, Colac and Dartmoor in the far south-west.	1	8/03/1998	Negligible - no previous records and lack of suitable habitat

SCIENTIFIC NAME	COMMON NAME	CONSERVATION STATUS		HABITAT PREFERENCE	COUNT OF SIGHTINGS	LAST RECORD	LIKELIHOOD OF OCCURRENCE
		EPBC ACT	FFG ACT				
Austrostipa rudis subsp. australis	Veined Spear-grass		Endangered	Uncommon, mostly in cool areas of southern Victoria. Usually at moderate altitude, in open-forest on sandy or sandstone-derived soils.	1	2/10/2017	Negligible - no previous records and lack of suitable habitat
Billardiera scandens s.s.	Velvet Apple-berry		Endangered	Uncommon in Victoria, occurring chiefly in dry open-forests and woodlands in the north-east (Beechworth, Whitfield etc.), with isolated occurrences near Mt Macedon, Eltham-Hurstbridge area, Eildon and Orbost.	1	19/09/1960	Negligible - limited previous records and lack of suitable habitat
Geijera parviflora	Wilga		Critically Endangered	Very rare in Victoria where confined to a few isolated populations around Kenley, north-west Victoria, in dry acacia or eucalypt woodland on heavy soils.	1	12/09/1989	Low – limited historical records and no suitable habitat in Structure Plan Area
Caladenia oenochila	Wine-lipped Spider-orchid		Critically Endangered	Endemic to Victoria where mostly known from the foothills immediately east of Melbourne, but sporadically distributed from Yarram through to Ararat. Relatively common in moist, often grassy forest or woodland, often in shaded habitats.	1	01/01/1890	Negligible – limited number of previous records and lack of suitable habitat
Thelymitra hiemalis	Winter Sun-orchid		Critically Endangered	Found in heathland and heathy woodland on well-drained soils.	1	1/03/1940	Negligible – limited number of previous records and lack of suitable habitat
FUNGI							
Morchella esculenta	Common Morel		Endangered	Found in a variety of habitats, with a preference for soil with a limestone base. The specimen is usually found in early spring, in forests, orchards, residential areas and in recently burnt areas. The species is observed growing under hardwoods and confiders.	1	30/05/2000	Low – limited historical records and limited suitable habitat.

TABLE B.2 LIKELIHOOOD OF OCCURRENCE ANALYSIS FOR THRETENED FAUNA WITHIN THE 5-KM SEARCH AREA FOR BOX HILL

SCIENTIFIC NAME	COMMON NAME	CONSERVATION STATUS		HABITAT PREFERENCE	COUNT OF SIGHTINGS	LAST RECORD	LIKELIHOOD OF OCCURRENCE
		EPBC ACT	FFG ACT				
AMPHIBIAN							
Pseudophryne bibronii	Brown Toadlet		Endangered	Lives in forests, heathlands and grasslands where it can be heard calling throughout the year	4	1/01/1967	Negligible – limited number of historical species records and no suitable habitat likely to occur in Structure Plan Area
Litoria raniformis	Growling Grass Frog	Vulnerable	Vulnerable	Persists in waterways and other aquatic habitats in the greater Melbourne region. Key habitat features for the species includes submerged vegetation for egg-laying, rocks and logs for basking, permanent freshwater lagoons for breeding and cracks, as well as debris and dense vegetation for refuge.	5	6/01/2002	Low - limited number of previous records and no suitable aquatic habitat or habitat corridors
Pseudophryne semimarmorata	Southern Toadlet		Endangered	Found at lower elevations in damp areas including leaf litter, logs and rocks. Often observed in a range of environments including forests, woodlands, heaths and grasslands.	1	1/03/1991	Low - limited number of previous records and no suitable aquatic habitat or habitat corridors
BIRDS							
Botaurus poiciloptilus	Australasian Bittern	Endangered	Critically Endangered	Frequents reedbeds, and other vegetation in water such as cumbungi, lignum and sedges.	0	PMST	Negligible - no previous species records and no suitable habitat likely to occur in the Structure Plan Area
Spatula rhynchotis	Australasian Shoveler		Vulnerable	Found in all kinds of wetlands, preferring large undisturbed heavily vegetated freshwater swamps. It is also found on open waters and occasionally along the coast.	1	1/01/1978	Negligible - limited number of historical species records and no suitable habitat likely to occur in Structure Plan Area
Rostratula australis	Australian Painted-Snipe	Endangered	Critically Endangered	Inhabits shallow terrestrial freshwater (occasionally brackish) wetlands, including temporary and permanent lakes, swamps and claypans. Also use inundated or waterlogged grassland or saltmarsh, dams, rice crops, sewage farms and bore drains.	0	PMST	Negligible - no previous species records and no suitable habitat likely to occur in the Structure Plan Area
Calidris ferruginea	Curlew Sandpiper	Critically Endangered	Critically Endangered	Intertidal mudflats in sheltered coastal areas. Non-tidal swamps, lakes and lagoons near the coast, and ponds in saltworks and sewage farms.	0	PMST	Negligible - no previous species records and no suitable habitat likely to occur in the Structure Plan Area
Ninox connivens	Barking Owl		Critically Endangered	Found in open woodlands and the edges of forests, often adjacent to farmland. They are less likely to use the interior of forested habitat.	1	28/05/2004	Low – no preferred habitat occurs within the Structure Plan Area
Falco subniger	Black Falcon		Critically Endangered	Found along tree-lined watercourses and in isolated woodlands, mainly in arid and semi-arid areas. It roosts in trees at night and often on power poles by day	8	22/02/2021	Low - Although the species may occasionally occur in the Structure Plan Area, the Structure Plan Area is unlikely

