

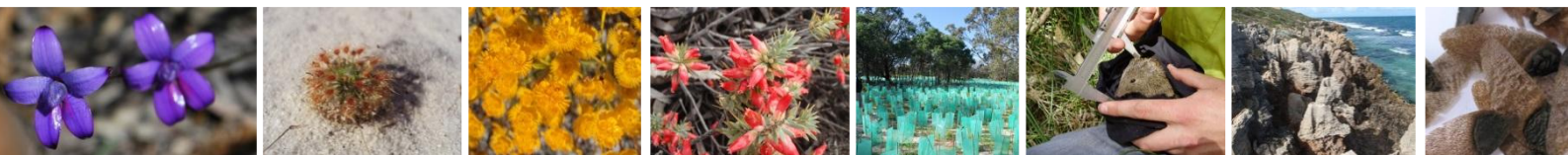


Natural Area
CONSULTING MANAGEMENT SERVICES

City of Kalamunda

Canning Road Environmental Assessment

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Ngala kaaditj Noongar moort keyen kaadak nidja boodja.

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Executive Summary

Natural Area Consulting Management Services (Natural Area) was contracted by the City of Kalamunda to undertake an environmental assessment of a portion of Canning Road in Carmel. The City of Kalamunda is seeking to implement road safety improvements with funding support from the Federal Government's National Blackspot Program. The environmental assessment undertaken across the site included a reconnaissance flora survey, targeted flora survey, basic fauna survey and black cockatoo habitat assessment to assist with relevant approvals.

The environmental assessments across the survey area determined:

- 187 flora species (taxa) were recorded from 48 families during the field survey, comprised of 74 introduced (weeds) and 113 native species.
- Three conservation significant flora species:
 - *Grevillea olivacea* (Olive Grevillea; P4)
 - *Grevillea thelemanniana* (Spider Net Grevillea; CR)
 - *Stylidium striatum* (Fan-leaved Triggerplant; P4)
- *Grevillea olivacea* and *Grevillea thelemanniana* were identified within a landscaped verge.
- Two declared pests and Weed of National Significance (WoNS) were identified within the survey site, Bridal Creeper (**Asparagus asparagoides*) and Blackberry (**Rubus ulmifolius*).
- Three vegetation types were recorded within the survey area, including *Eucalyptus marginata* and *Corymbia calophylla* woodland, *Banksia sessilis* shrubland, and introduced herbland.
- Vegetation condition on site ranged from completely degraded to very good.
- 16 native fauna species from 13 families were recorded.
- One conservation significance species was recorded within the survey site during the survey, Red-tailed Black Cockatoo (*Calyptorhynchus banksii naso*), this species is listed as Vulnerable under the EPBC Act.
- 111 trees that satisfied the Commonwealth guidelines for black cockatoo habitat trees (trees with DBH ≥500 mm).
- Three potential black cockatoo habitat trees contained hollows, with two trees containing potential suitable breeding hollows.
- A foraging quality score of 8 for the Red-tailed Black Cockatoo and a score of 10 for Carnaby's Cockatoo and Baudin's Cockatoo.
- None of the surveyed trees contained evidence of nesting fauna.
- Evidence of foraging from black cockatoo were recorded underneath 36 (32 %) of the trees surveyed across the area.

It is recommended that vegetation in a very good or higher condition is retained to conserve biodiversity values and that populations of *Stylidium striatum* (P4) are retained. The City of Kalamunda is to ensure that all hollows are inspected for native fauna occupancy prior to felling. If nesting birds species are found, including eggs or chicks, they are to be left in situ until chicks have fully fledged. During felling and clearing, an approved fauna spotter is to be onsite to assist with the relocation of any displaced fauna species.

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1.0 Introduction

Natural Area Consulting Management Services (Natural Area) was contracted by the City of Kalamunda to undertake an environmental assessment of a portion of Canning Road in Carmel. The City of Kalamunda is seeking to implement road safety improvements with funding support from the Australian Government Black Spot Program. The environmental assessment undertaken across the site included a reconnaissance flora survey, targeted flora survey, basic fauna survey and black cockatoo habitat assessment to assist with relevant approvals.

1.1 Location

The survey area forms a portion of Canning Road in Carmel, from approximately Welshpool East Road to Glenisla Road, SLK 5.83 – SLK 8.99. The site is located approximately 22 km east of Perth Central Business District (CBD) (Figure 1).

1.2 Legislative Context

State and Federal environment-related laws impact how environmental values are governed in Western Australia. The following legislation and policies are relevant to this report.

1.2.1 Relevant Legislation

Biosecurity and Agriculture Management Act 2007 (WA)

The *Biodiversity and Agriculture Management Act 2007* (BAM Act) regulates the framework for plant and animal pest and disease biosecurity in Western Australia. The framework provides for the control of declared flora and fauna species (declared organisms) that are known to be a significant environmental threat and the management, control and prevention of these declared plants and animals.

Biodiversity Conservation Act 2016 (WA)

The *Biodiversity Conservation Act 2016* (BC Act) aims to protect and conserve biodiversity as well as to promote the ecologically sustainable use of biodiversity components in the State. The BC Act provides the statute relating to conservation and legal protection of flora, fauna, and ecological communities. The BC Act follows the principles of ecologically sustainable development, detailing that decision-making processes should effectively integrate long-term and short-term economic, environmental, social, and equity considerations.

Environmental Protection Act 1986 (WA)

The *Environmental Protection Act 1986* (EP Act) provides for the prevention, control and abatement of pollution and environmental harm, for the conservation, preservation, protection, enhancement, and management of the environment connected with the foregoing. The Environmental Protection Authority (EPA) is established under this act and provides a structured policy framework that is consistent with the EP Act. The EPA produces the guidelines and procedures associated with conducting environmental assessments in line with the EP Act.

Environment Protection and Biodiversity Conservation Act 1999 (Cth)

The Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) serves to protect and manage nationally and internationally important flora, fauna, ecological communities, and heritage places. The primary objective of the EPBC Act is to promote the conservation of biodiversity and the sustainable use of natural resources while allowing for ecologically sustainable development. The EPBC Act allows for the creation of conservation agreements between the Australian government and individuals, communities, or organisations to support the conservation of biodiversity.

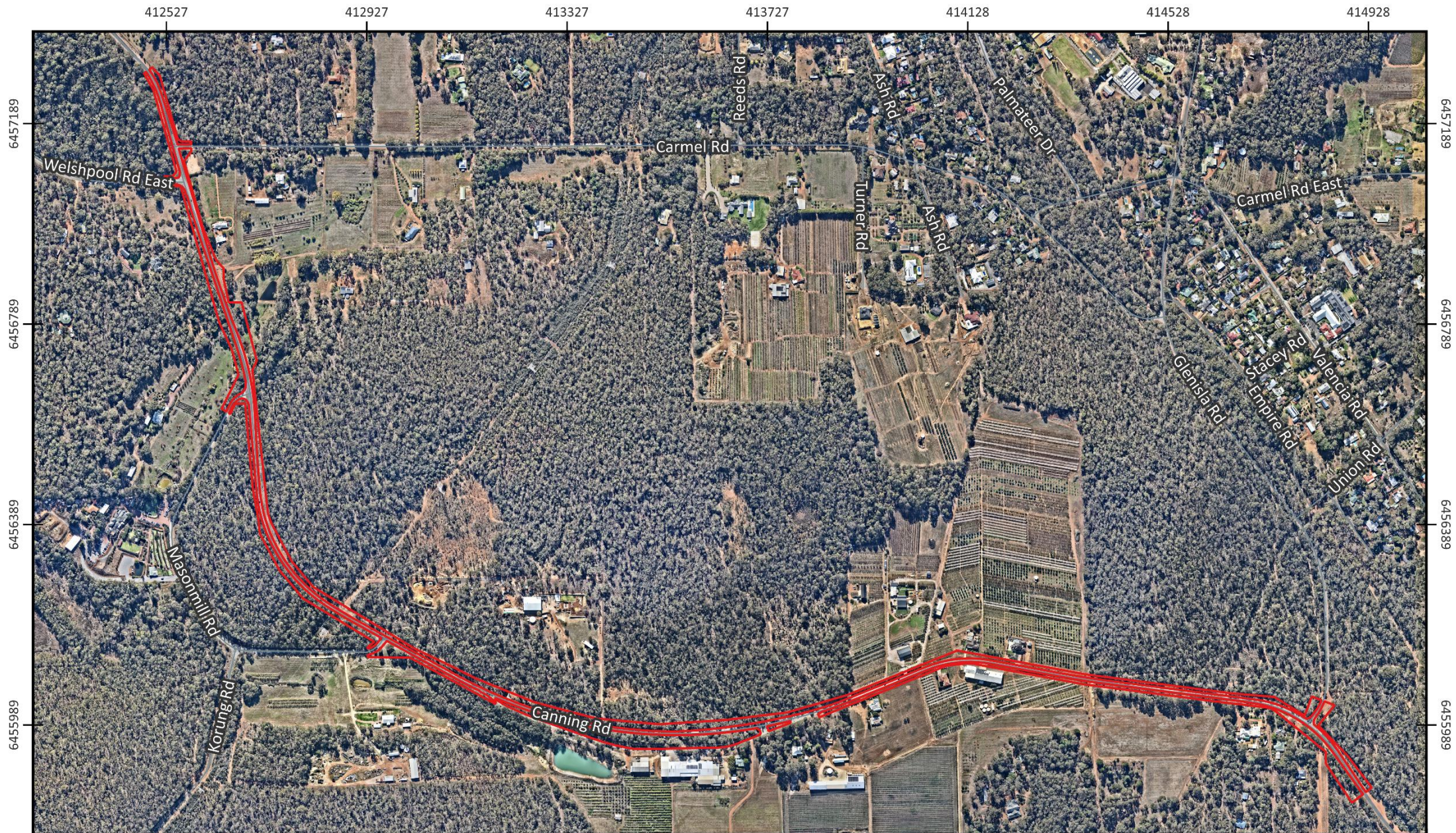


Figure 1:
Site Location SLK 5.83 - SLK 8.99



Canning Road, Carmel

Legend

Survey Area

Client: City of Kalamunda
Date: 19/08/2024
Created by: Z. Stoney
Image Source: Nearmap, 2024
Datum: GDA2020 / MGA zone 50
Scale: 1: 10000

0 100 200 m



2.0 Site Characteristics

2.1 Regional Context

The site is located within the western portion of the Northern Jarrah Forrest IBRA subregion (Department of Climate Change, Energy, the Environment and Water (DCCEEW), 2024a). This region is characterised by sand sheets and granite rocks, with occasional granite hills. Soils are generally comprised of laterite gravels, clayey soils, eluvial and alluvial deposits and Mesozoic sediments. The laterite gravels generally host Jarrah – Marri forests, while Wandoo – Marri woodlands occur on clayey soils. Jarrah forests with species rich shrublands are found on Mesozoic sediments and Agonis shrublands are found within areas of eluvial and alluvial deposits (Williams and Mitchell, 2001).

2.2 Climate

The survey site is located within the Mediterranean climatic zone, which is characterised by dry, hot summers and cool, wet winters. According to the Bureau of Meteorology (BoM), Perth Airport site ID, 009021, the long-term average climate conditions for the region are:

- average rainfall of 757.5 mm per annum, with majority of rainfall between May and August (1944 - 2024)
- average maximum temperature range of 19 °C in winter to 32 °C in summer (1944 - 2024)
- average minimum temperature ranging from 8.1 °C in winter to 15.1 °C in summer (1944 - 2024).

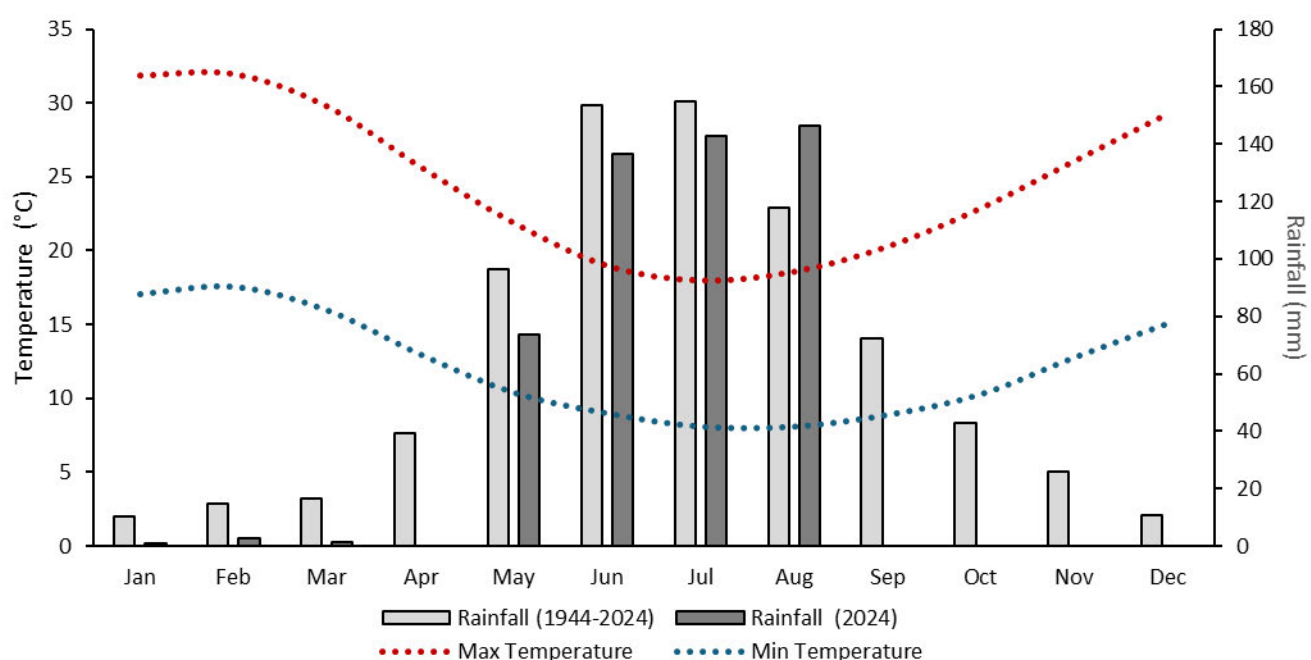


Figure 2: Temperature and rainfall data (1994 - 2024) from Perth Airport site ID 009021. Source: BoM, 2024a.

2.3 Topography and Soils

Three soil types were identified at site, being the Dwellingup 2 phase, the Yarragil 1 phase and the Yarragil 4 phase (Department of Primary Industries and Regional Development (DPIRD), 2022). Elevation across the site ranged from 227 m Australian Height Datum (AHD) in the centre portion of the survey to 289 m AHD in the most southern end of the survey area (Geoscience Australia, 2024). The soil types across the survey area are described in Table 1 and displayed in Figure 3.

Table 1: Soil types within the survey area

Name	Symbol	Description
Dwellingup 2 phase	255DpDW2	Very gently to gently undulating terrain (<10 %) with well drained, shallow to moderately deep gravelly brownish sands, pale brown sands and earthy sands overlying lateritic duricrust.
Yarragil 1 phase	255DPYG1	Very gentle to moderately inclined concave side slopes. Moderately well drained yellow duplex soils and yellow and brown massive earths and gravels. Woodland of <i>Eucalyptus wandoo</i> , <i>E. marginata</i> , <i>E. accedens</i> . <i>Casuarina obesa</i> on salt affected areas.
Yarragil 4 phase	255DPYG4	Valley floors with some poorly drained mottled yellow duplex soils and gentle lower slopes with moderately well to well drained loamy and sandy earths, gravels and duplex soils. Low woodland of <i>Eucalyptus wandoo</i> , <i>E. marginata</i> and <i>Acacia</i> spp.

Source: DPIRD, 2022.

2.4 Vegetation Complex

One vegetation complex exists within the site boundary, Yarragil 1 (DBCA, 2018a). It is described as an “Open forest of *Eucalyptus marginata* subsp. *marginata*-*Corymbia calophylla* on slopes with mixtures of *Eucalyptus patens* and *Eucalyptus megacarpa* on the valley floors in humid and subhumid zones” (Heddlé *et al.*, 1980).

The pre-European extent of this vegetation complex remaining is:

- 80.95 % within the Jarrah Forrest
- 72.01 % within the City of Kalamunda (Government of Western Australia, 2019).

2.5 Black Cockatoo Habitat

There is the potential for the three threatened black cockatoos and their habitat to occur on site, including the Carnaby’s Cockatoo (*Zanda latirostris*) listed as Endangered under the EPBC Act 1999 (Cwlth), the Red-tailed Black Cockatoo (*Calyptorhynchus banksia naso*) and the Baudin’s Black Cockatoo (*Zanda baudinii*) listed as Vulnerable. All are listed as Threatened under the *Biodiversity Conservation Act 2016* (WA).

According to DBCA, the survey site occurs or partly occurs within an area classified as:

- Carnaby’s Cockatoo unconfirmed roosting site (buffered 6 m) (DBCA, 2018b)
- Carnaby’s Cockatoo confirmed roosting site (buffered 6 m) (DBCA, 2018c)
- black cockatoo roosting site (buffered) (DBCA, 2019)
- Carnaby’s Cockatoo unconfirmed breeding site (DBCA, 2018d)
- Carnaby’s Cockatoo confirmed breeding site (DBCA, 2018e)
- requiring investigation into feeding habitat for Carnaby’s Cockatoo (DBCA, 2018f).

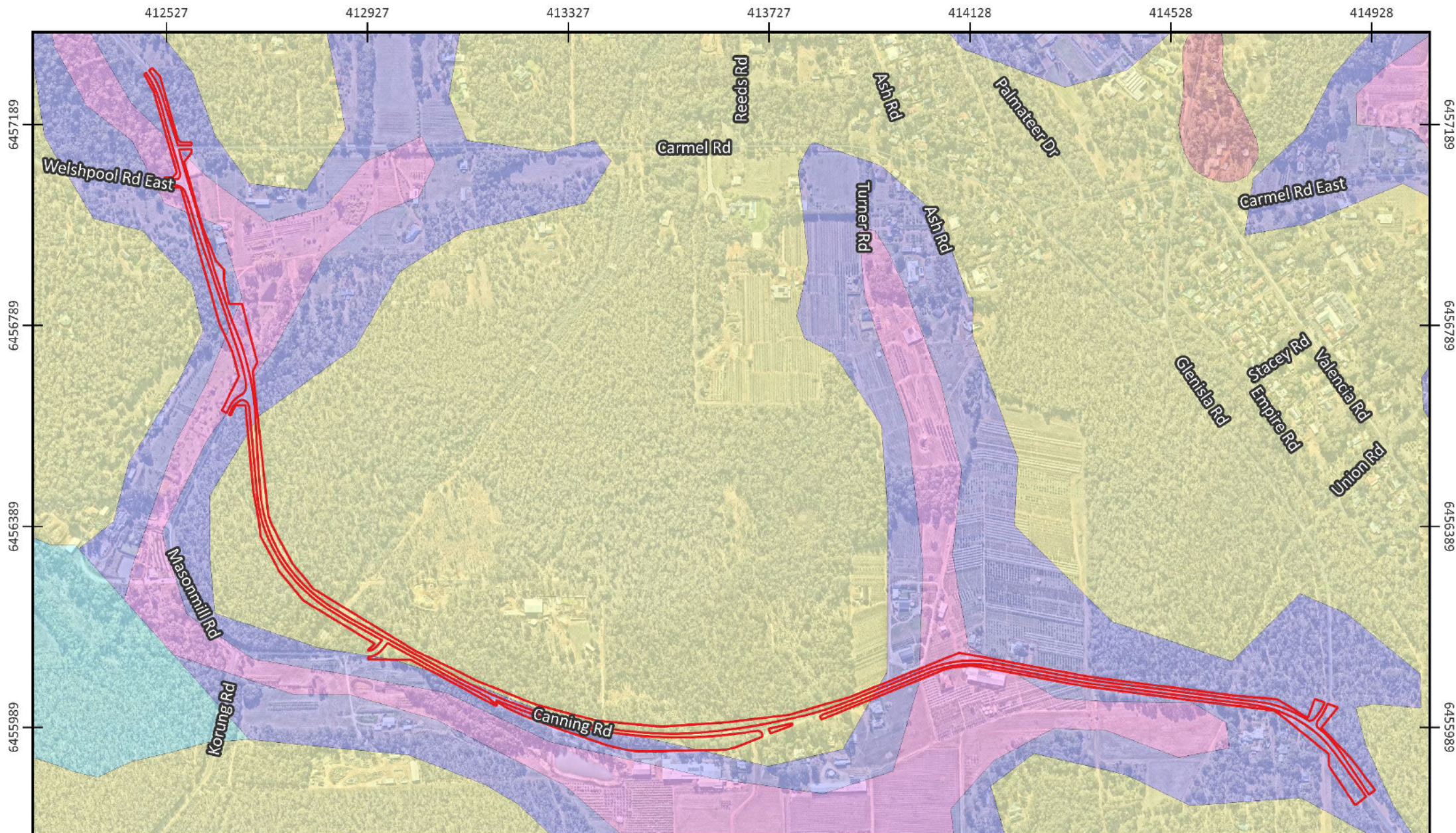


Figure 3:
Topography and Soils



Canning Road, Carmel

Legend

- Dwellingup 1 phase
- Dwellingup 2 phase
- Myara 1 phase
- Yarragil 1 phase
- Yarragil 4 phase
- Survey Area

Client: City of Kalamunda
 Date: 19/08/2024
 Created by: [REDACTED]
 Image Source: Nearmap, 2024
 Datum: GDA2020 / MGA zone 50
 Scale: 1: 10000

0 100 200 m



3.0 Methodology

3.1 Desktop and Literature Review

The desktop survey included reviewing online databases to gather contextual knowledge and determine preliminary site characteristics including:

- likely native and non-native flora and fauna species present
- current extent of native vegetation
- general floristic community types
- likely presence of threatened or priority flora and fauna species
- likely presence of any threatened or priority ecological communities.

The following databases were accessed to obtain relevant information:

- NatureMap (Department of Biodiversity, Conservation and Attractions (DBCA), 2024a)
- Dandjoo (DBCA, 2024b)
- Protected Matters Search Tool (Department of Climate Change, Energy, the Environment and Water (DCCEEWS)), 2024b) (Appendix 1)
- FloraBase (WA Herbarium, 2024)
- Threatened and priority flora database search (DBCA, 2024c)
- Threatened and priority fauna database search (DBCA, 2024d)
- Threatened and priority ecological community database search (DBCA, 2024e).

Conservation code definitions for the State and Commonwealth are provided in Appendix 2. Information relating to conservation significant species from database searches were summarised into field reference guides to aid with on-ground flora survey which is provided in Appendix 3.

3.2 Reconnaissance Flora Survey

The flora and vegetation survey was conducted in accordance with *Technical Guidance-Flora and Vegetation Surveys for Environmental Impact Assessment* (Environmental Protection Authority (EPA), 2016). Samples were collected, or photographs taken of unfamiliar species to enable later identification.

Natural Area environmental scientists undertook the survey on July 31, 2024, with key data recorded using QField software on a handheld tablet. Survey activities included:

- Traversing the entirety of the site and recording all species present, including native and invasive species.
- Marking locations of any conservation significant flora, declared pests and/or Weeds of National Significance (WoNS) identified.
- Recording vegetation type including dominant over, middle and understorey species to describe vegetation type in line with the National Vegetation Information System (NVIS) Level V – Association (Executive Steering Committee for Australian Vegetation Information (ESCAVI), 2003).
- Recording vegetation condition using the scale attributed to Keighery (Table 2).
- The use of GPS to map significant species and boundaries of differing vegetation type and condition.
- Recording evidence of disturbance, such as fire.

3.2.1 Vegetation Type

Vegetation type is described using the structural classes outlined in the Australian Vegetation Attribute Manual (ESCAVI, 2003). Vegetation type is described to Level V (Association). This includes the dominant growth form, height, cover and three dominant species for each strata (ESCAVI, 2003).

3.2.2 Vegetation Condition

Vegetation condition was assessed using the rating scale attributed to Keighery in *Technical Guidance-Flora and Vegetation Surveys for Environmental Impact Assessment* (EPA, 2016) (Table 2). Table 2 provides a description of the rating scale.

