Natural Area
CONSULTING MANAGEMENT SERVICES

Shire of Serpentine Jarrahdale

Paterson Mundijong Roundabout Tree Survey and Habitat Assessment

Natural Area Holdings Pty Ltd
Whadjuk Country
57 Boulder Road, Malaga WA 6090
Ph: (08) 9209 2767
info@naturalarea.com.au
www.naturalarea.com.au

Acknowledgement of Country

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Occupational health and safety management system registered to ISO 45001:2018

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D1	12/02/2025	New Document	MB	JW/LI	Draft for client comment
V1	17/03/2025	Minor changes	MB	JW	Final

Executive Summary

Natural Area Consulting Management Services (Natural Area) was contracted by the Shire of Serpentine Jarrahdale to undertake a tree survey and habitat assessment at the intersection of Mundijong Road and Paterson Street in Mundijong. The habitat assessment undertaken across the site included a reconnaissance flora survey and black cockatoo habitat assessment to assist with relevant approvals for the instalment of a proposed roundabout.

The assessment across the survey area determined:

- 40 flora species (taxa) were recorded from 18 families during the field survey, comprised of 29 introduced (weeds) and 11 native species.
- One declared pest was identified within the survey site, Narrowleaf Cottonbush (**Gomphocarpus fruticosus*).
- Two vegetation types were recorded within the survey area, including *Corymbia calophylla* woodland, and introduced herbland.
- Vegetation condition on site ranged from completely degraded to degraded.
- One conservation significance species was recorded through secondary evidence within the survey site, Forest Red-tailed Black Cockatoo (*Calyptorhynchus banksii naso*), this species is listed as Vulnerable under the *Environmental Protection and Biodiversity Conservation Act 1999* (Cth) and *Biodiversity Conservation Act 2016* (WA).
- A total of 19 trees were recorded within the survey site and of those three trees satisfied the Commonwealth guidelines for black cockatoo habitat trees (trees with diameter at breast height (DBH) ≥ 500 mm).
- None of the surveyed trees contained evidence of nesting fauna.
- Only one hollow was recorded on site, and it was unsuitable for Black Cockatoo breeding. This small hollow (10 x 10 cm) was occupied by the introduced European honeybee (Apis mellifera).
- Evidence of foraging from black cockatoos were recorded across the survey area.

Under the *Environmental Protection Act 1986* (WA) (EP Act), a Native Vegetation Clearing Permit (NVCP) will be required to undertake native vegetation clearing unless an exemption applies. Exemptions from clearing under requirements of another written law or authorised under certain statutory processes are listed in Schedule 6 of the EP Act. Other exemptions that may apply comes under Environmental Protection (Clearing of Native Vegetation) Regulations 2004. As the site contains Western Australian native flora species, a clearing permit may apply.

The Shire of Serpentine Jarrahdale is to ensure that all hollows are inspected for native fauna occupancy prior to felling. If nesting bird 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 required to be onsite to assist with the relocation of any displaced fauna species.

Contents

1.0 Introduction

Natural Area Consulting Management Services (Natural Area) was contracted by the Shire of Serpentine Jarrahdale (the Shire) to undertake a tree survey and habitat assessment of a portion of bushland at the intersection of Mundijong Road and Paterson Street in Mundijong. The Shire proposes road upgrades including a roundabout at the intersection. The environmental assessment undertaken across the site included a reconnaissance flora survey and black cockatoo habitat assessment to inform relevant environment approvals.

1.1 Location

The survey area is approximately 1,100 m^2 and is located at the intersection of Mundijong Road and Paterson Street in Mundijong. The site is located approximately 40 km south-east of Perth Central Business District (CBD) (Figure 1). The site location with the proposed roundabout design overlay is provided in Appendix 4.

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 *Biosecurity and Agriculture Management Act 2007* (WA) (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* (WA) (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* (WA) (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* (Cth) (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

Mundijong, Western Australia

Legend
Survey Area

Client:	Shire of Serpentine/Jarrahdale
Date:	13/02/2025
Created by:	M. Beeton
Image Source:	Nearmap, 2025
Datum:	GDA2020 / MGA zone 50
Scale:	1: 630

0 10 20 m

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2.0 Site Characteristics

2.1 Regional Context

The site is located within the Swan Coastal Plain 2 IBRA subregion (Department of Climate Change, Energy, the Environment and Water (DCCEEW), 2024). This subregion is composed of colluvial sands, alluvial river flats and coastal limestone. Marri woodland on colluvial and alluvial soils are only extensive in the South (Mitchell *et al*., 2002).

