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Document Reference: EP23-030(05)--003A

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8 October 2024

Attention: Native Vegetation Regulation
Department of Water and Environmental Regulation
8 Davidson Terrace
JOONDALUP WA 6027

Delivered by email to: info@dwer.wa.gov.au

REFERRAL OF PROPOSED CLEARING SUPPORTING INFORMATION – FORREST ROAD UPGRADE AND WIDENING BETWEEN WOLLASTON AVENUE AND ELEVENTH ROAD, HAYNES AND HILBERT

1 INTRODUCTION

Stockland Development Pty Limited (the Proponent) have engaged Emerge Associates (Emerge) to provide environmental consultancy services to support the proposed upgrade and widening of Forrest Road between Wollaston Avenue and Eleventh Road in the suburbs of Haynes and Hilbert.

This document provides supporting information for a Referral of Proposed Clearing (section 51DA of the *Environmental Protection Act 1986* (EP Act)) in relation to proposed clearing of identified native vegetation, where it intersects the proposed road upgrade and widening works and where a valid Clearing Permit exemption does not apply.

This supporting memo provides an assessment of the proposed clearing against all clearing referral criteria listed in Section 51DA(4) of the EP Act. Based on an assessment undertaken by Emerge against these criteria, it would appear that there are reasonable grounds to suggest that the clearing within the clearing referral area would result in very low environmental impacts.

2 PROPOSED ROAD UPGRADE AND WIDNENING WORKS

2.1 Existing road status

Forrest Road is an existing single carriageway (supporting one lane for each direction of travel), which extends across the entirety of the Wungong Urban Water Project Area. The road has historically serviced surrounding rural land uses.

2.2 Land use planning context and need for road widening and upgrade works

In accordance with the Armadale Redevelopment Scheme 2 and Wungong Urban Water Master Plan, urban development is currently progressing across the Wungong Urban Water Project Area to transition the area from rural to urban land uses. As part of urban development, existing arterial roads (such as Forrest Road) require upgrading and widening to safely accommodate the increased local population and associated vehicle traffic.

Required upgrades and widening to Forrest Road are identified in the Wungong Urban Water Master Plan, as well as the approved Structure Plans for each precinct that the road passes through. This includes the approved *Precinct 13 (D) - Eighth Road Structure Plan* and the approved *Precinct 15 (F) - Town Centre Structure Plan*. There is a current need to progress widening and upgrade works for Forrest Road between Wollaston Avenue and Eleventh Road, given urban development has already substantially progressed across immediately adjacent land, including within Wungong Precinct 13 and Wungong Precinct 15 (Sienna Wood).

2.3 Proposed widening and upgrade works

The proposed Forrest Road upgrades and widening between Wollaston Avenue and Eleventh Road include construction of a dual carriageway, including two lanes for each direction of travel, associated medians and verges, upgraded intersection treatments (including roundabouts at Eleventh Road and Daintree Street), other ancillary infrastructure including pedestrian and bike paths, and landscaping of the newly created road medians and verges.

The extent of the road upgrade and widening works is shown in the attached **Figure 1**. Native vegetation only occurs within a small portion of the works area, which defines the extent of this Referral, also shown in the attached **Figure 1**.

DevelopmentWA and City of Armadale are the responsible authorities for implementation of the Armadale Redevelopment Scheme 2 and Wungong Urban Water Master Plan and therefore are responsible for the implementation of public works such as arterial road upgrades and widening. The Forrest Road widening and upgrade works are to be funded by the developer contribution scheme and grant funding where available. The Proponent is undertaking the proposed widening and upgrade works for this portion of Forrest Road on behalf of City of Armadale and DevelopmentWA.

2.4 Referral area

The referral area, shown in **Figure 1**, comprises the combined extent of the 9 trees proposed to be cleared that meet the definition of 'native vegetation' under the EP Act and that are also not subject to any valid exemptions for a Clearing Permit. The referral area is based on the outermost circumference of each tree's canopy and drip line, which totals 0.03 hectares (ha). Vegetation that does not meet the EP Act definition of 'native vegetation', or for which a valid Clearing Permit exemption applies, is not included in this clearing referral.

2.5 Existing subdivision approvals

The *Planning and Development Act 2005* provides for a schedule 6 exemption for the clearing of native vegetation in accordance with a subdivision approval. Numerous subdivision approvals presently exist across parts of the proposed road upgrade footprint (Western Australian Planning Commission reference numbers #158823, #161463, #162036, #163281, #164406 and #200348), which provide approval to subdivide a widened road reserve to accommodate the upgrades to Forrest Road. Native vegetation which are subject to these subdivision approvals is <u>not</u> included in this clearing referral.

2.6 Other approvals

No other planning or development approvals are required to implement the proposed road widening and upgrade works.

The Proponent has prepared civil engineering designs for the proposed road upgrade, which has been an iterative design process. This has included submission of 15%, 50%, 85% and 100% design packages to the City of Armadale for review and comment. The 100% civil design package is currently with the City of Armadale for final civil design approval, prior to commencement of construction works. Similarly, the Proponent has submitted concept landscape plans to the City, which will be further documented in the detailed landscape designs, with final approval to be provided by the City of Armadale.

3 EXISTING ENVIRONMENT

3.1 Environmental surveys completed to date

The following environmental surveys have been completed to date in relation to the proposed Forrest Road upgrades and widening:

- Preliminary Ecological Assessment (Emerge Associates, June 2023)
- Ecological Assessment (Emerge Associates, July 2024) (**Attachment A**), which supersedes the previous Preliminary Ecological Assessment
- Arboricultural Assessment, Tree Survey Report (Arborite Tree Management Solutions, December 2023) (**Attachment A**).

In addition to the above, a tree pickup survey was completed by MNG Survey in September 2023. The surveyed tree locational data was used for all subsequent environmental surveys and reporting, as well as for civil design drawings.

The Ecological Assessment includes a 'reconnaissance' level flora, vegetation and fauna assessment undertaken with reference to the *Technical Guidance – Flora and Vegetation Surveys for Environmental Impact Assessment* (EPA 2016), *Technical Guidance - Terrestrial vertebrate fauna surveys for environmental impact assessment* (EPA 2020) and the *Environment Protection and Biodiversity Conservation Act 1999 Black Cockatoo Referral Guidelines* (DAWE 2022).

The surveys listed above have informed preparation of this referral.

3.2 Summary of existing environmental values within referral area

The referral area comprises nine existing trees, as detailed in **Table 1** and summarised as follows:

- Of the nine trees, five are *Melaleuca preissiana* (paperbark) and four are *Eucalyptus rudis* (flooded gum).
- Of the nine trees, five are juvenile specimens (around 10 years old) and four are mature specimens (over 60 years old), based on a review of historical aerial imagery.
- The juvenile trees are likely to have grown from seed dispersed from other nearby trees or regrown from previously cleared trees. The four flooded gum trees are likely to have grown from seed released from nearby flooded gums which were themselves historically planted.
- Whilst there is potential that the five juvenile trees may have been planted, for the purpose of this clearing referral it has been conservatively assumed that they are naturally occurring and meet the definition of 'native vegetation' under the EP Act.
- None of the nine trees contain hollows or provide foraging, roosting or breeding habitat for threatened species of black cockatoo.

Table 1: Trees to be cleared within referral area

ID	Species	Common name	Age	Diameter	Likely origin	Established date
105	*Eucalyptus rudis*	Flooded gum	Juvenile	100 mm	Seed/regrowth	~2014
106	*Eucalyptus rudis*	Flooded gum	Juvenile	140 mm	Seed/regrowth	~2014
107	*Eucalyptus rudis*	Flooded gum	Juvenile	100 mm	Seed/regrowth	~2014
108	*Eucalyptus rudis*	Flooded gum	Juvenile	140 mm	Seed/regrowth	~2014
127	*Melaleuca preissiana*	Paperbark	Mature	500 mm	Remnant	Pre 1960
628	*Melaleuca preissiana*	Paperbark	Mature	600 mm	Remnant	Pre 1960
10001	*Melaleuca preissiana*	Paperbark	Juvenile	*150 mm	Seed/regrowth	~2014
10002	*Melaleuca preissiana*	Paperbark	Mature	*500 mm	Remnant	Pre 1960
10005	*Melaleuca preissiana*	Paperbark	Mature	*600 mm	Remnant	Pre 1960

** DBH estimated as tree not captured in tree-pickup survey*

The location of the nine trees is shown in **Figure 2** and images are provided in **Plate 1** to **Plate 5**.

Plate 1: Eucalyptus rudis trees 108, 107, 106, 105 (left to right, facing south, Forrest Road)

Plate 2: Melaleuca preissiana tree 1005 (facing north, Forrest Road)

Plate 3: Melaleuca preissiana trees 127 and 10002 (left to right, facing south, Forrest Road)

Plate 4: Melaleuca preissiana tree 628 (facing east, Eleventh Road)

Plate 5: Melaleuca preissiana tree 1001 (facing west, Eleventh Road)

3.3 Summary of existing environmental values within surrounding area

Based on the Ecological Assessment (Emerge Associates 2024), which assessed the environmental values of the referral area and surrounding road upgrade area, the environmental values of the surrounding area are summarised as follows:

- The road upgrade area and surrounding locality has been subject to significant historical disturbance and has limited flora and vegetation and fauna habitat values remaining. The majority of land comprises paddocks and pasture historically cleared of native vegetation.
- Vegetation was assessed to be in 'completed degraded' or 'degraded – completely degraded' condition, reflecting the high level of historical disturbance.
- The majority of the road upgrade area (included the areas subject to the clearing referral) is mapped within the Guildford regional vegetation complex area. The Ecological Assessment concluded that none of the vegetation present within the survey area is representative of the Guildford complex, due to the high level of clearing and historic disturbance and resulting vegetation condition.
- No conservation significant flora or ecological communities was identified in the road upgrade footprint.
- The primary environmental values are existing trees, the majority of which are planted species which are not native to the local area; primarily *Eucalyptus camaldulensis* (river gum).
- Native vegetation within the road upgrade area is limited to three native tree species (*Allocasuarina* sp., *Eucalyptus rudis* and *Melaleuca preissiana*). However, most of these native trees have been historically planted, evidenced by having an evenly spaced, geometrically regular and linear alignment along Forrest Road and fences bordering adjacent rural land parcels. This conclusion is supporting by historical aerial imagery which identifies these trees appearing at the same time, indicating they were planted concurrently. Planted vegetation does not meet the definition of 'native vegetation' for the purpose of the EP Act and therefore has not been included in this clearing referral. However, nine *Eucalyptus rudis* and *Melaleuca preissiana* trees are not considered to be planted and are the subject of this clearing referral.
- No black cockatoo breeding habitat or roosting habitat was identified in the Ecological Assessment. Some discrete areas of secondary non-native foraging habitat for black cockatoos was identified (none of which is associated with the trees subject to the clearing referral). No primary foraging habitat for any black cockatoo species was observed.
- No material habitat for conservation significant fauna species was considered to occur in the road upgrade footprint.

Further detail on the existing flora, vegetation and fauna values of the referral area and wider road upgrade footprint is provided in the Ecological Assessment (Emerge Associates 2024) (**Attachment A**), including an assessment to determine the extent of 'native vegetation' per the EP Act definition. Further detailed assessment of individual tree values is provided in the Arboricultural Assessment (Arborite Tree Management Solutions 2023) (**Attachment A**).

4 IMPACT MITIGATION

4.1 Avoidance

The road upgrade and widening project has been planned and design to avoid clearing to the extent possible. However, it is important to recognise that there are significant constraining factors for the project to avoid all clearing impacts, given the following design requirements and constraints:

- Given the Forrest Road carriageway and road reservation already exists, the location and alignment of the road (and therefore any associated upgrades and widening) is already determined. As such, this restricts consideration of potential alternate road alignments whereby avoidance of potential clearing impacts could be more holistically considered.
- Land adjoining Forrest Road is owned by a variety of private landowners and is being developed for urban land uses in accordance with the Wungong Urban Water Master Plan. Some of this land has already commenced (or completed) urban development, whilst a range of existing subdivision approvals (issued by WAPC) also apply to surrounding land. This means the location and extent of the widened road reserve has already been subdivided and established in areas (or approved to do so in other areas through existing WAPC subdivision approvals). This restricts consideration of potential alternate road reserve alignments whereby avoidance of potential clearing impacts could be further considered, as the widened road reserve alignment has already been established.
- Upgrade of Forest Road requires road surface levels to be lifted to a higher elevation, to tie into the necessary local drainage infrastructure (which are constrained by shallow outfall levels and high groundwater levels). This results in the need for the introduction of fill and incorporation of batters to tie into adjacent elevations. This will result in the burial of structural root zones of adjacent trees that limits their ability to be retained. The use of retaining walls in lieu of batters has been assessed through the civil design process and in most locations is not feasible due to lack of available space and/or the need for high retaining wall heights.

The proposed road upgrade and widening works will avoid 9 other trees (all mature or semi-mature *Melaleuca preissiana* trees) which meet the definition of 'native vegetation' under the EP Act. These trees are situated in proximity to the road upgrade and widening footprint and have been avoided through the civil design process. This has involved limiting the extent of works and battering to avoid these trees, which was possible based on their location (i.e. they were not limited by the above design constraints).

More broadly and in consideration of all trees across the balance of the road upgrade area (i.e. not just limited to trees that meet the definition of 'native vegetation' for the purpose of the EP Act), the following avoidance outcomes have been achieved for existing trees:

- 55 trees (combination of native and non-native) are identified to be avoided and retained as part of the road upgrade and widening works, the majority of which are situated adjacent to the road carriageway and associated batters. It is noted that many of these trees are located in areas that are identified for future urban development and therefore the long-term status of these trees is uncertain.
- 13 trees are identified to be avoided and retained, subject to investigation. Final retention viability will be confirmed through a road design safety audit (for example where existing trees are close to road edges or have potential to obstruct sight-lines) and through onsite consultation during the construction phase between the civil contractor, civil engineer and arborist. 6 of these 13 trees are located within the centre of a proposed roundabout at the intersection of Forrest Road & Daintree Street. A design modification was undertaken to shift the centre of the roundabout to accommodate these trees, which would otherwise have been impacted (i.e. trees to be removed) by the road construction works.

- 7 trees located on Eleventh Road are nursery plantings that will be relocated prior to construction works to the Town Centre streetscape, facilitating their long-term retention. These 7 trees are London plane trees (non-native).

Whilst not all clearing impacts are avoidable, the residual clearing is necessary to facilitate the road upgrade and widening works, which is a project that is required to be implemented to conform with the existing land use planning framework (i.e. in accordance with the Armadale Redevelopment Scheme 2, Wungong Urban Water Master Plan, *Precinct 13 (D) - Eighth Road Structure Plan* and *Precinct 15 (F) - Town Centre Structure Plan*) and will provide public benefit through increased road safety, access, capacity and functionality for the growing local and regional population.

4.2 Minimisation

Where existing trees are identified for retention, potential impacts to these trees from construction works will be minimised and mitigated through adherence to Australian Standard 4970-2009 *Protection of trees on development sites* (AS 4970-2009). This will include engagement of a project arborist as part of the civil construction works, who will provide advice based on the controls specified in AS 4970-2009.

Structural Root Zones (SRZs) Tree Protection Zones (TPZs) will be established, which are defined as: *"a specified area above and below ground and at a given distance from the trunk set aside for the protection of a tree's roots and crown to provide for the viability and stability of a tree to be retained where it is potentially subject to damage by development".* SRZs and TPZs have been determined as part of the Arboricultural Assessment.

Where possible, TPZ's will be isolated from construction disturbance, so that the tree remains viable. However, the majority of trees to be retained directly abut the proposed road carriageway and as such there will be instances of unavoidable encroachment of construction into TPZs. Any such encroachments will be undertaken based on advice from the appointed project arborist, based on the controls specified in AS 4970-2009.

To minimise the risk of impacts to fauna utilising trees identified for clearing; onsite fauna observers will be used during clearing works.

4.3 Rehabilitation

Whilst some impacts to existing trees are unavoidable, the proposed road upgrades and widening also involves the implementation of landscaping works and associated planting within the new road medians and verges. This will include planting of trees, low shrubs and groundcovers. The concept landscape plans for the proposed road upgrade and widening, which are subject to detailed landscape design and CoA approval, are provided in **Attachment B.**

Whilst the works area contains minimal black cockatoo habitat values, many of the proposed landscaping species (including all proposed tree species) are known to provide breeding, roosting and/or foraging habitat resources for black cockatoos. These species are underlined below, with further detail provided in **Attachment C**.

The concept landscape Plans include planting of the following tree species (346 trees in total):

- 83 *Allocasuarina fraseriana* (sheoak)
- 6 *Corymbia callophylla* (marri)
- 6 *Eucalyptus gomphocephala* (tuart)
- 12 *Eucalyptus rudis* (flooded gum)
- 89 *Eucalyptus wandoo* (white gum)
- 38 *Melaleuca preissiana* (stout paperbark)
- 36 *Melaleuca quinquinervia* (broad-leafed paperbark)
- 76 *Melaleuca rhaphiophylla* (swamp paperbark)

Both native species which are the subject of this referral (*Melaleuca preissiana* and *Eucalyptus rudis*) are included in the concept landscape planting palette.

As part of the concept landscape design process, an estimation of existing vs future urban forest/tree canopy extent has been completed and is summarised as follows:

- The existing urban forest/tree canopy is estimated to be approximately **5,191 m^2**
- The proposed urban forest/tree canopy, at maturity, is estimated to be approximately **19,207 m^2** (approximately 370% of existing canopy cover).

In addition to tree planting, the following low shrub species are also proposed to be planted:

- *Acacia pulchella*
- *Acacia saligna*
- *Conostylis candicans*
- *Dianella revoluta*
- *Gastrolobium capitatum*
- *Hakea varia*
- *Jacksonia furcellata*
- *Lomandra longifolia 'Tanika'*
- *Melaleuca thymoides*
- *Regelia ciliata*
- *Regelia inops*
- *Taxandria linearitolia*

The following groundcover species are also proposed to be planted:

- *Banksia nivea*
- *Gompholobium confertum*
- *Kennedia prostrata*
- *Melaleuca trichophylla*
- *Orthrosanthus laxus*
- *Philotheca spicata*

Overall, significant landscape planting is proposed (including a total of 346 trees, plus shrubs and groundcovers) that will assist in mitigating the unavoidable loss of existing trees as part of the proposed road upgrade and landscape works. Ultimately, it is estimated that urban forest/tree canopy cover along this section of road will be approximately 370% of the area that is currently provided, once landscape planting reaches maturity.

4.4 Offsets

Based on the proposed impact mitigation measures (avoidance, minimisation and rehabilitation planting) no significant residual impacts are anticipated to occur. As such, no offsets are proposed.

5 RESPONSE TO CLEARING REFERRAL CRITERIA

DWER's referrals process supports a risk-based approach to assessing native vegetation clearing proposals by establishing a pathway to assess very low impact clearing activities that are deemed not to require a permit. When assessing the clearing referral, DWER have regard to the referral criteria listed in Section 51DA(4) of the EP Act. A clearing permit is required if all referral criteria are met.

In support of this clearing referral, the four referral criteria have been considered and responded to, provided in **Table 2**.

Table 2: Response to EP Act clearing referral criteria

EP Act s51DA(4) criteria	Response to the EP Act clearing referral criteria
Criterion 1: The area proposed to be cleared is small relative to the total remaining vegetation • Relative to the total remaining vegetation in the region where the proposed clearing is located, and	The site is located within the Metropolitan Perth Region Scheme constrained area. The 'constrained area' of Metropolitan Perth is the Swan Coastal Plain IBRA portion of the Perth Region Scheme. The Native Vegetation Clearing Referrals Guideline ('the Guideline') (DWER 2021) states that if the extent of the proposed clearing is more than 1 ha, a clearing permit is required. The proposed clearing would involve the removal of 9 individual native trees covering an area of 0.03 ha, which is less than the 1 ha threshold and is anticipated to result in a very low environmental impact.

EP Act s51DA(4) criteria	Response to the EP Act clearing referral criteria
• Relative to the total remaining vegetation of the ecological community that the vegetation proposed to be cleared forms a part of	Vegetation complex mapping for the Swan Coastal Plain (DBCA-046) indicates that the referral area is situated within the 'Guildford' vegetation complex. However, the site-specific Ecological Assessment (Emerge Associates 2024) concluded that vegetation present within the survey area (including the referral area) is <u>not</u> representative of the Guildford complex, due to the high level of clearing and historic disturbance and resulting vegetation condition ('Completely Degraded' and 'Degraded to Completely Degraded'). A review of the current native vegetation extent dataset (DPIRD-005), within a 5 km buffer of the site, indicates that the threshold for remaining native vegetation surrounding the boundary of the site is above the 10% as highlighted in the Guideline. The pre-European native vegetation extent within 5 km of the site was approximately 9,301 ha, whilst presently there is an estimated total of 1,460 ha of native vegetation remaining (approximately 15%) within a 5 km radius of the clearing area, as shown in **Figure 3**.
Criterion 2: There are no known or likely significant environmental values within the area • Biological values (e.g. flora, fauna, ecological communities) • Conservation values (e.g. impact to ecological linkages, conservation areas and heritage values) • Land and water resource values (e.g. wetlands and watercourses, water resources, land and soil quality)	No known or likely significant environmental values occur within the area, as summarised below. As such, the proposed clearing is not at variance with this criterion. <u>Biological values</u> • The referral area is mapped as comprising vegetation in 'Completely Degraded' and 'Degraded to Completely Degraded' condition, based on the Ecological Assessment (Emerge Associates 2024). • The trees within the referral area do not provide material habitat for any threatened, priority or specially protected fauna, including foraging, roosting or breeding habitat for black cockatoos, based on the Ecological Assessment (Emerge Associates 2024). • The trees within the referral area do not provide critical habitat for fauna, based on the Ecological Assessment (Emerge Associates 2024). • The referral area does not contain, nor is it in proximity to, any threatened or priority ecological community occurrences. • The referral area does not contain, nor is it in proximity to, any threatened or priority flora occurrences. <u>Conservation values</u> • The referral area does not intersect any mapped regional ecological linkages. • The referral area does not intersect any conservation reserves (e.g. Bush Forever, Environmental Protection Policy areas, DBCA managed land, Regional Open Space, or crown reserves vested for conservation purposes). • The referral area does not intersect any mapped Aboriginal Cultural Heritage or Historic Heritage places. <u>Land and water resource values</u> • The referral area does not contain, nor is it in proximity to, any wetlands listed under the Convention on Wetlands of International Importance (Ramsar Convention) or the Directory of Important Wetlands in Australia, or wetlands classified as 'conservation category' or 'resource enhancement' in the DBCA *Geomorphic wetlands* database. The referral area intersects a large 'multiple use' palusplain wetland (UFI 15797) that extends across an area of 7,266 ha. • The referral area does not intersect with or impact upon a watercourse. • The referral area is not within a public drinking water source area. • The DWER Contaminated Sites Database does not indicate any known contamination within the referral area or the surrounding area. • Regional acid sulfate soil (ASS) mapping indicates that the site is within an area classified as 'moderate to low' risk of ASS occurring within 3 m of the natural soil surface. The clearing of native vegetation is unlikely to disturb ASS. Similarly, earthworks associated with the road upgrades will primarily involve the importation of fill (as opposed to excavation) and therefore is also unlikely to disturb ASS.
Criterion 3: The state of scientific knowledge of native vegetation within the region is adequate	The site is located within the Swan Coastal Plain. Various databases, spatial datasets and other relevant readily available information is available for the site and the broader region. Additionally, site-specific arboricultural, flora, vegetation and fauna investigations for the proposed road widening and upgrade works have been completed (see **Section 3.1**). The state of scientific knowledge of native vegetation in the region (and locally) is adequate. As such, the proposed clearing is not at variance with this criterion.

EP Act s51DA(4) criteria	Response to the EP Act clearing referral criteria
Criterion 4: Conditions will not be required to manage environmental impacts	Efforts to avoid, minimise and rehabilitate environmental impacts of the road upgrade and widening works have been incorporated into the civil design process, concept landscape plans and proposed construction approach. Tree retention outcomes as part of the civil design package are subject to approval by the City of Armadale before commencement of works. Furthermore, the residual impacts outlined in this referral (being the clearing of 9 native trees) have been assessed to be of very low environmental impact and are not anticipated to require any conditions to manage effects on the environment. As such, the proposed clearing is not at variance with this criterion.

6 SUMMARY AND CLOSING

Stockland Development Pty Limited propose to upgrade and widening of Forrest Road between Wollaston Avenue and Eleventh Road in the suburbs of Haynes and Hilbert, on behalf of the City of Armadale and DevelopmentWA. The proposed works are in accordance with the Armadale Redevelopment Scheme 2 and Wungong Urban Water Master Plan. The works are necessary to safely accommodate increases to the local population and associated vehicle traffic.

The proposed clearing subject to this referral comprises 9 native trees (totalling 0.03 ha in area). Impact avoidance (retention of 9 other native trees, plus up to an addition 66 other non-native trees), impact minimisation (application of AS 4970-2009 tree protection controls and fauna management protocols during construction) and impact rehabilitation (implementation of a comprehensive landscape package) is proposed, such that no significant residual impacts are anticipated.

Overall, the proposed clearing activities are assessed to have a very low environmental impact and are not considered to be at variance with the four referral criteria outlined in the EP Act and the Guideline, which have been addressed in detail within this letter.

Should you have any questions regarding the referral or content of this supporting letter please do not hesitate to contact the undersigned.

Yours sincerely
Emerge Associates

Andreas Biddiscombe
SENIOR ENVIRONMENTAL CONSULTANT

cc: Louise Nazareth – Stockland Development Pty Limited

Encl: Figure 1: Referral Area and Proposed Road Upgrade and Widening Footprint
Figure 2: Proposed Native Vegetation (Trees) to be Cleared
Figure 3: Local Native Vegetation Extent
Attachment A: Ecological Assessment (Emerge Associates 2024), including Arboricultural Assessment (Arborite Tree Management Solutions 2023)
Attachment B: Concept Landscape Plans (Emerge Associates 2024)
Attachment C: Planting Palette – Black Cockatoo Habitat Values

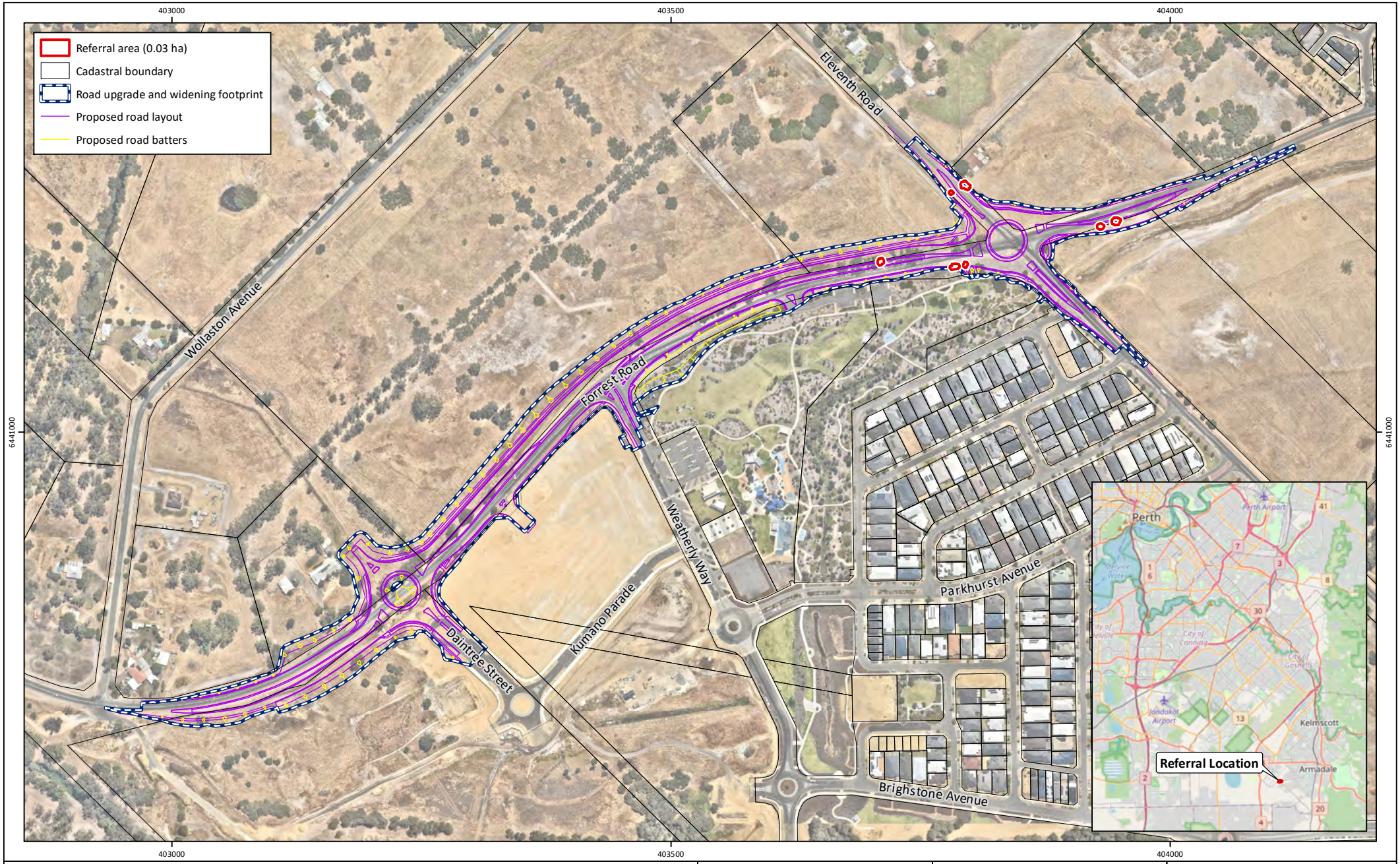

Figure 1: **Referral Area and Proposed Road Upgrade and Widening Footprint**

Project: Referral of Proposed Clearing - Supporting Information
Forrest Road Upgrade and Widening between Wollaston Avenue and Eleventh Road, Haynes and Hilbert