Table 2: Vegetation condition ratings

Category		Description
1	Pristine	Pristine or nearly so, no obvious signs of disturbance or damage caused by human activities since European settlement.
2	Excellent	Vegetation structure intact, disturbance affecting individual species and weeds are non-aggressive species. Damage to trees caused by fire, the presence of non-aggressive weeds and occasional vehicle tracks.
3	Very Good	Vegetation structure altered, obvious signs of disturbance. Disturbance to vegetation structure caused by repeated fires, the presence of some more aggressive weeds, dieback, logging and grazing.
4	Good	Vegetation structure significantly altered by very obvious signs of multiple disturbances. Retains basic vegetation structure or ability to regenerate it. Disturbance to vegetation structure caused by very frequent fires, the presence of some very aggressive weeds, partial clearing, dieback and grazing.
5	Degraded	Basic vegetation structure severely impacted by disturbance. Scope for regeneration but not to a state approaching good condition without intensive management. Disturbance to vegetation structure caused by very frequent fires, the presence of very aggressive weeds at high density, partial clearing, dieback and grazing.
6	Completely Degraded	The structure of the vegetation is no longer intact, and the area is completely or almost completely without native species. These areas are often described as 'parkland cleared' with the flora comprising weed or crop species with isolated native trees or shrubs.

Source: EPA, 2016.

3.3 Targeted Flora Survey

The targeted flora survey was conducted in accordance with *Technical Guidance-Flora and Vegetation Surveys for Environmental Impact Assessment* (Environmental Protection Authority (EPA), 2016). Natural Area environmental scientists undertook the survey on October 30, 2024, with key data recorded using QField software on a handheld tablet. Survey activities included:

- Traversing the entirety of the site and conducting a search for conservation significant flora species with the potential to occur in the area
- Marking locations of any conservation significant flora identified and determining population size and extent.

3.4 Basic Fauna Survey

The fauna survey was completed in accordance with a basic fauna survey as outlined in the *Technical Guidance, Terrestrial vertebrate fauna surveys for environmental impact assessment* (EPA, 2020). Natural Area environmental scientists traversed the site on July 31, 2024, and undertook this survey in conjunction with other survey activities. A basic survey is defined as a low-intensity survey, which gathers broad fauna and habitat information including opportunistic fauna observations (EPA, 2020). The fauna survey included recording opportunistic sightings of fauna species while traversing the survey area, along with recording evidence of their presence in the form of:

- scats
- tracks
- diggings
- burrows, dens and warrens
- runnels (vegetative tunnels)
- calls.

3.5 Black Cockatoo Habitat Assessment

A black cockatoo habitat assessment was conducted in accordance with *Referral guideline for 3 WA threatened black cockatoo species: Carnaby's Cockatoo, Baudin's Cockatoo and the Forest Red-tailed Black-cockatoo* (DAWE, 2022).

Natural Area environmental scientists undertook the survey between August 27 and 28, 2024, with key data recorded using QField software on a handheld tablet. Survey activities included:

- Traversing the whole site in a systematic grid search.
- Recording the location and evidence of breeding, roosting and foraging activities (e.g. chew marks, feathers, scats, chewed nuts).
- Marking the GPS locations of each habitat tree with a diameter at breast height (DBH) ≥ 500 mm.
- Recording the height, DBH, health, and species of each habitat tree.
- Recording evidence of hollows, including size, type, and location within the tree.
- Recording foraging habitat, vegetation type, and condition..

The black cockatoo foraging quality scoring tool (DAWE, 2022) was applied to the survey area to determine the quality of black cockatoo foraging habitat. This scoring tool assigns a habitat score between 1 and 10, with a score of 10 representing the maximum possible score and very high-quality foraging habitat. Contextual adjustors (attributes that improve or reduce functionality of foraging habitat) such as tree species composition, distances from known breeding and roosting sites, distance from other foraging habitat, evidence of feeding debris, and presence of disease e.g. *Phytophthora* spp. or Marri Canker were used to evaluate habitat quality. The scoring tool template is provided in Table 3.

A refined scale scoring tool was also applied to each individual tree using the Bamford tree scoring matrix (Bamford, 2016), in addition to the assessment against the Commonwealth guidelines (DAWE, 2022). The Bamford tree scoring matrix (Table 4) classes trees according to their individual characteristics (evidence of use, type, and size of hollow present).

Table 3: Foraging quality scoring tool template

Starting score		Baudin's Cockatoo	Carnaby's Cockatoo	Red-tailed Black Cockatoo
10		Start at a score of 10 if your site is native eucalypt woodlands and forest, and proteaceous woodland and heath, particularly Marri, within the range of the species, including along roadsides and parkland cleared areas. Can include planted vegetation. This tool only applies to sites equal to or larger than 1 hectare in size.	Start at a score of 10 if your site is native shrubland, kwongan heathland or woodland, dominated by proteaceous plant species such as Banksia spp. (including Dryandra spp.), Hakea spp. and Grevillea spp., as well as native eucalypt woodland and forest that contains foraging species, within the range of the species, including along roadsides and parkland cleared areas. Also includes planted native vegetation. This tool only applies to sites equal to or larger than 1 hectare in size.	Start at a score of 10 if your site is Jarrah or Marri woodland and/or forest, or if it is on the edge of Karri forest, or if Wandoo and Blackbutt occur on the site, within the range of the subspecies, including along roadsides and parkland cleared areas. This tool only applies to sites equal to or larger than 1 hectare in size.
Attribute	Sub-tractions	Context adjustor (attributes reducing functionality of foraging habitat)		
Foraging potential	-2	Subtract 2 from your score if there is no evidence of feeding debris on your site.	Subtract 2 from your score if there is no evidence of feeding debris on your site.	Subtract 2 from your score if there is no evidence of feeding debris on your site.
Connectivity	-2	Subtract 2 from your score if you have evidence to conclude that there is no other foraging habitat within 12 km of your site.	Subtract 2 from your score if you have evidence to conclude that there is no other foraging habitat within 12 km of your site.	Subtract 2 from your score if you have evidence to conclude that there is no other foraging habitat within 12 km of your site.
Proximity to breeding	-2	Subtract 2 if you have evidence to conclude that your site is more than 12 km from breeding habitat.	Subtract 2 if you have evidence to conclude that your site is more than 12 km from breeding habitat	Subtract 2 if you have evidence to conclude that your site is more than 12 km from breeding habitat.
Proximity to roosting	-1	Subtract 1 if you have evidence to conclude that your site is more than 20 km from a known night roosting habitat.	Subtract 1 if you have evidence to conclude that your site is more than 20 km from a known night roosting habitat.	Subtract 1 if you have evidence to conclude that your site is more than 20 km from a known night roosting habitat.
Impact from significant plant disease	-1	Subtract 1 if your site has disease present (e.g. Phytophthora spp. or Marri canker) and the disease is affecting more than 50% of the preferred food plants present.	Subtract 1 if your site has disease present (e.g. Phytophthora spp. or Marri canker) and the disease is affecting more than 50% of the preferred food plants present.	Subtract 1 if your site has disease present (e.g. Phytophthora spp. or Marri canker) and the disease is affecting more than 50% of the preferred food plants present.
Total score		Enter score	Enter score	Enter score
Appraisal		To support your habitat score, you should provide an overall appraisal of the habitat on the impact site and within 20km of the impact area to clearly explain and justify the score. It should include discussion on the foraging habitat's proximity to other resources (e.g. exact distance to proximate resources), frequency of use of proximate sites, the degree of evidence and description of vegetation type and condition.		

Source: DAWE, 2022.

Table 4: Bamford tree scoring matrix

Class	Description of Trees and Hollows/ Activity
1	Active nest observed; adult (or immature) bird seen entering or emerging from hollow
2	Hollow of suitable size and angle (i.e. near vertical) visible with chew marks around entrance
3	Potentially suitable hollow visible but no chew marks present; or potentially suitable hollow present (as suggested by structure of tree, such as large, vertical trunk broken off at a height of >10 m)
4	Tree with large hollows or broken branches that might contain large hollows, but hollows or potential hollows are not vertical or near vertical; thus, a tree with or likely to have hollows of sufficient size but not to have hollows of the angle preferred by Black Cockatoos
5	Tree lacking large hollows or broken branches that might have large hollows; a tree with more or less intact branches and a spreading crown

3.6 Limitations

Limitation associated with the flora and fauna survey are provided in Table 3.

Table 3: Flora survey limitations

Potential Limitation	Degree of Limitation	Comments
Availability of contextual information	None	Regional and local contextual information of the site was readily available.
Competency/ experience of team	None	Survey activities were undertaken by experienced environmental scientists who have extensive experience undertaking flora survey within the Swan Coastal Plain bioregion.
Proportion of flora recorded/ collected, any identification issues	Minor	A total of 187 flora species (taxa) were recorded from 48 families during the field survey, comprised of 40 % introduced (weeds) and 60 % native species. Of these, two species (1 %) were unable to be identified to species level. One species ' <i>Eucalyptus</i> sp.' was identified to genus level due to a lack of diagnostic characteristics present at the time of survey. One species was unable to be identified to species level, ' <i>*Phontinia</i> sp.' this is a landscaped plant and is likely a cultivated species. Both of these species do not contain characteristics of conservation significant flora identified as likely to occur within the site.
Survey effort and extent	None	All of the site was traversed across four days in July, August and October.
Access restrictions	None	No access restrictions were encountered across the site.

Potential Limitation	Degree of Limitation	Comments
		The survey was undertaken during July and October. The October survey was conducted within the optimal season for flora surveys within the Swan Coastal Plain subregion. Some species may flower outside of these survey times and may lack key diagnostic features required for identification.
Survey timing	Minor	Of the 10 conservation significant flora species identified in the desktop survey as being likely to occur within the survey area, three have flowering periods outside of the survey period. All of these with flowering periods outside of the survey period are perennial and would have had other features present to allow for identification.
Disturbances	None	No recent disturbances which may have had an impact on survey results were identified during the survey.

4.0 Flora Survey Results

4.1 Desktop Survey

A desktop survey of online databases indicated the potential for a total of 110 conservation significant species to occur within 10 km of the survey area (Table 5). Dandjoo (DBCA, 2024b) indicated 38 conservation significant flora species and Naturemap (DBCA, 2024a) indicated 98 conservation significant flora species listed under the *Biodiversity Conservation Act 2016* (WA) or by the Western Australian Herbarium (2024). A review of the Protected Matters Search Tool (PMST) (DCCEEW, 2024b) indicated 34 significant flora species listed under the *Environment Protection and Biodiversity Conservation Act 1999* (Cwlth) as potentially occurring within a 10 km radius of the site.

A review of the DBCA (2024c) threatened and priority flora database indicated 96 threatened or priority species have been recorded within 10 km of the site. Of the conservation significant species potentially found in the area, it was determined that the site conditions (soil type, drainage, location) may be suitable for 10 (highlighted green) of these species (Table 4). Conservation code descriptions are provided in Appendix 3.

Table 4: Threatened and Priority flora species listed by Dandjoo, PMST and DBCA

Species Name	Cons Code	NatureMap	Dandjoo	PMST	DBCA
<i>Acacia anomala</i>	T / VU	X	X	X	X
<i>Acacia aphylla</i>	T / VU	X	X	X	X
<i>Acacia horridula</i>	P3	X	X		X
<i>Acacia lasiocarpa</i> var. <i>bracteolata</i> long peduncle variant	P1	X			X
<i>Acacia oncinophylla</i> subsp. <i>oncinophylla</i>	P3	X	X		X
<i>Acacia oncinophylla</i> subsp. <i>patulifolia</i>	P4	X	X		X
<i>Allocasuarina grevilleoides</i>	P3	X	X		X
<i>Andersonia gracilis</i>	T / VU	X			X
<i>Andersonia</i> sp. <i>Blepharifolia</i>	P2	X			X
<i>Anthocercis gracilis</i>	T / VU	X			X
<i>Aponogeton hexatepalus</i>	P4	X			X
<i>Asteridea gracilis</i>	P3	X		X	X
<i>Austrostipa bronweniae</i>	T / EN	X			X
<i>Babingtonia urbana</i>	P3	X	X	X	X
<i>Banksia kippistiana</i> var. <i>paenepeccata</i>	P3	X	X		X
<i>Banksia mimica</i>	T / VU	X	X		X
<i>Banksia pteridifolia</i> subsp. <i>vernalis</i>	P3	X	X	X	X

Species Name	Cons Code	NatureMap	Dandjoo	PMST	DBCA
<i>Beaufortia purpurea</i>	P3	X			X
<i>Boronia humifusa</i>	P1	X			X
<i>Borya subulata</i>	P4	X	X	X	X
<i>Bossiaea modesta</i>	P2	X			X
<i>Byblis gigantea</i>	P3	X	X		X
<i>Caladenia huegelii</i>	T / EN	X			X
<i>Calandrinia uncinella</i>	P1	X			X
<i>Calectasia grandiflora</i>	P2	X	X		X
<i>Calothamnus accedens</i>	P4	X			X
<i>Calothamnus graniticus</i> subsp. <i>leptophyllus</i>	P4		X	X	
<i>Calytrix breviseta</i> subsp. <i>breviseta</i>	T / CR	X	X		X
<i>Chamaescilla gibsonii</i>	P3	X	X		X
<i>Chamelaucium lullfitzii</i>	T / EN	X			X
<i>Comesperma griffinii</i>	P2	X			X
<i>Comesperma rhadinocarpum</i>	P3	X	X	X	X
<i>Commersonia</i> sp. <i>Lesmurdie</i>	P2	X			X
<i>Conospermum undulatum</i>	T / VU			X	
<i>Cyanicula ixiioides</i> subsp. <i>ixiioides</i>	P4	X			X
<i>Cyanothamnus tenuis</i>	P4	X			X
<i>Darwinia apiculata</i>	T / EN	X			X
<i>Diplolaena andrewsii</i>	T / EN	X	X	X	X
<i>Diuris brevis</i>	P2	X			X
<i>Diuris drummondii</i>	T / EN	X	X		X
<i>Diuris micrantha</i>	T / VU	X	X	X	X
<i>Diuris purdiei</i>	T / EN			X	
<i>Drakaea elastica</i>	T / EN	X			X
<i>Drakaea micrantha</i>	T / VU	X		X	X
<i>Drosera occidentalis</i>	P4			X	
<i>Eleocharis keigheryi</i>	T / VU	X	X	X	X
<i>Eremophila glabra</i> subsp. <i>chlorella</i>	T / EN		X	X	
<i>Eriochilus glareosus</i>	P1			X	
<i>Eryngium pinnatifidum</i> subsp. <i>Palustre</i>	P3	X			X

Species Name	Cons Code	NatureMap	Dandjoo	PMST	DBCA
<i>Eryngium sp. Subdecumbens</i>	P3	X		X	X
<i>Eucalyptus x balanites</i>	T / EN	X	X	X	X
<i>Goodenia arthrotricha</i>	T / EN	X			X
<i>Grevillea curviloba</i> subsp. <i>incurva</i>	T / EN	X	X		X
<i>Grevillea dissectifolia</i>	P3	X			X
<i>Grevillea flexuosa</i>	T / VU		X	X	
<i>Grevillea pimeleoides</i>	P4	X		X	X
<i>Grevillea thelemanniana</i>	T / CR		X	X	
<i>Haemodorum loratum</i>	P3	X			X
<i>Halgania corymbosa</i>	P3			X	
<i>Hydrocotyle lemnoides</i>	P4	X	X		X
<i>Hydrocotyle striata</i>	P1	X	X	X	X
<i>Isopogon autumnalis</i>	P3	X	X		X
<i>Isotropis cuneifolia</i> subsp. <i>glabra</i>	P3	X			X
<i>Johnsonia pubescens</i> subsp. <i>cygnorum</i>	P2	X			X
<i>Lasiopetalum bracteatum</i>	P4	X			X
<i>Lasiopetalum glutinosum</i> subsp. <i>glutinosum</i>	P3	X			X
<i>Lepidosperma rostratum</i>	T / EN	X			X
<i>Lepyrodia curvescens</i>	P2	X			X
<i>Leucopogon sp. Busselton</i>	P2	X	X		X
<i>Macarthuria keigheryi</i>	T / EN	X			X
<i>Meionectes tenuifolia</i>	P3	X	X	X	X
<i>Melaleuca viminalis</i> var. <i>viminalis</i>	P2	X			X
<i>Microtis quadrata</i>	P4	X			X
<i>Morelotia australiensis</i>	T / VU	X	X	X	X
<i>Myriophyllum echinatum</i>	P3	X			X
<i>Ornduffia submersa</i>	P4	X			X
<i>Paracaleana ferricola</i>	P2	X			X
<i>Pimelea rara</i>	P4	X		X	X
<i>Pithocarpa corymbulosa</i>	P3	X			X
<i>Platysace ramosissima</i>	P3	X			X
<i>Ptilotus pyramidatus</i>	T / CR	X			X

Species Name	Cons Code	NatureMap	Dandjoo	PMST	DBCA
<i>Rytidosperma racemosum</i> var. <i>racemosum</i>	P2	X			X
<i>Schoenus benthamii</i>	P3	X	X		X
<i>Schoenus capillifolius</i>	P3	X			X
<i>Schoenus loliaceus</i>	P2	X			
<i>Schoenus natans</i>	P4	X			X
<i>Schoenus</i> sp. <i>Beaufort</i>	P1	X			
<i>Schoenus pennisetis</i>	P3	X			X
<i>Scholtzia</i> sp. <i>Bickley</i>	EX	X			X
<i>Senecio gilbertii</i>	P1	X			X
<i>Senecio leucoglossus</i>	P4	X			X
<i>Sporobolus blakei</i>	P3	X			X
<i>Stackhousia</i> sp. <i>Red-blotched corolla</i>	P3	X			X
<i>Stylidium aceratum</i>	P3	X	X		X
<i>Stylidium striatum</i>	P4	X			X
<i>Styphelia filifolia</i>	P3	X			X
<i>Synaphea</i> sp. <i>Fairbridge Farm</i>	T / CR	X		X	X
<i>Synaphea</i> sp. <i>Pinjarra Plain</i>	T / EN			X	
<i>Synaphea</i> sp. <i>Serpentine</i>	T / CR			X	
<i>Thelymitra dedmaniarum</i>	T / EN			X	
<i>Thelymitra magnifica</i>	T / CR	X			X
<i>Thelymitra stellata</i>	T / EN	X	X	X	X
<i>Thysanotus anceps</i>	P3	X			X
<i>Thysanotus cymosus</i>	P3	X			X
<i>Thysanotus glaucus</i>	P4	X			X
<i>Verticordia fimbrilepis</i> subsp. <i>fimbrilepis</i>	T / EN			X	
<i>Verticordia lindleyi</i> subsp. <i>lindleyi</i>	P4	X	X		X

4.1.1 Threatened and Priority Ecological Communities

A total of 17 threatened or priority ecological communities were found to occur within 10 km of the site. A review of the PMST report identified six listed Threatened Ecological Communities that could potentially occur within 10 km of the site (DCCEEW, 2024b) (Table 5). A review of the DBCA database search for threatened and priority ecological communities identified 14 threatened or priority ecological communities that occur within 10 km of the site (DBCA, 2024e).

Table 5: Potential threatened and priority ecological communities within 10 km of the site survey

Name	Status (Cwlth)	Status (WA)
<i>Banksia attenuata</i> and/or <i>Eucalyptus marginata</i> woodlands of the eastern side of the Swan Coastal Plain (floristic community type 20b as originally described in Gibson <i>et al.</i> 1994)	EN	CR
<i>Banksia attenuata</i> woodlands over species rich dense shrublands (floristic community type 20a as originally described in Gibson <i>et al.</i> 1994)	EN	CR
<i>Banksia</i> Woodlands of the Swan Coastal Plain ecological community	EN	P3
Central Northern Darling Scarp Granite Shrubland Community		P4
Clay Pans of the Swan Coastal Plain	CR	
<i>Corymbia calophylla</i> - <i>Eucalyptus marginata</i> woodlands on sandy clay soils of the southern Swan Coastal Plain (floristic community type 3b as originally described in Gibson <i>et al.</i> 1994)		EN
<i>Corymbia calophylla</i> - <i>Kingia australis</i> woodlands on heavy soils of the Swan Coastal Plain	EN	CR
<i>Corymbia calophylla</i> - <i>Xanthorrhoea preissii</i> woodlands and shrublands, Swan Coastal Plain (floristic community type 3c as originally described in Gibson <i>et al.</i> 1994)	EN	EN
Empodisma peatlands of southwestern Australia	EN	
Herb rich saline shrublands in clay pans (floristic community type 7 as originally described in Gibson <i>et al.</i> 1994)	CR	EN
Herb rich shrublands in clay pans (floristic community type 8 as originally described in Gibson <i>et al.</i> 1994)	CR	EN
Low lying <i>Banksia attenuata</i> woodlands or shrublands	EN	P3
Shrublands and Woodlands of the eastern Swan Coastal Plain	EN	CR
Shrublands and woodlands on Muchea Limestone of the Swan Coastal Plain	EN	EN
Shrublands on dry clay flats (floristic community type 10a as originally described in Gibson <i>et al.</i> 1994)	CR	EN
Southern wet shrublands, Swan Coastal Plain (floristic community type 2 as originally described in Gibson <i>et al.</i> 1994)		CR
Tuart (<i>Eucalyptus gomphocephala</i>) Woodlands and Forests of the Swan Coastal Plain ecological community	CR	

Source: DCCEEW, 2024b; DBCA, 2024d.

4.2 Flora Survey Results

4.2.1 Flora

A total of 187 flora species (taxa) were recorded from 48 families during the field survey, comprised of 74 introduced (weeds) and 113 native species. Examples of introduced flora species are shown in Figure 4 and native flora species in Figure 5. A complete flora species list is provided in Appendix 4. Three conservation significant flora species were identified within the survey area, *Grevillea olivacea* (Olive Grevillea; P4), *Grevillea thelemanniana* (Spider Net Grevillea; CR), and *Stylidium striatum* (Fan-leaved Triggerplant; P4). A total of 5 *Grevillea olivacea*, 2 *Grevillea thelemanniana* and 72 *Stylidium striatum* recorded across the site. *Grevillea olivacea* and *Grevillea thelemanniana* were identified within a landscaped verge. The locations of conservation significant flora species are provided in Figure 6.

Two declared pests and Weed of National Significance (WoNS) were identified within the survey site, including Bridal Creeper (**Asparagus asparagoides*) and Blackberry (**Rubus ulmifolius*), their locations are shown in Figure 6. Declared pests are listed on the Western Australian Organism List (WAOL) under the *Biosecurity and Agriculture Management Act 2007* (WA). This classification requires the landowner/land manager to control the population to limit damage as a result of the presence of these species (DPIRD, 2019).



Waterbuttons (**Cotula coronopifolia*)



Staggerweed (**Stachys arvensis*)



Bridal Creeper (**Asparagus asparagoides*) (declared pest and WoNS)



Largeflower Wood Sorrel (**Oxalis purpurea*)

Figure 4: Examples of introduced flora species recorded.



Pigea floribunda



Hovea pungens (Devil's Pins)



Daviesia rhombifolia



Chamaescilla corymbosa (Blue Squill)



Daviesia decurrens (Prickly Bitter-pea)



Trymalium ledifolium

Figure 5: Examples of native flora species recorded.

