Report

Naturaliste Heights Residential Development - Lot 9020 Martingale Road, Dunsborough, WA

Dunsborough Joint Venture

Preliminary Documentation

(Rev 3)

Prepared by: EDS Environmental

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1. Introduction

1.1 Background

Dunsborough Joint Venture (herein referred to as the proponent) proposes the development of residential lots (the Proposal) within Lot 9020 (previously 9019) Martingale Road, Dunsborough (herein referred to as the Proposal area) (refer to **Figure 1**). The Proposal area is currently zoned primarily as 'Residential' land use under the City of Busselton Town Planning Scheme No. 21.

The Proposal will require the removal of **2.3 hectares** (ha) of vegetation (disturbance footprint). In contrast, **18.9 ha** of native vegetation within the Proposal area will be surrendered and put into a conservation reserve (Conservation area), as presented in **Figure 2.** Additionally, the establishment of the Conservation area will include the rezoning of **8.85 ha** of land currently zoned as 'Residential' to 'Parks and Recreation' (**Figure 3**) and rehabilitation of no less than **8 ha**.

The Proposal was referred to the Department of the Environment and Energy (DotEE; now the Department of Climate Change, Energy, the Environment and Water [DCCEWW]) on October 10, 2018, due to anticipated impacts on Matters of National Environmental Significance (MNES) protected under the *Environmental Protection and Biodiversity Conservation Act 1999* (EPBC Act). The Proposal referred to at the time included a disturbance footprint of **11.5 ha**.

- On 19th December 2018, a delegate of the Minister for the Environment determined that the Proposal is a controlled action and will be assessed by preliminary documentation on the basis of potential impacts to threatened species and communities, including:
- Baudin's cockatoo (*Zanda baudinii*).
- Carnaby`s cockatoo (*Zanda latirostris*).
- Forest red-tailed black cockatoo (*Calyptorhynchus banksii naso*).
- Western ringtail possum (*Pseudocheirus occidentalis*).
- Giant spider-orchid (*Caladenia exelsa)*.
- Banksia Woodlands of the Swan Coastal Plain Threatened Ecological Community (TEC).

Following the completion of biological investigations, the following MNES have been confirmed as present or having a high likelihood of occurrence within the Proposal area:

- Baudin's cockatoo (*Zanda baudinii*).
- Carnaby`s cockatoo (*Zanda latirostris*).
- Forest red-tailed black cockatoo (*Calyptorhynchus banksii naso*).
- Western ringtail possum (*Pseudocheirus occidentalis*).

1.2 Summary of all components of the Proposal

The Proposal is comprised of the following elements:

- Residential lots and internal road network (disturbance footprint) – **2.3 ha** (excluding cleared areas).
- Conservation area – **18.9 ha.**

1.3 Description of the activities associated with the Proposal

The Proposal will result in the removal of up to **2.3 ha** of native vegetation to facilitate the development. The Proposal will involve:

- Earthworks and the construction of roads, drainage basins and infrastructure to service the development. This includes sewerage, water, and electricity.
- Rezoning of approximately **8.85 ha** of 'Residential' zoned land to 'Parks and Recreation' under the City of Busselton Local Planning Scheme (LPS) No. 21, and inclusion into the Conservation area.
- Rehabilitation of at least **8 ha** within the **18.9 ha** Conservation area.

1.4 Changes since referral

The Proposal has undergone several amendments since referral, which considered an initial disturbance footprint of 11.5 ha. This includes:

- Draft Preliminary Document submission increased the disturbance footprint to **12.5 ha** and reduced the Conservation area to **12.4 ha**.
- Following the results of a targeted western ringtail possum and black cockatoo survey completed in 2022 (Biologic, 2022), the disturbance footprint was reduced to **9.3 ha** to avoid areas where western ringtail possum observations are at their highest[1] and minimise clearing to areas considered to represent the highest-quality habitat for western ringtail possum (WRP) and black cockatoo.
- Disturbance footprint further reduced to **2.3 ha** with an increase in Conservation area, following consultation with DCCEEW and review of results from a targeted western ringtail possum survey in 2023 (Western Environmental, 2023).
- Removal of all external APZs impacting the Conservation area through revised subdivision design.

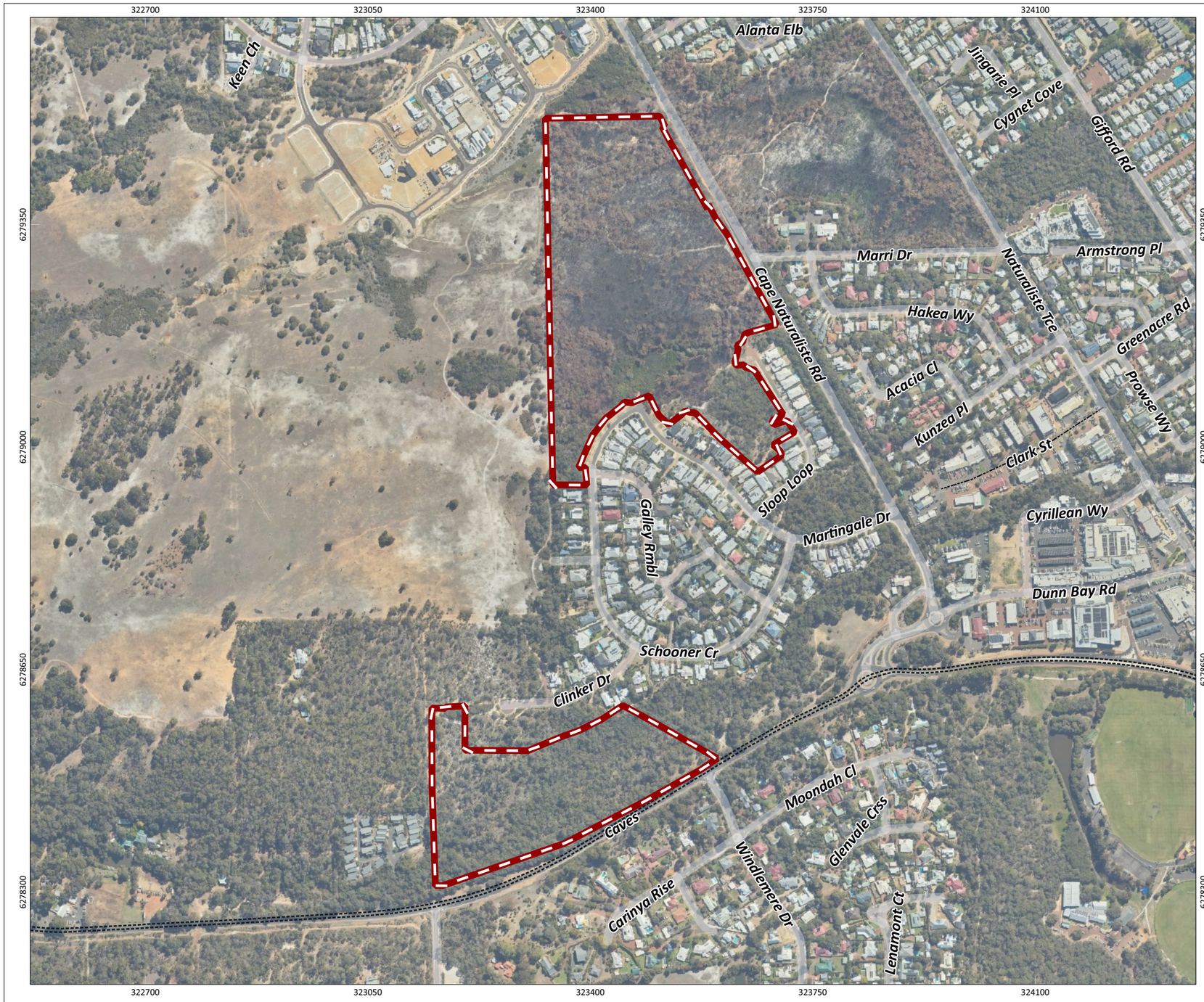
1.5 Purpose and scope of this document

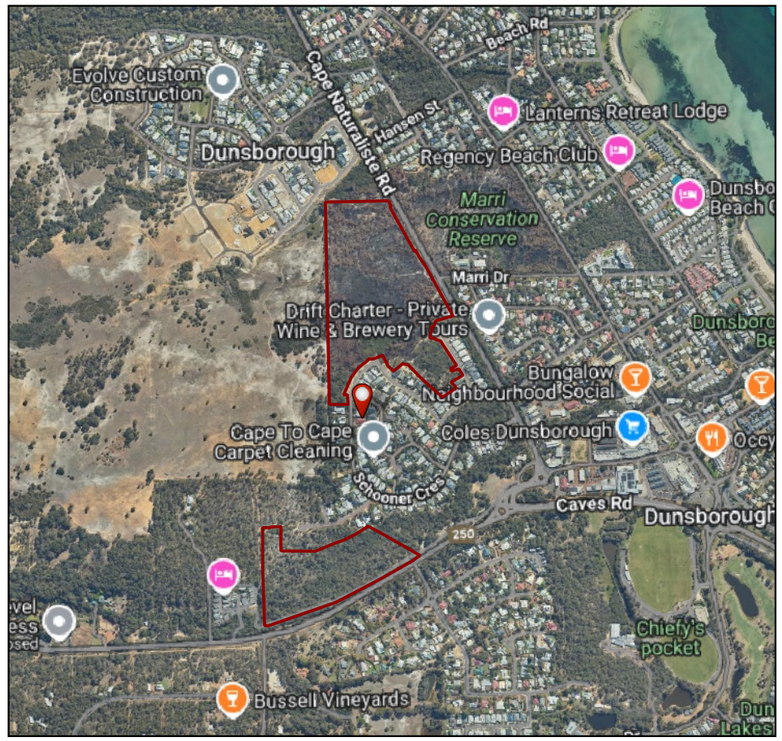
This document provides a detailed response to the additional information requested by DCCEEW following the controlled action decision upon referral. The scope of this document is to provide sufficient information for DCCEEW to complete their assessment of the Proposal. This includes the results of recent biological investigations, increased conservation areas and reduced impact areas.

1.6 Structure of this document

This document is structured to provide additional context for the identified MNES, and addresses the request for further information from DCCEEW. The full description of the Proposal is not intended to be restated as provided in the referral document.

[1] Based on three annual multiple night surveys





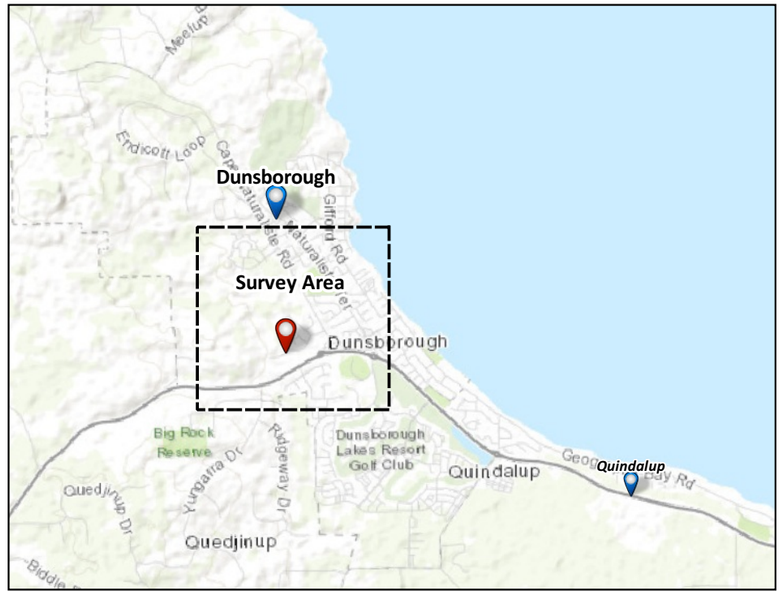


Figure 1: Proposal Area

N

0 100 200 300 400 m

PROJECT/REPORT NAME	Preliminary Documentation Lot 9020 Martingale Road, Dunsborough
SCALE	1:7,000
SHEET SIZE	A3 COLOUR
CLIENT	Dunsborough Joint Venture
COORDINATE REFERENCE SYSTEM	GDA2020 / MGA zone 50
PROJECT NUMBER	A25.024
VERSION	0
DATA SOURCE	LANDGATE AERIAL IMAGERY NOW
DRAWN BY / REVIEWED BY	MD/BH
DATE	21/7/2025

Legend

Proposal Area

No	Description	Drawn	Approved	Date
A	Original issue	MD	BH	21/7/2025

NOTES:

Cadastral boundary (LGATE-002). Base map ESRI Topo. Townsites (LGATE-248).

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Figure 2: Disturbance Footprint and Conservation Area

PROJECT/REPORT NAME: Preliminary Documentation Lot 9020 Martingale Road, Dunsborough		
SCALE: 1:4,445	SHEET SIZE: A3 COLOUR	CLIENT: Dunsborough Joint Venture
COORDINATE REFERENCE SYSTEM: GDA2020 / MGA zone 50	PROJECT NUMBER: A25.024	VERSION: 0
DATA SOURCE: LANDGATE AERIAL IMAGERY NOW	DRAWN BY / REVIEWED BY: MD/BH	DATE: 21/7/2025

Legend

- Proposal Area
- Disturbance Footprint
- Conservation Offset Area

No	Description	Drawn	Approved	Date
A	Original issue	MD	BH	21/7/2025

NOTES:

Cadastral boundary (LGATE-002). Label corresponds to the vegetation association number.

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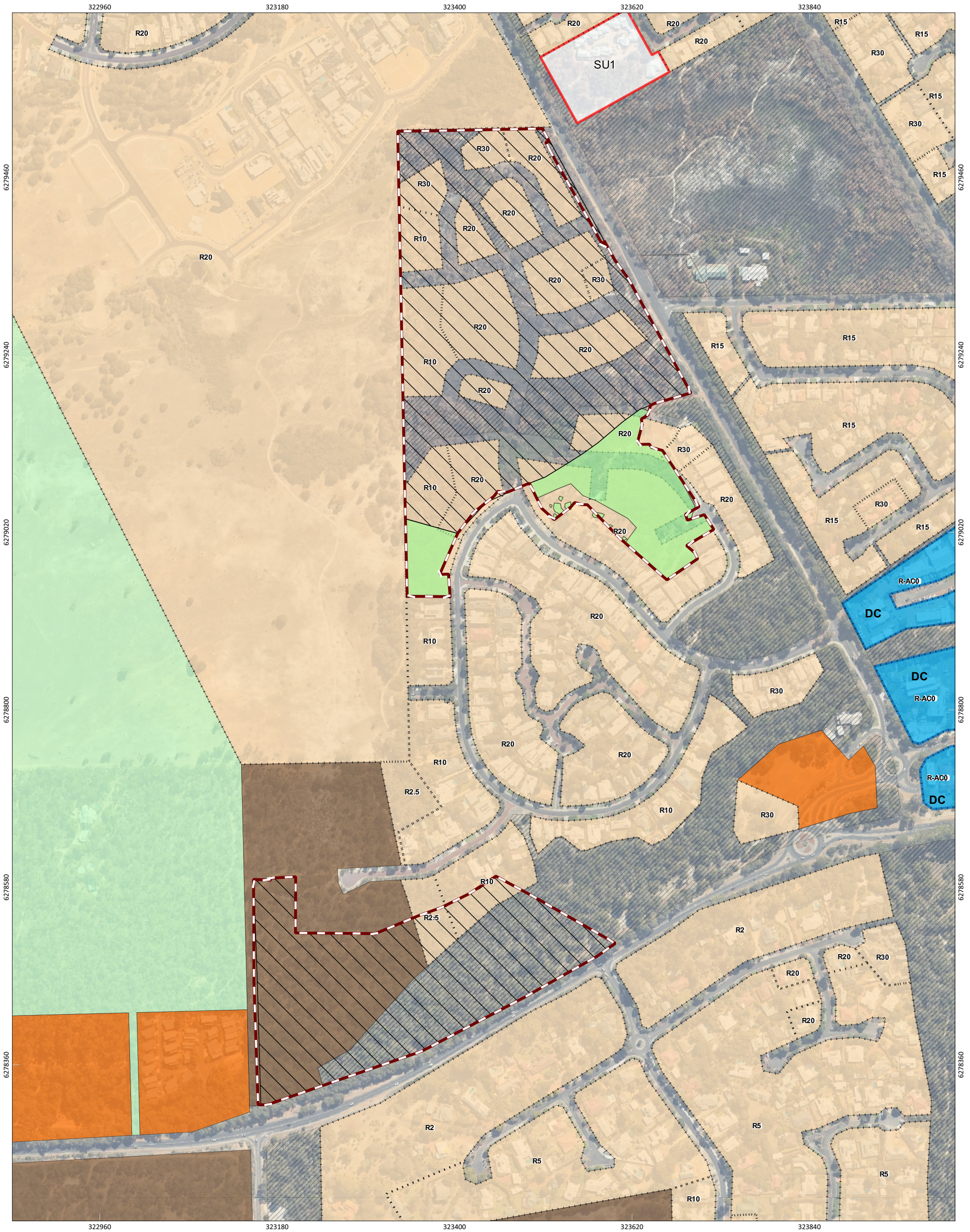

Figure 3: Disturbance Footprint and Conservation Area

0 40 80 120 160 m

N

PROJECT/REPORT NAME	Preliminary Documentation Lot 9020 Martingale Road, Dunsborough
SCALE	1:4,400
SHEET SIZE	A3 COLOUR
CLIENT	Dunsborough Joint Venture
COORDINATE REFERENCE SYSTEM	GDA2020 / MGA zone 50
PROJECT NUMBER	A25.024
VERSION	0
DATA SOURCE	LANDGATE AERIAL IMAGERY NOW
DRAWN BY / REVIEWED BY	MD/BH
DATE	21/7/2025

Legend

- Proposal Area
- Disturbance Footprint
- Conservation Offset Area
- Local Planning Scheme - R Codes (DPLH-070)

Local Planning Scheme - Zones and Reserves (DPLH-071)

- District centre
- Public purposes
- Recreation
- Residential
- Rural
- Rural residential
- Special use
- Tourism

No	Description	Drawn	Approved	Date
A	Original issue	MD	BH	21/7/2025

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2. Existing Environment

2.1 Topography, geology and soils

Topography across the Proposal area is mapped as gently rising from 14 m Australian Height Datum (AHD) at the eastern boundary to 22 m AHD at the western boundary.

The Proposal area is located across three soil systems, including:

- Abba System (213ab) – defined as 'Poorly drained flats, on the southern Swan Coastal Plain. Grey deep sandy duplex and wet soil. Jarrah-marri-paperbark woodland'.
- Spearwood System (211Sp) – defined as 'Sand dunes and plains. Yellow deep sands, pale deep sands and yellow/brown shallow sands'.
- Whicher Scarp System (214Ws) – defined as 'Low scarp and raised platform, on the northern edge of the Donnybrook Sunkland. Sandy gravel and pale deep sands, loamy gravel and non-saline wet soils. Jarrah-marri forest and woodland'.

2.2 Hydrology

A paluslope wetland is located in the central lower part of the northern proposal area (**Figure 4**). This includes areas of free-standing water and seasonally waterlogged and inundated soils. Surface water flow into the wetland via a drainage line from the west, which enters the Proposal area within the bounds of the Conservation area, approximately 140 m north of the disturbance footprint (**Figure 4**). No impacts to the drainage line are anticipated as a result of the Proposal.

The wetland is proposed to be included within the Conservation area and subject to further protection through the implementation of an Urban Water Management Plan (UWMP). The UWMP is being prepared to support the State planning approval process and will be reviewed by the Department of Biodiversity Conservation and Attractions (DBCA). Additionally, a Stormwater Management Strategy will be implemented (McDowall Affleck, 2024; **Appendix A**)

The southern section of the Proposal area includes Dugalup Brook; a small, seasonal creek that runs parallel to Caves Road towards the Dunsborough town centre. Dugalup Brook will be protected as a component of the Conservation area.

Groundwater within the Proposal area varies in depth between seasons, as presented in **Table 1** and **Table 2**. Hydrological features within the Proposal area are presented in **Figure 4**.

Table 1: Groundwater levels within the Proposal area (mRL) (2018)

Monitoring Location	18-Jul	16-Aug	20-Sep	19-Oct	26-Nov
GW1	1.34	1.07	1.225	1.325	1.65
GW2	2.26	1.18	1.49	1.64	2.03
GW3	1.1	0.97	1.045	1.07	1.155
GW4	1.555	1.41	1.595	1.63	1.795
GW5	1.93	1.235	1.15	1.19	1.295
GW6	2.69	1.57	1.54	1.73	2.32
GW7	2.16	1.86	2.045	2.2	2.47

Table 2: Groundwater levels within the Proposal area (mRL) (2022)

Monitoring Location	18-Jul	16-Aug	20-Sep	19-Oct	26-Nov
GW1	2.71	2.36	1.77	1.4	1.22
GW2	3.07	3.12	2.63	2.09	1.74
GW3	2.72	2.41	1.56	1.1	0.98
GW4	2.6	2.54	1.65	1.55	1.54
GW5	2.71	2.58	2.18	1.72	1.34
GW6	4.52	4.52	4.53	2.95	2.23
GW7	2.45	2.45	2.45	2.13	2.19

2.3 Vegetation and Flora

2.3.1 Vegetation

Ten native vegetation units (VUs) were defined and mapped within the Proposal area (Accendo, 2018).

The VUs are summarised in **Table 3** and presented in **Figure 5**.