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), Karnet site ID, 009111, the long-term average climate conditions for the region are:

- Average rainfall of 1,122.5 mm per annum, with majority of rainfall between May and August (1965 - 2024).
- Average maximum temperature range of 15.5 °C in winter to 30.7 °C in summer (1965 - 2025).
- average minimum temperature ranging from 8.3 °C in winter to 15.8 °C in summer (1965 - 2025).

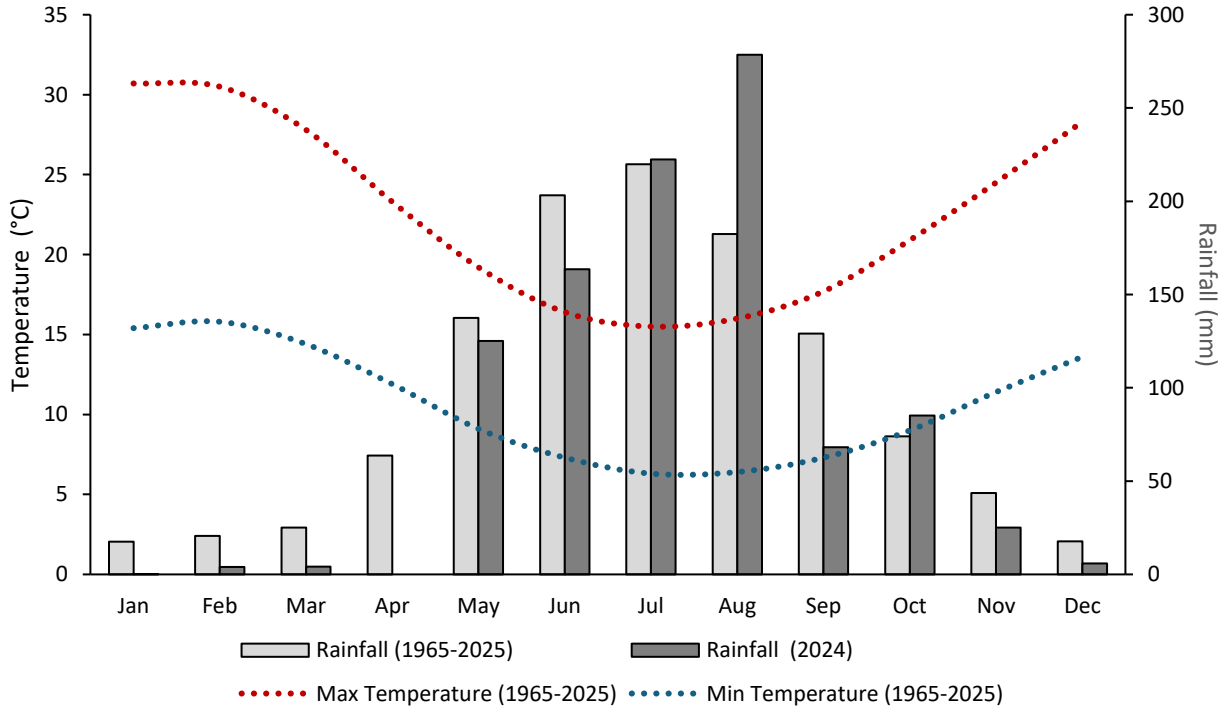

Figure 2: Temperature and rainfall data (1994 - 2024) from Karnet site ID 009111. Source: BoM, 2025.

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
- likely presence of any threatened or priority fauna species.

The following databases were accessed to obtain relevant information:

- NatureMap (Department of Biodiversity, Conservation and Attractions (DBCA), 2024a)
- FloraBase (WA Herbarium, 1998)
- Threatened and priority fauna database search (DBCA, 2024b)

Conservation code definitions for the State and Commonwealth are provided in Appendix 1.

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* (EPA, 2016). Samples were collected, or photographs taken of unfamiliar species to enable later identification.

Natural Area environmental scientists undertook the survey on December 5, 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 (DP) 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 1).
- The use of GPS to map significant species and boundaries of differing vegetation type and condition.
- Recording evidence of disturbance, such as fire.

Table 1: 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.

Category		Description
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 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* (Department of Agriculture, Water, and the Environment (DAWE) (2022).

Natural Area environmental scientists undertook the survey on December 5, 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) could not be applied to this survey area, as it covered only 1,151 m², significantly less than the required 10,000 m² to be able to use the scoring tool.

A refined scale scoring tool was 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 2) classes trees according to their individual characteristics (evidence of use, type, and size of hollow present).

Table 2: 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

Source: Bamford, 2016

3.4 Limitations

Limitation associated with the flora survey and black cockatoo habitat assessment are provided in Table 3.

