WESTERN
ENVIRONMENTAL

Lot 39 Lakes Road
North Dandalup

Biological Surveys

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Lot 39 Lakes Road
North Dandalup

Biological Surveys

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In accordance with the scope of services, WEPL has conducted environmental field monitoring and/or testing in the preparation of this report. The nature and extent of monitoring and/or testing conducted is described in this report.

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If an Auditor is engaged by the Client to undertake review of this report, it shall be made available subject to the terms and conditions of the agreement between the Client and WEPL and the caveats in this statement.

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This report is intended to be read in its entirety, and sections or parts of this report should therefore not be read and relied on out of context.

WEPL will not be liable to update or revise this report to take into account any events or circumstances or facts becoming apparent after the date of this report.

Executive Summary

Western Environmental Approvals Pty Ltd (WEPL) was commissioned by Harley Dykstra to undertake biological surveys to collect baseline data on environmental values on Lot 39 Lakes Road, North Dandalup.

The biological surveys included a:

- Out of season Reconnaissance level flora and vegetation survey.
- Out of season assessment for potential presence of Threatened and Priority Ecological Communities and habitat for Threatened and Priority flora species.
- Basic fauna Survey.
- Targeted Black Cockatoo habitat assessment, exclusive of the foreshore reserve.

The fauna survey, black cockatoo habitat assessment, flora and vegetation survey and targeted survey was undertaken on 1 of April and 2 of April 2025.

Flora and Vegetation

No conservation significant flora was recorded within the Survey Area. One DBCA record was previously recorded within the Survey Area (*Synaphea sp. Pinjarra* R. Davis 6578 (CR) (T)) although the description in the DBCA data does not match the point location and that the location has been cleared for over 50 years. The locality description places the species on the eastern side of the railway line, whereas the Survey Area is located on the northern side and is >1 km north from the nearest part of the railway line. No *Synaphea sp. Pinjarra* R. Davis 6578 (CR) (T) were recorded during the Reconnaissance Flora and Vegetation Survey.

A total of 37 vascular flora species, including 11 introduced species, were recorded from within the Survey Area from nine relevés.

Following the survey, an updated likelihood of occurrence assessment was undertaken, both within and outside of the foreshore reserve. Species within the foreshore reserve that were assigned a high or medium likelihood of occurrence retained their classifications, as the survey was undertaken outside their flowering period. However, species outside of the foreshore reserve with an initial high or medium likelihood were reclassified to low due to the completely degraded vegetation condition, which makes their presence in the Survey Area unlikely.

Four vegetation types were identified, with the majority of the Survey Area being cleared, degraded or Completely Degraded condition.

No Threatened Ecological Community (TEC) or Priority Ecological Community (PEC) were found as being present during the survey. None of the TECs and PECs identified by the desktop assessment as having a high or medium likelihood of occurrence were identified as occurring within the Survey Area.

Basic Fauna Survey

The three species that had a high likelihood of occurrence were:

- *Zanda baudinii* (Baudin's black cockatoos)—EN.
- *Zanda latirostris* (Carnaby's black cockatoos)—EN.
- *Calyptorhynchus banksii naso* (Forest red-tailed black cockatoos)—VU.

The four species that had a medium likelihood of occurrence were:

- *Isoodon fusciventer* (Quenda)—P4.
- *Notamacropus irma* (Western brush wallaby)—P4.
- *Phascogale tapoatafu wambenger* (South-western brush-tailed phascogale)—CD.
- *Westralunio carteri* (Carter's Freshwater Mussel)—VU.

Nine fauna habitat types were described. These habitats are considered to provide core habitat service for three of the conservation significant species identified as present or having a medium or high likelihood of occurrence. Core habitat is provided for all of the conservation significant species, whilst supporting habitat is provided for all conservation significant species except Carter's freshwater mussel.

Black Cockatoo Habitat Assessment

Areas within the planned foreshore area have not been assessed in detail for the presence and extent of black cockatoo habitat due to the planned retention of the area and a particular focus on potential impacts of the project. Additional black cockatoo habitat is likely to be present within the retention area.

The Survey Area falls within the Swan Coastal Plain which is within the modelled distribution range of all three species of black cockatoos: Baudin's black cockatoo (*Zanda baudinii*), Carnaby's black cockatoo (*Zanda latirostris*), Forest red-tailed *(Calyptorhynchus banksii naso*) (DAWE, 2022). No known breeding sites are present within or immediately adjacent to the Survey Area. The nearest roost site is 3.6 km north-east and 4.5 km north (Object ID 127) of the Survey Areas (DBCA-064).

One potential nesting tree (Tree number 315) was identified within the Survey Area.

Eight-hundred and fifty-two potential nesting trees were recorded within the Survey Area.

Nine fauna habitat types were described within the Survey Area. Foraging habitat quality was rated using the Commonwealth Habitat Quality Scoring Tool (DCCEEW, n.d.). As per the Habitat Quality Scoring Tool areas with a site condition score of 2 or lower (low, negligible or none value) are "extremely unlikely to be considered as suitable habitat". These areas are therefore classified as not comprising suitable foraging habitat in this assessment. Foraging habitat quality extents within the Survey Area out of ten are:

- Baudin's black cockatoo: 7.43 ha (10/10), 1.84 ha (6/10), and 154.53 ha (Low 2 to None 0). Total of 9.27 ha of suitable foraging habitat and 154.53 ha of unsuitable foraging habitat.
- Carnaby's black cockatoo: 7.43 ha (10/10), 1.84 ha (6/10), and 154.53 ha (Low 2 to None 0). Total of 9.27 ha of suitable foraging habitat and 154.53 ha of unsuitable foraging habitat.
- Forest red-tailed black cockatoo: 9.26 ha (10/10), 3.65 ha (6/10), and 150.88 ha (Low 2 to None 0). Total of 12.91 ha of suitable foraging habitat and 150.88 ha of unsuitable foraging habitat.
- A total of 32.69 ha within the retained foreshore area was not allocated a foraging habitat quality score. It is recommended that this area will be assessed for the presence and extent of black cockatoo foraging species.

No evidence of roosting was recorded. Within the Survey Area, fauna habitat types FHT-01 and FHT-03 provides the most suitable roosting habitat as they contain medium and large stands of eucalypts with medium canopies. Access to permanent water is within the Survey Area from the North Dandalup River.

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Introduction

1.1 Project Background

Western Environmental Approvals Pty Ltd (WEPL) was commissioned by Harley Dykstra to undertake biological surveys to define baseline environmental values present at Lot 39 Lakes Road, North Dandalup.

The biological survey findings will support the proposed Local Planning Scheme 4 (LSP 4) Amendment No. 3, which proposes a rezoning of the Site from 'Rural' to 'Special Rural' with subsequent subdivision being planned for future planning stages.

1.2 Location

Lot 39 Lakes Road, North Dandalup (the Survey Area) covers 196.57 hectares (ha) and is located approximately 76 km south of the Perth Central Business District (Figure 1).

1.3 Objective and Scope of Work

The objective of the survey was to delineate key flora, vegetation, fauna, and black cockatoo habitat values within the Survey Area.

The scope of work included:

- Desktop assessment of State and Commonwealth databases and other sources.
- Out-of-season Reconnaissance level flora and vegetation survey consistent with the *Technical Guidance - Flora and Vegetation Surveys for Environmental Impact Assessments* (EPA, 2016) and other relevant Commonwealth and State Environmental Protection Authority (EPA) guidance.
- Out-of-season assessment for potential presence of Threatened and Priority Ecological Communities and habitat for Threatened and Priority flora species.
- Basic fauna survey consistent with the *Technical Guidance - Terrestrial Vertebrate Fauna Surveys for Environmental Impact Assessment* (EPA, 2020).
- Assessment of black cockatoo habitat conducted in accordance with the *Referral Guideline for 3 WA Black Cockatoo Species* (DAWE, 2022). This assessment excluded the 'Potential Foreshore Reserve' shown on Figure 1, which buffers the North Dandalup River given this area will be retained.
- Preparation of a technical report including the results of the desktop assessment.

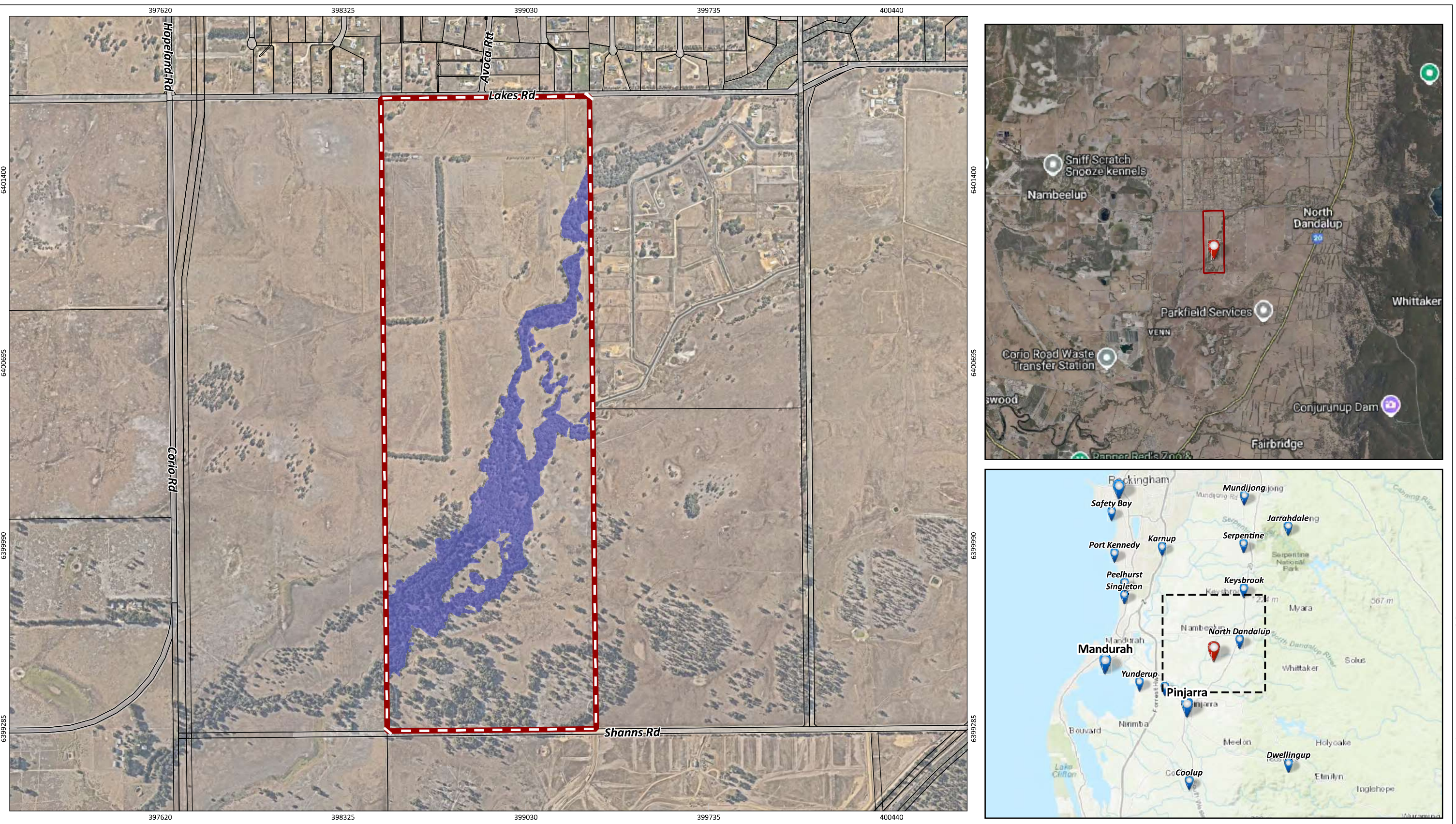

Figure 1: Survey Area

0 200 400 600 800 m	PROJECT/REPORT NAME: Flora, Vegetation and Black Cockatoo Habitat Assessment 1818 Lakes Road, North Dandalup
SCALE: 1:14,100	SHEET SIZE: A3 COLOUR
CLIENT: Harley Dykstra	
COORDINATE REFERENCE SYSTEM: GDA2020 / MGA zone 50	PROJECT NUMBER: A25.034
VERSION: 0	
DATA SOURCE: NEARMAPS	DRAWN BY / REVIEWED BY: JP/JB
DATE: 18/6/2025	