Table 3: Vegetation Units within the Proposal area

Vegetation Type	Description	Area (ha)
VU1: *Corymbia* calophylla – Banksia grandis woodland:	Woodland of *Corymbia calophylla*, *Eucalyptus marginata* and *Banksia grandis* over open shrubland of *Xanthorrhoea preissii* and *Xylomelum occidentale* over rushes and herbs, including *Desmocladus flexuosus* and *Cyathochaeta avenacea*.	5.33
VU2: Corymbia calophylla woodland	Woodland of Corymbia calophylla and Agonis flexuosa over *Trymalium odoratissimum* subsp. *odoratissimum* and *Xanthorrhoea preissii* over *Tetraria* sp. Jarrah Forest and *Hibbertia hypericoides* on brown sandy loams.	5.50
VU3: *Stirlingia latifolia* – *Nuytsia floribunda* shrubland	Open low shrubland of *Stirlingia latifolia* and *Jacksonia furcellata* with emergent *Nuytsia floribunda* and *Agonis flexuosa* over rushes and herbs including *ypolaena exsulca* on grey sands.	0.67
VU4: *Agonis flexuosa* - *Banksia attenuata* low woodland	Low open forest of *Agonis flexuosa*, *Banksia attenuata* and *Corymbia calophylla* over tall open shrubland of *Taxandria linearifolia* and *Acacia saligna* over low open shrubland of *Adenanthos meisneri*, *Pteridium esculentum* and *Macrozamia riedlei* on brown loamy sands.	0.92
VU5: *Agonis flexuosa* riparian woodland	Woodland of *Agonis flexuosa*, *Corymbia calophylla* and *Eucalyptus patens* over an open shrubland of *Trymalium odoratissimum* subsp. *trifidum*, *Acacia divergens* and *Callistachys lanceolata* over sedgeland of *Lepidosperma tetraquetrum* on damp brown loams.	0.84
VU6: Paluslope wetlands	Low open forest of *Melaleuca preissiana* and *Banksia littoralis* over tall sparse shrubland of *Taxandria linearifolia* and *Astartea scoparia* over sedgeland of *Cyathochaeta teretifolia* and/or *Hypolaena grandiuscula* in damp brown silty loams.	3.01
VU7: Dunsborough Forest Swamp	Open forest of *Eucalyptus patens* and *Melaleuca rhaphiophylla* over tall shrubland of *Spyridium globulosum*, *Exocarpos odoratus* and *Xanthorrhoea preissii* over sedgeland of *Baumea juncea* in brown loamy sands.	2.84

VU8: *Melaleuca preissiana* - **Typha orientalis* rushland	Closed rushland of **Typha orientalis* with emergent *Taxandria linearifolia* in deeper freestanding water.	1.30
VU9: *Melaleuca preissiana – Cyathochaeta teretifolia* open forest	Woodland of *Melaleuca preissiana* and *Corymbia calophylla* over sparse *Agonis flexuosa* and *Taxandria linearifolia* over open sedgeland of *Cyathochaeta teretifolia* on yellow clayey sands.	1.11
VU10: Bassendean Orange Sands	No Description provided.	0.08
Total		**21.6**

Vegetation condition within the wider Proposal area was assessed as part of the Flora and Vegetation Survey undertaken in 2018 (Accendo, 2018). The vegetation condition across most of the Proposal area was assessed as 'Very Good' to 'Excellent' condition, with some areas of 'Degraded' or 'Completely Degraded'. The vegetation condition within the Proposal area is presented in **Figure 6**.

Accendo (2018) describes the *Melaleuca preissiana – Cyathachaeta teretifolia* open forest vegetation type in the north of the Proposal area as having lost most of its structure due to potential historic clearing. A review of historic aerial imagery indicates that much of the Proposal area had been cleared prior to 1970. It is assumed that natural recruitment occurred between 1970 and 1996, resulting in re-established vegetation within the Proposal area, as shown in **Plate 1**.

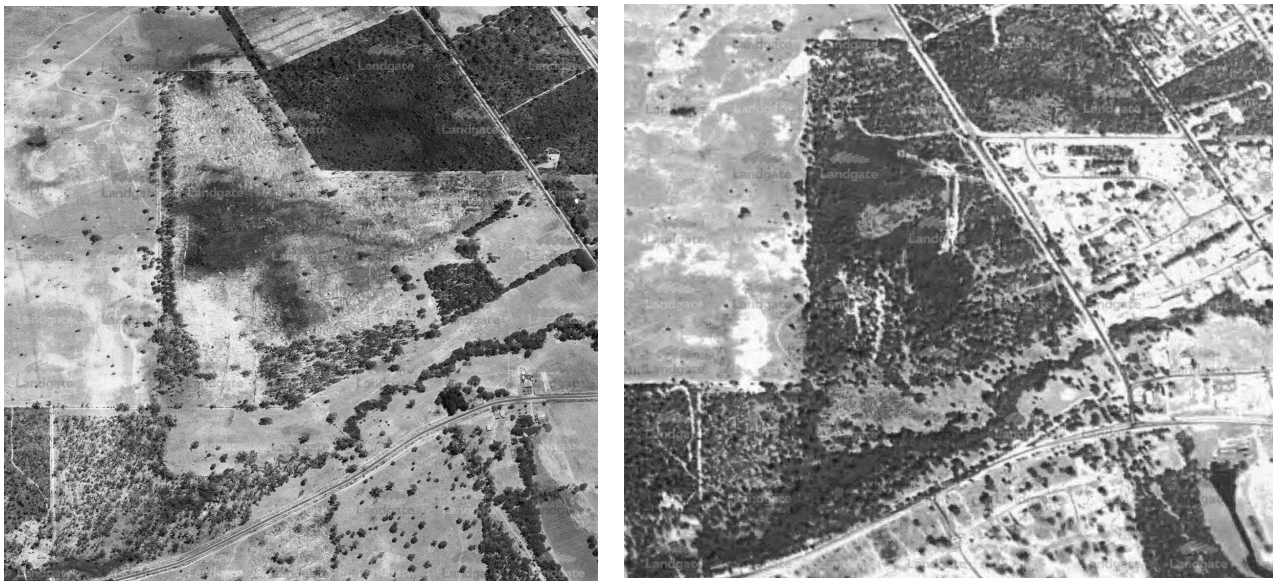

Plate 1: Proposal area in 1970 (Left) and 1996 (Right)

2.3.2 Flora

A total of 158 native and 26 non-native (introduced and cultivated) taxa were recorded within the Proposal area, representing 52 families and 128 genera (Accendo, 2018). The dominant families containing mostly native taxa were *Myrtaceae* (16 native taxa), *Fabaceae* (21 native taxa, 3 non-native taxa), *Orchidaceae* (13 native taxa) and *Cyperaceae* (13 native taxa) (Accendo, 2018).

No Threatened or Priority flora species under the EPBC Act or *Biodiversity Conservation Act 2016* (BC Act) were recorded within the Proposal area, and no TECs or Priority Ecological Communities were identified within the Proposal area.

Figure 4: Topography and Hydrology

N 0 40 80 120 160 m	PROJECT/REPORT NAME: Preliminary Documentation Lot 9020 Martingale Road, Dunsborough		
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DATA SOURCE: LANDGATE AERIAL IMAGERY NOW		DRAWN BY / REVIEWED BY: MD/BH	DATE: 21/7/2025

Legend

- Proposal Area
- Disturbance Footprint
- Conservation Offset Area
- 2 metre contours (DPIRD-072)

Geomorphic Wetlands Leeuwin Naturaliste Ridge and Donnybrook to Nannup - Unreviewed (DBCA-043)

- Floodplain

No	Description	Drawn	Approved	Date
A	Original issue	MD	BH	21/7/2025

NOTES:

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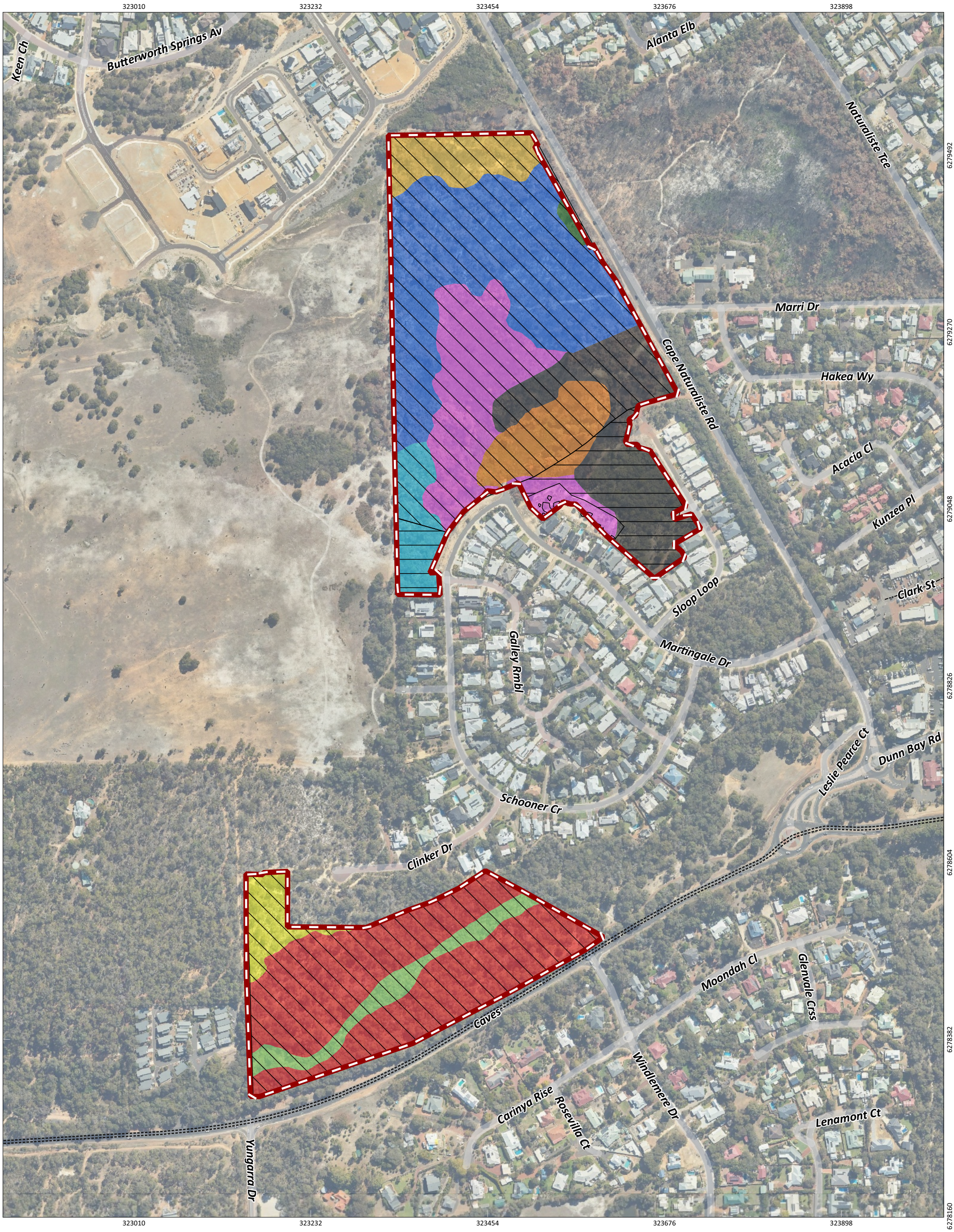

Figure 5: Vegetation Units

N

0 40 80 120 160 m

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CLIENT	Dunsborough Joint Venture
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PROJECT NUMBER	A25.024
VERSION	0
DATA SOURCE	LANDGATE AERIAL IMAGERY NOW
DRAWN BY / REVIEWED BY	MD/BH
DATE	21/7/2025

Legend

- Proposal Area
- Disturbance Footprint
- Conservation Offset Area
- Agnois flexuosa - Banksia attenuata low woodland
- Agnois flexuosa riparian woodland
- Bassendean Orange Sands
- Corymbia calophylla - Banksia grandis woodland
- Corymbia calophylla woodland
- Dunsborough Swamp Forest
- Melaleuca preissiana - Cyathochaeta teretifolia woodland
- Melaleuca preissiana - Typha orientalis
- Paluslope Wetland
- Stirlingia latifolia - Nuytsia floribunda shrubland

No	Description	Drawn	Approved	Date
A	Original issue	MD	BH	21/7/2025

NOTES:

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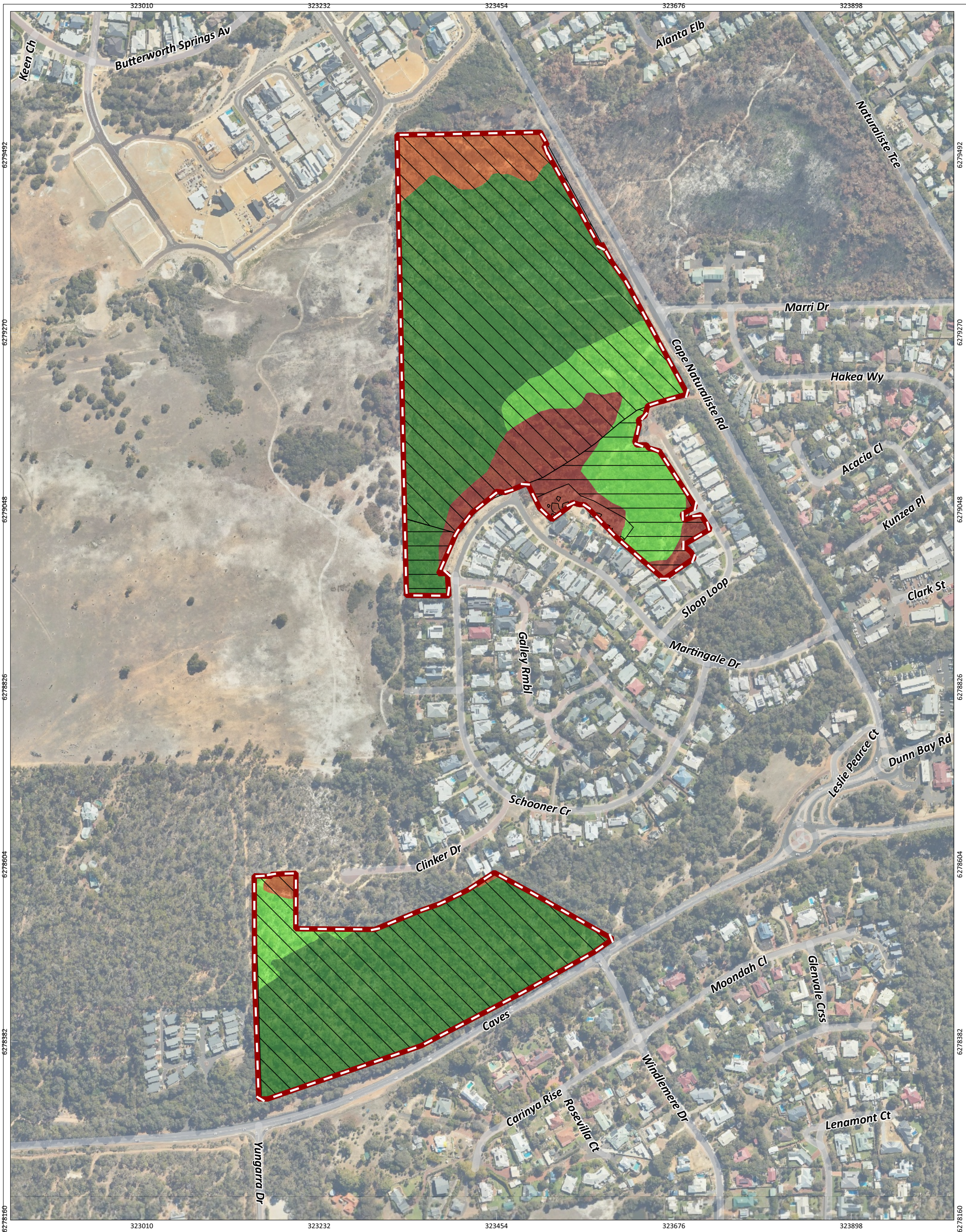

Figure 6: Vegetation Condition

N

0 40 80 120 160 m

PROJECT/REPORT NAME	Preliminary Documentation Lot 9020 Martingale Road, Dunsborough
SCALE	1:4,445
SHEET SIZE	A3 COLOUR
CLIENT	Dunsborough Joint Venture
COORDINATE REFERENCE SYSTEM	GDA2020 / MGA zone 50
PROJECT NUMBER	A25.024
VERSION	0
DATA SOURCE	LANDGATE AERIAL IMAGERY NOW
DRAWN BY / REVIEWED BY	MD/BH
DATE	22/7/2025

Legend

- Proposal Area
- Disturbance Footprint
- Conservation Offset Area
- Completely degraded
- Degraded
- Very Good
- Excellent

No	Description	Drawn	Approved	Date
A	Original issue	MD	BH	22/7/2025

NOTES:

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3. Matters of National Environmental Significance

3.1 Studies and Surveys

The Proposal area has been extensively surveyed to identify flora, vegetation, and terrestrial fauna values. **Table 4** provides an overview of these surveys.

Since the submission of the first draft Preliminary Document, the following additional surveys have been undertaken:

- Biologic (2022) – a targeted black cockatoo and WRP survey was undertaken for the Proposal area. The primary objective of the targeted survey was to determine the continued presence, distribution, and abundance of WRP's within the Proposal area, and undertake further black cockatoo habitat assessment for all three species. This included re-assessment of previously identified suitable hollows, as recorded by Harewood (2017).
- Stream Environmental (2022) – targeted survey for the giant spider orchid (*Caladenia excelsa*).
- Western Environmental (2023) – targeted WRP Survey. Undertaken to confirm population abundance over multiple years and inform final disturbance footprint design.
- Viridis Environmental (2023)) – third targeted survey for the giant spider orchid (*Caladenia excelsa*). Undertaken to confirm absence of species and ensure multiple year survey coverage.

The results from these recent surveys have informed responses to the additional information requested by DCCEEW.

Table 4: Ecological surveys undertaken for the Proposal

Survey/Report Name	Location/Extent	Methodology
Flora and Vegetation Survey, Lot 9017 Martingale Road, Dunsborough (Accendo, 2018) (Appendix A)	**Location:** former Lot 9017 (now Lot 9020) Martingale Road. **Extent:** Entire Proposal area	A field survey was conducted over four days by a senior botanist. The survey was undertaken per the Environmental Protection Authority's (EPA's) Technical Guidance: Flora and Vegetation Survey for Environmental Impact Assessment (2016).
Fauna Assessment, Lot 9017 Martingale Road, Dunsborough (Harewood, 2017) (Appendix A)	**Location:** former Lot 9017 (now Lot 9020) Martingale Road. **Extent:** Entire Proposal area	Level 1 fauna survey undertaken per the *EPA Technical Guidance: Terrestrial Fauna Surveys* (2016b). Field survey carried out between October and November. Trees identified as suitable hollows were inspected with binoculars to identify evidence of use and scratched/raked with a large pole to flush birds out.
Targeted Western Ringtail Possum and Black Cockatoo Survey: Lot 9020 Martingale Rd and Lot 377 Clinker Drive, Dunsborough (Biologic, 2022) (Appendix A)	The entire extent of Lot 9020 Martingale Rd and Lot 377 Clinker Drive, and a targeted isolated visit to Marri Reserve, adjacent the Proposal area	The survey was consistent with guidance documents developed by the EPA, DBCA and the DCCEEW.

Targeted *Caladenia excelsa* Survey, Lot 9020 Martingale Rd, Dunsborough (Stream Environmental, 2022) (Appendix B)	Identified suitable habitat within Lot 9020 Martingale Rd	Targeted assessment walking tracks through all areas of suitable habitat. The assessment was undertaken in October to coincide with the flowering period.
Targeted Caladenia excelsa Survey, Lot 9020 Martingale Rd, Dunsborough (Viridis Environmental, 2023) (Appendix B)	Identified suitable habitat within Lot 9020 Martingale Rd	Targeted assessment walking tracks through all areas of suitable habitat. The assessment was undertaken in October to coincide with the flowering period.
Targeted Western Ringtail Possum: Lot 9020 Martingale Rd and Lot 377 Clinker Drive, Dunsborough (Western Environmental, 2023) (Appendix A)	**Location:** former Lot 9017 (now Lot 9020) Martingale Road Lot 377 Clinker Drive. **Extent:** Entire Proposal area	The survey was conducted in accordance with guidance documents developed by the EPA, DBCA, and the DCCEEW.

4. Black Cockatoos

The Proposal is located within the modelled distribution of all three black cockatoo species as described in the *Referral guidelines for 3 WA threatened black cockatoo species* (the Referral Guidelines; DAWE 2022):

- Baudin's cockatoo (*Zanda baudinii*).
- Carnaby's cockatoo (*Zanda latirostris*).
- Forest red-tailed cockatoo (*Calyptorhynchus banksii naso*).

Database searches identified a high number of historical records for all black cockatoo species within a 10 km radius of the Proposal area, including 133 occurrences of Baudin's cockatoo, 51 occurrences of Carnaby's cockatoo, 45 occurrences of forest red-tailed black cockatoo, and 132 records broadly identified as "white-tailed black cockatoo spp." (Biologic, 2022). Due to the potential habitat within and surrounding the Proposal area, all three species are considered likely to utilise vegetation within the Proposal area.