Table 3: 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 and fauna surveys within the Swan Coastal Plain bioregion.
Proportion of flora recorded/ collected, any identification issues	Minor	A total of 40 flora species (taxa) were recorded from 18 families during the field survey, comprised of 72 % introduced (weeds) and 28 % native species. Of these, one species was unable to be identified to species level. One seedling '*Eucalyptus* sp.' Could only be identified to genus level due to a lack of diagnostic characteristics present at the time of survey.
Survey effort and extent	Moderate	All of the site was traversed across one day in December. No nocturnal survey was undertaken to determine black cockatoo night roosting.
Access restrictions	None	No access restrictions were encountered across the site.

Potential Limitation	Degree of Limitation	Comments
Flora survey timing	Minor	The survey was conducted in December, outside the optimal season for flora surveys in the Swan Coastal Plain subregion. However, this limitation is minimal, as all species could be identified except for a *Eucalyptus* seedling, which couldn't be identified to species level due to the seedling having no diagnostic features. Survey was conducted in December and coincides with main breeding season within the Swan Coastal Plain (July to December). Foraging evidence can be surveyed all year round because foraging debris will persist for up to two years.
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 Flora

A total of 40 flora species (taxa) were recorded from 18 families during the field survey, comprised of 29 introduced (weeds) and 11 native species. Examples of introduced flora species are shown in Figure 3 and native flora species in Figure 4. A complete flora species list is provided in Appendix 2.

Narrowleaf Cottonbush (**Gomphocarpus fruticosus*) was the only declared pest identified within the survey site, its location is shown in Figure 5. Declared pests are listed on the Western Australian Organism List (WAOL) under the BAM Act. This classification requires the landowner/land manager to control the population to limit damage as a result of the presence of these species (Department of Primary Industries and Regional Development (DPIRD), 2019).

Narrowleaf Cottonbush (**Gomphocarpus fruticosus*) (declared pest)

Common Centaury (**Centaurium erythraea*)

Windmill Grass (**Chloris truncata*)

French Flax (**Linum trigynum*)

Figure 3: Examples of introduced flora species recorded.

Tricoryne elatior (Yellow Autumn Lily)

Acacia pulchella (Prickly Moses)

Kingia australis

Gompholobium marginatum

Figure 4: Examples of native flora species recorded.

Figure 5:
Declared Pests

Mundijong, Western Australia

Legend

- *Gomphocarpus fruticosus (DP)
- Survey Area

Client: Shire of Serpentine/Jarrahdale
Date: 24/02/2025
Created by: M. Beeton
Image Source: Nearmap, 2025
Datum: GDA2020 / MGA zone 50
Scale: 1: 315

0 5 10 m

N

4.1.1 Vegetation Types

Two vegetation types were recorded in the survey area: *Corymbia calophylla* woodland and introduced herbland. Vegetation types are described in Table 4 and shown in Figure 6.

Table 4: Vegetation types within the survey area

Vegetation Type	Description	Site Photos
Corymbia calophylla **woodland**	A woodland of *Corymbia calophylla* over isolated *Xanthorrhoea preissii* shrubland over introduced herbland understorey.	
Introduced herbland	A herbland of introduced flora species	