Client: Stockland Development Pty Limited

Plan Number:
EP23-030(05)--F30

Drawn:	ADB
Date:	08/08/2024
Checked:	ADB
Approved:	ADB
Date:	08/08/2024

N

0 50 100 150
Metres

Scale: 1:5,000@A4

GDA2020 MGA zone 50

emerge ASSOCIATES

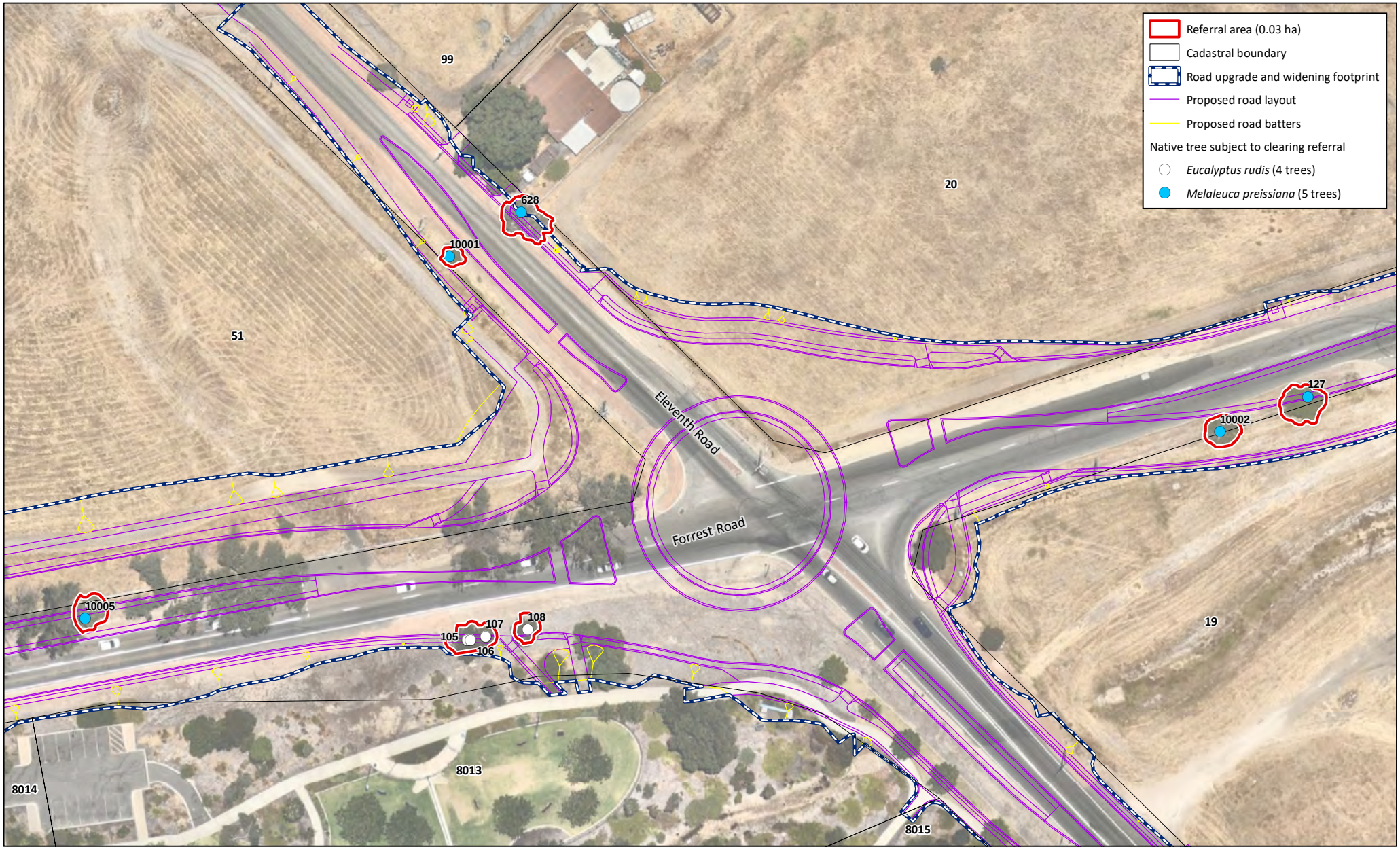

Figure 2: Proposed Native Vegetation (Trees) to be Cleared

Project: Referral of Proposed Clearing - Supporting Information
Forrest Road Upgrade and Widening between Wollaston Avenue and Eleventh Road, Haynes and Hilbert

Client: Stockland Development Pty Limited

Plan Number:
EP23-030(05)--F31

Drawn:	ADB
Date:	08/08/2024
Checked:	ADB
Approved:	ADB
Date:	08/08/2024

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Metres

Scale: 1:1,000@A4

GDA2020 MGA zone 50

emerge ASSOCIATES

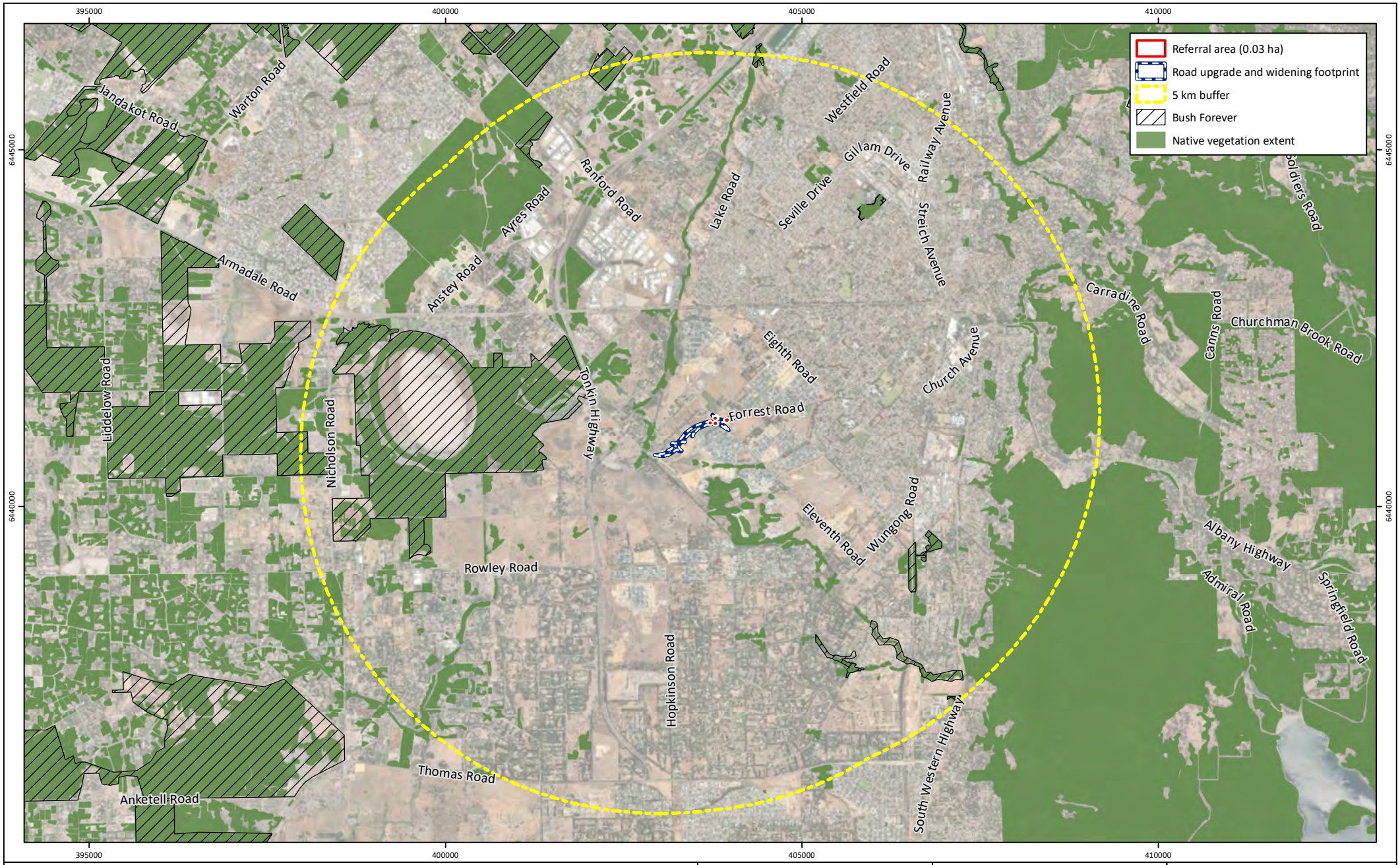

Figure 3: Local Native Vegetation Extent

Project: Referral of Proposed Clearing - Supporting Information
Forrest Road Upgrade and Widening between Wollaston Avenue and Eleventh Road, Haynes and Hilbert

Client: Stockland Development Pty Limited

Plan Number:
EP23-030(05)--F35

Drawn:	ADB
Date:	08/08/2024
Checked:	ADB
Approved:	ADB
Date:	08/08/2024

0 500 1,000 1,500 2,000
Metres

Scale: 1:70,000@A4

GDA2020 MGA zone 50

emerge ASSOCIATES

Attachment A: Ecological Assessment (Emerge Associates 2024), including Arboricultural Assessment (Arborite Tree Management Solutions 2023)

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Document Reference: EP23-030(03)—005 SKP

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5 July 2024

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Delivered by email to: Louise.Nazareth@stockland.com.au

PART FORREST ROAD, HAYNES – ECOLOGICAL ASSESSMENT

1 INTRODUCTION

1.1 Project background

Emerge Associates (Emerge) were engaged by Stockland to characterise the ecological values within part of the Forrest Road reserve and adjacent land within Haynes (referred to herein as the 'survey area'). The survey area is located approximately 26 kilometres (km) southeast of the Perth Central Business District within the City of Armadale.

The survey area (15.77 ha) comprises a linear corridor that extends from Wollaston Avenue in the west to Wetterhorn Road in the east and supports bituminised surface (Forrest Road), road reserve and parts of private lots. It is understood that the existing road reserve will be widened to accommodate proposed upgrades to Forrest Road.

A smaller extent (6.59 ha) of the survey area has been targeted for upgrade, and is referred to herein as the 'road upgrade footprint'. The location and extent of the survey area and road upgrade footprint are shown in **Figure 1.**

An arboricultural tree survey was undertaken by Arborite (2024) which is provided as **Appendix A**.

1.2 Purpose and scope of works

A survey to determine the ecological values within the survey area was required to inform planning for the proposed widening and upgrade of Forrest Road.

The scope of work was specifically to undertake a 'reconnaissance' flora, vegetation and fauna assessment with reference to the Environmental Protection Authority's (EPA's) technical guidance (EPA 2016, 2020) and the *Environment Protection and Biodiversity Conservation Act* black cockatoo referral guidelines (DAWE 2022).

As part of the scope of work the following tasks were completed:

- A desktop review of relevant background information pertaining to the survey area and surrounds. This included a detailed review of historical aerial imagery to assess whether flora and vegetation is remnant or planted.
- A field survey to assess vegetation type and condition and black cockatoo habitat values.
- Mapping of vegetation, trees and black cockatoo habitat.

- Documentation of the desktop assessment, methodology, field survey and results into a letter report.

1.3 Legislation and policy

The *Environmental Protection Act 1986* (EP Act) defines 'native vegetation' as indigenous aquatic or terrestrial vegetation (including dead vegetation). The definition does not include vegetation that is in a plantation (vegetation that was intentionally sown, planted or propagated) unless:

- that vegetation was sown, planted or propagated as required under the EP Act or another written law. (EP Act section 51A)

  OR

- the planting was funded (wholly or partly) by a person who is not the landowner, and it was for the purpose of biodiversity conservation or land conservation. (*Environmental Protection (Clearing of Native Vegetation) Regulations 2004* section 4)

  OR

- A conservation or restrictive covenant or some other binding undertaking to maintain the vegetation applies. (*Environmental Protection (Clearing of Native Vegetation) Regulations 2004* section 4)

Native vegetation is protected in Western Australia and can't be cleared without a permit or valid exemption. Biological diversity, habitat function, scarcity, association with wetlands and other ecosystem services influence the value placed on native vegetation (DWER 2018).

Flora and ecological communities may be listed as threatened under the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) (DCCEEW 2021) and the State *Biodiversity Conservation Act 2016* (BC Act) (DBCA 2022b, 2023a). Threatened flora and TECs are classified as either 'critically endangered'(CR), 'endangered' (EN) and 'vulnerable' (VU) (DCCEEW 2021). Commonwealth and/or State ministerial approval is required to impact threatened flora or TECs.

Native flora and ecological communities that are not listed as threatened, but are otherwise considered rare or under threat, may be added to a Department of Biodiversity Conservation and Attractions (DBCA) priority list (DBCA 2022a, b). 'Priority flora' and PECs are classified as either 'priority 1' (P1), 'priority 2' (P2), 'priority 3' (P3) or 'priority 4' (P4). They do not have direct statutory protection. However, their priority classification is taken into account during State and Local government approval processes.

Flora that are regarded as having negative environmental or economic impacts are often referred to as weeds (DBCA 2023b). Particularly detrimental weed species may be listed as a 'declared pest' pursuant to the State *Biosecurity and Agriculture Management Act 2007* (BAM Act) or as a 'weed of national significance' (WoNS) (DAWE 2021). Management of weeds, declared pests and WoNS may be required during government approval processes.

1.4 Environmental context

The survey area occurs on the Swan Coastal Plain, which is the geomorphic unit that characterises much of the Perth metropolitan area. The Swan Coastal Plain is approximately 500 km long and 20 to 30 km wide and is roughly bound by the Indian Ocean to the west and the Darling Scarp to the east.

Broadly the Swan Coastal Plain consists of two sedimentary belts of different origin. Its eastern side comprises the Pinjarra Plain which formed from the deposition of alluvial material washed down from the Darling Scarp, while its western side comprises three dune systems that run roughly parallel to the Indian Ocean coastline (Seddon 2004). These dune systems, referred to as Quindalup, Spearwood and Bassendean associations, represent a succession of coastal deposition that has occurred since the late Quaternary period (approximately two million years ago) (Kendrick *et al.* 1991) and, as a result, they contain soils at different stages of leaching and formation. The survey area is mapped as occurring on the Pinjarra Plain (Churchward and McArthur 1980) within the

Guildford vegetation complex (north-eastern portion) and the Beermullah vegetation complex (south-western portion).

Since European settlement, the Pinjarra Plain has been subject to extensive clearing to facilitate historical agricultural land uses, due to suitability of the soils for such land uses. This has resulted in limited remnant native vegetation current remaining across the Pinjarra Plain, with much of the land now comprising cleared areas and paddocks associated with existing rural land uses. This is characteristic of the survey area and surrounding locality.

The Guildford vegetation complex is described as comprising a mixture of open forest to tall open forest of *Corymbia calophylla, Eucalyptus wandoo, Eucalyptus marginata* and woodland of *Eucalyptus wandoo*, sometimes with *Eucalyptus rudis* and *Melaleuca rhaphiophylla*. This complex has approximately 5.19% of its original pre-European extent remaining, with 2.1% of its original pre-European extent protected for conservation purposes (Government of Western Australia 2019).

The Beermullah vegetation complex comprise a mixture of low open forest of *Casuarina obesa* and open woodland of *C. calophylla*, *Eucalyptus wandoo* and *Eucalyptus marginata*. Components include closed scrub of *Melaleuca* spp. This complex has approximately 6.7% of its original pre-European extent remaining, with 0.3% of its original pre-European extent protected for conservation purposes (Government of Western Australia 2019).

Studies have indicated that the loss of biodiversity caused by habitat fragmentation is significantly greater once a habitat type falls below 30% of its original extent (Miles 2001). The national objectives and targets for biodiversity conservation established an objective of retaining 30% of the original extent of each vegetation complex (Environment Australia 2001). However, a lower objective of 10% is applied in 'constrained urban areas' such as the Swan Coastal Plain (Ministry for Planning 1995). The percentage protected for conservation of the Guildford and Beermullah vegetation complexes is below the 10% retention objective.

The survey area and surrounds forms part of a large 'multiple use' wetland ('unique feature identifier' (UFI) number 15797 (Armadale Palusplain)).

1.4.1 Threatened and priority flora and vegetation

A variety of threatened and priority flora occur within the local area but are generally restricted to areas of intact native vegetation (often defined as vegetation in 'good' or better condition). Review of the Keighery *et al.* (2012) *weed and native flora* dataset, which contains validated records of floristic community types on the Swan Coastal Plain, indicates the following three TECs and one PEC occur in the within 5 km of the site:

- SCP3a '*Corymbia calophylla - Kingia australis* woodlands on heavy soils of the Swan Coastal Plain' (listed as EN under the EPBC Act and CR in WA)
- SCP10a 'shrublands on dry clay flats' (listed as CR under the EPBC Act and EN in WA).
- Banksia woodlands of the Swan Coastal Plain (listed as EN under the EPBC Act and P3 in WA).

1.4.2 Threatened and priority fauna

The survey area occurs within the modelled distribution of three threatened species in the south-west of WA (referred to herein collectively as 'black cockatoos'):

- *Zanda latirostris* (Carnaby's black cockatoo) which is listed as 'endangered' under the EPBC Act and the BC Act.
- *Zanda baudinii* (Baudin's black cockatoo) which is listed as 'endangered' under the EPBC Act and the BC Act.
- *Calyptorhynchus banksii naso* (forest red-tailed black cockatoo) which is listed as 'vulnerable' under the EPBC Act and the BC Act.

2 METHODS

2.1 Desktop survey

Prior to the field survey, an ecologist reviewed high resolution aerial imagery and Google Street View to make an initial assessment of vegetation type and condition and likely tree species within the survey area.

2.2 Field surveys

An ecologist and zoologist from Emerge visited the survey area on 15 May 2023 to ground truth desktop information (**Section 2.1**). A subsequent survey was undertaken by an ecologist on the 6 December 2023.

A tree survey was undertaken separately by Arborite on the 4 and 5 December 2023 and 9 February 2024.

2.2.1 Flora and vegetation

The survey area was traversed by vehicle and foot and the composition and condition of vegetation was recorded on a hand-held tablet. Photographs were taken throughout the field visit to show particular site conditions. No formal sampling (i.e. quadrats or relevés) of vegetation was undertaken due to the disturbed condition of the vegetation. Data was instead collected through preparation of species lists of native and non-native flora species and changes in the vegetation structure. Any potential habitat for threatened or priority flora species (in good or better condition, as defined in **Table 1**) was traversed on foot at 5-10 m intervals.

Vegetation condition was assigned at each sample and changes in vegetation condition were also noted and mapped across the survey area. The condition of the vegetation was assessed using the Keighery (1994) scale (**Table 1**).

Table 1. Vegetation condition scale applied during the field assessment (Keighery 1994)

Condition category	Definition
Pristine	Pristine or nearly so, no obvious signs of disturbance.
Excellent	Vegetation structure intact, disturbance affecting individual species and weeds are non-aggressive species.
Very good	Vegetation structure altered obvious signs of disturbance. For example, disturbance to vegetation structure caused by repeated fires, the presence of some more aggressive weeds, dieback, logging and grazing.
Good	Vegetation structure significantly altered by very obvious signs of multiple disturbances. Retains basic vegetation structure or ability to regenerate it. For example, disturbance to vegetation structure caused by very frequent fires, the presence of some very aggressive weeds at high density, partial clearing, dieback and grazing.
Degraded	Basic vegetation structure severely impacted by disturbance. Scope for regeneration but not to a state approaching good condition without intensive management. For example, disturbance to vegetation structure caused by very frequent fires, the presence of very aggressive weeds, partial clearing, dieback and grazing.
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.

2.2.2 Native vegetation in accordance with the EP Act

Vegetation was assessed against the *Environmental Protection Act 1986* (EP Act) 'native vegetation' definition (refer to **Section 1.3**). Flora species recorded were assessed initially to determine whether they comprised:

- Australian native species

- WA native species
- Local native species.

Those species that did not meet the local native criteria were not considered to comprise 'native vegetation', on the basis that they would have had to be planted to occur in this location.

Best-available historical aerial photography published by Landgate was then reviewed for those areas with species that met the local native species criteria. Trees were assessed into the following categories:

- 'Remnant' (as they were visible on the earliest available aerial imagery).
- 'Planted or natural regrowth (unclear)', which was conservatively considered to be natural regrowth given insufficient evidence to demonstrate they were planted.
- 'Planted', where it is clear based on available evidence and historical aerial imagery. For example, the following observations indicate a planted tree:
    - Group of trees all appear at the same time on historical aerials, indicating they were concurrently planted.
    - Group of trees occur in an evenly spaced and/or linear planting pattern.

Vegetation consisting of local native species and assessed to be either 'remnant' or 'planted or natural regrowth (unclear)' were considered to meet the definition of 'native vegetation' under the EP Act.

All vegetation that met the 'native vegetation' definition was mapped on aerial imagery.

2.2.3 Tree survey

The results of the tree survey undertaken by Arborite were used to confirm tree characteristics and check for native vegetation as defined in **Section 2.2.2**.

2.2.4 Black cockatoo habitat

The survey area was traversed by vehicle and on foot and the presence of potential black cockatoo breeding, night roosting and foraging habitat was recorded. If observed, the presence of black cockatoos within or near the survey area was noted. Active searches for evidence of breeding, roosting and foraging activity such as chew marks, branch clippings, droppings, moulted feathers and chewed *Corymbia calophylla* (marri) or banksia fruit were conducted, where possible.

2.2.4.1 Breeding habitat

A 'habitat tree' was defined as a native eucalypt[1] that is typically known to support black cockatoo breeding such as marri, jarrah, blackbutt, tuart, wandoo, salmon gum or to a lesser extent flooded gum, with a DBH ≥50 cm or DBH ≥30 cm for wandoo or salmon gum. As any tree that has a suitable hollow may provide breeding habitat for black cockatoos, other tree species were also considered to be habitat trees if they contained a suitable hollow.

To be suitable for use as breeding habitat by black cockatoos it was considered a hollow must:

- have an entrance opening of at least 10 cm but preferably 20-30 cm (Saunders *et al.* 1982; Groom 2010; Johnstone *et al.* 2013)
- be located at least 3 m from the ground (Saunders 1979b; Johnstone and Storr 1998; Groom 2010; Saunders 2014)
- be located in a trunk or branch that is generally large enough to contain a hollow that has a floor diameter of at least 40 cm and depth of 50-200 cm such that it could house an adult

[1] *Eucalyptus* or *Corymbia*

black cockatoo and nestlings (Saunders 1979a; Johnstone and Storr 1998; Saunders 2014; DPaW 2015)

- have vertical or near vertical orientation (Johnstone and Kirkby 2008; Johnstone *et al.* 2013).

Occasionally, native eucalypts were encountered that met DBH requirements but did not contain a trunk/branch of a sufficient size to support a hollow suitable for use by black cockatoos. For example, the tree may have been less than 3 m tall or had a trunk that forked between 1.3 m and 3 m in height and after the fork no limbs had a diameter of ≥50 cm or ≥30 cm for wandoo or salmon gum. These trees were not recorded as habitat trees as the likelihood they would form a suitable hollow was low.

Habitat trees were individually identified and the attributes outlined in **Table 2** were recorded for each tree.

Table 2: Attributes recorded for each habitat tree in the survey area

Attribute	Description
GPS location	The location was recorded using a handheld GPS unit
Tree species	Species and common name were identified
Hollows potentially suitable for breeding by a black cockatoo	Number of hollows potentially suitable for breeding by a black cockatoo recorded (assessed from ground level only)

Each habitat tree was assigned to a category based on current black cockatoo guidelines listed in **Table 3**. Assessment of the suitability of the breeding habitat trees was made on observations from ground level. Further investigation will be required with an internal hollow inspection to determine the breeding habitat value of any trees with hollows.

Table 3: Habitat tree categories (DAWE 2022)

Category	Specifications
Known nesting tree	Trees (live or dead but still standing) which contains a hollow where black cockatoo breeding has been recorded or which demonstrates evidence of breeding (i.e. showing evidence of use through scratches, chew marks or feathers).
Suitable nesting tree	Trees with suitable nesting hollows present, although no evidence of use. Note that any species of tree may develop suitable hollows for breeding. Hollow confirmed by internal hollow inspection^.
Potential nesting tree	Trees that have a suitable DBH to develop a nest hollow, but do not currently have hollows. Trees suitable to develop a nest hollow in the future are >500 mm DBH (except for wandoo which can form a nest hollow at >300 mm DBH). Note that many species of eucalypt may develop suitable hollows for breeding.

2.2.4.2 Roosting habitat

Roosting habitat is defined as a stand of tall (>8 m) native and/or non-native trees that are situated within 2 km of a water source (Glossop *et al.* 2011; DAWE 2022). If present, groups of tall native and non-native trees were assumed to provide roosting habitat. The presence of active or historical roosts in these trees was determined through evidence of roosting activity, such as branch clippings, droppings or moulted feathers.

2.2.4.3 Foraging habitat

Foraging habitat was identified by assessing vegetation in the survey area for plant species known to provide food for black cockatoos (Davies 1966; Saunders 1980; Johnstone and Storr 1998; Johnstone and Kirkby 1999; Groom 2011; Johnstone et al. 2011; DAWE 2022).

Foraging habitat was classified as either 'native' or 'non-native' based on the predominant vegetation's naturalised status. It was also classified as either 'primary' or 'secondary' based on black cockatoo foraging preferences. Primary food plants were defined as those with historical and contemporary records of regular consumption by a black cockatoo species. Secondary food plants were defined as plants that black cockatoo species have been recorded consuming occasionally or that, based on their limited extent or agricultural origin, should not be considered a sustaining

resource. A list of plant species classified as primary or secondary food plants is provided as **Appendix B**.

Each patch of foraging habitat was assigned a foraging value for each species of black cockatoo likely to occur within the survey area: primary native, primary non-native, secondary native or secondary non-native. As it is not always possible to separate out food plants from non-food plants, mapped foraging habitat may also include vegetation comprising non-food plants. The proportion of non-food plants in mapped foraging habitat was minimised as far as practicable.

Evidence of black cockatoo foraging, such as chewed fruits, was searched for within the survey area and allocated to a species where possible.

2.3 Mapping and analysis

2.3.1 Vegetation

The vegetation units within the survey area were identified from notes taken during the field survey. Where appropriate, vegetation was described according to the dominant species present using the structural formation descriptions of the *National Vegetation Inventory System* (NVIS) (NVIS Technical Working Group 2017). The identified vegetation types were mapped on aerial photography and boundaries were interpreted from aerial photography and notes taken in the field. Vegetation condition was mapped on aerial photography based on notes recorded during the field survey to define areas with differing condition. Canopy overhang from vegetation located adjacent to the survey area was not mapped.

2.3.1 Trees

Each tree mapped by Arborite (2024) was assessed to confirm whether they met the definition of 'native vegetation' under the EP Act, as discussed in **Section 2.2.2**.

2.3.2 Black cockatoo habitat

Habitat trees were classified according to the scheme outlined in **Section 2.2.4.1** and mapped on aerial imagery.

Foraging habitat was described according to the dominant flora species or vegetation type present and mapped using boundaries interpreted from aerial photography and notes taken in the field. The foraging value of each patch of foraging habitat was attributed separately for each species of black cockatoo likely to occur in the survey area. Foraging value was assigned as outlined **Section 2.2.4.3**.

2.4 Limitations

Whilst the survey timing was completed outside of the optimal (spring) period for flora and vegetation assessment, it was acceptable for a reconnaissance level survey. As the vegetation in the survey area is generally completely degraded or degraded this did not represent a significant limitation on survey outcomes. Nevertheless, additional annual flora species would likely be recorded if the survey area was surveyed during spring. Due to the level of historical disturbance, these additional species are likely to predominantly include annual non-native species. As no habitat for threatened or priority flora species exists, it is not considered that additional species would include conservation significant flora species.

3 RESULTS

3.1 General site conditions

The survey area is located in a relatively flat low-lying landscape which is part of a large wetland landform. A waterway (Wungong Brook) occurs outside of and to the west of the survey area.

The majority of the survey area has been highly disturbed as a result of historical and existing land uses (including rural paddocks, roads and residential development) and currently comprises bare

ground and non-native grassland vegetation. Native vegetation is limited to scattered trees and shrubs.

3.2 Flora

No threatened or priority flora were recorded within the survey area. None are considered likely to occur due to lack of suitable habitat.

3.3 Vegetation

3.3.1.1 Vegetation units

Five vegetation types were identified within the survey area, as detailed in **Table 4**. Representative photographs of each are provided in *Error! Reference source not found.* to **Plate 5**. The location of each vegetation type is shown in **Figure 2**.

Table 4: Description and extent of vegetation units identified within the survey area and road upgrade footprint

Vegetation unit	Description	Area (ha) within survey area	Area (ha) within road upgrade footprint
Er	Open woodland to forest of *Eucalyptus rudis* over closed grassland of pasture grasses (**Plate 1**)	0.34	0.18
ErMp	Open forest of *Eucalyptus rudis* and *Melaleuca preissiana* over grassland of pasture grasses (**Plate 2**)	0.07	0.07
Planted native	Landscaped areas comprising predominantly native tree and shrub species (**Plate 3**)	0.87	0.34
Non-native	Planted non-native trees and shrubs over pasture grasses (**Plate 4**)	1.16	0.33
Cleared	Cleared road reserves and sealed areas including roads and paths, with scattered native species (**Plate 5**)	13.32	5.66

*Plate 1: Vegetation type **Er** in 'degraded to completely degraded' condition*

*Plate 2: Vegetation type **ErMp** in 'degraded to completely degraded' condition. Based on historical aerials, the Melaleuca preissiana trees present are remnant whilst the Eucalyptus rudis trees have been planted.*

Plate 3: Planted native species in landscaped areas.

Plate 4: Planted non-native vegetation in 'completely degraded' condition

Plate 5: Cleared areas in 'completely degraded' condition with scattered native species

3.3.1.2 Vegetation condition

Areas of vegetation contained only scattered patches of native trees with little to no native understorey elements and were mapped as being in 'degraded - completely degraded' condition as the vegetation structure is no longer intact.