Biologic (2022) completed a targeted black cockatoo assessment to verify and supplement the findings of Harewood (2017). These findings are summarised below:

- Within the disturbance footprint, the survey identified:
  - 0.5 ha of 'Very High-Quality' foraging habitat (quality score of 10) for Carnaby's cockatoo.
  - 1.7 ha of 'Moderate Quality' foraging habitat (quality score of 3) for Carnaby's cockatoo.
  - 0.1 ha of 'Low Quality' foraging habitat for Carnaby's and Baudins cockatoo.
  - 2.2 ha of 'Moderate Quality' (foraging score 3) habitat for Baudin's cockatoo.
  - No suitable foraging habitat for forest red-tailed black cockatoo.
- Thirty-one potential black cockatoo breeding trees (defined below in section 4.2.2) identified by Harewood (2017) were re-assessed by Biologic (2022), and an additional tree not previously identified was recorded. All hollows deemed suitable for current use were inspected with a camera pole. One hollow identified by Harewood (2017) was deemed not a hollow following the subsequent assessment by Biologic (2022) and was excluded from the assessment.
- No signs of active breeding were recorded.
- No evidence of roosting was recorded.
- The survey did not record any direct observations of individual black cockatoos. Presence was recorded through observed foraging evidence.
- The following sections discuss each of the three black cockatoo species in the context of the Proposal.

4.1 Abundance, distribution, ecology and habitat preference

4.1.1 Carnaby's Cockatoo

The estimated population of Carnaby's cockatoo ranged from 11,000 to 60,000 birds in the 1980s (Saunders et al., 1985). By 2010, this estimate was refined to approximately 40,000 individuals (DPaW, 2013). As of September 2019, the population remains estimated at 40,000 individuals, with at least 13,984 residing in the Greater Perth-Peel Region (Peck et al. 2019).

Carnaby's cockatoo is endemic to the southwest of Western Australia, exhibiting a broad distribution from Kalbarri in the northwest to Nuytsland Nature Reserve in the southeast (DEECCW, 2022). Breeding occurs between late July and December, primarily in the inland regions of its distribution, where annual average rainfall ranges from 300 to 700 mm (DCCEEW, 2022).

Most Carnaby's cockatoos migrate seasonally in alignment with their breeding patterns, moving to higher rainfall coastal areas during the non-breeding season. On the Swan Coastal Plain, breeding is limited to isolated pockets around Yanchep, Rockingham, Bunbury, and Busselton. The species predominantly breeds in woodlands or forests that feature trees such as Salmon Gum, Wandoo, Tuart, Jarrah, Flooded Gum, Karri, and Marri, although they may also nest in isolated trees within former woodland or forest areas.

Foraging habitats for Carnaby's cockatoo include proteaceous woodlands and shrublands, typically consisting of Banksia spp., Hakea spp., and Grevillea spp. While their traditional diet primarily comprised native seeds and nectar, it has expanded to include a greater variety of seeds from introduced plant species, such as those from broad-acre crops and plantation pines (DPaW, 2013).

4.1.2 Baudin's Cockatoo

The historical distribution and abundance of Baudin's cockatoo remain largely unknown, as early literature did not differentiate between Carnaby's cockatoo and Baudin's cockatoo (Higgins, 1999). Currently, the population size of Baudin's cockatoo is estimated at approximately 12,000 individuals. This species primarily inhabits the humid and sub-humid regions of south-western Western Australia, particularly in areas receiving an average annual rainfall of 750 mm (Saunders, 1979).

The known distribution range of Baudin's cockatoo extends from Albany in the south to Gidgegannup in the north, and eastward to Mount Helena, Wandering, Quindanning, Kojonup, Frankland, and King River, reaching the eastern boundary of the Swan Coastal Plain (Johnstone, 1997; Johnstone & Storr, 1998). Additionally, Baudin's cockatoo is found in the Stirling Range (Sedgwick, 1964), Porongurup Range (Abbott, 1981), and near Boyup Brook (Davies, 1966; Saunders 1974a, 1979; Saunders et al., 1985; Johnstone & Storr, 1998).

While this species is primarily associated with forested areas, it also inhabits open agricultural lands, where it is considered locally resident but migrates at the end of the breeding season in January due to changes in food availability (Saunders, 1974b). Flocks are known to visit the central and northern Darling Range and the eastern boundary of the Swan Coastal Plain during March and September (Johnstone & Storr, 1998). They migrate north through the Perth region from March to May and south from August to September (Sedgwick, 1940; Saunders, 1979).

Baudin's cockatoos breed in the hollows of mature trees, such as Marri, Karri, Jarrah, and Wandoo, during the breeding season, from July to November. However, limited information is available regarding their breeding cycle, as locating nests proves to be highly challenging (DEC, 2008).

Marri seeds and fruits constitute the primary food source for Baudin's cockatoo, supplemented by other foraging species, including Banksia spp., Hakea spp., Erodium botrys, Jarrah, and Dryandra spp. The species also consumes apple and pear seeds from domestic orchards, which can lead to destructive behaviour (DEC, 2008).

4.1.3 Forest Red-tailed Black Cockatoo

As of September 2019, the total population of forest red-tailed black cockatoos is estimated to be 15,000 individuals (Peck et al., 2019). Their numbers rose from an average count of 559 between 2014 and 2016 to 1,934 in 2017, 4,037 in 2018, and 3,499 in 2019. However, this

increase in numbers may not necessarily reflect an increase in the population but rather a redistribution of the birds from forested areas to more urbanised locations.

Forest red-tailed black cockatoos are a sub-species of red-tailed black cockatoos characterised by the significant size of the bill (Ford, 1980). They are geographically distinct from other red-tailed black cockatoos, preferring the humid and sub-humid zones of south-west Western Australia, which stretch from Gingin in the northeast to Boxwood Hill in the southeast (DoEE, 2017).

The species' foraging habitat consists almost exclusively of Marri (*Corymbia calophylla*) and Jarrah (*Eucalyptus marginata*) fruits; however, the species is known to feed on the fruit of other plants. This species prefers to nest in large hollows of Marri, Jarrah, and Karri (*Eucalypts diversicolor*) (Johnstone & Kirkby, 1999), and breeding may occur at any time of the year, with peaks in April to June and August to October (DotEE, 2017).

4.1.4 Habitat connectivity

The remnant vegetation within the Proposal area forms part of a regional ecological linkage, connecting vegetation to the west and northwest of the site. Regional ecological linkages link regionally significant areas through high-condition patches, which act as stepping stones across the landscape (Accendo, 2018).

The Dunsborough Forest Swamp and the Swan Coastal Plain Paluslope Wetlands are the most significant botanical values within the site. The Dunsborough Forest Swamp is contiguous with the wetland vegetation of the Marri Reserve on the eastern side of Cape Naturaliste Rd, which is connected to the vegetation within Armstrong Reserve to the east of Naturaliste Terrace.

Due to the lack of habitat remaining across the southwest and its connectivity values, preserving fauna habitat in this region is significant for maintaining fauna populations. Previous investigations have recorded significant fauna species in surrounding bushland. The remnant bushland areas immediately adjacent to the Proposal area likely represent habitat for WRP and black cockatoos.

The retained vegetation within the Conservation area will ensure that habitat connectivity is maintained within the local region and reduce the likelihood of a significant impact on species dispersal.

4.2 Extent of habitat and the number of individuals present, historical patterns of use within the Proposal area and surrounds

4.2.1 Carnaby's Cockatoo, Baudin's Cockatoo and Forest Red-tailed Black Cockatoo

Foraging Habitat

Black cockatoo foraging habitat value within the Proposal area was determined and mapped by Biologic (2022). The foraging habitat quality for all three species ranges from 'Low' to 'Very High', as summarised in **Table 5** and presented in **Figure 7.**

Table 5: Black cockatoo foraging habitat quality within the Proposal area

Species	Disturbance footprint			Conservation area		
	Low (ha)	Moderate Quality (ha)	Very High (ha)	Low (ha)	Moderate Quality (ha)	Very High (ha)
Carnaby cockatoo	0.1	1.7	0.5	0.5	5.8	12.6
Baudin's cockatoo	0.1	2.2	-	1.6	6.0	11.3
Forest red-tail black cockatoo	-	-	-	-	-	11.3

It is acknowledged that a known roost (1.5 km northwest) contributes to the values within the Proposal area, which has been reflected in the quality assessment undertaken by Biologic (2022).

Within the Proposal area, 11 observations of foraging evidence attributed to Baudin's cockatoo were recorded, mainly from chewed marri nuts. One observation of foraging evidence from Carnaby's was recorded, while no observations of forest red-tailed black cockatoo foraging were recorded.

Regionally, potential foraging habitat for all three black cockatoo species occurs within 10-12 km of the Proposal area (Biologic, 2022). Within 6 km and 12 km of the Proposal area, there is up to 4,179 ha and 9,735 ha of potential foraging habitat, respectively (based on available datasets). Regional foraging habitat extent is presented in **Figure 8**.

The Proposal area is located near a number of conservation reserves and National Parks, all of which contain foraging habitats for all three black cockatoo species. The presence of these Conservation areas provides long-term protection of fauna habitats and ensures that foraging habitat is not a limiting factor for the species present in this area, unlike the Swan Coastal Plain. This includes the following local nature reserves, which contain records of several black cockatoo records occur:

- Leeuwin-Naturaliste National Park (total area 15,600 ha over 28 separate reserves) (Class A) – located 3.7 km west of the Proposal area.
- Marri Reserve (10.5 ha) (Class C) - located 65 m east of the Proposal area.
- Armstrong Reserve (2.51 ha) (Class C) - located 3.5 km east of the Proposal area.
- Meelup Regional Park (577 ha) (Class A) - located 1.3 km north of the Proposal area.

Historic survey reports noted evidence of all three black cockatoo species foraging in the above-mentioned reserves. Biologic (2022) also noted two records of foraging evidence during their opportunistic walkthrough of the adjacent Marri Reserve.

Habitat retained within the above local reserves, the onsite Conservation area, and regional reserves will ensure the long-term protection of foraging habitats for black cockatoo species within the Dunsborough sub-region.

4.2.2 Breeding Habitat

The black cockatoo breeding habitat assessment involved the identification of all potential breeding tree species (endemic species only) and potentially suitable hollows. Target tree species included Marri and Jarrah. Peppermints, banksia and sheoak tree species (for example) were not assessed as they typically do not develop hollows suitable for black cockatoos.

Harewood (2017) initially undertook a breeding assessment which Biologic (2022) reassessed. The Harewood (2017) assessment assessed hollow suitability via visual ground observations. The Biologic (2022) assessment, in addition to visual ground observations, deployed camera poles to assess the internal structure of identified hollows.

Throughout this report, the following definitions apply in the context of black cockatoo breeding habitat:

- **Potential black cockatoo breeding tree** – in accordance with the Commonwealth definition, tree species of a suitable DBH (greater than 50 cm DBH for most native eucalypt species) to develop a hollow suitable for black cockatoos to use for breeding purposes, or contain a potential nest hollow or a suitable nest hollow (DCCEEW, 2022). Typically includes native eucalypts such as marri, jarrah, wandoo and tuart, however can also include non-endemic species.
- **Suitable nest hollow** – Hollows that, on assessment (observation), present with the required hollow diameter (≥10cm), suitable depth and/or presence of chew marks at the entrance.
- **Potential/potentially suitable nest hollow** – hollows that, on assessment (observation), do not present with the required hollow diameter (≥10cm) or suitable depth and do not contain presence of chew marks at the entrance.
- **Suitable black cockatoo breeding tree** – a potential black cockatoo breeding tree that contains a suitable hollow or potentially suitable nest hollow.
- **Known black cockatoo breeding tree** – a suitable black cockatoo breeding tree that contains recorded evidence of use by black cockatoos for breeding, including occupied hollows, or presence of chew marks at the entrance.

Within the Proposal area, all potential black cockatoo breeding trees recorded were either marri (*Corymbia calophylla*), jarrah (*Eucalyptus marginata*), blackbutt (*Eucalyptus patens*) or dead, unidentifiable species. All previously recorded potential black cockatoo breeding trees identified by Harewood (2017) with hollows defined as “potential black cockatoo hollows” were re-assessed by Biologic (2022) during their targeted survey. Attributes including tree species (where discernible), approximate height, DBH, and condition (i.e., living, or dead) were recorded. However, the assessment focussed primarily on the suitability of hollows and evidence of previous breeding attempts by black cockatoos. The results of this assessment are provided in **Appendix A.**

Suitable hollows, where identified, were subject to detailed investigation to identify the presence/absence of any known breeding signs attributable to black cockatoos, i.e. hollows showing evidence of wear and chew marks around the hollow entrance. Hollows were inspected using a nest hollow camera (GoPro Hero 9) and a 12 m extension pole, including an assessment of hollow entrance size.

Harewood (2017) identified 32 potential black cockatoo breeding trees within the broader survey area, of which 28 occur within the Proposal area. Nine (9) of these were identified as

containing suitable nest hollows or potentially suitable nest hollows, and are considered potential breeding trees that would support black cockatoo breeding. No known black cockatoo breeding trees were recorded during the survey, or within the Proposal area.Biologic (2022) identified ten trees within the Proposal area with evidence of previous fauna occupation, including one occupied by a WRP, two actively occupied by bees and seven with evidence of chew marks likely made by galahs or other parrot species. One of the trees occupied by bees was considered a suitable black cockatoo breeding tree (Biologic, 2022).

A summary of suitable black cockatoo breeding trees and potential black cockatoo breeding located within the Proposal area is provided in **Table 6** below (refer to **Figure 9)**. As identified in **Table 6,** all potential black cockatoo breeding trees will be retained within the Conservation area, and no potential black cockatoo breeding trees will be impacted by the current disturbance footprint.

Table 6: Potential black cockatoo breeding trees and suitable black cockatoo breeding trees within the Proposal area

Species	Black cockatoo species suitability		Proposal area		Disturbance footprint		Conservation area	
	Breeding	Night roosting	Number of potential black cockatoo breeding trees	Number of suitable black cockatoo breeding trees (# suitable/ potential hollows)	Number of potential black cockatoo breeding trees	Number of suitable black cockatoo breeding trees (# suitable/ potential hollows)	Number of potential black cockatoo breeding trees	Number of suitable black cockatoo breeding trees (# suitable/ potential hollows)
Eucalyptus marginata (Jarrah)	• Forest red-tailed black cockatoo (FRTBC) • Carnaby's cockatoo	• Baudin's cockatoo • FRTBC	1	-	-	-	1	-
Corymbia calophylla (Marri)	• Baudin's cockatoo • FRTBC • Carnaby's cockatoo	• Baudin's cockatoo • FRTBC • Carnaby's cockatoo	23	12 (3 x suitable hollows, and 6 x potential hollows)	-	-	23	12 (3 x suitable hollows, and 6 x potential hollows)
Unknown sp. (live)	• Baudin's cockatoo • FRTBC • Carnaby's cockatoo	• Baudin's cockatoo • FRTBC • Carnaby's cockatoo	2	1 (1 x potential hollow)	-	-	2	1 (1 x potential hollow)
Unknown sp. (stag)	• Baudin's cockatoo • FRTBC • Carnaby's cockatoo	• Baudin's cockatoo • FRTBC • Carnaby's cockatoo	2	1 (2x potential hollow)	-	-	2	1 (2x potential hollow)
TOTAL			**28**	**14 (9)**	**-**	**-**	**28**	**14 (9)**

4.2.3 Roosting habitat

As defined within the referral guidelines, night roosting habitat for black cockatoo species generally includes any tall trees in or near riparian environments or in proximity to permanent water sources (DAWE, 2022). In particular, this includes Jarrah, Flooded Gum, Blackbutt, Tuart and introduced eucalypts.

Two targeted night roosting surveys were undertaken by Biologic (2022) in the hour preceding dusk on the 25th and 27th of May (2 hrs total) to observe black cockatoo species that may be utilising or traversing the Proposal area to reach nearby potential roosting sites. A Birdlife Australia black cockatoo search was conducted within the Proposal area to identify known roosting locations (Biologic, 2022).

Several species of trees considered suitable for night roosting were recorded within the Proposal area, as identified in **Table 6**. However no night roosting habitat or evidence of black cockatoo roosting activity (i.e. clipped leaves and branches or droppings under suitable trees) was identified by Biologic (2022) within the Proposal area. This was consistent with findings from Harewood (2017). However, potential night roosting habitat was identified within the following marri and jarrah-based habitats (**Figure 10**):

- Woodland of *Eucalyptus marginata* and *Corymbia calophylla* over low open forest of *Melaleuca rhaphiophylla*, *Banksia littoralis*, and *Agonis flexuosa* over low shrubland on grey sand.
- Open Woodland of *Corymbia calophylla*, *Eucalyptus marginata* and *Eucalyptus patens* over a Low Open Forest of *Banksia attenuata*, *Banksia grandis*, *Agonis flexuosa* and *Allocasuarina fraseriana* over a shrubland on grey sand.
- Woodland of *Corymbia calophylla* and *Eucalyptus marginata* over low open forest of *Banksia attenuata* and/or *Agonis flexuosa* over a shrubland on grey sand.
- Open Forest of *Corymbia calophylla* over a low woodland of *Banksia attenuata* and *Agonis flexuosa* over a sedgeland on clayish sand (bordering Dugalup Brook (seasonal creek).

This is supported by white-tailed black cockatoo night roosts located 1.5 km north of the Proposal area in a similar and adjoining habitat (Biologic, 2022). Regionally, there are eight known roost locations for white-tailed black cockatoos (Carnaby's cockatoo and/ or Baudin's cockatoo) and two forest-red tailed black cockatoo roosts within 12 km of the Proposal area (Biologic, 2022).

The closest confirmed white-tailed black cockatoo species roost is located 1.5 km to the north-north-west of the Proposal area, where a total of 228 individuals have been counted over five surveys (conducted in 2013, 2014, 2018, 2019 and 2021) (Biologic, 2022). The roost has been used for three consecutive years (Biologic, 2022). The highest number of white-tailed black cockatoos were located approximately 4.3 km south of the Proposal area over eight years (2013 to 2021, excluding 2020). Individuals were observed utilising the roost each survey year, with numbers ranging from 31 in 2015, to 251 in 2019, indicating it is an important roost for white-tailed black cockatoo species in the area (Biologic, 2022).

Of the two identified forest red-tailed black cockatoo roosts, BUSYALR003 was surveyed in one year only (2016), with five individuals observed, and roost BUSYALR004 surveyed in 2018 only, with nine individuals observed. **Figure 11** presents the known locations of regional roost sites.

Black cockatoos will favour night roost sites within 2 km of water sources (Biologic, 2022). Multiple permanent artificial water sources are located in the broader area of the Proposal area, including dams at Dunsborough Lakes Golf Club located 1 km from the Proposal area, and a pastoral dam located 1.5 km from the Proposal area.

Given the lack of roosting evidence within the Proposal area, no roosting habitat exists within the disturbance footprint. Additionally, there are also more significant roost sites and night roost habitat in the surrounding region.

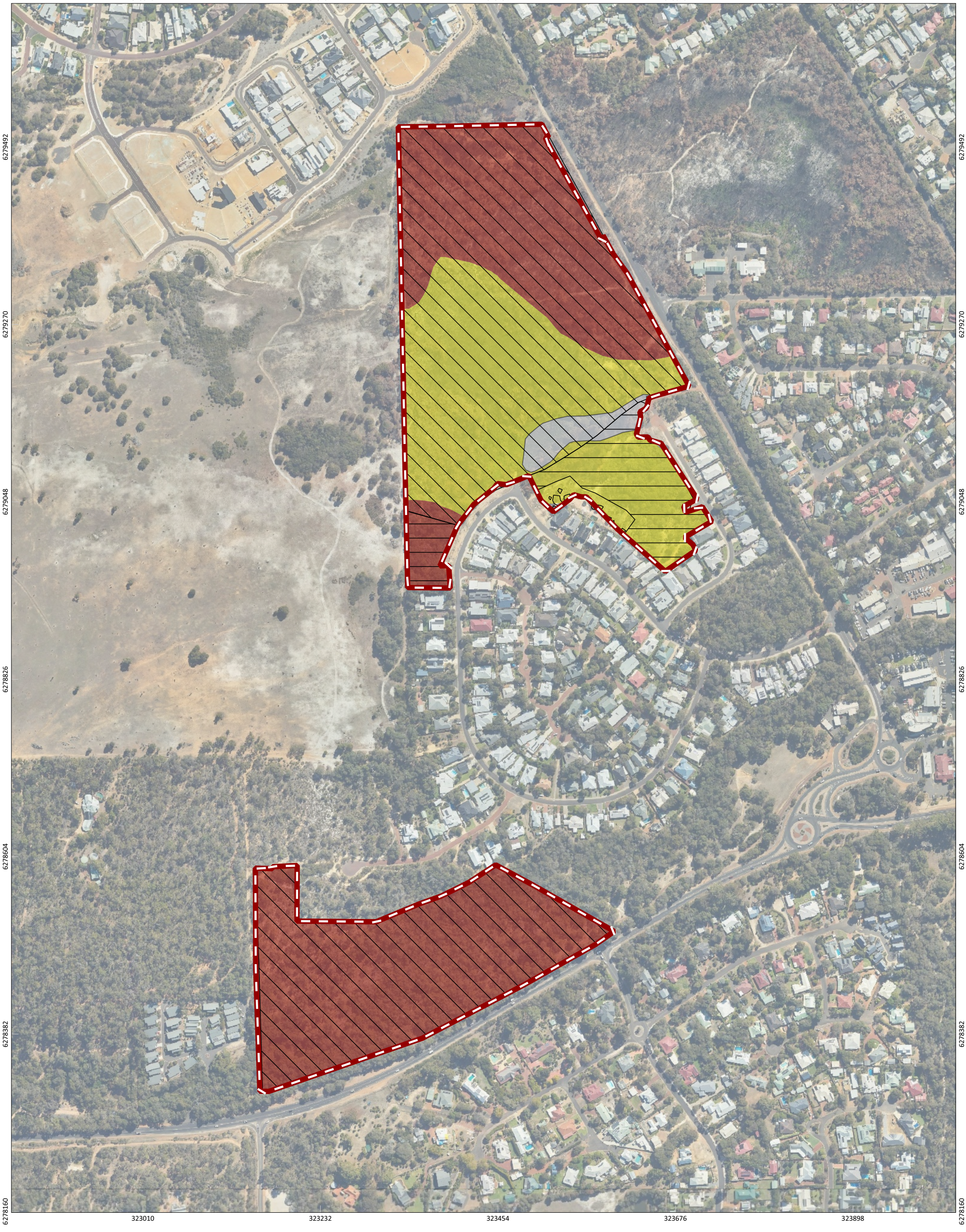

Figure 7a: Carnaby's foraging habitat within the Proposal area

N

0 40 80 120 160 m

PROJECT/REPORT NAME: Preliminary Documentation Lot 9020 Martingale Road, Dunsborough		
SCALE: 1:4,445	SHEET SIZE: A3 COLOUR	CLIENT: Dunsborough Joint Venture
COORDINATE REFERENCE SYSTEM: GDA2020 / MGA zone 50	PROJECT NUMBER: A25.024	VERSION: 0
DATA SOURCE: LANDGATE AERIAL IMAGERY NOW	DRAWN BY / REVIEWED BY: MD/BH	DATE: 22/7/2025

Legend

- Proposal Area
- Conservation Offset Area
- Disturbance Footprint

Carnaby's Cockatoo Foraging Quality

- Low
- Quality
- Very High

No	Description	Drawn	Approved	Date
A	Original issue	MD	BH	22/7/2025

NOTES:

Cadastral boundary (LGATE-002). Label corresponds to the vegetation association number.