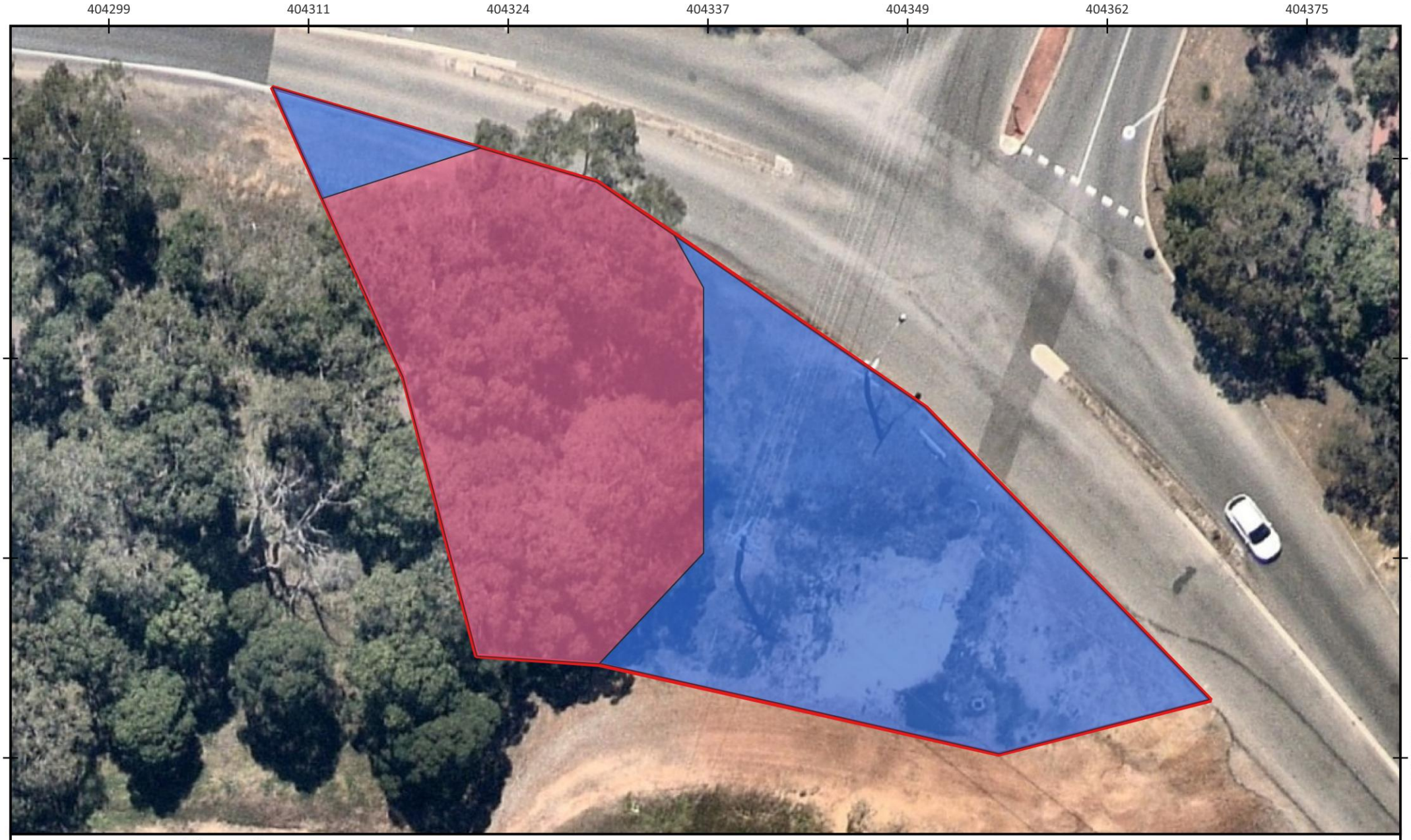

Figure 6:
Vegetation Type

Mundijong, Western Australia

Legend

- Corymbia calophylla woodland
- Introduced herbland
- Survey Area

Client: Shire of Serpentine/Jarrahdale
Date: 24/02/2025
Created by: M. Beeton
Image Source: Nearmap, 2025
Datum: GDA2020 / MGA zone 50
Scale: 1: 315

0 5 10 m

N

4.1.2 Vegetation Condition

Vegetation condition on site ranged from completely degraded to degraded (Table 5; Figure 7). 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 cleared.

Table 5: Vegetation condition within the survey area

Vegetation Condition	Pristine	Excellent	Very Good	Good	Degraded	Completely Degraded	Total
Area (m^2)	0.0	0.0	0.0	0.0	558.5	592.5	1,151
Area (%)	0	0	0	0	49	51	100

Figure 7:
Vegetation Condition

Mundijong, Western Australia

Legend

- Degraded
- Completely Degraded
- Survey Area

Client:	Shire of Serpentine/Jarrahdale
Date:	24/02/2025
Created by:	M. Beeton
Image Source:	Nearmap, 2025
Datum:	GDA2020 / MGA zone 50
Scale:	1: 315

0 5 10 m

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5.0 Black Cockatoo Habitat Assessment

There is the potential for the three threatened black cockatoos and their habitat to occur on site, including the Carnaby's Cockatoo (*Zanda latirostris*) and Baudin's Black Cockatoo (*Zanda baudinii*) listed as Endangered under the EPBC Act, and the Forest Red-tailed Black Cockatoo (*Calyptorhynchus banksii naso*) listed as Vulnerable under the BC Act. According to DBCA, the survey site occurs within:

- a black cockatoo roosting site (buffered) (DBCA, 2019)
- a Carnaby's Cockatoo unconfirmed breeding site (DBCA, 2018)
- 1 km of a known black cockatoo roosting site (DBCA, 2024)

A total of 19 trees were recorded within the survey site and of those, three satisfied the Commonwealth guidelines (DAWE, 2022) for black cockatoo habitat trees (trees with DBH ≥ 500 mm) (Figure 8). All trees recorded within the survey area were *Corymbia calophylla* which are a high priority species for black cockatoo nesting, roosting and foraging (DAWE, 2022). Forest Red-tailed Black Cockatoos (*Calyptorhynchus banksii naso*) were recorded within the survey area from secondary evidence in the form of feathers (Figure 9).