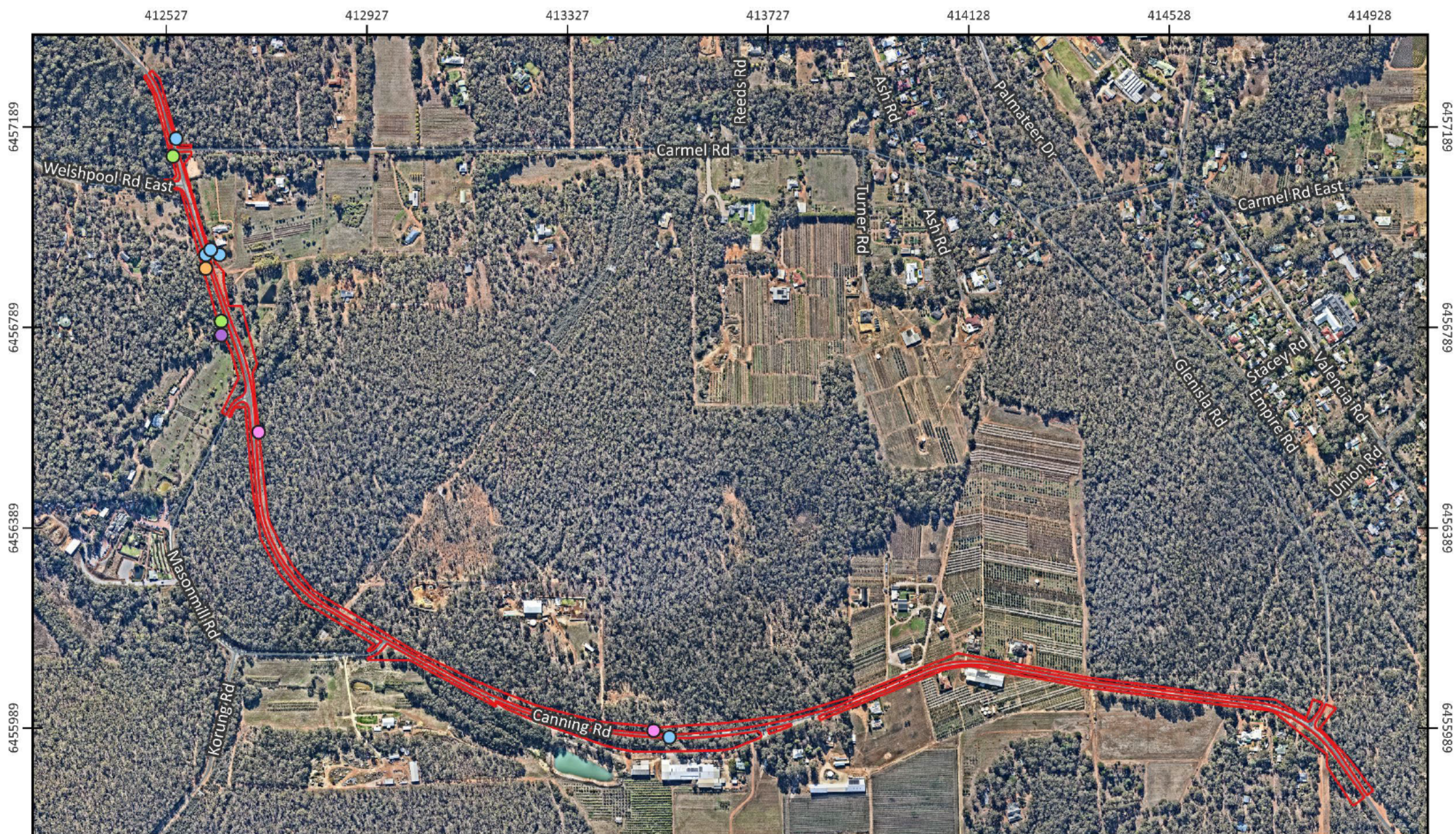


Figure 6:
Conservation Significant Flora, Declared Pests (DP) and
Weeds of National Significance (WoNS)



Canning Road, Carmel

Legend

- Grevillea olivacea (P4)
- Grevillea thelemanniana (T/CR)
- Stylidium striatum (P4)
- *Asparagus asparagoides (DP and WoNS)
- *Rubus ulmifolius (DP and WoNS)
- Survey Area




Client: City of Kalamunda
 Date: 06/11/2024
 Created by: [REDACTED]
 Image Source: Nearmap, 2024
 Datum: GDA2020 / MGA zone 50
 Scale: 1: 10000
 0 100 200 m



4.2.2 Vegetation Types

A total of three vegetation types were recorded within the survey area, including *Eucalyptus marginata* and *Corymbia calophylla* woodland, *Banksia sessilis* shrubland, and introduced herbland. Vegetation types are described in Table 6 and shown in Figures 7 to 9.

Table 6: Vegetation types within the survey area

Vegetation Type	Description	Photograph
<i>Eucalyptus marginata</i> and <i>Corymbia calophylla</i> woodland	A woodland of <i>Eucalyptus marginata</i> and <i>Corymbia calophylla</i> over <i>Xanthorrhoea preissii</i> shrubland over native understorey.	
<i>Banksia sessilis</i> shrubland	A shrubland of <i>Banksia sessilis</i> over native and introduced understorey.	
Introduced herbland	A herbland of introduced flora species	

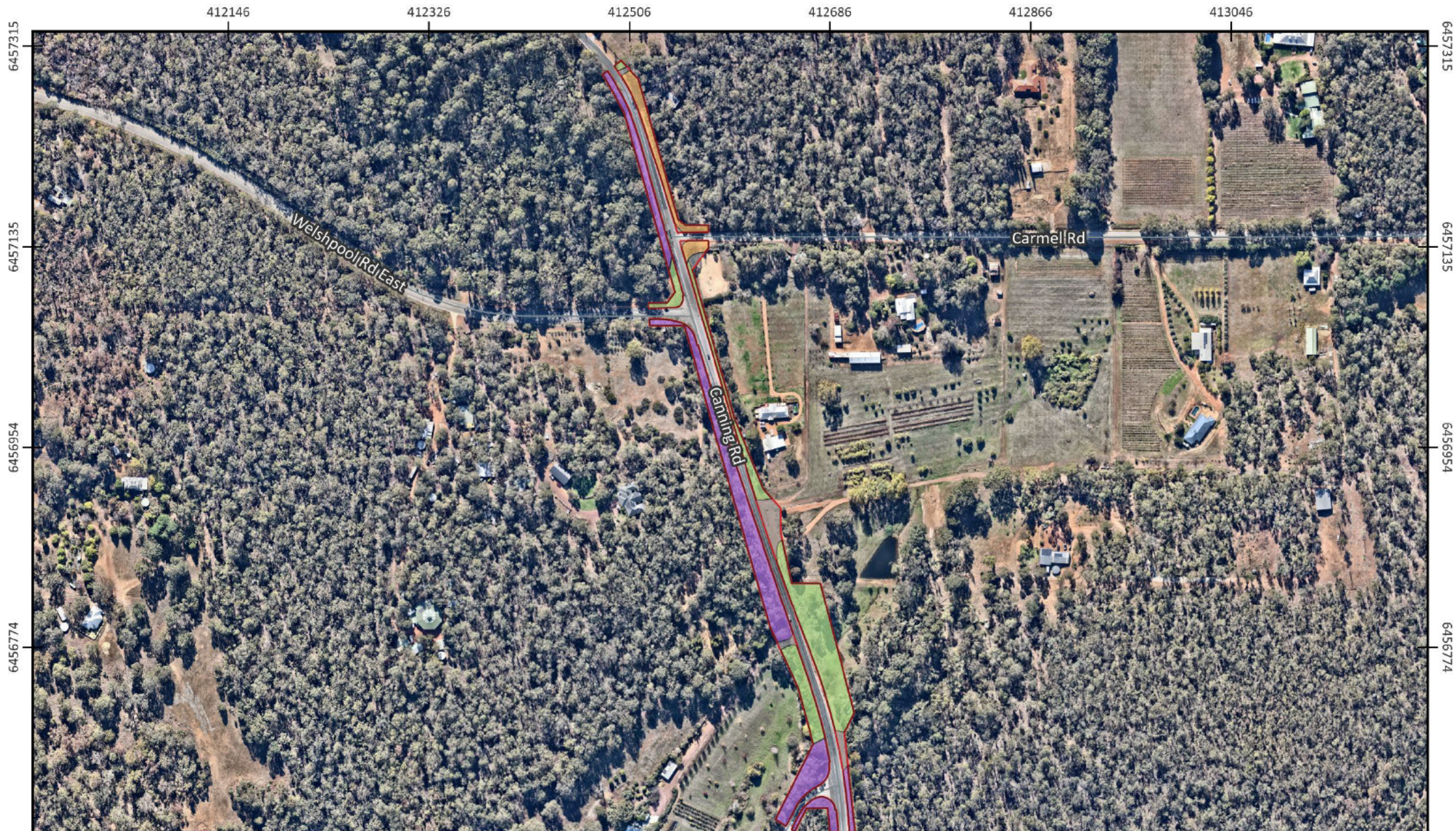


Figure 7:
Vegetation Type



Canning Road, Carmel

Legend

- Banksia sessilis shrubland
- Eucalyptus marginata and Corymbia calophylla woodland
- Introduced hermland
- Completely cleared
- Survey Area

Client: City of Kalamunda
 Date: 20/08/2024
 Created by: [REDACTED]
 Image Source: Nearmap, 2024
 Datum: GDA2020 / MGA zone 50
 Scale: 1: 4500



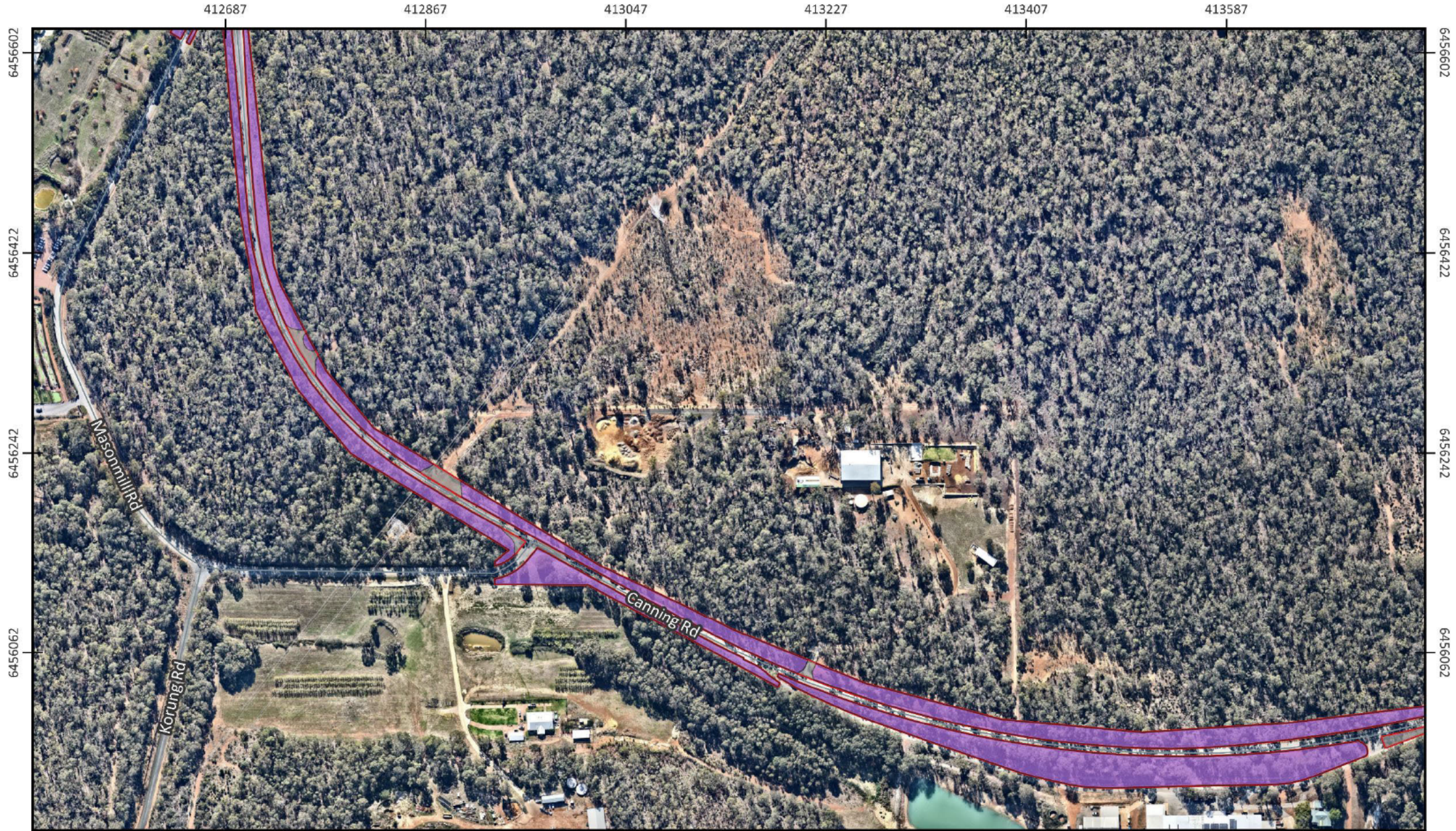


Figure 8:
Vegetation Type

Canning Road, Carmel

Legend

- Eucalyptus marginata and Corymbia calophylla woodland
- Completely cleared
- Survey Area

Client: City of Kalamunda
Date: 19/08/2024
Created by: [REDACTED]
Image Source: Nearmap, 2024
Datum: GDA2020 / MGA zone 50
Scale: 1: 4500
 0 50 100 m





Figure 9:
Vegetation Type

Canning Road, Carmel

Legend

- Banksia sessilis shrubland
- Eucalyptus marginata and Corymbia calophylla woodland
- Introduced hermland
- Completely cleared
- Survey Area

Client: City of Kalamunda
Date: 19/08/2024
Created by: [REDACTED]
Image Source: Nearmap, 2024
Datum: GDA2020 / MGA zone 50
Scale: 1: 4500
 0 50 100 m



4.2.3 Vegetation Condition

Vegetation condition on site ranged from completely degraded to very good (Table 7; Figures 10 to 12). Vegetation in very good condition contained an intact vegetation structure with a low presence of weed species. Vegetation in good condition had evidence of disturbance with a presence of weed species and the presence of some aggressive weeds. Degraded vegetation included areas containing a high level of disturbance with a high weed load and presence of some aggressive weeds. Vegetation regarded as completely degraded contain little to no native species with a high weed load or were areas that have been completely cleared and developed.

Table 7: Vegetation condition within the survey area

Vegetation Condition	Pristine	Excellent	Very Good	Good	Degraded	Completely Degraded	Total
Area (ha)	0.00	0.00	2.51	1.54	0.10	3.09	7.24
Area (%)	0	0	35	21	1	43	100

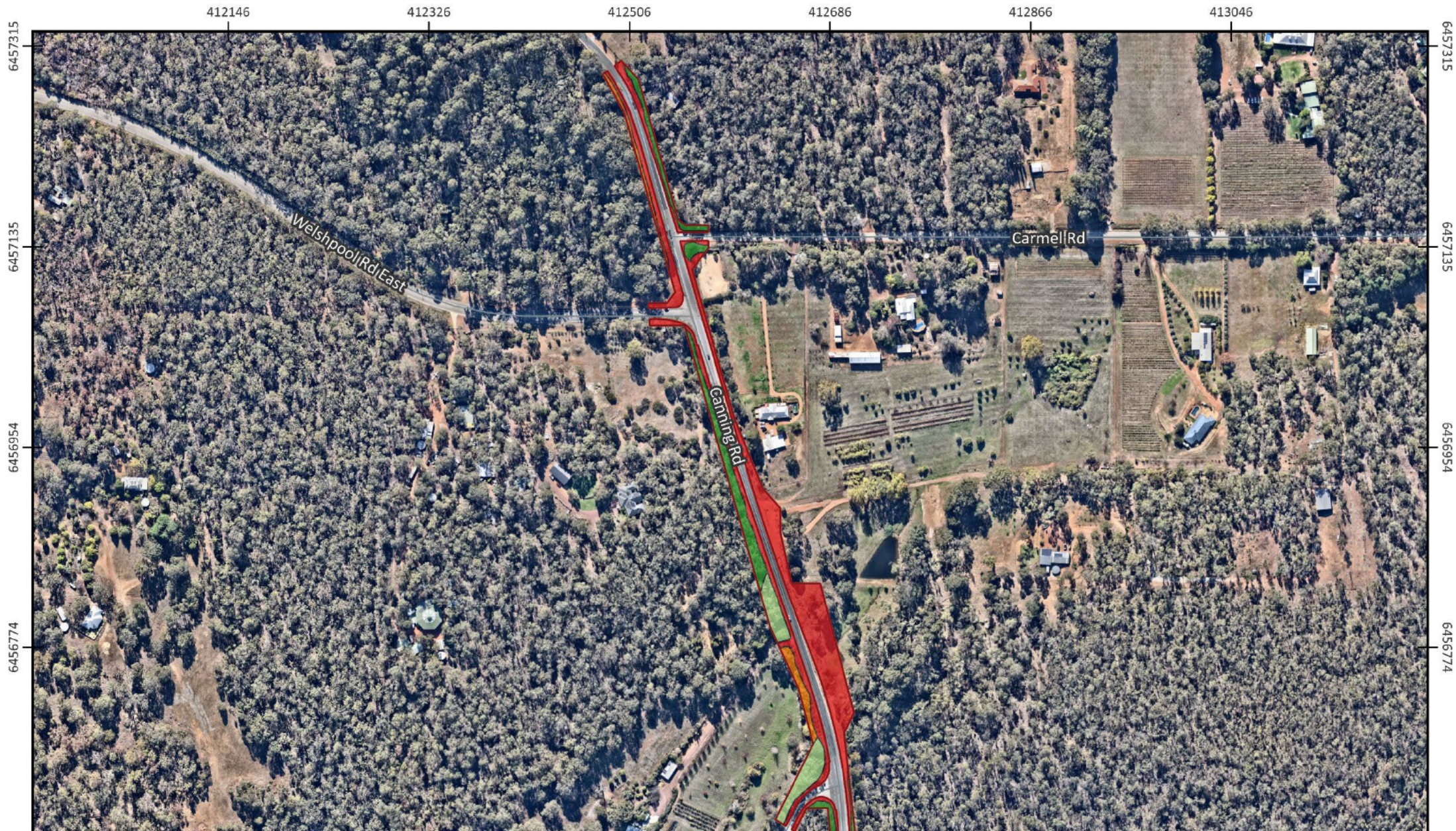


Figure 10:
Vegetation Condition

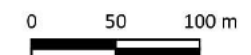


Canning Road, Carmel

Legend

- Very Good
- Good
- Degraded
- Completely Degraded
- Survey Area

Client: City of Kalamunda
 Date: 20/08/2024
 Created by: [REDACTED]
 Image Source: Nearmap, 2024
 Datum: GDA2020 / MGA zone 50
 Scale: 1: 4500



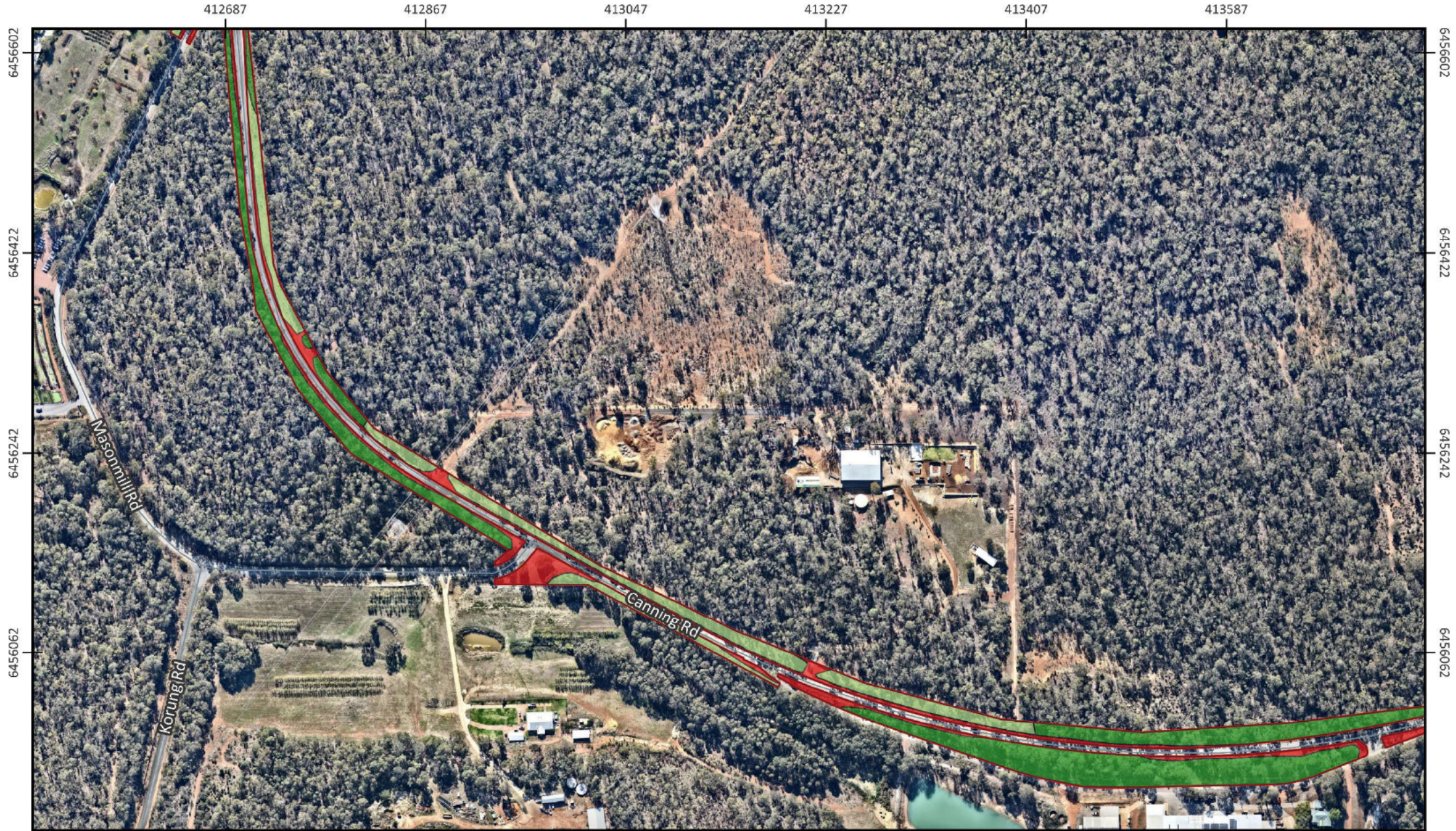


Figure 11:
Vegetation Condition

Canning Road, Carmel

Legend

-  Very Good
-  Good
-  Completely Degraded
-  Survey Area

Client: City of Kalamunda
Date: 19/08/2024
Created by: [REDACTED]
Image Source: Nearmap, 2024
Datum: GDA2020 / MGA zone 50
Scale: 1: 4500
0 50 100 m






Figure 12:
Vegetation Condition

Canning Road, Carmel

Legend

-  Very Good
-  Good
-  Completely Degraded
-  Survey Area

Client: City of Kalamunda
Date: 19/08/2024
Created by: 
Image Source: Nearmap, 2024
Datum: GDA2020 / MGA zone 50
Scale: 1: 4500
0 50 100 m



5.0 Fauna Survey Results

5.1 Desktop Survey

A desktop survey of online databases indicated the potential for a total of 39 conservation significant fauna species to occur within 10 km of the survey area (Table 8). NatureMap indicated 32 conservation significant species listed under the *Biodiversity Conservation Act 2016* (WA) as potentially occurring within a 10 km radius of the site (DBCA, 2024a), and Dandjoo indicated 13 conservation significant species potentially to occur (DBCA, 2024b). The Protected Matters Search Tool (PMST) indicated 16 threatened species listed under the *Environment Protection and Biodiversity Conservation Act 1999* (Cwlth) as potentially occurring within a 10 km radius of the site (DCCEEW, 2024b) (Appendix 2). A review of the DBCA threatened and priority fauna species database indicated the potential for 32 conservation significant fauna species to occur within a 10 km radius of the site (DBCA, 2024d).

Both abiotic (soil, climate) as well as biotic (food resources, predator pressure) will determine the suitability of habitats for specific fauna assemblages, based on their ecological requirements. Evaluating the site locality, existing conditions and known home ranges. The following five species (highlighted green in Table 8) were determined to have the potential to be present within the survey site.