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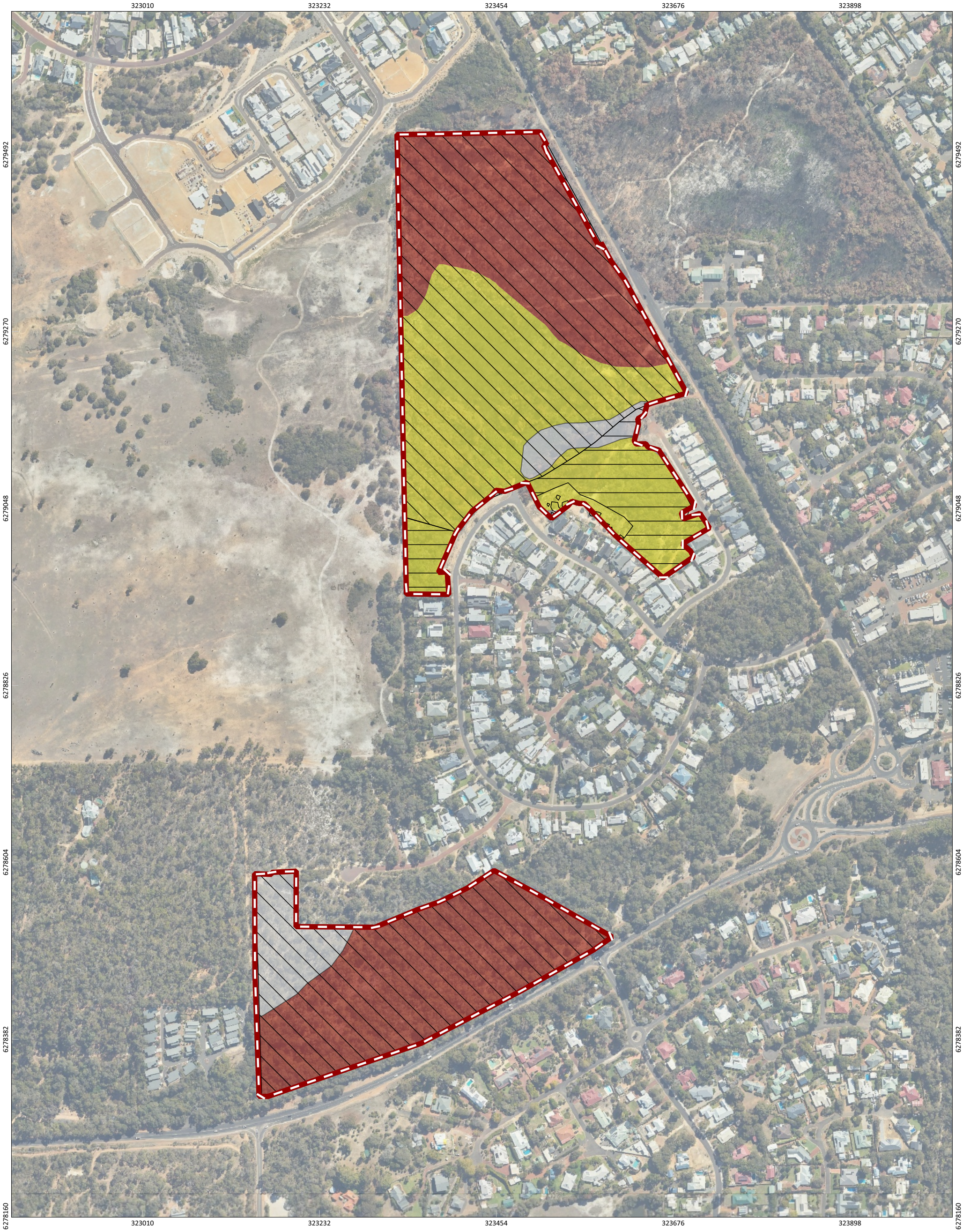

Figure 7b: Baudin's foraging habitat within the Proposal area

0 40 80 120 160 m
N

PROJECT/REPORT NAME	Preliminary Documentation Lot 9020 Martingale Road, Dunsborough
SCALE	1:4,445
SHEET SIZE	A3 COLOUR
CLIENT	Dunsborough Joint Venture
COORDINATE REFERENCE SYSTEM	GDA2020 / MGA zone 50
PROJECT NUMBER	A25.024
VERSION	0
DATA SOURCE	LANDGATE AERIAL IMAGERY NOW
DRAWN BY / REVIEWED BY	MD/BH
DATE	22/7/2025

Legend

- Proposal Area
- Conservation Offset Area
- Disturbance Footprint

Baudin's Cockatoo Foraging Quality

- Low
- Quality
- Very High

No	Description	Drawn	Approved	Date
A	Original issue	MD	BH	22/7/2025

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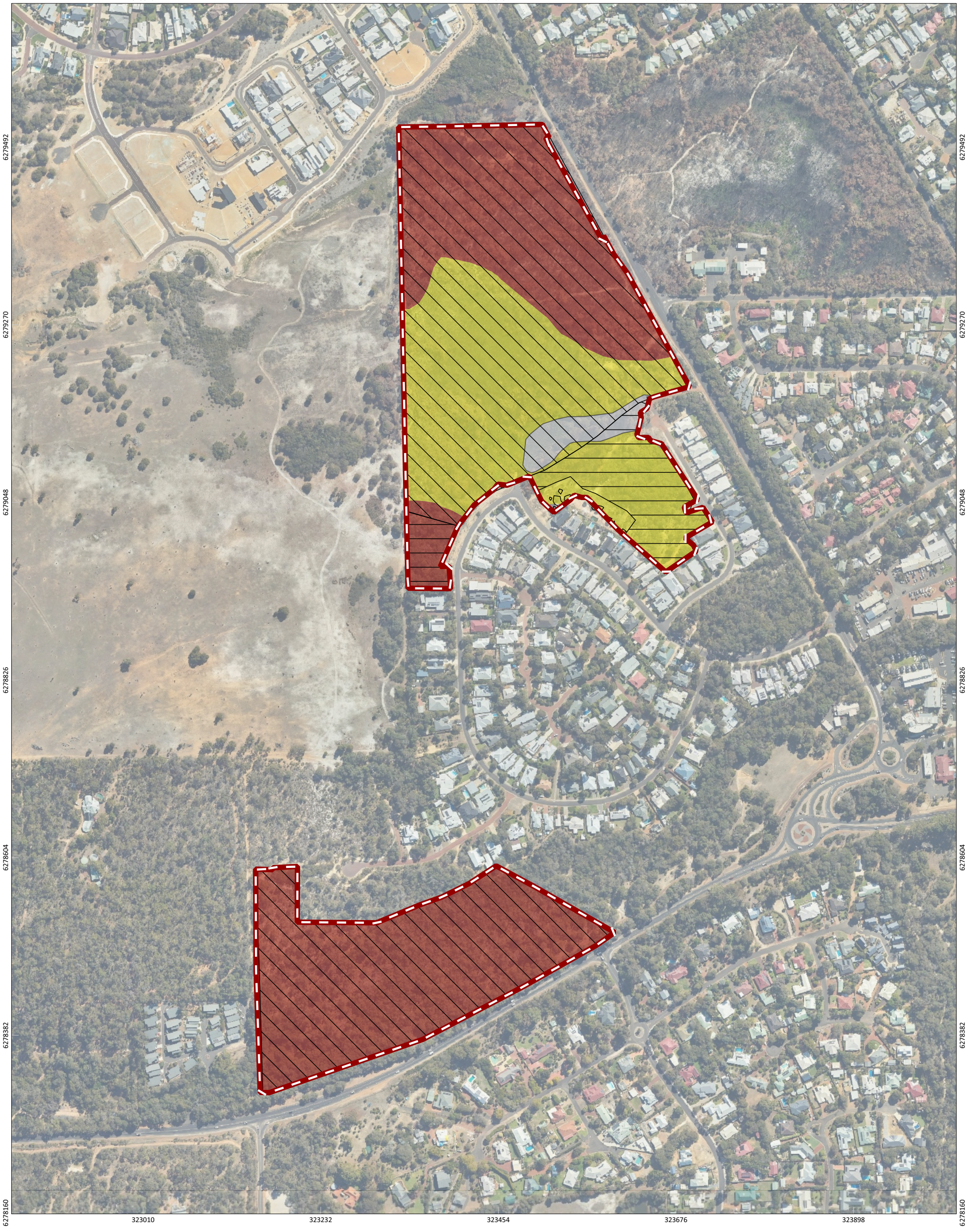

Figure 7c: Forest Red-Tailed Black Cockatoo Foraging Habitat within the Proposal Area

N

0 40 80 120 160 m

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SCALE: 1:4,445	SHEET SIZE: A3 COLOUR	CLIENT: Dunsborough Joint Venture	
COORDINATE REFERENCE SYSTEM: GDA2020 / MGA zone 50		PROJECT NUMBER: A25.024	VERSION: 0
DATA SOURCE: LANDGATE AERIAL IMAGERY NOW		DRAWN BY / REVIEWED BY: MD/BH	DATE: 22/7/2025

Legend

- Proposal Area
- Conservation Offset Area
- Disturbance Footprint

FRTBC Foraging Quality

- Low
- Quality
- Very High

No	Description	Drawn	Approved	Date
A	Original issue	MD	BH	22/7/2025

NOTES:

Cadastral boundary (LGATE-002). Label corresponds to the vegetation association number.

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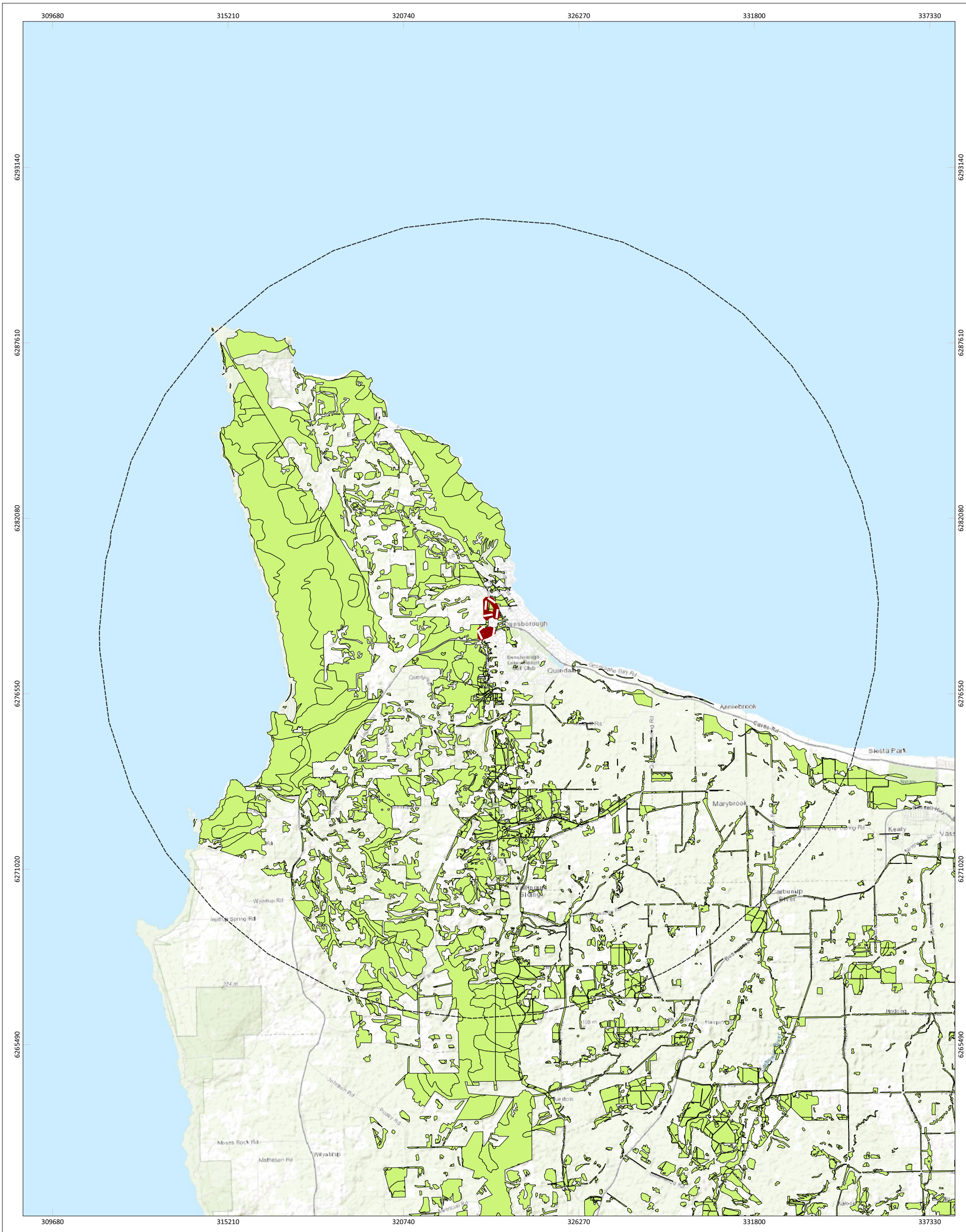

Figure 8: Potential Regional Black Cockatoo Foraging Habitat

0 1 2 3 km

N

SCALE: 1:110,600	SHEET SIZE: A3 COLOUR
COORDINATE REFERENCE SYSTEM: GDA2020 / MGA zone 50	PROJECT NUMBER: A25.024 / VERSION: 0
DATA SOURCE: ESRI Topographic Map	DRAWN BY / REVIEWED BY: MD/BH / DATE: 22/7/2025

PROJECT/REPORT NAME: Preliminary Documentation
Lot 9020 Martingale Road, Dunsborough

CLIENT: Dunsborough Joint Venture

Legend

- Proposal Area
- 12km Buffer
- Carnabys Cockatoo Areas requiring investigation as feeding habitat in the Swan Coastal Plain (SCP) IBRA Region (DBCA-057)
- Carnabys Cockatoo Areas requiring investigation as feeding habitat in the Jarrah Forest IBRA Region (DBCA-056)

No	Description	Drawn	Approved	Date
A	Original issue	MD	BH	22/7/2025

NOTES:

Cadastral boundary (LGATE-002). Label corresponds to the vegetation association number.

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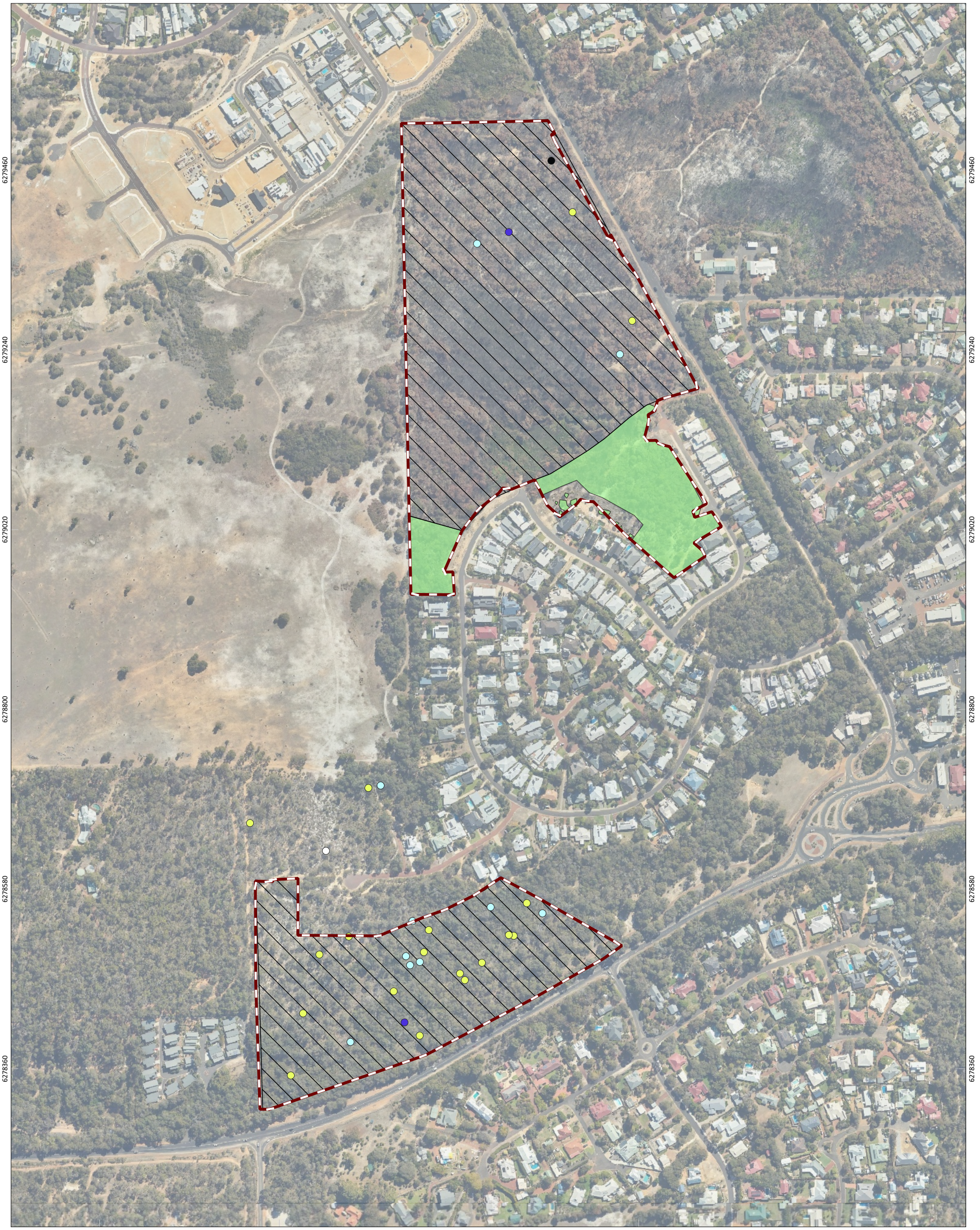

Figure 9: Potential Black Cockatoo Breeding Trees And Suitable Black Cockatoo Breeding Trees Within The Proposal Area

N 0 40 80 120 160 m

SCALE: 1:4,400	SHEET SIZE: A3 COLOUR	CLIENT: Dunsborough Joint Venture	
COORDINATE REFERENCE SYSTEM: GDA2020 / MGA zone 50		PROJECT NUMBER: A25.024	VERSION: 0
DATA SOURCE: LANDGATE AERIAL IMAGERY NOW		DRAWN BY / REVIEWED BY: MD/BH	DATE: 22/7/2025

PROJECT/REPORT NAME: Preliminary Documentation
Lot 9020 Martingale Road, Dunsborough

Legend

Proposal Area

DBH <50mm and Suitable Hollows

- 1 Suitable Hollow
- 2 Suitable Hollows
- 3 Suitable Hollows
- 4 Suitable Hollows
- 5 Suitable Hollows

No	Description	Drawn	Approved	Date
A	Original issue	MD	BH	22/7/2025

NOTES:

Cadastral boundary (LGATE-002). Label corresponds to the vegetation association number.

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322960 323180 323400 323620 323840

6279460 6279240 6279020 6278800 6278580 6278360

Figure 10: Black Cockatoo Roosting Habitat Within The Proposal Area

0 40 80 120 160 m

N

PROJECT/REPORT NAME	Preliminary Documentation Lot 9020 Martingale Road, Dunsborough
SCALE	1:4,400
SHEET SIZE	A3 COLOUR
CLIENT	Dunsborough Joint Venture
COORDINATE REFERENCE SYSTEM	GDA2020 / MGA zone 50
PROJECT NUMBER	A25.024
VERSION	0
DATA SOURCE	LANDGATE AERIAL IMAGERY NOW
DRAWN BY / REVIEWED BY	MD/BH
DATE	22/7/2025

Legend

- Proposal Area
- Conservation Offset Area
- Disturbance Footprint

Potential Roosting Habitat

- Potential
- Limited
- nil

No	Description	Drawn	Approved	Date
A	Original issue	MD	BH	22/7/2025

NOTES:

Cadastral boundary (LGATE-002). Label corresponds to the vegetation association number.