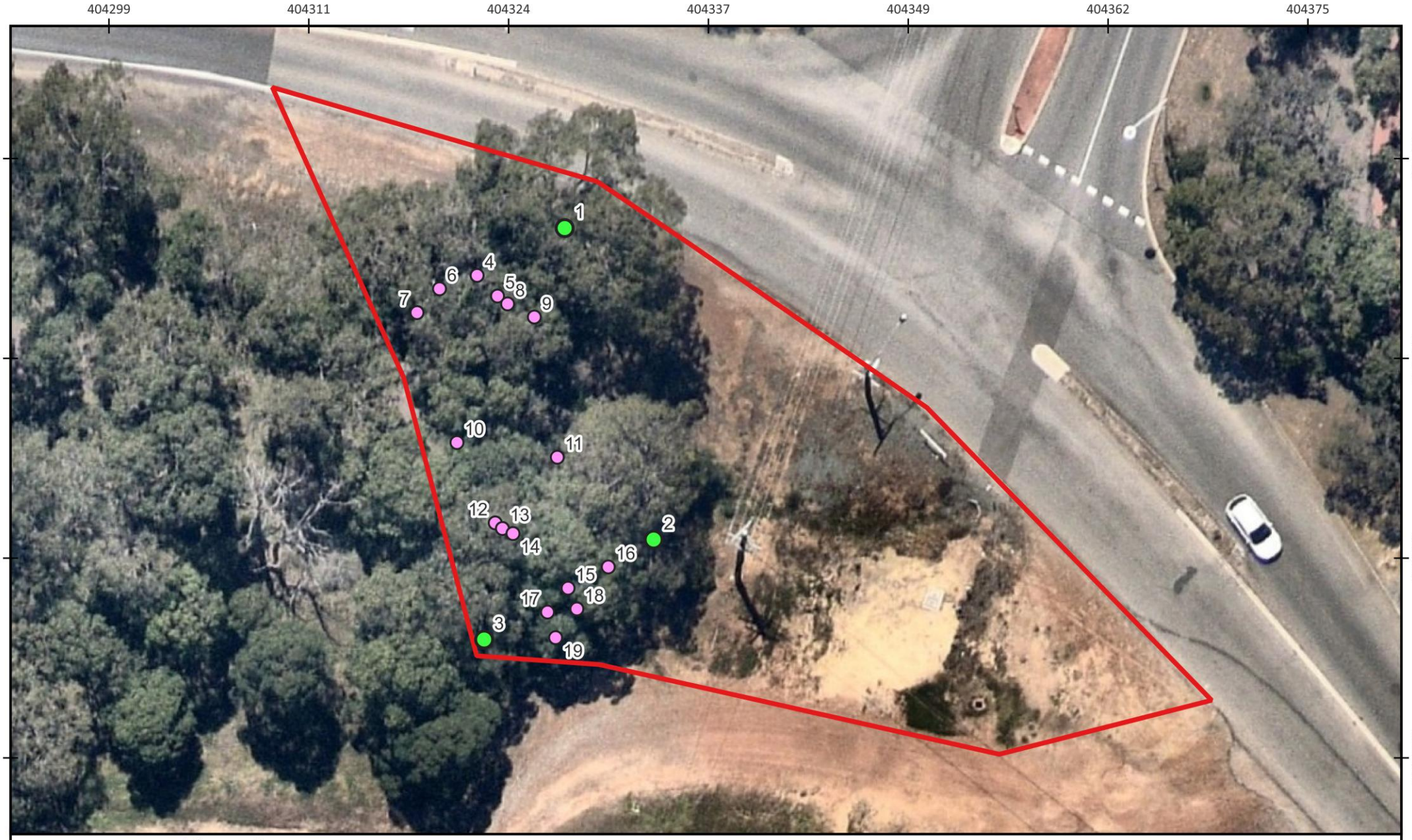

Figure 8:
Trees within survey site

Mundijong, Western Australia

Legend

- Potential Habitat Tree
- Not Habitat Tree
- Survey Area

Client:	Shire of Serpentine/Jarrahdale
Date:	26/02/2025
Created by:	M. Beeton
Image Source:	Nearmap, 2025
Datum:	GDA2020 / MGA zone 50
Scale:	1: 315

0 5 10 m

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5.1 Foraging Habitat

Approximately 49 % of the survey area was covered by the *Corymbia calophylla* canopy, which serves as a primary feeding resource for black cockatoos (Department of Environment and Conservation (DEC), 2011). A total of three species known to provide feeding resources for black cockatoos were recorded within the survey area (Table 6). Evidence of foraging by Forest Red-tailed Black Cockatoos and potentially Carnaby's, in the form of chewed Marri nuts and feathers, were recorded across the survey area (Figure 9).