Table 8: Threatened and Priority fauna species listed by NatureMap, PMST and DBCA

Species Name	Cons Code	Nature Map	Dandjoo	PMST	DBCA
Bird					
<i>Actitis hypoleucos</i>	MI	X			X
<i>Apus pacificus</i>	MI	X			X
<i>Botaurus poiciloptilus</i>	T/ EN			X	
<i>Calidris acuminata</i>	T/ VU			X	
<i>Calidris ferruginea</i>	T/ CR			X	
<i>Calyptorhynchus banksii naso</i>	T/ VU	X	X	X	X
<i>Falco peregrinus</i>	OS	X	X		X
<i>Leipoa ocellata</i>	T/ VU			X	
<i>Numenius madagascariensis</i>	T/ CR			X	
<i>Oxyura australis</i>	P4	X	X		X
<i>Platycercus icterotis xanthogenys</i>	P4	X			X
<i>Plegadis falcinellus</i>	MI	X			X
<i>Rostratula australis</i>	T/ EN			X	
<i>Tringa glareola</i>	MI	X			X
<i>Tringa nebularia</i>	MI	X		X	X
<i>Tringa stagnatilis</i>	MI	X			X

Species Name	Cons Code	Nature Map	Dandjoo	PMST	DBCA
<i>Zanda baudinii</i>	T/ EN	X	X	X	X
<i>Zanda latirostris</i>	T/ EN	X	X	X	X
Invertebrate					
<i>Glossurocolletes bilobatus</i>	P2	X			X
<i>Idiosoma sigillatum</i>	P3	X			X
<i>Kawanaphila pachomai</i>	P1	X			X
<i>Leioproctus douglasiellus</i>	T/ EN	X			X
<i>Westralunio carteri</i>	T/ VU	X	X	X	X
Mammal					
<i>Bettongia penicillata ogilbyi</i>	T/ CR	X		X	X
<i>Dasyurus geoffroii</i>	T/ VU	X		X	X
<i>Hydromys chrysogaster</i>	P4	X	X		X
<i>Isoodon fusciventer</i>	P4	X	X		X
<i>Macrotis lagotis</i>	T/ VU	X			X
<i>Myrmecobius fasciatus</i>	T/ EN	X		X	X
<i>Notamacropus eugenii derbianus</i>	P4	X			X
<i>Notamacropus irma</i>	P4	X	X		X
<i>Phascogale tapoatafa wambenger</i>	CD	X			X
<i>Pseudocheirus occidentalis</i>	T/ CR	X		X	X
<i>Setonix brachyurus</i>	T/ VU	X	X	X	X
<i>Falsistrellus mackenziei</i>	P4		X		
Reptile					
<i>Acanthophis antarcticus</i>	P3	X			X
<i>Ctenotus delli</i>	P4	X	X		X
<i>Neelaps calonotos</i>	P3	X			X
<i>Pseudemydura umbrina</i>	T/ CR	X	X		X

5.2 Fauna Survey Results

Basic fauna survey across the survey determined the presence of 16 native fauna species from 13 families (Table 9). One conservation significance species was recorded within the survey site during the survey, Red-tailed Black Cockatoo (*Calyptrorhynchus banksii naso*), this species is listed as Vulnerable under the EPBC Act. Fauna habitats present across the site was minimal, lacking suitable features in the lower storey for faunal refuge. More suitable fauna habitat and refuge was present within the adjacent vegetation.

Table 9: Fauna observations within the survey area (Conservation significant fauna species are highlighted green)

Family	Species Name	Common Name
Bird		
Meliphagidae	<i>Phylidonyris novaehollandiae</i>	New Holland Honeyeater
Meliphagidae	<i>Anthochaera carunculata</i>	Red Wattlebird
Cacatuidae	<i>Calyptorhynchus banksii naso</i>	Red-tailed Black Cockatoo
Corvidae	<i>Corvus coronoides</i>	Australian Raven
Artamidae	<i>Gymnorhina tibicen</i>	Australian Magpie
Rhipiduridae	<i>Rhipidura albiscapa</i>	Grey Fantail
Campephagidae	<i>Coracina novaehollandiae</i>	Black-faced Cuckooshrike
Psittaculidae	<i>Barnardius zonarius</i>	Australian Ringneck
Mammal		
Macropodinae	<i>Macropus fuliginosus melanops</i>	Western Grey Kangaroo
Amphibian		
Pelodyadidae	<i>Litoria adelaidensis</i>	Slender Tree Frog
Myobatrachidae	<i>Crinia insignifera</i>	Squelching Froglet
Myobatrachidae	<i>Crinia glauerti</i>	Clicking Frog
Reptile		
Scincidae	<i>Cryptoblepharus buchananii</i>	Buchanan's Snake-Eyed Skink
Elapidae	<i>Pseudonaja affinis</i>	Dugite
Agamidae	<i>Pogona minor minor</i>	Western Bearded Dragon
Scincidae	<i>Tiliqua rugosa rugosa</i>	Bobtail

5.3 Black Cockatoo Habitat Assessment

A total of 111 trees that satisfied the Commonwealth guidelines (DAWE, 2022) for black cockatoo habitat trees (trees with DBH ≥ 500 mm) were recorded within the survey areas. These trees were identified from six different species consisting primarily of *Eucalyptus marginata* (Jarrah; 24 %) and *Corymbia calophylla* (Marri; 70 %). Both Marri and Jarrah are high priority species for black cockatoo nesting, roosting and foraging (DAWE, 2022). Two tree species were unable to be identified to species level at the time of the survey due to the lack of identifiable characteristics, one was able to be identified to genus level as *Eucalyptus* sp.. Red-tailed Black Cockatoos (*Calyptorhynchus banksii naso*) were observed within the survey area during the field survey.

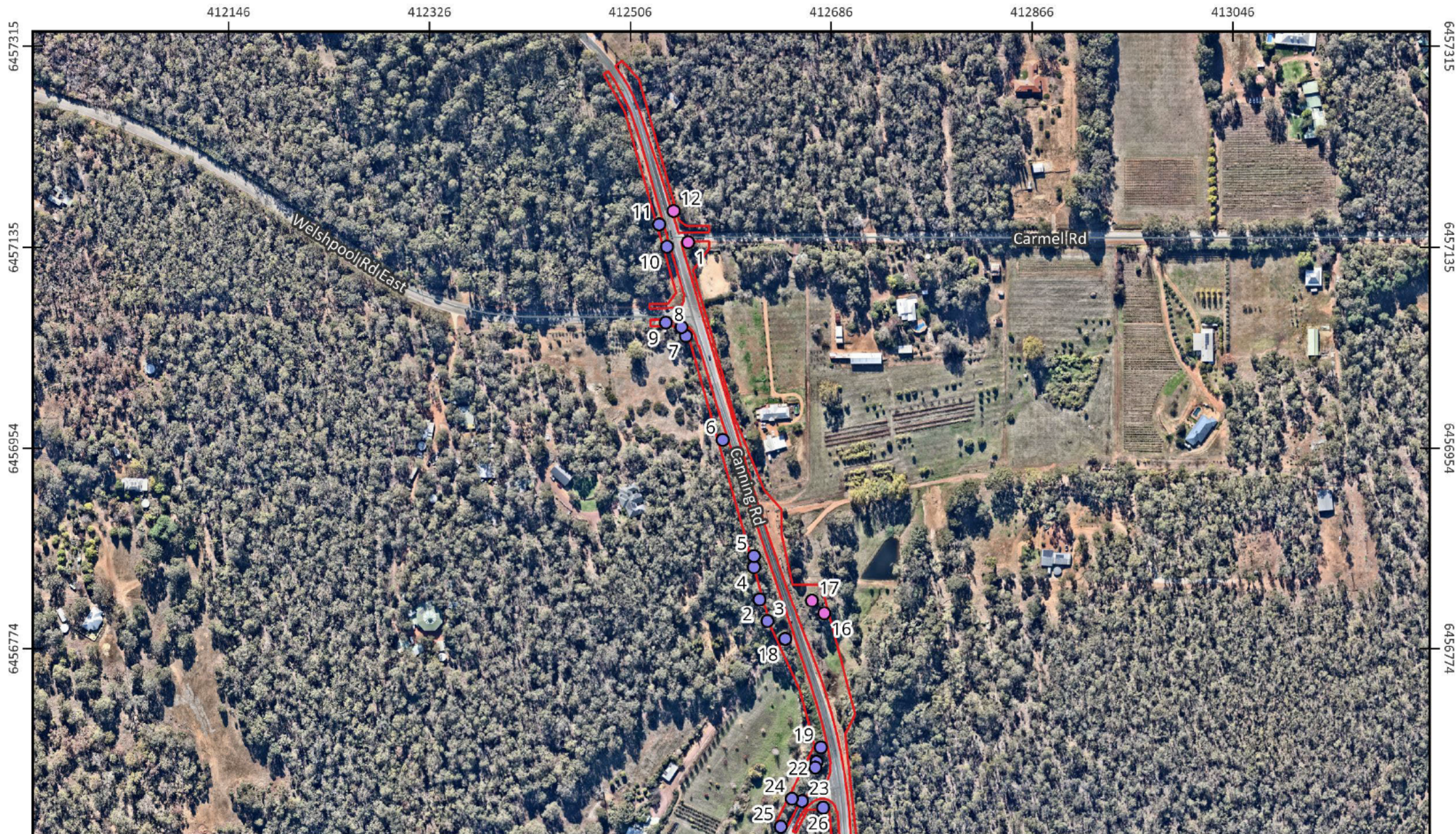


Figure 13:
Potential Black Cockatoo Habitat Trees



Canning Road, Carmel

Legend

- *Corymbia calophylla*
- *Eucalyptus marginata*
- Survey Area

Client: City of Kalamunda
 Date: 01/10/2024
 Created by: [REDACTED]
 Image Source: Nearmap, 2024
 Datum: GDA2020 / MGA zone 50
 Scale: 1: 4500

0 50 100 m



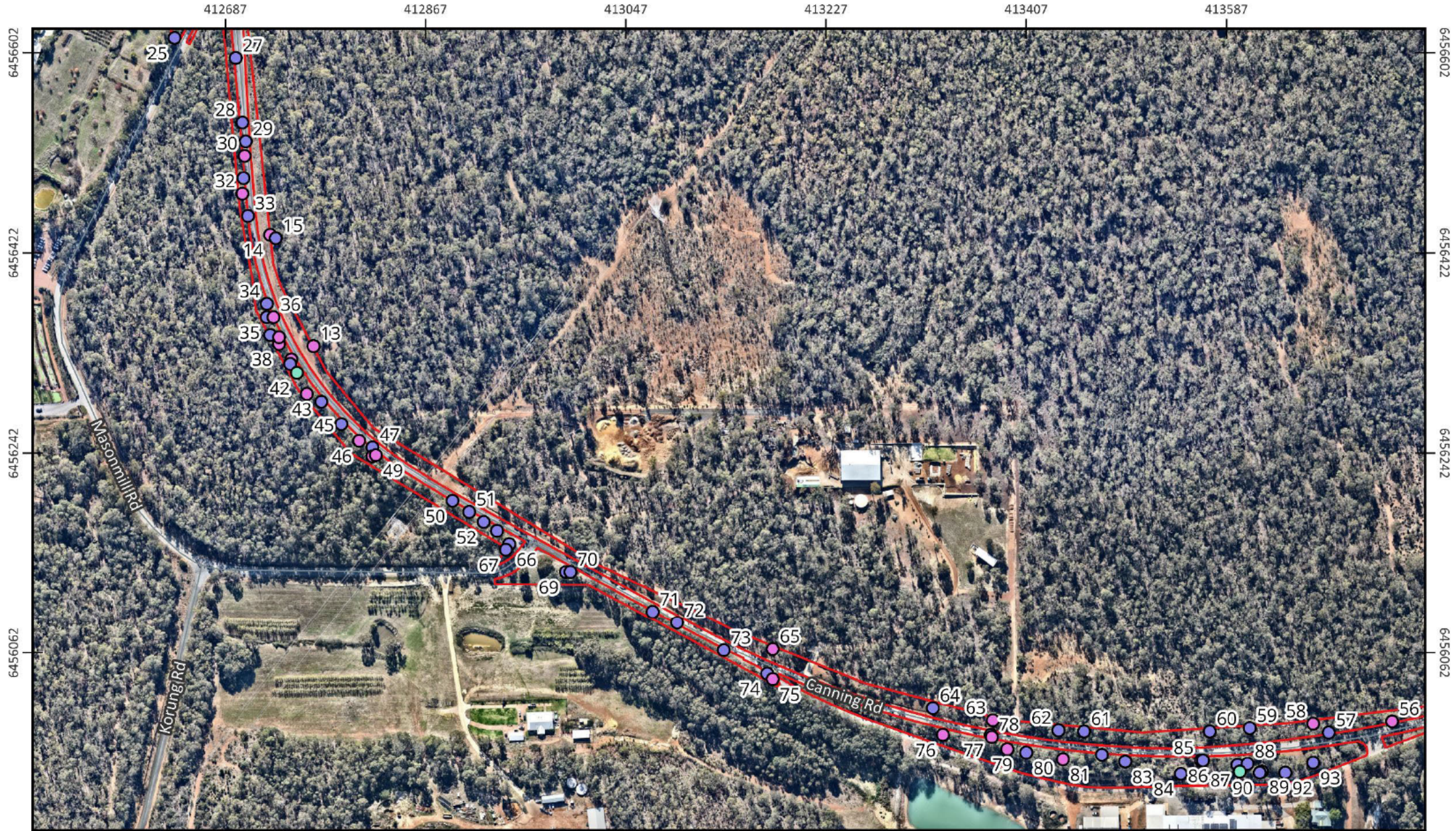


Figure 14:
Potential Black Cockatoo Habitat Trees



Canning Road, Carmel

Legend

- *Corymbia calophylla*
- *Eucalyptus marginata*
- Unknown sp.
- Survey Area

Client: City of Kalamunda
 Date: 01/10/2024
 Created by: [REDACTED]
 Image Source: Nearmap, 2024
 Datum: GDA2020 / MGA zone 50
 Scale: 1: 4500
 0 50 100 m





Figure 15:
Potential Black Cockatoo Habitat Trees

Canning Road, Carmel

Legend

- *Corymbia calophylla*
- *Eucalyptus camaldulensis*
- *Eucalyptus marginata*
- *Eucalyptus* sp.
- Survey Area

Client: City of Kalamunda
Date: 01/10/2024
Created by: [REDACTED]
Image Source: Nearmap, 2024
Datum: GDA2020 / MGA zone 50
Scale: 1: 4500
 0 50 100 m



5.3.1 Foraging Habitat

All of the survey areas contained areas of vegetation that provide primary feeding resources for black cockatoos, including *Eucalyptus marginata*, *Corymbia calophylla*, *Banksia sessilis*, and *Hakea trifurcata* (DEC, 2011). A total of 22 species known to provide feeding resources for black cockatoos were recorded within the survey area (Table 10). Red-tailed Black cockatoos were observed foraging within Jarrah and Marri trees during the time of the survey. Evidence of foraging by Red-tailed Black Cockatoos, parrots, and potentially Carnaby's or Baudin's Cockatoos, in the form of chewed Marri nuts, was recorded across the survey area, with 36 of the habitat trees assessed containing evidence of foraging underneath (Figure 16 to 19).

Table 10: Plants species known to provide feeding resources to black cockatoos across the survey area

Family	Species Name	Common
Casuarinaceae	<i>Allocasuarina fraseriana</i>	Sheoak
Casuarinaceae	<i>Allocasuarina huegeliana</i>	Rock Sheoak
Fabaceae	* <i>Acacia baileyana</i>	
Fabaceae	<i>Acacia saligna</i>	Orange Wattle
Malvaceae	# <i>Hibiscus tiliaceus</i>	
Myrtaceae	# <i>Callistemon phoeniceus</i>	
Myrtaceae	* <i>Corymbia citriodora</i>	
Myrtaceae	<i>Corymbia calophylla</i>	Marri
Myrtaceae	<i>Darwinia citriodora</i>	Lemon-scented Darwinia
Myrtaceae	<i>Eucalyptus marginata</i>	Jarrah
Pinaceae	* <i>Pinus pinaster</i>	Pinaster Pine
Proteaceae	# <i>Grevillea olivacea</i>	Olive Grevillea
Proteaceae	# <i>Hakea laurina</i>	Pincushion Hakea
Proteaceae	<i>Banksia armata</i>	Prickly Dryandra
Proteaceae	<i>Banksia dallanneyi</i>	Couch Honey-pot
Proteaceae	<i>Banksia sessilis</i>	Parrot Bush
Proteaceae	<i>Hakea amplexicaulis</i>	Prickly Hakea
Proteaceae	<i>Hakea cristata</i>	Snail Hakea
Proteaceae	<i>Hakea lissocarpa</i>	Honey Bush
Proteaceae	<i>Hakea trifurcata</i>	Two-leaf Hakea
Proteaceae	<i>Hakea varia</i>	Variable-leaved Hakea
Xanthorrhoeaceae	<i>Xanthorrhoea preissii</i>	Grass tree

Source: DEC, 2011; DAWE, 2022.



Figure 16: Examples of black cockatoo foraging evidence and Red-tailed Black Cockatoo foraging on site.

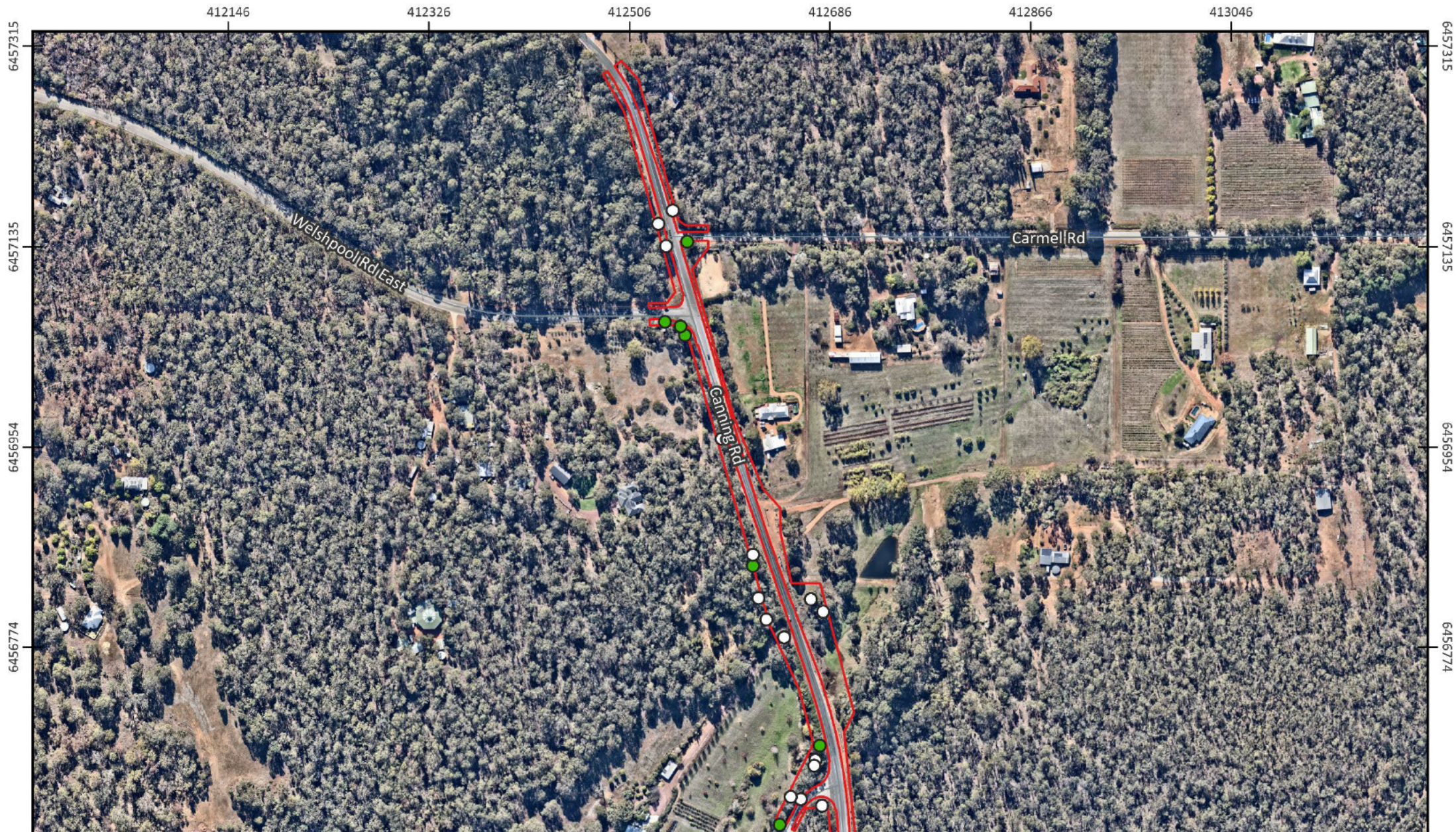


Figure 17:
Foraging Evidence Present Underneath Habitat Trees



Canning Road, Carmel

Legend

- Foraging Evidence Present
- No Foraging Evidence Present
- Survey Area

Client: City of Kalamunda
 Date: 01/10/2024
 Created by: [REDACTED]
 Image Source: Nearmap, 2024
 Datum: GDA2020 / MGA zone 50
 Scale: 1: 4500

0 50 100 m



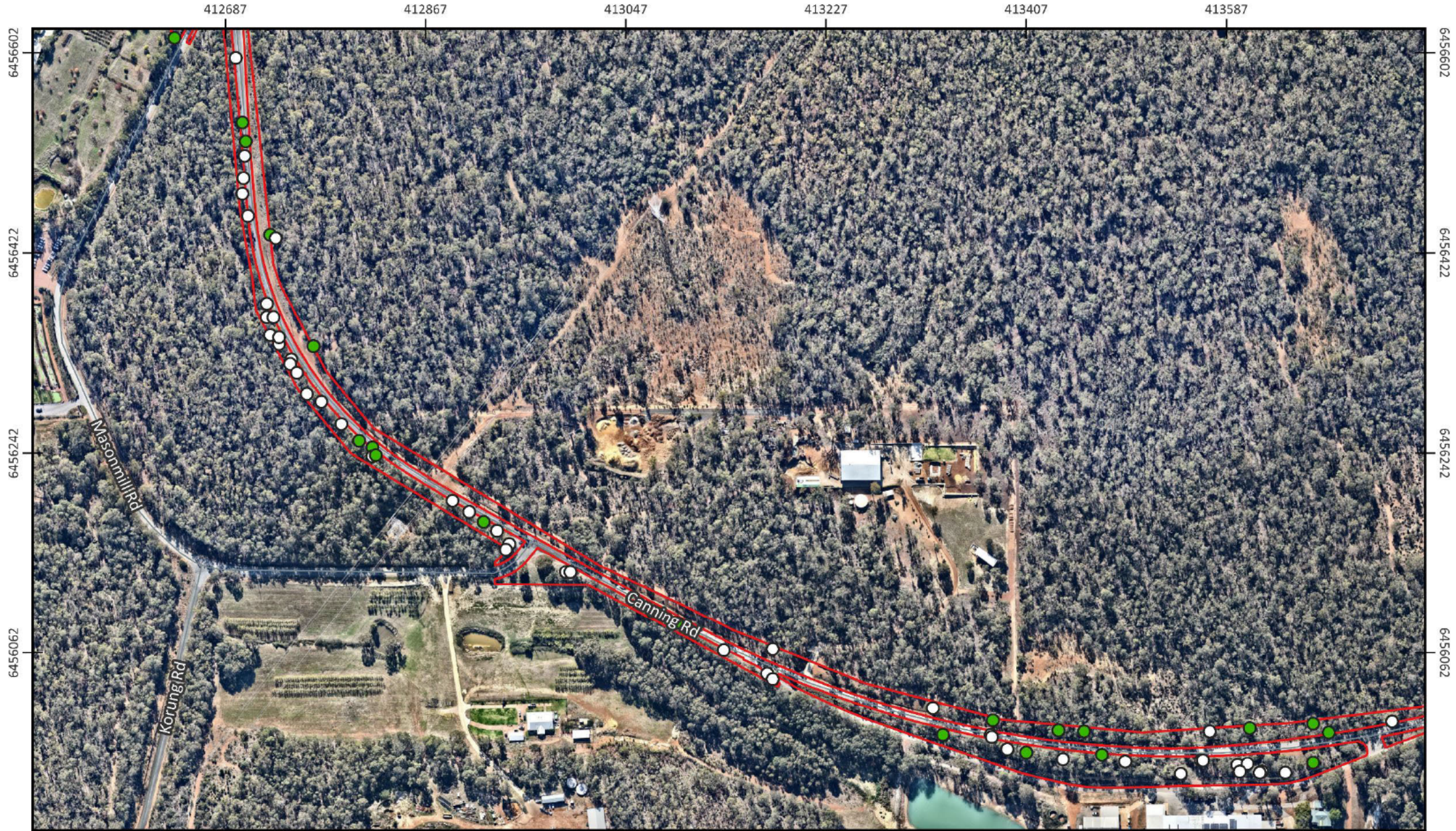


Figure 18:

Foraging Evidence Present Underneath Habitat Trees

Canning Road, Carmel

Legend

- Foraging Evidence Present
- No Foraging Evidence Present
- Survey Area

Client: City of Kalamunda
 Date: 01/10/2024
 Created by: [REDACTED]
 Image Source: Nearmap, 2024
 Datum: GDA2020 / MGA zone 50
 Scale: 1: 4500
 0 50 100 m



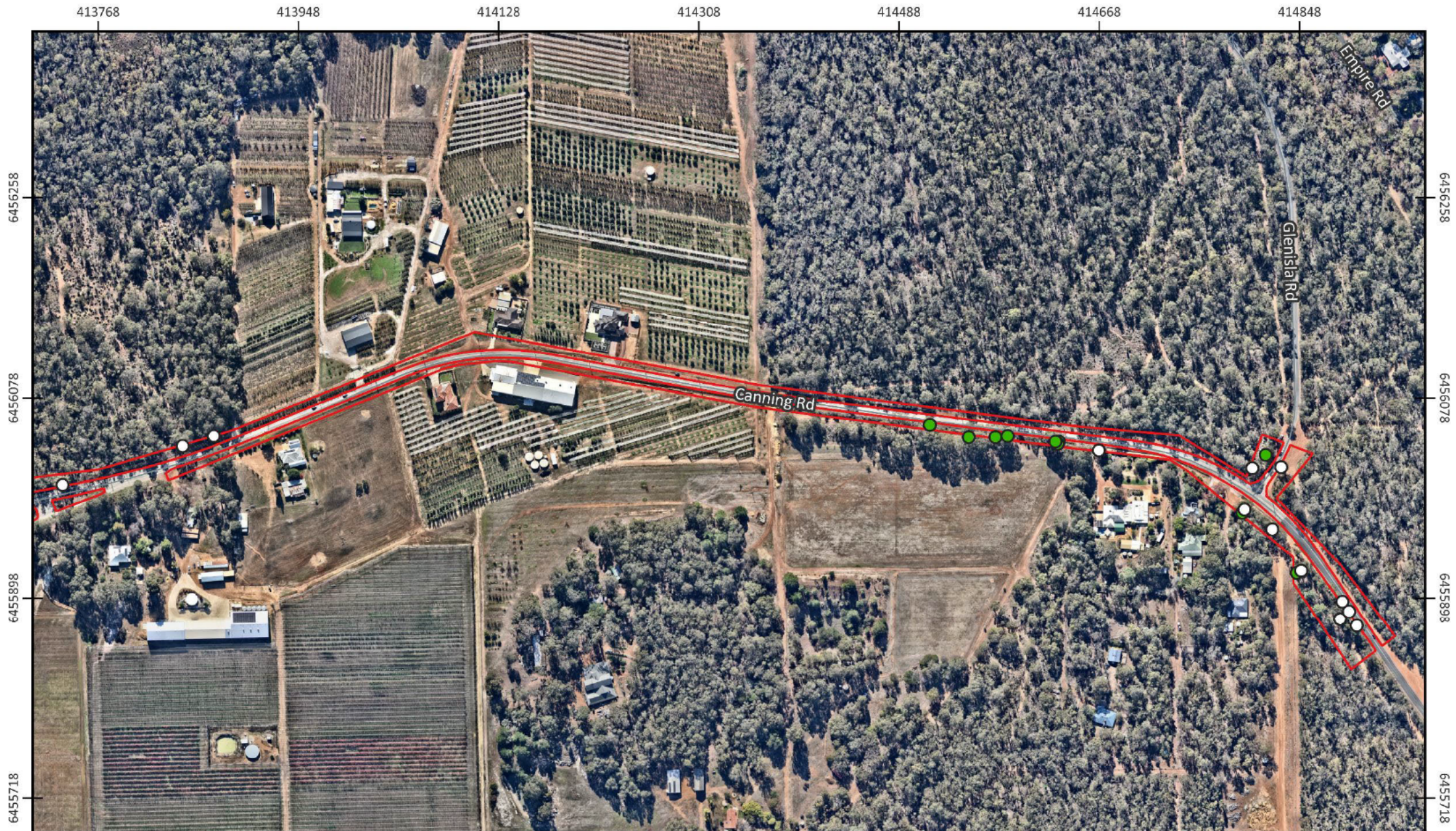


Figure 19:
Foraging Evidence Present Underneath Habitat Trees

Canning Road, Carmel

Legend

- Foraging Evidence Present
- No Foraging Evidence Present
- Survey Area

Client: City of Kalamunda
Date: 01/10/2024
Created by: [REDACTED]
Image Source: Nearmap, 2024
Datum: GDA2020 / MGA zone 50
Scale: 1: 4500
0 50 100 m



5.3.2 Roosting Habitat

No evidence of roosting in the form of scats or feathers was observed within the survey areas. Evening surveys were not conducted as part of this assessment, so the location of any potential roosting sites cannot be confirmed. The survey area is within a confirmed roosting area, with roosting sites for Red-tailed Black Cockatoo recorded within approximately 65 metres of the survey area (DBCA, 2019; DBCA, 2024d).

5.3.3 Breeding Habitat

The survey area contained potential suitable breeding habitat for black cockatoos. The survey area is within a known Carnaby's Cockatoo confirmed breeding area (DBCA, 2018e). Of the 111 habitat trees that were recorded, 3 contained hollows.

Black cockatoos are known to utilise hollows that have a vertical to near-vertical orientation and have an entrance diameter of at least 100 mm (Cherriman, 2022). Two of the trees contained hollows (Tree ID 51 and 60) with suitable characteristics for black cockatoo breeding. The third hollow was not of sufficient size and angle to be a potential hollow for black cockatoo breed. The suitable hollows were recorded as chimney hollows with an entrance diameter of 200 x 200 mm and 250 x 350 mm (Table 11). No secondary evidence of hollow use, including rubbing and chew marks were observed in the hollows and no other secondary evidence such as scats or feathers were observed within the survey areas. As this survey was undertaken from the ground, the depth of these hollows were estimated. Hollows were estimated to be > 1 m for Tree ID 51 and < 20 cm for Tree ID 60. The breeding range of the site is more suitable for Carnaby's Black Cockatoo, they are known to utilise hollows that are 0.5 m to 2 m deep (DEC, 2010). The hollow characteristics recorded for Tree ID 51 may be suitable black cockatoos breeding. Using the Bamford scoring, Tree ID 51 and 60 received a Bamford Score of 3. Examples of the hollows observed are shown in Figure 20 and the locations of all trees with hollows are shown in Figure 21.

Table 11: Potentially Suitable Breeding Trees for Black Cockatoos

Tree ID	Species Name	Common Name	Hollow No.	Hollow Size	Hollow Orientation	Breeding Evidence	Bamford Score
60	<i>Corymbia calophylla</i>	Marri	1	35x35 cm	Chimney	No	3
51	<i>Corymbia calophylla</i>	Marri	1	20x20cm	Chimney	No	3

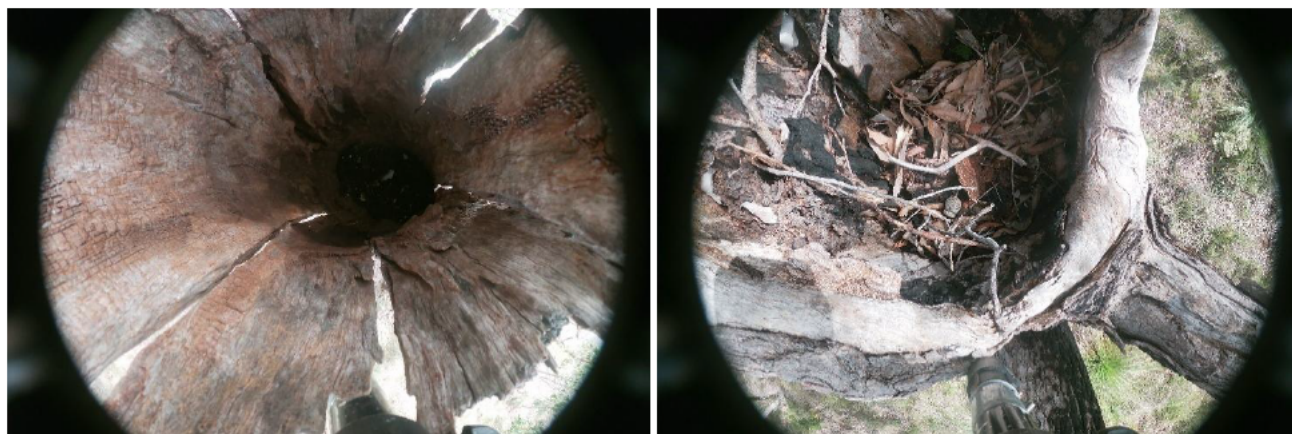


Figure 20: Hollows present onsite, left Tree ID 51 and right Tree ID 60.

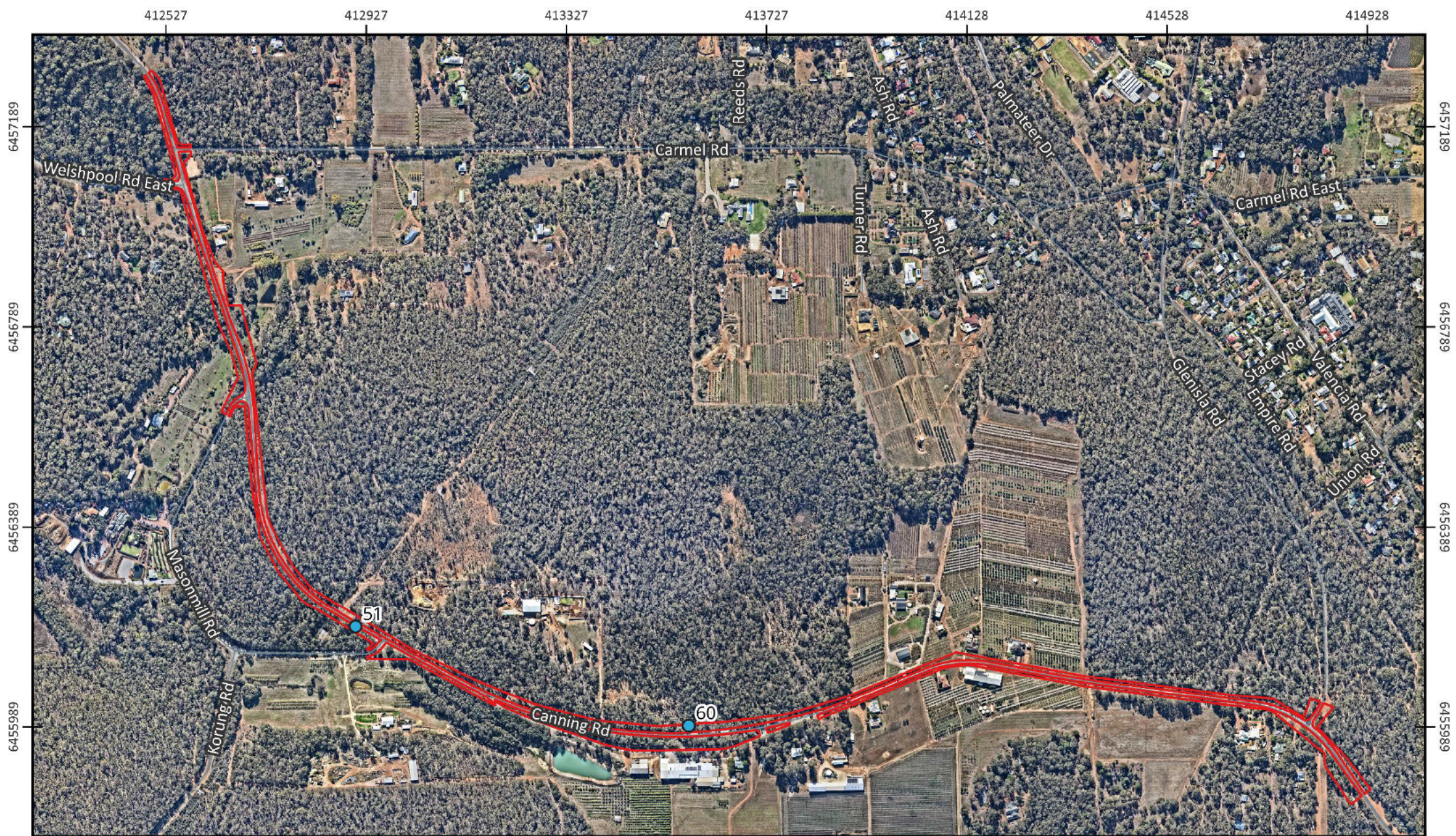


Figure 21:
Black Cockatoo Habitat Trees with Suitable Breeding
Hollows



Canning Road, Carmel

Legend

- Suitable Hollows Present
- Survey Area

Client: City of Kalamunda
 Date: 01/10/2024
 Created by: [REDACTED]
 Image Source: Nearmap, 2024
 Datum: GDA2020 / MGA zone 50
 Scale: 1: 10000

0 100 200 m



5.3.4 Foraging Quality Scoring Tool

The black cockatoo foraging quality scoring tool (DAWE, 2022) was applied across the survey areas and a score of 8 was assigned for the Red-tailed Black Cockatoo and a score of 10 was assigned for Carnaby's Cockatoo and Baudin's Cockatoo (Table 12). These scores represent that the area is considered to have high-quality native foraging habitat for black cockatoos.

Table 12: Foraging quality score for the survey area

	Baudin's Cockatoo	Carnaby's Cockatoo	Red-tailed Black Cockatoo	Appraisal
Starting score	10	10	10	
Foraging potential	10	10	10	Evidence of foraging by the Red-tailed Black Cockatoo and potentially Carnaby's or Baudin's Cockatoo
Connectivity	10	10	10	Foraging habitat is present within 12 km of the survey areas
Proximity to breeding	10	10	8	Survey areas are within a confirmed breeding area for Carnaby's Cockatoo (DBCA; 2018e). The nearest known Red-tailed Black Cockatoo breeding area is over 12 km from the survey area.
Proximity to roosting	10	10	8	Survey areas are within a known night roost site for Carnaby's Black Cockatoos and black cockatoos (DBCA, 2018c; DBCA, 2019).
Impact from significant plant disease	10	10	8	No significant pests or diseases were evident throughout the survey
Total Score	10	10	8	

6.0 Implications of Results

6.1 Flora and Vegetation

A total of 187 flora species were identified within the survey boundary, this comprised of 74 (40 %) introduced (weeds) and 113 (60 %) native species. The survey area contained three main vegetation types, *Eucalyptus marginata* and *Corymbia calophylla* woodland, *Banksia sessilis* shrubland, and introduced herbland. The vegetation condition across the survey area ranged from completely degraded to very good. The survey area was primarily composed of areas regarded as completely degraded which have evidence of disturbance, with a high weed load and little to no native flora species present. No threatened or priority ecological communities were identified across the survey area. It is recommended that vegetation in a very good or higher condition is retained to conserve biodiversity values.

Two declared pests and WoNS were identified within the survey site, including Blackberry (**Rubus ulmifolius*) and Bridal Creeper (**Asparagus asparagoides*). Declared pests are listed on the Western Australian Organism List (WAOL) under the Biosecurity and Agriculture Management Act 2007 (WA). This classification requires the landowner/land manager to control the population to limit damage as a result of the presence of these species (DPIRD, 2019). It is recommended that the control of these species is undertaken prior to any potential future works within the site to prevent the spread of these species.

6.2 Significant Flora

A total of three conservation significant flora species were identified across the survey area including *Grevillea olivacea* (Olive Grevillea), *Grevillea thelemanniana* (Spider Net Grevillea), and *Stylidium striatum* (Fan-leaved Triggerplant). *Grevillea olivacea* (Olive Grevillea) and *Stylidium striatum* (Fan-leaved Triggerplant) is listed as Priority 4 under the BC Act, and *Grevillea thelemanniana* (Spider Net Grevillea) is listed as Critically Endangered under the EPBC Act. *Grevillea olivacea* (Olive Grevillea) and *Grevillea thelemanniana* (Spider Net Grevillea) were recorded within a landscaped verge not within their known distribution. It is likely that these are cultivated species and have been planted.

Stylidium striatum (Fan-leaved Triggerplant), is a Priority 4 species. The habitat descriptions for this species match the vegetation type recorded across the survey area. This species has previously been recorded within 1 km from the site. *Stylidium striatum* (Fan-leaved Triggerplant) has an identified flowering period between October and November with species recorded and identified between September to December (Australasian Virtual Herbarium, n.d). A targeted flora survey for *Stylidium striatum* (Fan-leaved Triggerplant, P4) undertaken during its recorded growth period between October and November determined a total of 72 individuals present across the survey area. It is recommended to retain the populations of *Stylidium striatum* where possible.

Pimelea rara (Summer Pimelea) (P4) has previously been recorded within the site boundary in 1998, no *Pimelea rara* individuals were recorded in the 2024 survey.

Of the 10 conservation significant flora species identified to potentially occur within the survey area all are perennial herb, shrub, or sedge species for which other characteristics would be present to enable identification to a minimum of genus level. *Paracaleana ferricola* (Darling Range Duck Orchid), is a Priority 2

species and is part of the Orchidaceae family which whilst are recorded as perennial herbs may only have identifiable features present during its main growth period. The habitat descriptions of *Paracaleana ferricola* correlate with the vegetation type recorded within the survey area. The closest recorded population of *Paracaleana ferricola* (Darling Range Duck Orchid) is over 4 km away from the survey area, no *Paracaleana ferricola* (Darling Range Duck Orchid) individuals were recorded across the survey area.

6.3 Fauna

A total of 16 fauna species were observed across the survey area from 13 families. One conservation significant species, the Red-tailed Black Cockatoo (*Calyptorhynchus banksii naso*) was sighted within the survey boundary. The survey area provided a low fauna habitat value with the site adjacent to a sealed road (Canning Road) and the vegetation present has reduced middle and understorey values across some portions of the site. The sealed road fragments and reduces the amount of available habitat, and also provides a high disturbance from anthropogenic traffic. The surrounding vegetation around the survey area is likely to provide further suitable habitat for fauna species. During clearing, an approved fauna spotter is to be onsite to assist with the relocation of any displaced fauna species.

6.4 Black Cockatoo Habitat

The survey area contained suitable foraging, roosting and breeding habitat for black cockatoos. The survey area was determined to have a foraging quality score of 8 for the Red-tailed Black Cockatoo and a score of 10 for Carnaby's Cockatoo and Baudin's Cockatoo. Of the 111 trees assessed within the survey area, 3 contained hollows, with 2 trees containing potential suitable breeding hollows. None of the surveyed trees contained any evidence of nesting fauna. There was evidence of foraging from black cockatoo underneath 36 (32 %) of the trees surveyed across the area.

Due to the proximity to a major road (Canning Road), these trees are unlikely to support breeding activities due to disturbance from traffic. With the adjacent remnant vegetation to the site likely to provide more suitable breeding habitat. The City of Kalamunda is to ensure that all hollows are inspected for native fauna occupancy prior to felling. If nesting birds species are found, including eggs or chicks, they are to be left in situ until chicks have fully fledged.

7.0 References

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Appendix 1: PMST Report 10 km



Australian Government

Department of Climate Change, Energy,
the Environment and Water

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: 29-Jul-2024

[Summary](#)

[Details](#)

[Matters of NES](#)

[Other Matters Protected by the EPBC Act](#)

[Extra Information](#)

[Caveat](#)

[Acknowledgements](#)

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:	6
Listed Threatened Species:	51
Listed Migratory Species:	9

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:	54
Commonwealth Heritage Places:	None
Listed Marine Species:	14
Whales and Other Cetaceans:	None
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:	18
Regional Forest Agreements:	1
Nationally Important Wetlands:	1
EPBC Act Referrals:	43
Key Ecological Features (Marine):	None
Biologically Important Areas:	None
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			
Goldfields Water Supply Scheme, Western Australia	WA	Listed place	In buffer area only

Wetlands of International Importance (Ramsar Wetlands)		[Resource Information]
Ramsar Site Name	Proximity	Buffer Status
Forrestdale and thomsons lakes	Within 10km of Ramsar site	In buffer area only

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
Banksia Woodlands of the Swan Coastal Plain ecological community	Endangered	Community likely to occur within area	In feature area
Clay Pans of the Swan Coastal Plain	Critically Endangered	Community likely to occur within area	In buffer area only
Corymbia calophylla - Kingia australis woodlands on heavy soils of the Swan Coastal Plain	Endangered	Community known to occur within area	In buffer area only
Empodisma peatlands of southwestern Australia	Endangered	Community may occur within area	In buffer area only
Shrublands and Woodlands of the eastern Swan Coastal Plain	Endangered	Community known to occur within area	In buffer area only
Tuart (Eucalyptus gomphocephala) Woodlands and Forests of the Swan Coastal Plain ecological community	Critically Endangered	Community may occur within area	In buffer area only

Listed Threatened Species			[<u>Resource Information</u>]
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			

Scientific Name	Threatened Category	Presence Text	Buffer Status
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 likely 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
Calyptorhynchus banksii naso Forest Red-tailed Black-Cockatoo, Karrak [67034]	Vulnerable	Species or species habitat known to occur within area	In feature area
Leipoa ocellata Malleefowl [934]	Vulnerable	Species or species habitat likely 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
Rostratula australis Australian Painted Snipe [77037]	Endangered	Species or species habitat likely 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
Zanda baudinii listed as Calyptorhynchus baudinii Baudin's Cockatoo, Baudin's Black-Cockatoo, Long-billed Black-cockatoo [87736]	Endangered	Roosting known to occur within area	In feature area
Zanda latirostris listed as Calyptorhynchus latirostris Carnaby's Black Cockatoo, Short-billed Black-cockatoo [87737]	Endangered	Breeding known to occur within area	In feature area
INSECT			
Leioproctus douglasiellus a short-tongued bee [66756]	Critically Endangered	Species or species habitat known to occur within area	In buffer area only
MAMMAL			

Scientific Name	Threatened Category	Presence Text	Buffer Status
Bettongia penicillata ogilbyi Woylie [66844]	Endangered	Species or species habitat known to occur within area	In feature area
Dasyurus geoffroii Chuditch, Western Quoll [330]	Vulnerable	Species or species habitat known to occur within area	In feature area
Myrmecobius fasciatus Numbat [294]	Endangered	Species or species habitat may occur within area	In buffer area only
Pseudocheirus occidentalis Western Ringtail Possum, Ngwayir, Womp, Woder, Ngoor, Ngoolangit [25911]	Critically Endangered	Species or species habitat may occur within area	In feature area
Setonix brachyurus Quokka [229]	Vulnerable	Species or species habitat known to occur within area	In feature area
OTHER			
Westralunio carteri Carter's Freshwater Mussel, Freshwater Mussel [86266]	Vulnerable	Species or species habitat known to occur within area	In buffer area only
PLANT			
Acacia anomala Grass Wattle, Chittering Grass Wattle [8153]	Vulnerable	Species or species habitat known to occur within area	In feature area
Acacia aphylla Leafless Rock Wattle [13553]	Vulnerable	Species or species habitat known to occur within area	In feature area
Andersonia gracilis Slender Andersonia [14470]	Endangered	Species or species habitat known to occur within area	In buffer area only
Anthocercis gracilis Slender Tailflower [11103]	Vulnerable	Species or species habitat known to occur within area	In feature area
Austrostipa bronweniae listed as Austrostipa bronwenae [92773]	Endangered	Species or species habitat known to occur within area	In buffer area only