Legend

- Survey Area
- Potential Foreshore Reserve
- Cadastre (No Attributes) (LGATE-001)

No	Description	Drawn	Approved	Date
A	Original issue	JP	JB	18/6/2025

NOTES:

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

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1.4 Relevant Legislation and Guidance

This environmental assessment was conducted in accordance with Commonwealth and State legislation and guidelines:

- Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act).
- Western Australian *Environmental Protection Act 1986* (EP Act).
- Western Australian *Biodiversity Conservation Act 2016* (BC Act).
- Western Australian *Biodiversity Conservation Regulations 2018*.
- Department of the Environment (DotE). (2013). *Matters of National Environmental Significance - Significant Impact Guidelines 1.1 - EPBC Act.*
- Department of the Environment Water Heritage and the Arts (DEWHA). (2010). *Survey Guidelines for Australia's Threatened Birds*.
- WA EPA. (2016). *Technical Guidance – Flora and Vegetation Surveys for Environmental Impact Assessment.* Known herein as the 'Flora and Vegetation Technical Guidance.'
- WA EPA. (2020). *Technical Guidance - Terrestrial Vertebrate Fauna Surveys for Environmental Impact Assessment*. Known herein as the 'Fauna Technical Guidance'.
- Department of Biodiversity Conservation and Attractions (DBCA). (2023). *Draft: Methods for survey and identification of Western Australian Threatened Ecological Communities.* Communities and Communities Program, DBCA.
- Department of Agriculture, Water and the Environment (DAWE). (2022). *Referral Guideline for 3 WA Threatened Black Cockatoo Species.*

A short description of key legislation is provided in Appendix A. Other definitions, including species and ecological community conservation categories, are provided in Appendix B.

1.5 Survey Limitations and Constraints

Limitations and constraints of the fauna, flora and vegetation survey as outlined in the Flora and Vegetation Technical Guidance and Fauna Survey Technical Guidance are detailed in Table 1.

Table 1: Limitations and Constraints of the Flora, Vegetation and Fauna Survey

Possible Limitation	Degree of Limitation (Significant, Moderate or Negligible)	Potential Constraints on Survey Outcomes
Survey Level/ Scope	Negligible	The Reconnaissance flora and vegetation survey was undertaken outside of the optimal survey season, with aim to assess habitat suitability for Threatened and Priority flora and ecological communities. The scope was deemed appropriate given the highly degraded condition of the Survey Area and the level of investigation for the project. The basic fauna survey and targeted assessment of black cockatoo habitat was considered suitable based on species expected to be present and the extent and condition of the vegetation/habitat present within the Survey Area. The level of information collected during the surveys were suitable to provide information required to inform and support approvals and referrals. Detailed assessment of flora, vegetation, and fauna habitat values within the Potential Foreshore Area was not undertaken during the survey. This presents a limitation of information in this area, however it is understood that this area is to be retained in the ultimate development layout and no impacts are proposed. Foraging habitat scoring has therefore not been applied to this area.
Availability of contextual information at a regional and local scale	Negligible	All data required to complete the scope of works including regional and local contextual information was available. DBCA data was requested as part of the desktop assessment.
Site Access	Negligible	The Survey Area was readily accessed by vehicle and on foot (Figure 2). The boundary of the Conservation Category Wetland (CCW) was fenced off and access was limited to certain areas with open fencing and accessible slope.
Survey Intensity and Extent	Negligible	Suitable survey effort by experienced ecologists was applied within the proposed survey level/scope. Survey effort included: • Two person days sampling for flora and vegetation assessment. • Nine relevès were sampled. • Four-person days of basic fauna survey and black cockatoo assessment. All planned Survey Areas were adequately sampled in line with the project scope of works, Fauna habitat assessment within the proposed foreshore reserve were inferred from the Reconnaissance vegetation and flora survey. Targeted black cockatoo habitat was not assessed in the foreshore reserve, as it was excluded from the survey scope. See Figure 2 for botanical survey effort, tracklogs and sampling locations.
Experience	Negligible	The ecologist leading the flora and vegetation field survey (Daniel Rubick) has been conducting flora and vegetation surveys in Western Australia for over four years, with over four years' experience in the Swan Coastal Plain bioregion. The ecologist leading the fauna field survey (Jack Rogers) has been conducting cockatoo targeted assessments in Western Australia as well as Targeted

Possible Limitation	Degree of Limitation (Significant, Moderate or Negligible)	Potential Constraints on Survey Outcomes
		Ornithological Surveys in the UK, with over three years' experience. Back-office support was provided by senior ecologists who have worked in the region for over ten years.
Timing, weather, season	Significant	The out of season Reconnaissance flora and vegetation survey was completed in April, aimed to assess habitat suitability for Threatened and Priority Flora and Ecological Communities. However, rainfall prior to the survey (January-March) was below the long-term average (Graph 1). The timing and weather experienced during Reconnaissance survey present a limitation as most Threatened and Priority Flora species identified within the desktop assessment were not flowering at the time of survey. Given the Completely Degraded condition of the Survey Area and the high level of disturbance, the likelihood of occurrence of these species was found to be low due to a lack of habitat being present. Timing of the survey is therefore not considered a significant limitation. The Targeted black cockatoo survey was undertaken in April which is within the recommended timing for both foraging and breeding habitat for Baudin's black cockatoos (March to April, August to January breeding), Carnaby's black cockatoo (year-round foraging, July to December breeding) and Forest red-tailed black cockatoo (year-round) (DAWE, 2022). Targeted searches were undertaken for secondary evidence of the species presence (i.e. foraging evidence which can be done at any time of year) and to evaluate the potential suitability of the habitat. The temperatures and weather experienced during the fauna field surveys were not considered a limitation and did not affect the ability to record fauna or habitats.
Proportion of the flora and fauna recorded and/or collected, and any identification issues	Negligible	A total of 37 vascular flora species were recorded, including 11 introduced species. The number of species recorded was low relative to the extent of the area surveyed. This is attributed to the historic clearing and current agricultural grazing in the Survey Area, resulting in limited remnant vegetation in the lower stratum. These factors were not considered a limitation to the survey as they reflect the existing condition of the Survey Area. Species sampling was in line with the Flora and Vegetation Technical Guidance for a reconnaissance level flora and vegetation, and the Fauna Technical Guidance for basic fauna and targeted black cockatoo habitat assessment.
Mapping Reliability	Negligible	The majority of the Survey Area was traversed by foot and mapping reliability is considered high. Mapping accuracy and reliability was not considered a limitation.

Possible Limitation	Degree of Limitation (Significant, Moderate or Negligible)	Potential Constraints on Survey Outcomes
Disturbances (fire, flood etc.)	Negligible	Areas of disturbance associated with historic clearing for agricultural and weeds were recorded but were not a constraint on the results of the survey.

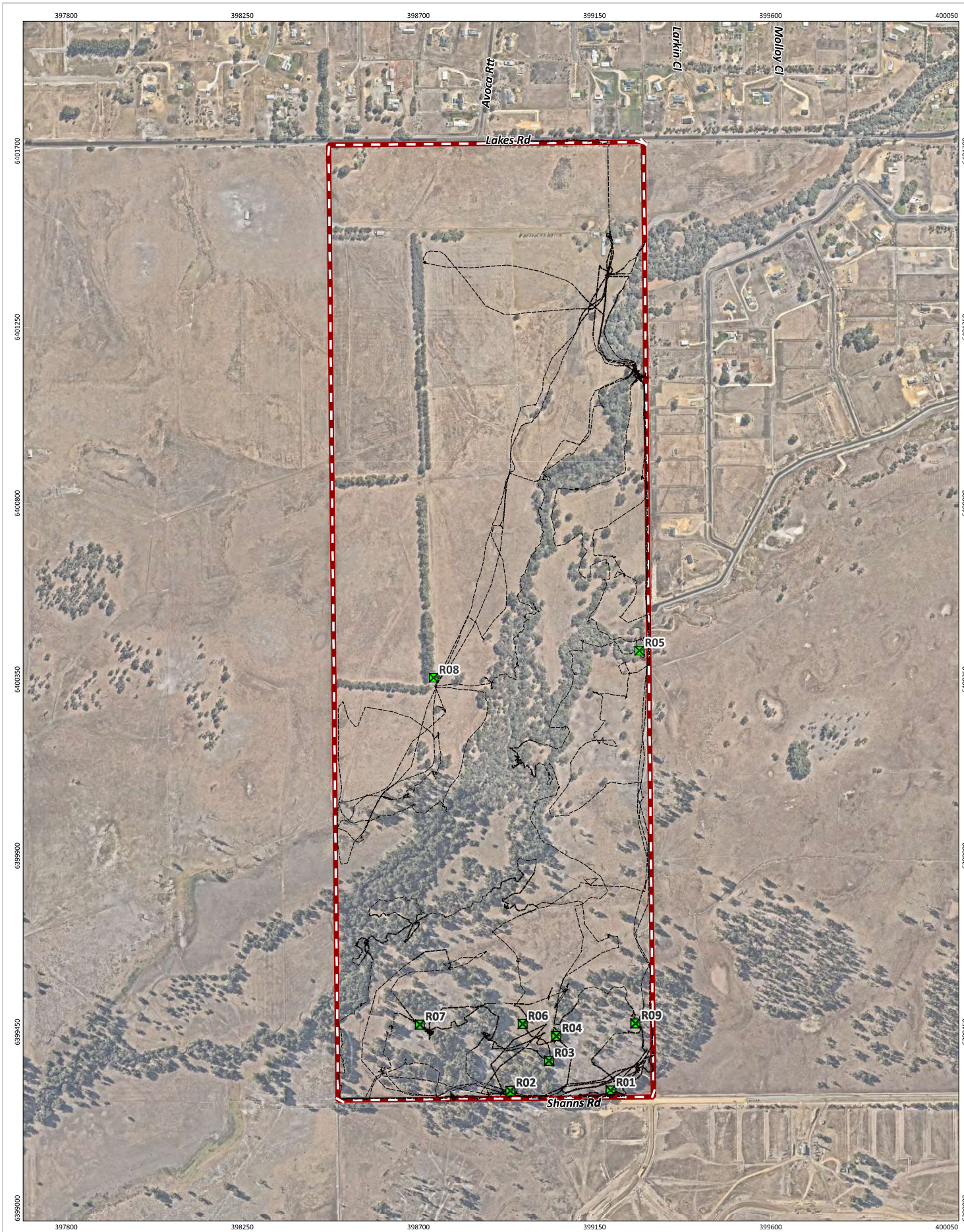

Figure 2: Flora and Vegetation Survey Effort and Sampling Locations

N

0 75 150 225 300 m

PROJECT/REPORT NAME	Flora, Vegetation and Black Cockatoo Habitat Assessment 1818 Lakes Road, North Dandalup
SCALE	1:9,000
SHEET SIZE	A3 COLOUR
CLIENT	Harley Dykstra
COORDINATE REFERENCE SYSTEM	GDA2020 / MGA zone 50
PROJECT NUMBER	A25.034
VERSION	0
DATA SOURCE	NEARMAPS
DRAWN BY / REVIEWED BY	JP/JB
DATE	28/5/2025