Table 6: Plants species known to provide feeding resources to black cockatoos across the survey area (species highlighted in green indicates species recorded within survey area)

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

Source: DEC, 2011; DAWE, 2022.

Figure 9: Examples of black cockatoo foraging evidence within the survey area.

5.2 Roosting Habitat

One Forest Red-tailed Black Cockatoo feather was found within the survey area. However, evening surveys were not conducted as part of this assessment, so the location of any potential roosting sites cannot be confirmed. There is one confirmed Black Cockatoo roosting site within 1 km of the survey site. This site is located approximately 900 m east of the survey area (SERMUNR002). As part of the Great Cockatoo Count this roosting site recorded 10 White-tailed Cockatoos and no Forrest Red-tailed Cockatoos in 2016, while 12 White-tailed Cockatoos and 4 Forrest Red-tailed Cockatoos were recorded in 2017. However, no Black Cockatoos have been recorded since 2017 (Table 7) (DBCA, 2024).

Table 7: Great Cockatoo Count results at site SERMUNR002. * denotes the survey was not conducted at this location on that year.

	Great Cockatoo Count (Site: SERMUNR002)			
	2016	**2017**	**2018**	**2019**
White-tailed	10	12	*	0
Red-tailed	0	4	*	0

5.3 Breeding Habitat

The survey area contained no suitable breeding habitat for black cockatoos. A small, unsuitable hollow was identified within the survey area. It is located in a non-habitat tree (Tree 4) and is currently occupied by the introduced European honeybee (*Apis mellifera*) (Table 8). All habitat trees received a Bamford tree score of 5, as none of them contained suitable hollows. It is important to note that the area is within a known Carnaby's Cockatoo unconfirmed breeding area (DBCA, 2018).

Table 8: Results of Tree 4 which contained the only hollow recorded on site.

Species	*Corymbia calophylla*	
Location	404322 (Northing)	6425921 (Easting)
Diameter at breast height (DBH)	320 mm	
Condition	Very Good condition	
Bamford Class	5	

Hollow
Small hollow with less than 50 mm entrance diameter and hollow entrance is only 1.5m off the ground. Currently occupied by the European Honeybee (*Apis mellifera).

Unsuitable for Black Cockatoo breeding.

6.0 Implications of Results

6.1 Flora and Vegetation

A total of 40 flora species were identified within the survey boundary, this comprised of 29 (72 %) introduced (weeds) and 11 (28 %) native species. The survey area contained two vegetation types, *Corymbia calophylla* woodland, and introduced herbland. The vegetation condition across the survey area ranged from completely degraded to degraded which are primarily composed of areas with a high weed load and little to no native flora species present.

Narrowleaf Cottonbush (**Gomphocarpus fruticosus*) was the only declared pest identified within the survey site. Declared pests are listed on the Western Australian Organism List (WAOL) under the BAM Act. 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.

Under the EP Act, a Native Vegetation Clearing Permit (NVCP) will be required to undertake native vegetation clearing unless an exemption applies. Exemptions from clearing under requirements of another written law or authorised under certain statutory processes are listed in Schedule 6 of the EP Act. Other exemptions that may apply comes under *Environmental Protection (Clearing of Native Vegetation) Regulations 2004*. As the site contains Western Australian native flora species, a clearing permit may apply.

6.2 Black Cockatoo Habitat

The survey area is unlikely able to support black cockatoo breeding due to the lack of suitable breeding hollows; however, the area still contains suitable foraging and roosting habitat. The Commonwealth black cockatoo foraging quality scoring tool (DAWE, 2022) could not be applied to this survey area, as it covered only 1,151 m², significantly less than the required 10,000 m² to be able to use the scoring tool. However, this survey area is part of a Marri woodland that is continuous with a remnant vegetation extending to nearby reserves including Watkins Road Nature Reserve and Mundijong Oval.

None of trees within the survey area contained any evidence of nesting fauna. However, the Shire is to ensure that all trees 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.

6.3 Recommendations

The following is recommended regarding the survey site and the findings from the survey:

- Retain as many *Corymbia calophylla* (Marri) as possible, prioritising the potential black cockatoo habitat trees.
- Given the low diversity and coverage of middle and understorey species, it is recommended to improve native species diversity and coverage once the roundabout is completed. Ongoing weed control and revegetation efforts should be implemented to maintain the area
- Consult with DCCEEW to determine whether a referral under the EPBC Act is necessary. While a referral is unlikely to be required for foraging habitat due to the small size of the impacted area, removal of any part of a known night roosting site may require a referral to the Minister.