Scientific Name	Threatened Category	Presence Text	Buffer Status
Banksia mimica Summer Honeypot [82765]	Endangered	Species or species habitat known to occur within area	In feature area
Caladenia huegelii King Spider-orchid, Grand Spider-orchid, Rusty Spider-orchid [7309]	Endangered	Species or species habitat likely to occur within area	In buffer area only
Calytrix breviseta subsp. breviseta Swamp Starflower [23879]	Endangered	Species or species habitat known to occur within area	In buffer area only
Chamelaucium lullfitzii listed as Chamelaucium sp. Gingin (N.G.Marchant 6) Gingin Wax [92777]	Endangered (listed as Chamelaucium sp. Gingin)	Species or species habitat may occur within area	In buffer area only
Conospermum undulatum Wavy-leaved Smokebush [24435]	Vulnerable	Species or species habitat known to occur within area	In feature area
Darwinia apiculata Scarp Darwinia [8763]	Endangered	Species or species habitat known to occur within area	In feature area
Diplolaena andrewsii [6601]	Endangered	Species or species habitat likely to occur within area	In feature area
Diuris drummondii Tall Donkey Orchid [4365]	Vulnerable	Species or species habitat known to occur within area	In feature area
Diuris micrantha Dwarf Bee-orchid [55082]	Vulnerable	Species or species habitat likely to occur within area	In feature area
Diuris purdiei Purdie's Donkey-orchid [12950]	Endangered	Species or species habitat known to occur within area	In feature area
Drakaea elastica Glossy-leaved Hammer Orchid, Glossy-leaved Hammer Orchid, Warty Hammer Orchid [16753]	Endangered	Species or species habitat likely to occur within area	In buffer area only

Scientific Name	Threatened Category	Presence Text	Buffer Status
Drakaea micrantha Dwarf Hammer-orchid [56755]	Vulnerable	Species or species habitat may occur within area	In buffer area only
Eleocharis keigheryi Keighery's Eleocharis [64893]	Vulnerable	Species or species habitat known to occur within area	In buffer area only
Eremophila glabra subsp. chlorella [84927]	Endangered	Species or species habitat known to occur within area	In buffer area only
Eucalyptus x balanites Cadda Road Mallee, Cadda Mallee [87816]	Endangered	Species or species habitat may occur within area	In buffer area only
Goodenia arthrotricha [12448]	Endangered	Species or species habitat known to occur within area	In buffer area only
Grevillea curviloba subsp. incurva Narrow curved-leaf Grevillea [64909]	Endangered	Species or species habitat likely to occur within area	In buffer area only
Grevillea flexuosa Zig Zag Grevillea [2957]	Vulnerable	Species or species habitat may occur within area	In buffer area only
Grevillea thelemanniana Spider Net Grevillea [32835]	Critically Endangered	Species or species habitat known to occur within area	In buffer area only
Lepidosperma rostratum Beaked Lepidosperma [14152]	Endangered	Species or species habitat known to occur within area	In buffer area only
Macarthuria keigheryi Keighery's Macarthuria [64930]	Endangered	Species or species habitat known to occur within area	In buffer area only
Morelotia australiensis listed as Tetraria australiensis Southern Tetraria [92784]	Vulnerable	Species or species habitat known to occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Ptilotus pyramidatus Pyramid Mulla-mulla [18216]	Critically Endangered	Species or species habitat known to occur within area	In buffer area only
Synaphea sp. Fairbridge Farm (D.Papenfus 696) Selena's Synaphea [82881]	Critically Endangered	Species or species habitat known to occur within area	In buffer area only
Synaphea sp. Pinjarra Plain (A.S.George 17182) [86878]	Endangered	Species or species habitat may occur within area	In buffer area only
Synaphea sp. Serpentine (G.R.Brand 103) [86879]	Critically Endangered	Species or species habitat may occur within area	In buffer area only
Thelymitra dedmaniarum Cinnamon Sun Orchid [65105]	Endangered	Species or species habitat may occur within area	In buffer area only
Thelymitra stellata Star Sun-orchid [7060]	Endangered	Species or species habitat known to occur within area	In feature area
Verticordia fimbrilepis subsp. fimbrilepis Shy Featherflower [24631]	Endangered	Species or species habitat may 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
Migratory Terrestrial Species			
Motacilla cinerea Grey Wagtail [642]		Species or species habitat may occur within area	In feature area
Migratory Wetlands Species			
Actitis hypoleucos Common Sandpiper [59309]		Species or species habitat known to occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Calidris acuminata Sharp-tailed Sandpiper [874]	Vulnerable	Species or species habitat likely 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 likely 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
Pandion haliaetus Osprey [952]		Species or species habitat likely 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

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 - BUSHMEAD RIFLE RANGE [50143]	WA	In buffer area only
Defence - BUSHMEAD TRAINING AREA [50260]	WA	In buffer area only
Defence - BUSHMEAD TRAINING AREA [50258]	WA	In buffer area only
Defence - BUSHMEAD TRAINING AREA [50259]	WA	In buffer area only
Unknown		
Commonwealth Land - [51266]	WA	In buffer area only
Commonwealth Land - [50950]	WA	In buffer area only
Commonwealth Land - [51347]	WA	In buffer area only

Commonwealth Land Name	State	Buffer Status
Commonwealth Land - [51299]	WA	In buffer area only
Commonwealth Land - [51297]	WA	In buffer area only
Commonwealth Land - [51318]	WA	In buffer area only
Commonwealth Land - [50874]	WA	In buffer area only
Commonwealth Land - [50952]	WA	In buffer area only
Commonwealth Land - [50873]	WA	In buffer area only
Commonwealth Land - [50872]	WA	In buffer area only
Commonwealth Land - [50870]	WA	In buffer area only
Commonwealth Land - [51319]	WA	In buffer area only
Commonwealth Land - [51927]	WA	In buffer area only
Commonwealth Land - [51920]	WA	In buffer area only
Commonwealth Land - [51335]	WA	In buffer area only
Commonwealth Land - [51334]	WA	In buffer area only
Commonwealth Land - [51333]	WA	In buffer area only
Commonwealth Land - [51332]	WA	In buffer area only
Commonwealth Land - [51928]	WA	In buffer area only
Commonwealth Land - [51525]	WA	In buffer area only
Commonwealth Land - [51348]	WA	In buffer area only
Commonwealth Land - [51313]	WA	In buffer area only
Commonwealth Land - [51242]	WA	In buffer area only
Commonwealth Land - [51312]	WA	In buffer area only
Commonwealth Land - [51268]	WA	In buffer area only
Commonwealth Land - [51349]	WA	In buffer area only
Commonwealth Land - [51267]	WA	In buffer area only
Commonwealth Land - [50867]	WA	In buffer area only
Commonwealth Land - [51523]	WA	In buffer area only
Commonwealth Land - [51528]	WA	In buffer area only

Commonwealth Land Name	State	Buffer Status
Commonwealth Land - [50949]	WA	In buffer area only
Commonwealth Land - [51526]	WA	In buffer area only
Commonwealth Land - [51357]	WA	In buffer area only
Commonwealth Land - [51354]	WA	In buffer area only
Commonwealth Land - [51350]	WA	In buffer area only
Commonwealth Land - [51356]	WA	In buffer area only
Commonwealth Land - [51314]	WA	In buffer area only
Commonwealth Land - [51910]	WA	In buffer area only
Commonwealth Land - [51986]	WA	In buffer area only
Commonwealth Land - [50885]	WA	In buffer area only
Commonwealth Land - [51315]	WA	In buffer area only
Commonwealth Land - [51914]	WA	In buffer area only
Commonwealth Land - [50866]	WA	In buffer area only
Commonwealth Land - [51387]	WA	In buffer area only
Commonwealth Land - [51917]	WA	In buffer area only
Commonwealth Land - [51918]	WA	In buffer area only
Commonwealth Land - [51320]	WA	In buffer area only
Commonwealth Land - [51317]	WA	In buffer area only
Commonwealth Land - [51972]	WA	In buffer area only
Commonwealth Land - [51321]	WA	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 known to occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Apus pacificus Fork-tailed Swift [678]	Vulnerable	Species or species habitat likely to occur within area overfly marine area	In feature area
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]		Species or species habitat likely to occur within area	In feature area
Calidris ferruginea Curlew Sandpiper [856]		Species or species habitat may occur within area overfly marine area	In feature area
Calidris melanotos Pectoral Sandpiper [858]	Critically Endangered	Species or species habitat likely to occur within area overfly marine area	In feature area
Haliaeetus leucogaster White-bellied Sea-Eagle [943]		Species or species habitat likely to occur within area	In feature area
Merops ornatus Rainbow Bee-eater [670]		Species or species habitat may occur within area overfly marine area	In feature area
Motacilla cinerea Grey Wagtail [642]		Species or species habitat may 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
Pandion haliaetus Osprey [952]		Species or species habitat likely to occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
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
Thinornis cucullatus as Thinornis rubricollis			
Hooded Plover, Hooded Dotterel [87735]		Species or species habitat may occur within area overfly marine area	In buffer area only
Tringa nebularia			
Common Greenshank, Greenshank [832]	Endangered	Species or species habitat likely to occur within area overfly marine area	In feature area

Extra Information

State and Territory Reserves			[Resource Information]
Protected Area Name	Reserve Type	State	Buffer Status
Beelu	National Park	WA	In buffer area only
Canning River	Management Area	WA	In buffer area only
Dundas Road	Nature Reserve	WA	In buffer area only
Gooseberry Hill	National Park	WA	In buffer area only
Greenmount	National Park	WA	In buffer area only
Helena River	Management Area	WA	In buffer area only
Kalamunda	National Park	WA	In buffer area only
Kenwick Wetlands	Nature Reserve	WA	In buffer area only
Korung	National Park	WA	In feature area
Lesmurdie Falls	National Park	WA	In buffer area only
Midgegooroo	National Park	WA	In buffer area only
Stinton Cascades	Nature Reserve	WA	In buffer area only
Unnamed WA21569	5(1)(g) Reserve	WA	In buffer area only
Unnamed WA23076	Nature Reserve	WA	In buffer area only
Unnamed WA24657	Conservation Park	WA	In buffer area only

Protected Area Name	Reserve Type	State	Buffer Status
Unnamed WA29815	5(1)(h) Reserve	WA	In buffer area only
Unnamed WA37997	Nature Reserve	WA	In buffer area only
Unnamed WA49079	Nature Reserve	WA	In buffer area only

Regional Forest Agreements
[Resource Information]

Note that all areas with completed RFAs have been included. Please see the associated resource information for specific caveats and use limitations associated with RFA boundary information.

RFA Name	State	Buffer Status
South West WA RFA	Western Australia	In feature area

Nationally Important Wetlands
[Resource Information]

Wetland Name	State	Buffer Status
Brixton Street Swamps	WA	In buffer area only

EPBC Act Referrals
[Resource Information]

Title of referral	Reference	Referral Outcome	Assessment Status	Buffer Status
Fruit Orchard Expansion Project	2022/09315		Completed	In buffer area only
Industrial Development MKSEA Precinct 1	2023/09760		Completed	In buffer area only
Residential subdivision of Lot 126 Lawnbrook Road, Walliston	2021/9105		Completed	In buffer area only
Roe Highway and Great Eastern Highway Bypass Grade Separation Interchange, Hazelmere WA	2020/8784		Post-Approval	In buffer area only
Talbot Road Asbestos Water Supply Pipe Decommissioning Project	2023/09661		Completed	In buffer area only
Vinci Quarry, Gravel Quarry Expansion	2022/9142		Assessment	In buffer area only

Controlled action

Airport & Freight Access Gateway	2010/5384	Controlled Action	Post-Approval	In buffer area only
Bushmead Residential Development, Hazelmere, WA	2015/7414	Controlled Action	Post-Approval	In buffer area only
Clearing for orchard expansion, Lot 400 Canning Road, Carmel, WA	2016/7647	Controlled Action	Completed	In feature area
Construction of Residential Dwelling, Ozone Terrace,	2006/3147	Controlled Action	Post-Approval	In buffer area only

Title of referral	Reference	Referral Outcome	Assessment Status	Buffer Status
Controlled action				
<u>Kalamunda</u>				
<u>Development of an Integrated Aged Care Facility, Kalumunda, WA</u>	2013/6990	Controlled Action	Completed	In buffer area only
<u>Goldfields Water Supply Scheme Project</u>	2019/8547	Controlled Action	Post-Approval	In buffer area only
<u>Goldfields Water Supply Scheme-remove sections from existing main conduit, WA</u>	2017/7935	Controlled Action	Completed	In buffer area only
<u>National Lifestyle Village, Lot 97 Adelaide Street</u>	2009/5141	Controlled Action	Post-Approval	In buffer area only
<u>Native vegetation clearing of Lot 21 Webster Road for Industrial Development</u>	2011/6186	Controlled Action	Post-Approval	In buffer area only
<u>Natural Gas Pipeline Expansion</u>	2006/2813	Controlled Action	Post-Approval	In buffer area only
<u>Nava-1 Cable System</u>	2001/510	Controlled Action	Completed	In buffer area only
<u>Roe Highway and Kalamunda Road Interchange upgrade, WA</u>	2018/8316	Controlled Action	Post-Approval	In buffer area only
<u>Tonkin Highway Grade Separated Interchanges</u>	2019/8529	Controlled Action	Post-Approval	In buffer area only
Not controlled action				
<u>Berkshire Road and Roe Highway Interchange, Forrestfield, East Perth, WA</u>	2014/7243	Not Controlled Action	Completed	In buffer area only
<u>Canning Mills Road Improvement Project, Martin, WA</u>	2015/7426	Not Controlled Action	Completed	In buffer area only
<u>Clearing of Lot 400 Canning Road, Carmel, WA</u>	2017/7979	Not Controlled Action	Completed	In feature area
<u>Community Centre Project, Kalamunda, WA</u>	2019/8473	Not Controlled Action	Completed	In buffer area only
<u>Construction of international rowing course and commercial/residential areas</u>	2003/1034	Not Controlled Action	Completed	In buffer area only
<u>Eradication of the European House Borer, Perth metropolitan area, WA</u>	2009/5027	Not Controlled Action	Completed	In feature area
<u>Forrestfield Airport Link, WA</u>	2015/7399	Not Controlled Action	Completed	In buffer area only

Title of referral	Reference	Referral Outcome	Assessment Status	Buffer Status
Not controlled action				
Hartfield Park Sporting Field Extension	2013/7008	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
Industrial Development (multiple lots) Edward Street, Kenwick, WA	2018/8231	Not Controlled Action	Completed	In buffer area only
Mundaring Outlet Works Upgrade - Stage 1	2012/6315	Not Controlled Action	Completed	In buffer area only
Pipeline Extension, Hazelmere and Helena Valley, WA	2018/8239	Not Controlled Action	Completed	In buffer area only
Residential Development - Lot 608 Dixon Road, Kalamundah, WA	2014/7389	Not Controlled Action	Completed	In buffer area only
Residential development of Lots 302, 308, 320 and part of Lot 9502, Hawtin Rd, Forrestfield, WA	2016/7770	Not Controlled Action	Completed	In buffer area only
Ridge Hill Road intersection modification and offsite water main installation, Gooseberry Hill, WA	2020/8842	Not Controlled Action	Completed	In buffer area only
Roe Highway Noise Wall, High Wycombe, WA	2014/7149	Not Controlled Action	Completed	In buffer area only
To develop a residential development at Glyde Road, Lesmurdie, WA	2013/7096	Not Controlled Action	Completed	In buffer area only
Tonkin Highway Extension	2001/470	Not Controlled Action	Completed	In buffer area only
Wungong Transfer Mains Project	2007/3532	Not Controlled Action	Completed	In buffer area only
Not controlled action (particular manner)				
Commercial Estate and Aeronautical Infrastructure Development, Precincts 2A & 2B	2006/3021	Not Controlled Action (Particular Manner)	Post-Approval	In buffer area only
INDIGO Marine Cable Route Survey (INDIGO)	2017/7996	Not Controlled Action (Particular Manner)	Post-Approval	In feature area
Mundaring Water Treatment Plant and Mundaring C Pump Station Project	2009/5193	Not Controlled Action (Particular	Post-Approval	In buffer area only

Title of referral	Reference	Referral Outcome	Assessment Status	Buffer Status
Not controlled action (particular manner)				
Manner)				
Referral decision				
Commercial development of Lot 414 Grove Road, Kenwick	2021/9022	Referral Decision	Referral Publication	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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Appendix 2: Significant Species




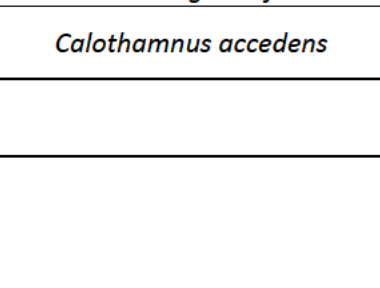
Taxon	Common Name	Description	Flowering Period	Habitat Type	Cons Code	Likelihood (Y/N)
 <p><i>Acacia anomala</i> Photos: B.R. Maslin, D. Coates & S.D. Hopper</p>	Grass Wattle	Slender, rush-like shrub, 0.2-0.5 m high. Fl. Yellow.	Aug to Sep.	Lateritic soils. Slopes.	T	Y
 <p><i>Acacia aphylla</i> Photos: S.D. Hopper & B.R. Maslin</p>	Leafless Rock Wattle	Divaricately branched, spinescent, glaucous shrub, 0.9-2.5 m high. Fl. Yellow.	Aug to Oct.	Sand, loam, clay loam. Granite outcrops, hills.	T / VU	Y
 <p><i>Acacia horridula</i> Photos: S.J. Patrick & H. Bowler</p>		Harsh, slender, single-stemmed shrub, 0.3-0.6(-1) m high. Fl. yellow	May to Aug.	Gravelly soils over granite, sand. Rocky hillsides.	P3	Y
<p><i>Acacia lasiocarpa</i> var. <i>bracteolata</i> long peduncle variant</p>		Shrub, 0.4-1.5 m high. Fl. yellow	May or Aug	Grey or black sand over clay. Swampy areas, winter wet lowlands.	P1	N



Taxon	Common Name	Description	Flowering Period	Habitat Type	Cons Code	Likelihood (Y/N)
<i>Acacia oncinophylla</i> subsp. <i>oncinophylla</i>		Shrub, 0.9-2.5 m high, 'minni-ritchi' bark, phyllodes mostly 8-13 cm long, 1-2 mm wide. Fl. yellow	Aug to Oct.	Granitic soils.	P3	N
 <p><i>Acacia oncinophylla</i> subsp. <i>patulifolia</i></p>		Shrub, 0.5-2.5(-3) m high, 'minni-ritchi' bark, phyllodes 4-9 cm long, 3-6 mm wide. Fl. yellow	Aug to Nov or Nov to Dec.	Granitic soils, occasionally on laterite.	P4	N
	<i>Acacia oncinophylla</i> subsp. <i>patulifolia</i>					
<i>Allocasuarina grevilleoides</i>		Dioecious, lignotuberous shrub, 0.15-0.4 m high.		Sand over laterite, gravel.	P3	
<i>Amanita fibrilloses</i>					P3	N
<i>Amanita kalamundae</i>	Kalamunda Lepidella				P3	N
<i>Amanita quenda</i>					P1	N
<i>Amanita wadjukiorum</i>					P3	N
 <p><i>Andersonia gracilis</i></p>		Slender erect or open straggly shrub, 0.1-0.5(-1) m high. Fl. white-pink-purple.	Sep to Nov.	White/grey sand, sandy clay, gravelly loam. Winter-wet areas, near swamps.	T / VU	N
	<i>Andersonia gracilis</i>					
<i>Andersonia</i> sp. <i>Blepharifolia</i>					P2	N



Taxon	Common Name	Description	Flowering Period	Habitat Type	Cons Code	Likelihood (Y/N)
<div>   </div> <div> <i>Anthocercis gracilis</i> <i>Anthocercis gracilis</i> </div>	Slender Tailflower	Erect, spindly shrub, to 0.6(-1) m high. Fl. yellow-green			T / VU	Y
<div>   </div> <div> <i>Aponogeton hexatepalus</i> <i>Aponogeton hexatepalus</i> </div>		Rhizomatous or cormous, aquatic perennial, herb, leaves floating. Fl. green-white.	Jul to Oct.	Mud. Freshwater: ponds, rivers, claypans.	P4	N
<div>  </div> <div> <i>Asteridea gracilis</i> <i>Asteridea gracilis</i> </div>		Annual, herb, 0.15-0.35 m high. Fl. white-pink	Sep to Dec.	Sand, clay, gravelly soils.	P3	N
<i>Austrostipa bronweniae</i>					T / EN	N
<i>Babingtonia urbana</i>	Coastal Plain Babingtonia				P3	N




Taxon	Common Name	Description	Flowering Period	Habitat Type	Cons Code	Likelihood (Y/N)
<i>Banksia kippistiana</i> var. <i>paenepeccata</i>		Erect, prickly, lignotuberous shrub, 0.3-1.2 m high. Fl. yellow-cream	Oct to Nov.	Lateritic gravelly soils.	P3	
 <div> <i>Banksia mimica</i> Photos: A.P. Brown & S. Patrick </div>	Summer Honeypot	Prostrate, lignotuberous shrub, 0.15-0.4 m high. Fl. yellow-brown.	Dec or Jan to Feb.	White or grey sand over laterite, sandy loam.	T / VU	N
 <div> <i>Banksia pteridifolia</i> subsp. <i>vernalis</i> Photos: M. Parnell </div>		Prostrate, lignotuberous shrub, to 0.4 m high. Fl. cream-white/yellow.	Sep to Oct.	White/grey sand over laterite.	P3	N


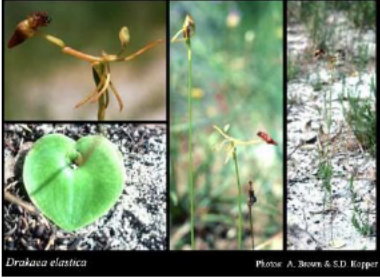

Taxon	Common Name	Description	Flowering Period	Habitat Type	Cons Code	Likelihood (Y/N)
 <p><i>Beaufortia purpurea</i></p>	Purple Beaufortia	Erect or spreading shrub, 0.3-1.5 m high. Fl. red-purple	Oct to Dec or Jan to Feb.	Lateritic or granitic soils. Rocky slopes.	P3	N
 <p><i>Boronia humifusa</i></p>		Low-growing, wiry perennial, herb, 0.1-0.2 m high. Fl. pink/red	Jun or Sep.	Gravelly clay loam over laterite. Jarrah-marri open forest.	P1	N
<i>Borya subulata</i>		Tufted perennial, herb, 0.05-0.1 m high. Fl. white	Jun.	Sandstone.	P4	N
 <p><i>Bossiaea modesta</i></p>		Slender, trailing & twining shrub. Fl. yellow & red	Oct to Dec.	Soils derived from granite. Damp areas close to stream.	P2	Y



Taxon	Common Name	Description	Flowering Period	Habitat Type	Cons Code	Likelihood (Y/N)
 <p><i>Byblis gigantea</i> Photos: B.A. Falcus & J. Hart</p>	Rainbow Plant	Small, branched perennial, herb (or sub-shrub), to 0.45 m high. Fl. pink-purple/white.	Sep to Dec or Jan.	Sandy-peat swamps. Seasonally wet areas.	P3	N
 <p><i>Caladenia huegelii</i> Photos: J. & M. Greve & J.L. Robson</p>	Grand Spider Orchid	Tuberous, perennial, herb, 0.25-0.6 m high. Fl. green & cream & red.	Sep to Oct.	Grey or brown sand, clay loam.	T / CR	N
 <p><i>Calandrinia uncinella</i> Photos: P.J. Davies, M. Hering</p>	Blue Tinsel Lily	Rhizomatous, perennial, herb (or undershrub), to 0.65 m high, without stilt roots. Fl. blue/purple.	Jun to Nov.	White, grey or yellow sand, sandy clay, gravel, laterite, granite. Swampy areas, rock outcrops, flats, slopes, ridges.	P2	N
 <p><i>Calothamnus accedens</i></p>		Erect & slender shrub, to 1.8 m high. Fl. pink-red.		Sandy soils over laterite. Road verge.	P4	N