Legend

- Survey Area
- Track
- Releve

No	Description	Drawn	Approved	Date
A	Original issue	JP	JB	28/5/2025

NOTES:

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

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2. Existing Environment

2.1 Climate and Rainfall

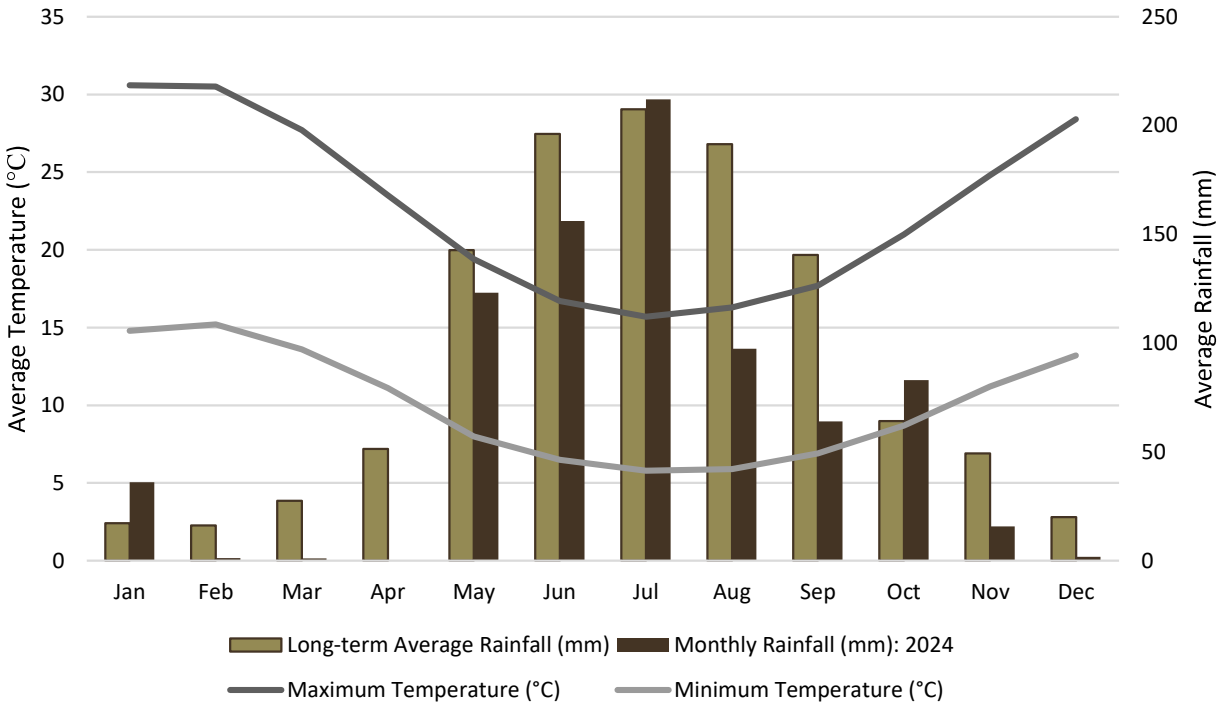
The Survey Area is located within the Swan Coastal Plain (SCP). Beard (1990) described the climate of the area as warm Mediterranean, with cool wet winters (May to September) and warm dry summers.

Climate results are presented using the closest long-term Bureau of Meteorology (BoM) weather station with a complete dataset. The station utilised for the Survey Area was Dwellingup (Station 009538).

Climate statistics were calculated utilising data from the most current climate normal, which is defined as a 30-year interval (BoM, 2007), where possible. A climate normal is a period long enough to include year-to-year variations while avoiding the influence of longer-term changes in climate.

The long-term mean minimum temperature for Dwellingup ranges from 5.8 C (July) to 15.2 C (February) (1991-2020) and the long-term mean maximum temperature ranges from 15.7 C (July) to 30.6 C (January).

The Dwellingup WA weather station recorded 777.8 mm of rainfall in the 12 months prior to the flora survey (March 2024 to March 2025), which is 346.4 mm below the long-term average of 1124.2 mm (BoM 2025). In the three months prior to the survey (January to March 2025), 23.4 mm of rainfall was recorded, which is 37.6 mm below the long-term average of 61 mm for the same time period (BoM, 2025).



Graph 1: Long-term and Monthly Total Rainfall, Maximum and Minimum Temperature for Dwellingup (Station 009538) (BoM, 2025)

2.2 Interim Biogeographic Regionalisation for Australia

The Interim Biogeographic Regionalisation of Australia (IBRA) divides Australia into 89 bioregions based on major biological, geographical and geological attributes. These bioregions are subdivided into 419 subregions as part of a refinement of the IBRA framework (Commonwealth of Australia, 2012). The Survey Area occurs within the Swan Coastal Plain Biogeographic Region, Perth subregion (SWA02).

2.3 Geology and Soils

The soil landscape mapping units (DPIRD-027) intersecting the Survey Areas are listed below in Table 2 and shown in Figure 3.

Table 2: Geology Systems Intersecting the Survey Area (DPIRD-027)

Mapping Unit Symbol	Map Unit Name	Description
213Pj_P1b	Pinjarra P1b phase	Flat to very gently undulating plain with deep acidic mottled yellow duplex (or effective duplex) soils. Moderately deep pale sand to loamy sand over clay: imperfectly drained and moderately susceptible to salinity in limited areas.
213Pj_P1a	Pinjarra P1a phase	Flat to very gently undulating plain with deep acidic mottled yellow duplex (or effective duplex) soils. Shallow pale sand to sandy loam over clay; imperfect to poorly drained and generally not susceptible to salinity.
213Pj_P9	Pinjarra P9 phase	Shallowly incised stream channels of minor creeks and rivers with deep acidic mottled yellow duplex soils.
212Bs_B2	Bassendean B2 phase	Flat to very gently undulating sandplain with well to moderately well drained deep bleached grey sands with a pale yellow B horizon or a weak iron-organic hardpan 1-2 m.

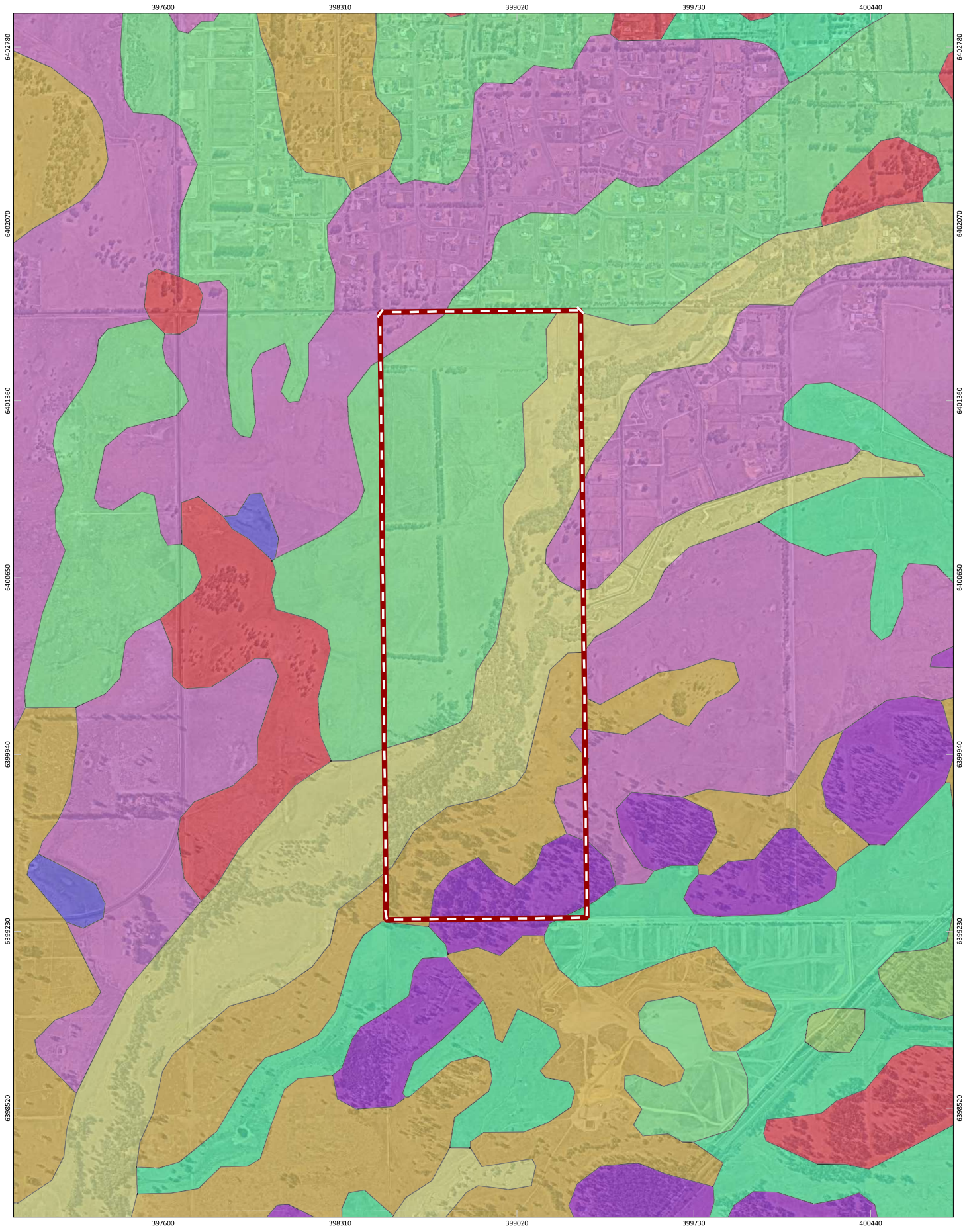


Figure 3: Geology Systems Intersecting the Survey Area

0 100 200 300 400 m

N

SCALE	1:14,200
SHEET SIZE	A3 COLOUR
PROJECT/REPORT NAME	Flora, Vegetation and Black Cockatoo Habitat Assessment 1818 Lakes Road, North Dandalup
CLIENT	Harley Dykstra
COORDINATE REFERENCE SYSTEM	GDA2020 / MGA zone 50
PROJECT NUMBER	A25.034
VERSION	0
DATA SOURCE	NEARMAPS
DRAWN BY / REVIEWED BY	JP/JB
DATE	28/5/2025

Legend

- Survey Area

Soil Landscape Mapping - Best Available (DPIRD-027)

- 212Bs__B1
- 212Bs__B2
- 213Pj__B1
- 213Pj__B2
- 213Pj__P1a
- 213Pj__P1b
- 213Pj__P7
- 213Pj__P8
- 213Pj__P9

No	Description	Drawn	Approved	Date
A	Original issue	JP	JB	28/5/2025

NOTES:

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

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2.4 Pre-European Vegetation

2.4.1 Vegetation Association Mapping

During the 1970s, John Beard and associates conducted a systematic survey of native vegetation, describing the vegetation systems in Western Australia. Beard (1981) mapped the vegetation of the Swan Coastal Plain at 1:1,000,00 scale. This mapping described two broad vegetation units for the Survey Area.