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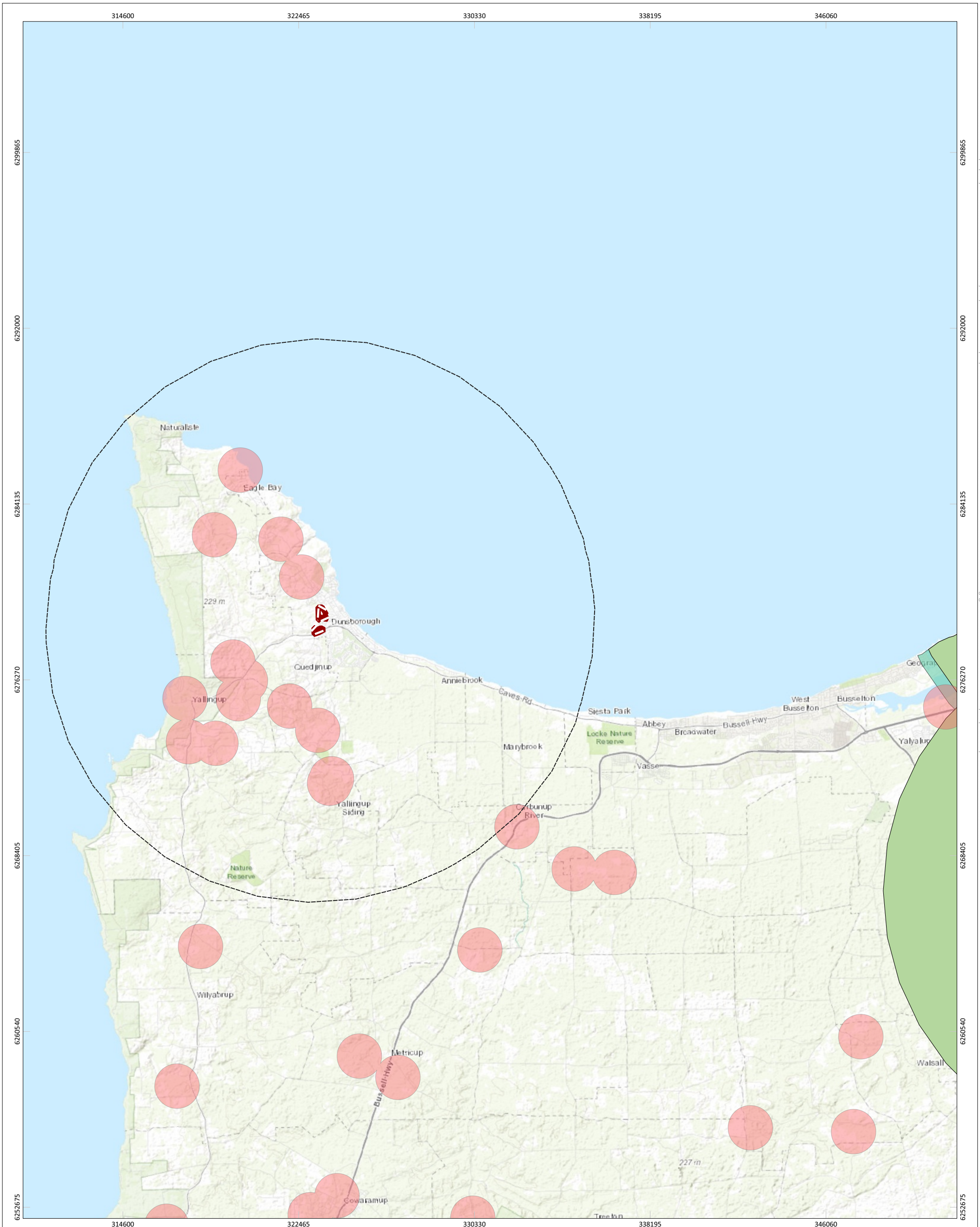

Figure 11: Regional Black Cockatoo Roosting And Breeding Locations

0 1 2 3 km

N

SCALE: 1:157,300	SHEET SIZE: A3 COLOUR
PROJECT/REPORT NAME: Preliminary Documentation Lot 9020 Martingale Road, Dunsborough	CLIENT: Dunsborough Joint Venture
COORDINATE REFERENCE SYSTEM: GDA2020 / MGA zone 50	PROJECT NUMBER: A25.024 / VERSION: 0
DATA SOURCE: ESRI Topographic Map	DRAWN BY / REVIEWED BY: MD/BH / DATE: 22/7/2025

Legend

- Proposal Area
- 12km Buffer
- Black Cockatoo Roosting Sites - Buffered (DBCA-064)
- Carnabys Cockatoo Confirmed Breeding Areas within the Swan Coastal Plain and Jarrah Forest IBRA Regions (DBCA-054)
- Carnabys Cockatoo Unconfirmed Breeding Areas within the Swan Coastal Plain and Jarrah Forest IBRA Regions (DBCA-055)

No	Description	Drawn	Approved	Date
A	Original issue	MD	BH	22/7/2025

NOTES:

Cadastral boundary (LGATE-002). Label corresponds to the vegetation association number.

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4.3 Potential impacts

Implementation of the Proposal has the potential to result in the following impacts on black cockatoos:

- Loss of black cockatoo habitat.
- Loss of black cockatoo individuals.
- Habitat fragmentation.
- Habitat degradation associated with construction activity including fire, transmission of weeds; introduction/spread of dieback, dust and increased abundance of introduced fauna species.
- Noise and vibration.

4.4 Assessment of Impacts

4.4.1 Loss of black cockatoo habitat

The Proposal area currently supports high-quality foraging and dispersal habitat for black cockatoos and has the potential to support night roosting and breeding. The Proposal will result in the direct loss of up to **2.3 ha** of black cockatoo habitat due to vegetation clearing (**Figure 7**).

Up to **0.5 ha** of the impacted black cockatoo habitat represents 'high-quality' foraging habitat for Carnaby's cockatoos, and 1.7 ha of 'moderate-quality' foraging habitat. The remaining 0.1 ha is considered 'low-quality' habitat for the species. In comparison, establishing the Conservation area will retain and protect up to **12.6 ha** of 'high-quality' foraging habitat for the species. The loss of **0.5 ha** represents a 3.8% reduction in 'high-quality' foraging habitat for Carnaby's cockatoo within the Proposal area. This impact is not considered to be significant.

With regards to Baudin's cockatoo and forest red-tailed black cockatoo, the Proposal will result in the loss of:

- **2.2 ha** of 'moderate' habitat for Baudin's cockatoo.
- **0.1 ha** of 'low' quality habitat for Baudin's cockatoo.
- **No** 'high-quality' habitat for Baudin's cockatoo.
- **No** habitat suitable for forest red-tailed black cockatoo.
- As the Conservation area will retain up to **11.3 ha** of 'high-quality' foraging habitat for both species, the loss of **2.2 ha** of 'moderate' quality foraging habitat for Baudin's cockatoo is not considered significant.

Vegetation clearing within the Proposal area is estimated to contribute to a <1% reduction in the current extent of black cockatoo habitat (depending on the vegetation association) at a local scale (6 km radius buffer around the Proposal area), between 0.03 - 0.22% reduction at a local government scale (City of Busselton) and less than 0.01-0.33% reduction at a regional scale (Interim Biogeographic Regionalisation for Australia (IBRA) bioregion) (**Table 7**).

Additionally, foraging evidence for all three black cockatoo species has been recorded in adjacent nature reserves, including:

- Marri Reserve (Class C) located immediately adjacent to the Proposal area.
- Armstrong Reserve (Class C) located 3.5 km from the Proposal area.
- Meelup Regional Park (Class A) located 1.3 km north from the Proposal area.

Considering the above, removing 2.3 ha of foraging habitat for Carnaby and Baudin's cockatoo will not result in a significant loss of available habitat or impact to either species.

Table 7: Proposed impacts to regional black cockatoo foraging habitat[2]

Vegetation Association	Scale	Current extent	% Current extent remaining	Proposed clearing (ha)	Extent (ha) after Proposal	% Reduction
3	IBRA Region - Jarrah Forest	1,604,101.5	67.10	2.3	1,604,092	<0.01%
	IBRA Region - Swan Coastal Plain	3,150.76	18.14	2.3	3,141.5	0.30%
	LGA - City of Busselton	33,797.98	63.5	2.3	33,788.7	0.03%
	6 km of Proposal	588.2	-	2.3	578.9	1.6%
	12 km of Proposal	2,300.4	-	2.3	2291.1	0.4%
1000	IBRA Region - Jarrah Forest	2,802.16	51.62	2.3	2,792.9	0.33%
	IBRA Region - Swan Coastal Plain	27,768.84	26.41	2.3	27,759.5	0.03%
	LGA - City of Busselton	4,244.00	35.3	2.3	4,234.7	0.22%
	6 km of Proposal	1,930.0	-	2.3	1,920.7	0.48%
	12 km of Proposal	2,712.1	-	2.3	2,702.8	0.34%

[2] 6 km and 12 km native vegetation extents based on native vegetation remnant dataset that align with vegetation associations 3 and 1000

Clearing within the disturbance footprint will not remove or impact any potential breeding trees. All 28 identified potential black cockatoo breeding trees (including the 9 suitable breeding trees) will be retained within the Conservation area.

There are no known breeding records for black cockatoos within the Dunsborough locality. The closest known breeding location is 37 km away (pers. comm., Tony Kirkby 2018). No roosting activity has been recorded within the Proposal area during any survey.

However, the Proposal area, particularly the Conservation area, contains trees suitable for roosting. Given the lack of observed evidence of either breeding or roosting within the Proposal area, removing **2.3 ha** of vegetation will not significantly impact the breeding cycles of the three species or significantly reduce the available habitat for roosting or breeding.

In summary, the implementation of the Proposal will result in the removal of:

- 2.3 ha of suitable foraging habitat, comprised of:
    - 0.5 ha of 'Very High-Quality' foraging habitat (quality score of 10) for Carnaby's cockatoo.
    - 1.7 ha of 'Moderate Quality' foraging habitat (quality score of 3) for Carnaby's cockatoo.
    - 0.1 ha of 'Low Quality' foraging habitat for Carnaby's and Baudins cockatoo.
    - 2.2 ha of 'Moderate Quality' (foraging score 3) habitat for Baudin's cockatoo.
    - The Proposal will result in:
- No impact on suitable foraging habitat for forest red-tailed black cockatoo.
- No impact to any identified potential black cockatoo breeding trees (including suitable black cockatoo breeding trees) within the Proposal area.
- No removal of known roosting habitat within the Proposal area.
- Retention of 18.9 ha of foraging habitat onsite through a Conservation area.
- Retention of 28 potential black cockatoo breeding trees within the Conservation area, including nine suitable black cockatoo breeding trees with suitable and potential hollows that may support black cockatoo breeding.

4.4.2 Loss of individuals

Injury and mortality of black cockatoos can occur due to construction activities, and post-construction residential land use. Individuals may be attracted to water sources adjacent to the Proposal area. Potential sources of impact include:

- Fauna being injured/killed by collisions with earthmoving equipment and/or vehicles during construction works.
- Vegetation clearing, which reduces the extent of fauna habitat and may result in the loss of individual fauna.
- Ground disturbance activities, which may result in the direct removal of nests and nest young.
- Vehicle strikes from residents.

Loss of individuals within and adjacent to the Proposal area can decrease local population abundance.

A qualified fauna spotter will be present during clearing and construction activities, as required in the Western Ringtail Possum Management Plan (WRMP). Implementing a fauna spotter will ensure that the potential impacts on fauna from collisions will not affect the conservation

status of black cockatoo species present. As a result, potential impacts to the three species through injury or mortality are not expected to be significant.

Additionally, signs for black cockatoos and WRPs will be installed within the Proposal area, alerting residents of their presence. The City of Busselton will be consulted regarding additional measures to reduce the risk of vehicle impacts, including appropriate speed limits around the Proposal area.

4.4.3 Fragmentation of habitat

Habitat fragmentation can significantly impact local populations of black cockatoos. Increased foraging distances have been linked to poor chick health and lower breeding success rates, leading to abandonment of breeding areas due to a lack of food availability (Saunders, 1982; Saunders, 1990). Chicks of adult birds that had to travel greater distances, including up to 12 km to find food, had lower growth rates and fledging success compared to the chicks of adult birds that had foraging habitat available within 7 km of a nest site (Saunders, 1980; Saunders, 1982).

Quantifying regional vegetation that represents black cockatoo habitat cannot be done at a fine scale, as only broad-scale vegetation complex mapping is available. A high percentage of the broad-scale vegetation complex is likely to contain breeding, foraging, and/or roosting habitats (Harewood, 2017). Available mapping data indicates approximately 2,518 ha of remnant native vegetation within 6 km of the Proposal area. Of this, at least 50% is contained within land subject to Department of Biodiversity and Conservation and Attractions (DBCA) management (i.e. national parks, reserves or state forests) (Biologic, 2022). The vegetation within the disturbance footprint (2.3 ha) comprises <0.3% of native vegetation extent within a 6 km range.

Removing 2.3 ha of fauna habitat from the Proposal area will not fragment vegetation to the extent that it impacts black cockatoos. Retaining 18.9 ha of habitat within the Conservation area will maintain existing vegetation corridors across the Proposal area and surrounds. These include:

- The east-west corridor between Marri Reserve, Armstrong Reserve and Caves Road.
- The north-south ecological corridor between Meelup Nature Reserve and remnant vegetation south of the Proposal area.

Following vegetation removal as part of the Proposal, current distances to water sites, roosting sites, breeding habitats and high to medium-quality foraging habitat within 12 km of the Proposal area are not expected to change (**Table 8**). The Proposal will not result in a significant gap in habitat, and all existing corridors will be retained. As such, the Proposal is not expected to fragment the existing linkage across the surrounding area.

Table 8: Proposal area proximity to nearby black cockatoo important sites

Attribute	Current distance (km)	Distance following the Proposal (km)
Water Sites	Dams at Dunsborough Lakes Golf Club approximately 1 km from the Proposal area Pastoral dam, located 1.5 km from the Proposal area.	The Proposal will not impact water sources. Distance to permanent water sources will remain unchanged following the Proposal.
Roosting Sites	Closest confirmed white-tailed black cockatoo species roost is located 1.5 km to the north-north-west of the Proposal.	No confirmed roost site within the disturbance footprint. As such, the distance to the nearest confirmed roosting site will remain unchanged.

Breeding habitat	Confirmed breeding area (buffer) within Swan Coastal Plain and Jarrah Forest is approximately 26.5 km east of the disturbance footprint.	No known breeding to occur within the Proposal area. Distance to the nearest confirmed breeding site will remain unchanged.
High to medium quality foraging habitat	Currently located within the Proposal area. Also located in the following conservation areas: - Marri Reserve (Class C) located immediately adjacent to the Proposal area. - Armstrong Reserve (Class C) located 3.5 km from the Proposal area. - Meelup Regional Park (Class A) located 1.3 km north from the Proposal area.	Up to 4,179 ha of confirmed and unconfirmed foraging habitat within 6 km of the Proposal area; and up to 9,735 ha of confirmed and unconfirmed foraging habitat within 12 km of the Proposal area Distances to nearby conservation reserves with high to medium foraging quality will remain unchanged.

4.4.4 Habitat degradation – fire, weeds, dieback, dust and introduced fauna

Construction activities and vehicle movements have the potential to increase dust, spread weeds and cause fire, all of which may result in the degradation of fauna habitat. Dust and fire will be managed throughout construction by implementing an Environment Management Plan. These potential indirect impacts are not expected to impact black cockatoo habitat within the Proposal area.

The introduction of dieback and/ or weeds into the fauna habitat in the Conservation area may degrade black cockatoo values. The risks associated with weed and dieback are considered low; however, these risks will be effectively managed during construction by implementing the Offset Area Management Plan (OAMP).

Vegetation clearing can increase the presence of feral predators within fauna habitats in the Conservation area. Two introduced species; European rabbit (*Oryctolagus cuniculus*), and red fox (*Vulpes vulpes*), were identified within the Proposal area (Biologic, 2022). An inactive red fox den was located in remnant bushland adjacent to the Proposal area (Biologic, 2022). Implementing the Proposal does not change the current presence of introduced species in the local area. It is anticipated that any vagrant foxes within the Proposal area will be deterred following the commencement of construction works. As residential dwellings will adjoin the conservation areas, targeted fox control management measures are not considered suitable (i.e. baiting, shooting). Instead, ring-lock fencing is proposed to be installed around the Conservation areas to restrict feral animal movement.

The City of Busselton also has stringent local laws for cats in Western Australia, which aim to prevent damage to local fauna species. These local laws will apply to all future landowners within the Naturaliste Heights estate. This information is contained on the City of Busselton's webpages.

The potential residual impacts on black cockatoos due to the Proposal are not expected to be local or regionally significant.

4.4.5 Noise and Vibration

During construction activities, there is a potential risk that noise and vibration from machinery will disrupt and negatively impact the behaviours of local black cockatoo individuals. However, considering the limited area of the disturbance, the short duration of clearing activities and the presence of 18.9 ha of retained vegetation, this potential impact is not considered significant.

4.5 Mitigation Measures

Key mitigation measures for the Proposal include:

- Reduction in the total area (ha) of vegetation clearing proposed to be cleared from 11.5 ha to 2.3 ha.
- Retention of 18.9 ha of vegetation within the Conservation area immediately surrounding the Proposal.
- Implementation of standard management actions during construction to effectively manage potential impacts for:
    - Risk of mortality of black cockatoos during construction works (loss of individuals and vehicle strikes).
    - Habitat degradation associated with construction activity including fire, transmission of weeds, introduction/ spread of dieback, dust and potential increased abundance of introduced fauna species.
    - Discharge of polluting substances during construction reduce the loss of good quality water sources for black cockatoos.

The mitigation and management measures detailed in **Table 9** will be implemented throughout construction to minimise potential environmental impacts.

4.5.1 Reduction in the disturbance footprint

The State-approved City of Busselton's LPS No. 21 has already zoned most of the vegetation identified for retention within the Concept Plan as 'Residential' (refer to **Figure 3**). An EPA-approved Structure Plan supports this zoning.

During the design phase of the Proposal, the mitigation hierarchy (avoid, minimise, offset) was applied. Accordingly, 8.85 ha of currently zoned 'Residential' land is proposed to be re-zoned and retained within the Conservation area to enable greater protection of black cockatoo habitat.

The disturbance footprint has been strategically located to avoid areas containing high-quality foraging habitat (located along Dugalup Brook), and all potential breeding trees.

4.6 Conservation Area

A key design objective for the Proposal was to protect as much of the existing biodiversity values within the Proposal area as possible while enabling the construction of priority residential housing. This has been achieved by retaining 18.9 ha of remnant vegetation within the proposed Conservation area. This area will be voluntarily rezoned, where required, from 'Residential' to 'Parks and Recreation', and placed into a conservation covenant and ceded to the local government, free of cost, for inclusion in their reserve system.

Areas of vegetation retention have been selected to retain quality habitat for black cockatoos and WRPs while providing ecological linkages throughout the Proposal area and to adjoining areas. In addition, it is proposed that no less than 8 ha of land within the Conservation area will be rehabilitated. This includes an area of revegetation in the southern section of the Proposal area. Management measures will also be implemented, including weed control and access control. Flora species associated with WRP and black cockatoo habitat will be utilised for rehabilitation. This will significantly enhance the value of this remnant vegetation.

The City of Busselton implements planning decisions based on the LPS No. 21. In accordance with LPS No. 21, once an area has been approved as a Reserve, the following actions are restricted:

- Demolish or damage any building or works.

- Remove or damage any trees.
- Change the use of the land or building.
- Excavate, spoil or use the land so as to destroy, affect or impair its usefulness for the purpose for which it is reserved.
- Construct, extend or alter any building or structure, other than a boundary fence.

The proponent will implement a Offset Area Management Plan (OAMP) (**Appendix C**), which will include weed management, revegetation, access control, rehabilitation of post-fire burned areas and general maintenance.

The objective of the OAMP is to enhance the existing habitat for black cockatoos and WRP by minimising the current indirect impacts, which include:

- Uncontrolled access – currently, vehicles, motorbikes and pedestrians have unfettered access to the Conservation area. This is resulting in vegetation destruction (through the creation of new tracks, paths etc.), rubbish dumping, fire risks and the spread/introduction of weeds and dieback. A recent site visit also observed a number of individuals removing vegetation debris and branches from an area that would be within the Conservation area, highlighting the value of access management actions.
- Weed and disease spread/introduction – weeds are prolific throughout some of the wetland contained within the Conservation areas, as a result of previous and ongoing anthropogenic impacts. There are currently no mechanisms for the control of weeds and disease within this area.
- Feral and domestic animal management – the Conservation areas are completely unmanaged and therefore in consideration of the surrounding rural and urban environment, provide a sanctuary for feral and domestic animals.

The OAMP will be provided to the City of Busselton and the DBCA for comment. As a minimum, it will provide the following:

- Location of the key natural area and its environmental attributes.
- Identification of areas to be rehabilitated and revegetation, including:
    - The objectives of the revegetation and completion criteria.
    - Supplementary planting program.
    - Weed control.
- Implementation of a management program including controlling public access, rubbish collection, weeds, pests and fire management.
- Monitoring program and contingency actions.

Implementation of the OAMP will occur during construction and continue until the areas are ceded to the Crown and managed by the City of Busselton. At this time, the vegetation will be retained in perpetuity in secure public tenure. The City of Busselton has already endorsed the reservation of vegetation within the Proposal area, evidenced in the approved Structure Plan and Town Planning Scheme map (refer to the overlay map provided in **Figure 3**).