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		EPBC ACT	FFG ACT				
							to contain significant habitat for permanent or regular use
Oxyura australis	Blue-billed Duck		Vulnerable	Almost wholly aquatic. Non-breeding flocks congregate on large, deep open freshwater dams and lakes in autumn.	1	29/11/2005	Low – limited historical species records and lack of habitat suitability
Neophema chrysostoma	Blue-winged Parrot	Vulnerable		Inhabits a range of habitats from coastal, sub-coastal and inland areas, right through to semi-arid zones. Throughout their range they favour grasslands and grassy woodlands. They are often found near wetlands both near the coast and in semi-arid zones.	1	1/01/1975	Negligible - limited number of historical species records and no suitable habitat likely to occur in Structure Plan Area
Climacteris picumnus	Brown Treecreeper	Vulnerable		Found in the drier open forests and woodlands	4	26/06/1976	Negligible - limited number of historical species records and no suitable habitat likely to occur in Structure Plan Area
Tringa nebularia	Common Greenshank	Endangered, Migratory		Found in a wide variety of inland wetlands and sheltered coastal habitats of varying salinity, typically with large mudflats and saltmarsh, mangroves or seagrass.	0	PMST	Low – no previous species records and the Structure Plan Area does not contain any saltwater environments considered to attract or support the species.
Numenius madagascariensis	Eastern Curlew	Critically Endangered	Critically Endangered	Largest shorebird in Australia. Breeds in Russia and north-eastern China, arrives back to Australia in August to feed on crabs and molluscs in intertidal mudflats on the coast.	0	PMST	Negligible - no previous species records and no suitable habitat likely to occur in the Structure Plan Area
Geopelia cuneata	Diamond Dove		Vulnerable	Diamond Doves gather in small parties or flocks in dry open savanna in mulga areas often among spinifex or grasses. They are also often in open riparian woodland (beside waterways).	1	1/03/1999	Low - limited historical species records and lack of habitat suitability
Stagonopleura guttata	Diamond Firetail	Vulnerable	Vulnerable	Found in open grassy woodland, heath and farmland or grassland with scattered trees	2	1/01/1974	Negligible - limited number of historical species records and no suitable habitat likely to occur in Structure Plan Area
Sternula nereis nereis	Fairy Tern	Vulnerable	Critically Endangered	Nests on sheltered sandy beaches, spits and banks above the high tide line and below vegetation.	0	PMST	Negligible - no previous species records and no suitable habitat likely to occur in the Structure Plan Area
Ardea alba modesta	Eastern Great Egret		Vulnerable	Distributed across mainland Australia and preferring permanent shallow waters; including damp or flooded grasslands, wetland habitat, rivers, lakes and estuarine mudflats.	3	4/02/2019	Low - limited species records and lack of habitat suitability
Stictonetta naevosa	Freckled Duck		Endangered	Prefers permanent fresh water swamps and creeks with heavy growth of cumbungi (bullrushes), lignum or tea-tree.	1	13/12/2001	Low - limited historical species records and lack of habitat suitability