Beard's mapping attempted to depict the native vegetation as it was presumed to be at the time of settlement and is known as the pre-European vegetation type and extent. Beard's vegetation maps are maintained in digital form by the Department of Primary Industries and Regional Development (DPIRD, 2019). Extents are updated periodically by DBCA (Government of Western Australia [GoWA], 2018). The representative vegetation associations within the Survey Area are Pinjarra and Bassendean (Table 3; Figure 4).

Table 3: Pre-European Vegetation Intersecting the Survey Area (DPIRD-006)

Vegetation Association	Description	Original Extent (ha)	Current Extent (ha)	% Remaining	% Managed for Conservation
Pinjarra_968	Medium woodland; jarrah, marri & wandoo	135,999.02	8,996.33	6.61%	1.19%
Bassendean_1000	Mosaic: Medium forest; jarrah-marri / Low woodland; banksia / Low forest; teatree (*Melaleuca* spp.)	88,077.18	23,647.51	26.85%	1.90%

2.4.2 Vegetation Complex Mapping

Regional vegetation for the Swan Coastal Plain was mapped at vegetation complex level by Heddle et al. (1980) at a scale of 1:250,000 and are maintained in digital form by DBCA (DBCA-046; GoWA, 2019b). According to this data (DBCS-046), the Survey Area is primarily representative of one vegetation complex (Figure 4). The current extents of the Heddle (1980) vegetation complex are presented in Table 4 (GoWA, 2019a, GoWA, 2019b).

Table 4: Pre-European Vegetation Complex Representation (DBCA-046)

Vegetation Association or Complex within the Waterloo Site	Description	Original Extent (ha)	Current Extent (ha)	% Remaining	% Managed for Conservation
Guildford Complex	A mixture of open forest to tall open forest of *Corymbia calophylla* (marri) - *Eucalyptus wandoo* (wandoo) - *Eucalyptus marginata* (jarrah) and woodland of *Eucalyptus wandoo* (wandoo) (with rare	90,513.13	4,607.91	5.09%	0.26%

Vegetation Association or Complex within the Waterloo Site	Description	Original Extent (ha)	Current Extent (ha)	% Remaining	% Managed for Conservation
	occurrences of *Eucalyptus lane-poolei* [salmon white gum]). Minor components include *Eucalyptus rudis* (flooded gum) - *Melaleuca rhaphiophylla* (swamp paperbark).				

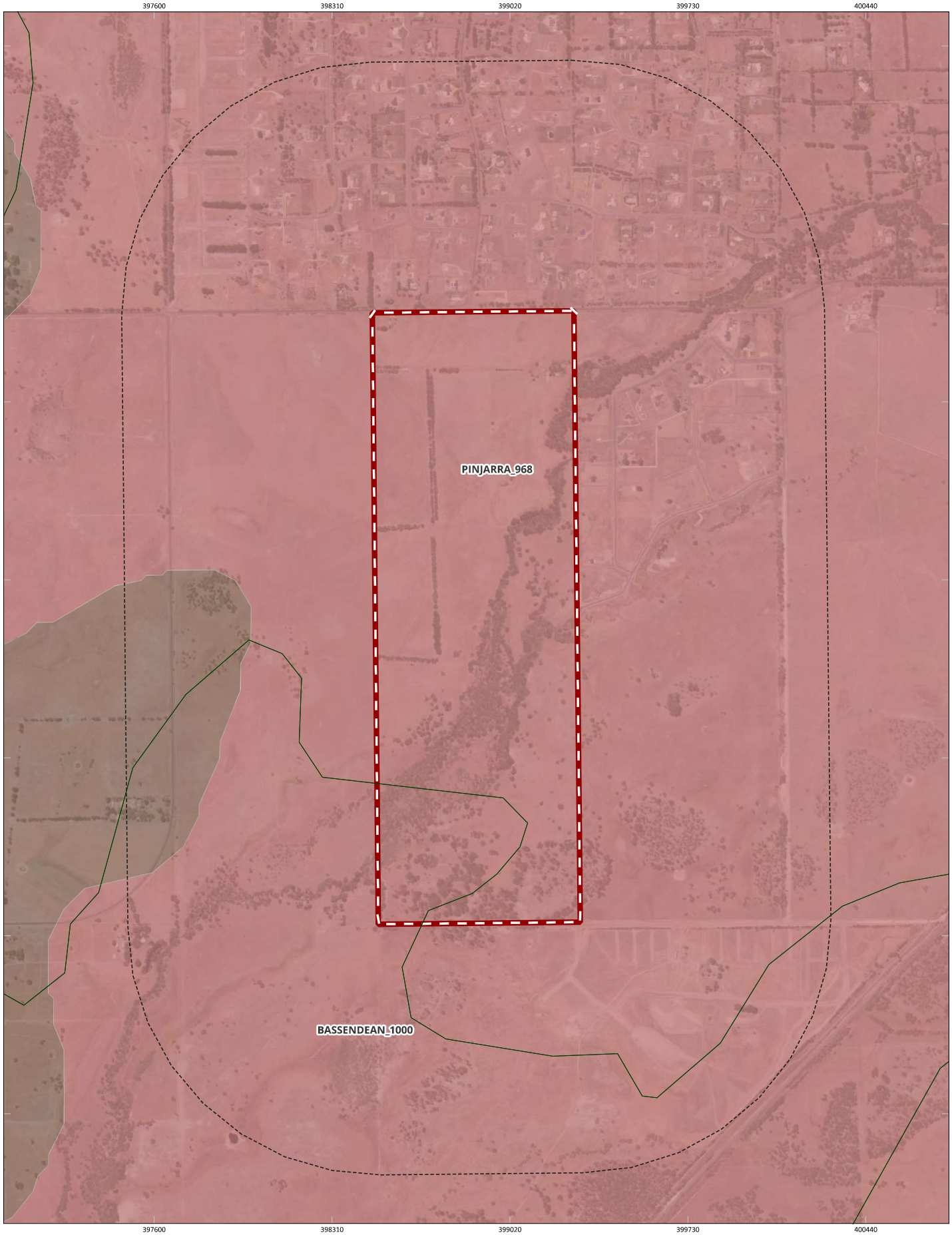

Figure 4: Vegetation Complexes & Associations

0 100 200 300 400 m
N

SCALE: 1:14,200	SHEET SIZE: A3 COLOUR
PROJECT/REPORT NAME: Flora, Vegetation and Black Cockatoo Habitat Assessment 1818 Lakes Road, North Dandalup	CLIENT: Harley Dykstra
COORDINATE REFERENCE SYSTEM: GDA2020 / MGA zone 50	PROJECT NUMBER: A25.034 / VERSION: 0
DATA SOURCE: NEARMAPS	DRAWN BY / REVIEWED BY: JP/JB / DATE: 8/7/2025

Legend

- Survey Area
- 1km Buffer
- Native Vegetation Extent (DPIRD-005)

Vegetation Complexes - Swan Coastal Plain (DBCA-046)

- Southern River Complex
- Guildford Complex

Pre-European Vegetation (DPIRD-006)

- System Association

No	Description	Drawn	Approved	Date
A	Original issue	JP	JB	8/7/2025

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

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2.5 Environmentally Sensitive Areas

One Environmentally Sensitive Area (ESA) intersects the Survey Area (DWER-046) which is associated with the buffer to a CCW (Unique Feature ID [UFI] 13313) as shown on Figure 5.

The Survey Area does not intersect any Bush Forever Areas (DPLH-019). The nearest Bush Forever Sites are over 8 km north-west of the Survey Area (Site 77 - Yangedi Swamp).

2.6 Wetlands and Hydrology

The Survey Area intersects two drainage lines (DWER-031) that passes from the north-east corner towards the south-west corner of the Survey Area. These are:

- North Dandalup River (Minor River)— (Object ID 65586, basin 614)
- Insignificant Tributary— (Object ID 54901, basic 614)

Areas surrounding both drainage lines are classed as conservation category wetlands, split into two features:

- UFI 13313 categorised as palusplain.
- UFI 6018 categorised as palusplain.

The remainder of the Survey Area, not classified as a drainage line or CCW is predominantly comprised of Multiple Use Wetlands (MUWs) split into three features:

- UFI 15802 categorised as palusplain.
- UFI 6030 categorised as palusplain.
- UFI 6022 categorised as palusplain.

Locations of wetlands and hydrological features within and adjacent to the Survey Area are shown on Figure 6. The Survey Area does not intersect with any wetlands listed under the Directory of Important Wetlands in Australia (DBCA-045).