The remainder of the vegetation in the survey area is in 'completely degraded' condition and predominantly consists of isolated native trees, non-native plant species such as pasture grasses and planted trees and shrubs. Bare ground and sealed areas within the survey area were also mapped as

being in 'completely degraded' condition. Landscaped planted areas were not assigned a condition category as these areas have been highly altered despite containing some planted native species.

The extent of vegetation by condition category is detailed in **Table 5** and shown in **Figure 3**.

Table 5: Extent of vegetation condition categories within the survey area

Condition category (EPA 2016)	Size (ha) within the survey area	Size (ha) within the road upgrade footprint
Excellent	0	0
Very good	0	0
Good	0	0
Degraded	0	0
Degraded - completely degraded	0.44	0.25
Completely degraded	14.46	5.98
N/A	0.87	0.34

3.3.1.3 Threatened and priority ecological communities

No TECs or PECs were recorded within the survey area, and none are considered to occur based on the degraded condition of vegetation. The local native species present within the site does not align with any of the TECs or PECs that occur within the wider local area.

3.4 Native vegetation in accordance with the EP Act

'Native vegetation' as defined under the EP Act occurs over 0.24 ha of the survey area, with 0.07 ha partially or completely intersecting the road upgrade footprint, as shown in **Figure 4**.

Within the road upgrade footprint, a total of 16 trees were considered to be either remnant trees or of unclear origin and thus comprise the 0.07 ha of 'native vegetation', as shown in **Figure 7**.

3.5 Trees

A total of 317 trees with a diameter at breast height of 100 mm or greater were recorded by Arborite (2024) within the survey area and 128 of these trees were within the road upgrade footprint, as shown in **Figure 5**. Of these 128 trees within the road upgrade footprint, 49 are local native species (*Allocasuarina* sp., *Eucalyptus rudis* and *Melaleuca* spp.) and 79 were planted non-locally native species. Species and number of trees are detailed in **Table 6**. Note five *Melaleuca* sp. were added by Emerge after the tree survey as these trees were not captured in the original survey.

The retention priority of each tree, as assessed by Arborite (2024), is shown in **Figure 6**. Further details on each tree are provided in the Tree Survey Report (Arborite 2024) provided in **Appendix A**.

Table 6: Trees ≥100 mm recorded within the survey area and road upgrade footprint. Local native species are shaded green.

Species name	Common name	No. trees		Australian native	WA native	Local native	Recorded by Arborite	Added by Emerge
		Survey area	Road upgrade footprint					
Allocasuarina sp.	Sheoak	2	2	Y	Y	Y	2	-
Brachychiton populneus	Kurrajong	1	0	Y	-	-	1	-
**Citharexylum spinosum*	Fiddlewood	1	0	-	-	-	1	-
Corymbia maculata	Spotted gum	2	0	Y	-	-	2	-
Eucalyptus botryoides	Southern mahogany	4	0	Y	-	-	4	-
Eucalyptus camaldulensis	River gum	187	64	Y	Y	-	195	-

Eucalyptus globulus	Blue gum	2	0	Y	-	-	2	-
Eucalyptus gomphocephala	Tuart	6	3	Y	Y	-	6	-
Eucalyptus grandis	Rose gum	1	0	Y	-	-	1	-
Eucalyptus rudis	Flooded gum	46	38	Y	Y	Y	63	-
Eucalyptus victrix	Little ghost gum	2	0	Y	Y	-	2	-
**Jacaranda mimosifolia*	Jacaranda	2	1	-	-	-	2	-
Melaleuca sp.	Paperbark	15	9	Y	Y	Y	10	5
**Platanus acerifolia*	London plane	14	10	-	-	-	14	-
**Quercus robur*	English Oak	1	0	-	-	-	1	-
**Syagrus romanzoffiana*	Cocos palm	9	0	-	-	-	9	-
Xylomelum pyriforme	Woody pear	1	0	Y	-	-	1	-
Unknown	-	1	1	-	-	-	1	-

3.6 Black cockatoo habitat

3.6.1 Breeding habitat

No black cockatoo habitat trees were recorded within the survey area**.**

3.6.2 Roosting habitat

No roosts or evidence of roosting were observed within the survey area during the survey. However, the survey area contains tall trees and groups of tall trees that have the potential to provide roosting habitat for black cockatoos.

3.6.3 Foraging habitat

No primary or secondary native foraging habitat occurs within the survey area or the road upgrade footprint. A total of 0.67 ha of secondary non-native foraging habitat for Carnaby's black cockatoo, 0.05 ha for Baudin's black cockatoo and 1.50 ha for forest red-tailed black cockatoo were recorded in the survey area as shown in **Figure 8** to **Figure 10**. Of this foraging habitat, the road upgrade footprint contains 0.31 ha of foraging habitat for Carnaby's black cockatoo, 0.59 ha for forest red-tailed black cockatoo and no foraging habitat for Baudin's black cockatoo.

The extent of foraging habitat by value category is detailed in **Table 7**.

Table 7: Foraging habitat recorded within the survey area

Foraging habitat	Black cockatoo species and area of foraging habitat (ha) in survey area			Black cockatoo species and area of foraging habitat (ha) in road upgrade footprint		
	Carnaby's	Baudin's	Forest red-tailed	Carnaby's	Baudin's	Forest red-tailed
Primary native	0	0	0	0	0	0
Primary non-native	0	0	0	0	0	0
Secondary native	0	0	0	0	0	0
Secondary non-native	0.67	0.05	1.50	0.31	0	0.59
Total	0.67	0.05	1.50	0.31	0	0.59

4 DISCUSSION

4.1 Flora and vegetation

Limited flora and vegetation values remain within the survey area. No threatened or priority flora species are considered to occur as due to the high level of historical disturbance and lack of native understorey habitats are unlikely to be suitable.

No TECs or PECs occur. The vegetation present within the survey area is not representative of the Guildford and Beermullah vegetation complexes that are described in **Section 1.4** due to the high level of clearing and historic disturbance.

4.2 Trees

Arborite (2024) recorded a total of 317 trees with dbh ≥ 100 mm within the survey area, 128 of these trees are located within the road upgrade footprint. The majority of trees recorded were non-native, planted species. Of the trees present within the road upgrade footprint, the majority had a medium or low retention potential, with only 6 trees assessed as being high retention potential.

4.3 Fauna

Fauna values within the survey area are generally low due to the degraded condition of the understorey vegetation. It is likely to be predominantly used by common and widespread native and non-native fauna with non-specific habitat requirements, which enable them to persist in highly modified environments.

4.3.1 Black cockatoos

No evidence of black cockatoo foraging was observed within the survey area. Some chewed marri fruit attributed to forest red-tailed black cockatoos was observed to the east of the survey area. Carnaby's black cockatoo and Baudin's black cockatoo are also likely to forage within the wider area. As the site contains secondary non-native foraging habitat, primary foraging habitat present within the wider local area is likely to be preferentially utilised over the foraging habitat present within the site.

While no dusk roost survey was undertaken, no secondary evidence of black cockatoo roosting such as branch clippings, droppings or feathers were observed within the survey area. Therefore, there is no reason to suspect that roosting by black cockatoos has recently occurred in the survey area. Nevertheless, the survey area contains tall trees and groups of tall trees that have the potential to provide roosting habitat for black cockatoos.

None of the trees present within the survey area were deemed to represent potential breeding trees. Whilst there were some mature *Eucalyptus rudis* trees present, these trees had a multistem habit, with trunks that forked under 3 m in height and after the fork no limbs had a diameter of ≥50 cm, as such the likelihood of these trees forming hollows is low.

The site has some potential for use by black cockatoo species, primarily for foraging and roosting due to the presence of secondary non-native foraging habitat and potential roosting habitat. However, in the context of the extensive areas of foraging habitat of greater value occurring in the local area, the site does not provide a significant resource for black cockatoos. These nearby resources include marri trees further east along Forrest Road and the nearby Darling Scarp with extensive areas of intact jarrah and marri forest.

5 CONCLUSIONS

Outcomes of the preliminary ecological assessment are as follows:

- The survey area has been subject to significant historical disturbance and has limited flora and vegetation and fauna habitat values.
- No conservation significant flora species were recorded and none are considered to occur due to a lack of suitable habitat.
- Native vegetation (vegetation units **Er** and **ErMp**) occurs as small patches or scattered individuals in 'degraded - completely degraded' condition and extend over 0.24 ha of the survey area, with 0.07 ha partially or completely intersecting the road upgrade footprint.

- Non-native vegetation, planted native (landscaped) and cleared areas in 'completely degraded' condition (or not assigned a condition category) occur over 15.33 ha of the survey area and 6.32 ha of the road upgrade footprint.
- The road upgrade footprint contains 47 local native trees and 73 non-native trees with a DBH over 100 mm, the majority of which were historically planted.
- The survey area and road upgrade footprint contains no black cockatoo habitat trees.
- A total of 0.67 ha of secondary non-native foraging habitat for Carnaby's black cockatoo was mapped within the survey area of which 0.31 ha occurs in the road upgrade footprint.
- A total of 0.05 ha of secondary non-native foraging habitat for Baudin's black cockatoo was mapped within the survey area, none of which is within the road upgrade footprint.
- A total of 1.50 ha of secondary non-native foraging habitat for forest red-tailed black cockatoo was mapped within the survey area, of which 0.59 occurs in the road upgrade footprint.

Summary and closing

We trust that this letter provides sufficient details on the ecological survey undertaken within the survey area and road upgrade footprint. Should you have any questions regarding the content of this letter, please do not hesitate to contact the undersigned.

Yours sincerely
Emerge Associates

Rachel Weber
SENIOR ENVIRONMENTAL CONSULTANT – TEAM LEADER, ECOLOGY

cc: none

Encl:
Figure 1: Site Location
Figure 2: Vegetation Units
Figure 3: Vegetation Condition
Figure 4: EP Act Native Vegetation
Figure 5: Trees Species
Figure 6: Tree Retention Priority
Figure 7: Remnant vs Planted Trees
Figure 8: Carnaby's Black Cockatoo Foraging Habitat
Figure 9: Baudin's Black Cockatoo Foraging Habitat
Figure 10: Forest Red-tailed Black Cockatoo Foraging Habitat
Appendix A: Tree Survey Report (Arborite 2024)
Appendix B: Black Cockatoo Foraging Plants

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Figures

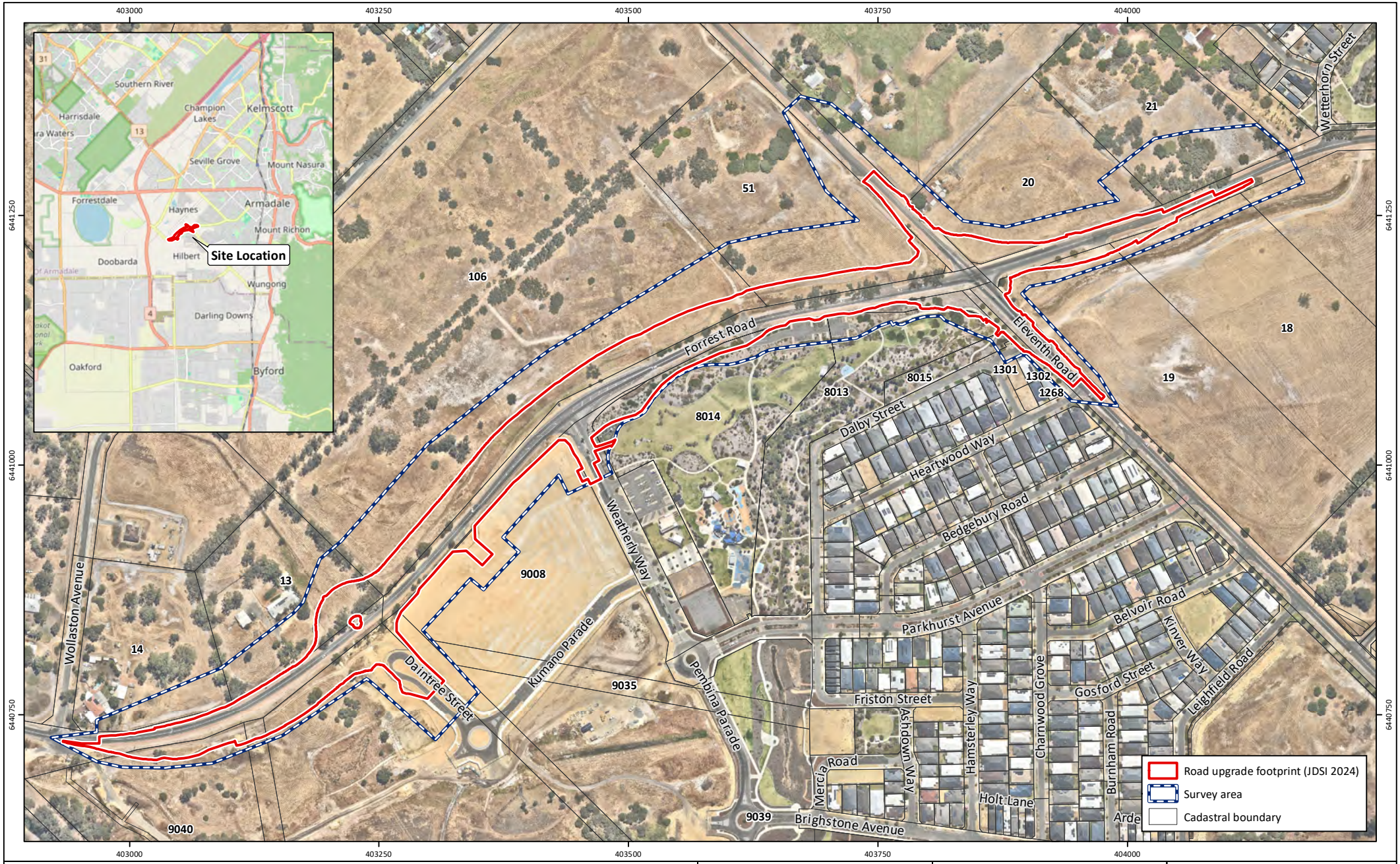

Figure 1: Site Location

Project:	Ecological Assessment Forrest Road, Haynes
Client:	Stockland

Plan Number:
EP23-030(03)--F19

Drawn:	AS
Date:	14/05/2024
Checked:	SKP
Approved:	ADB
Date:	25/06/2024

N

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Metres

Scale: 1:5,000@A4

GDA2020 MGA Zone 50

emerge ASSOCIATES

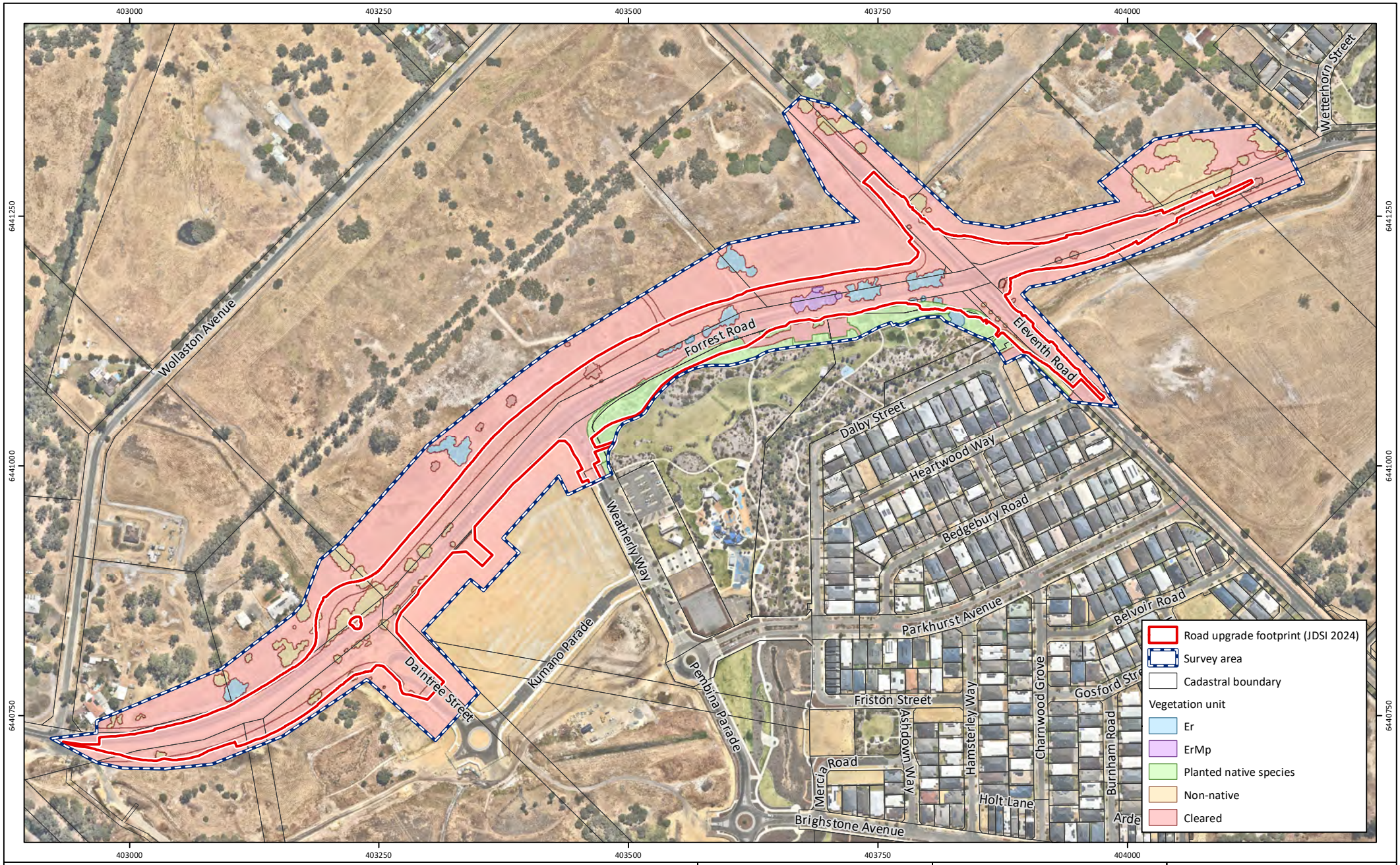

Figure 2: Vegetation Units

Project:	Ecological Assessment Forrest Road, Haynes
Client:	Stockland

Plan Number:
EP23-030(03)--F20

Drawn:	AS
Date:	14/05/2024
Checked:	SKP
Approved:	ADB
Date:	25/06/2024

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Metres

Scale: 1:5,000@A4

GDA2020 MGA Zone 50

emerge ASSOCIATES

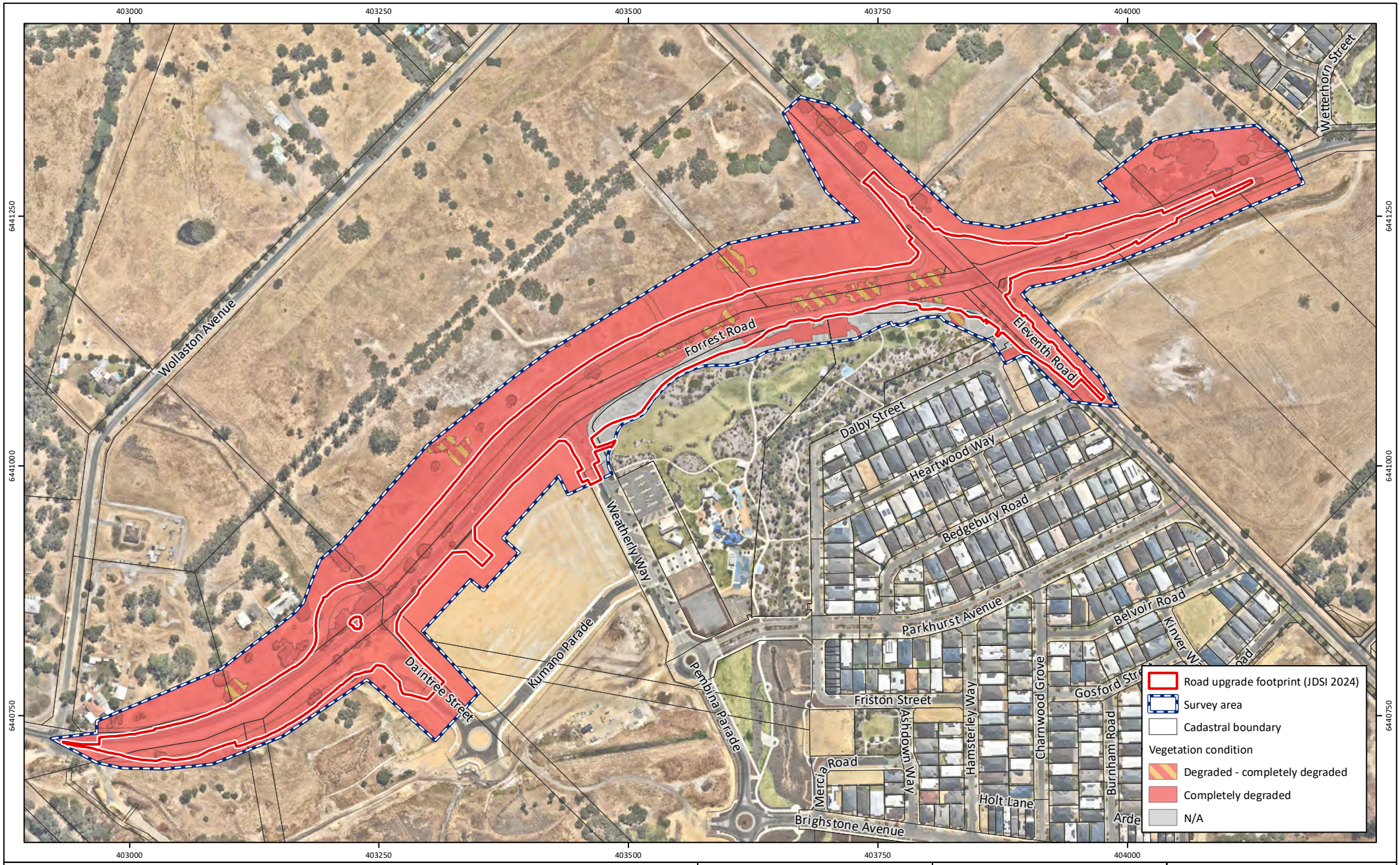

Figure 3: Vegetation Condition

Project:	Ecological Assessment Forrest Road, Haynes
Client:	Stockland

Plan Number:
EP23-030(03)--F21

Drawn:	AS
Date:	14/05/2024
Checked:	SKP
Approved:	ADB
Date:	25/06/2024

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Metres

Scale: 1:5,000@A4

GDA2020 MGA Zone 50

emerge ASSOCIATES

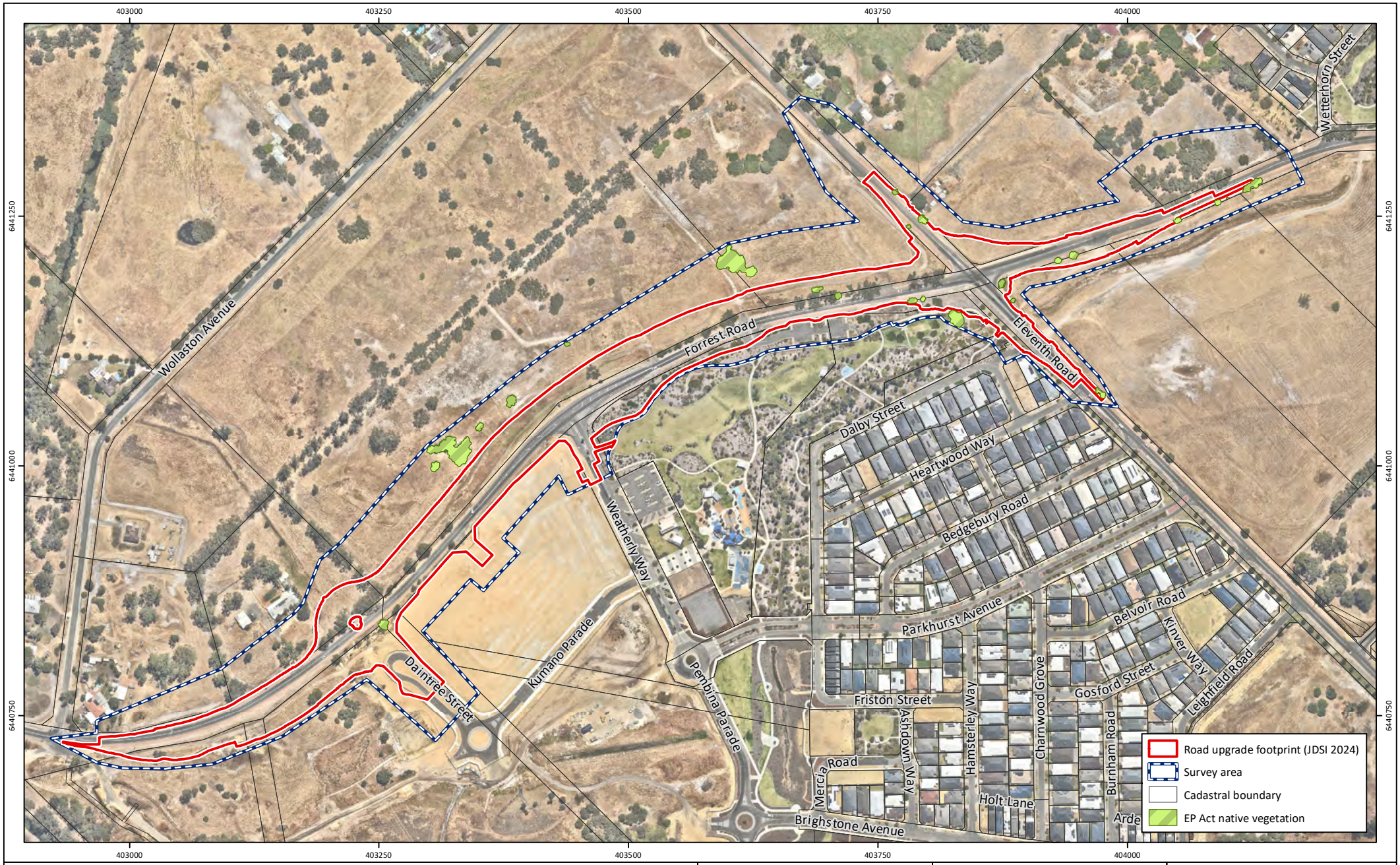

Figure 4: EP Act Native Vegetation

Project:	Ecological Assessment Forrest Road, Haynes
Client:	Stockland

Plan Number:
EP23-030(03)--F22

Drawn:	AS
Date:	14/05/2024
Checked:	SKP
Approved:	ADB
Date:	25/06/2024

N

0 50 100 150
Metres

Scale: 1:5,000@A4

GDA2020 MGA Zone 50

emerge ASSOCIATES

Species	Common name	No.	Australian native	WA native	Local native
Allocasuarina sp.	Sheoak	2	x	x	x
Brachychiton populneus	Kurrajong	1	x	☐	☐
Citharexylum spinosum	Fiddlewood	1	☐	☐	☐
Corymbia maculata	Spotted gum	2	x	☐	☐
Eucalyptus botryoides	Southern mahogany	4	x	☐	☐
Eucalyptus camaldulensis	River gum	187	x	x	☐
Eucalyptus globulus	Blue gum	2	x	☐	☐
Eucalyptus gomphocephala	Tuart	6	x	x	☐
Eucalyptus grandis	Rose gum	1	x	☐	☐
Eucalyptus rudis	Flooded gum	46	x	x	x
Eucalyptus victrix	Little ghost gum	2	x	x	☐
Jacaranda mimosifolia	Jacaranda	2	☐	☐	☐
Melaleuca sp.	Paperbark	15	x	x	x
Platanus acerifolia	London plane	14	☐	☐	☐
Quercus robur	English oak	1	☐	☐	☐
Syagrus romanzoffiana	Cocos palm	9	☐	☐	☐
Xylomelum pyriforme	Woody pear	1	x	☐	☐

403000 403200 403400 403600 403800 404000

6441400 6441200 6441000 6440800

Wollaston Avenue
Forrest Road
Eleventh Road
Dalby Street
Heartwood Way
Gisburn Street
Bedgebury Road
Weatherly Way
Parkhurst Avenue
Kumano Parade
Daintree Street
Pembina Parade
Friston Street
Leighton Way

106 51 20 18 19 13 14 9008 9040 8013 8014 8015

Road upgrade footprint (JDSi 2024)
Survey area
Cadastral boundary

WA native & local native species
- *Allocasuarina* sp. *(2)*
- *Eucalyptus rudis (46)*
- *Melaleuca* sp. *(15)*

WA native species
- *Eucalyptus camaldulensis (187)*
- *Eucalyptus gomphocephala (6)*
- *Eucalyptus victrix (2)*

Australian native species
- *Brachychiton populneus (1)*
- *Corymbia maculata (2)*
- *Eucalyptus botryoides (4)*
- *Eucalyptus globulus (2)*
- *Eucalyptus grandis (1)*
- *Xylomelum pyriforme (1)*

Non-Australian exotic species
- *Citharexylum spinosum (1)*
- *Jacaranda mimosifolia (2)*
- *Platanus acerifolia (14)*
- *Quercus robur (1)*
- *Syagrus romanzoffiana (9)*
- *Unknown* sp. *(1)*

Figure 5: Tree Species

Project: Ecological Assessment
Forrest Road, Haynes
Client: Stockland

Plan Number:
EP23-030(03)--F23
Drawn: AS
Date: 14/05/2024
Checked: SKP
Approved: ADB
Date: 25/06/2024

N

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Metres
Scale: 1:3,250@A3
GDA2020 MGA Zone 50

emerge ASSOCIATES

403000 403200 403400 403600 403800 404000

6441400 6441200 6441000 6440800

Wollaston Avenue
Forrest Road
Eleventh Road
Dalby Street
Heartwood Way
Gisburn Street
Bedgebury Road
Weatherly Way
Parkhurst Avenue
Kumano Parade
Daintree Street
Pembina Parade
Friston Street
Hamsterley Way
Ashdown Way
Mercia Road
Holt Lane
Brighstone Avenue
Charnwood G
Burnham Road
Leigh
Arde