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Callocephalon fimbriatum	Gang-gang Cockatoo	Endangered		During summer, the Gang-gang Cockatoo is found in tall mountain forests and woodlands, with dense shrubby understoreys. In winter, Gang-gangs will move to lower altitudes into drier, more open forests and woodlands. At this time, they may be seen by roadsides and in parks and gardens of urban areas. They require tall trees for nest hollows.	326	23/08/2021	Moderate – species is likely to utilize available treed habitat for temporary foraging
Charadrius leschenaultii	Greater Sand Plover	Vulnerable	Vulnerable	Almost entirely coastal, inhabiting littoral and estuarine habitats. They mainly occur on sheltered sandy, shelly or muddy beaches with large intertidal mudflats or sandbanks, as well as sandy estuarine lagoons and inshore reefs, rock platforms, small rocky islands or sand cays on coral reefs.	0	PMST	Negligible - no previous species records and no suitable habitat likely to occur in the Structure Plan Area
Falco hypoleucos	Grey Falcon	Vulnerable	Vulnerable	Usually restricted to shrubland, grassland and wooded watercourses of arid and semi-arid regions, although it is occasionally found in open woodlands near the coast.	0	PMST	Negligible - no previous species records and no suitable habitat likely to occur in the Structure Plan Area
Accipiter novaehollandiae	Grey Goshawk		Endangered	Occurs in coastal areas in northern and eastern Australia, found in most forest types, especially tall closed forests, including rainforests.	5	28/10/2020	Low - whilst the species may occasionally fly over the Structure Plan Area, the Structure Plan Area does not contain suitable habitat to support the species long term
Pomatostomus temporalis	Grey-crowned Babbler		Vulnerable	The Grey-crowned Babbler is found in open forests and woodlands, favouring inland plains with an open shrub layer, little ground cover and plenty of fallen timber and leaf litter. May be seen along roadsides and around farms.	4	1/10/1946	Negligible - limited number of historical species records and no suitable habitat likely to occur in Structure Plan Area
Synoicus chinensis	King Quail		Endangered	Inhabits dense low vegetation, including swamps, wet heathlands, shrubland, swamp scrub, grasslands and crops such as Lucerne.	2	1/01/1901	Negligible - limited number of historical species records and no suitable habitat likely to occur in Structure Plan Area
Gallinago hardwickii	Latham's Snipe	Vulnerable, Migratory		Occurs in a range of permanent and ephemeral wetlands including freshwater wetlands with low, dense vegetation (e.g. swamps, flooded grasslands or heathlands, around bogs and other water bodies)	10	10/02/2020	Low – this species is known to opportunistically occur in a range of environments as they move through the landscape. The Structure Plan Area is not considered to provide significant foraging habitat for the species.
Lewinia pectoralis	Lewin's Rail		Vulnerable	Freshwater to saline wetlands, either permanent or ephemeral.	1	1/01/1937	Negligible - limited number of historical species records and no suitable habitat likely to occur in Structure Plan Area