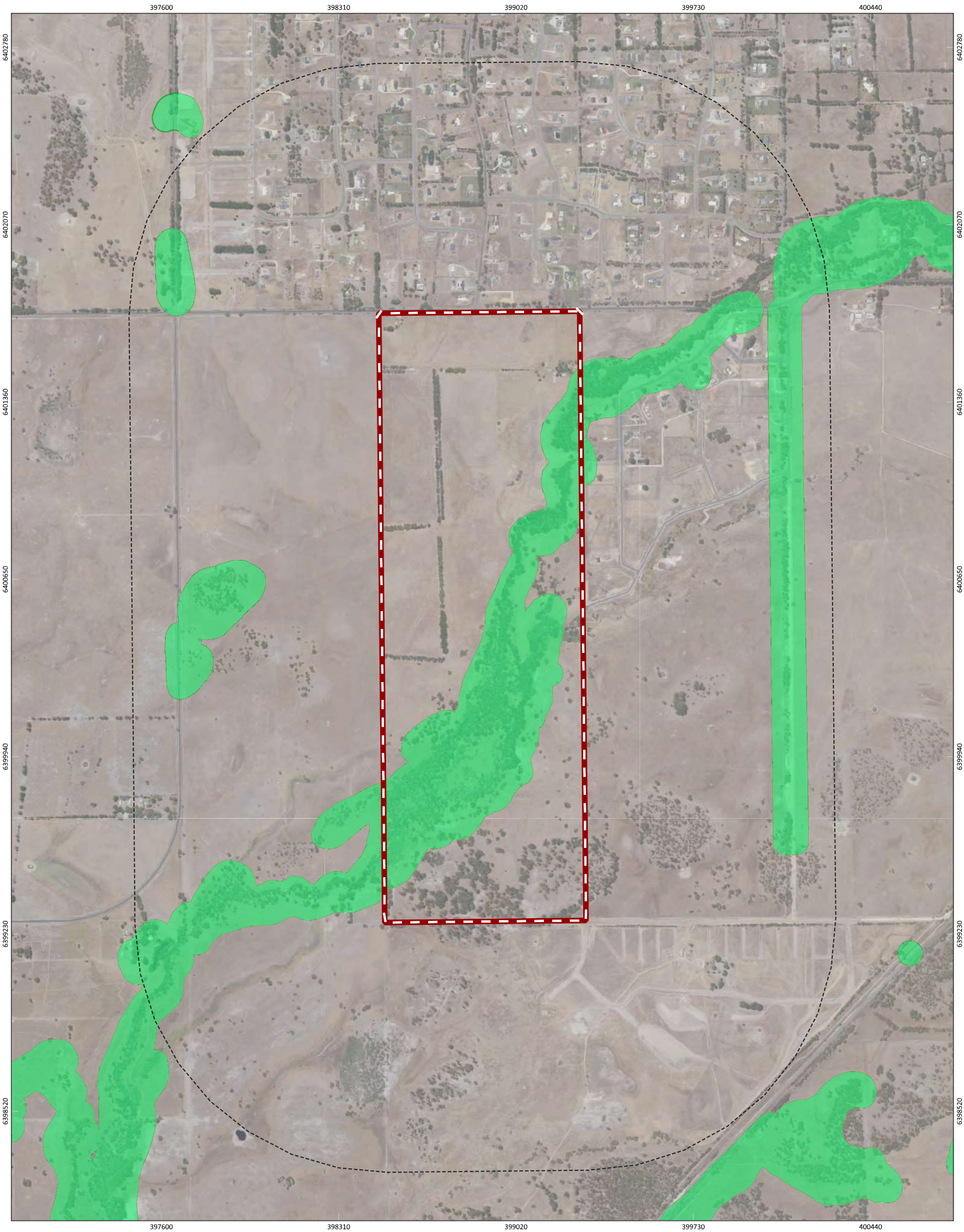

Figure 5: Environmentally Sensitive Areas, Conservation Estate and Bush Forever

0 100 200 300 400 m

N

SCALE	1:14,200
SHEET SIZE	A3 COLOUR
COORDINATE REFERENCE SYSTEM	GDA2020 / MGA zone 50
DATA SOURCE	ESRI Topographic Map
PROJECT/REPORT NAME	Flora, Vegetation and Black Cockatoo Habitat Assessment 1818 Lakes Road, North Dandalup
CLIENT	Harley Dykstra
PROJECT NUMBER	A25.034
VERSION	0
DRAWN BY / REVIEWED BY	JP/JB
DATE	8/7/2025

Legend

- Survey Area
- 1km Buffer
- Clearing Regulations - Environmentally Sensitive Areas (DWER-046)

No	Description	Drawn	Approved	Date
A	Original issue	JP	JB	8/7/2025

NOTES:

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

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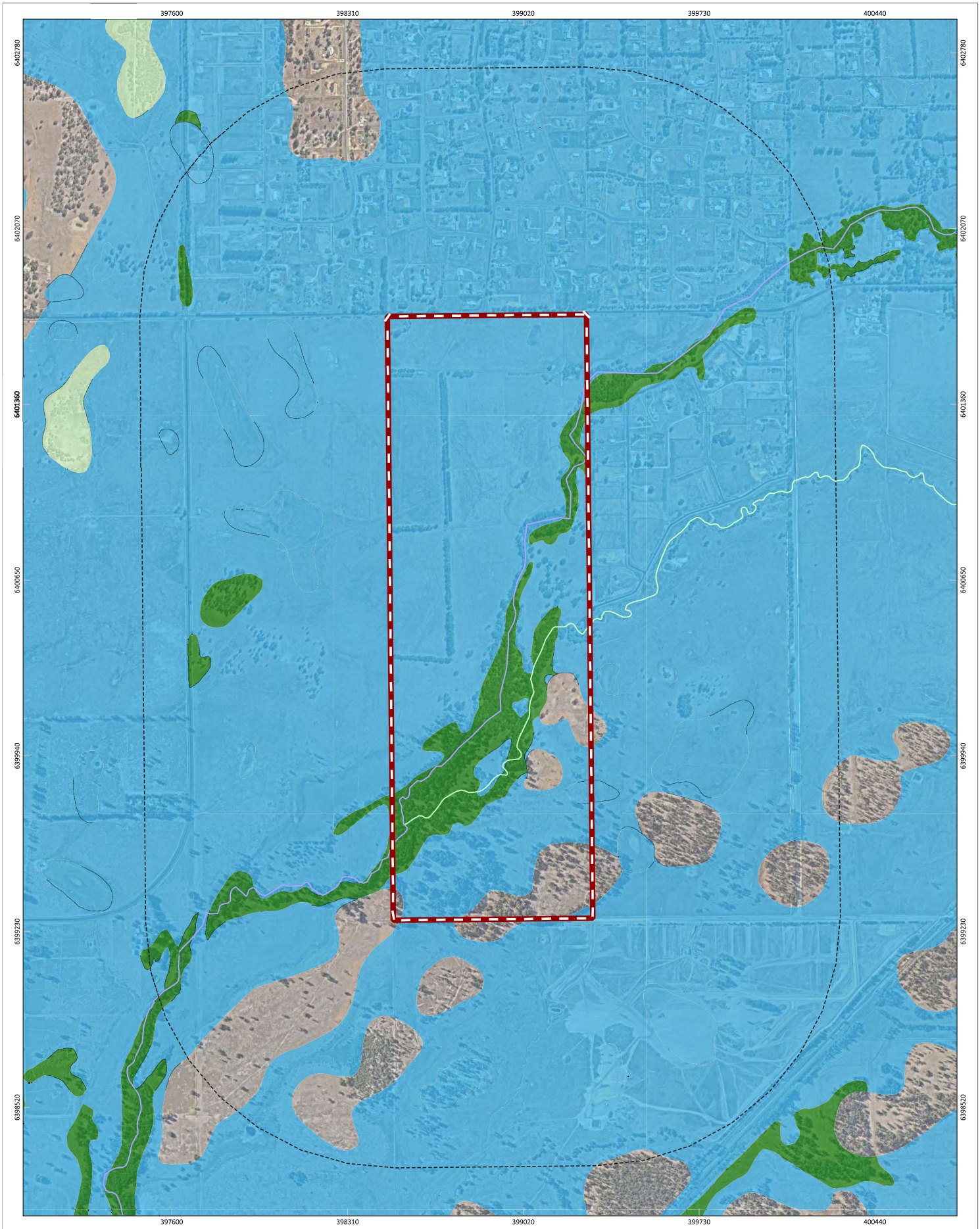

Figure 6: Surface Water Features and Geomorphic Wetlands

0 100 200 300 400 m

N

SCALE	1:14,200
SHEET SIZE	A3 COLOUR
PROJECT/REPORT NAME	Flora, Vegetation and Black Cockatoo Habitat Assessment 1818 Lakes Road, North Dandalup
CLIENT	Harley Dykstra
COORDINATE REFERENCE SYSTEM	GDA2020 / MGA zone 50
PROJECT NUMBER	A25.034
VERSION	0
DATA SOURCE	NEARMAPS
DRAWN BY / REVIEWED BY	JP/JB
DATE	28/5/2025

Legend

- Survey Area
- 1km Buffer

Hydrography Linear (Hierarchy) (DWER-031)

- Minor River
- Minor Tributary
- Insignificant Tributary

Geomorphic Wetlands, Swan Coastal Plain (DBCA-019)

- Conservation
- Multiple Use
- Resource Enhancement

No	Description	Drawn	Approved	Date
A	Original issue	JP	JB	28/5/2025

NOTES:

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

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3. Methodology

3.1 Desktop Assessment

3.1.1 Database Searches

A search of database records held by DBCA was undertaken to compile a list of conservation significant flora, fauna, and ecological communities previously recorded within or surrounding the Survey Areas (Table 5). In addition, a search of the EPBC Act Protected Matters Search Tool (PMST) was undertaken to identify potential Matters of National Environmental Significance (MNES) within or surrounding the Survey Areas (DCCEEW, 2023).

Table 5: Database Searches

Database Name	Date Received and Reference Number	Search Type	Search Area
DBCA Threatened and Priority Fauna database search (Department of Biodiversity Conservation and Attractions, 2024a)	31/03/2025 51-0325FA	Threatened and Priority Fauna	10 km buffer around the Survey Areas
DBCA Threatened and Priority Flora database search (Department of Biodiversity Conservation and Attractions, 2024b)	31/01/2025 52-0325FL	Threatened and Priority Flora	10 km buffer around the Survey Areas
DBCA Threatened and Priority Ecological Communities database search (Department of Biodiversity Conservation and Attractions, 2024c)	16/04/2025 36-0325EC	Threatened and Priority Ecological Communities	10 km buffer around the Survey Areas
Protected Matters Search Tool (Department of Agriculture Water and the Environment [DAWE], 2024)	21/03/2025	Commonwealth listed Threatened flora, fauna and Threatened Ecological Communities	10 km buffer around the Survey Areas

3.1.2 Likelihood of Occurrence

Conservation significant flora, fauna and ecological communities identified from the desktop assessment were assessed to determine their likelihood of occurrence within the Survey Area, both before and after the field survey. The assessment was completed based on the likelihood of occurrence criteria presented in Table 6.

Only species that were either recorded within the Survey Area, or considered to have a high or medium likelihood of occurrence during the post field survey assessment will be discussed in detail. Species that were classified as having a low likelihood of occurrence will not be discussed unless a justification for this classification is required.

Species listed as Marine only under the EPBC Act (e.g. sharks, whales, turtles) and pelagic seabirds that have been excluded from the likelihood of occurrence list as there is no marine habitat present within or near the Survey Area. The likelihood of occurrence assessment is contained within Appendix C.

Table 6: Likelihood of Occurrence Criteria

Likelihood	Criteria
Recorded	Recorded in the Survey Area from database searches, previous survey by others or by current survey.
High	**Flora and Communities** Suitable habitat for flora or communities occurs within the Survey Area; and • Records of flora or community <2 km from the Survey Area, with record <30 years old. **Fauna** Records of fauna species <10 km from the Survey Area. With record <20 years old; or • For species with well understood and specific habitat preference/ requirements, when specific habitat is present in the Survey Area, and records present <10 km from the Survey Area. • Species with general habitat preference, which is present in the Survey Area, and records present <5 km from the Survey Area.
Medium	**Flora and Communities** Suitable or marginally suitable habitat occurs within the Survey Area; and • Records of flora or community <5 km from the Survey Area. • Species or community is strongly linked to a specific habitat, which occurs within the Survey Area and records are present <10 km from the Survey Area. **Fauna** There are records <10 km from the Survey Area, however: • The species is strongly linked to a specific habitat, which is marginally suitable or small in extent in the Survey Area; or • Species has a general habitat preference, but small extent of suitable habitat is present. There is suitable habitat in the Survey Area, but records are >10 km from Survey Area.
Low	• Records are historical only or are pre mapping procedures (e.g. records assigned to towns or place names). • The species has a well understood and specific habitat preference/ requirements, which is absent from the Survey Area; or • Suitable habitat is present, however there are no existing records of the species from the region despite reasonable previous search effort; or • There is some suitable habitat in the Survey Area, however the species is very infrequently recorded in the locality (e.g. migratory bird species).