106 51 20 18 19 8015 8013 8014 9008 13 14 9040

Road upgrade footprint (JDSi 2024)
Survey area
Cadastral boundary
Retention priority (Arborite 2024)
High (13)
Medium (215)
Low (69)

Figure 6: Tree Retention Priority

Project: Ecological Assessment
Forrest Road, Haynes
Client: Stockland

Plan Number:
EP23-030(03)--F24
Drawn: AS
Date: 14/05/2024
Checked: SKP
Approved: ADB
Date: 25/06/2024

N

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Metres
Scale: 1:1,500@A3
GDA2020 MGA Zone 50

emerge ASSOCIATES

403000 403200 403400 403600 403800 404000

6441400 6441200 6441000 6440800

Wollaston Avenue
Forrest Road
Eleventh Road
Dalby Street
Heartwood Way
Gisburn Street
Bedgebury Road
Belvoir Road
Kinver Way
Gosford Street
Weatherly Way
Kumano Parade
Daintree Street
Holt Lane
Hamsterley Way
Charnwood Grove
106
13
9008
9040

Road widening and upgrade footprint (JDSi 2024)
Survey area
Cadastral boundary

Tree status
- Remnant or naturally regrown tree (15)
- Planted tree (270)
- Unclear – either naturally regrown or planted tree (12)

EP Act native vegetation
- Yes (15)
- Yes, assuming that tree established from natural regrowth (12)

Figure 7: Remnant vs Planted Trees

Project: Ecological Assessment
Forrest Road, Haynes
Client: Stockland

Plan Number:
EP23-030(03)--F25
Drawn: AS
Date: 14/05/2024
Checked: SKP
Approved: ADB
Date: 25/06/2024

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Metres
Scale: 1:3,250@A3
GDA2020 MGA Zone 50

emerge ASSOCIATES

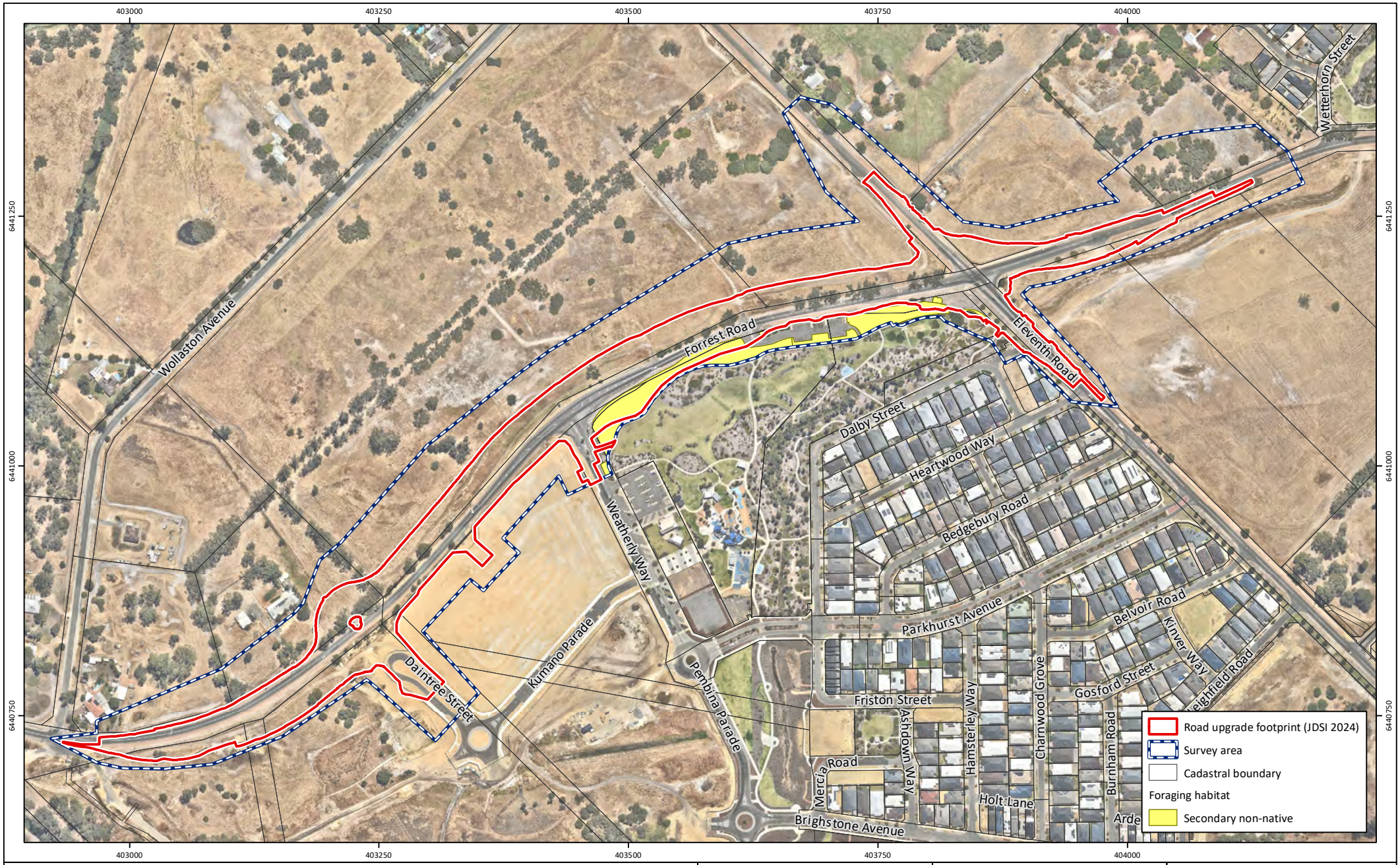

Figure 8: Carnaby's Black Cockatoo Foraging Habitat

Project:	Ecological Assessment Forrest Road, Haynes
Client:	Stockland

Plan Number:
EP23-030(03)--F27

Drawn:	AS
Date:	14/05/2024
Checked:	SKP
Approved:	ADB
Date:	25/06/2024

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Metres

Scale: 1:5,000@A4

GDA2020 MGA Zone 50

emerge ASSOCIATES

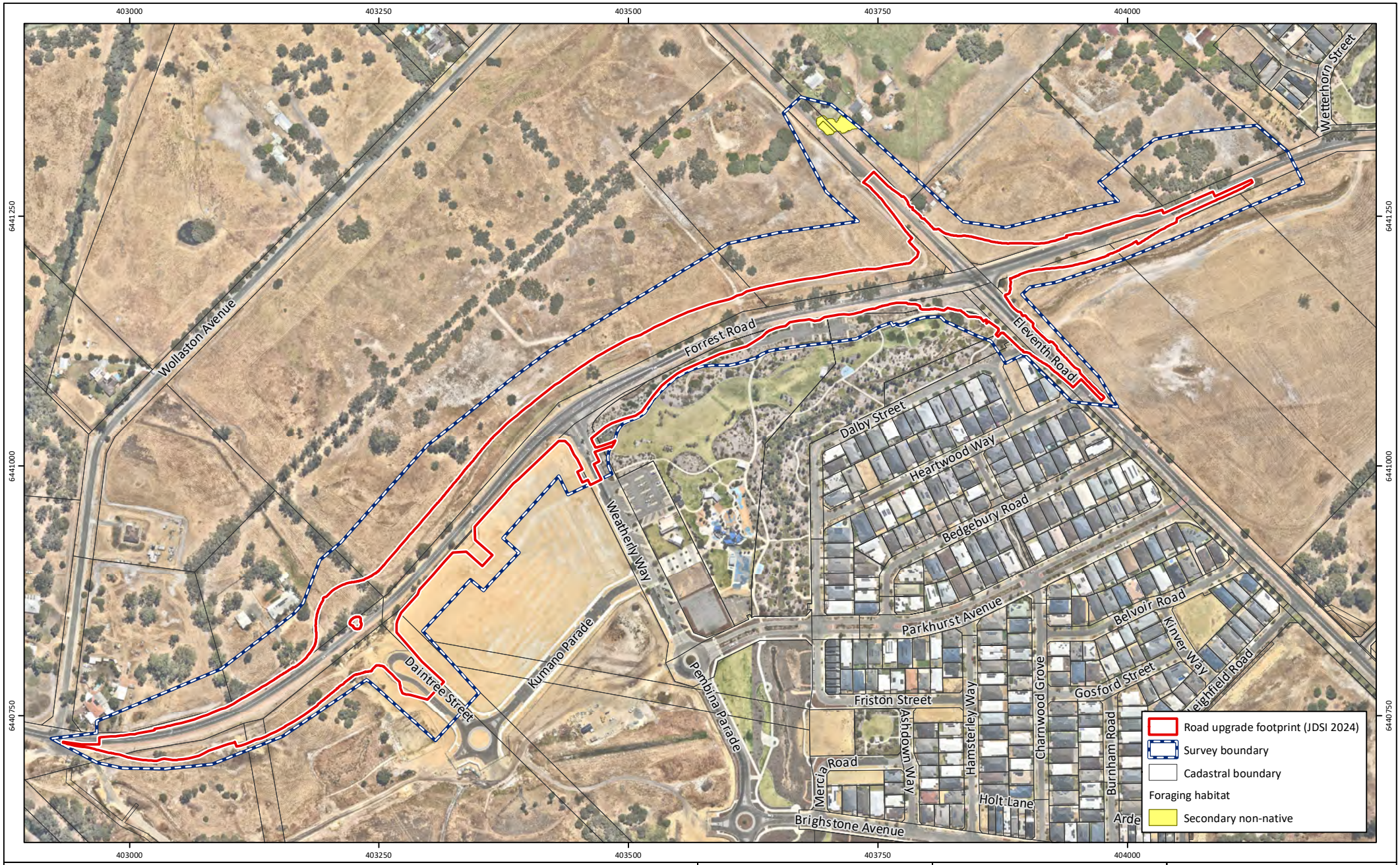

Figure 9: **Baudin's Black Cockatoo Foraging Habitat**

Project:	Ecological Assessment Forrest Road, Haynes
Client:	Stockland

Plan Number:
EP23-030(03)--F28

Drawn:	AS
Date:	14/05/2024
Checked:	SKP
Approved:	ADB
Date:	25/06/2024

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Metres

Scale: 1:5,000@A4

GDA2020 MGA Zone 50

emerge ASSOCIATES

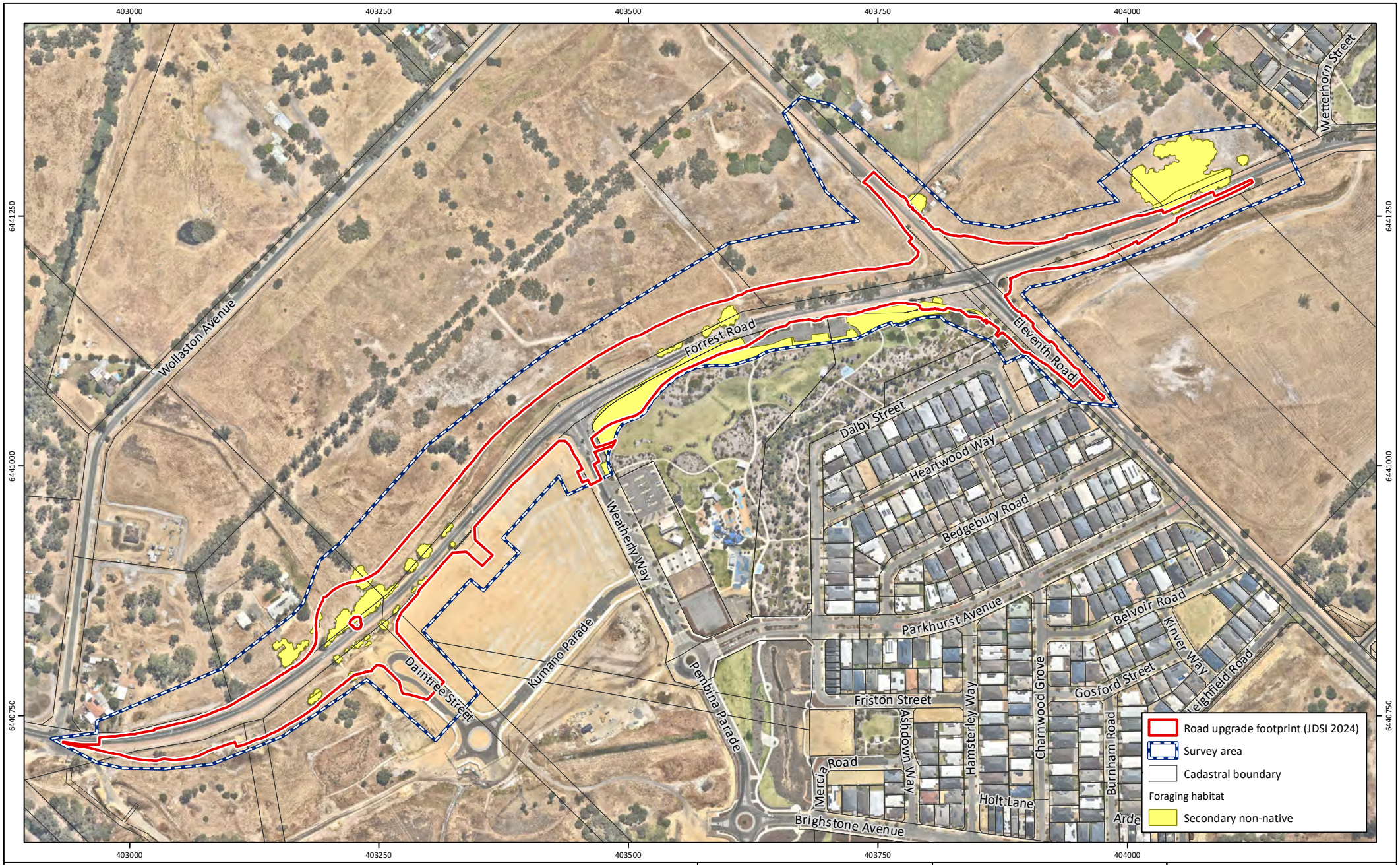

Figure 10: Forest Red-tailed Black Cockatoo Foraging Habitat

Project:	Ecological Assessment Forrest Road, Haynes
Client:	Stockland

Plan Number:
EP23-030(03)--F29

Drawn:	AS
Date:	14/05/2024
Checked:	SKP
Approved:	ADB
Date:	25/06/2024

N

0 50 100 150
Metres

Scale: 1:5,000@A4

GDA2020 MGA Zone 50

emerge ASSOCIATES

Appendix A

Tree Survey Report (Arborite 2024)

Prepared for: Stockland

Prepared by: ARBORITE TREE MANAGEMENT SOLUTIONS

12 December, 2023

Tree Survey Report

Forrest Road
Hilbert WA 6112

Consulting Arborist
David Cuddihy
Graduate Certificate Arboriculture (AQF 8)
www.arboritetms.com
arboritetms@gmail.com
#0456 152 142

Contents

"People who will not sustain trees will soon live in a world that will not sustain people."

– Bryce Nelson

1. Client

Stockland Development Pty Ltd.
C/- Andreas Biddiscombe - Senior Environmental Consultant
Suite 4, 26 Railway Road, Subiaco WA 6008
emergeassociates.com.au
Andreas.Biddiscombe@emergeassociates.com.au

2. Introduction

The purpose of this report is to provide an independent Arboricultural assessment of a tree set located at Forrest Road, Hilbert WA 6112 (Fig. 2). Arborite Tree Management Solutions has been employed to establish; tree details, health & condition and useful life expectancy (ULE) to assist with tree retention priorities. Additionally, habitat observations and recommendations shall be addressed, in particular with the 'Carnaby Cockatoo'. A risk assessment will be conducted on the subject trees and recommendations to mitigate associated risks will be provided where necessary.

3. Key objectives

- Perform visual tree inspection (VTA) on the subject trees to determine health and structure
- Identify scientific and common names
- Conduct a risk assessment (QTRA) of the subject trees and provide recommendations to maintain/improve the health and structure of the tree to maximise amenity value
- Determine the subject trees height, width, trunk diameter, tree protection zone (TPZ) and structural root zone (SRZ)
- Establish tree retention values

4. Methodology

- The site was assessed from observations made from ground level on the 4th and 5th December 2023, and 9th February 2024
- Field notes were taken and the information documented was an accurate account of the subject trees on the above specified date
- A tape measure was used to determine relevant trees diameter at breast height (DBH)
- Trees with a DBH of less than 100mm have not been surveyed
- The height and spread of the trees were estimated
- A walk by assessment (ISA Level 2 risk assessment) was performed on all trees on site and QTRA risk assessment model was applied to determine levels of risk.
- A Samsung tablet and Geographic Information System (GIS) have been used to capture the tree and its location imposed on Nearmap imagery
- Some information contained in this report is derived from information supplied by the client
- All trees on site have been assessed for risk and trees that require attention have been recorded with unique tag numbers (Fig. 1). Where possible, tags will be affixed on the southern side of the tree at eye level.

- Trees on private land have not been tagged and photos have been taken outside the boundary of private property

Fig. 1 - An example of a unique tag attached to the tree

5. Limitations

Information contained in this report pertains only to the trees examined on the above specified dates of inspection. The tree assessment was performed by a suitably qualified arborist (AQF 8) using a recognised model (VTA) that aligns with the International Society of Arboriculture (ISA). The assessment was limited to a ground based VTA that did not extend to aerial inspections, nor below ground evaluations. The documented, observations, results, recommendations and conclusions given may vary after the site visit due to environmental conditions or variances in site conditions. There is no warranty or guarantee, expressed or implied, that problems or deficiencies of the subject tree may not arise in the future.

6. Site details

6.1 Site Map

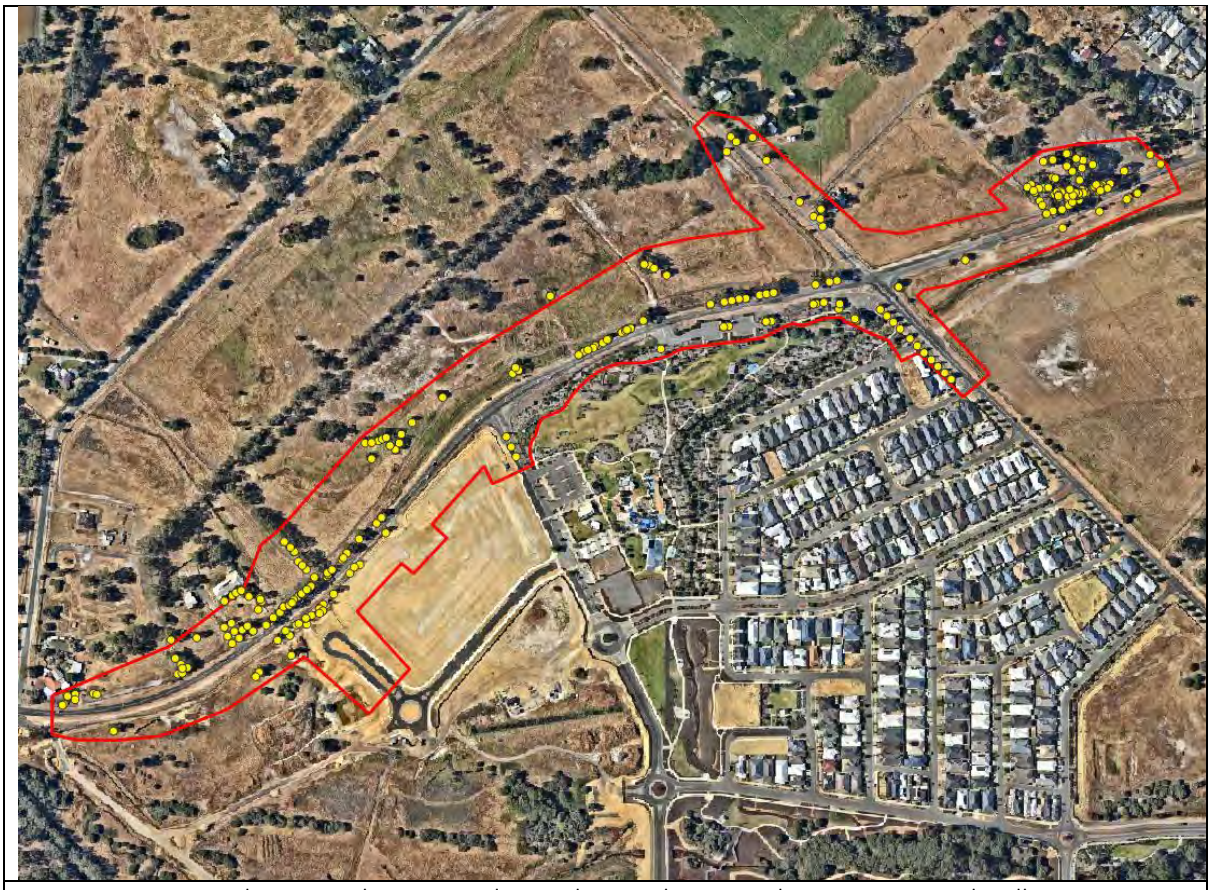

Fig. 2 - Site map indicating subject trees located on and surrounding Forrest Road, Hilbert (Nearmap, 6 December 2023)

7. Tree details

7.1 Tree survey

322 trees were surveyed, with the species percentages listed in the table below.

Species	Common name	Total	%
Eucalyptus camaldulensis	River Red Gum	195	60.56%
Eucalyptus rudis	Flooded Gum	63	19.57%
Platanus acerifolia *	London Plane *	14	4.35%
Syagrus romanzoffiana *	Cocos Palm *	12	3.73%
Melaleuca sp.	Paperbark	10	3.11%
Eucalyptus gomphocephala	Tuart	6	1.86%
Eucalyptus botryoides	Southern Mahogany	4	1.24%
Corymbia maculata	Spotted Gum	2	0.62%
Eucalyptus globulus	Blue Gum	2	0.62%
Eucalyptus victrix	Little Ghost Gum	2	0.62%
Allocasuarina sp.	She Oak	2	0.62%
Jacaranda mimosifolia *	Jacaranda *	2	0.62%

Species	Common name	Total	%
Xylomelum pyriforme	Woody Pear	1	0.31%
Callistemon sp.	Bottlebrush	1	0.31%
Brachychiton populneus	Kurrajong	1	0.31%
Quercus robur *	English Oak *	1	0.31%
Eucalyptus platypus	Moort	1	0.31%
Eucalyptus grandis	Rose Gum	1	0.31%
Citharexylum spinosum *	Fiddlewood *	1	0.31%
Unknown sp.		1	0.31%

Table 1: Indicating distribution species. * de-notes non-Australian species

A complete tree survey can be found in the Appendix (Appendices 13.1) section of this report

7.2 Surveyed trees

The trees surveyed for the purpose of this report have been derived from a feature survey conducted by MNG land survey. The attributes have been modified to represent the current tree information including health, structure, ULE and retention value.

Some trees have been deleted from the original survey mostly due to the trees being limbs of a multi-stemmed tree and were considered superfluous.

Additional trees have been added to the original survey to include a tree set located in the North eastern corner of the site boundary.

7.3 Vegetation overview

A large portion of the trees are *Eucalyptus camaldulensis* and *Eucalyptus rudis* with scattered *E. gomphocephala* and *Melaleuca sp*. There are nearby water sources which is a natural habitat for *E. rudis* and *Melaleuca* and the larger species may be remnant however, it is more than likely that the trees have been planted along road ways. The *E. camaldulensis* are not endemic to this area and have either been planted, self-seeded or seeded from other areas nearby.

7.4 Trees not surveyed

Trees not surveyed are those that are or may include trees;

1. Not within the scope of this report
2. With a DBH of less than 100mm

8. Tree retention value

8.1 Retention value

There is always a compromise between retaining trees on a development site and the economic imperatives of land development. Retaining trees on development sites is a fine balance between sustaining amenity and the economic development of the land. Establishing priorities for the retention of trees is an important part of the planning process if amenity is to be sustained in the long term. If the trees are found to have high significance plans may be altered or construction methods changed to accommodate tree retention.

8.2 Methodology

The retention value of a tree can be somewhat subjective and there are various models or methodologies that assess their worth which in turn can be modified by the key stakeholders values and objectives.

For the purpose of this report, Arborite has used the Helliwell valuation model (Appendices 11.5 Helliwell System) to assign retention values whereby; trees > $9,000 have been award 'high' retention, $1,000 to $9,000 have been awarded 'medium' retention and trees <$ 1,000 have been award 'low' retention'

8.3 High retention value trees

13 trees have been classified as having high retention values (Fig. 3). Typically trees in this category are of high quality with an estimated remaining life expectancy of at least 25 years, have high amenity value and may make significant environmental contributions.

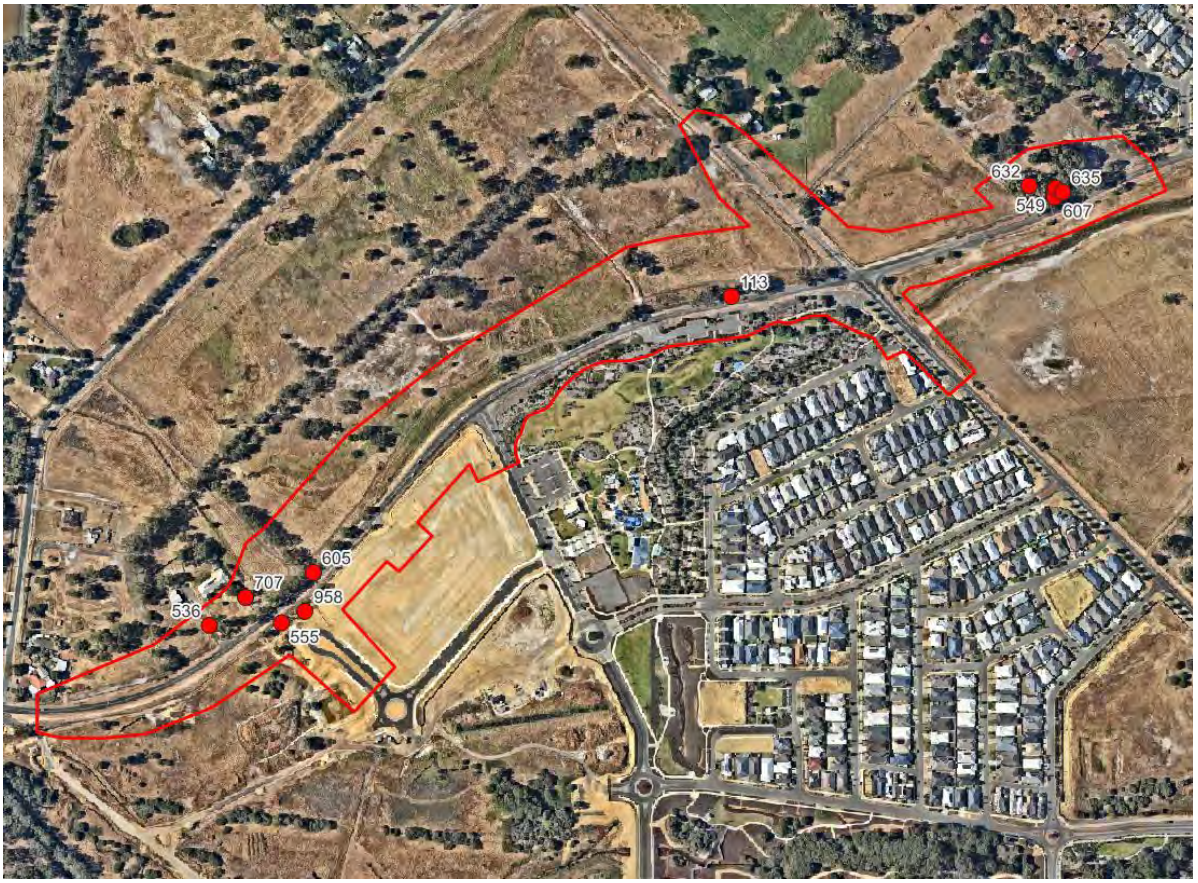

Fig. 3 - Indicating high retention value trees

Tree ID	Species	Height	Canopy	Diameter	Age class	ULE	Retention Value	Helliwell value
113	*Eucalyptus rudis*	13700	13700	730	Mature	40 - 100	High	$11,623.92
535	*Eucalyptus camaldulensis*	19500	12000	450	Mature	40 - 100	High	$13,284.48
536	*Corymbia maculata*	14700	7900	380	Semi-mature	40 - 100	High	$9,963.36
549	*Eucalyptus camaldulensis*	19400	19200	590	Mature	40 - 100	High	$13,284.48
555	*Eucalyptus camaldulensis*	19000	14500	620	Mature	40 - 100	High	$13,284.48

Tree ID	Species	Height	Canopy	Diameter	Age class	ULE	Retention Value	Helliwell value
561	*Eucalyptus camaldulensis*	17000	15400	700	Mature	40 - 100	High	$9,963.36
605	*Eucalyptus rudis*	14000	17400	570	Mature	40 - 100	High	$9,963.36
607	*Eucalyptus rudis*	18300	20000	650	Mature	40 - 100	High	$9,963.36
612	*Eucalyptus rudis*	17800	15000	640	Mature	40 - 100	High	$14,945.04
632	*Eucalyptus camaldulensis*	17900	10900	380	Semi-mature	40 - 100	High	$11,623.92
635	*Eucalyptus camaldulensis*	25800	24700	1140	Mature	40 - 100	High	$14,945.04
707	*Eucalyptus globulus*	17900	14900	1110	Mature	5 - 40	High	$9,963.36
958	*Eucalyptus botryoides*	20000	18000	1500	Mature	40 - 100	High	$19,926.72

Table 2: High retention value trees

8.4 Medium retention value trees

233 trees were categorized as having a medium retention value (Fig. 4). Typically trees in this category were of average quality with an estimated remaining life expectancy of 15–25 years. They have moderate amenity value and make low/moderate environmental contributions. Trees with this retention value warrant minor design consideration in an attempt to allow for their retention or a suitable replanting scheme.