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Hieraaetus morphnoides	Little Eagle		Vulnerable	Seen over woodland and forested lands and open country, extending into the arid zone. It tends to avoid rainforest and heavy forest.	2	8/01/2009	Low - limited number of historical species records and no suitable habitat likely to occur in Structure Plan Area
Anseranas semipalmata	Magpie Goose		Vulnerable	Widespread in northern Australia, where they may congregate in huge flocks. Was once also widespread in southern Australia, but disappeared from the region largely due to drainage of breeding wetlands. Often found in floodplains and wet grasslands.	1	15/05/2008	Low - Aquatic habitat in the Structure Plan Area is isolated, heavily degraded and unlikely to support the species
Lophochroa leadbeateri	Major Mitchell's Cockatoo	Endangered	Critically Endangered	Living mostly in semi-arid and arid areas, in dry woodlands, particularly mallee. They are also found in stands of River Red Gum, Eucalyptus camaldulensis, or Black Box, E. largiflorens, and on sand plains and dunes. Sometimes they are found in other areas such as Acacia shrubland with a spinifex (Trioda) ground cover, or Banksia heathlands.	1	14/05/1967	Negligible - limited number of historical species records and no suitable habitat likely to occur in Structure Plan Area
Biziura lobata	Musk Duck		Vulnerable	Aquatic habitats. Broadly ranging throughout Australia.	4	10/08/2020	Low – Aquatic habitat in the Structure Plan Area is isolated, heavily degraded and unlikely to support the species
Grantiella picta	Painted Honeyeater	Vulnerable	Vulnerable	Found in dry open forests and woodlands, and is strongly associated with mistletoe.	2	28/01/1937	Negligible - limited number of historical species records and no suitable habitat likely to occur in Structure Plan Area
Pycnoptilus floccosus	Pilotbird	Vulnerable	Vulnerable	Found in wet and dry sclerophyll forests with dense undergrowth and woodlands occupying dry slopes and ridges	0	PMST	Negligible - no previous species records and no suitable habitat likely to occur in the Structure Plan Area
Pedionomus torquatus	Plains-wanderer	Critically Endangered	Critically Endangered	Inhabit sparse native grasslands and are often absent from areas where grass becomes too dense or too sparse. They nest amongst native grasses and herbs, or sometimes amongst crops.	1	14/09/1972	Negligible - limited number of historical species records and no suitable habitat likely to occur in Structure Plan Area
Ninox strenua	Powerful Owl		Vulnerable	Occurs in open forests and woodlands, as well as along sheltered gullies in wet forests with dense understoreys, especially along watercourses. Will sometimes be found in open areas near forests such as parks and suburban areas. Needs old growth trees to nest.	11	23/01/2021	Low – Despite recent species records, the Structure Plan Area is unlikely to contain suitable long-term habitat for the species
Calidris canutus	Red Knot	Endangered	Endangered	Intertidal mudflats, sandflats and sandy beaches of sheltered coasts	0	PMST	Negligible - no previous species records and no suitable habitat likely to occur in the Structure Plan Area

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Anthochaera phrygia	Regent Honeyeater	Critically Endangered	Critically Endangered	Primarily occurs in box-ironbark woodland, but also occurs in other forest types. Mainly feeds on nectar from eucalypts and mistletoes with movements governed by the flowering of select eucalypt species.	33	2/02/1990	Low – historical species records and lack of habitat suitability
Calidris acuminata	Sharp-tailed Sandpiper	Vulnerable, Migratory		Prefers muddy edges of shallow fresh or brackish wetlands, with inundated or emergent sedges, grass, saltmarsh or other low vegetation.	1	14/05/1967	Negligible – no suitable habitat considered likely to support the species
Tyto tenebricosa	Sooty Owl		Endangered	Occurs in rainforest, including dry rainforest, subtropical and warm temperate rainforest, as well as moist eucalypt forests.	1	3/03/2008	Negligible – no suitable habitat considered likely to support the species
Melanodryas cucullata cucullata	South-eastern Hooded Robin	Endangered		Lightly timbered woodland, mainly dominated by acacia and/or eucalypts.	0	PMST	Negligible - no previous species records and no suitable habitat likely to occur in the Structure Plan Area
Aphelocephala leucopsis	Southern Whiteface	Vulnerable		Dry open forests and woodland and inland scrubs of mallee, mulga and saltbush are the preferred habitat of Southern Whiteface, especially areas with fallen timber or dead trees and stumps.	0	PMST	Negligible - no previous species records and no suitable habitat likely to occur in the Structure Plan Area
Pyrrholaemus sagittatus	Speckled Warbler		Endangered	Lives in a wide range of Eucalyptus dominated communities that have a grassy understorey, often on rocky ridges or in gullies.	4	28/10/1934	Negligible - limited number of historical species records and no suitable habitat likely to occur in Structure Plan Area
Polytelis swainsonii	Superb Parrot	Vulnerable	Endangered	Found along timbered waterways and nearby well-watered woodlands, especially in River Red Gums along the Murray and Murrumbidgee Rivers. They are usually seen in family parties or small flocks. They roost communally in trees.	1	14/08/1999	Negligible – no suitable habitat considered likely to support the species
Lathamus discolor	Swift Parrot	Critically Endangered	Critically Endangered	Breeds in Tasmania and overwinters in Victoria. Found in dry sclerophyll forests and woodlands, suburban parks and gardens where it feeds on the nectar of flowering eucalypts, namely Grey, Red Ironbark, Mugga Ironbark, Yellow Gum and White Box. Also feed on lerp psyllids amongst Red Gum.	15	3/05/1998	Low - limited number of historical species records and no suitable habitat likely to occur in Structure Plan Area
Hirundapus caudacutus	White-throated Needletail	Vulnerable	Vulnerable	Almost exclusively aerial, over a wide variety of habitats	32	10/02/2020	Low – species is exclusively aerial and unlikely to utilise planted vegetation in the Structure Plan Area
FISH							
Prototroctes maraena	Australian Grayling	Vulnerable	Endangered	Occurs in streams and rivers on the eastern and southern flanks of the Great Dividing Range, from Sydney, southwards to the Otway Ranges of	0	PMST	Negligible - no previous species records and no suitable habitat likely to occur in the Structure Plan Area