3.2 Flora and Vegetation Survey

3.2.1 Field Survey and Timing

The field survey was conducted over two days by the survey team listed in Table 7. The survey was conducted during the Autumn flowering period for the region which was adequate for a Reconnaissance level flora survey (EPA, 2016).

Table 7: Survey Team and Timing

Name	Position and years of Experience	DBCA Licence No.	Survey Dates
Dan Rubick	Senior Botanist, 4 years	FB62000688	1st and 2nd of April, 2025

3.2.2 Floristic Sampling

A Reconnaissance level survey was undertaken to describe the values within the Survey Area. This included several sampling techniques as described below. All sampling methodologies were undertaken as per the Flora and Vegetation Technical Guidance (EPA, 2016).

Relevé Sampling

A total of nine non-permanent flora relevés were established within the Survey Area.

The following information was collected from within each relevé:

- Observer.
- Date.
- Relevé /site number.
- Global Position System (GPS) location (GDA2020; accuracy +/- 0.5 m) at the centre of the relevés.
- Digital photograph (spatially referenced with a reference number), taken from the north-west corner, looking diagonally across the relevés.
- Broad soil type and colour.
- Topography.
- List of flora species recorded with height and total foliar cover within the relevés for each species.
- National Vegetation Information System (NVIS) Vegetation description (NVIS Technical Working Group, 2017).
- Vegetation condition

The data collected in the relevés are provided in Appendix D. Survey effort, including sampling locations and track logs, is presented in Figure 2.

Opportunistic Sampling

Species that were not captured in the relevés were recorded and collected opportunistically to ensure all species within the Survey Area were captured. The full flora inventory is provided in Appendix E as a Site by Species Matrix.

3.2.3 Flora Taxonomy and Lodgement of Specimens

Where plant taxa could not be identified in the field, specimens were collected for identification using resources of the Western Australian Herbarium (WAH). Identification of flora collections were completed by Daniel Rubick and non-typical specimens were submitted to the WAH and confirmed by WAH taxonomist (M. Hislop).

The finalised species list was checked against FloraBase (Western Australian Herbarium, 2025) to determine the conservation status and known distribution of each taxon. Introduced species were compared against the current *Biosecurity and Agriculture Management Act 2007* (BAM Act) Declared Pest list (DPIRD, 2022) and the list of Weeds of National Significance (WoNS) (DAWE, 2022) to determine their control status.

Threatened and Priority Flora Report Forms were submitted to DBCA for new populations of conservation-listed flora.

3.2.4 Vegetation Description and Classification

Vegetation was described from relevés, using the height and estimated cover of dominant and characteristic species of each stratum based on NVIS, recorded at Level V (NVIS Technical Working Group, 2017). Up to three species per stratum from each stratum (upper, mid and ground) were used to formulate vegetation descriptions for each relevé and each vegetation type. Vegetation types were defined by observation of species dominance and structural composition by the field survey team.

3.2.5 Vegetation Condition Assessment

Vegetation condition mapping was undertaken as per the requirements of the Flora and Vegetation Technical Guidance (EPA, 2016). The delineation and mapping of vegetation condition within the Survey Area included critical review of sampling data (quadrats, relevés and mapping notes), vegetation mapping, and aerial photography (i.e. delineation of tracks and cleared areas). Polygon boundaries for vegetation condition were digitised using QGIS.

3.3 Identification and Assessment of Significant Vegetation

3.3.1 Identification of Threatened and Priority Ecological Communities

The presence of Threatened and Priority ecological communities was assessed in accordance with the following:

- *Methods for survey and identification of Western Australian threatened ecological communities* (DBCA, 2023a).
- Comparison of species to the Gibson et al. (1994) report and Keighery et al. (2012) reports, particularly the list of taxa presented in Appendix 1 of Gibson et al. (1994).
- Listing in the *Priority Ecological Communities for Western Australia* version 35 (DBCA, 2023b).
- Where applicable, Commonwealth Approved Conservation Advice including Listing Advice was also applied for EPBC Act listed communities.

3.3.2 Banksia Woodland of the Swan Coastal Plain TEC

The presence and distribution of the Banksia Woodland of the Swan Coastal Plain TEC ('Banksia Woodland TEC') was determined as per the diagnostics presented in Section 2 of the Department of the Environment and Energy (DotEE; 2016). This process includes:

- Determining if the key diagnostic characteristics are present.
- Determining the condition of the patch/s.
- Determining if the patch/s size meets the minimum size (ha) requirements.
- Review of patch/s in surrounding context to determine if patch meets condition thresholds.

3.4 Basic Fauna Survey

The basic fauna survey incorporated a number of survey techniques as per the Fauna Technical Guidance (EPA, 2020). A basic survey is a low-intensity survey, conducted at the local scale to gather broad fauna and habitat information. The primary objectives are to verify the overall adequacy of the desktop study, and to map and describe habitats, with a focus on habitat for conservation listed fauna.

Fauna species were identified by active searches, secondary evidence such as scats, tracks, calls, remains, diggings and other signs. A fauna inventory was not compiled as part of this survey (not required under basic level survey) however observations are used to inform the fauna habitat type assessment.

Potential habitats for conservation listed species were identified and evaluated and the likelihood of occurrence assessed. See Table 8 below for survey team and timing.

Table 8: Fauna Survey Team and Timing

Name	Position and years of Experience	Survey Dates
Jack Roger	Environmental Scientist, 4 years	1st and 2nd of April, 2025
Zirui Lin	Environmental Scientist, 1.5 years	

3.4.1 Fauna Habitat Type Assessment

The fauna habitat types present within the Survey Area were defined considering landform, vegetation, structure such as rockpiles and logs and fauna assemblage occupying the area.

The following information was used to define and map all fauna habitat types within the Survey Area at specific fauna habitat assessment points and during traverses of the Survey Area:

- Land systems and landform.
- Vegetation type and condition mapping.
- Soil characteristics.
- Structure such as rockpiles and logs.
- Fauna assemblage information from desktop assessment and field observations.
- Aerial imagery and historic imagery.

Each fauna habitat type was described considering suitability for various fauna species groups or conservation listed species. In addition, the fauna habitat type's likelihood to harbour specialised fauna species which are not found in adjacent areas was taken into consideration. Habitat types were delineated in the field and digitised upon return from the field survey.

3.4.2 Fauna Taxonomy

Terrestrial vertebrate fauna taxa were identified in the field by an experienced ecologist.

Taxonomy and nomenclature follow the WA Museum checklist 2024 (Western Australian Museum [WAM], 2024). Conservation status follows the DBCA Threatened and Priority fauna list (DBCA, 2024). Where required verification of identification of secondary evidence (tracks, scats, diggings) may be undertaken by a relevant species group expert.

3.5 Targeted Black Cockatoo Survey

3.5.1 Black cockatoo Habitat Assessment

The Survey Area falls within the Swan Coastal Plain which is within the modelled distribution range of Baudin's black cockatoo (*Zanda baudinii*), Carnaby's black cockatoo (*Zanda latirostris*) and forest red-tailed (*Calyptorhynchus banksii naso*) (DAWE, 2022).

The Swan Coastal Plain is used by Carnaby's black cockatoos for foraging, with some patches of breeding within the Swan Coastal Plain from July to December (DAWE, 2022). Vegetation used by Carnaby's black cockatoo is dominated by *Banksia* spp. and Tuart (*Eucalyptus gomphocephala*) woodlands, as well as marri (*Corymbia calophylla*), with jarrah (*E. marginata*) in the east Swan Coastal Plain. (DAWE, 2022).

Within the eastern and southern portion of the Swan Coastal Plain, Baudin's black cockatoos can be observed foraging from March to September, with unlikely observations in the western and northern Swan Coastal Plain. Vegetation used by Baudin's black cockatoo is dominated by marri and native proteaceous plant species (*Banksia* ssp.) including Hakea species, but rarely jarrah (DAWE, 2022). Breeding for Baudin's black cockatoo typically occurs in the southern jarrah forest but may also occur in the southern Swan Coastal Plain (DAWE, 2022).

Within the Swan Coastal Plain, forest red-tailed black cockatoo can be flexibly observed year-round, most commonly present from January through to July, some individuals remain present all year round. Vegetation used by forest red-tails are primarily the seeds of jarrah and marri woodlands and forests, *Allocasuarina* cones, fruits of snotty-gobble (*Persoonia longifolia*), blackbutt, bullich, *Hakea* spp., tuart and some introduced eucalyptus such as river red gum (DAWE, 2022). Breeding may occur in locations containing suitable breeding tree species, including the Perth Metropolitan area (DAWE, 2022).

The timing of the survey in April 2025 provided good opportunity to record foraging individuals and nesting for all three species of black cockatoos. If no individuals are present, searching for foraging evidence is a reliable alternative as it will generally persist in the landscape (particularly marri nut chews) for up to two years (DAWE, 2022).

The Black cockatoo habitat field survey followed the Commonwealth *Referral Guideline for 3 WA Threatened Black Cockatoo Species* (DAWE, 2022) for identifying breeding, foraging and roosting habitat.

Breeding Habitat Assessment

Areas within the planned foreshore area have not been assessed in detail for the presence and extent of black cockatoo breeding habitat due to the planned retention of the area and a particular focus on potential impacts of the project. These areas are comprised of FHT-09 and a small portion of FHT-08 as described in sections 4.5.1 and 4.5.3. Additional breeding habitat is likely to be present within the retention area.

DAWE (2022) defines breeding habitat as that which contains known, suitable or potential nesting trees, and which occurs within the range of the species. Terminology used in this report for breeding habitat trees follows that defined in the glossary of DAWE (2022) as shown in Table 9.

Table 9: Breeding Habitat Terminology

Breeding Habitat Term	Definition (DCCEEW, 2022)
Known nesting trees	Trees (live or dead but still standing) which contains a hollow where black cockatoo breeding has been recorded or which demonstrates evidence of breeding (i.e. showing evidence of use through scratches, chew marks or feathers).
Suitable nesting trees	Trees with suitable nesting hollows present, although no evidence of use.
Suitable nesting hollows	Any hollow with dimensions suitable for use for nesting by black cockatoos. See Table 20 for further discussion on nesting hollow characteristics.
Potential nesting trees	Trees that have a suitable Diameter at Brest Height (DBH) to develop a nest hollow, but do not currently have hollows. For most species of trees, suitable nest hollows are only found in live trees with a DBH of at least 500 mm.
Potential future nesting trees	Trees suitable to develop a nest hollow in the future are 300-500 mm DBH.