- A NVCP under EP Act is required for the clearing of native vegetation unless an exemption applies.

7.0 References

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Appendix 1: 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: DBCA, 2023

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: DBCA, 2023

Appendix 2: 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 species highlighted in red indicates declared pests.

Family	Species Name	Common
Apocynaceae	**Gomphocarpus fruticosus*	Narrowleaf Cottonbush
Asphodelaceae	*Xanthorrhoea gracilis*	Graceful grass tree
Asphodelaceae	*Xanthorrhoea preissii*	Grass tree
Asparagales	*Tricoryne elatior*	Yellow Autumn Lily
Asteraceae	**Erigeron canadensis*	
Asteraceae	**Hypochaeris radicata*	Flat weed
Asteraceae	**Sonchus asper*	Rough sowthistle
Asteraceae	**Sonchus oleraceus*	Common sowthistle
Cyperaceae	*Lepidosperma leptostachyum*	
Cyperaceae	*Lepidosperma squamatum*	
Dasypogonaceae	*Kingia australis*	Kingia
Fabaceae	*Acacia pulchella*	Prickly moses
Fabaceae	**Acacia longifolia*	
Fabaceae	**Lotus angustissimus*	Narrowleaf trefoil
Fabaceae	**Trifolium campestre*	Hop clover
Fabaceae	*Acacia saligna*	Orange Wattle
Fabaceae	*Gompholobium marginatum*	
Gentianaceae	**Centaurium erythraea*	Common Centaury
Iridaceae	**Watsonia meriana*	Bulbil watsonia
Linaceae	**Linum trigynum*	French flax
Lythraceae	**Lythrum hyssopifolia*	Lesser loosestrife
Malvaceae	**Malva parviflora*	Marshmallow
Myrtaceae	**Eucalyptus camaldulensis*	River gum
Myrtaceae	*Corymbia calophylla*	Marri
Myrtaceae	*Eucalyptus sp*	
Onagraceae	**Oenothera stricta*	Common evening primrose
Plantaginaceae	**Plantago lanceolata*	Ribwort plantain
Poaceae	**Digitaria sanguinalis*	Crab grass
Poaceae	**Avena barbata*	Bearded oat
Poaceae	**Briza maxima*	Blowfly grass
Poaceae	**Briza minor*	Shivery grass
Poaceae	**Ehrharta calycina*	Perennial veldt grass

Poaceae	**Lolium rigidum*	Wimmera ryegrass
Poaceae	** Eragrostis curvula*	Love grass
Poaceae	** Melinis repens*	Red natal grass
Poaceae	**Setaria parviflora*	Slender Pigeon Grass
Poaceae	**Vulpia myuros*	Rat's tail fescue
Poaceae	**Chloris truncata*	Windmill grass
Primulaceae	**Lysimachia arvensis*	Pimpernel
Solanaceae	**Solanum nigrum*	Black berry nightshade