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				Victoria and in Tasmania. The species is found in fresh and brackish waters of coastal lagoons.			
Galaxiella pusilla	Dwarf Galaxias	Vulnerable	Endangered	Slow flowing, still shallow permanent and temporary freshwater habitats.	0	PMST	Negligible - no previous species records and no suitable habitat likely to occur in the Structure Plan Area
Maccullochella peelii	Murray Cod	Vulnerable	Endangered	Distributed throughout the Murray-Darling Basin.	2	11/02/1922	Negligible - limited number of historical species records and no suitable habitat likely to occur in Structure Plan Area
Bidyanus bidyanus	Silver Perch	Critically Endangered	Endangered	Inhabits faster flowing water in the Murray-Darling system	2	1/02/1988	Negligible - limited number of historical species records and no suitable habitat likely to occur in Structure Plan Area
Nannoperca obscura	Yarra Pygmy Perch	Vulnerable	Vulnerable	Preferring slow-moving or still waters including rivers, streams and lakes. Often located in sites that contain abundant submerged and emergent aquatic vegetation and wood debris.	0	PMST	Negligible - no previous species records and no suitable habitat likely to occur in the Structure Plan Area
INVERTEBRATES							
Paralucia pyrodiscus lucida	Eltham Copper Butterfly	Endangered	Endangered	Endemic to Victoria, where it is known from three remnant areas, including the Eltham-Greensborough area of Melbourne, in the Castlemaine/Bendigo area of central Victoria, and in the Kiata-Nhill-Dimboola area in northwest Victoria.	0	PMST	Negligible - no previous species records and no suitable habitat likely to occur in the Structure Plan Area
Engaeus victoriensis	Foothill Burrowing Crayfish		Endangered	Found in large cavernous burrows in grey, clay-dominated soils in temperate, wet sclerophyll forest at the foot of the Dandenong Ranges. The largest male found was 30.1 mm carapace length. Mature females ranged from 24.2 to 38.5 mm carapace length. The largest non-reproductive female was 29.3 mm carapace length (Horwitz 1990).	1	8/11/1905	Negligible - limited number of historical species records and no suitable habitat likely to occur in Structure Plan Area
Synemon plana	Golden Sun Moth	Vulnerable	Vulnerable	Occurs in grassy areas in the greater Melbourne region, mainly in areas dominated by native grasses such as wallaby grass and spear grass, but also in areas of introduced grasses such as Chilean Needle-grass.	0	PMST	Negligible - no previous species records and no suitable habitat likely to occur in the Structure Plan Area