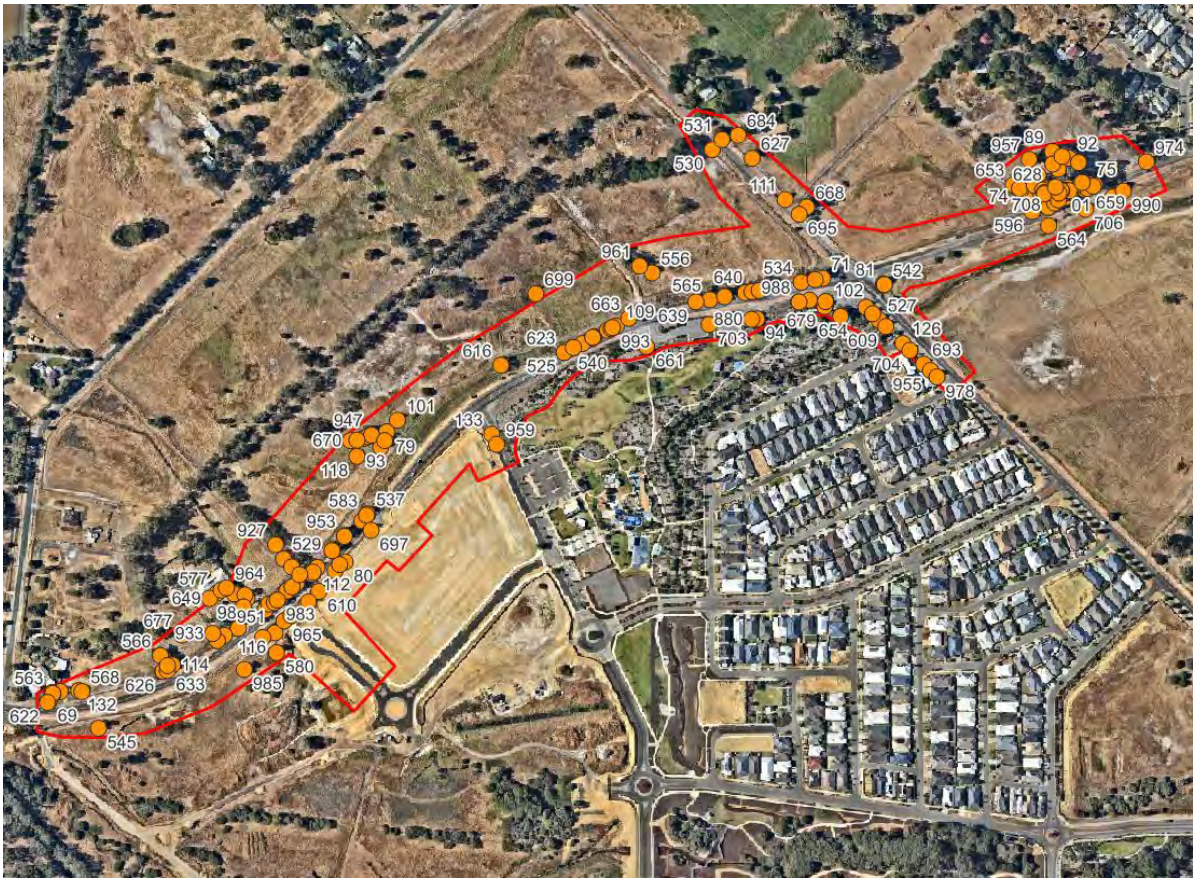

Fig. 4 - Indicating medium retention value trees

8.5 Low retention value trees

76 trees were categorized as having a low retention value (Fig. 5). Trees in this category were typically of low health and condition with an estimated remaining life expectancy of 5–15 years or; young trees

that are easily replaceable, trees of poor health and structure or undesirable species. Low retention value trees do not warrant design consideration.

Fig. 5 - Indicating low retention value trees

8.6 Small trees

With present day abilities to easily move small trees or replace them with virtually identical semi-matures, it is inappropriate that they should dictate the long-term layout of a new construction site. For the purpose of this report, trees/shrubs with a DBH of <100mm have not been regarded.

9. Tree Protection Zone (TPZ)

9.1 Tree protection Zone (TPZ):

9.1.1 TPZ

Tree protection zones (TPZ) are the principal means of protecting trees on development sites and are defined by AS 4970-2009 Protection of Trees on Development Sites (Standards Australia 2009). The TPZ is a combination of the root area and crown area requiring protection. It is an area that is required to be isolated from construction disturbance to ensure continued viability of the tree.

The TPZ for an individual tree is determined as follows (Standards Australia 2009):

TPZ = DBH × 12

That is, the radius of the TPZ = 12 X the DBH measured at 1.4 metres (m).

A TPZ should not be less than 2 m nor greater than 15 m except where crown protection is required.

The TPZ incorporates the structural root zone (SRZ).

9.1.2 SRZ

The structural root zone (SRZ) is the minimum volume of roots required by the tree to remain stable in the ground (Standards Australia 2009). If the SRZ is breached the chances of windthrow are significantly increased, especially if roots are cut on the same side as prevailing winds. Windthrow is an event where the entire tree fails/falls over. Often, the tree is completely uprooted with devastating results.

It is important to note that the SRZ is not related to tree health. It refers to the physical volume of roots required for the tree to remain stable in the ground. It is in no way related to the physiological requirements of the tree but is the minimum volume of roots required for the tree to remain standing.

9.2 Tree survey TPZ

The full list of the surveyed trees TPZ's can be found in the appendix section (Appendices 11.2) of this report

9.3 Calculating incursions

Using the TPZ summary table (Appendix 11.2), the relative TPZ values can be added to the feature survey and overlaid with concept/development plans to gain a more accurate TPZ incursion figure (Fig. 6). As a general rule;

1. Trees with a TPZ incursion of <10% can be retained and will not require additional arboricultural input
2. Trees with a TPZ incursion of 10-25% can typically be retained with minimal intervention
3. Trees with a TPZ incursion of 25-50% may have retention viability with additional arboricultural input (i.e., design review & root mapping)
4. Trees with a TPZ incursion of >50% or with an SRZ breach will typically require removal. For trees in this category that have HIGH retention values, an additional viability assessment is recommended.

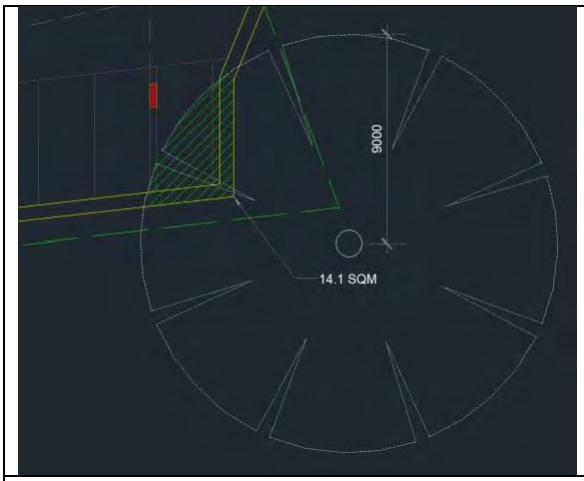

Fig. 6 - An example of TPZ incursion using CAD

10. Disclaimer

The conclusions and recommendations contained in this report refer to the trees' condition on the day of inspection only. The report should be read and considered in its entirety. All care has been taken using the most up to date arboricultural information in the preparation of this report. The report is based on visual inspection only. No guarantee can be given nor can it be predicted that branch failure or uprooting (windthrow) would not occur as a result of high winds and /or excessive rainfall and other unpredictable events. Tree health and environmental conditions can change at any time due to unforeseen circumstances.

11. Appendices

11. Tree survey

Tree / Tag ID	Species	Height	Canopy	Diameter	Age class	ULE	Health	Structure	Retention Value	Easting	Northing	Comment
01	*Melaleuca sp.*	6500	4000	450	Mature	5 - 40	6	5	Medium			
69	*Eucalyptus camaldulensis*	9500	4500	310	Mature	40 - 100	8	5	Medium	403032.650813	6440706.909157	Multi-stemmed habit
71	*Eucalyptus camaldulensis*	13200	9200	270	Semi-mature	40 - 100	8	5	Medium	403185.076752	6440765.068531	Multi-stemmed habit
72	*Eucalyptus camaldulensis*	10000	4500	450	Semi-mature	5 - 40	6	5	Medium	403188.76456	6440769.919996	Multi-stemmed habit
74	*Eucalyptus camaldulensis*	13700	8600	330	Semi-mature	40 - 100	8	6	Medium	403223.246796	6440787.920188	Co-dominant stem
75	*Eucalyptus camaldulensis*	12800	8000	400	Semi-mature	40 - 100	8	6	Medium	403208.545394	6440804.169824	Multi-stemmed habit
77	*Eucalyptus camaldulensis*	5800	2100	100	Juvenile	5 - 40	8	5	Low	403217.078176	6440814.379366	
79	*Eucalyptus camaldulensis*	14000	5300	270	Juvenile	5 - 40	6	8	Medium	403228.504721	6440820.550647	
80	*Eucalyptus camaldulensis*	7800	5000	200	Juvenile	5 - 40	7	6	Medium	403231.355228	6440821.900693	
81	*Eucalyptus camaldulensis*	7500	3000	130	Juvenile	5 - 40	7	8	Medium	403239.941706	6440821.226284	
82	*Eucalyptus camaldulensis*	6200	2200	100	Juvenile	5 - 40	7	6	Low	403238.447356	6440827.471437	
83	*Eucalyptus camaldulensis*	8200	4000	130	Juvenile	5 - 40	8	7	Medium	403238.864748	6440827.699976	
85	*Eucalyptus camaldulensis*	4400	2200	100	Juvenile	5 - 40	7	7	Low	403245.088031	6440830.728739	
86	*Eucalyptus camaldulensis*	5000	2500	170	Juvenile	5 - 40	7	5	Low	403253.535756	6440832.94415	
87	*Eucalyptus camaldulensis*	7000	2000	100	Juvenile	5 - 40	6	7	Low	403256.039259	6440834.756276	
88	*Allocasuarina sp.*	4300	2300	130	Juvenile	5 - 40	7	6	Low	403257.068556	6440835.617402	

Tree / Tag ID	Species	Height	Canopy	Diameter	Age class	ULE	Health	Structure	Retention Value	Easting	Northing	Comment
89	*Allocasuarina sp.*	16200	5900	100	Juvenile	5 - 40	7	8	Medium	403253.560877	6440837.933299	
90	*Eucalyptus camaldulensis*	11300	8900	220	Semi-mature	40 - 100	8	7	Medium	403255.581779	6440839.719122	
91	*Eucalyptus camaldulensis*	6700	1900	140	Semi-mature	40 - 100	8	5	Medium	403257.493098	6440842.378543	Co-dominant
92	*Eucalyptus camaldulensis*	12500	8900	310	Semi-mature	40 - 100	8	5	Medium	403268.63041	6440853.486526	Co-dominant stem, wounding
93	*Eucalyptus camaldulensis*	7300	4100	100	Juvenile	40 - 100	8	7	Medium	403286.055915	6440875.813132	
94	*Eucalyptus camaldulensis*	5000	3900	100	Juvenile	40 - 100	8	7	Medium	403290.874858	6440882.356653	Co-dominant stem
95	*Eucalyptus camaldulensis*	6700	4000	100	Juvenile	40 - 100	8	7	Medium	403296.789952	6440885.045101	
96	*Eucalyptus camaldulensis*	10500	5000	180	Semi-mature	40 - 100	8	5	Medium	403324.552254	6440918.997761	Co-dominant stem
97	*Platanus acerifolia*	6500	2700	100	Juvenile	40 - 100	8	7	Medium	403453.842312	6441021.895416	
98	*Platanus acerifolia*	6300	2700	100	Juvenile	40 - 100	8	6	Medium	403459.121504	6441011.130915	
99	*Platanus acerifolia*	6000	2000	100	Juvenile	40 - 100	8	7	Medium	403464.303949	6441000.527313	
100	*Eucalyptus gomphocephala*	3800	3200	150	Juvenile	40 - 100	8	6	Medium	403619.622333	6441115.94931	
101	*Eucalyptus victrix*	4700	3500	150	Juvenile	40 - 100	8	7	Medium	403686.806923	6441139.513833	Co-dominant stem
102	*Eucalyptus victrix*	5400	3900	130	Juvenile	40 - 100	8	7	Medium	403692.342904	6441140.219555	Co-dominant stem
103	*Eucalyptus gomphocephala*	5100	6300	170	Juvenile	40 - 100	8	5	Medium	403732.318212	6441145.094081	Multi-stemmed
104	*Eucalyptus gomphocephala*	5000	5300	180	Juvenile	40 - 100	8	5	Medium	403737.961454	6441145.501051	Multi-stemmed
105	*Eucalyptus rudis*	5500	6000	100	Juvenile	5 - 40	7	5	Medium	403782.464132	6441163.705335	Suppressed growth
106	*Eucalyptus rudis*	5200	5600	140	Juvenile	40 - 100	7	6	Medium	403783.099163	6441163.689322	Multi-stemmed
107	*Eucalyptus rudis*	4300	3700	100	Juvenile	40 - 100	7	6	Low	403786.067313	6441164.341816	Multi-stemmed
108	*Eucalyptus rudis*	5400	5000	140	Juvenile	40 - 100	7	7	Medium	403794.262164	6441165.731623	

Tree / Tag ID	Species	Height	Canopy	Diameter	Age class	ULE	Health	Structure	Retention Value	Easting	Northing	Comment
109	*Eucalyptus gomphocephala*	7600	8000	280	Juvenile	40 - 100	8	7	Medium	403810.485259	6441158.749626	
110	*Eucalyptus gomphocephala*	4000	3300	180	Juvenile	40 - 100	8	7	Low	403811.541989	6441160.661813	Co-dominant stem
111	*Eucalyptus gomphocephala*	5500	6600	250	Juvenile	40 - 100	8	6	Medium	403811.362668	6441164.150047	Multi-stemmed
112	*Eucalyptus rudis*	13000	10800	420	Mature	40 - 100	8	8	Medium	403827.611543	6441148.185378	Minor suppression
113	*Eucalyptus rudis*	13700	13700	730	Mature	40 - 100	8	8	High	403828.827272	6441146.6391	
114	*Platanus acerifolia*	8600	2300	140	Semi-mature	40 - 100	8	8	Medium	403854.846192	6441158.019656	
115	*Platanus acerifolia*	8500	3700	150	Semi-mature	40 - 100	8	8	Medium	403861.905927	6441151.077876	
116	*Platanus acerifolia*	8000	5000	200	Semi-mature	40 - 100	8	8	Medium	403868.866202	6441144.361952	
117	*Platanus acerifolia*	6700	4300	200	Semi-mature	40 - 100	8	8	Medium	403886.670423	6441126.878737	
118	*Platanus acerifolia*	5100	2300	160	Juvenile	40 - 100	6	7	Medium	403894.36403	6441119.208096	
119	*Platanus acerifolia*	6300	2700	100	Juvenile	40 - 100	8	8	Medium	403901.755049	6441111.779072	
120	*Platanus acerifolia*	5700	1900	130	Juvenile	40 - 100	7	8	Medium	403909.539821	6441104.273397	
121	*Platanus acerifolia*	6300	2900	100	Juvenile	40 - 100	8	8	Medium	403916.56199	6441097.020277	
122	*Platanus acerifolia*	5900	2300	100	Juvenile	40 - 100	8	8	Medium	403923.920829	6441090.244751	
123	*Platanus acerifolia*	8200	4100	190	Semi-mature	40 - 100	8	8	Medium	403930.845502	6441083.402466	
124	*Eucalyptus rudis*	9700	8700	100	Semi-mature	40 - 100	8	5	Medium	403873.534902	6441182.846534	Congested plantings
125	*Eucalyptus rudis*	8000	3800	130	Juvenile	5 - 40	7	6	Medium	403874.488837	6441182.287153	Congested plantings, suppression
126	*Eucalyptus rudis*	7600	3700	150	Semi-mature	5 - 40	7	7	Medium	403874.260326	6441181.792752	Congested plantings, suppression
127	*Melaleuca sp.*	6000	5700	500	Mature	40 - 100	8	6	Medium	403945.995669	6441211.010006	

Tree / Tag ID	Species	Height	Canopy	Diameter	Age class	ULE	Health	Structure	Retention Value	Easting	Northing	Comment
128	*Melaleuca sp.*	4600	6300	340	Semi-mature	40 - 100	7	6	Medium	404050.423189	6441245.351607	
129	*Melaleuca sp.*	4800	5300	190	Semi-mature	5 - 40	6	7	Medium	404089.944928	6441263.01421	
130	*Melaleuca sp.*	5000	5400	190	Semi-mature	5 - 40	6	8	Medium	404119.173361	6441276.007677	
131	*Melaleuca sp.*	5600	6400	300	Semi-mature	5 - 40	6	7	Medium	404120.961485	6441277.686958	
132	*Melaleuca sp.*	6000	8600	240	Semi-mature	5 - 40	6	6	Medium	404129.875687	6441282.120977	
133	*Melaleuca sp.*	6200	8700	.7	Mature	5 - 40	6	7	Medium	404130.569388	6441282.49752	
518	*Syagrus romanzoffiana*	2800	1700	200	Juvenile	5 - 40	8	8	Low	402977.947667	6440734.591254	Not tagged, private property
519	*Syagrus romanzoffiana*	8000	4600	300	Mature	5 - 40	8	8	Medium	402979.606612	6440735.74424	Not tagged, private property
520	*Syagrus romanzoffiana*	6400	2400	220	Semi-mature	5 - 40	8	8	Low	402982.925043	6440745.183613	Not tagged, private property
521	*Syagrus romanzoffiana*	8800	4300	260	Semi-mature	5 - 40	8	8	Medium	402983.477222	6440744.246897	Not tagged, private property
522	*Syagrus romanzoffiana*	6500	3100	180	Semi-mature	5 - 40	7	7	Low	402983.702796	6440743.644514	Not tagged, private property
523	*Syagrus romanzoffiana*	8400	3300	320	Mature	5 - 40	8	8	Medium	402991.410184	6440740.541984	Not tagged, private property
524	*Syagrus romanzoffiana*	8000	5400	290	Semi-mature	5 - 40	8	8	Medium	402991.609107	6440746.272881	Not tagged, private property
525	*Syagrus romanzoffiana*	7600	3500	240	Semi-mature	5 - 40	8	8	Medium	403011.353245	6440747.128848	Not tagged, private property
526	*Syagrus romanzoffiana*	6200	2600	320	Semi-mature	5 - 40	6	8	Medium	403014.823095	6440746.16223	Not tagged, private property
527	*Eucalyptus rudis*	11200	12500	320	Semi-mature	5 - 40	6	6	Medium	403101.619893	6440767.858988	Not tagged, private property
528	*Eucalyptus rudis*	10700	7000	320	Semi-mature	5 - 40	7	8	Medium	403106.354916	6440768.850843	Not tagged, private property
529	*Eucalyptus rudis*	13200	10000	480	Semi-mature	40 - 100	8	7	Medium	403106.41476	6440774.04633	Not tagged, private property
530	*Eucalyptus rudis*	13500	10000	450	Semi-mature	5 - 40	7	6	Medium	403105.16324	6440778.210625	Not tagged, private property

Tree / Tag ID	Species	Height	Canopy	Diameter	Age class	ULE	Health	Structure	Retention Value	Easting	Northing	Comment
531	*Eucalyptus rudis*	11300	12000	450	Semi-mature	5 - 40	7	6	Medium	403111.883948	6440774.735328	Not tagged, private property
532	*Eucalyptus camaldulensis*	11600	6000	360	Semi-mature	40 - 100	7	8	Medium	403159.860503	6440800.704143	Not tagged, private property
533	*Eucalyptus camaldulensis*	11400	10700	280	Semi-mature	5 - 40	7	7	Medium	403154.919677	6440808.427058	Not tagged, private property
534	*Eucalyptus camaldulensis*	12000	11800	410	Semi-mature	40 - 100	8	7	Medium	403167.39016	6440806.399673	Not tagged, private property
535	*Eucalyptus camaldulensis*	19500	12000	450	Mature	40 - 100	8	8	High	403162.213827	6440813.628109	Not tagged, private property
536	*Corymbia maculata*	14700	7900	380	Semi-mature	40 - 100	8	7	High	403170.713265	6440815.323207	Not tagged, private property
537	*Corymbia maculata*	14500	8000	450	Semi-mature	5 - 40	7	6	Medium	403176.275132	6440819.403459	Not tagged, private property
538	*Unknown sp.*	6000	4000	250	Semi-mature	<2	0	7	Low	403182.324184	6440813.910229	Not tagged, private property
539	*Eucalyptus camaldulensis*	17500	9300	570	Mature	40 - 100	8	7	Medium	403196.385836	6440820.290446	
540	*Eucalyptus camaldulensis*	13000	6500	220	Semi-mature	5 - 40	7	3	Medium	403187.994201	6440836.886404	Not tagged, private property
541	*Eucalyptus camaldulensis*	13800	2500	220	Juvenile	40 - 100	8	8	Medium	403191.550194	6440845.45158	Not tagged, private property
542	*Eucalyptus camaldulensis*	12000	3500	240	Juvenile	40 - 100	8	8	Medium	403189.801886	6440845.788275	Not tagged, private property
543	*Eucalyptus camaldulensis*	13300	6000	320	Juvenile	40 - 100	8	8	Medium	403190.132043	6440847.858439	Not tagged, private property
544	*Eucalyptus camaldulensis*	9000	3600	170	Juvenile	5 - 40	8	7	Medium	403189.481904	6440849.702872	
545	*Eucalyptus camaldulensis*	13700	7000	370	Semi-mature	40 - 100	8	8	Medium	403203.993549	6440828.43428	Not tagged, private property
546	*Eucalyptus camaldulensis*	13300	4500	190	Semi-mature	5 - 40	8	5	Medium	403211.256838	6440833.895932	Not tagged, private property
547	*Eucalyptus camaldulensis*	9500	3600	110	Juvenile	5 - 40	7	7	Medium	403213.259458	6440837.799076	Not tagged, private property
548	*Eucalyptus camaldulensis*	8000	3500	100	Juvenile	5 - 40	6	7	Low	403214.988689	6440840.015595	Not tagged, private property
549	*Eucalyptus camaldulensis*	19400	19200	590	Mature	40 - 100	8	8	High	403214.988689	6440840.015595	Not tagged, private property

Tree / Tag ID	Species	Height	Canopy	Diameter	Age class	ULE	Health	Structure	Retention Value	Easting	Northing	Comment
550	*Eucalyptus camaldulensis*	7800	2700	130	Juvenile	5 - 40	7	7	Medium	403221.013204	6440841.572503	Suppressed
551	*Eucalyptus camaldulensis*	21500	17500	550	Mature	40 - 100	7	7	Medium	403221.466573	6440843.439068	Not tagged, private property
552	*Eucalyptus camaldulensis*	8900	3000	150	Juvenile	5 - 40	8	8	Low	403224.478976	6440843.795119	Suppressed
553	*Eucalyptus camaldulensis*	9500	3200	150	Juvenile	5 - 40	8	8	Medium	403224.137773	6440844.184279	Suppressed
554	*Eucalyptus camaldulensis*	19500	14300	630	Mature	<2	1	5	Low	403225.904644	6440847.341998	Not tagged, private property
555	*Eucalyptus camaldulensis*	19000	14500	620	Mature	40 - 100	8	8	High	403230.639516	6440850.893272	Not tagged, private property
556	*Eucalyptus camaldulensis*	9300	6300	230	Juvenile	5 - 40	7	7	Medium	403234.047986	6440853.508169	Not tagged, private property
557	*Eucalyptus camaldulensis*	6000	2700	100	Juvenile	5 - 40	7	7	Low	403234.318002	6440853.59212	Not tagged, private property
558	*Eucalyptus camaldulensis*	9300	4700	140	Juvenile	5 - 40	7	7	Medium	403234.427203	6440854.026223	Not tagged, private property
559	*Eucalyptus camaldulensis*	8800	5000	120	Juvenile	5 - 40	7	7	Medium	403234.700645	6440854.253179	Not tagged, private property
560	*Eucalyptus camaldulensis*	6700	3000	140	Juvenile	5 - 40	7	7	Low	403237.263041	6440855.982971	Not tagged, private property
561	*Eucalyptus camaldulensis*	17000	15400	700	Mature	40 - 100	8	7	High	403239.987894	6440858.304415	Not tagged, private property
562	*Eucalyptus camaldulensis*	17500	17000	600	Mature	40 - 100	7	7	Medium	403244.51855	6440861.970417	Not tagged, private property
563	*Eucalyptus camaldulensis*	21000	10500	780	Mature	40 - 100	8	7	Medium	403230.876957	6440888.308431	Not tagged, private property
564	*Eucalyptus camaldulensis*	17500	13200	660	Mature	40 - 100	8	7	Medium	403235.090326	6440884.187702	Not tagged, private property
565	*Eucalyptus camaldulensis*	18700	9300	550	Mature	40 - 100	8	7	Medium	403239.482174	6440879.747009	Not tagged, private property
566	*Eucalyptus camaldulensis*	16500	15000	660	Mature	40 - 100	7	7	Medium	403248.053204	6440871.476144	Not tagged, private property
567	*Eucalyptus camaldulensis*	7000	2700	100	Juvenile	5 - 40	8	8	Low	403261.522176	6440872.202117	Self seeded
568	*Eucalyptus camaldulensis*	8600	6000	120	Juvenile	5 - 40	8	8	Medium	403262.495615	6440874.233364	

Tree / Tag ID	Species	Height	Canopy	Diameter	Age class	ULE	Health	Structure	Retention Value	Easting	Northing	Comment
569	*Eucalyptus camaldulensis*	9400	3400	160	Juvenile	5 - 40	8	8	Medium	403262.677748	6440874.490309	
570	*Eucalyptus camaldulensis*	6800	3000	100	Juvenile	5 - 40	8	8	Low	403262.018711	6440876.416626	
571	*Eucalyptus camaldulensis*	6000	2600	100	Juvenile	5 - 40	8	8	Low	403263.117498	6440875.958814	
572	*Eucalyptus camaldulensis*	8100	3600	150	Juvenile	5 - 40	8	8	Low	403266.852334	6440879.170165	
573	*Eucalyptus camaldulensis*	7800	3300	120	Juvenile	5 - 40	7	7	Medium	403266.920923	6440879.569829	
574	*Eucalyptus camaldulensis*	2300	1400	100	Juvenile	5 - 40	6	7	Low	403277.552129	6440890.243342	
575	*Eucalyptus camaldulensis*	1800	1600	100	Juvenile	5 - 40	7	5	Low	403279.149539	6440892.355434	
576	*Eucalyptus camaldulensis*	14600	12200	620	Mature	40 - 100	8	8	Medium	403282.832184	6440897.221837	
577	*Eucalyptus camaldulensis*	14000	14000	320	Mature	5 - 40	8	5	Medium	403296.047353	6440912.482731	
578	*Eucalyptus camaldulensis*	8900	4300	150	Juvenile	5 - 40	7	8	Medium	403314.802425	6440929.275206	
579	*Eucalyptus camaldulensis*	9200	2800	130	Juvenile	5 - 40	7	6	Low	403319.655383	6440935.180245	
580	*Eucalyptus camaldulensis*	9300	6300	220	Juvenile	5 - 40	7	8	Medium	403320.09948	6440935.435072	
581	*Eucalyptus camaldulensis*	9700	6200	200	Semi-mature	5 - 40	8	7	Medium	403320.716731	6440936.581601	
582	*Eucalyptus rudis*	10400	6600	310	Semi-mature	5 - 40	5	5	Medium	403460.673948	6441089.619208	Not tagged, private property
583	*Eucalyptus rudis*	11000	13400	310	Semi-mature	5 - 40	6	6	Medium	403463.71483	6441095.932221	Not tagged, private property.
584	*Eucalyptus rudis*	11400	9000	370	Semi-mature	5 - 40	5	5	Medium	403467.00665	6441092.971094	
585	*Eucalyptus rudis*	4300	2600	100	Juvenile	5 - 40	6	7	Low	403531.43173	6441109.548867	
586	*Eucalyptus rudis*	7200	6600	100	Juvenile	5 - 40	7	7	Medium	403531.916603	6441109.914117	
587	*Eucalyptus camaldulensis*	7000	6400	100	Juvenile	5 - 40	8	7	Medium	403532.918667	6441110.796937	
588	*Eucalyptus rudis*	6600	4400	150	Juvenile	5 - 40	7	6	Low	403534.367174	6441110.993823	