Taxon	Common Name	Description	Flowering Period	Habitat Type	Cons Code	Likelihood (Y/N)
 <p><i>Calothamnus graniticus</i> subsp. <i>leptophyllus</i> Photos: A.D. Crawford, M. Hancock & R. McGrouther</p>		Erect, multi-stemmed shrub, 1-2 m high. Fl. red	Jun to Aug.	Clay over granite, lateritic soils. Hillsides.	P4	N
 <p><i>Calytrix breviseta</i> subsp. <i>breviseta</i> Photos: A.P. Brown, D. Coates & E. Holliday</p>		Shrub, 0.4-1 m high. Fl. purple-blue.	Oct to Nov.	Sandy clay. Swampy flats.	T / CR	N
<i>Chamaescilla gibsonii</i>		Clumped tuberous, herb. Fl. Blue.	Sep.	Clay to sandy clay. Winter-wet flats, shallow water-filled claypans.	P3	N
<i>Chamelaucium lullfitzii</i>					T / EN	N
<i>Comesperma griffinii</i>		Annual or perennial, herb, to 0.15 m high. Fl. White.	Oct.	Yellow or grey sand. Plains.	P2	N
<i>Comesperma rhadinocarpum</i>	Slender-fruited Comesperma	Perennial, herb. Fl. Blue.	Oct to Nov.	Sandy soils.	P3	N



Taxon	Common Name	Description	Flowering Period	Habitat Type	Cons Code	Likelihood (Y/N)
<i>Commersonia sp. Lesmurdie</i>					P2	N
		Erect, compact shrub, 0.6-2 m high. Fl. white-other.	May to Oct.	Grey or yellow-orange clayey sand.	T / VU	N
<i>Conospermum undulatum</i>						
	Yellow China Orchid	Tuberous, perennial, herb, 0.05-0.15 m high. Fl. yellow	Aug to Oct.	Laterite, gravel.	P4	Y
<i>Cyanicula ixioides subsp. ixioides</i>						
<i>Cyanothamnus tenuis</i>	Blue Boronia				P4	Y
<i>Darwinia apiculata</i>	Scarp Darwinia	Densely branched shrub, 0.4-0.5 m high. Fl. green & yellow/red.	Oct.	Lateritic soils.	T / EN	N


Taxon	Common Name	Description	Flowering Period	Habitat Type	Cons Code	Likelihood (Y/N)
 <p><i>Diplolaena andrewsii</i></p>		Erect shrub, 0.5-1 m high, inner involucral bracts glabrous, leaves broadly cordate. Fl. Red.	Jul to Oct.	Loam, clay. Granite outcrops & hillsides.	T / EN	N
<i>Diplolaena andrewsii</i>						
<i>Diuris brevis</i>	Short-nosed Donkey Orchid				P2	N
 <p><i>Diuris drummondii</i></p>	Tall Donkey Orchid	Tuberous, perennial, herb, 0.5-1.05 m high. Fl. Yellow.	Nov to Dec or Jan.	Low-lying depressions, swamps.	T	N
<i>Diuris drummondii</i>						
 <p><i>Diuris micrantha</i></p>	Dwarf Bee Orchid	Tuberous, perennial, herb, 0.3-0.6 m high. Fl. yellow & brown	Sep to Oct.	Brown loamy clay. Winter-wet swamps, in shallow water.	T / VU	N
<i>Diuris micrantha</i>						


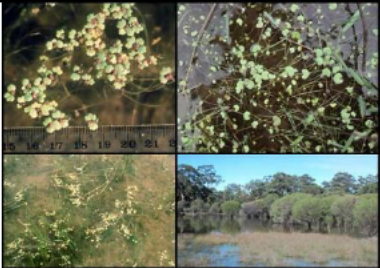
Taxon	Common Name	Description	Flowering Period	Habitat Type	Cons Code	Likelihood (Y/N)
 <p><i>Diuris purdiei</i></p>	Purdie's Donkey Orchid	Tuberous, perennial, herb, 0.15-0.35 m high. Fl. Yellow.	Sep to Oct.	Grey-black sand, moist. Winter-wet swamps.	T / EN	N
 <p><i>Drakaea elastica</i></p>	Glossy-leaved Hammer Orchid	Tuberous, perennial, herb, 0.12-0.3 m high. Fl. red & green & yellow.	Oct to Nov.	White or grey sand. Low-lying situations adjoining winter-wet swamps.	T / EN	N
 <p><i>Drakaea micrantha</i></p>	Dwarf Hammer Orchid	Tuberous, perennial, herb, 0.15-0.3 m high. Fl. red & yellow.	Sep to Oct.	White-grey sand.	T / VU	N


Taxon	Common Name	Description	Flowering Period	Habitat Type	Cons Code	Likelihood (Y/N)
 <i>Drosera occidentalis</i> Photo: S.D. Hopper & J.L. Robson	Western Sundew	Fibrous-rooted, rosetted perennial, herb, to 0.025 m high. Fl. pink/white	Oct to Dec or Jan.		P4	N
<i>Drosera occidentalis</i>						
 <i>Eleocharis keigheryi</i> Photo: G.J. Keighery		Rhizomatous, clumped perennial, grass-like or herb (sedge), to 0.4 m high. Fl. Green.	Aug to Nov.	Clay, sandy loam. Emergent in freshwater: creeks, claypans.	T / VU	N
<i>Eleocharis keigheryi</i>						
<i>Eremophila glabra subsp. chlorella</i>					T / EN	N


Taxon	Common Name	Description	Flowering Period	Habitat Type	Cons Code	Likelihood (Y/N)
<i>Eriochilus glareosus</i>	Scarp bunny orchid		Jun to July.	Jarrah and Casuarina woodlands on laterite	P1	N
<i>Eryngium pinnatifidum</i> subsp. <i>Palustre</i>					P3	N
<i>Eryngium</i> sp. <i>Subdecumbens</i>					P3	N
 <p><i>Eucalyptus balanites</i> Photos: R. Cranfield, L. Sweeney & S.D. Hopper</p>	Cadda Road Mallee	(Mallee), to 5 m high, bark rough, flaky. Fl. White.	Oct to Dec or Jan to Feb.	Sandy soils with lateritic gravel.	T / EN	N
	<i>Eucalyptus x balanites</i>					
 <p><i>Goodenia arthrotricha</i> Photo: H. Bowler</p>		Erect perennial, herb, to 0.4 m high. Fl. blue	Oct to Nov.	Gravel. Granite rocks, slopes.	T / EN	N
<i>Goodenia arthrotricha</i>						
<i>Grevillea curviloba</i> subsp. <i>incurva</i>		Prostrate to erect shrub, 0.1-2.5 m high. Fl. white-cream.	Aug to Oct.	Grey sand, sandy loam. Winter-wet heath.	T / EN	N
<i>Grevillea dissectifolia</i>					P3	N






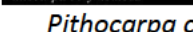
Taxon	Common Name	Description	Flowering Period	Habitat Type	Cons Code	Likelihood (Y/N)
 <p><i>Grevillea flexuosa</i></p>	Tangled Grevillea	Irregular, few-branched, non-lignotuberous shrub, to 2 m high. Fl. creamy-yellow.	Jul to Oct.	Red-brown sand with laterite & gravel, sand over granite. Ridgetop plateau & associated breakaways.	T / VU	N
 <p><i>Grevillea pimeleoides</i></p>		Non-lignotuberous shrub, 0.4-2.4 m high. Fl. yellow-orange.	May to Nov.	Gravelly soils over granite. Rocky hillsides.	P4	N


Taxon	Common Name	Description	Flowering Period	Habitat Type	Cons Code	Likelihood (Y/N)
 <i>Grevillea thelemanniana</i> Photo: L.Anderson <i>Grevillea thelemanniana</i>	Spider Net Grevillea	Spreading, lignotuberous shrub, 0.3-1.5 m high. Fl. pink-red.	May to Nov.	Sand, sandy clay. Winter-wet low-lying flats.	T / CR	N
<i>Haemodorum loratum</i>		Bulbaceous, perennial, herb, 0.45-1.2(-2) m high. Fl. black/brown-black/green.	Nov.	Grey or yellow sand, gravel.	P3	N


Taxon	Common Name	Description	Flowering Period	Habitat Type	Cons Code	Likelihood (Y/N)
6						
 <i>Halgania corymbosa</i> Photo: H. Bowler		Erect shrub, 0.35-1 m high. Fl. blue-purple.	Aug to Nov.	Gravelly soils, soils over granite.	P3	N
 <i>Hydrocotyle lemnoides</i> Photo: S.D. Hopper & J.L. Roberts	Aquatic Pennywort	Aquatic, floating annual, herb. Fl. Purple.	Aug to Oct.	Swamps.	P4	N
<i>Hydrocotyle striata</i>		Herb.		Clay. Springs.	P1	N
<i>Isopogon autumnalis</i>	Autumn Isopogon				P3	N



Taxon	Common Name	Description	Flowering Period	Habitat Type	Cons Code	Likelihood (Y/N)
<i>Isotropis cuneifolia</i> subsp. <i>glabra</i>		Prostrate to ascending, spreading perennial, herb or shrub, 0.05-0.15 m high. Fl. yellow/orange & red.	Sep.	Sand, clay loam. Winter-wet flats.	P3	N
<i>Johnsonia pubescens</i> subsp. <i>cygnorum</i>		Tufted perennial, herb, 0.15-0.25 m high. Fl. white-green.	Sep.	Grey-white-yellow sand. Flats, seasonally-wet sites.	P2	N
 <i>Lasiopetalum bracteatum</i>	Helena Velvet Bush	Erect, open shrub, 0.4-1.5 m high. Fl. pink-purple.	Aug to Nov.	Sandy clay, clay, lateritic gravel. Along drainage lines, creeks, gullies, granite outcrops.	P4	N
<i>Lasiopetalum glutinosum</i> subsp. <i>glutinosum</i>					P3	N
<i>Lepidosperma rostratum</i>		Rhizomatous, tufted perennial, grass-like or herb (sedge), 0.5 m high. Fl. brown.		Peaty sand, clay.	T / EN	
<i>Lepyrodia curvescens</i>		Dioecious, shortly creeping, tufted rhizomatous, herb, 0.24-0.4 m high, rhizomes on surface or to 1 cm deep.	Sep to Nov.	Sand, laterite. Seasonally inundated swampland.	P2	N
<i>Leucopogon</i> sp. <i>Busselton</i>					P2	N




Taxon	Common Name	Description	Flowering Period	Habitat Type	Cons Code	Likelihood (Y/N)
 <p><i>Macarthuria keigheryi</i></p>		Erect or spreading perennial, herb or shrub, 0.2-0.4 m high, 0.3-0.6 m wide.	Sep to Dec or Feb to Mar.	White or grey sand.	T / EN	N
<i>Meionectes tenuifolia</i>					P3	N
<i>Melaleuca viminalis</i> var. <i>viminalis</i>					P2	N
<i>Microtis quadrata</i>	South Coast Mignonette Orchid				P4	N
<i>Morelotia australiensis</i>	Southern Tetraria				T	N
<i>Myriophyllum echinatum</i>		Erect annual, herb, 0.02-0.03 m high. Fl. Red.	Nov.	Clay. Winter-wet flats.	P3	N
<i>Ornduffia submersa</i>					P4	N
<i>Paracaleana ferricola</i>	Darling Range Duck Orchid		Sept to Dec.	Lateritic soils in open forests.	P2	Y




Taxon	Common Name	Description	Flowering Period	Habitat Type	Cons Code	Likelihood (Y/N)
  <p><i>Pimelea rara</i></p>	Summer Pimelea	Shrub, 0.2-0.35 m high. Fl. white	Dec or Jan.	Lateritic soils.	P4	Y
 <p><i>Pimelea rara</i></p>						
  <p><i>Pithocarpa corymbulosa</i></p>	Corymbose Pithocarpa	Erect to scrambling perennial, herb, 0.5-1 m high. Fl. White.	Jan to Apr.	Gravelly or sandy loam. Amongst granite outcrops.	P3	N
 <p><i>Pithocarpa corymbulosa</i></p>						
<i>Platysace ramosissima</i>		Perennial, herb, to 0.3 m high. Fl. white-cream.	Oct to Nov.	Sandy soils.	P3	N
<i>Ptilotus pyramidatus</i>		Small herb. Fl. white.			T / CR	N
<i>Rytidosperma racemosum</i> var. <i>racemosum</i>					P2	N
<i>Schoenus benthamii</i>		Tufted perennial, grass-like or herb (sedge), 0.15-0.45 m high. Fl. Brown.	Oct to Nov.	White, grey sand, sandy clay. Winter-wet flats, swamps.	P3	N
<i>Schoenus capillifolius</i>		Semi-aquatic tufted annual, grass-like or herb (sedge), 0.05 m high. Fl. Green.	Oct to Nov.	Brown mud. Claypans.	P3	N




Taxon	Common Name	Description	Flowering Period	Habitat Type	Cons Code	Likelihood (Y/N)
<i>Schoenus loliaceus</i>		Annual, grass-like or herb (sedge), 0.03-0.06 m high.	Aug to Nov.	Sandy soils. Winter-wet depressions.	P2	N
 <div> <i>Schoenus natans</i> Photos: G.J. Kightley & J.L. Roberts </div>	Floating Bog-rush	Aquatic annual, grass-like or herb (sedge), 0.3 m high. Fl. Brown.	Oct.	Winter-wet depressions.	P4	N
<i>Schoenus natans</i>						
Schoenus sp. Beaufort		Annual, grass-like or herb (sedge), ca 0.05 m high. Fl. green.		Mud. Winter-wet claypans.	P1	N
<i>Schoenus pennisetis</i>		Tufted annual, grass-like or herb (sedge), 0.05-0.15 m high. Fl. purple-black.	Aug to Sep.	Grey or peaty sand, sandy clay. Swamps, winter-wet depressions.	P3	N
<i>Scholtzia sp. Bickley</i>					EX	N


Taxon	Common Name	Description	Flowering Period	Habitat Type	Cons Code	Likelihood (Y/N)
 <p><i>Senecio gilbertii</i> Photo: S.J. Patrick</p>		Erect, slender perennial, herb, to 1.5 m high. Fl. Yellow.	Sep to Nov.	Peaty sand. Swamps, slopes.	P1	N
<i>Senecio leucoglossus</i>		Erect annual, herb, to 1.3 m high. Fl. white	Aug to Dec.	Gravelly lateritic or granitic soils. Granite outcrops, slopes.	P4	N
<i>Sporobolus blakei</i>		Tufted perennial, grass-like or herb, 0.45-0.6 m high. Fl. green-purple	Mar or Jun to Jul.	Red sandy clay, loam. Creeks.	P3	N
<i>Stackhousia</i> sp. Red-blotched corolla					P3	N
<i>Stylidium aceratum</i>		Fibrous rooted annual, herb, 0.05-0.09 m high, leaves spatulate. Fl. pink/white.	Oct to Nov.	Sandy soils. Swamp heathland.	P3	N

Taxon	Common Name	Description	Flowering Period	Habitat Type	Cons Code	Likelihood (Y/N)
<i>Stylidium periscelanthum</i>	Pantaloon Triggerplant	Bulb-forming perennial, herb, 0.07-0.15 m high. Fl. pink	Sep to Oct.	Loamy clay, moist soils pockets. Wet flats, low granitic hills.	P3	N
 <i>Stylidium striatum</i>	Fan-leaved Triggerplant	Rosetted perennial, herb, 0.15-0.55 m high, Leaves erect, oblanceolate to spatulate, 1.5-4 cm long, 1.5-6 mm wide, apex acute to acuminate, margin entire, glabrous, striate. Scape sparingly glandular on inflorescence axis, glabrous below. Inflorescence racemose. Fl. yellow.	Oct to Nov.	Brown clay loam over laterite. Hillslopes. Jarrah/Marri forest, Wandoo woodland.	P4	Y
<i>Styphelia filifolia</i>					P3	N
 <i>Synaphea sp. Fairbridge Farm</i> (D. Papenfus 696)		Dense, clumped shrub, to 0.3 m high, to 0.4 m wide. Fl. yellow	Oct.	Sandy with lateritic pebbles. Near winter-wet flats, in low woodland with weedy grasses.	T / CR	N

Taxon	Common Name	Description	Flowering Period	Habitat Type	Cons Code	Likelihood (Y/N)
 <div> <i>Synaphea</i> sp. Pinjarra Plain (A.S. George 17182) Photos: R. Butcher </div>		Erect, clumped shrub (sub-shrub), to 0.8 m high. Fl. yellow	Sep to Nov.	Grey sandy loam or clay, grey-brown clayey sand, brown clayey loam, laterite. Flats, seasonally wet areas, railroad reserves often with wet depressions or drains.	T / EN	N
 <div> <i>Synaphea</i> sp. Serpentine (G.R. Brand 103) Photos: R. Butcher </div>					T	N
 <div> <i>Thelymitra dedmaniarum</i> Photos: A.P. Brown, N. Hoffman & J.L. Robinson </div>	Cinnamon Sun Orchid	Tuberous, perennial, herb, to 0.8 m high. Fl. Yellow.	Nov to Dec or Jan.	Granite.	T / EN	N

Taxon	Common Name	Description	Flowering Period	Habitat Type	Cons Code	Likelihood (Y/N)
 <i>Thelymitra magnifica</i>	Crystal Brook Star Orchid	Perennial, herb.		Stony ridges.	T / CR	N
 <i>Thelymitra stellata</i>	Star Orchid	Tuberous, perennial, herb, 0.15-0.25 m high. Fl. yellow & brown.	Oct to Nov.	Sand, gravel, lateritic loam.	T / EN	N
 <i>Thysanotus anceps</i>		Rhizomatous, leafless perennial, herb, to 0.4 m high. Fl. Purple.	Oct to Dec.	White or grey sand, lateritic gravel, laterite.	P3	N

Taxon	Common Name	Description	Flowering Period	Habitat Type	Cons Code	Likelihood (Y/N)
 <i>Thysanotus cymosus</i>		Caespitose perennial, herb (with fibrous roots with ellipsoidal tubers), to 0.3 m high. Fl. purple	Sep to Oct.	Clay, granitic or lateritic sand.	P3	N
 <i>Thysanotus glaucus</i>		Caespitose, glaucous perennial, herb, 0.1-0.2 m high. Fl. purple	Oct to Dec or Jan to Mar.	White, grey or yellow sand, sandy gravel.	P4	N
 <i>Verticordia fimbrialepis subsp. fimbrialepis</i>		Shrub, 0.3-0.7 m high. Fl. pink-white	Oct to Dec or Jan.	Gravelly sandy or clayey soils. Flats, road verges.	T	N

Taxon	Common Name	Description	Flowering Period	Habitat Type	Cons Code	Likelihood (Y/N)
 <i>Verticordia lindleyi</i> subsp. <i>lindleyi</i> <i>Verticordia lindleyi</i> subsp. <i>lindleyi</i>		Erect shrub, 0.2-0.75 m high. Fl. pink	May or Nov to Dec or Jan.	Sand, sandy clay. Winter-wet depressions.	P4	

Appendix 3: Conservation Codes

Western Australia

Conservation Code	Name	Description
T	Threatened	Flora or fauna that is rare or likely to become extinct, ranked according to their level of threat using IUCN Red List criteria (Schedules 1-3 of the Wildlife Conservation (Specially Protected Fauna) Notice or the Wildlife Conservation (Rare Flora) Notice)
CR	Critically endangered	Species considered to be facing an extremely high risk of extinction within the wild in the immediate future
EN	Endangered	Species considered to be facing a very high risk of extinction in the wild in the near future
VU	Vulnerable	Species considered to be facing a high risk of extinction in the wild in the medium-term future
EX	Extinct Species	Species where 'there is no reasonable doubt that the last member of the species has died (Schedule 4 of the Wildlife Conservation (Specially Protected Fauna) Notice or the Wildlife Conservation (Rare Flora) Notice)
EW	Extinct in the Wild	Species that are known to only survive in cultivation, in captivity, or as a naturalised population well outside its past range; and it has not been recorded in its known or expected habitat at appropriate seasons anywhere in its past range, despite surveys over a timeframe appropriate to its life cycle and form
MI	Migratory Species	Fauna that periodically or occasionally visit Australia or an external Territory or the exclusive economic zone; or the species is subject of an international agreement that relates to the protection of migratory species and that binds the Commonwealth (Schedule 5 of the Wildlife Conservation (Specially Protected Fauna) Notice)
CD	Conservation Dependent	Species of special conservation interest (conservation dependent fauna), being species dependent on ongoing conservation intervention to prevent it becoming eligible for listing as threatened (Schedule 6 of the Wildlife Conservation (Specially Protected Fauna) Notice)
OS	Specially Protected	Fauna otherwise in need of special protection to ensure their conservation (Schedule 7 of the Wildlife Conservation (Specially Protected Fauna) Notice)
P	Priority Species	Possibly threatened species that do not meet survey criteria, or are otherwise data deficient, are added to the Priority Fauna or Priority Flora Lists under Priorities 1, 2 or 3. These three categories are ranked in order of priority for survey and evaluation of conservation status so that consideration can be given to their declaration as threatened fauna

Conservation Code	Name	Description
		or flora. Species that are adequately known, are rare but not threatened, or meet criteria for near threatened, or that have been recently removed from the threatened species or other specially protected fauna lists for other than taxonomic reasons, are placed in Priority 4. These species require regular monitoring.
P1	Priority One	Poorly known species – Species that are known from one or a few locations (generally five or less) which are potentially at risk. All occurrences are either very small or on lands not managed for conservation, such as road verges, urban areas, farmland, active mineral lease and under threat of habitat destruction or degradation.
P2	Priority Two	Poorly known species – Species that are known from one or a few locations (generally five or less), some of which are on lands managed primarily for nature conservation, such as national parks, conservation parks, nature reserves, State forest, vacant Crown land, water reserves and similar.
P3	Priority Three	Poorly known species – Species that are known from several locations, and the species does not appear to be under imminent threat, or from few but widespread locations with either large population size or significant remaining areas of apparently suitable habitat, much of it not under imminent threat
P4	Priority Four	Rare or near threatened and other species in need of monitoring.

(Source: Department of Biodiversity, Conservation and Attractions, 2020a)

Commonwealth

Category	Description
Critically Endangered	Species facing an extremely high risk of extinction in the wild in the immediate future
Endangered	Species facing a very high risk of extinction in the wild in the near future
Vulnerable	Species facing a high risk of extinction in the wild in the medium term

(Source: Department of Biodiversity, Conservation and Attractions, 2019)

Appendix 4: Species List

The complete flora list for the site is provided in the table below with flora listed by family, and vegetation type they occurred within indicated. *Denotes introduced species and # denotes species that are native to Western Australia but not to this local region. Species highlighted in red indicates declared pests and WoNS, and species highlighted in green indicates conservation significant flora.