Table 9: Application of the mitigation hierarchy for black cockatoos

Potential impact	Avoidance	Minimisation	Residual Impacts	Offsets
Loss of black cockatoo habitat	The vegetation disturbance footprint has been reduced (post referral) from 12.5 ha to 2.3 ha, of which 0.5 ha is considered 'high-quality' foraging habitat for Carnaby's cockatoo only.	Clearing will be restricted to a disturbance footprint of 2.3 ha only, to avoid over-clearing in adjacent conservation areas and to minimise indirect impacts to adjacent fauna habitat.	Loss of up to 2.3 ha of black cockatoo foraging habitat (0.5 ha 'high-quality' for Carnaby's cockatoo). After applying the mitigation hierarchy, the direct removal of up to 2.3 ha of suitable habitat, of which 0.5 ha is considered 'high-quality' for Carnaby's cockatoo is not considered locally significant to black cockatoos. Rehabilitation of up 8 ha of land will be undertaken within the Conservation area.	No offset is proposed.
Loss of black cockatoo individuals	Restrict vegetation clearing and construction work activities to the Proposal area only.	Implementation of management measures during clearing, through the EMP. Clearing will also be undertaken outside the known breeding season for black cockatoos.	Vehicle movements have the potential to result in mortality for fauna. These impacts affect individuals and may significantly impact species. After the mitigation hierarchy has been applied, the Proposal can be appropriately managed to address this impact, and therefore, no significant impacts to black cockatoos are expected.	Not applicable.
Habitat fragmentation	Not applicable	Clearing will be restricted to the Proposal area only, to avoid over-clearing in adjacent conservation areas and to minimise indirect impacts to adjacent fauna habitat.	No significant residual impacts regarding habitat fragmentation will occur. The Proposal will retain no less than 18.9 ha of black cockatoo habitat within the Proposal area. This vegetation	Not applicable.

Potential impact	Avoidance	Minimisation	Residual Impacts	Offsets
		Improvement and protection of 18.9 ha of vegetation within the Conservation Area, included in the Proposal Area.	maintains the existing ecological linkage between Marri and Armstrong reserves to the east and along Caves road to the west.	
Habitat degradation associated with construction activity includes fire, transmission of weeds, introduction/spread of dieback, dust and increased abundance of introduced fauna species.	Weeds and introduced fauna are currently established in and surrounding the Proposal area.	Risks associated with activities will be managed through: • Implementation of the OAMP. • No hot works or clearing activities will be permitted on days of 'Extreme' fire danger or higher. • Vehicles are to be fitted with fire extinguishers. • All vehicles are to be clean on entry, when operating in proximity to the Conservation area. • Dust suppression, as required, will be implemented on site to minimise disturbance to fauna habitats. • Use of domestic waste facilities to minimise fauna (and feral animal) access. • Roadkill (that may attract introduced predators) will be removed from trafficable areas.	The Proposal can be managed to address any potential increase or spread of weeds, dust, and the increased abundance of introduced fauna species, and significant residual impact on black cockatoos is not anticipated.	Not applicable.

4.7 Summary of Assessment of Level of Significant of Impact on MNES

A range of guidance exists to direct the protection and conservation of Matters of National Environment Significance (MNES). This includes measures for minimising further impacts from Proposals and broader conservation initiatives.

This section describes how the Proposal has had regard to, and is not inconsistent with, relevant recovery plans, conservation advice and threat abatement plans for the three EPBC Act listed black cockatoo species. Broader conservation initiatives are typically the focus of organisations with those responsibilities and capabilities and are therefore not considered further in this section. **Table 10** assesses the threats to each species as a result of the Proposal, in relation to each of the recovery plans.

The relevant plans and guidance documents are:

- DPaW (2013), 'Carnaby's Cockatoo (*Calyptorhynchus latirostris*) Recovery Plan'.
- DEWHA (2009), 'Approved Conservation Advice for *Calyptorhynchus banksii naso* (Forest Red-tailed Black Cockatoo)'.
- DEC (2008), 'Forest Black Cockatoo (Baudin's Cockatoo *Calyptorhynchus baudinii* and Forest Red-Tailed Black Cockatoo *Calyptorhynchus Banksii Naso*) Recovery Plan'.
- TSSC (2018). Conservation Advice *Calyptorhynchus baudinii* Baudin's cockatoo.

Table 10: Assessment against relevant recovery plans, threat abatement plants and conservation advice for black cockatoos

No.	Plan/ Conservation Advice and Threats	Response
DPaW (2013), 'Carnaby's Cockatoo (*Calyptorhynchus latirostris*) Recovery Plan'		
1a	Loss of breeding habitat	The Proposal will not remove any known or potential breeding habitat, including potential black cockatoo breeding trees.
2a	Loss of non-breeding, foraging and night roosting habitat	The Proposal will result in the removal of 2.3 ha of foraging habitat (0.5 ha 'high-quality). No known night roosting habitat will be removed.
3a	Tree health	Activities associated with the Proposal are not anticipated to exacerbate this threat. The OAMP will be implemented during the construction phase to reduce the risk of introducing and/or spreading Phytopthora Dieback into the adjacent Conservation area.
4a	Illegal shooting	The Proposal is not expected to exacerbate this threat. No firearms are permitted during construction within the Proposal area.
5a	Illegal taking	The Proposal is not expected to exacerbate this threat due to the absence of known breeding trees within the Proposal area, and retaining of all potential breeding trees. No evidence of breeding has been recorded within the Proposal area
6a	Collisions with motor vehicles	Although the Proposal has the potential to exacerbate this threat, the risk of this impact occurring after the mitigation hierarchy has been applied is considered to be low during construction.
DEWHA (2009), 'Approved Conservation Advice for *Calyptorhynchus banksii naso* (Forest Red-tailed Black Cockatoo)'		
1b	Illegal shooting	The Proposal will not exacerbate this threat. The Proposal is not considered to be inconsistent with the recovery plan. Refer to 4a above which also applies forest red-tailed black cockatoo.
2b	Habitat loss	No suitable foraging habitat for forest red-tailed black cockatoo was identified by Biologic (2022) within the disturbance footprint.
3b	Nest hollow shortage	No potential breeding will be removed from within the Proposal area, and all potential black cockatoo breeding trees will be retained within the Conservation area. The Proposal will not exacerbate this threat

No.	Plan/ Conservation Advice and Threats	Response
4b	Competition from other species	The Proposal is not expected to increase competition for nesting hollows or foraging habitat from other species (Galahs, parrots, bees etc.). Nine trees identified by Biologic (2022) showed evidence of previous fauna occupation, including one hollow actively occupied by an individual WRP, two hollows actively occupied by bees, and seven hollows exhibiting potential chew marks in and around hollow entries. However, due to the small extent of chew marks around the hollow entrance, most of these marks were likely made by other avian species such as galahs or other parrot species (Biologic 2022). As there is already competition for hollows and occupancy of these hollows by other species, the Proposal is not considered to be inconsistent with the recovery plan.
5b	Injury or death from *Apis mellifera* (European Honeybees)	One suitable hollow to support black cockatoo breeding was occupied by bees (-33.6108, 115.0967). However, as this already exists, the Proposal will not exacerbate this threat and is not considered inconsistent with the recovery plan.
DEC (2008), 'Forest Black Cockatoo (Baudin's Cockatoo *Calyptorhynchus baudinii* and Forest Red-Tailed Black Cockatoo *Calyptorhynchus Banksii Naso*) Recovery Plan'		
1c	Killing by illegal shooting	The Proposal will not exacerbate this threat. Refer to 1b above
2c	Feral honeybees	Refer to 5b above
3c	Habitat loss	Refer to item 2b above on the Approved Conservation Advice for Forest Red-tailed Black Cockatoos.
4c	Nest hollow shortage	Refer to 3b above. The proposal will not significantly exacerbate this threat
5c	Nest hollow competition	Refer to 4b above.
TSSC (2018). Conservation Advice *Calyptorhynchus baudinii* Baudin's cockatoo		
1d	Habitat loss, disturbance and modifications	The Proposal will result in vegetation clearing of up to 2.3 ha, of which 2.2 ha is of 'Moderate' quality and 0.1 ha is 'Low' quality.

No.	Plan/ Conservation Advice and Threats	Response
2d	Fire	The Proposal will not exacerbate this threat. On-ground management measures during construction will actively manage threatening processes including fire, this will include the implementation of a OAMP that outlines fire presentation and control measures. As such, the Proposal is not expected to be inconsistent with the Recovery Plan.
3d	Invasive species	Refer to 2c above. The proposal will not significantly exacerbate this threat
4d	Competition with native species	Refer to 4c above. The proposal will not significantly exacerbate this threat
5d	Illegal killing	The Proposal will not exacerbate this threat of shooting by orchardists. Refer to 1c above.
6d	Phytopathogens and pests	The Proposal will not exacerbate this threat for Phytopathogens affecting key tree species. Refer to 3a above.
7d	Phytopathogens and pests	The Proposal will not exacerbate this threat for infestation of bullseye borer (*Phoracantha acanthocera*) Refer to 3a above.
8d	Climate change	The Proposal will not exacerbate this threat of reduced rainfall and increased temperature.

5. Western Ringtail Possum

The WRP was first listed as threatened under the Western Australian *Wildlife Conservation Act 1950* in 1983 and the Commonwealth EPBC Act in 2000. In 2018, the BC Act and EPBC Act reassessed its listing to Critically Endangered.

The following sections describe this species and the Proposal's direct and potential indirect impacts.

5.1 Ecology, abundance, distribution, and habitat preferences

5.1.1 Distribution

Historically, the species was once widely distributed across the south and south-west of the state (from north of Perth to east of Albany). However, vegetation clearing throughout this region has significantly reduced the species' habitat and distribution. The species is now restricted to the three key management zones: the SCP, the Southern Forests and the South Coast.

5.1.2 Ecology

The WRP is endemic to the south-west of Western Australia. Population size and density can vary significantly with seasonal conditions. Unless they are isolated or constrained, populations usually consist of a combination of resident and transient individuals.

During discrete surveys, it is impossible to distinguish residents from transient animals. However, population variations due to repeated seasonal observations can provide a distinction. The proportion of transient individuals increases during the breeding season as males move through patches in search of a mate, and again when young are dispersing. The maintenance of corridors or implementation of an alternative means of dispersal is essential in considering the long-term viability of a resident population in a region (DPAW, 2017). WRPs generally use up to two and seven refuges in their home range, but can use an average of 20 or more refuges over a year (DPAW, 2017). As a result, the abundance of WRPs in an area may fluctuate, with individuals moving throughout their home range within the year.

5.1.3 Abundance

The conservation advice for the WRP (TSSC, 2018) states that the estimated population in 2015 was 3,400 individuals. A review of the estimated population advice highlights that the value is based on assumption rather than considered survey effort. The accuracy of the estimated population is uncertain, given that neither State nor Commonwealth agencies have reviewed this estimate since the advice was released.

Since the release of the conservation advice, there has been a significant increase in survey efforts within the species distribution, primarily to support development projects. The largest of these has been a regional survey completed by Biota (2020) for the presence/abundance of this species across known strongholds, to support the Bunbury Outer Ring Road Project (Southern Section) commissioned by Main Roads Western Australia (Main Roads).

Biota (2020) surveyed an area of 114,243 ha using 1,249 transects within the three WRP management zones: the Swan Coastal Plain (SCP), Southern Forest and South Coast. The surveyed footprint of the SCP management zone (in which the Proposal area is located) yielded the greatest estimated abundance of WRP at 9,270 individuals, with the majority (around 6,500) occurring in the SCP IBRA region. The estimated abundance within the Southern Forests management zone was 7,500, and the abundance within the South Coast management zone was 3,340. This resulted in an estimated total abundance of more than **20,000** individuals.

None of the reserves within the Dunsborough local area were surveyed by Biota (2020). The nearest surveyed reserves to the Proposal area were:

- Locke Nature Reserve (12 km SE) – 98 individuals recorded.
- Big Rock (3 km SW) – 97 individuals recorded.
- Yallingup (4.6 km SW) – 284 individuals recorded.

Previous surveys within reserves adjacent and near the Proposal area, including Marri Reserve and Armstrong Reserve respectively, have recorded individuals of WRP ranging from 14 to 31 (Biologic, 2022). In addition, WRP individuals have been recorded along Caves Road and further to the south. Additional survey efforts are expected to continue to record individuals in the local area and improve the understanding of the regional species' abundance. Regional records of WRP are displayed in **Figure 12**.

5.1.4 Habitat preference

DPAW (2017) outlines that the species feeds on leaves of myrtaceous species, predominantly Peppermint (*Agonis flexuosa*), but also Marri (*Corymbia calophylla*) and Jarrah (*Eucalyptus marginata*). Recently, it has been demonstrated that the species utilises far broader habitat types than initially understood. This includes usage of Jarrah/marri forests, and sustained presence within urban and semi-urban areas where tree canopy is preserved.

Habitat critical for the species' survival is generally associated with areas that provide high-nutrient foliage for food, suitable structures for protection/nesting (including suitable hollows), and canopy continuity. Linkages between areas of suitable habitat area also considered critical to the species' survival. On the SCP, critical habitat includes mature, unburnt peppermint woodlands with high canopy continuity, high nutrient foliage, and connectivity with other patches (DPaW, 2017). Movement pathways are often established between areas of quality habitat and water sources, and along continuous corridors such as vegetated riparian zones.

The size of WRP home ranges and population density vary with the quality and productivity of the habitat. Home ranges are generally less than 5.0 ha; those within peppermint-dominated habitats are usually less than 2.0 ha, and 0.4 ha and 0.3 ha on average for females and males respectively (DPaW, 2017). Densities of up to 20 individuals per hectare have been recorded in Peppermint woodland in Busselton on the southern SCP (DPaW, 2017). WRPs are known to be susceptible to heat stress and can overheat at ambient temperatures of 35ºC and above (Yin, 2006) in (DPaW, 2017)). WRP will move to new areas in search of high-quality foraging habitat, a mate or if competition for resources is high. They will also utilise a range of nest and shelter sites to avoid predators and exposure to the weather (Shedley & Williams, 2014).

5.1.5 Breeding ecology

Typically, females will give birth to young over two seasonal peaks, with one over winter months (April-June) and a second over spring (October-November) (Shedley & Williams, 2014). However, in BORR (2020), it is highlighted that the breeding periods mentioned in literature (e.g. Shedley & Williams (2014)) are generalised and are also 10 years old.

Studies by Biota (2020a) and advice from Ms Barbara Jones, an independent subject matter expert on WRP (pers comm), indicate that the peak season for WRP births in western coastal areas (Bunbury, Busselton) is usually June-September. This is supported by the recent WRP survey results from within the Proposal area, with Western Environmental (2023) discussing that the population value within the Proposal area was likely a result of median or above median rainfall and a cyclical population high point.

WRP populations fluctuate locally on a seasonal basis, peaking with the maturation of young in spring and early summer, and falling with the dispersal of young males and death of older individuals through natural attrition. These fluctuations can often be considerable and strongly

related to climatic variations (Shedley & Williams, 2014). Based on June-September birthing, most young are mature enough to leave the pouch during spring when climate and food resources are at their optimum. The overall population is expected to decline over summer into autumn due to increased temperatures, lower foraging quality and less moisture availability.

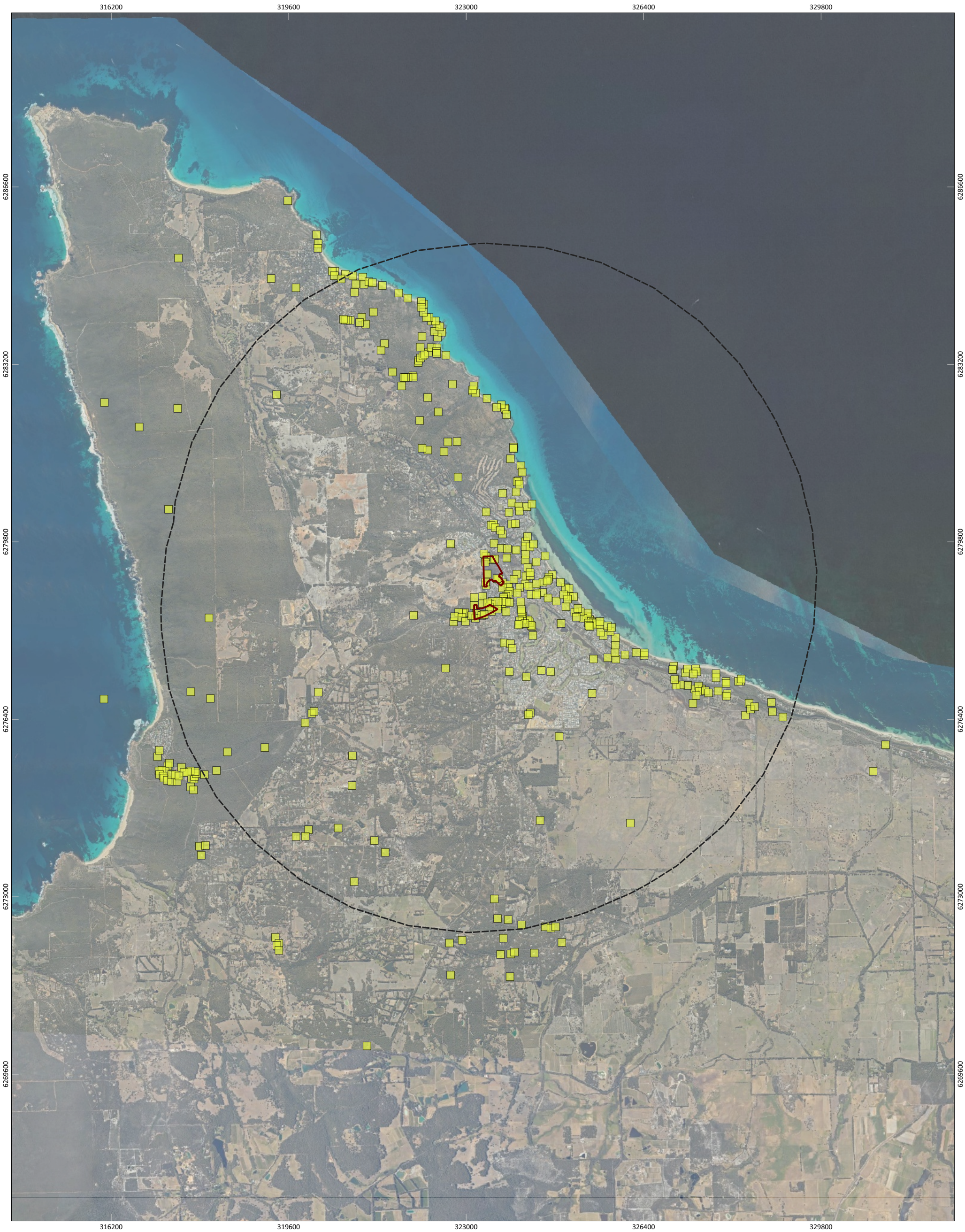

Figure 12: Regional Western Ringtail Possum Records

N

0 1 2 3 km

PROJECT/REPORT NAME: Preliminary Documentation Lot 9020 Martingale Road, Dunsborough		
SCALE: 1:68,000	SHEET SIZE: A3 COLOUR	CLIENT: Dunsborough Joint Venture
COORDINATE REFERENCE SYSTEM: GDA2020 / MGA zone 50	PROJECT NUMBER: A25.024	VERSION: 0
DATA SOURCE: ESRI Topographic Map	DRAWN BY / REVIEWED BY: MD/BH	DATE: 22/7/2025

Legend

- Proposal Area
- 6km Buffer
- Western Ringtail Possum

No	Description	Drawn	Approved	Date
A	Original issue	MD	BH	22/7/2025

NOTES:

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5.2 Habitat, abundance, and movement within the Proposal area

5.2.1 Suitable habitat

Habitat critical for the species' survival is generally associated with areas that provide high nutrient foliage for food, suitable structures for protection/ nesting (including suitable hollows), and canopy continuity, typically core habitat comprises of predominantly Peppermint (*Agonis flexuosa*), but also Marri (*Corymbia calophylla*) and Jarrah (*Eucalyptus marginata*) woodlands/forests.

Within the Proposal area, WRPs were recorded in all habitat types except for the core palusplain wetland area associated with the *Melaleuca preissiana – Typha oreintalis* vegetation type (Accendo, 2018). Within the Proposal area, there is up to 20.9 ha of critical habitat for the species (**Figure 13**), including 2.3 ha within the disturbance footprint (**Figure 14**).

Previous studies indicate that the WRP utilises fringing habitat of creek-lines and wetland areas, with the highest relative abundances between Bunbury and Dunsborough observed in wetlands without peppermint trees and foraging confined to mature *Melaleauca* spp. (including *M. cuticularis*, *M. viminea* and to a lesser extent *M. rhaphiophylla*) (Molloy et al., unpublished data in Shedley and Williams (2014). The Conservation area boundary has been modified to include more fringing vegetation surrounding the wetland area.

5.2.2 Dreys

Fifty-four dreys were recorded within the Proposal area by Biologic (2022), indicating a high utilisation of the mature trees, with one tree recorded as containing three dreys. These numbers are significantly higher than the seven dreys Harewood (2017) recorded within the Proposal area.

Biologic (2022) infers that the increase in dreys may indicate that WRPs are more commonly using dreys rather than hollows for shelter. Similar numbers of individuals observed during each survey support this assumption. In coastal areas, preference for hollows has been previously observed in tuart forests, with dreys more commonly used in peppermint woodland (Ellis & Jones, 1992; Inions, 1989; Jones & Hillcox, 1995; Jones et al., 1994).

Other studies have identified that dreys are used in dense jarrah forest habitats (Wayne et al., 2005), which suggests vegetation structure may influence different shelter types. It is also noteworthy that none of the dreys recorded by Harewood existed when resurveyed by Biologic (2022).