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Temognatha sanguinipennis	Jewel Beetle		Endangered	Living in variable environments including woodlands, forests and heathland.	1	22/02/1970	Negligible - limited number of historical species records and no suitable habitat likely to occur in Structure Plan Area
MAMMALS							
Petauroides volans	Southern Greater Glider	Endangered	Endangered	Greater Gliders are distributed throughout forested parts of eastern Victoria, including inland and southern falls of the Great Dividing Range, as well as the Strzelecki and Strathbogie Ranges. Greater Gliders are forest dependent and prefer older tree age classes in moist forest types. Typically found in highest abundance in taller, montane, moist eucalypt forests with relatively old trees and abundant hollows.	0	PMST	Negligible - no previous species records and no suitable habitat likely to occur in the Structure Plan Area
Pteropus poliocephalus	Grey-headed Flying-fox	Vulnerable	Vulnerable	Requires foraging resources and roosting sites. The primary food source is blossom from Eucalyptus and related genera but commonly forages on fruit trees in urban areas. Two known Flying Fox camps occur in the greater Melbourne region including one at Yarra Bend and one at Doveton.	18	28/12/2017	Moderate – recent species records. Habitat suitability in the form of street trees and planted trees provide temporary habitat for the species
Pseudomys novaehollandiae	New Holland Mouse	Vulnerable	Endangered	Open heathlands, woodlands and dry sclerophyll forests with a heath understorey, grasslands and vegetated sand dunes	0	PMST	Negligible – no previous species records and no suitable or preferred habitat present
Ornithorhynchus anatinus	Platypus		Vulnerable	Inhabits freshwater streams, ranging from alpine creeks to tropical lowland rivers; also lakes, shallow reservoirs and farm dams. Prefers areas with steep, vegetated banks in which to burrow; entrances concealed under overhangs or vegetation.	1	1/01/1909	Negligible - limited number of historical species records and no suitable habitat likely to occur in Structure Plan Area
Isoodon obesulus obesulus	Southern Brown Bandicoot	Endangered	Endangered	Inhabits areas of dense ground cover in heathland, shrubland, sedgeland, heathy open forest and woodland. Suitable habitat includes any areas of vegetation (native or introduced) within the species range, that comprises an understorey vegetation structure with 50–80% foliage cover in the 0.2–1 m height range.	1	1/02/1949	Negligible - limited number of historical species records and no suitable habitat likely to occur in Structure Plan Area
Dasyurus maculatus maculatus	Spot-tailed Quoll	Endangered	Endangered	Temperate and subtropical rainforests in mountain areas wet schlerophyll forest lowland forests open and closed eucalypt woodlands.	0	PMST	Negligible - no previous species records and no suitable habitat likely to occur in the Structure Plan Area

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Antechinus minimus maritimus	Swamp Antechinus	Vulnerable	Vulnerable	Habitat includes dense wet heathlands, tussock grasslands, sedgelands, damp gullies, swamps and some shrubby woodlands	0	PMST	Negligible - no previous species records and no suitable habitat likely to occur in the Structure Plan Area
Petaurus australis australis	Yellow-bellied Glider	Vulnerable	Vulnerable	Found at altitudes between sea level to 1400 m above sea level and has a widespread but patchy distribution from south-eastern QLD to near the SA-Vic border in eucalypt-dominated woodlands and forests, including both wet and dry sclerophyll forests.	0	PMST	Negligible - no previous species records and no suitable habitat likely to occur in the Structure Plan Area
REPTILES							
Aprasia parapulchella	Pink-tailed Worm-lizard	Vulnerable	Endangered	Habitat includes rocky outcrops or scattered partly buried rocks in grassland and woodland in south-east Australia.	0	PMST	Negligible – no previous species records and no suitable habitat present
Emydura macquarii	Murray River Turtle		Critically Endangered	Rivers, creeks, dams and lagoons associated with the Murray-Darling drainage systems of south east Australia.	5	5/12/2018	Low – Although suitable habitat occurs in the Surrey Hills wetland, there is no habitat connectivity or major tributaries enabling the species to disperse into the Structure Plan Area.
Delma impar	Striped Legless Lizard	Vulnerable	Endangered	Inhabits intact grassland habitats where it shelters in grass tussocks, under rocks and in cracks in the soil	0	PMST	Negligible - no previous species records and no suitable habitat likely to occur in the Structure Plan Area
Lissolepis coventryi	Swamp Skink	Endangered	Endangered	Often restricted to densely vegetated swamps and associated watercourses, and adjacent wet heaths (Melaleuca or Leptospermum thickets), sedgelands and saltmarshes. Can occur in association with freshwater and saltmarsh environments.	0	PMST	Negligible - no previous species records and no suitable habitat likely to occur in the Structure Plan Area

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