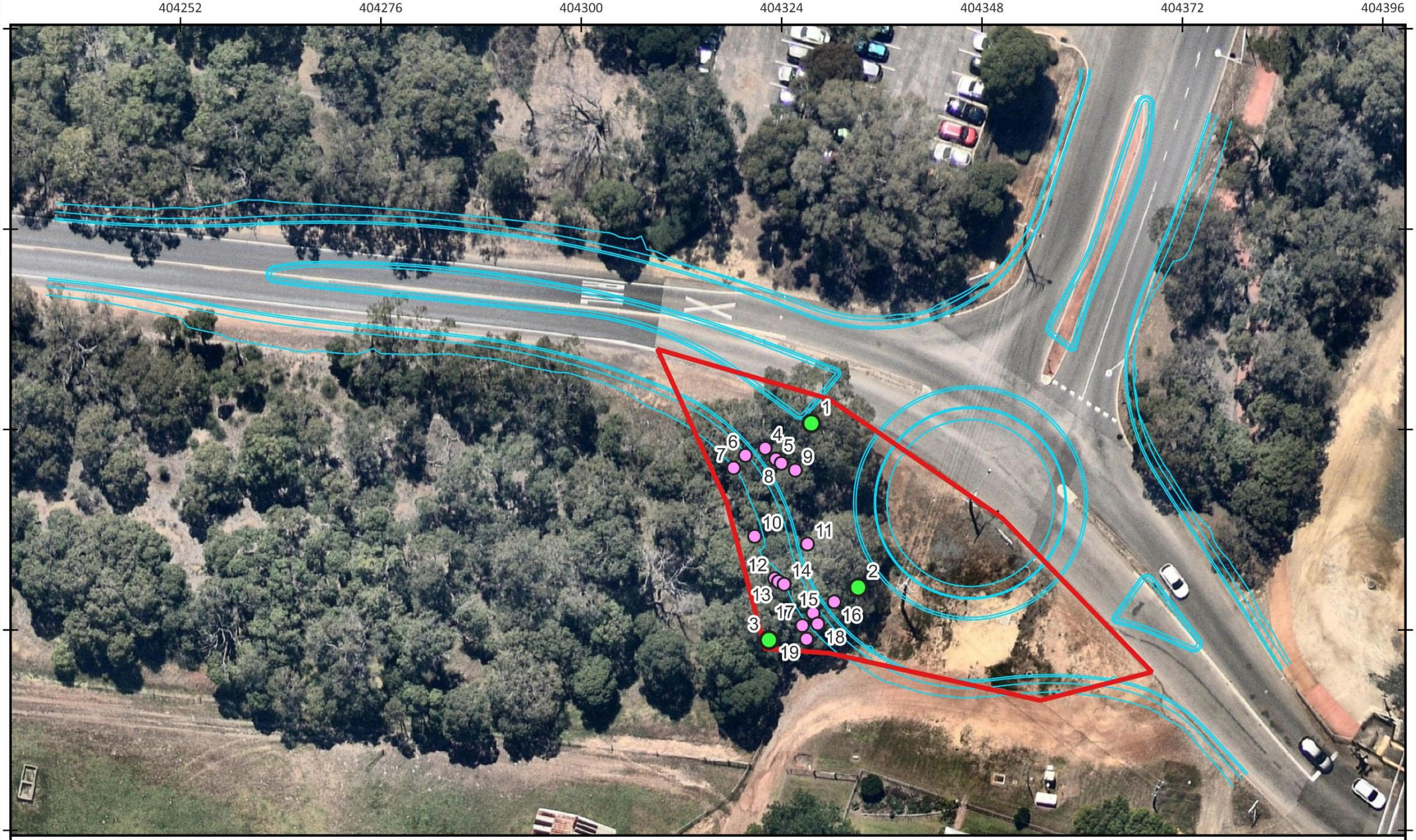
Appendix 3: Black Cockatoo Habitat Trees

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)	Hollow number	Hollow dimensions	Photo number	Foraging Evidence	Northing	Easting
1	*Corymbia calophylla*	Marri	V good	620	No			Yes	404328	6425926
2	*Corymbia calophylla*	Marri	Good	570	No			Yes	404333	6425906
3	*Corymbia calophylla*	Marri	Good	665	No			Yes	404323	6425900
4	*Corymbia calophylla*	Marri	V good	320	1	15x 5 cm, side, 2m high, unable to assess depth, Beehive hollow	6079 to 6081	Yes	404322	6425923
5	*Corymbia calophylla*	Marri	Slightly stressed	410	No		6082 to 6085	Yes	404323	6425921
6	*Corymbia calophylla*	Marri	Good	314	No			Yes	404320	6425922
7	*Corymbia calophylla*	Marri	V good	85	No			No	404318	6425920
8	*Corymbia calophylla*	Marri	V good	355	No			Yes	404324	6425921
9	*Corymbia calophylla*	Marri	Good	150	No			No	404326	6425920
10	*Corymbia calophylla*	Marri	V good	170	No		6086	Yes	404321	6425912
11	*Corymbia calophylla*	Marri	V good	15	No			No	404327	6425911

Tree ID	Species	Common Name	Tree Condition	DBH (mm)	Hollow number	Hollow dimensions	Photo number	Foraging Evidence	Northing	Easting
12	*Corymbia calophylla*	Marri	V good	185	No			Yes	404323	6425907
13	*Corymbia calophylla*	Marri	V good	130	No			Yes	404324	6425907
14	*Corymbia calophylla*	Marri	V good	150	No			Yes	404324	6425906
15	*Corymbia calophylla*	Marri	Good	140	No			Yes	404328	6425903
16	*Corymbia calophylla*	Marri	V good	430	No			Yes	404330	6425904
17	*Corymbia calophylla*	Marri	V good	150	No			Yes	404327	6425901
18	*Corymbia calophylla*	Marri	V good	90	No			No	404328	6425902
19	*Corymbia calophylla*	Marri	V good	170	No			Yes	404327	6425900

Appendix 4: Survey Site with Roundabout design overlap



Survey Area With Roundabout Design Overlap

Mundijong, Western Australia

Legend

- Potential Habitat Tree
- Not Habitat Tree
- Survey Area
- Design

Client:	Shire of Serpentine/Jarrahdale
Date:	26/02/2025
Created by:	M. Beeton
Image Source:	Nearmap, 2025
Datum:	GDA2020 / MGA zone 50
Scale:	1: 600

0 10 20 m

N