Western Environmental (2023) recorded 47 nests or dreys from 38 locations within the survey area, of which 41 dreys were located within the Proposal area. This supports the previous statements that within the Proposal area, individuals prefer the creation and usage of dreys over tree hollows.

5.2.3 Abundance

Biologic (2022) estimates that between 31 and 35 individual WRPs utilise the Proposal area, indicating a relative abundance of 2.93 per ha. In line with Shedley and Williams (2014), based on the density of WRPs present, the habitat suitability of the Proposal area is considered "Medium". This is an increase from the previous survey, where it was assessed as "Low" in the northern section of the proposal area and "Medium" in the southern section.

This suitability is considered relatively low when compared to other nearby reserves. In comparison, Armstrong Reserve (located 400 m east) was assessed in 2019 and found to support an abundance rate of 6 individuals per hectare, classifying the reserve as 'High' habitat suitability. Furthermore, across three reserves within 5 km of the Proposal area, 479 individuals have been recorded in the past two years.

However, Western Environmental (2023) recorded 48 individuals on night one and 45 individuals on night two within the survey area, including 42 within the Proposal area on night one and 36 within the Proposal area on night two, representing a 20% increase in the maximum number of individuals sampled in one night compared to previous surveys. As discussed in section 5.1, WRPs are known to move throughout areas in search of better quality foraging habitat, a mate, to reduce competition and to avoid predators or exposure to the weather. Populations also fluctuate locally on a seasonal basis, with an overall decline expected during summer and into autumn. As a result, the population within the Site is likely to continue to vary over time. Western Environmental (2023) noted that the increase in population compared to previous surveys was likely the result of median or above median rainfall and normal frequency of warm days, and that the survey potentially aligned with a cyclical population high point. For the purpose of this report, the maximum number of individuals recorded is used as a reference point where an estimate of individuals is required.

5.2.4 Movement

Biologic (2022) observed WRPs utilizing trees and fence lines adjacent to residential properties and roads (**Plate 2**). These possums use man-made structures, such as fences and buildings, to navigate the Proposal area and access surrounding bushland. However, the extent of their usage and preference for different types of structures remains unclear.

WRPs can face electrocution when using power lines as connection corridors in fragmented urban landscapes (DPaW, 2017). Currently, no power lines link the Proposal area to adjacent remnant bushland containing vital foraging and nesting habitats for the species, such as Marri Reserve.

Consequently, the risk of electrocution for WRP individuals using power lines to connect the Proposal area with nearby suitable habitats is deemed negligible. Moreover, all power lines in both the previous and proposed stages of the Naturaliste Heights development have been installed underground, further minimizing the risk of mortality due to electrocution.

Following the submission of the Referral of Proposal, the disturbance footprint has been revised to significantly lessen the impact of clearing on WRPs. Removing vegetation associated with the disturbance footprint is not anticipated to fragment any important ecological corridor.

The highest densities of WRPs within the southern section of the Proposal area are found along Dugalup Brook, attributed to improved habitat quality, characterised by the absence of anthropogenic disturbances and the availability of preferred habitat species. Preserving this vegetation will sustain the east-west ecological corridor outside the Proposal area, which connects to the north-south ecological corridor along Cape Naturaliste Road.

Plate 2: WRP observations utilising both native vegetation (left) and man-made structure (right) (Biologic, 2022)

5.2.5 Water Source

WRPs obtain a high percentage of their water requirements from foliage, but also need access to additional water sources, particularly in summer (Hume, 2006). Studies undertaken by Grimm and De Tores (2009) indicate that WRP mortality rates were at their highest in late summer and autumn.

The Proposal area contains a known wetland located within the Conservation area. This wetland may provide water resources to local WRP individuals during summer, however, its usage is unknown. This wetland will be retained within the Conservation area and will not be subject to clearing or development, nor will the development impact the existing quality of the wetland following the application of mitigation measures.

The Proposal will be subject to an urban water management plan (UWMP), which will ensure groundwater and surface water quality and volume are not significantly impacted. The City of Busselton will review and endorse this plan. In addition, it is in the proposed OAMP that rehabilitation within the wetland area will be required. The OAMP will interact with the UWMP to ensure water resources are appropriately managed and maintained.

The WRMP will require installing and maintaining artificial water sources during clearing and construction. These artificial water sources will be located throughout the Conservation area and will minimise the potential impacts on individual WRPs that may be displaced due to the Proposal.

5.3 Potential Impacts

Implementation of the Proposal has the potential to result in the following impacts to WRPs:

- Habitat loss from direct clearing of native vegetation.
- Fauna mortality and/or injury during clearing activities.
- Increase in feral animal species.
- Habitat fragmentation.
- Displacement of individuals.

The following section identifies the potential environmental impacts associated with the Proposal before considering any management and mitigation measures.

5.3.1 Habitat loss

The Proposal will require the staged removal of **2.3 ha** of suitable habitat for WRPs, as part of the disturbance footprint. The removal of 2.3 ha represents an 11% reduction in available habitat within the Proposal area, and a 21% decrease within the entire Naturaliste Heights land area.

Biologic (2022) recorded 54 dreys in the broader survey area, with 46 of these within the Proposal area. Western Environmental (2023) recorded a total of 41 dreys within the Proposal area, of which 11 are within the disturbance footprint and 30 are within the Conservation area. Clearing within the disturbance footprint will result in a direct impact to approximately 11 dreys. **Table 11** summarises the WRP values within the Proposal area. The maximum number of individuals recorded in one night during surveys is used as a reference point below, to provide an estimate of individuals. However as noted in section 5.2, the population of WRPs within the Proposal area would likely fluctuate over the year, particularly in response to foraging habitat quality, climate and across the breeding season.

Table 11: Summary of WRP values within the Proposal area

Element	Total area of habitat (Ha)	Total Number of Dreys (#) (Western Environmental, 2023)*	Total number of individuals (#) (Western Environmental, 2023)*
Disturbance footprint	2.3	11	7
Conservation area	18.6	30	35

*maximum recorded in one night

Following the implementation of the Proposal, suitable habitat for the WRP will reduce by 11% within the Proposal area.

Habitat suitable for WRP is known to occur broadly outside the Proposal area. **Table 12** summarises the available habitat within the local and regional area and presents the potential reduction in these extents as a result of the Proposal.

Figure 13: Western Ringtail Possum Habitat Within The Proposal Area

N

0 40 80 120 160 m

PROJECT/REPORT NAME: Preliminary Documentation Lot 9020 Martingale Road, Dunsborough			
SCALE: 1:4,445	SHEET SIZE: A3 COLOUR	CLIENT: Dunsborough Joint Venture	
COORDINATE REFERENCE SYSTEM: GDA2020 / MGA zone 50		PROJECT NUMBER: A25.024	VERSION: 0
DATA SOURCE: LANDGATE AERIAL IMAGERY NOW		DRAWN BY / REVIEWED BY: MD/BH	DATE: 22/7/2025

Legend

- Proposal Area
- Western Ringtail Possum Habitat

No	Description	Drawn	Approved	Date
A	Original issue	MD	BH	22/7/2025

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Table 12: Regional habitat availability and impacts to WRP

Element	Regional Area (10 km)	Local Area (2.5 km)	Proposal area	Proposal (Direct Impacts)		
	Extent (ha)	Extent (ha)	Extent (ha)	Extent (ha)	% Reduction in Regional Area Extent	% Reduction in Local Area Extent
WRP Habitat	8,191	1,374	21.2	2.3	0.03	0.17

When considered in the broader context of the Dunsborough subregion, the Proposal is unlikely to significantly impact the species' long-term viability.

The proponent has amended the disturbance footprint from 12.5 ha to 2.3 ha to minimise the impacts associated with vegetation and habitat loss. This modification has resulted in at least 18.6 ha of WRP habitat proposed for retention within the Proposal area.

The Proposal will be implemented in such a manner as to minimise the risk of WRP mortality. The WRMP requires a number of management actions to be implemented. These include, but are not limited to:

- Directional clearing.
- Restrictions on clearing during peak breeding times.
- Installation of artificial dreys and water sources.
- Installation of fencing to prevent individuals re-entering the disturbance footprint.
- Pre-clearing surveys.

This is discussed further in **Section 5.4.**

5.3.2 Fauna mortality

Direct loss of or injury to fauna may occur due to clearing, earthworks, fire and vehicle strikes from machinery movement. During clearing operations, fatal incidents generally occur during tree felling where an individual is present within a hollow or drey.

Development of the Proposal and the associated clearing has the potential to result in fatalities or injury to WRP individuals. Certain aspects of the WRP ecology increase their risk of injury, including:

- Breeding: clearing during the breeding season may destroy nests, burrows and young of any species breeding within the Proposal area.
- Nocturnal species are in refugia during the day and would therefore be inactive when clearing activities occur. This may result in individuals not being observed in hollows or dreys during tree felling.

Road mortality is of concern for nocturnal species foraging or travelling near roads at night and species that tend to be active on roads (e.g. basking, foraging) during daylight hours. To manage these impacts, the WRMP will implement several management measures, including:

- An experienced fauna handler will undertake pre-clearance fauna surveys. Individuals identified in the clearing area will be moved to the Conservation area.
- Directional clearing will be implemented, with all clearing undertaken in the direction of retained vegetation.
- Speed limits will be implemented during clearing operations, and no night activities will occur.

- A fauna awareness program for site personnel will be implemented with respect to fauna protection and management, including reducing the risk of vehicle collisions with fauna.

Additional mitigation measures are provided in **Section 4.4**

With the implementation of these mitigation measures, the potential for mortality and injury is reduced. Isolated deaths or injury of individual fauna are not expected to affect the conservation status and distribution of any fauna species, including the WRP.

5.3.3 Habitat Fragmentation

Fragmentation of habitat may lead to the isolation of populations, reduced population size and/ or genetic decline. Maintenance of an effective meta-population size through the retention of adequate habitat area and connectivity may be important for maintaining WRP genetic diversity and population viability (Shedley & Williams, 2014).

While the removal **2.3 ha** of vegetation will reduce the area of habitat present within the Proposal area, it will not fragment or limit existing ecological corridors (**Figure 15**). Currently the existing Cape Naturaliste Road presents the biggest threat to species movement due to vehicle interactions. In February 2023, the Southwest NRM group installed a fauna rope bridge for WRP, connecting the proposed Conservation area with the adjacent Marri Reserve. The installation of this crossing was also a factor in the reduction of the disturbance footprint.

Through implementing the Proposal, the proponent will examine the benefits of this fauna crossing and look to support the construction of an additional rope bridge within the local Dunsborough area for the benefit of the species.

It is noted that fence lines associated with residential development do not seem to inhibit movement of the species through an area (as shown in **Plate 2**). For this reason, it is assumed that movement around and through the Proposal area, following implementation, will not be significantly impeded.

5.3.4 Habitat degradation – fire, weeds, dieback, dust and introduced fauna

Construction activities and vehicle movements have the potential to increase dust, spread weeds and cause fire, all of which may result in the degradation of fauna habitat. Dust and fire will be managed throughout construction through the implementation of an OAMP. These potential impacts are not expected to have a significant impact to WRP habitat.

The introduction of dieback and/ or weeds into the fauna habitat in the Conservation area may cause the degradation of fauna habitat values. The risks associated with weed and dieback are considered low, however, these risks will be effectively managed during construction through the implementation of the OAMP.

Vegetation clearing can increase feral predators' access to fauna habitats in the conservation area. Two introduced species, the European rabbit (*Oryctolagus cuniculus*), and the red fox (*Vulpes vulpes*) were identified within the Proposal area (Biologic, 2022). An inactive red fox den was located in remnant bushland adjacent to the Proposal area (Biologic, 2022). Implementing the Proposal does not change the current presence of introduced species in the local area (in relation to these species).

It is anticipated that any vagrant foxes within the Proposal area will be deterred following the commencement of construction works. As residential dwellings will adjoin the conservation areas, targeted fox control management measures are not considered suitable (i.e. baiting, shooting). Alternatively, ring-lock fencing is proposed around the entirety of the Conservation area to restrict feral animal movement.

The City of Busselton also has stringent local laws for cats in Western Australia, which is aimed at preventing damage to local fauna species. These local laws will apply to all future landowners within the Naturaliste Heights estate. This information is contained on the City of

Busselton's webpages. The OAMP has specific management measures for the control of feral animals within the Proposal area.

The potential residual impacts of the Proposal to WRPs are not expected to be locally or regionally significant.

Figure 14: Western Ringtail Possum Habitat Within The Disturbance Footprint

N 0 40 80 120 160 m	PROJECT/REPORT NAME: Preliminary Documentation Lot 9020 Martingale Road, Dunsborough		
SCALE: 1:4,445	SHEET SIZE: A3 COLOUR	CLIENT: Dunsborough Joint Venture	
COORDINATE REFERENCE SYSTEM: GDA2020 / MGA zone 50	PROJECT NUMBER: A25.024	VERSION: 0	
DATA SOURCE: LANDGATE AERIAL IMAGERY NOW	DRAWN BY / REVIEWED BY: MD/BH	DATE: 22/7/2025	

Legend

- Proposal Area
- Disturbance Footprint
- Western Ringtail Possum Habitat
- Western Ringtail Possum - Nest or Drey
- Western Ringtail Possum - Spotlight
- Western Ringtail Possum - Scat

No	Description	Drawn	Approved	Date
A	Original issue	MD	BH	22/7/2025

NOTES:

Cadastral boundary (LGATE-002). Label corresponds to the vegetation association number.

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Figure 15: Potential Habitat Corridors

N

0 40 80 120 160 m

PROJECT/REPORT NAME: Preliminary Documentation Lot 9020 Martingale Road, Dunsborough		
SCALE: 1:4,445	SHEET SIZE: A3 COLOUR	CLIENT: Dunsborough Joint Venture
COORDINATE REFERENCE SYSTEM: GDA2020 / MGA zone 50	PROJECT NUMBER: A25.024	VERSION: 0
DATA SOURCE: LANDGATE AERIAL IMAGERY NOW	DRAWN BY / REVIEWED BY: MD/BH	DATE: 22/7/2025

Legend

- Proposal Area
- Disturbance Footprint
- Conservation Offset Area
- South West Regional Ecological Linkages Axis Lines

No	Description	Drawn	Approved	Date
A	Original issue	MD	BH	22/7/2025

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5.4 Mitigation

The Proponent is committed to ensuring that the Proposal avoids or minimises, where practicable, impacts on MNES values present in the Proposal area.

The Proponent has applied the mitigation hierarchy (avoid, minimise, and offset) during the design process to develop mechanisms that address potential impacts to key WRP values within the Proposal area. The mechanisms applied are discussed below and summarised in **Table 13**.

5.4.1 Avoidance

The Proposal area has been predominately zoned for residential and rural residential for several decades. Compared to the zoning of the City of Busselton's LPS 21, the Proposal has significantly refined the proposed lot yield to retain preferential WRP habitat. This refinement has resulted in a **30% reduction** in clearing compared to the current zoning.

Compared to the original referral, clearing has **been reduced by 19%.**

Avoidance measures have resulted in the protection of **18.9 ha** of remnant vegetation (of which 18.6 ha represents suitable habitat for WRPs) and up to **30 dreys** within the Conservation area (Western Environmental, 2023). Furthermore, up to 35 individuals have been recorded within a single night, within the Conservation area (Western Environmental, 2023). WRP values within the Conservation area are presented in **Figure 16**.

This Conservation area will be placed into a conservation covenant with DCCEEW and managed by the City of Busselton post-development.

- Clearing within the disturbance footprint has been altered to reduce impacts to a relatively tight cluster of observed dreys along the western boundary. Previous clearing areas bisected this area, however the majority of the dreys are now within the Conservation area.

In other locations within the northern section of the proposal area, the disturbance footprint has been strategically amended to capture more fringing vegetation around the wetland and ensure a wider corridor to the north of the Proposal area.

5.4.2 Minimise and Management

Clearing will be minimised within the southern section of the Proposal area as a result of Local Government planning controls. These areas are zoned as 'Rural Residential', and as a result, clearing is only permitted where:

- Associated with implementing approved development envelope as approved in a structure plan.
- Essential for achieving adequate fire protection.
- The vegetation is dead, dying or dangerous.

These planning controls will ensure that native vegetation and supporting habitat will remain within the southern section of the Proposal area and continue to support WRP individuals.

The Proponent has also developed several management strategies, guidelines and programs to minimise the proposal's potential impact on the MNES values within the Proposal area. These are:

- **Conservation Area Management Plan (Appendix C)** – this will describe the management actions to be undertaken to protect and enhance the values of the vegetation and wetland retained within the Conservation area. Management measures have considered:
    - Dieback and weed management.

- Fencing and access controls.
- Feral animal controls.
- Bushfire management.
- Waste management.
- Rehabilitation measures.

- **Western Ringtail Possum Management Plan (Appendix D)** – this will describe the measures to manage direct and indirect impacts on the species during clearing and construction activities. The Plan has been prepared with consideration given to the following guidance documents:
  - Department of Parks and Wildlife (2017). Western Ringtail (Possum *Pseudocheirus occidentalis*) Recovery Plan. Wildlife Management Program No. 58. Department of Parks and Wildlife, Perth, WA.
  - Threatened Species Scientific Committee (2018). Conservation Advice (*Pseudocheirus occidentalis*) Western Ringtail Possum. Canberra: Department of the Environment and Energy.

Figure 16: Western Ringtail Possum Values Within The Conservation Area

N

0 40 80 120 160 m

PROJECT/REPORT NAME	Preliminary Documentation Lot 9020 Martingale Road, Dunsborough
SCALE	1:4,445
SHEET SIZE	A3 COLOUR
CLIENT	Dunsborough Joint Venture
COORDINATE REFERENCE SYSTEM	GDA2020 / MGA zone 50
PROJECT NUMBER	A25.024
VERSION	0
DATA SOURCE	LANDGATE AERIAL IMAGERY NOW
DRAWN BY / REVIEWED BY	MD/BH
DATE	22/7/2025

Legend

- Proposal Area
- Conservation Offset Area
- Western Ringtail Possum Habitat
- Western Ringtail Possum - Nest or Drey
- Western Ringtail Possum - Spotlight
- Western Ringtail Possum - Scat

No	Description	Drawn	Approved	Date
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Table 13: Application of the mitigation hierarchy for Western Ringtail Possum

Potential impact	Avoidance	Minimisation	Residual Impacts	Offsets	Significance Assessment
Loss of WRP habitat	The vegetation disturbance footprint has been reduced (post referral) from 12.5 ha to 2.3 ha to reduce direct impacts to WRP habitat. This represents a 19% reduction in clearing.	Clearing will be restricted to the Proposal area only to avoid over clearing in adjacent conservation areas and minimise impacts on adjacent fauna habitat. Measures to minimise inadvertent loss of habitat include: - Clearing undertaken outside of breeding season. - Demarcation of the proposed clearing area to be approved by the Superintendent before the clearing occurs. - Restricted vehicle movement to designated access tracks, to prevent vegetation damage and erosion. - Directional clearing.	Loss of 2.3 ha of suitable WRP habitat, including up to seven nests comprised of dreys/hollows.	Offsets are proposed (as outlined in the Offset Strategy (**Appendix E**) Offset to include: - Establish an 18.9 ha Conservation area (which includes 18.6 ha of WRP habitat) to be appropriately zoned within the City of Busselton Local Planning Scheme and voluntarily placed into a conservation covenant. - Installation of artificial dreys and water points within the Conservation area. Numbers and locations will be discussed with DCBA. - Rehabilitation of up to 8 ha of habitat within the Conservation Area.	After applying the mitigation hierarchy, the direct removal of 2.3 ha habitat and seven dreys is not considered locally significant to WRPs.
Loss of WRP individuals	Restrict vegetation clearing and construction work activities to the Proposal area only.	Clearing will be undertaken per the actions contained within the WRMP. Pre-clearance surveys will be undertaken the night	N/A	N/A	After the mitigation hierarchy has been applied the Proposal can be appropriately

Potential impact	Avoidance	Minimisation	Residual Impacts	Offsets	Significance Assessment
	Clearing is to be undertaken outside of breeding season	prior to clearing. Identified individuals will be appropriately handled by a licenced fauna spotter to adjacent vegetation within the Conservation Area			managed to address this impact and no significant impacts are expected.
Habitat fragmentation	Not applicable	Clearing will be restricted to the Proposal area only to avoid over-clearing in adjacent conservation areas and to minimise indirect impacts to adjacent fauna habitat. Improvement and protection of 18.9 ha within the dedicated Conservation Area within the Proposal Area. Potential installation of a fauna crossing, connecting the Conservation area with the adjacent Marri Reserve. This will be determined following consultation with the DBCA and City of Busselton	No significant residual impacts concerning habitat fragmentation are anticipated. The Proposal will retain at least 18.9 ha of vegetation within the Proposal area. This vegetation maintains the existing ecological linkage between Marri and Armstrong reserves to the east and along Caves Road to the west.	As per Offset Strategy (**Appendix E**)	After applying the mitigation hierarchy, the Proposal can be appropriately managed to address this impact, and no significant impacts are expected.
Habitat degradation associated with construction activity includes fire, transmission of weeds,	Weeds and introduced fauna are currently established in and	Minimisation measures include: • Develop and implement clean on entry/exit procedures.	The Proposal can be managed to address any potential increase or spread of weeds, dust and increased	N/A	After applying the mitigation hierarchy, the Proposal can be appropriately managed to

Potential impact	Avoidance	Minimisation	Residual Impacts	Offsets	Significance Assessment
introduction/spread of dieback, dust, and increased abundance of introduced fauna species.	surrounding the Proposal area.	• Dust suppression to minimise disturbance to fauna habitats. • Use of speed limits to minimise dust lift-off. • Use of domestic waste facilities to minimise fauna (and feral animal) access. • Roadkill (that may attract introduced predators) will be removed from trafficable areas.	abundance of introduced fauna species. No significant residual impact on WRPs is anticipated. No offsets are proposed.		address this impact, and no significant impacts are expected.