Tree / Tag ID	Species	Height	Canopy	Diameter	Age class	ULE	Health	Structure	Retention Value	Easting	Northing	Comment
589	*Eucalyptus rudis*	5500	3400	150	Juvenile	5 - 40	7	7	Low	403537.143306	6441113.015895	
590	*Eucalyptus rudis*	5900	4100	210	Juvenile	5 - 40	7	7	Low	403541.363849	6441114.879889	
591	*Eucalyptus rudis*	4700	2100	100	Juvenile	5 - 40	6	6	Low	403547.104039	6441116.926553	
593	*Eucalyptus rudis*	7100	5800	150	Juvenile	5 - 40	7	6	Medium	403548.824416	6441119.220953	
594	*Eucalyptus rudis*	6000	4500	100	Juvenile	5 - 40	5	6	Low	403551.220978	6441119.211312	
595	*Eucalyptus rudis*	4800	3600	100	Juvenile	5 - 40	7	6	Low	403557.361757	6441122.469108	
596	*Eucalyptus rudis*	9700	4500	100	Juvenile	5 - 40	8	7	Medium	403560.501651	6441124.778116	
597	*Eucalyptus rudis*	5400	2700	100	Juvenile	5 - 40	7	6	Low	403562.264001	6441125.528327	
598	*Eucalyptus rudis*	9500	4000	100	Juvenile	5 - 40	6	6	Medium	403562.091048	6441125.800363	
599	*Eucalyptus rudis*	9600	5000	100	Juvenile	5 - 40	6	6	Medium	403562.847862	6441125.892666	
600	*Eucalyptus rudis*	7500	4500	100	Juvenile	5 - 40	7	6	Medium	403563.561873	6441126.513377	
601	*Eucalyptus camaldulensis*	7500	9500	400	Semi-mature	40 - 100	8	6	Medium	403577.71748	6441133.440484	
602	*Eucalyptus rudis*	9800	2400	100	Juvenile	5 - 40	7	6	Low	403581.785891	6441135.046863	
603	*Eucalyptus rudis*	4500	2500	100	Juvenile	5 - 40	8	8	Low	403583.213453	6441136.330272	
604	*Eucalyptus rudis*	3700	2500	100	Juvenile	5 - 40	6	6	Low	403587.209064	6441138.010833	
605	*Eucalyptus rudis*	14000	17400	570	Mature	40 - 100	7	7	High	403600.674133	6441146.183062	
606	*Eucalyptus rudis*	15000	15700	400	Mature	5 - 40	5	7	Medium	403672.629214	6441163.785399	
607	*Eucalyptus rudis*	18300	20000	650	Mature	40 - 100	6	7	High	403687.593487	6441166.088446	
608	*Eucalyptus rudis*	16300	13400	420	Mature	5 - 40	4	6	Medium	403695.609424	6441167.656246	Reduced vitality
609	*Eucalyptus rudis*	20000	11500	400	Mature	5 - 40	5	7	Medium	403703.33434	6441169.413802	
610	*Eucalyptus rudis*	14700	17700	420	Mature	5 - 40	6	5	Medium	403725.530929	6441173.629952	
611	*Eucalyptus rudis*	17200	15400	550	Mature	5 - 40	5	7	Medium	403732.736732	6441174.771938	
612	*Eucalyptus rudis*	17800	15000	640	Mature	40 - 100	7	7	High	403740.3662	6441176.026559	
615	*Eucalyptus rudis*	17900	20000	700	Mature	5 - 40	5	6	Medium	403785.355163	6441184.738345	Reduced vitality
616	*Eucalyptus rudis*	20000	13200	780	Mature	5 - 40	5	7	Medium	403800.389799	6441187.643028	Reduced vitality
617	*Eucalyptus rudis*	18000	19800	1100	Mature	5 - 40	6	7	Medium	403808.351259	6441188.98228	
618	*Xylomelum pyriforme*	3900	2400	130	Semi-mature	5 - 40	7	4	Low	403690.130227	6441326.825828	
620	*Citharexylum spinosum*	8100	10600	310	Mature	5 - 40	7	6	Medium	403694.492607	6441342.887153	
621	*Quercus robur*	810	14700	640	Semi-mature	40 - 100	8	8	Medium	403700.438458	6441337.594742	

Tree / Tag ID	Species	Height	Canopy	Diameter	Age class	ULE	Health	Structure	Retention Value	Easting	Northing	Comment
622	*Jacaranda mimosifolia*	12500	13600	450	Mature	5 - 40	7	7	Medium	403717.898925	6441342.283691	
623	*Eucalyptus botryoides*	12300	9000	470	Mature	5 - 40	7	7	Medium	403732.886923	6441317.604125	
624	*Melaleuca sp.*	7300	5700	750	Mature	5 - 40	6	7	Medium	403768.28964	6441273.341519	
625	*Jacaranda mimosifolia*	7700	8200	180	Semi-mature	5 - 40	7	3	Medium	403783.289836	6441257.64605	Previously lopped
626	*Eucalyptus grandis*	23700	16700	1300	Mature	40 - 100	8	6	Medium	403791.224193	6441265.360552	
627	*Brachychiton populneus*	7000	7200	470	Semi-mature	5 - 40	8	6	Medium	403790.571578	6441255.154696	
628	*Melaleuca sp.*	5700	8000	600	Mature	5 - 40	5	6	Medium	403793.032516	6441246.925632	
632	*Eucalyptus camaldulensis*	17900	10900	380	Semi-mature	40 - 100	8	8	High	404025.804623	6441274.375247	Not tagged - Tree on private property
633	*Eucalyptus camaldulensis*	15000	7200	340	Juvenile	40 - 100	8	8	Medium	404028.595325	6441269.616023	Not tagged - Tree on private property
634	*Eucalyptus camaldulensis*	18200	8600	540	Mature	40 - 100	8	7	Medium	404033.031609	6441260.58687	
635	*Eucalyptus camaldulensis*	25800	24700	1140	Mature	40 - 100	8	8	High	404039.976783	6441263.609559	Not tagged - Tree on private property
636	*Eucalyptus camaldulensis*	23000	23900	600	Mature	40 - 100	8	7	Medium	404049.690572	6441265.064052	
637	*Eucalyptus camaldulensis*	21900	10700	450	Mature	40 - 100	8	8	Medium	404041.7371	6441281.366866	Not tagged - Tree on private property
638	*Eucalyptus camaldulensis*	19100	8300	280	Semi-mature	40 - 100	7	7	Medium	404044.173555	6441283.730121	Not tagged - Tree on private property
639	*Eucalyptus camaldulensis*	22500	6700	290	Juvenile	40 - 100	7	7	Medium	404045.999293	6441281.442721	
640	*Eucalyptus camaldulensis*	14000	4200	210	Juvenile	40 - 100	7	7	Medium	404045.997583	6441280.779854	
641	*Eucalyptus camaldulensis*	13500	4500	150	Juvenile	40 - 100	7	7	Medium	404045.877412	6441279.615798	
642	*Eucalyptus camaldulensis*	15500	6600	240	Juvenile	40 - 100	7	7	Medium	404045.893085	6441278.281274	
643	*Eucalyptus camaldulensis*	21400	6200	290	Juvenile	40 - 100	7	7	Medium	404046.511443	6441277.781189	

Tree / Tag ID	Species	Height	Canopy	Diameter	Age class	ULE	Health	Structure	Retention Value	Easting	Northing	Comment
644	*Eucalyptus camaldulensis*	11600	3500	170	Juvenile	40 - 100	7	7	Low	404048.20322	6441278.857548	
645	*Eucalyptus camaldulensis*	10300	5200	200	Juvenile	40 - 100	7	7	Medium	404047.308688	6441282.379907	
646	*Eucalyptus camaldulensis*	24600	7800	360	Juvenile	40 - 100	7	7	Medium	404047.903718	6441283.001309	
647	*Eucalyptus camaldulensis*	20500	9700	410	Juvenile	40 - 100	7	7	Medium	404047.712113	6441285.24269	
648	*Eucalyptus camaldulensis*	23400	5900	320	Juvenile	40 - 100	7	7	Medium	404048.941703	6441283.799542	
649	*Eucalyptus camaldulensis*	18600	3200	270	Juvenile	40 - 100	7	7	Medium	404049.47746	6441282.082825	
650	*Eucalyptus camaldulensis*	8900	2600	230	Juvenile	40 - 100	7	7	Low	404050.932052	6441281.998841	
651	*Eucalyptus camaldulensis*	20800	4000	260	Juvenile	40 - 100	7	7	Medium	404051.263305	6441282.878283	
652	*Eucalyptus camaldulensis*	12800	4200	160	Juvenile	40 - 100	7	7	Medium	404052.739924	6441284.337189	
653	*Eucalyptus camaldulensis*	13800	3800	220	Juvenile	40 - 100	7	7	Medium	404053.400397	6441282.279922	
654	*Eucalyptus camaldulensis*	20900	6200	270	Juvenile	40 - 100	7	7	Medium	404054.63871	6441282.680449	
655	*Eucalyptus camaldulensis*	14000	4500	240	Juvenile	40 - 100	7	7	Medium	404055.913493	6441283.128366	
656	*Eucalyptus camaldulensis*	9800	3300	110	Juvenile	40 - 100	7	7	Low	404054.333033	6441281.384383	
657	*Eucalyptus camaldulensis*	12400	4300	210	Juvenile	40 - 100	7	7	Medium	404054.373563	6441280.335068	
658	*Eucalyptus camaldulensis*	17400	4100	220	Juvenile	40 - 100	7	7	Medium	404055.114119	6441280.269227	
659	*Eucalyptus camaldulensis*	20600	2500	170	Juvenile	40 - 100	7	7	Medium	404056.109885	6441279.542344	
660	*Eucalyptus camaldulensis*	8500	3000	220	Juvenile	40 - 100	7	7	Low	404056.036967	6441279.263605	
661	*Eucalyptus camaldulensis*	15900	5200	220	Juvenile	40 - 100	7	7	Medium	404056.797126	6441276.141677	
662	*Eucalyptus camaldulensis*	23300	12000	820	Mature	40 - 100	7	7	Medium	404056.94933	6441269.663829	

Tree / Tag ID	Species	Height	Canopy	Diameter	Age class	ULE	Health	Structure	Retention Value	Easting	Northing	Comment
663	*Eucalyptus camaldulensis*	19700	12400	450	Mature	5 - 40	5	7	Medium	404058.685105	6441270.284776	
664	*Eucalyptus camaldulensis*	7300	4000	110	Juvenile	5 - 40	5	7	Low	404060.99134	6441272.943532	Not tagged - Tree on private property
665	*Eucalyptus camaldulensis*	20200	5900	270	Juvenile	40 - 100	7	7	Medium	404058.916741	6441279.497222	
666	*Eucalyptus camaldulensis*	19700	3500	250	Juvenile	40 - 100	7	7	Medium	404058.089604	6441280.799828	
667	*Eucalyptus camaldulensis*	20000	5600	250	Juvenile	40 - 100	7	7	Medium	404058.707301	6441280.814618	
668	*Eucalyptus camaldulensis*	10300	5200	220	Juvenile	40 - 100	7	7	Medium	404059.143625	6441280.13957	
669	*Eucalyptus camaldulensis*	18600	5800	370	Juvenile	40 - 100	7	7	Medium	404059.842917	6441280.462187	
670	*Eucalyptus camaldulensis*	17800	4800	210	Juvenile	40 - 100	7	7	Medium	404061.230395	6441279.480669	
671	*Eucalyptus camaldulensis*	17300	4000	160	Juvenile	40 - 100	7	7	Medium	404061.404637	6441280.273405	
672	*Eucalyptus camaldulensis*	7900	3700	200	Juvenile	40 - 100	7	7	Low	404062.11851	6441280.088297	
673	*Eucalyptus camaldulensis*	16200	6000	220	Juvenile	40 - 100	7	7	Medium	404063.250433	6441282.072293	
674	*Eucalyptus camaldulensis*	18700	3500	240	Juvenile	40 - 100	7	7	Medium	404063.729117	6441281.272739	
675	*Eucalyptus camaldulensis*	10900	4000	170	Juvenile	40 - 100	7	7	Low	404064.046888	6441280.741355	
676	*Eucalyptus camaldulensis*	7800	3800	200	Juvenile	40 - 100	7	7	Low	404064.466858	6441281.462809	
677	*Eucalyptus camaldulensis*	17200	6800	210	Juvenile	40 - 100	7	7	Medium	404064.45335	6441282.69138	
678	*Eucalyptus camaldulensis*	18700	5900	220	Juvenile	40 - 100	7	7	Medium	404066.577836	6441281.330054	
679	*Eucalyptus camaldulensis*	19500	4600	290	Juvenile	40 - 100	7	7	Medium	404066.859412	6441280.726289	
680	*Eucalyptus camaldulensis*	16500	6400	230	Juvenile	40 - 100	7	7	Medium	404067.95445	6441282.155005	
681	*Eucalyptus camaldulensis*	15100	4100	190	Juvenile	40 - 100	7	7	Medium	404067.517788	6441282.406146	

Tree / Tag ID	Species	Height	Canopy	Diameter	Age class	ULE	Health	Structure	Retention Value	Easting	Northing	Comment
682	*Eucalyptus camaldulensis*	8100	4900	170	Juvenile	40 - 100	7	7	Low	404067.376118	6441283.288386	
683	*Eucalyptus camaldulensis*	17700	6000	200	Juvenile	40 - 100	7	7	Medium	404067.726039	6441283.379214	
684	*Eucalyptus camaldulensis*	18000	5300	280	Juvenile	40 - 100	7	7	Medium	404068.17006	6441283.368099	
685	*Eucalyptus camaldulensis*	18000	4900	270	Juvenile	40 - 100	7	7	Medium	404069.687641	6441283.283808	
686	*Eucalyptus camaldulensis*	16000	6100	350	Juvenile	40 - 100	7	7	Medium	404071.584608	6441280.883217	
687	*Eucalyptus camaldulensis*	14600	4400	250	Juvenile	40 - 100	7	7	Medium	404070.940703	6441286.252911	
688	*Eucalyptus camaldulensis*	18300	5100	230	Juvenile	40 - 100	7	7	Medium	404072.698373	6441282.79103	
689	*Eucalyptus camaldulensis*	14000	5300	260	Juvenile	40 - 100	7	7	Medium	404073.402596	6441285.393181	
690	*Eucalyptus camaldulensis*	14300	7100	270	Juvenile	40 - 100	7	7	Medium	404075.150461	6441283.004948	
691	*Eucalyptus camaldulensis*	18800	6900	380	Semi-mature	5 - 40	6	5	Low	404084.473553	6441289.622965	Not tagged - Tree on private property
692	*Eucalyptus camaldulensis*	19600	8000	350	Semi-mature	5 - 40	6	7	Medium	404086.487167	6441291.707634	Not tagged - Tree on private property
693	*Eucalyptus camaldulensis*	14600	5900	250	Juvenile	5 - 40	5	8	Medium	404087.379603	6441291.649461	
694	*Eucalyptus camaldulensis*	13800	3900	190	Juvenile	5 - 40	6	8	Medium	404087.636985	6441289.972675	
695	*Eucalyptus camaldulensis*	25000	6900	400	Semi-mature	5 - 40	6	7	Medium	404088.406871	6441287.784641	Not tagged - Tree on private property
696	*Eucalyptus camaldulensis*	21700	7900	480	Mature	5 - 40	6	7	Medium	404089.300019	6441284.297259	Not tagged - Tree on private property
697	*Eucalyptus camaldulensis*	14200	4100	200	Juvenile	5 - 40	7	8	Medium	404090.844365	6441285.234029	
698	*Eucalyptus camaldulensis*	19300	9600	520	Mature	5 - 40	7	7	Medium	404092.004849	6441285.347765	
699	*Eucalyptus camaldulensis*	22100	6900	280	Semi-mature	5 - 40	6	8	Medium	404089.484618	6441289.422119	Not tagged - Tree on private property
700	*Eucalyptus camaldulensis*	23300	10500	340	Semi-mature	5 - 40	6	7	Medium	404090.321439	6441290.694031	Not tagged - Tree on private property

Tree / Tag ID	Species	Height	Canopy	Diameter	Age class	ULE	Health	Structure	Retention Value	Easting	Northing	Comment
701	*Eucalyptus camaldulensis*	17900	5300	270	Juvenile	5 - 40	7	8	Medium	404092.838562	6441290.448769	
702	*Eucalyptus camaldulensis*	24400	7900	430	Mature	5 - 40	6	8	Medium	404092.910727	6441291.614296	
703	*Eucalyptus camaldulensis*	21800	8300	490	Mature	5 - 40	6	7	Medium	404098.297968	6441287.752423	
704	*Eucalyptus camaldulensis*	21200	5400	340	Semi-mature	5 - 40	6	7	Medium	404100.004232	6441289.056889	Not tagged - Tree on private property
705	*Eucalyptus camaldulensis*	20200	7800	330	Mature	5 - 40	7	7	Medium	404101.244801	6441292.52574	Not tagged - Tree on private property
706	*Eucalyptus camaldulensis*	12900	11100	360	Semi-mature	40 - 100	8	7	Medium	404116.353601	6441306.415723	Not tagged - Tree on private property
707	*Eucalyptus globulus*	17900	14900	1110	Mature	5 - 40	7	8	High	404144.187122	6441323.885823	Not tagged - Tree on private property
708	*Eucalyptus globulus*	16800	12200	640	Mature	5 - 40	5	7	Medium	404155.274526	6441313.798058	Not tagged - Tree on private property
879	*Eucalyptus camaldulensis*	3500	1700	100	Juvenile	5 - 40	8	8	Low	403221.570952	6440809.124967	
880	*Platanus acerifolia*	8000	5100	190	Semi-mature	40 - 100	8	8	Medium	403876.045842	6441137.335511	
919	*Eucalyptus camaldulensis*	4300	1400	110	Juvenile	40 - 100	7	7	Low	404056.166674	6441280.287798	
920	*Eucalyptus camaldulensis*	12500	2500	120	Juvenile	40 - 100	7	7	Low	404057.080027	6441281.96446	
921	*Eucalyptus camaldulensis*	3200	1300	110	Juvenile	40 - 100	7	7	Low	404057.218563	6441283.549622	
922	*Eucalyptus camaldulensis*	10100	3400	150	Juvenile	40 - 100	7	7	Low	404056.988123	6441284.321911	
923	*Eucalyptus camaldulensis*	10300	2900	110	Juvenile	40 - 100	7	7	Low	404059.276354	6441280.979838	
924	*Eucalyptus camaldulensis*	11000	2700	140	Juvenile	40 - 100	7	7	Low	404059.590968	6441281.19025	
925	*Eucalyptus camaldulensis*	11600	2800	160	Juvenile	40 - 100	7	7	Low	404060.074633	6441281.483502	
926	*Eucalyptus camaldulensis*	4800	2200	110	Juvenile	40 - 100	7	7	Low	404058.7888	6441282.768068	
927	*Eucalyptus camaldulensis*	17200	4200	280	Juvenile	40 - 100	7	7	Medium	404057.805455	6441285.820558	

Tree / Tag ID	Species	Height	Canopy	Diameter	Age class	ULE	Health	Structure	Retention Value	Easting	Northing	Comment
928	*Eucalyptus camaldulensis*	21100	5500	160	Juvenile	40 - 100	7	7	Medium	404057.918047	6441286.85556	
929	*Eucalyptus camaldulensis*	12600	3300	220	Juvenile	40 - 100	7	7	Low	404060.698453	6441278.758984	
930	*Eucalyptus camaldulensis*	3400	1500	100	Juvenile	40 - 100	7	7	Low	404061.216884	6441281.164137	
931	*Eucalyptus camaldulensis*	6000	2400	100	Juvenile	40 - 100	7	7	Low	404061.432286	6441282.396224	
932	*Eucalyptus camaldulensis*	6600	2100	150	Juvenile	40 - 100	7	7	Low	404060.965225	6441283.047939	
933	*Eucalyptus camaldulensis*	13600	4800	180	Juvenile	40 - 100	7	7	Medium	404060.584288	6441283.868563	
934	*Eucalyptus camaldulensis*	9500	2700	170	Juvenile	40 - 100	7	7	Low	404062.220524	6441282.994756	
935	*Eucalyptus camaldulensis*	8900	1600	120	Juvenile	40 - 100	7	7	Low	404062.992406	6441281.352619	
936	*Eucalyptus camaldulensis*	11100	2300	140	Juvenile	40 - 100	7	7	Low	404063.379921	6441281.024956	
937	*Eucalyptus camaldulensis*	4200	2800	100	Juvenile	40 - 100	7	7	Low	404065.294051	6441279.973246	
938	*Eucalyptus camaldulensis*	10700	3000	170	Juvenile	5 - 40	6	8	Medium	404068.187989	6441275.463101	Not tagged - Tree on private property
939	*Eucalyptus camaldulensis*	7400	2500	200	Juvenile	40 - 100	7	7	Low	404063.9564	6441283.15181	
940	*Eucalyptus camaldulensis*	7700	1200	110	Juvenile	40 - 100	7	7	Low	404065.590146	6441281.686111	
941	*Eucalyptus camaldulensis*	5300	1500	150	Juvenile	40 - 100	7	7	Low	404065.894301	6441282.211336	
942	*Eucalyptus camaldulensis*	10200	2900	190	Juvenile	40 - 100	7	7	Low	404066.784211	6441280.109603	
943	*Eucalyptus camaldulensis*	3100	1400	120	Juvenile	40 - 100	7	7	Low	404068.537091	6441282.448346	
944	*Eucalyptus camaldulensis*	13000	3600	170	Juvenile	40 - 100	7	7	Low	404069.357009	6441281.347614	
945	*Eucalyptus camaldulensis*	17000	10000	450	Mature	40 - 100	8	5	Medium	404035.07	6441288.5	Not tagged - Tree on private property
946	*Eucalyptus camaldulensis*	19000	9000	500	Mature	40 - 100	7	8	Medium	404029.54	6441288.385	Not tagged - Tree on private property

Tree / Tag ID	Species	Height	Canopy	Diameter	Age class	ULE	Health	Structure	Retention Value	Easting	Northing	Comment
947	*Eucalyptus camaldulensis*	18000	5000	400	Mature	5 - 40	6	5	Medium	404024.84	6441287.554	Not tagged - Tree on private property
948	*Eucalyptus camaldulensis*	18000	8000	450	Mature	5 - 40	7	6	Medium	404019.17	6441285.298	Not tagged - Tree on private property
949	*Eucalyptus camaldulensis*	18000	6000	300	Semi-mature	5 - 40	8	7	Medium	404020.42	6441283.358	Not tagged - Tree on private property
950	*Eucalyptus camaldulensis*	20000	15000	850	Mature	40 - 100	8	6	Medium	404012.46	6441288.947	Not tagged - Tree on private property
951	*Eucalyptus camaldulensis*	14000	10000	400	Mature	40 - 100	8	7	Medium	404016.51	6441291.817	Not tagged - Tree on private property
952	*Eucalyptus camaldulensis*	15000	7000	350	Mature	40 - 100	8	7	Medium	404039.3	6441299.396	Not tagged - Tree on private property
953	*Eucalyptus camaldulensis*	13000	5000	250	Semi-mature	5 - 40	7	6	Medium	404042.47	6441298.513	Not tagged - Tree on private property
954	*Eucalyptus rudis*	18000	11000	550	Mature	40 - 100	8	5	Medium	404029.62	6441316.391	Not tagged - Tree on private property
955	*Eucalyptus camaldulensis*	12000	11000	450	Mature	5 - 40	8	6	Medium	404039.69	6441318.185	Not tagged - Tree on private property
956	*Eucalyptus botryoides*	13000	9000	550	Mature	5 - 40	8	6	Medium	404054.78	6441311.437	Not tagged - Tree on private property
957	*Eucalyptus camaldulensis*	15000	13000	450	Mature	40 - 100	8	7	Medium	404054.49	6441324.839	Not tagged - Tree on private property
958	*Eucalyptus botryoides*	20000	18000	1500	Mature	40 - 100	8	8	High	404068.51	6441296.461	Not tagged - Tree on private property
959	*Eucalyptus botryoides*	17000	9000	500	Mature	5 - 40	8	6	Medium	404060.71	6441305.86	Not tagged - Tree on private property
960	*Eucalyptus camaldulensis*	17000	15000	850	Mature	40 - 100	8	7	Medium	404071.05	6441309.419	Not tagged - Tree on private property
961	*Eucalyptus camaldulensis*	13500	8000	350	Semi-mature	5 - 40	7	6	Medium	404072.17	6441317.737	Not tagged - Tree on private property
962	*Eucalyptus camaldulensis*	16000	7000	350	Semi-mature	5 - 40	7	7	Medium	404064.82	6441319.65	Not tagged - Tree on private property
963	*Eucalyptus camaldulensis*	14000	12000	550	Mature	40 - 100	8	6	Medium	404082.43	6441312.988	Not tagged - Tree on private property
964	*Eucalyptus camaldulensis*	14000	12000	550	Mature	40 - 100	8	6	Medium	Private property, GPS not picked up	Private property, GPS not picked up	Sub-dominant

Tree / Tag ID	Species	Height	Canopy	Diameter	Age class	ULE	Health	Structure	Retention Value	Easting	Northing	Comment
965	*Eucalyptus camaldulensis*	16000	12000	550	Mature	40 - 100	8	6	Medium	Private property, GPS not picked up	Private property, GPS not picked up	Sub-dominant stem
966	*Eucalyptus camaldulensis*	14000	7000	400	Semi-mature	40 - 100	8	5	Medium	Private property, GPS not picked up	Private property, GPS not picked up	Sub-dominant stem
967	*Eucalyptus camaldulensis*	11000	8000	350	Semi-mature	40 - 100	8	8	Medium	Private property, GPS not picked up	Private property, GPS not picked up	
968	*Eucalyptus camaldulensis*	11000	4000	150	Juvenile	5 - 40	7	6	Low	Private property, GPS not picked up	Private property, GPS not picked up	
969	*Callistemon sp.*	11000	7000	350	Mature	40 - 100	8	7	Medium	Private property, GPS not picked up	Private property, GPS not picked up	
970	*Syagrus romanzoffiana*	13000	6000	350	Mature	5 - 40	7	8	Low	Private property, GPS not picked up	Private property, GPS not picked up	
971	*Syagrus romanzoffiana*	11000	6000	250	Mature	5 - 40	8	8	Low	Private property, GPS not picked up	Private property, GPS not picked up	
972	*Syagrus romanzoffiana*	15000	6000	350	Mature	5 - 40	7	8	Low	Private property, GPS not picked up	Private property, GPS not picked up	
973	*Eucalyptus platypus*	12000	12000	300	Mature	40 - 100	8	8	Medium	Private property, GPS not picked up	Private property, GPS not picked up	
974	*Eucalyptus camaldulensis*	16000	10000	600	Mature	40 - 100	8	7	Medium	Private property, GPS not picked up	Private property, GPS not picked up	
975	*Eucalyptus camaldulensis*	17000	10000	500	Mature	40 - 100	8	8	Medium	Private property, GPS not picked up	Private property, GPS not picked up	
976	*Eucalyptus camaldulensis*	15000	10000	500	Mature	40 - 100	8	6	Medium	Private property, GPS not picked up	Private property, GPS not picked up	

Tree / Tag ID	Species	Height	Canopy	Diameter	Age class	ULE	Health	Structure	Retention Value	Easting	Northing	Comment
977	*Eucalyptus rudis*	7000	9000	350	Semi-mature	5 - 40	7	5	Medium	Private property, GPS not picked up	Private property, GPS not picked up	
978	*Eucalyptus rudis*	8000	7000	250	Semi-mature	5 - 40	7	7	Medium	Private property, GPS not picked up	Private property, GPS not picked up	
979	*Eucalyptus rudis*	9000	7000	200	Juvenile	5 - 40	8	6	Medium	Private property, GPS not picked up	Private property, GPS not picked up	
980	*Eucalyptus rudis*	10000	7000	250	Semi-mature	5 - 40	8	7	Medium	Private property, GPS not picked up	Private property, GPS not picked up	
981	*Eucalyptus rudis*	9000	7000	250	Semi-mature	5 - 40	8	5	Medium	Private property, GPS not picked up	Private property, GPS not picked up	
982	*Eucalyptus rudis*	13000	9000	450	Mature	40 - 100	7	7	Medium	Private property, GPS not picked up	Private property, GPS not picked up	Sub-dominant stem
983	*Eucalyptus rudis*	11000	9000	550	Mature	5 - 40	6	5	Medium	Private property, GPS not picked up	Private property, GPS not picked up	
984	*Eucalyptus rudis*	15000	12000	550	Mature	5 - 40	6	5	Medium	Private property, GPS not picked up	Private property, GPS not picked up	Structural defects, major deadwood
985	*Eucalyptus rudis*	13000	12000	550	Mature	5 - 40	6	6	Medium	Private property, GPS not picked up	Private property, GPS not picked up	
986	*Eucalyptus rudis*	8000	4000	200	Juvenile	5 - 40	7	8	Low	Private property, GPS not picked up	Private property, GPS not picked up	
987	*Eucalyptus rudis*	8000	6000	250	Juvenile	5 - 40	6	7	Low	Private property, GPS not picked up	Private property, GPS not picked up	
988	*Eucalyptus rudis*	9000	10000	400	Semi-mature	5 - 40	7	6	Medium	Private property, GPS not picked up	Private property, GPS not picked up	

Tree / Tag ID	Species	Height	Canopy	Diameter	Age class	ULE	Health	Structure	Retention Value	Easting	Northing	Comment
989	*Eucalyptus rudis*	4000	3000	100	Juvenile	2 - 5	4	4	Low	Private property, GPS not picked up	Private property, GPS not picked up	
990	*Eucalyptus rudis*	15000	10000	550	Mature	40 - 100	7	5	Medium	Private property, GPS not picked up	Private property, GPS not picked up	Multi-stemmed habit
991	*Eucalyptus rudis*	9000	6000	250	Semi-mature	5 - 40	7	6	Medium	Private property, GPS not picked up	Private property, GPS not picked up	
992	*Eucalyptus rudis*	15000	12000	550	Mature	40 - 100	7	6	Medium	Private property, GPS not picked up	Private property, GPS not picked up	
993	*Eucalyptus rudis*	10000	10000	350	Semi-mature	5 - 40	7	6	Medium	Private property, GPS not picked up	Private property, GPS not picked up	