Family	Species Name	Common
Amaranthaceae	<i>Ptilotus manglesii</i>	Pom Poms
Apiaceae	<i>Actinotus glomeratus</i>	
Apiaceae	<i>Pentapeltis peltigera</i>	
Apiaceae	<i>Xanthosia candida</i>	
Arecaceae	* <i>Washingtonia filifera</i>	
Asparagaceae	* <i>Agave americana</i>	Century Plant
Asparagaceae	* <i>Asparagus asparagoides</i>	Bridal Creeper
Asparagaceae	<i>Laxmannia ramosa</i>	Branching Lily
Asparagaceae	<i>Lomandra nigricans</i>	
Asparagaceae	<i>Lomandra purpurea</i>	Purple Mat Rush
Asparagaceae	<i>Thysanotus manglesianus</i>	Mangles' Fringed Lily
Asteraceae	* <i>Arctotheca calendula</i>	Cape Weed
Asteraceae	* <i>Cotula coronopifolia</i>	Waterbuttons
Asteraceae	* <i>Erigeron sumatrensis</i>	
Asteraceae	* <i>Gazania linearis</i>	
Asteraceae	* <i>Hypochaeris glabra</i>	Smooth Cats-ear
Asteraceae	* <i>Sonchus asper</i>	Rough Sowthistle
Asteraceae	<i>Hypochaeris glabra</i>	Smooth Cats-ear
Asteraceae	<i>Ursinia anthemoides</i>	Ursinia
Brassicaceae	* <i>Brassica tournefortii</i>	Mediterranean Turnip
Campanulaceae	<i>Isotoma hypocrateriformis</i>	Woodbridge Poison
Caryophyllaceae	* <i>Cerastium glomeratum</i>	Mouse Ear Chickweed
Caryophyllaceae	* <i>Silene gallica</i>	French Catchfly
Caryophyllaceae	* <i>Spergula arvensis</i>	Corn Spurry
Caryophyllaceae	* <i>Stellaria media</i>	Chickweed
Casuarinaceae	<i>Allocasuarina fraseriana</i>	Sheoak
Casuarinaceae	<i>Allocasuarina huegeliana</i>	Rock Sheoak

Family	Species Name	Common
Colchicaceae	<i>Burchardia congesta</i>	Milkmaids
Cyperaceae	<i>Lepidosperma asperatum</i>	
Cyperaceae	<i>Lepidosperma costale</i>	
Cyperaceae	<i>Lepidosperma leptostachyum</i>	
Cyperaceae	<i>Lepidosperma tetraquetrum</i>	
Cyperaceae	<i>Mesomelaena pseudostygia</i>	Semaphore Sedge
Dilleniaceae	<i>Hibbertia huegelii</i>	
Dilleniaceae	<i>Hibbertia hypericoides</i>	Yellow Buttercups
Dilleniaceae	<i>Hibbertia ovata</i>	
Droseraceae	<i>Drosera erythrorhiza</i>	Red Ink Sundew
Droseraceae	<i>Drosera glanduligera</i>	Pimpernel Sundew
Droseraceae	<i>Drosera pallida</i>	Pale Rainbow
Ericaceae	<i>Styphelia propinqua</i>	
Ericaceae	<i>Styphelia discolor</i>	
Fabaceae	* <i>Acacia decurrens</i>	
Fabaceae	* <i>Acacia iteaphylla</i>	
Fabaceae	* <i>Acacia longifolia</i>	
Fabaceae	* <i>Acacia podalyriifolia</i>	
Fabaceae	* <i>Acacia pycnantha</i>	Golden Wattle
Fabaceae	* <i>Chamaecytisus palmensis</i>	Tagasaste
Fabaceae	* <i>Dipogon lignosus</i>	Dolichos Pea
Fabaceae	* <i>Lathyrus tingitanus</i>	Tangier Pea
Fabaceae	* <i>Lotus subbiflorus</i>	
Fabaceae	* <i>Lupinus angustifolius</i>	Narrowleaf Lupin
Fabaceae	* <i>Lupinus cosentinii</i>	
Fabaceae	* <i>Medicago polymorpha</i>	Burr Medic
Fabaceae	* <i>Vicia sativa</i>	Common Vetch
Fabaceae	<i>Acacia alata</i>	Winged Wattle
Fabaceae	* <i>Acacia baileyana</i>	
Fabaceae	<i>Acacia barbinervis</i>	
Fabaceae	<i>Acacia ephedroides</i>	
Fabaceae	<i>Acacia pulchella</i>	Prickly Moses

Family	Species Name	Common
Fabaceae	<i>Acacia pulchella</i> var. <i>pulchella</i>	Prickly Moses
Fabaceae	<i>Acacia saligna</i>	Orange Wattle
Fabaceae	<i>Acacia stenoptera</i>	Narrow Winged Wattle
Fabaceae	<i>Acacia teretifolia</i>	
Fabaceae	<i>Bossiaea aquifolium</i>	Water Bush
Fabaceae	<i>Bossiaea ornata</i>	
Fabaceae	<i>Chorizema dicksonii</i>	Yellow-eyed Flame Pea
Fabaceae	<i>Daviesia decurrens</i>	Prickly Bitter-pea
Fabaceae	<i>Daviesia rhombifolia</i>	
Fabaceae	<i>Gastrolobium capitatum</i>	Bacon and Eggs
Fabaceae	<i>Gompholobium knightianum</i>	
Fabaceae	<i>Gompholobium marginatum</i>	
Fabaceae	<i>Gompholobium ovatum</i>	
Fabaceae	<i>Hardenbergia comptoniana</i>	Native Wisteria
Fabaceae	<i>Hovea chorizemifolia</i>	Holly-leaved Hovea
Fabaceae	<i>Hovea pungens</i>	Devil's Pins
Fabaceae	<i>Hovea trisperma</i>	Common Hovea
Fabaceae	<i>Jacksonia alata</i>	
Fabaceae	<i>Kennedia prostrata</i>	Scarlet Runner
Fabaceae	<i>Mirbelia dilatata</i>	Holly-leaved Mirbelia
Geraniaceae	* <i>Erodium cygnorum</i>	Blue Heronsbill
Geraniaceae	* <i>Geranium molle</i>	Dove's Foot Cranesbill
Goodeniaceae	<i>Dampiera linearis</i>	Common Dampiera
Goodeniaceae	<i>Lechenaultia biloba</i>	Blue Leschenaultia
Haemodoraceae	<i>Conostylis candicans</i>	Grey Cottonhead
Haemodoraceae	<i>Conostylis setigera</i>	Bristly Cottonhead
Haemodoraceae	<i>Conostylis setosa</i>	White Cottonhead
Haemodoraceae	<i>Haemodorum laxum</i>	Bloodroot
Haemodoraceae	<i>Haemodorum simplex</i>	
Hemerocallidaceae	<i>Chamaescilla corymbosa</i>	Blue Squill
Hemerocallidaceae	<i>Corynotheca micrantha</i>	Hexagon Zigzag Lily
Hemerocallidaceae	<i>Dianella revoluta</i>	Blueberry Lily

Family	Species Name	Common
Hemerocallidaceae	<i>Dianella revoluta</i> var. <i>divaricata</i>	Flax Lily
Iridaceae	* <i>Babiana angustifolia</i>	
Iridaceae	* <i>Chasmanthe floribunda</i>	African Cornflag
Iridaceae	* <i>Freesia leichtlinii</i>	
Iridaceae	* <i>Gladiolus angustus</i>	Long Tubed Painted Lady
Iridaceae	* <i>Gladiolus caryophyllaceus</i>	Wild Gladiolus
Iridaceae	* <i>Romulea rosea</i>	Guildford Grass
Iridaceae	* <i>Watsonia meriana</i>	Bulbil Watsonia
Iridaceae	<i>Patersonia occidentalis</i>	Purple Flag
Iridaceae	<i>Patersonia umbrosa</i>	Yellow Flags
Lamiaceae	* <i>Lavandula stoechas</i>	Italian Lavender
Lamiaceae	* <i>Stachys arvensis</i>	Staggerweed
Lamiaceae	* <i>Westringia fruticosa</i>	
Lauraceae	<i>Cassytha flava</i>	Dodder Laurel
Malvaceae	# <i>Hibiscus tiliaceus</i>	
Malvaceae	* <i>Hibiscus rosa-sinensis</i>	
Malvaceae	<i>Thomasia foliosa</i>	
Myrtaceae	# <i>Callistemon phoeniceus</i>	
Myrtaceae	# <i>Eucalyptus lehmannii</i>	Bushy Yate
Myrtaceae	# <i>Eucalyptus camaldulensis</i>	River Gum
Myrtaceae	* <i>Corymbia citriodora</i>	
Myrtaceae	* <i>Corymbia maculata</i>	
Myrtaceae	* <i>Eucalyptus grandis</i>	
Myrtaceae	* <i>Gaudium laevigatum</i>	Coast Teatree
Myrtaceae	<i>Calytrix variabilis</i>	
Myrtaceae	<i>Corymbia calophylla</i>	Marri
Myrtaceae	<i>Darwinia citriodora</i>	Lemon-scented Darwinia
Myrtaceae	<i>Eucalyptus marginata</i>	Jarrah
Myrtaceae	<i>Eucalyptus</i> sp.	
Myrtaceae	<i>Hypocalymma angustifolium</i>	White Myrtle
Myrtaceae	<i>Leptospermum erubescens</i>	Roadside Teatree
Myrtaceae	<i>Melaleuca parviceps</i>	

Family	Species Name	Common
Myrtaceae	<i>Melaleuca viminea</i>	Mohan
Nyctaginaceae	* <i>Bougainvillea glabra</i>	
Oleaceae	* <i>Olea europaea</i>	Olive
Orchidaceae	<i>Eriochilus dilatatus</i>	White Bunny Orchid
Orchidaceae	<i>Pyrorchis nigricans</i>	Red Beaks
Oxalidaceae	* <i>Oxalis glabra</i>	
Oxalidaceae	* <i>Oxalis pes-caprae</i>	Soursob
Oxalidaceae	* <i>Oxalis purpurea</i>	Largeflower Wood Sorrel
Papaveraceae	* <i>Fumaria capreolata</i>	Whiteflower Fumitory
Papaveraceae	<i>Fumaria muralis</i>	Wall Fumitory
Passifloraceae	* <i>Passiflora filamentosa</i>	
Pinaceae	* <i>Pinus pinaster</i>	Pinaster Pine
Pittosporaceae	<i>Billardiera fusiformis</i>	Australian Bluebell
Plantaginaceae	* <i>Plantago lanceolata</i>	Ribwort Plantain
Poaceae	* <i>Avena barbata</i>	Bearded Oat
Poaceae	* <i>Briza maxima</i>	Blowfly Grass
Poaceae	* <i>Briza minor</i>	Shivery Grass
Poaceae	* <i>Cenchrus setaceus</i>	Fountain Grass
Poaceae	* <i>Ehrharta calycina</i>	Perennial Veldt Grass
Poaceae	* <i>Ehrharta longiflora</i>	Annual Veldt Grass
Poaceae	* <i>Lagurus ovatus</i>	Hare's Tail Grass
Poaceae	* <i>Melinis repens</i>	
Polygalaceae	<i>Comesperma calymega</i>	Blue-spike Milkwort
Primulaceae	* <i>Lysimachia arvensis</i>	Pimpernel
Proteaceae	# <i>Grevillea olivacea</i>	Olive Grevillea
Proteaceae	# <i>Hakea laurina</i>	Pincushion Hakea
Proteaceae	<i>Adenanthos barbiger</i>	
Proteaceae	<i>Banksia armata</i>	Prickly Dryandra
Proteaceae	<i>Banksia dallanneyi</i>	Couch Honeypot
Proteaceae	<i>Banksia sessilis</i>	Parrot Bush
Proteaceae	<i>Grevillea synapheae</i>	Catkin Grevillea
Proteaceae	<i>Grevillea thelemanniana</i>	Spider Net Grevillea

Family	Species Name	Common
Proteaceae	<i>Grevillea wilsonii</i>	Native Fuchsia
Proteaceae	<i>Hakea amplexicaulis</i>	Prickly Hakea
Proteaceae	<i>Hakea cristata</i>	Snail Hakea
Proteaceae	<i>Hakea lissocarpa</i>	Honey Bush
Proteaceae	<i>Hakea trifurcata</i>	Two-leaf Hakea
Proteaceae	<i>Hakea varia</i>	Variable-leaved Hakea
Proteaceae	<i>Isopogon dubius</i>	Pincushion Coneflower
Proteaceae	<i>Stirlingia latifolia</i>	Blueboy
Restionaceae	<i>Desmocladius asper</i>	
Rhamnaceae	<i>Trymalium ledifolium</i>	
Rosaceae	* <i>Cotoneaster glaucophyllus</i>	
Rosaceae	* <i>Photinia sp.</i>	
Rosaceae	* <i>Rosa canina</i>	
Rosaceae	* <i>Rubus ulmifolius</i>	Blackberry
Rubiaceae	* <i>Galium murale</i>	Small Goosegrass
Rubiaceae	<i>Opercularia vaginata</i>	Dog Weed
Rutaceae	* <i>Citrus limon</i>	
Rutaceae	<i>Philotheca spicata</i>	Pepper and Salt
Solanaceae	* <i>Solanum nigrum</i>	Black Berry Nightshade
Stylidiaceae	<i>Stylidium androsaceum</i>	Book Triggerplant
Stylidiaceae	<i>Stylidium brunonianum</i>	Pink Fountain Triggerplant
Stylidiaceae	<i>Stylidium ciliatum</i>	Golden Triggerplant
Stylidiaceae	<i>Stylidium recurvum</i>	
Stylidiaceae	<i>Stylidium repens</i>	Matted Triggerplant
Stylidiaceae	<i>Stylidium scariosum</i>	
Stylidiaceae	<i>Stylidium striatum</i>	Fan-leaved Triggerplant
Thymelaeaceae	<i>Pimelea imbricata</i>	
Violaceae	<i>Pigea floribunda</i>	
Xanthorrhoeaceae	<i>Xanthorrhoea gracilis</i>	Graceful Grass Tree
Xanthorrhoeaceae	<i>Xanthorrhoea preissii</i>	Grass tree
Zamiaceae	<i>Macrozamia riedlei</i>	Zamia

Appendix 5: Black Cockatoo Habitat Trees

The Black Cockatoo Habitat Trees assessed across the site is provided in the table below. # Denotes species that are native to Western Australia but not to this local region.

Tree ID	Species	Common Name	Tree Condition	DBH (mm)	Height (m)	Hollows	Hollow No.	Hollow Size	Hollow Orientation	Foraging Evidence	Northing	Easting
1	<i>Eucalyptus marginata</i>	Jarraah	Healthy	590	12	No				Yes		
2	<i>Corymbia calophylla</i>	Marri	Healthy	711	12	No				No		
3	<i>Corymbia calophylla</i>	Marri	Healthy	622	12	No				No		
4	<i>Corymbia calophylla</i>	Marri	Healthy	604	12	No				Yes		
5	<i>Corymbia calophylla</i>	Marri	Healthy	576	13	No				No		
6	<i>Corymbia calophylla</i>	Marri	Healthy	591	9	No				No		
7	<i>Corymbia calophylla</i>	Marri	Healthy	933	13	No				Yes		
8	<i>Corymbia calophylla</i>	Marri	Healthy	1038	14	No				Yes		
9	<i>Corymbia calophylla</i>	Marri	Healthy	720	12	No				Yes		
10	<i>Corymbia calophylla</i>	Marri	Healthy	1083	12	No				No		
11	<i>Corymbia calophylla</i>	Marri	Healthy	755	12	No				No		
12	<i>Eucalyptus marginata</i>	Jarraah	Healthy	611	11	No				No		
13	<i>Eucalyptus marginata</i>	Jarraah	Healthy	682	13	No				Yes		
14	<i>Eucalyptus marginata</i>	Jarraah	Healthy	510	12	No				Yes		

Tree ID	Species	Common Name	Tree Condition	DBH (mm)	Height (m)	Hollows	Hollow No.	Hollow Size	Hollow Orientation	Foraging Evidence	Northing	Easting
15	<i>Corymbia calophylla</i>	Marri	Poor	535	4	No				No		
16	<i>Eucalyptus marginata</i>	Jarrah	Healthy	605	13	No				No		
17	<i>Eucalyptus marginata</i>	Jarrah	Healthy	609	14	No				No		
18	<i>Corymbia calophylla</i>	Marri	Healthy	518	14	No				No		
19	<i>Corymbia calophylla</i>	Marri	Healthy	710	12	No				Yes		
20	<i>Corymbia calophylla</i>	Marri	Healthy	715	13	No				No		
22	<i>Corymbia calophylla</i>	Marri	Healthy	911	13	No				No		
23	<i>Corymbia calophylla</i>	Marri	Healthy	903	12	No				No		
24	<i>Corymbia calophylla</i>	Marri	Healthy	687	13	No				No		
25	<i>Corymbia calophylla</i>	Marri	Healthy	582	13	No				Yes		
26	<i>Corymbia calophylla</i>	Marri	Poor	572	14	No				No		
27	<i>Corymbia calophylla</i>	Marri	Poor	523	10	No				No		
28	<i>Corymbia calophylla</i>	Marri	Healthy	602	14	No				Yes		
29	<i>Corymbia calophylla</i>	Marri	Healthy	543	13	No				Yes		
30	<i>Eucalyptus marginata</i>	Jarrah	Healthy	523	14	No				No		
31	<i>Corymbia calophylla</i>	Marri	Healthy	553	12	No				No		
32	<i>Eucalyptus marginata</i>	Jarrah	Healthy	876	12	No				No		
33	<i>Corymbia calophylla</i>	Marri	Healthy	863	5	No				No		

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Tree ID	Species	Common Name	Tree Condition	DBH (mm)	Height (m)	Hollows	Hollow No.	Hollow Size	Hollow Orientation	Foraging Evidence	Northing	Easting
34	<i>Corymbia calophylla</i>	Marri	Healthy	620	15	No				No		
35	<i>Corymbia calophylla</i>	Marri	Healthy	573	15	No				No		
36	<i>Eucalyptus marginata</i>	Jarra	Healthy	573	10	No				No		
37	<i>Corymbia calophylla</i>	Marri	Healthy	1323	14	No				No		
38	<i>Eucalyptus marginata</i>	Jarra	Poor	529	12	No				No		
39	<i>Eucalyptus marginata</i>	Jarra	Healthy	505	13	No				No		
40	<i>Eucalyptus marginata</i>	Jarra	Healthy	531	13	No				No		
41	<i>Corymbia calophylla</i>	Marri	Healthy	524	14	No				No		
42	Unknown sp.		Dead	514	15	No				No		
43	<i>Eucalyptus marginata</i>	Jarra	Healthy	1032	15	No				No		
44	<i>Corymbia calophylla</i>	Marri	Healthy	523	15	No				No		
45	<i>Corymbia calophylla</i>	Marri	Healthy	508	13	No				No		
46	<i>Eucalyptus marginata</i>	Jarra	Healthy	693	16	No				Yes		
47	<i>Corymbia calophylla</i>	Marri	Healthy	575	14	No				Yes		
48	<i>Eucalyptus marginata</i>	Jarra	Healthy	575	15	No				No		
49	<i>Eucalyptus marginata</i>	Jarra	Healthy	731	13	No				Yes		
50	<i>Corymbia calophylla</i>	Marri	Healthy	680	12	No				No		

Tree ID	Species	Common Name	Tree Condition	DBH (mm)	Height (m)	Hollows	Hollow No.	Hollow Size	Hollow Orientation	Foraging Evidence	Northing	Easting
51	<i>Corymbia calophylla</i>	Marri	Healthy	857	15	Yes	1	20 x 20cm	Chimney	No		
52	<i>Corymbia calophylla</i>	Marri	Healthy	540	13	No				Yes		
53	<i>Corymbia calophylla</i>	Marri	Healthy	609	15	No				No		
54	<i>Corymbia calophylla</i>	Marri	Healthy	739	12	No				No		
55	<i>Corymbia calophylla</i>	Marri	Healthy	1039	15	No				No		
56	<i>Eucalyptus marginata</i>	Jarra	Healthy	510	15	No				No		
57	<i>Corymbia calophylla</i>	Marri	Healthy	741	17	No				Yes		
58	<i>Eucalyptus marginata</i>	Jarra	Healthy	1045	15	No				Yes		
59	<i>Corymbia calophylla</i>	Marri	Healthy	654	15	No				Yes		
60	<i>Corymbia calophylla</i>	Marri	Healthy	643	8	Yes	1	35 x 35 cm	Chimney	No		
61	<i>Corymbia calophylla</i>	Marri	Healthy	723	20	No				Yes		
62	<i>Corymbia calophylla</i>	Marri	Healthy	537	15	No				Yes		
63	<i>Eucalyptus marginata</i>	Jarra	Healthy	591	17	No				Yes		
64	<i>Corymbia calophylla</i>	Marri	Healthy	588	17	No				No		
65	<i>Eucalyptus marginata</i>	Jarra	Healthy	571	12	No				No		
66	<i>Corymbia calophylla</i>	Marri	Healthy	733	18	No				No		
67	<i>Corymbia calophylla</i>	Marri	Healthy	578	17	No				No		
69	<i>Corymbia calophylla</i>	Marri	Healthy	639	14	No				No		

Tree ID	Species	Common Name	Tree Condition	DBH (mm)	Height (m)	Hollows	Hollow No.	Hollow Size	Hollow Orientation	Foraging Evidence	Northing	Easting
70	<i>Corymbia calophylla</i>	Marri	Healthy	508	17	No				No		
71	<i>Corymbia calophylla</i>	Marri	Healthy	639	18	No				No		
72	<i>Corymbia calophylla</i>	Marri	Poor	586	18	No				Yes		
73	<i>Corymbia calophylla</i>	Marri	Healthy	531	15	No				No		
74	<i>Corymbia calophylla</i>	Marri	Healthy	729	17	No				No		
75	<i>Eucalyptus marginata</i>	Jarra	Healthy	885	15	No				No		
76	<i>Eucalyptus marginata</i>	Jarra	Healthy	765	13	No				Yes		
77	<i>Corymbia calophylla</i>	Marri	Healthy	630	17	No				No		
78	<i>Eucalyptus marginata</i>	Jarra	Healthy	540	20	No				No		
79	<i>Eucalyptus marginata</i>	Jarra	Healthy	500	17	No				No		
80	<i>Corymbia calophylla</i>	Marri	Healthy	764	20	No				Yes		
81	<i>Eucalyptus marginata</i>	Jarra	Healthy	679	17	No				No		
82	<i>Corymbia calophylla</i>	Marri	Healthy	578	16	No				Yes		
83	<i>Corymbia calophylla</i>	Marri	Healthy	631	18	No				No		
84	<i>Corymbia calophylla</i>	Marri	Healthy	1074	21	No				No		
85	<i>Corymbia calophylla</i>	Marri	Healthy	638	16	No				No		
86	<i>Corymbia calophylla</i>	Marri	Healthy	791	15	No				No		
87	<i>Corymbia calophylla</i>	Marri	Healthy	708	17	No				No		

Tree ID	Species	Common Name	Tree Condition	DBH (mm)	Height (m)	Hollows	Hollow No.	Hollow Size	Hollow Orientation	Foraging Evidence	Northing	Easting
88	<i>Corymbia calophylla</i>	Marri	Healthy	604	16	No				No		
89	<i>Corymbia calophylla</i>	Marri	Healthy	850	20	No				No		
90	<i>Corymbia calophylla</i>	Marri	Healthy	517	15	No				No		
91	<i>Unknown sp.</i>		Dead	700	15	No				No		
92	<i>Corymbia calophylla</i>	Marri	Healthy	540	15	No				No		
93	<i>Corymbia calophylla</i>	Marri	Healthy	722	13	No				Yes		
94	<i>Corymbia calophylla</i>	Marri	Healthy	564	10	No				No		
95	<i>Corymbia calophylla</i>	Marri	Healthy	509	12	No				Yes		
96	<i>Eucalyptus marginata</i>	Jarra	Healthy	821	11	No				No		
97	<i>#Eucalyptus camaldulensis</i>	River Gum	Healthy	592	20	Yes	1	5 x 5 cm	Side	No		
98	<i>#Eucalyptus camaldulensis</i>	River Gum	Poor	509	15	No				No		
99	<i>Eucalyptus sp.</i>		Healthy	598	21	No				No		
100	<i>#Eucalyptus camaldulensis</i>	River Gum	Healthy	522	23	No				No		
101	<i>Eucalyptus marginata</i>	Jarra	Healthy	794	22	No				Yes		
102	<i>Corymbia calophylla</i>	Marri	Healthy	679	25	No				No		
103	<i>Corymbia calophylla</i>	Marri	Healthy	799	22	No				No		
104	<i>Corymbia calophylla</i>	Marri	Healthy	535	21	No				Yes		
105	<i>Corymbia calophylla</i>	Marri	Healthy	756	20	No				No		

Tree ID	Species	Common Name	Tree Condition	DBH (mm)	Height (m)	Hollows	Hollow No.	Hollow Size	Hollow Orientation	Foraging Evidence	Northing	Easting
106	<i>Corymbia calophylla</i>	Marri	Healthy	665	10	No				No		
107	<i>Corymbia calophylla</i>	Marri	Healthy	565	18	No				Yes		
108	<i>Corymbia calophylla</i>	Marri	Healthy	609	23	No				Yes		
109	<i>Corymbia calophylla</i>	Marri	Healthy	909	23	No				Yes		
110	<i>Corymbia calophylla</i>	Marri	Healthy	748	20	No				Yes		
111	<i>Corymbia calophylla</i>	Marri	Healthy	548	18	No				Yes		
112	<i>Corymbia calophylla</i>	Marri	Healthy	713	20	No				Yes		
113	<i>Corymbia calophylla</i>	Marri	Healthy	725	15	No				Yes		