5.5 Recovery Plans and Conservation Advice

The *Western Ringtail Possum (*Pseudocheirus occidentalis*) Recovery Plan* (DPaW, 2017) provides specific recovery objectives for the Swan Coastal Plain zone over the next 10 years.

To demonstrate that the Proposal is not interfering with the recovery objectives for WRPs, an assessment has been conducted within **Table 14**.

Table 14: Assessment against relevant recovery plans, threat abatement plants and conservation advice for Western Ringtail Possum

Plan/ Conservation Advice and Threats	Response
Habitat critical for survival for western ringtail possums is identified and protected.	The disturbance footprint has been designed to avoid WRP dreys and recorded individuals as far as possible. Areas that contain preferential WRP habitat (as supported by increased WRP densities and dreys) will be retained in the Conservation area. The Conservation area will be subjected to management measures that will reduce existing impacts and enhance habitat quality for WRPs.
Threatening processes that are constraining the recovery of western ringtail possums are mitigated.	• Both the OAMP and WRMP will be implemented as pre-development, during-development, and post-development management measures to reduce the potential impacts associated with the threatening process. • The Conservation area is currently experiencing threatening processes that have the potential to limit the species' recovery. To mitigate these impacts, the OAMP will include access control (fencing), weed and disease management, and rehabilitation. These management measures will manage the threatening processes and enhance habitat quality for WRPs (which is currently declining). • The WRMP will include species-specific management actions that will directly benefit individuals within the Proposal area, including maintaining water sources and supporting nesting habitat.
An evidence-based approach is applied to the management and recovery of western ringtail possums.	The disturbance footprint has been designed based on the results of an extensive fauna survey undertaken by qualified zoologists with over 25 years of experience. As a result of the survey, the proposed subdivision has been strategically designed to avoid impacts on significant WRP habitats as far as practicable.
The management of displaced, orphaned, injured and rehabilitated western ringtail possums aids the conservation outcome for the species.	The Proposal has been designed to maintain habitat in situ, including the retention of habitat corridors and areas containing WRP dreys. Accordingly, it is expected that all resident WRPs will continue to reside on site within the Conservation area. Management of WRPs during clearing operations will be undertaken in accordance with the WRMP.
Increased awareness of the status of western ringtail possums and support behaviour change to mitigate anthropogenic processes.	Residents will be provided with educational materials and advice on living with WRPs.

6. Giant Spider-Orchid

6.1 Description, abundance, distribution, and habitat

The giant spider-orchid (*Caladenia excelsa)* is a tuberous, perennial herb. It is one of the tallest spider orchids in Western Australia, with stems 45-90 cm tall and usually one to two cream-coloured flowers with maroon stripes (Williams et al., 2001).

The distribution of the species is within the Leeuwin Naturaliste Ridge between Yallingup and Karridale, Western Australia (Atkins, 1998; Williams et al., 2001). The distribution of this species overlaps with the Aquatic Root Mat Community 4 in Caves of the Leeuwin Naturaliste Ridge EPBC Act listed threatened ecological community.

The total known population size is 257 plants across 26 small, fragmented sub-populations (DEC, 2007).

Giant spider-orchid grows on hilltops, slopes, swales and low plains in deep pale yellow, white or grey sandy soils (Hoffman & Brown, 1992; Atkins, 1998; Brown et al., 1998; Hoffman & Brown, 1998), and is found among dense low shrubs in Banksia (Banksia sp., Jarrah (*Eucalyptus marginata*) and Marri (*Corymbia calophylla*) woodlands (Hopper & Brown, 2001; Williams et al., 2001).

6.2 Field Surveys

6.2.1 Accendo (2018)

A comprehensive flora and vegetation survey (Accendo, 2018) was undertaken in October (9^{th}- 12^{th}) within the Proposal area. This survey identified a total of 13 orchid taxa, including five *Caladenia* species that were evidently flowering. None of the orchids identified represented taxa of conservation significance.

6.2.2 Stream Environmental (2022)

Stream environmental was engaged to undertake a targeted survey for the giant spider-orchid within the Proposal area. This survey was undertaken in October, during the flowering period for the species.

6.3 Assessment Summary

It is understood that an individual giant spider-orchid (*Caladenia excelsa*) has previously been recorded along Cape Naturaliste Road, in proximity to the Proposal area. A targeted survey undertaken on the 28 September and 20 October 2017 failed to identify the individual (Ecoedge, 2017).

If the individual did flower unusually early, then the orchid basal leaves without the flowering stem would still be visible. Furthermore, early orchid flowering is typically attributed to unseasonal environmental conditions (Patten et al., 2005) which were not experienced in 2017. Accordingly, either the giant spider-orchid individual was subject to herbivore grazing or did not flower in 2017.

This is not uncommon for the species, as not all plants will produce flowers in any one year (Stack et al., 2002). On this basis, the individual giant spider-orchid previously recorded along Cape Naturaliste Road may not flower for a number of years. However, its individual flowering patterns are not representative of *Caladenia excelsa* taxa.

As stated within the Survey Guidelines for Australia's Threatened Orchids (DoEE, 2013), "not all plants in a population or different populations are likely to flower at the same time". This suggests that with the absence of any unseasonal environmental conditions, if present in the Proposal area, some giant spider-orchid individuals would have been flowering and therefore

recorded during the survey. This is considered especially relevant given that five *Caladenia* species were recorded within the Proposal area during the survey (Accendo, 2017).

In consideration of the above and given that the flora and vegetation survey was undertaken in accordance with the Survey Guidelines for Australia's Threatened Orchids (DoEE, 2013) and the Environmental Protection Authority's (EPA's) Technical Guidance: Flora and Vegetation Survey for Environmental Impact Assessment (2016), it is reasonable to conclude that no taxa of conservation significance are likely to occur within the Proposal area. As a result, there are no anticipated impacts to the giant spider-orchid as a result of the Proposal.

7. Banksia Woodlands of the Swan Coastal Plain

7.1 Assessment of Presence

Based on the results of the flora and vegetation survey (Accendo, 2018), the Proposal area contains three vegetation communities which may relate to the Banksia Woodlands of the Swan Coastal Plain TEC (herein referred to as the Banksia Woodlands TEC). These are:

- *Agonis flexuosa – Banksia attenuata* low woodland community.
- *Stirlingia latifolia – Nuytsia floribunda* shrubland.
- *Corymbia calophylla – Banksia grandis* woodland community.

In addition to the information provided within the *Referral of Proposal*, an assessment has been undertaken to determine the presence of the Banksia Woodlands TEC within the Proposal area. This has involved detailed statistical analysis of the dataset obtained during the flora and vegetation survey (Accendo, 2018) and consideration of site-specific environmental characteristics.

7.1.1 Floristic Community Types

Floristic Community Types (FCTs) that relate to the Banksia Woodlands TEC are provided below:

- FCT 20a *Banksia attenuata* woodlands over species rich dense shrublands.
- FCT 20b Eastern *Banksia attenuata* and/or *Eucalyptus marginata* woodlands.
- FCT*20c Eastern shrublands and woodlands.
- FCT 21a Central *Banksia attenuata - Eucalyptus marginata* woodlands.
- FCT 21b Southern *Banksia attenuata* woodlands.
- FCT 21c Low lying *Banksia attenuata* woodlands or shrublands.
- FCT 22 *Banksia ilicifolia* woodlands.
- FCT 23a Central *Banksia attenuata - Banksia menziesii* woodlands.
- FCT 23b Northern *Banksia attenuata - Banksia menziesii* woodlands.
- FCT 23c North-eastern *Banksia attenuata - Banksia menziesii* woodlands.
- FCT S9 *Banksia attenuata* woodlands over dense low shrublands.
- FCT 24 Northern Spearwood shrublands and woodlands.
- FCT 25 Southern *Eucalyptus gomphocephala – Agonis flexuosa* woodlands.
- FCT 28 Spearwood *Banksia attenuata* or *Banksia attenuata* - Eucalyptus woodlands.

To identify the conservation significance of the identified plant communities within the Proposal area, site data was compared to the above-mentioned FCTs. This involved statistical analysis utilising a non-hierarchical clustering method. This method was used as it allows new plot data to be added to previous classifications, given they are based on the concept that each group or cluster is represented by a prototype i.e. either a centroid or a medoid (a 'type' plot) (De Cáceres and Wiser, 2012). On this basis, new observations can be assigned to an existing classification by calculating the distance to the nearest prototype (which may be considered a membership criterion). This approach is preferred to the hierarchical reconstruction approach because it defines numerical rules that can be consistently applied.

The results of the assignment to the FCTs revealed no close similarity for any of the plots within the Proposal area (none greater than a 60% probability of belonging to a particular

group). All plots were either most similar to FCT 6 (weed dominated wetlands) or the deeper wetland group of FCTs 13, 15, 16 and 17.

As a result, based on statistical analysis of the dataset obtained from the flora and vegetation survey (Accendo, 2018), no vegetation types within the Proposal area are comparable to FCTs that represent Banksia Woodland TEC.

7.1.2 Soils and Landforms

The Banksia Woodlands TEC typically occurs on well-drained, low-nutrient soils on sandplain landforms and is contained within the Bassendean Zone and the Perth Coastal Zone landforms.

The Proposal area does not occur in any of these landform units. Mapping produced by the Department of Primary Industries and Regional Development (DPIRD) (2019) indicates that the Proposal area occurs within the very southern extent of the Pinjarra Zone, the Leeuwin Zone and the Donnybrook Sunkland Zone. The Proposal area is not comprised of Bassendean sands.

7.1.3 Flora Structural Features

Agonis flexuosa - *Banksia attenuata* low woodland community

The dominant species of the *Agonis flexuosa* – *Banksia attenuata* low woodland community is *Agonis flexuosa*. This species has not been identified as a key indicator of the Banksia Woodlands TEC and is not referenced in any descriptions of the TEC within the DotEE's *Banksia Woodlands of the Swan Coastal Plain: a nationally-protected ecological community* (Commonwealth of Australia, 2016).

Furthermore, key species found within the shrub layer of this community include *Taxandria linearifolia, Acacia saligna, Adenanthos meisneri, Pteridium esculentum* and *Macrozamia riedlei*. None of these species have been identified as key shrub layer indicator species of the Banksia Woodlands TEC.

Stirlingia latifolia – Nuytsia floribunda shrubland

The *Stirlingia latifolia – Nuytsia floribunda* shrubland does contain some individuals of *Banksia attenuata* but does not qualify as an example of the Banksia Woodlands TEC. This community does not contain any Banksia species that are dominant or co-dominant in the canopy. There are stags of dead individual banksia trees as well as logs on the ground, with live individuals only being relatively sparse. This area may have experienced an infestation of Phytophthora dieback, which may have resulted in the low numbers of banksia in the community.

Corymbia calophylla – Banksia grandis woodland

The Banksia Woodland TEC is described as "having a generally dominant Banksia component, which includes at least one of four key species—*Banksia attenuata* (candlestick banksia), *B. menziesii* (firewood banksia), *B. prionotes* (acorn banksia) and/or *B. ilicifolia* (holly-leaved banksia)" (Commonwealth of Australia, 2016). None of the species are dominant or co-dominant within the *Corymbia calophylla – Banksia grandis* woodland community.

7.1.4 Conclusion

Based on the above assessment, the Proposal area does not contain the Banksia Woodland TEC and therefore there are no anticipated impacts to this TEC.

8. Environmental Offsets

Offsets are required to achieve a conservation outcome that counterbalances any significant residual impact on a matter of national environmental significance (MNES) due to the Proposal. These offsets must provide environmental values like the ones being lost, minimise the time-lap between the impact and delivery of the offset, and provide additional protection to the environmental values at risk or management actions to improve environmental values.

The provision of direct offsets is proposed based on the outcomes of the significance assessment and the extent of the significant residual impacts on MNES. Based on this, one protected matter has been identified that is likely to be subject to significant impacts when assessed against the significant impact guidelines 1.1 (DoE, 2013). This protected Matter is the WRP (*Pseudocheirus occidentalis)*.

The Project will reduce the extent of the habitat for the WRP by removing 2.3 ha of vegetation. The removal of this habitat fauna habitat is unavoidable. Therefore, to mitigate the loss, direct offsets are proposed in accordance with the Commonwealth's EPBC Act Environmental Offsets Policy and calculated as per the EPBC Act Offset Assessment Guide.

An Offset Strategy and Management Plan (OSMP) (**Appendix E**) has been prepared for the Proposal. The following sections provided an overview of the proposed offsets to address residual impacts resulting from the Proposal.

8.1 Offset Policy

The EPBC Act Environmental Offsets Policy (DSEWPaC, 2012b) requires that offsets satisfy the following Principles:

- Suitable offsets must deliver an overall conservation outcome that improves or maintains the viability of the protected matter.
- Suitable offsets must be built around direct offsets but may include other compensatory measures.
- Suitable offsets must be in proportion to the level of statutory protection that applies to the protected matter.
- Suitable offsets must be of a size and scale proportionate to the residual impacts on the protected matter.
- Suitable offsets must effectively account for and manage the risks of the offset not succeeding.
- Suitable offsets must be additional to what is already required, determined by law or planning regulations, or agreed to under other schemes or programs.
- Suitable offsets must be efficient, effective, timely, transparent, scientifically robust and reasonable.
- Suitable offsets must have transparent governance arrangements including being able to be readily measured, monitored, audited and enforced.

Additionally, the EPBC Act Environmental Offsets Policy (2012) requires the delivery of an "overall conservation outcome that improves or maintains the viability of the aspect of the environment that is protected by national environmental law and affected by the Proposal". The Commonwealth environmental offset is a measure that compensates for the residual adverse impacts of an impact on the environment, whereby offsets are only necessary where the residual impacts are significant.

The EPBC Act Offsets Policy provides for the application of direct offsets and other compensatory measures as follows:

- Direct offsets are defined as those actions that provide a measurable conservation gain for an impacted protected matter. A minimum of 90% of an offset must be a direct offset.
- Other compensatory measures are defined as those actions that do not directly offset impacts but are anticipated to lead to benefits for the impacted protected matter.

While the design of the Proposal has minimised the scale and intensity of potential impacts on habitat associated with WRPs and black cockatoos, some residual impacts will occur that require offsets.

8.2 Offset Strategy

The Environmental Offset Strategy identifies the environmental offsets proposed, which are proportionate to the environmental impact level and the significance of the environmental values present. A summary of the proposed environmental offsets is provided below:

- Establishment of **18.9 ha** onsite conservation area that will be placed into a conservation covenant and appropriately zoned under the City of Busselton Local Planning Scheme.
- Rehabilitation of at least 8 ha within the Conservation area. Particular focus will be applied to degraded areas northeast of the wetland and where WRP survey results showed reduced abundance, compared to other locations. An area of revegetation is proposed in the southern section of the Proposal area, and post-fire restoration in the northern section.
- Installation of habitat enhancement features (e.g. artificial drays) within the Conservation area, informed and implemented in consultation with DBCA, local SME's and Landcare groups.
- Implementation of a management plan (the OAMP) to ensure the integrity of vegetation within the OAMP is improved or maintained.
- Transfer of funding to the Local Government or local Landcare group for the purposes of restoration or management actions for WRP within the Dunsborough local region.

Refer to **Appendix E** for additional information on the proposed Offset Strategy.

8.3 Environmental Outcomes

The overarching environmental outcome is to achieve the conservation goal of securing and enhancing habitat that supports:

- WRP (*Pseudocheirus occidentalis*).

The environmental outcomes to be achieved are:

- Improve and restore habitat across the offset site through the implementation of an OAMP and the WRMP.
- Implement the OAMP to ensure the integrity of existing remnant vegetation is maintained.
- Facilitate an adaptive management plan for the offset area, including interim milestones and a monitoring program.
- Compliance reports detailing the progress and performance of the implemented management plan and the achievement towards, and maintenance of the targeted environmental outcomes annually.

The be considered successful, the offset must meet the following criteria to demonstrate a conservation outcome based on suitable habitat quality assessments:

1. After 20 years, the offset area habitat quality score must be at least 1 point greater than the impact area habitat quality score (prior to the impact); and
2. After 20 years, the offset area habitat quality score must have achieved an overall habitat quality gain of at least 1 point.

Therefore, to successfully restore the habitat in the proposed offset area, the interim milestones and management plan must result in a habitat quality score of 8 out of 10 after 20 years for habitat supporting the WRP. This criterion aligns with the EPBC Act's Offset Assessment Guide (DCCEEW, 2012).

Additionally, for the offset to be successful, any identified Weeds of National Significance (WoNS) within the offset area must present densities lower than 1% and locally significant weeds must be reduced by over 90% from the baseline monitoring assessment. Additionally, pest animals must not be detected within the offset area for a period of two or more years.

Actions to achieve the desired environmental outcomes are contained within the OAMP (**Appendix C**) and the WRPMP (**Appendix E**).

9. Threat Abatement Plans

9.1 Recovery Plans and Conservation Advice

The relevant recovery plans and conservation advice for black cockatoos and WRPs have been addressed in **Section 2.5** and **Section 3.6**, respectively.

9.2 Threat Abatement Plans

9.2.1 Threat Abatement Plan for Phytophthora cinnamomi

The Threat abatement plan for disease in natural ecosystems caused by Phytophthora cinnamomi (Commonwealth of Australia, 2014) provides the following objectives:

- Objective 1: Identify and prioritise for protection biodiversity assets that are, or may be, impacted by *Phytophthora cinnamomi*.
- Objective 2: Protect priority biodiversity assets through reducing the spread and mitigating the impacts of *Phytophthora cinnamomi.*
- Objective 3: Communication and training.

There is potential for *Phytophthora cinnamomi* to occur within the southern section of the Proposal area. Accordingly, the OAMP will incorporate dieback management measures associated with construction activity control methods. Construction management measures include weed and disease hygiene with clean on entry/exit requirements.

9.2.2 Threat Abatement Plan for Predation by Feral Cats

The *Threat abatement plan for predation by feral cats* (Commonwealth of Australia, 2015) provides the following objectives:

- Objective 1: Effectively control feral cats in different landscapes.
- Objective 2: Improve effectiveness of existing control options for feral cats.
- Objective 3: Develop or maintain alternative strategies for threatened species recovery.
- Objective 4: Increase public support for feral cat management and promote responsible cat ownership.

The City of Busselton has particularly stringent local laws for cats in Western Australia, including the requirement that all cats must be contained on their own property at all times, which is aimed at preventing damage to local fauna species. This information is contained on the City of Busselton's web pages as follows:

- https://www.busselton.wa.gov.au/Community-Services/Ranger-Services/Animal-Information/Cat-Information/Keeping-and-Control-of-Cats.
- https://www.busselton.wa.gov.au/Community-Services/Ranger-Services/Animal-Information/Cat-Information/Nuisance-Cats.
- https://www.busselton.wa.gov.au/Community-Services/Ranger-Services/Animal-Information/Cat-Information.

9.2.3 Threat Abatement Plan for Predation by the European Red Fox

The Threat abatement plan for predation by the European red fox (Commonwealth of Australia, 2008) provides the following objectives:

- Objective 1: Prevent foxes occupying new areas in Australia and eradicate foxes from high-conservation-value 'islands'.

- Objective 2: Promote the maintenance and recovery of native species and ecological communities that area affected by fox predation.
- Objective 3: Improve knowledge and understanding of fox impacts and interactions with other species and other ecological processes.
- Objective 4: Improve the effectiveness, target specificity, integration and humaneness of control options for foxes.
- Objective 5: Increase awareness of all stakeholders of the objectives and actions of the TAP, and of the need to control and manage foxes.

The City of Busselton implements an annual control program to reduce the fox population and their impact on native fauna and domestic animals throughout the area. This includes the control of foxes through a baiting programme using the naturally occurring poison '1080' and providing fox traps available for use in areas where baiting is not permitted. Training and development of peri-urban landholders' skills in fox trapping and encouraging fox baiting with funding for free baits in approved rural areas is also undertaken in conjunction with Geocatch.

It is anticipated that any vagrant foxes within the Proposal area will be deterred following the commencement of construction works. Given that residential dwellings adjoin the Conservation area, targeted fox control management measures are not considered suitable (i.e. baiting, shooting). Alternatively, it is proposed to install ring-lock fencing around the entirety of the Conservation area to restrict feral animal movement.

10. Economic and Social Matters

The Proposal area is zoned Residential and Rural Residential under the City of Busselton *Local Planning Scheme Number 21*. The proposed residential development will provide multiple positive social and economic benefits. This will include direct and indirect employment that would be generated by lot and dwelling construction. Furthermore, the residential population would generate demand for addition regional retail, commercial and other services in the Dunsborough area.

10.1 Housing shortage

West Australia is experiencing a significant housing shortage negatively impacting families and local communities. The South-west in particular is facing a growing crisis with families moving into caravans and short-term accommodation (Bunbury Times, 2021). The Proposal will deliver up to 90 new residential blocks to the local community and assist in providing housing opportunities within the Dunsborough region.

10.2 Job creation

The Proposal will create and sustain work for local construction and building businesses over its development life. The Proposal is anticipated to support at least 40 local jobs. The Proposal will also bring new residents to the local community providing growth opportunities and assisting in addressing labour shortages within the local community.

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Appendix A Biologic (2022) and Western Environmental (2023) Targeted Black Cockatoo and Western Ringtail Possum Survey Report

Appendix B Targeted *Caladenia excelsa* Survey Report

Appendix C Offset Area Management Plan

Appendix D Western Ringtail Possum Management Plan

Appendix E Offset Strategy

Document Distribution

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