Table 3 - Highlighted cells are GPS locations, and not provided by surveyor

11.2 Tree survey TPZ

Tree / Tag ID	Species	DBH (mm)	TPZ (m)	SRZ (m)
01	*Melaleuca sp.*	450	5.40	2.37
69	*Eucalyptus camaldulensis*	310	3.72	2.02
71	*Eucalyptus camaldulensis*	270	3.24	1.91
72	*Eucalyptus camaldulensis*	450	5.40	2.37
74	*Eucalyptus camaldulensis*	330	3.96	2.08
75	*Eucalyptus camaldulensis*	400	4.80	2.25
77	*Eucalyptus camaldulensis*	100	2.00	1.50
79	*Eucalyptus camaldulensis*	270	3.24	1.91
80	*Eucalyptus camaldulensis*	200	2.40	1.68
81	*Eucalyptus camaldulensis*	130	2.00	1.50
82	*Eucalyptus camaldulensis*	100	2.00	1.50
83	*Eucalyptus camaldulensis*	130	2.00	1.50
85	*Eucalyptus camaldulensis*	100	2.00	1.50
86	*Eucalyptus camaldulensis*	170	2.04	1.57
87	*Eucalyptus camaldulensis*	100	2.00	1.50
88	*Allocasuarina sp.*	130	2.00	1.50
89	*Allocasuarina sp.*	100	2.00	1.50
90	*Eucalyptus camaldulensis*	220	2.64	1.75
91	*Eucalyptus camaldulensis*	140	2.00	1.50
92	*Eucalyptus camaldulensis*	310	3.72	2.02
93	*Eucalyptus camaldulensis*	100	2.00	1.50
94	*Eucalyptus camaldulensis*	100	2.00	1.50
95	*Eucalyptus camaldulensis*	100	2.00	1.50
96	*Eucalyptus camaldulensis*	180	2.16	1.61
97	*Platanus acerifolia*	100	2.00	1.50
98	*Platanus acerifolia*	100	2.00	1.50
99	*Platanus acerifolia*	100	2.00	1.50
100	*Eucalyptus gomphocephala*	150	2.00	1.50
101	*Eucalyptus victrix*	150	2.00	1.50
102	*Eucalyptus victrix*	130	2.00	1.50
103	*Eucalyptus gomphocephala*	170	2.04	1.57
104	*Eucalyptus gomphocephala*	180	2.16	1.61
105	*Eucalyptus rudis*	100	2.00	1.50
106	*Eucalyptus rudis*	140	2.00	1.50
107	*Eucalyptus rudis*	100	2.00	1.50
108	*Eucalyptus rudis*	140	2.00	1.50
109	*Eucalyptus gomphocephala*	280	3.36	1.94
110	*Eucalyptus gomphocephala*	180	2.16	1.61
111	*Eucalyptus gomphocephala*	250	3.00	1.85
112	*Eucalyptus rudis*	420	5.04	2.30
113	*Eucalyptus rudis*	730	8.76	2.90
114	*Platanus acerifolia*	140	2.00	1.50
115	*Platanus acerifolia*	150	2.00	1.50
116	*Platanus acerifolia*	200	2.40	1.68
117	*Platanus acerifolia*	200	2.40	1.68
118	*Platanus acerifolia*	160	2.00	1.53
119	*Platanus acerifolia*	100	2.00	1.50
120	*Platanus acerifolia*	130	2.00	1.50
121	*Platanus acerifolia*	100	2.00	1.50
122	*Platanus acerifolia*	100	2.00	1.50
123	*Platanus acerifolia*	190	2.28	1.65
124	*Eucalyptus rudis*	100	2.00	1.50
125	*Eucalyptus rudis*	130	2.00	1.50
126	*Eucalyptus rudis*	150	2.00	1.50
127	*Melaleuca sp.*	500	6.00	2.47

Tree / Tag ID	Species	DBH (mm)	TPZ (m)	SRZ (m)
128	*Melaleuca sp.*	340	4.08	2.10
129	*Melaleuca sp.*	190	2.28	1.65
130	*Melaleuca sp.*	190	2.28	1.65
131	*Melaleuca sp.*	300	3.60	2.00
132	*Melaleuca sp.*	240	2.88	1.82
133	*Melaleuca sp.*	.7	2.00	1.50
518	*Syagrus romanzoffiana*	200	2.40	1.68
519	*Syagrus romanzoffiana*	300	3.60	2.00
520	*Syagrus romanzoffiana*	220	2.64	1.75
521	*Syagrus romanzoffiana*	260	3.12	1.88
522	*Syagrus romanzoffiana*	180	2.16	1.61
523	*Syagrus romanzoffiana*	320	3.84	2.05
524	*Syagrus romanzoffiana*	290	3.48	1.97
525	*Syagrus romanzoffiana*	240	2.88	1.82
526	*Syagrus romanzoffiana*	320	3.84	2.05
527	*Eucalyptus rudis*	320	3.84	2.05
528	*Eucalyptus rudis*	320	3.84	2.05
529	*Eucalyptus rudis*	480	5.76	2.43
530	*Eucalyptus rudis*	450	5.40	2.37
531	*Eucalyptus rudis*	450	5.40	2.37
532	*Eucalyptus camaldulensis*	360	4.32	2.15
533	*Eucalyptus camaldulensis*	280	3.36	1.94
534	*Eucalyptus camaldulensis*	410	4.92	2.28
535	*Eucalyptus camaldulensis*	450	5.40	2.37
536	*Corymbia maculata*	380	4.56	2.20
537	*Corymbia maculata*	450	5.40	2.37
538	*Unknown sp.*	250	3.00	1.85
539	*Eucalyptus camaldulensis*	570	6.84	2.61
540	*Eucalyptus camaldulensis*	220	2.64	1.75
541	*Eucalyptus camaldulensis*	220	2.64	1.75
542	*Eucalyptus camaldulensis*	240	2.88	1.82
543	*Eucalyptus camaldulensis*	320	3.84	2.05
544	*Eucalyptus camaldulensis*	170	2.04	1.57
545	*Eucalyptus camaldulensis*	370	4.44	2.18
546	*Eucalyptus camaldulensis*	190	2.28	1.65
547	*Eucalyptus camaldulensis*	110	2.00	1.50
548	*Eucalyptus camaldulensis*	100	2.00	1.50
549	*Eucalyptus camaldulensis*	590	7.08	2.65
550	*Eucalyptus camaldulensis*	130	2.00	1.50
551	*Eucalyptus camaldulensis*	550	6.60	2.57
552	*Eucalyptus camaldulensis*	150	2.00	1.50
553	*Eucalyptus camaldulensis*	150	2.00	1.50
554	*Eucalyptus camaldulensis*	630	7.56	2.73
555	*Eucalyptus camaldulensis*	620	7.44	2.71
556	*Eucalyptus camaldulensis*	230	2.76	1.79
557	*Eucalyptus camaldulensis*	100	2.00	1.50
558	*Eucalyptus camaldulensis*	140	2.00	1.50
559	*Eucalyptus camaldulensis*	120	2.00	1.50
560	*Eucalyptus camaldulensis*	140	2.00	1.50
561	*Eucalyptus camaldulensis*	700	8.40	2.85
562	*Eucalyptus camaldulensis*	600	7.20	2.67
563	*Eucalyptus camaldulensis*	780	9.36	2.98
564	*Eucalyptus camaldulensis*	660	7.92	2.78
565	*Eucalyptus camaldulensis*	550	6.60	2.57
566	*Eucalyptus camaldulensis*	660	7.92	2.78
567	*Eucalyptus camaldulensis*	100	2.00	1.50
568	*Eucalyptus camaldulensis*	120	2.00	1.50

Tree / Tag ID	Species	DBH (mm)	TPZ (m)	SRZ (m)
569	*Eucalyptus camaldulensis*	160	2.00	1.53
570	*Eucalyptus camaldulensis*	100	2.00	1.50
571	*Eucalyptus camaldulensis*	100	2.00	1.50
572	*Eucalyptus camaldulensis*	150	2.00	1.50
573	*Eucalyptus camaldulensis*	120	2.00	1.50
574	*Eucalyptus camaldulensis*	100	2.00	1.50
575	*Eucalyptus camaldulensis*	100	2.00	1.50
576	*Eucalyptus camaldulensis*	620	7.44	2.71
577	*Eucalyptus camaldulensis*	320	3.84	2.05
578	*Eucalyptus camaldulensis*	150	2.00	1.50
579	*Eucalyptus camaldulensis*	130	2.00	1.50
580	*Eucalyptus camaldulensis*	220	2.64	1.75
581	*Eucalyptus camaldulensis*	200	2.40	1.68
582	*Eucalyptus rudis*	310	3.72	2.02
583	*Eucalyptus rudis*	310	3.72	2.02
584	*Eucalyptus rudis*	370	4.44	2.18
585	*Eucalyptus rudis*	100	2.00	1.50
586	*Eucalyptus rudis*	100	2.00	1.50
587	*Eucalyptus camaldulensis*	100	2.00	1.50
588	*Eucalyptus rudis*	150	2.00	1.50
589	*Eucalyptus rudis*	150	2.00	1.50
590	*Eucalyptus rudis*	210	2.52	1.72
591	*Eucalyptus rudis*	100	2.00	1.50
593	*Eucalyptus rudis*	150	2.00	1.50
594	*Eucalyptus rudis*	100	2.00	1.50
595	*Eucalyptus rudis*	100	2.00	1.50
596	*Eucalyptus rudis*	100	2.00	1.50
597	*Eucalyptus rudis*	100	2.00	1.50
598	*Eucalyptus rudis*	100	2.00	1.50
599	*Eucalyptus rudis*	100	2.00	1.50
600	*Eucalyptus rudis*	100	2.00	1.50
601	*Eucalyptus camaldulensis*	400	4.80	2.25
602	*Eucalyptus rudis*	100	2.00	1.50
603	*Eucalyptus rudis*	100	2.00	1.50
604	*Eucalyptus rudis*	100	2.00	1.50
605	*Eucalyptus rudis*	570	6.84	2.61
606	*Eucalyptus rudis*	400	4.80	2.25
607	*Eucalyptus rudis*	650	7.80	2.76
608	*Eucalyptus rudis*	420	5.04	2.30
609	*Eucalyptus rudis*	400	4.80	2.25
610	*Eucalyptus rudis*	420	5.04	2.30
611	*Eucalyptus rudis*	550	6.60	2.57
612	*Eucalyptus rudis*	640	7.68	2.74
615	*Eucalyptus rudis*	700	8.40	2.85
616	*Eucalyptus rudis*	780	9.36	2.98
617	*Eucalyptus rudis*	1100	13.20	3.44
618	*Xylomelum pyriforme*	130	2.00	1.50
620	*Citharexylum spinosum*	310	3.72	2.02
621	*Quercus robur*	640	7.68	2.74
622	*Jacaranda mimosifolia*	450	5.40	2.37
623	*Eucalyptus botryoides*	470	5.64	2.41
624	*Melaleuca sp.*	750	9.00	2.93
625	*Jacaranda mimosifolia*	180	2.16	1.61
626	*Eucalyptus grandis*	1300	15.00	3.69
627	*Brachychiton populneus*	470	5.64	2.41
628	*Melaleuca sp.*	600	7.20	2.67
632	*Eucalyptus camaldulensis*	380	4.56	2.20

Tree / Tag ID	Species	DBH (mm)	TPZ (m)	SRZ (m)
633	*Eucalyptus camaldulensis*	340	4.08	2.10
634	*Eucalyptus camaldulensis*	540	6.48	2.55
635	*Eucalyptus camaldulensis*	1140	13.68	3.50
636	*Eucalyptus camaldulensis*	600	7.20	2.67
637	*Eucalyptus camaldulensis*	450	5.40	2.37
638	*Eucalyptus camaldulensis*	280	3.36	1.94
639	*Eucalyptus camaldulensis*	290	3.48	1.97
640	*Eucalyptus camaldulensis*	210	2.52	1.72
641	*Eucalyptus camaldulensis*	150	2.00	1.50
642	*Eucalyptus camaldulensis*	240	2.88	1.82
643	*Eucalyptus camaldulensis*	290	3.48	1.97
644	*Eucalyptus camaldulensis*	170	2.04	1.57
645	*Eucalyptus camaldulensis*	200	2.40	1.68
646	*Eucalyptus camaldulensis*	360	4.32	2.15
647	*Eucalyptus camaldulensis*	410	4.92	2.28
648	*Eucalyptus camaldulensis*	320	3.84	2.05
649	*Eucalyptus camaldulensis*	270	3.24	1.91
650	*Eucalyptus camaldulensis*	230	2.76	1.79
651	*Eucalyptus camaldulensis*	260	3.12	1.88
652	*Eucalyptus camaldulensis*	160	2.00	1.53
653	*Eucalyptus camaldulensis*	220	2.64	1.75
654	*Eucalyptus camaldulensis*	270	3.24	1.91
655	*Eucalyptus camaldulensis*	240	2.88	1.82
656	*Eucalyptus camaldulensis*	110	2.00	1.50
657	*Eucalyptus camaldulensis*	210	2.52	1.72
658	*Eucalyptus camaldulensis*	220	2.64	1.75
659	*Eucalyptus camaldulensis*	170	2.04	1.57
660	*Eucalyptus camaldulensis*	220	2.64	1.75
661	*Eucalyptus camaldulensis*	220	2.64	1.75
662	*Eucalyptus camaldulensis*	820	9.84	3.04
663	*Eucalyptus camaldulensis*	450	5.40	2.37
664	*Eucalyptus camaldulensis*	110	2.00	1.50
665	*Eucalyptus camaldulensis*	270	3.24	1.91
666	*Eucalyptus camaldulensis*	250	3.00	1.85
667	*Eucalyptus camaldulensis*	250	3.00	1.85
668	*Eucalyptus camaldulensis*	220	2.64	1.75
669	*Eucalyptus camaldulensis*	370	4.44	2.18
670	*Eucalyptus camaldulensis*	210	2.52	1.72
671	*Eucalyptus camaldulensis*	160	2.00	1.53
672	*Eucalyptus camaldulensis*	200	2.40	1.68
673	*Eucalyptus camaldulensis*	220	2.64	1.75
674	*Eucalyptus camaldulensis*	240	2.88	1.82
675	*Eucalyptus camaldulensis*	170	2.04	1.57
676	*Eucalyptus camaldulensis*	200	2.40	1.68
677	*Eucalyptus camaldulensis*	210	2.52	1.72
678	*Eucalyptus camaldulensis*	220	2.64	1.75
679	*Eucalyptus camaldulensis*	290	3.48	1.97
680	*Eucalyptus camaldulensis*	230	2.76	1.79
681	*Eucalyptus camaldulensis*	190	2.28	1.65
682	*Eucalyptus camaldulensis*	170	2.04	1.57
683	*Eucalyptus camaldulensis*	200	2.40	1.68
684	*Eucalyptus camaldulensis*	280	3.36	1.94
685	*Eucalyptus camaldulensis*	270	3.24	1.91
686	*Eucalyptus camaldulensis*	350	4.20	2.13
687	*Eucalyptus camaldulensis*	250	3.00	1.85
688	*Eucalyptus camaldulensis*	230	2.76	1.79
689	*Eucalyptus camaldulensis*	260	3.12	1.88

Tree / Tag ID	Species	DBH (mm)	TPZ (m)	SRZ (m)
690	*Eucalyptus camaldulensis*	270	3.24	1.91
691	*Eucalyptus camaldulensis*	380	4.56	2.20
692	*Eucalyptus camaldulensis*	350	4.20	2.13
693	*Eucalyptus camaldulensis*	250	3.00	1.85
694	*Eucalyptus camaldulensis*	190	2.28	1.65
695	*Eucalyptus camaldulensis*	400	4.80	2.25
696	*Eucalyptus camaldulensis*	480	5.76	2.43
697	*Eucalyptus camaldulensis*	200	2.40	1.68
698	*Eucalyptus camaldulensis*	520	6.24	2.51
699	*Eucalyptus camaldulensis*	280	3.36	1.94
700	*Eucalyptus camaldulensis*	340	4.08	2.10
701	*Eucalyptus camaldulensis*	270	3.24	1.91
702	*Eucalyptus camaldulensis*	430	5.16	2.32
703	*Eucalyptus camaldulensis*	490	5.88	2.45
704	*Eucalyptus camaldulensis*	340	4.08	2.10
705	*Eucalyptus camaldulensis*	330	3.96	2.08
706	*Eucalyptus camaldulensis*	360	4.32	2.15
707	*Eucalyptus globulus*	1110	13.32	3.46
708	*Eucalyptus globulus*	640	7.68	2.74
879	*Eucalyptus camaldulensis*	100	2.00	1.50
880	*Platanus acerifolia*	190	2.28	1.65
919	*Eucalyptus camaldulensis*	110	2.00	1.50
920	*Eucalyptus camaldulensis*	120	2.00	1.50
921	*Eucalyptus camaldulensis*	110	2.00	1.50
922	*Eucalyptus camaldulensis*	150	2.00	1.50
923	*Eucalyptus camaldulensis*	110	2.00	1.50
924	*Eucalyptus camaldulensis*	140	2.00	1.50
925	*Eucalyptus camaldulensis*	160	2.00	1.53
926	*Eucalyptus camaldulensis*	110	2.00	1.50
927	*Eucalyptus camaldulensis*	280	3.36	1.94
928	*Eucalyptus camaldulensis*	160	2.00	1.53
929	*Eucalyptus camaldulensis*	220	2.64	1.75
930	*Eucalyptus camaldulensis*	100	2.00	1.50
931	*Eucalyptus camaldulensis*	100	2.00	1.50
932	*Eucalyptus camaldulensis*	150	2.00	1.50
933	*Eucalyptus camaldulensis*	180	2.16	1.61
934	*Eucalyptus camaldulensis*	170	2.04	1.57
935	*Eucalyptus camaldulensis*	120	2.00	1.50
936	*Eucalyptus camaldulensis*	140	2.00	1.50
937	*Eucalyptus camaldulensis*	100	2.00	1.50
938	*Eucalyptus camaldulensis*	170	2.04	1.57
939	*Eucalyptus camaldulensis*	200	2.40	1.68
940	*Eucalyptus camaldulensis*	110	2.00	1.50
941	*Eucalyptus camaldulensis*	150	2.00	1.50
942	*Eucalyptus camaldulensis*	190	2.28	1.65
943	*Eucalyptus camaldulensis*	120	2.00	1.50
944	*Eucalyptus camaldulensis*	170	2.04	1.57
945	*Eucalyptus camaldulensis*	450	5.40	2.37
946	*Eucalyptus camaldulensis*	500	6.00	2.47
947	*Eucalyptus camaldulensis*	400	4.80	2.25
948	*Eucalyptus camaldulensis*	450	5.40	2.37
949	*Eucalyptus camaldulensis*	300	3.60	2.00
950	*Eucalyptus camaldulensis*	850	10.20	3.09
951	*Eucalyptus camaldulensis*	400	4.80	2.25
952	*Eucalyptus camaldulensis*	350	4.20	2.13
953	*Eucalyptus camaldulensis*	250	3.00	1.85
954	*Eucalyptus rudis*	550	6.60	2.57

Tree / Tag ID	Species	DBH (mm)	TPZ (m)	SRZ (m)
955	*Eucalyptus camaldulensis*	450	5.40	2.37
956	*Eucalyptus botryoides*	550	6.60	2.57
957	*Eucalyptus camaldulensis*	450	5.40	2.37
958	*Eucalyptus botryoides*	1500	15.00	3.92
959	*Eucalyptus botryoides*	500	6.00	2.47
960	*Eucalyptus camaldulensis*	850	10.20	3.09
961	*Eucalyptus camaldulensis*	350	4.20	2.13
962	*Eucalyptus camaldulensis*	350	4.20	2.13
963	*Eucalyptus camaldulensis*	550	6.60	2.57
964	*Eucalyptus camaldulensis*	550	6.60	2.57
965	*Eucalyptus camaldulensis*	550	6.60	2.57
966	*Eucalyptus camaldulensis*	400	4.80	2.25
967	*Eucalyptus camaldulensis*	350	4.20	2.13
968	*Eucalyptus camaldulensis*	150	2.00	1.50
969	*Callistemon sp.*	350	4.20	2.13
970	*Syagrus romanzoffiana*	350	4.20	2.13
971	*Syagrus romanzoffiana*	250	3.00	1.85
972	*Syagrus romanzoffiana*	350	4.20	2.13
973	*Eucalyptus platypus*	300	3.60	2.00
974	*Eucalyptus camaldulensis*	600	7.20	2.67
975	*Eucalyptus camaldulensis*	500	6.00	2.47
976	*Eucalyptus camaldulensis*	500	6.00	2.47
977	*Eucalyptus rudis*	350	4.20	2.13
978	*Eucalyptus rudis*	250	3.00	1.85
979	*Eucalyptus rudis*	200	2.40	1.68
980	*Eucalyptus rudis*	250	3.00	1.85
981	*Eucalyptus rudis*	250	3.00	1.85
982	*Eucalyptus rudis*	450	5.40	2.37
983	*Eucalyptus rudis*	550	6.60	2.57
984	*Eucalyptus rudis*	550	6.60	2.57
985	*Eucalyptus rudis*	550	6.60	2.57
986	*Eucalyptus rudis*	200	2.40	1.68
987	*Eucalyptus rudis*	250	3.00	1.85
988	*Eucalyptus rudis*	400	4.80	2.25
989	*Eucalyptus rudis*	100	2.00	1.50
990	*Eucalyptus rudis*	550	6.60	2.57
991	*Eucalyptus rudis*	250	3.00	1.85
992	*Eucalyptus rudis*	550	6.60	2.57
993	*Eucalyptus rudis*	350	4.20	2.13

Table 3: TPZ survey

11.3 Health rating

Assessed trees are given a numerical value to signify their overall health. Several factors and/or symptoms are taken into consideration when assessing the health of a tree. It's vigour and seasonal extension growth, symptoms of decline like deadwood and/or dieback, foliage density, colour, size and intactness as well as signs of pests and/or disease are all appraised.

Rating	Health
10	Exceptional
9	
8	Good
7	
6	Average
5	
4	
3	Poor
2	
1	Dead

Classification	Description
Exceptional	Canopy is full with dense foliage coverage throughout, leaves are entire and are of an excellent size and colour for the species with no visible pathogen damage. Excellent growth indicators, e.g. seasonal extension growth.
Good	Canopy is full with minor variations in foliage density throughout, leaves are entire and are of good size and colour for the species with minimal or no visible pathogen damage. Some minor dead wood and epicormic growth. Good growth indicators.
Average	Canopy has moderate variations in foliage density throughout, leaves not entire with reduced size and/or atypical in colour, moderate pathogen damage. Reduced growth indicators, visible amounts of minor and major deadwood/dieback, and epicormic growth.
Poor	Canopy density significantly reduced throughout, leaves are not entire, are significantly reduced in size and/or are discoloured, significant pathogen damage. Significant amounts of deadwood and/or epicormic growth, noticeable dieback of branch tips, possibly extensive.
Dead	Dead No live plant material observed throughout the canopy, bark may be visibly delaminating

11.4 Structure rating

Assessed trees are given a numerical rating to signify their overall structure. Several factors and/or conditions are taken into consideration when assessing a tree's structure. It's form, branching habit, trunk and lower stem are all appraised.

Rating	Structure
10	Exceptional
9	
8	Good
7	
6	
5	Average
4	
3	Unacceptable
2	
1	

Classification	Description
Exceptional	Good form and branching habit typical of the species. Structural defects are insignificant or undetected. All major unions appear well attached and devoid of anything that could be considered a weakness. All aspects of the tree exhibit no evidence of pathogens. No obvious damage to the trunk and roots.
Good	Canopy devoid of major defects but may exhibit minor damage, disease or decay in the crown, trunk and roots. Branching habit is well formed, spaced and tapered. May contain small amounts of deadwood or have evidence of previous limb failure.
Average	Moderate structural defects, damage, disease or decay that impact longevity. Defects may not reflect an imminent threat
Unacceptable	Serious structural defects that could cause failure within 12 months i.e., active splits, unstable/loose in ground, excessive branch end-weight. Immediate arboricultural intervention recommended to minimise risk.

11.5 Helliwell system

11.5.1 Overview

The Helliwell System is one of several methods of placing a monetary value on the visual amenity provided by individual trees and/or woodland. It has been extensively used in court cases, insurance claims and public inquiries to place visual amenity values on individual trees and is supported by the Tree Council and the Arboricultural Association.

The Helliwell system enables an assessor to ascribe a visual amenity value to a tree or woodland on a points scale. This figure can then be multiplied by a conversion factor, to arrive at an appropriate monetary value for planning purposes. The important features of the method are:

1. The system used to arrive at a points value must be soundly based,
2. The intervals on the scale must have similar values,
3. The monetary conversion factor must be realistic, and must be accepted as such by a wide spectrum of users, in addition to being clearly independent of any particular

From 1st January 2021 a conversion factor of $77.25 (AUD) is awarded for each point (Arboricultural association, 2021).

11.5.2 Criteria

Six factors are identified for each tree. For each of these factors the tree is given a score, and the scores for all six factors are then multiplied together. The product of the scores is then be multiplied by the current monetary conversion factor to arrive at an assessment of the visual amenity value of the tree in monetary terms.

11.5.3 Size of tree

The size of the tree is assessed as an area of the tree when viewed from the side. It is calculated as the height of the tree multiplied by the average crown diameter e.g. a tree 15.0m in height with an average crown diameter of 4.0m has a calculated area of 60.0m2.

11.5.4 Expected duration of visual amenity (ULE)

An estimate of the probable length of time that the tree is likely to contribute to the visual amenity of its location. This will take into account the normal biological life span of a tree of that species, its current approximate age and any other factors which may either extend or to reduce the safe useful life expectancy, including the trees position and structural condition.

11.5.5 Importance of position in the landscape

This factor is an expression of the visual prominence of the tree. A single prominent tree in a city centre will rate highly under this factor, while an individual tree a secluded residential area will not.

11.5.6 Presence of other trees

This factor considers the general abundance of trees within the locality or ‘visual area’. The loss of one tree in an area of abundance may be less important, other thing being equal, than the loss of a similar tree in an area with few other trees.

11.5.7 Relation to setting

This factor is very difficult to determine. A small tree in a large space may appear insignificant and score lowly. Equally a large tree in a small space may appear overwhelming or inappropriate and also score lowly. Trees which screen an unpleasant view may be given a higher score; equally a weeping willow hanging down into flowing water or a cedar of Lebanon in the grounds of a country estate may attract a higher score.

11.5.8 Form

Trees in this category are rated poor, average or good and related to the overall health and condition of the tree.

11.5.9 Helliwell point system

Below is a table representing the factors of a tree and their individual weighting shown as 'points available'.

	Points Available									
	0	0.5	1	2	3	4	5	6	7	8
Factor										
Size (m2)	<2	2 – 5	5 -10	10 – 20	20 – 30	30 – 50	50 – 100	100 – 150	150 – 200	over 200
Duration (ULE years)	<2	–	2-5	4-40	40-100	100+				
Importance	None	Very little	Little	Some	Considerable	Great				
Tree Cover		Woodland	Many	Some	Few	None				
Suitability	Not	Poor	Just	Fairly	Very	Particularly				
Form	–	Poor	Average	Good	–	–				

Table 4: Helliwell point system

12. Glossary of terms

ULE – Useful Life expectancy

DBH – Diameter at breast height

TPZ – Tree protection Zone

SRZ – Structural root zone

VTA - Visual tree assessment

QTRA – Quantified tree risk assessment

DTW – Distance to works

TPP – Tree Protection Plan

Appendix B

Black Cockatoo Foraging Plants

Species name	Common name	Foraging category as assigned by Emerge			Literature references
		CBC	BBC	FRTBC	
Acacia baileyana	Cootamundra wattle	Secondary	-	-	Groom 2011
Acacia pentadenia	Karri wattle	Secondary	-	-	Groom 2011
Acacia saligna	Orange wattle	Secondary	-	-	Groom 2011
Agonis flexuosa	Peppermint tree	Secondary	-	-	Groom 2011
Allocasuarina fraseriana	Sheoak	-	Secondary	Secondary	Johnstone & Storr 1998; Johnstone *et al.* 2010; Johnstone 2017; DoEE 2017
Allocasuarina spp.		Secondary	-	Secondary	Johnstone *et al.* 2010; Groom 2011; DSEWPaC 2012; DoEE 2017
Anigozanthos flavidus	Tall kangaroo paw	-	Secondary	-	Johnstone *et al.* 2010; DSEWPaC 2012; DoEE 2017
Araucaria heterophylla	Norfolk island pine	Secondary	-	-	Groom 2011; DoEE 2017
Banksia ashbyi	Ashby's banksia	Primary	Secondary	-	Saunders 1980; Groom 2011; DoEE 2017
Banksia attenuata	Slender banksia	Primary	Secondary	-	Saunders 1980; Johnstone *et al.* 2010; Groom 2011; DoEE 2017
Banksia baxteri	Baxter's banksia	Primary	Secondary	-	Johnstone *et al.* 2010; Groom 2011; DoEE 2017
Banksia carlinoides	Pink dryandra	Primary	Secondary	-	Johnstone *et al.* 2010; Groom 2011; DoEE 2017
Banksia coccinea	Scarlet banksia	Primary	Secondary	-	Johnstone *et al.* 2010; Groom 2011; DoEE 2017
Banksia dallanneyi	Couch honeypot dryandra	Primary	Secondary	-	Groom 2011; DoEE 2017
Banksia ericifolia	Heath-leaved banksia	Primary	Secondary	-	Johnstone *et al.* 2010; Groom 2011; DoEE 2017
Banksia fraseri		Primary	Secondary	-	Johnstone *et al.* 2010; Groom 2011; DoEE 2017
Banksia gardneri	Prostrate banksia	Primary	Secondary	-	Groom 2011; DoEE 2017
Banksia grandis	Bull banksia	Primary	Secondary	-	Saunders 1980; Johnstone & Storr 1998; Johnstone *et al.* 2010; Groom 2011; DoEE 2017
Banksia hookeriana	Hooker's banksia	Primary	Secondary	-	Johnstone *et al.* 2010; Groom 2011; DoEE 2017
Banksia ilicifolia	Holly banksia	Primary	Secondary	-	Johnstone *et al.* 2010; Groom 2011; Johnstone & Storr 1998; DoEE 2017
Banksia kippistiana		Primary	Secondary	-	Groom 2011; DoEE 2017
Banksia leptophylla		Primary	Secondary	-	Groom 2011; DoEE 2017
Banksia lindleyana	Porcupine banksia	Primary	Secondary	-	Johnstone *et al.* 2010; DoEE 2017