In addition to the Commonwealth's guideline for assessing breeding habitat trees, a scoring system based on that developed by Dr Mike Bamford (referred to as Bamford Class) was applied to class breeding habitat trees. The alignment of the Bamford Class with the DAWE (2022) breeding habitat terminology is detailed in Table 10.

Table 10: Black Cockatoo Potential Breeding Tree Class

Bamford Class	Description of Tree and Hollows/Activity	Alignment with DAWE (2022) Breeding Habitat Terminology
1	Active nest observed; adult (or immature) bird seen entering or emerging from hollow, eggs present.	Known nesting tree
2	Hollow of suitable size and angle visible with chew marks attributed to Black Cockatoo nesting activity around entrance.	Known nesting tree
3	Potentially suitable hollow visible but no chew marks present; or potentially suitable hollow present if from ground-based assessment only (as suggested by structure of tree, such as large, vertical trunk broken off at a height of >10 m with thin rim).	Suitable nesting tree

Bamford Class	Description of Tree and Hollows/Activity	Alignment with DAWE (2022) Breeding Habitat Terminology
4	Tree with hollows or broken branches that might or do contain hollows, but hollows or potential hollows are not of a suitable size, or are aligned or obstructed so as to prevent access	Potential nesting tree
5	Tree lacking large hollows or broken branches that might have large hollows; a tree with more or less intact branches and a spreading crown.	Potential nesting tree
No Class	No description. Potential future nesting trees were not considered in the Bamford Class scale.	Potential future nesting trees

Trees that were identified to contain potentially suitable hollows present were inspected using a pole camera or small drone to inspect hollow internal dimensions. Hollow information that was recorded included:

- Size of entry.
- Estimated depth.
- Hollow type (knot, fissure, spout, vertical/chimney.
- Suitability for use.
- Evidence of use.
- Presence of other birds or bees.

Foraging Habitat Assessment

DAWE (2022) defines foraging habitat as areas including plants of species known to support foraging within the range of each black cockatoo species. Marri (*Corymbia calophylla*) and jarrah (*Eucalyptus marginata*) woodlands are particularly important to Baudin's and Forest red-tailed black cockatoos, while proteaceous heaths (shrublands dominated by banksia, hakea and grevillea species) are also utilised by Carnaby's black cockatoo (DAWE, 2022).

The potential of the habitat within the Survey Area to support foraging was described, and any evidence was recorded, along with opportunistic sightings of any black cockatoo individuals.

Habitat mapping of the Survey Area was used in conjunction with the site assessment to determine the foraging quality using the Foraging Habitat Scoring Tool (DAWE, 2022).

Areas within the planned foreshore area have not been assessed in detail for the presence and extent of black cockatoo foraging species due to the planned retention of the area and a particular focus on potential impacts of the project. These areas are comprised of FHT-09 and a small portion of FHT-08 as described in sections 4.5.1 and 4.5.3. No Foraging Habitat Scoring, as described below, was applied to those areas.

The Foraging Habitat Scoring Tool (DAWE, 2022) is applied once only for an entire site. A secondary assessment was undertaken using the 'Habitat Scoring System for WA black cockatoo foraging habitat' (the Habitat Quality Scoring Tool) provided by DAWE in 2023 as an unpublished source. The Habitat Quality Scoring Tool produces a score of 0-7 for site condition and may be applied to each identified fauna habitat type. An overall site context score of 0-3 is then added. See Appendix G for detailed scoring tool methodologies.

As per the Habitat Quality Scoring Tool areas with a site condition score of 2 or lower (foraging condition low, negligible or none) are "extremely unlikely to be considered as suitable habitat". These areas are therefore classified as not comprising suitable foraging habitat in this assessment.

Roosting Habitat Assessment

Roosting habitat was assessed based on the observation of roosting or roosting evidence recorded during survey and based on habitat suitability (generally tall trees in the landscape in proximity to a water source). During the field survey, searches were conducted for evidence of roosting (e.g. piles of scats, feeding debris or chewed trees).

4. Results

4.1 Desktop Assessment

4.1.1 Flora Desktop Assessment

The DBCA database and EPBC Act PMST searches identified 39 conservation-listed flora species as occurring within 10 km. These species are either found within 10km of the Survey Areas or have the potential to occur in the region as identified by PMST searches. See Figure 7.

One previous record was present within the Survey Area (Synaphea sp. Pinjarra R. Davis 6578 (CR) (T)) recorded in 2003. See Appendix C for full database search results and likelihood of occurrence assessment.

Pre-Survey Likelihood of Occurrence

Of the pre-survey likelihood of occurrence assessment identified that of the 39 conservation listed flora species:

- Five were considered to have a high likelihood of occurrence.
- Thirteen were considered to have a medium likelihood of occurrence.
- Twenty-one were considered to have a low likelihood of occurrence.
- One Threatened flora, *Synaphea* sp. *Pinjarra* R. Davis 6578 (CR)(T), was previously recorded within the Survey Area in 2003, over 20 years ago. However, this record is considered to be inaccurate as the locality description attribute does not match the data point locality and that the point location has been cleared for more than 50 years. The locality description places the species on the eastern side of the railway line, whereas the Survey Area is located on the northern side and does not intersect the railway line. The likelihood of occurrence of this species is considered to be high.

Species with a likelihood of occurrence of high or medium are discussed below in Table 11.

Table 11: Pre-Survey Desktop Assessment of Threatened and Priority Flora Species with High or Medium Likelihood of Occurrence

Species	Conservation Status		Source		Species information		Habitat Occurs Within the Survey Area	Pre-Survey Likelihood of Occurrence
	State	Federal	PMST	DBCA	Flowering Period	Preferred Habitat		
Drakaea elastica	CR	EN	x	x	Oct to Nov	White or grey sand. Low-lying situations adjoining winter-wet swamps	Yes	Medium - Site is mapped as a suitable soil type, including grey and white sands, includes low lying areas associated with a river and wetlands. Recent record within 10 km of the Site.
Synaphea sp. Fairbridge Farm (D. Papenfus 696)	CR	CR	x	x	Oct	Sandy with lateritic pebbles. Near winter-wet flats, in low woodland with weedy grasses.	Potentially	High - the Site is mapped as sandy, however not lateritic. Contains low lying wet areas and flats. Multiple recent records within 2 km of the Site.
Synaphea sp. Pinjarra (R. Davis 6578)	CR	CR	x	x	Sep	White, grey clayey sand on the edges of seasonally inundated	Yes	High - the Site contains suitable habitat, given it is mapped as pale or grey sands over clay, and within a low-lying wetland and floodplain. Species was recorded in 2003 within the Site. Multiple records of the species within 2 km of the Site.
Diuris drummondii	EN	VU	x	x	Nov to Dec or Jan	Low-lying depressions, swamps.	Yes	Medium - Site contains suitable habitat, including low lying areas and almost entirely mapped as a wetland. Recent record within 10 km of the Site.
Synaphea sp. Pinjarra Plain (A.S. George 17182)	EN	EN	x	x	Oct	Grey sandy loam or clay, grey-brown clayey sand, brown clayey loam, laterite. Flats, seasonally wet areas, railroad reserves often with wet depressions or drains.	Yes	High - Site is mapped as a suitable soil type, including grey sandy loam, and includes mapped wetlands and inundation areas. Multiple records within 2 km of the Site.

Species	Conservation Status		Source		Species information		Habitat Occurs Within the Survey Area	Pre-Survey Likelihood of Occurrence
	State	Federal	PMST	DBCA	Flowering Period	Preferred Habitat		
Synaphea stenoloba	EN	EN	x	x	Aug to Oct	Sandy or sandy clay soils. Winter-wet flats, granite.	Yes	Medium - Site is mapped as suitable soil type, including grey sandy loam and contains mapped wetlands and low lying wet areas. Multiple recent records within 5 km of the Site.
Morelotia australiensis	VU	VU	x	x	Dec	Grey sand over clay; also described as yellow and sandy or clayey lateritic soils. Winter-wet swampy depressions, drainage lines or rises surrounding swamps. Open forest or woodland over low shrubs, herbs and sedges.	Yes	High - the Site is mapped as grey sand and yellow duplex in sections. Partly mapped as a wetland. Recent record within 2 km of the Site.
Acacia lasiocarpa var. bracteolata long peduncle variant (G.J. Keighery 5026)	P1	-		x	May or Aug	Grey or black sand over clay. Swampy areas, winter wet lowlands.	Likely	Medium - Site is mapped as grey and clayey sands. Mapped floodplain and low lying areas. Recent record within 10 km of the Site.
Acacia benthamii	P2	-		x	Aug to Sep	Sand. Typically on limestone breakaways.	Potentially	Medium - Site is mapped as sandy, and a recent record exists within 5 km of the Site
Grevillea ornithopoda	P2	-		x	Sep to Oct	South-west Botanical Province, in the Swan Coastal Plain or Jarrah Forest IBRA subregion	Potentially	Medium - limited information available on habitat type, however recent record exists within 10 km of the Site.
Johnsonia pubescens subsp. cygnorum	P2	-		x	Sep	Grey-white-yellow sand. Flats, seasonally-wet sites.	Yes	Medium - Site is mapped as a suitable soil type, including grey, yellow and white sands, includes low lying areas associated with a river and wetlands. Recent record within 10 km of the Site.

Species	Conservation Status		Source		Species information		Habitat Occurs Within the Survey Area	Pre-Survey Likelihood of Occurrence
	State	Federal	PMST	DBCA	Flowering Period	Preferred Habitat		
Leucopogon sp. Busselton (D. Cooper 243)	P2	-		x	Aug to Sep	Perth IBRA subregion	Potentially	High - Little information available on habitat, however has been recorded within the bioregion. Recent record within 2 km of the Site.
Boronia capitata subsp. gracilis	P3	-		x	Jun to Nov	White/grey or black sand. Winter-wet swamps, hillslopes.	Yes	Medium - Site is partially mapped as grey or bleached sands. Contains a mapped river and wetland. Recent record within 10 km.
Myriophyllum echinatum	P3	EN		x	Oct to Nov	Clay. Winter-wet flats.	Potentially	Medium - the Site contains a mapped wetland, and low lying wet areas. A recent record exists within 5 km.
Schoenus pennisetis	P3	-		x	Aug to Sep	Grey or peaty sand, sandy clay. Swamps, winter-wet depressions.	Yes	Medium - Site is mapped as a suitable soil type, and includes low lying areas and wetlands. Recent record within 5 km.
Styphelia filifolia	P3	-		x	Mar and May	Occurs sporadically from north of Eneabba to the Harvey area in	Yes	Medium - Site is mapped as sandy soils on low lying areas, and likely contains remnant woodland. Recent record within 5 km.
Parsonsia diaphanophleba	P4	-		x	Jan to Feb or Apr to Jun or Sep	Alluvial soils. Along rivers.	Yes	Medium - the Site contains a mapped river, and is mapped as alluvial soils. A recent record exists within 10 km of the Site.
Stylidium ireneae	P4	-		x	Oct to Nov	Sandy loam. Valleys near creek lines, woodland, often with Agonis.	Yes	Medium - Site contains potentially suitable habitat, including woodland near creek line, and mapped as sandy loam. Recent record within 5 km.