Species name	Common name	Foraging category as assigned by Emerge			Literature references
		CBC	BBC	FRTBC	
Banksia littoralis	Swamp banksia	Primary	Secondary	-	Saunders 1980; Groom 2011Johnstone & Storr 1998; Johnstone *et al.* 2010; DoEE 2017
Banksia menziesii	Firewood banksia	Primary	Secondary	-	Saunders 1980; Johnstone *et al.* 2010; Groom 2011; DoEE 2017
Banksia mucronulata	Swordfish dryandra	Primary	Secondary	-	Groom 2011; DoEE 2017
Banksia nivea	Honeypot dryandra	Primary	Secondary	-	Saunders 1980; Groom 2011; DoEE 2017
Banksia nobilis	Golden dryandra	Primary	Secondary	-	Saunders 1980; Groom 2011; DoEE 2017
Banksia praemorsa	Cut-leaf banksia	Primary	Secondary	-	Saunders 1980; Johnstone *et al.* 2010; Groom 2011; DoEE 2017
Banksia prionotes	Acorn banksia	Primary	Secondary	-	Johnstone *et al.* 2010; Groom 2011; DoEE 2017
Banksia prolata		Primary	Secondary	-	Johnstone *et al.* 2010; DoEE 2017
Banksia quercifolia	Oak-leaved banksia	Primary	Secondary	-	Johnstone & Storr 1998; Johnstone *et al.* 2010; Groom 2011; DoEE 2017
Banksia sessilis	Parrot bush	Primary	Secondary	-	Saunders 1980; Johnstone & Storr 1998; Johnstone *et al.* 2010; Groom 2011; DoEE 2017
Banksia speciosa	Showy banksia	Primary	Secondary	-	Johnstone *et al.* 2010; Groom 2011; DoEE 2017
Banksia spp.		Primary	Secondary	-	Saunders 1979; DSEWPaC 2012; DoEE 2017
Banksia squarrosa	Pingle	Primary	Secondary	-	Johnstone *et al.* 2010; Groom 2011; DoEE 2017
Banksia tricuspis	Pine banksia	Primary	Secondary	-	Groom 2011; DoEE 2017
Banksia undata	Urchin dryandra	Primary	Secondary	-	Groom 2011; DoEE 2017
Banksia verticillata	Granite banksia	Primary	Secondary	-	Saunders 1980; Groom 2011; DoEE 2017
Brassica campestris	Canola	Secondary	-	-	Groom 2011; DoEE 2017
Callistemon spp.		Secondary	Secondary	-	Johnstone *et al.* 2010; DoEE 2017
Callistemon viminalis	Captain cook bottlebrush	Secondary	-	-	Groom 2011
Callitris sp.		Secondary	-	-	Johnstone *et al.* 2010; Groom 2011
Carya illnoinensis	Pecan	Primary	Secondary	-	Johnstone *et al.* 2010; Groom 2011; Groom 2014; DoEE 2017
Casuarina cunninghamiana	River sheoak	Secondary	-	-	Groom 2011
Citrullus lanatus	Pie or afghan melon	Secondary	-	-	Johnstone *et al.* 2010; Groom 2011

Species name	Common name	Foraging category as assigned by Emerge			Literature references
		CBC	BBC	FRTBC	
Corymbia calophylla	Marri	Primary	Primary	Primary	Johnstone & Storr 1998; Johnstone & Kirkby 1999; Johnstone *et al.* 2010; DSEWPaC 2012; DoEE 2017; Johnstone 2017; Saunders 1979; Johnstone & Kirkby 2008
Corymbia citriodora	Lemon scented gum	Secondary	Secondary	Secondary	Johnstone *et al.* 2010; DSEWPaC 2012; Groom 2011; Johnstone 2017
Corymbia ficifolia	Red flowering gum	Secondary	-	-	Groom 2011
Corymbia haematoxylon	Mountain marri	Secondary	-	Secondary	Groom 2011; DoEE 2012; DoEE 2017
Corymbia maculata	Spotted gum	-	-	-	-
Darwinia citriodora	Lemon-scented darwinia	Secondary	Secondary	-	Groom 2011; Johnstone *et al.* 2010
Diospryros sp.	Sweet persimmon	Secondary	Secondary	-	Johnstone *et al.* 2010; Groom 2011; DSEWPaC 2012; DoEE 2017
Eremophila glabra	Tarbush	Secondary	-	-	Groom 2011
Erodium aureum		Secondary	-	-	Groom 2011
Erodium botrys	Long storksbill	Secondary	Secondary	-	Groom 2011; Johnstone & Storr 1998; Johnstone *et al.* 2010
Erodium spp.		Secondary	Secondary	-	Johnstone *et al.* 2010; DoEE 2017
Eucalyptus caesia	Silver princess	Secondary	-	Secondary	Johnstone *et al.* 2010; Groom 2011; DSEWPaC 2012; DoEE 2017; Johnstone 2017
Eucalyptus camaldulensis	River red gum	-	-	Secondary	DoEE 2012; DoEE 2017
Eucalyptus decipiens	Red heart/moit	-	-	Secondary	Johnstone 2017
Eucalyptus diversicolor	Karri	-	-	Primary	Johnstone *et al.* 2010; DSEWPaC 2012; DoEE 2017; Johnstone & Storr 1998
Eucalyptus erythrocorys	Illyarrie	Secondary	-	Secondary	DSEWPaC 2012; DoEE 2017; Johnstone 2017, Johnstone *et al.* 2010
Eucalyptus gomphocephala	Tuart	Secondary	-	Secondary	Johnstone *et al.* 2010; Groom 2011; DSEWPaC 2012; DoEE 2017
Eucalyptus grandis	Flooded gum, rose gum	-	-	Secondary	DoEE 2012; DoEE 2017
Eucalyptus lehmannii	Bushy yate	-	-	Secondary	Johnstone 2017
Eucalyptus leucoxylon	Yellow gum	Secondary	-	-	Groom 2014

Species name	Common name	Foraging category as assigned by Emerge			Literature references
		CBC	BBC	FRTBC	
Eucalyptus loxophleba	York gum	Secondary	-	-	Johnstone *et al.* 2010; Groom 2011; DSEWPaC 2012; DoEE 2017
Eucalyptus marginata	Jarrah	Primary	Secondary	Primary	Saunders 1980; Johnstone *et al.* 2010; Groom 2011; DSEWPaC 2012; DoEE 2017; Johnstone & Storr 1998; Johnstone & Kirkby 1999; Johnstone 2017
Eucalyptus patens	Blackbutt	Primary	-	Primary	Johnstone & Storr 1998; Johnstone & Kirkby 1999; Johnstone *et al.* 2010; DSEWPaC 2012; DoEE 2017; Johnstone 2017; Groom 2011
Eucalyptus pleurocarpa	Tallerack	Secondary	-	-	Groom 2011
Eucalyptus preissiana	Bell-fruited mallee	Secondary	-	-	Groom 2011
Eucalyptus robusta	Swamp mahogany	Secondary	-	-	Johnstone *et al.* 2010; Groom 2011
Eucalyptus salmonophloia	Salmon gum	Primary	-	-	Johnstone *et al.* 2010; Groom 2011; DSEWPaC 2012; DSEWPaC 2012; DoEE 2017
Eucalyptus staeri	Albany blackbutt	-	-	Secondary	Johnstone & Storr 1998
Eucalyptus todtiana	Coastal blackbutt	Secondary	-	-	Saunders 1980; Johnstone *et al.* 2010; Groom 2011; Johnstone & Kirkby 2008
Eucalyptus wandoo	Wandoo	Primary	Secondary	Primary	Saunders 1980; Johnstone *et al* . 2010; Groom 2011; DSEWPaC 2012; DoEE 2017
Ficus sp.	Fig	Secondary	-	-	Groom 2011
Grevillea armigera	Prickly toothbrushes	Primary	-	-	Groom 2011
Grevillea bipinnatifida	Fuschia grevillea	Primary	-	-	Groom 2011
Grevillea hookeriana	Red toothbrushes	Primary	-	-	Groom 2011
Grevillea hookeriana subsp. api	Black toothbrushes	Primary	-	-	Groom 2011
Grevillea paniculata	Kerosene bush	Primary	-	-	Groom 2011
Grevillea paradoxa	Bottlebrush grevillea	Primary	-	-	Groom 2011
Grevillea petrophiloides	Pink poker	Primary	-	-	Groom 2011
Grevillea robusta	Silky oak	Primary	-	-	Johnstone *et al.* 2010; Groom 2011

Species name	Common name	Foraging category as assigned by Emerge			Literature references
		CBC	BBC	FRTBC	
Grevillea spp.		Primary	-	-	Saunders 1979; Johnstone *et al.* 2010; DSEWPaC 2012; DoEE 2017
Grevillea wilsonii	Native fuchsia	-	Secondary	-	Johnstone *et al.* 2010
Hakea auriculata		Primary	-	-	Saunders 1980; Groom 2011
Hakea candolleana		Primary	-	-	Groom 2011
Hakea circumalata	Coastal hakea	Primary	-	-	Groom 2011
Hakea commutata		Primary	-	-	Groom 2011
Hakea conchifolia	Shell-leaved hakea	Primary	-	-	Groom 2011
Hakea costata	Ribbed hakea	Primary	-	-	Groom 2011
Hakea cristata	Snail hakea	Primary	Secondary	-	Groom 2011; Johnstone *et al.* 2010
Hakea cucullata	Snail hakea	Primary	-	-	Groom 2011
Hakea cyclocarpa	Ramshorn	Primary	-	-	Saunders 1980; Groom 2011
Hakea eneabba		Primary	-	-	Groom 2011
Hakea erinacea	Hedgehog hakea	Primary	Secondary	-	Johnstone *et al.* 2010; Groom 2011
Hakea falcata	Sickle hakea	Primary	-	-	Groom 2011
Hakea flabellifolia	Fan-leaved hakea	Primary	-	-	Groom 2011
Hakea gilbertii		Primary	-	-	Saunders 1980; Groom 2011
Hakea incrassata	Golfball or marble hakea	Primary	-	-	Johnstone *et al.* 2010; Groom 2011
Hakea lasiantha	Woolly flowered hakea	Primary	-	-	Johnstone *et al* . 2010; Groom 2011
Hakea lasianthoides		Primary	Secondary	-	Johnstone *et al.* 2010; Groom 2011
Hakea laurina	Pin-cushion hakea	Primary	-	-	Johnstone *et al.* 2010; Groom 2011
Hakea lissocarpha	Honeybush	Primary	Secondary	-	Saunders 1980; Johnstone *et al.* 2010; Groom 2011
Hakea marginata		-	Secondary	-	Johnstone *et al.* 2010
Hakea megalosperma	Lesueur hakea	Primary	-	-	Groom 2011
Hakea multilineata	Grass leaf hakea	Primary	-	-	Groom 2011
Hakea neospathulata		Primary	-	-	Groom 2011
Hakea obliqua	Needles and corks	Primary	-	-	Saunders 1980; Groom 2011
Hakea oleifolia	Dungyn	Primary	-	-	Groom 2011

Species name	Common name	Foraging category as assigned by Emerge			Literature references
		CBC	BBC	FRTBC	
Hakea pandanicarpa subsp. crassifolia	Thick-leaved hakea	Primary	-	-	Groom 2011
Hakea petiolaris	Sea urchin hakea	Primary	-	-	Groom 2011
Hakea polyanthema		Primary	-	-	Groom 2011
Hakea preissii	Needle tree	Primary	-	-	Groom 2011
Hakea prostrata	Harsh hakea	Primary	Secondary	-	Saunders 1980; Johnstone *et al.* 2010; Groom 2011
Hakea psilorrhyncha		Primary	-	-	Groom 2011
Hakea ruscifolia	Candle hakea	Primary	Secondary	-	Saunders 1980; Groom 2011; Johnstone *et al.* 2010
Hakea scoparia	Kangaroo bush	Primary	-	-	Groom 2011
Hakea smilacifolia		Primary	-	-	Groom 2011
Hakea spp.		Primary	Secondary	-	Saunders 1979; DSEWPaC 2012; DoEE 2017
Hakea stenocarpa	Narrow-fruited hakea	Primary	Secondary	-	Johnstone et al. 2010; Groom 2011
Hakea sulcata	Furrowed hakea	Primary	-	-	Groom 2011
Hakea trifurcata	Two-leaved hakea	Primary	Secondary	-	Saunders 1980; Johnstone *et al.* 2010; Groom 2011
Hakea undulata	Wavy-leaved hakea	Primary	Secondary	-	Saunders 1980; Johnstone *et al.* 2010; Groom 2011
Hakea varia	Variable-leaved hakea	Primary	Secondary	-	Saunders 1980; Groom 2011
Harpephyllum caffrum	Kaffir plum	-	-	Secondary	Johnstone 2017
Helianthus annuus	Sunflower	Secondary	-	-	Johnstone *et al.* 2010; Groom 2011
Hibiscus sp.	Hibiscus	Secondary	-	-	Groom 2011
Isopogon scabriusculus		Secondary	-	-	Groom 2011
Jacaranda mimosifolia	Jacaranda	Secondary	Secondary	-	Johnstone *et al.* 2010; Groom 2011
Jacksonia furcellata	Grey stinkwood	Secondary	-	-	Groom 2011
Kingia australis	Kingia	-	Secondary	-	Johnstone *et al.* 2010
Lambertia inermis	Chittick	Secondary	-	-	Johnstone & Storr 1998; Groom 2011
Lambertia multiflora	Many-flowered honeysuckle	Secondary	-	-	Saunders 1980; Groom 2011

Species name	Common name	Foraging category as assigned by Emerge			Literature references
		CBC	BBC	FRTBC	
Liquidamber styraciflua	Liquid amber	Primary	-	Secondary	Johnstone *et al.* 2010; Groom 2011; Groom 2014; Personal observation
Lupinus sp.	Lupin	Secondary	-	-	Saunders 1980; Groom 2011
Macadamia integrifolia	Macadamia	Primary	Secondary	-	Johnstone *et al.* 2010; Grooms 2011; Groom 2014
Malus domestica	Apple	Secondary	Secondary	-	Johnstone *et al* . 2010; Johnstone & Storr 1998; DSEWPaC 2012; DoEE 2017; Groom 2011
Melaleuca leuropoma		Secondary	-	-	Saunders 1980; Groom 2011
Melia azedarach	Cape lilac or white cedar	Secondary	-	Primary	Johnstone *et al.* 2010; Groom 2011
Mesomeleana spp.		Secondary	-	-	Johnstone *et al.* 2010; Groom 2011
Olea europea	Olive	-	-	Secondary	Johnstone 2017
Persoonia longifolia	Snottygobble	-	-	Secondary	Johnstone & Storr 1998; Johnstone & Kirkby 1999; Johnstone *et al.* 2010; DSEWPaC 2012; DoEE 2017
Pinus canariensis	Canary island pine	Primary	-	-	Johnstone *et al.* 2010; Groom 2011
Pinus caribea	Caribbean pine	Primary	-	-	Johnstone *et al.* 2010; Groom 2011
Pinus pinaster	Pinaster or maritime pine	Primary	-	-	Groom 2011
Pinus radiata	Radiata pine	Primary	Secondary	-	Johnstone *et al.* 2010; Groom 2011
Pinus spp.		Primary	Secondary	-	Johnstone & Storr 1998; Saunders 1979; Johnstone *et al.* 2010; DSEWPaC 2012; DoEE 2017
Protea 'Pink Ice'		Secondary	-	-	Groom 2011
Protea repens		Secondary	-	-	Groom 2011
Protea spp.		Secondary	-	-	Johnstone *et al.* 2010
Prunus amygdalus	Almond tree	Secondary	-	-	Johnstone & Storr 1998; Johnstone *et al.* 2010; Groom 2011; DoEE 2017
Pyrus communis	European pear	-	Secondary	-	Johnstone & Storr 1998; Johnstone *et al.* 2010; DSEWPaC 2012; DoEE 2017
Quercus spp.	Oak	-	Secondary	-	Johnstone *et al.* 2010

Species name	Common name	Foraging category as assigned by Emerge			Literature references
		CBC	BBC	FRTBC	
Raphanus raphanistrum	Wild radish	Secondary	-	-	Groom 2011; DoEE 2017
Reedia spathacea		-	Secondary	-	Johnstone *et al.* 2010
Rumex hypogaeus	Doublegee	Secondary	-	-	Saunders 1980
Stenocarpus sinuatus		Secondary	-	-	Johnstone *et al.* 2010
Syzygium smithii	Lilly pilly	Secondary	-	-	Groom 2014
Tipuana tipu	Tipu or rosewood tree	Primary	-	-	Groom 2011, Groom 2014
Xanthorrhoea preissii	Grass tree	Secondary	Secondary	-	Groom 2011; Johnstone *et al.* 2010
Xylomelum occidentale	Woody pear	Secondary	-	-	Groom 2014

CBC=Carnaby's black cockatoo, BBC=Baudin's black cockatoo and FRTBC=Forest red-tailed black cockatoo

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Attachment B: Concept Landscape Plans (Emerge Associates 2024)

FUTURE ROADWORKS BY OTHERS

WOLLASTON AVE

RESIDENTIAL LOTS

RESIDENTIAL LOTS

FORREST ROAD

TOWN CENTRE MEDIUM DENSITY HOUSING

NEW ENTRY ROAD

HILBERT TOWN CENTRE STAGE 1 RETAIL

WEATHERLY WAY

EXISTING SHIPWRECK PARK

ELEVENTH ROAD

LEGEND

- EOW - STAGE ONE
- EOW - STAGE TWO
- CONCRETE PATH BY CIVIL
- GROUNDCOVER PLANTING
- SHRUB PLANTING
- RED BRICK PAVING
- ROAD
- PROPOSED TREES

NOTE: IRRIGATION TO BE CONNECTED TO FUTURE BORE IN NEERIGEN BROOK STAGE 6

SIENNA WOOD

FORREST ROAD UPGRADE - LANDSCAPE CONCEPT

DWG **SI-61-01**
REV **D**
DATE **12.09.2024** SCALE **1 : 1500 @ A1**

emerge ASSOCIATES

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LEGEND

- EOW - STAGE ONE
- EOW - STAGE TWO
- CONCRETE PATH BY CIVIL
- GROUNDCOVER PLANTING
- SHRUB PLANTING
- RED BRICK PAVING
- ROAD
- PROPOSED TREES

NOTE: IRRIGATION TO BE CONNECTED TO FUTURE BORE IN NEERIGEN BROOK STAGE 6

LOCATION PLAN

SIENNA WOOD

FORREST ROAD UPGRADE - DETAIL PLAN ONE

DWG **SI-61-02**
REV **D**
DATE **12.09.2024** SCALE **1 : 750 @ A1**

emerge ASSOCIATES

LIMESTONE RETAINING WALL

RESIDENTIAL LOTS

FORREST ROAD

IL +26.25

EXISTING PAVERS TO WEATHERLY WAY MEDIAN

DRAINAGE BASIN

IL +26.25

JOINT PAGE SI-61-2

WEATHERLY WAY

EXISTING PLANTED VERGE

EXISTING WEATHERLY WAY STREETSCAPE

EXISTING SHIPWRECK PARK

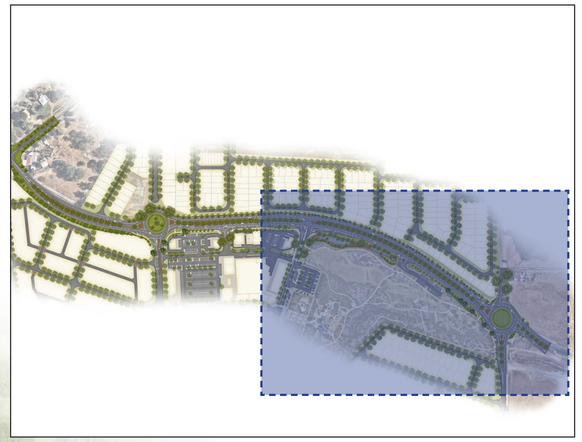
ELEVENTH ROAD

EXISTING DOG PARK

LEGEND

- EOW - STAGE ONE
- EOW - STAGE TWO
- CONCRETE PATH BY CIVIL
- GROUNDCOVER PLANTING
- SHRUB PLANTING
- RED BRICK PAVING
- ROAD
- PROPOSED TREES

NOTE: IRRIGATION TO BE CONNECTED TO FUTURE BORE IN NEERIGEN BROOK STAGE 6



LOCATION PLAN

SIENNA WOOD

FORREST ROAD UPGRADE - DETAIL PLAN TWO

DWG **SI-61-03**
REV **D**
DATE **12.09.2024** SCALE **1 : 750 @ A1**

emerge ASSOCIATES

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EXISTING CANOPY = **5,191 sq.m**

LEGEND

- EOW - STAGE ONE
- EOW - STAGE TWO
- EXISTING TREES

NOTE: IRRIGATION TO BE CONNECTED TO FUTURE BORE IN NEERIGEN BROOK STAGE 6

SIENNA WOOD

FORREST ROAD UPGRADE - EXISTING TREES

DWG **SI-61-04**
REV **D**
DATE **12.09.2024** SCALE **1 : 1500 @ A1**

emerge ASSOCIATES

PROPOSED CANOPY AT MATURITY = **19,207 sq.m**
PROPOSED CANOPY AT INSTALLATION = **4,014 sq.m**

LEGEND

- EOW - STAGE ONE
- EOW - STAGE TWO
- PROPOSED TREES AT MATURITY

NOTE: IRRIGATION TO BE CONNECTED TO FUTURE BORE IN NEERIGEN BROOK STAGE 6

SIENNA WOOD

FORREST ROAD UPGRADE - PROPOSED TREES

DWG **SI-61-05**
REV **D**
DATE **12.09.2024** SCALE **1 : 1500 @ A1**

emerge ASSOCIATES

U:\CURRENT PROJECTS\Sienna Wood - Stockland\(SI-61) Drawings Forrest Rd Upgrade\INDD\SI-61_Forrest Road Upgrade_240905.indd

Eucalyptus rudis
Flooded Gum
100 Litre
Total: 12

Corymbia callophylla
Marri
500 Litre
Total: 6

Melaleuca quinquinervia
Broad-Leafed Paperbark
200 Litre
Total: 36

Eucalyptus wandoo
White Gum
100 Litre
Total: 89

Melaleuca preissiana
Stout Paperbark
200 Litre
Total: 38

Eucalyptus gomphocephala
Tuart
200 Litre
Total: 6

Melaleuca rhaphiophylla
Swamp Paperbark
200 Litre
Total: 76

Allocasuarina fraseriana
Sheoak
500 Litre
Total: 83

LOCATION PLAN

SIENNA WOOD

FORREST ROAD UPGRADE - STREET TREE PLAN ONE

DWG **SI-61-06**
REV **D**
DATE **12.09.2024** SCALE **1 : 750 @ A1**

emerge ASSOCIATES

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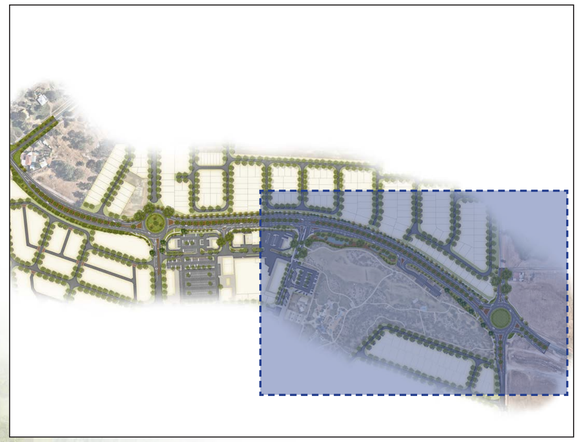


LOCATION PLAN

FORREST ROAD

WEATHERLY WAY

ELEVENTH ROAD

JOINT PAGE SI-61-4

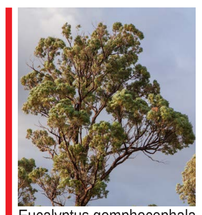
Eucalyptus rudis
Flooded Gum
100 Litre
Total: 12

Corymbia callophylla
Marri
500 Litre
Total: 6

Melaleuca quinquinervia
Broad-Leafed Paperbark
200 Litre
Total: 36

Eucalyptus wandoo
White Gum
100 Litre
Total: 89

Melaleuca preissiana
Stout Paperbark
200 Litre
Total: 38



Eucalyptus gomphocephala
Tuart
200 Litre
Total: 6

Melaleuca rhaphiophylla
Swamp Paperbark
200 Litre
Total: 76

Allocasuarina fraseriana
Sheoak
500 Litre
Total: 83

SIENNA WOOD

FORREST ROAD UPGRADE - STREET TREE PLAN TWO

DWG **SI-61-07**
REV **D**
DATE **12.09.2024** SCALE **1 : 750 @ A1**

emerge ASSOCIATES

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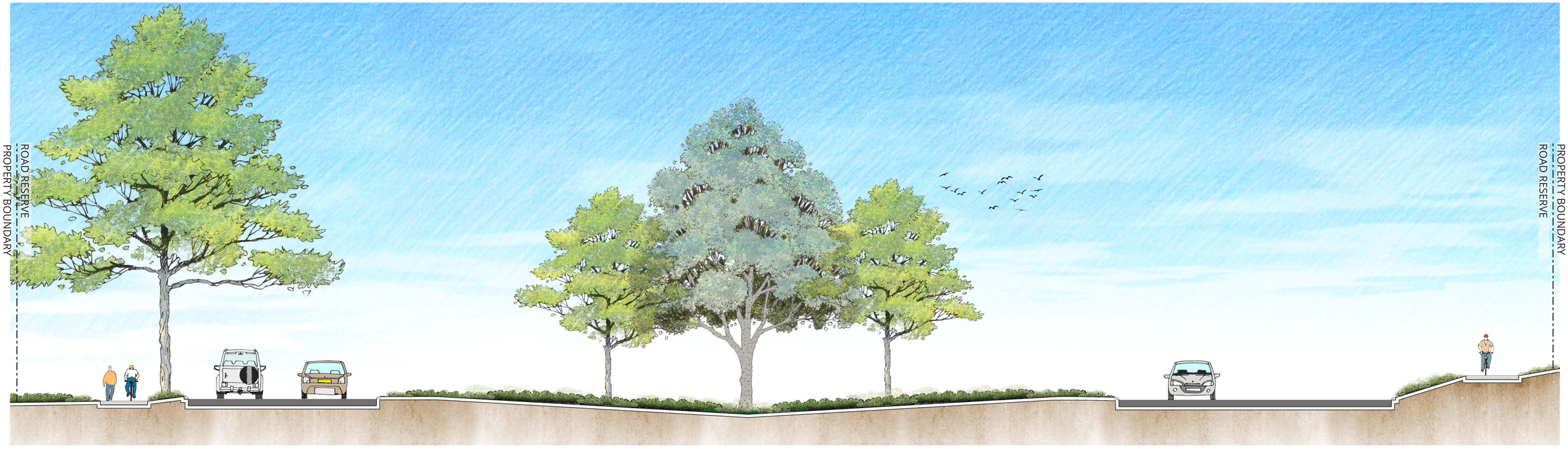

SECTION AA

SECTION BB

SIENNA WOOD

FORREST ROAD UPGRADE - TYPICAL SECTIONS

DWG **SI-61-08**
REV **D**
DATE **12.09.2024**
SCALE **1 : 100 @ A1**
0 1 2 3 4 5 m

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LOW SHRUB PLANTING


Acacia pulchella


Acacia saligna


Lomandra longifolia 'Tanika'


Gastrolobium capitatum


Hakea varia


Philotheca spicata


Banksia nivea


Gompholobium confertum


Melaleuca thymoides


Regelia ciliata


Regelia inops


Taxandria linearitolia


Jacksonia furcellata


Kennedia prostrata


Melaleuca trichophylla


Orthrosanthus laxus


Conostylis candicans


Dianella revoluta

GROUNDCOVER PLANTING

SIENNA WOOD
LANDSCAPE PLANTING PALETTE

DWG **SI-61-09**
REV **D**
DATE **12.09.2024**

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Attachment C: Planting Palette – Black Cockatoo Habitat Values

Planting Palette – Black Cockatoo Habitat Values

Type	Species	BC breeding habitat	BC roosting habitat	CBC foraging habitat	FRTBC foraging habitat	BBC foraging habitat
Tree	*Allocasuarina fraseriana* (sheoak)	Yes	Yes	No	Yes	Yes
Tree	*Corymbia callophylla* (marri)	Yes	Yes	Yes	Yes	Yes
Tree	*Eucalyptus gomphocephala* (tuart)	Yes	Yes	Yes	Yes	No
Tree	*Eucalyptus rudis* (flooded gum)	Yes	Yes	No	No	No
Tree	*Eucalyptus wandoo* (white gum)	Yes	Yes	Yes	Yes	Yes
Tree	*Melaleuca preissiana* (stout paperbark)	Potential[1]	Potential[2]	No	No	No
Tree	*Melaleuca quinquinervia* (broad-leafed paperbark)	No	Potential[2]	No	No	No
Tree	*Melaleuca rhaphiophylla* (swamp paperbark)	Potential[1]	Potential[2]	No	No	No
Low shrub	*Acacia pulchella*	No	No	No	No	No
Low shrub	*Acacia saligna*	No	No	Yes	No	No
Low shrub	*Conostylis candicans*	No	No	No	No	No
Low shrub	*Dianella revoluta*	No	No	No	No	No
Low shrub	*Gastrolobium capitatum*	No	No	No	No	No
Low shrub	*Hakea varia*	No	No	Yes	No	Yes
Low shrub	*Jacksonia furcellata*	No	No	Yes	No	No
Low shrub	*Lomandra longifolia* 'Tanika'	No	No	No	No	No
Low shrub	*Melaleuca thymoides*	No	No	No	No	No
Low shrub	*Regelia ciliata*	No	No	No	No	No
Low shrub	*Regelia inops*	No	No	No	No	No
Low shrub	*Taxandria linearitolia*	No	No	No	No	No
Groundcover	*Banksia nivea*	No	No	Yes	No	Yes
Groundcover	*Gompholobium confertum*	No	No	No	No	No
Groundcover	*Kennedia prostrata*	No	No	No	No	No
Groundcover	*Melaleuca trichophylla*	No	No	No	No	No
Groundcover	*Orthrosanthus laxus*	No	No	No	No	No
Groundcover	*Philotheca spicata*	No	No	No	No	No

[1] Melaleuca trees typically don't grow large enough to develop hollows of a suitable size and height off the ground for BCs, however the potential for long-lived and large specimens to produce hollows in the long-term cannot be ruled out. Non-native Melaleucas are not considered to represent breeding trees.

[2] BCs can roost in any large trees, however Melaleuca trees are less likely to reach a suitable height and provide adequate branch structure to support black cockatoo roosting.