4.1.2 Threatened and Priority Ecological Communities

The desktop assessment identified that records of 11 Threatened Ecological Communities (TECs) and Priority Ecological Communities (PECs) occur within 10 km of the Survey Area (see Figure 7). The occurrences shown are buffered. The pre survey assessment identified that of the 11 communities:

- One TEC is indicated by DBCA buffered occurrence mapping as within 2 km of the Survey Area and is assessed as having a high likelihood of occurrence.
- Two TECs have a buffered occurrence indicated by DBCA <5 km of the Survey Area and are assessed as having a medium likelihood of occurrence.
- Eight have a low likelihood of occurrence.

Communities with a high or medium likelihood of occurrence are discussed below in Table 12. See Appendix C for full database search results and likelihood of occurrence assessment.

Table 12: Pre-Survey Assessment of Threatened or Priority Ecological Communities with High or Medium Likelihood of Occurrence

Floristic Community Name	Community Description	Conservation Status		Source		Likelihood of Occurrence	Justification
		State	Federal	PMST	DBCA		
Banksia Woodlands of the Swan Coastal Plain	Canopy is most commonly dominated or co-dominated by *Banksia attenuata* and/or *B. menziesii*. Other Banksia species that can dominate in the community are *B. prionotes* or *B.ilicifolia*. It typically occurs on well drained, low nutrient soils on sandplain landforms, particularly deep Bassendean and Spearwood sands and occasionally on Quindalup sands; it is also common on sandy colluvium and aeolian sands of the Ridge Hill Shelf, Whicher Scarp and Dandaragan Plateau.	P3(iii)	EN	x	x	High	Record of the community within 2 km of the Site, and multiple records within 5 km. Site likely contains suitable, with mapped sandplain and well drained soils in sections.
***Corymbia calophylla — Eucalyptus marginata* woodlands on sandy clay soils of the southern Swan Coastal Plain (floristic community type 3b as originally described in Gibson et al. 1994)**	Known from the eastern side of the Swan Coastal Plain largely between Wannamal and Dunsborough. Most occurrences of the community are dominated by both *Corymbia calophylla* and *Eucalyptus marginata* with additional common taxa comprising low shrubs, sedges, grasses and herbs	EN	-	-	x	Medium	Community occurrence or buffer of one has been recorded within 5 km of the Site.
***Corymbia calophylla — Xanthorrhoea preissii* woodlands and shrublands, Swan Coastal Plain (floristic community type 3c as originally described in Gibson et al. 1994)**	Occurs on heavy soils of the eastern side of the southern Swan Coastal Plain, generally between Bullsbrook and Stratham. The community is usually dominated by *Corymbia calophylla* and *Xanthorrhoea preissii.* It also occasionally includes *Eucalyptus wandoo*. The more common shrubs include *Gompholobium marginatum, Hypocalymma angustifolium* and *Banksia dallanneyi*, with herbs, grasses and sedges	EN	EN	-	x	Medium	Community occurrence or buffer of one has been recorded within 5 km of the Site.

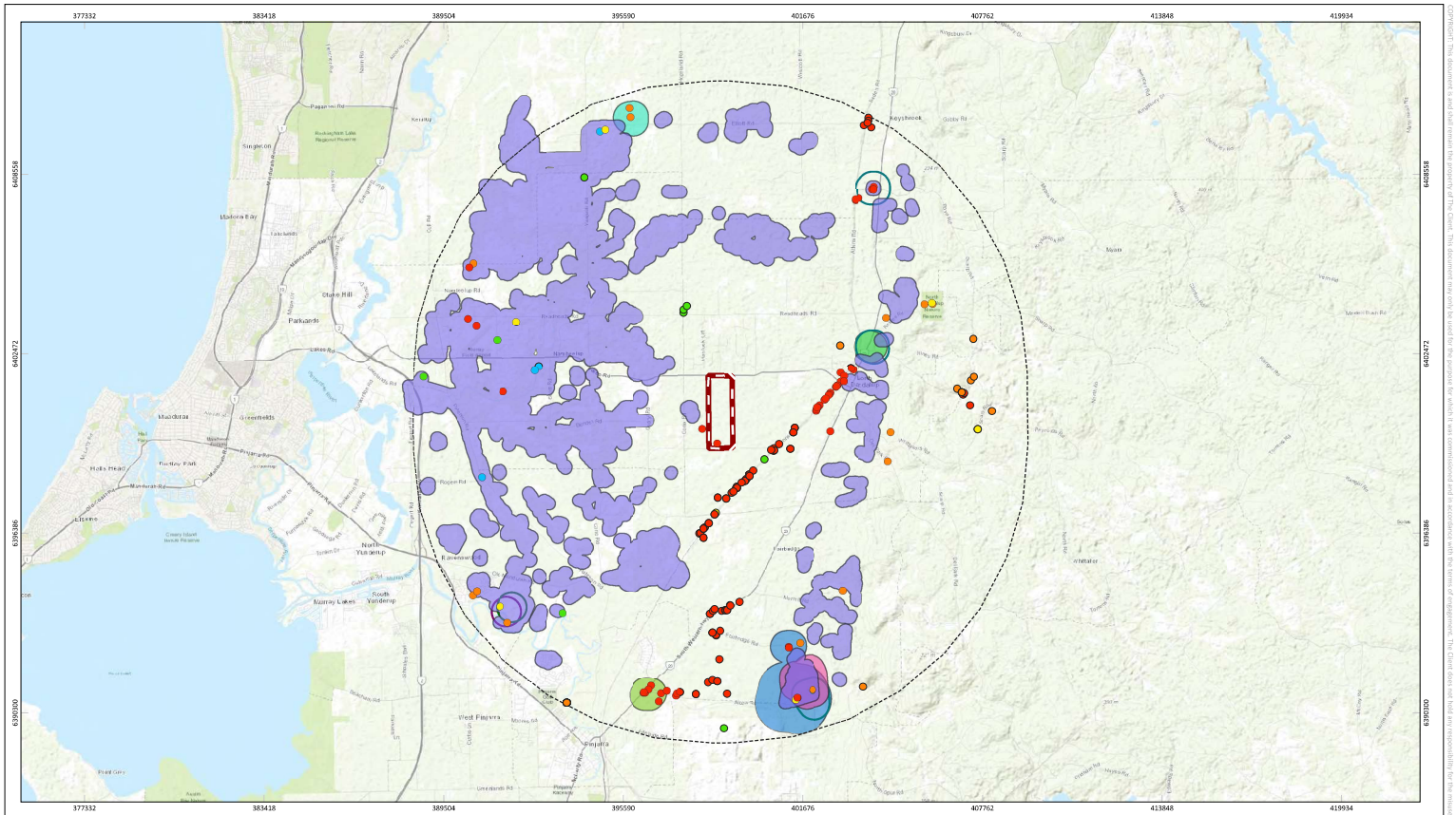

Figure : DBCA Database Search Results Flora and Communities

N 0 1,800 3,600 5,400 7,200 m	PROJECT/REPORT NAME: Flora, Vegetation and Black Cockatoo Habitat Assessment 1818 Lakes Road, North Dandalup	Legend: Project Area, 10km Buffer	
SCALE: 1:121,729	SHEET SIZE: A3 COLOUR	CLIENT: Harley Dykstra	
COORDINATE REFERENCE SYSTEM: GDA2020 / MGA zone 50		PROJECT NUMBER: A25.034	VERSION: 0
DATA SOURCE: ESRI Topographic Map		DRAWN BY / REVIEWED BY: JP/JB	DATE: 18/6/2025

No	Description	Drawn	Approved	Date
A	Original issue	JP	JB	18/6/2025

NOTES:
Cadastral boundary from LANDGATE - 2022. Label corresponds to the vegetation association number.

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4.2 Flora Survey

4.2.1 Flora

A total of 37 vascular flora species, including 11 introduced species, were recorded from within the Survey Area from nine relevés and opportunistic observations.

The families with the highest number of taxa were Myrtaceae (9 taxa), Poaceae (6 taxa) and Proteaceae (5 taxa) The most recorded genera were *Melaleuca* and *Ehrharta* (2 taxa each). These families and genera are typical and common for the locality.

A site by species matrix and inventory of flora recorded is provided in Appendix E.

Post-Survey Likelihood of Occurrence

An assessment of habitat suitability for each listed species was undertaken post survey. The habitat present was separated based on vegetation condition. Habitat was also separated into the foreshore reserve, which contains degraded condition vegetation (still possessing some ground and mid stratum native species) and areas outside of the foreshore reserve, which are completely degraded or cleared. Given the prolonged agricultural grazing in areas outside of the foreshore reserve, the completely degraded condition and the paucity of native species diversity, the habitat is highly unlikely to support listed flora species which are unable to tolerant present disturbance. Within the foreshore reserve some Threatened and Priority flora species retain a high or medium post survey likelihood of occurrence.

4.2.2 Threatened and Priority Flora

No Threatened or Priority flora species were identified during the survey. One DBCA record was previously recorded within the Survey Area (*Synaphea* sp. *Pinjarra* R. Davis 6578 (CR) (T)) although the description in the DBCA data does not match the point location. The locality description places the species on the eastern side of the railway line, whereas the Survey Area is located on the northern side and is >1 km north from the nearest part of the railway line. No *Synaphea sp. Pinjarra* R. Davis 6578(CR)(T) were recorded during the Reconnaissance flora and vegetation survey.

The post-survey likelihood of occurrence for habitats within the foreshore reserve remains consistent with the pre-survey assessment, as most listed flora species were not in flowering period at time of Survey. The soil types and landscape features present within the foreshore reserve are considered to have the potential to support listed species. Species with a likelihood of occurrence of high or medium within the foreshore reserve are listed in Table 13 below.

The post-survey likelihood of occurrence for habitats outside of the foreshore reserve found that all threatened, or priority flora species had low likelihood of occurring due to the highly disturbed condition of the habitat and lack of understory vegetation to support the listed species.

The majority of the Survey Area was highly disturbed due to the presence of cattle, and comprised of scattered trees over paddock. This does not represent suitable habitat for native species. Greater emphasis was placed on targeting flora in the VT02 community (*Corymbia calophylla/Kingia australis* woodland) and along the edge of the riparian vegetation VT04 (Riparian vegetation) however, as these areas had greater species diversity and higher likelihood of threatened and priority species occurring.

Table 13: Post-Survey Assessment of Threatened and Priority Flora Species with High or Medium Likelihood of Occurrence in Areas of Different Habitat Condition.

Species	Conservation Status		Species Information		Post-survey Likelihood of Occurrence	
	State	Federal	Flowering Period	Species Preferred habitat	Habitat within the foreshore reserve: Degraded condition	Habitats outside of the foreshore reserve: Completely Degraded to Cleared conditions
Drakaea elastica	CR	EN	Oct to Nov	White or grey sand. Low-lying situations adjoining winter-wet swamps	Medium - Site is mapped as a suitable soil type, including grey and white sands, includes low lying areas associated with a river and wetlands. Recent record within 10 km of the Site.	Low
Synaphea sp. Fairbridge Farm (D. Papenfus 696)	CR	CR	Oct	Sandy with lateritic pebbles. Near winter-wet flats, in low woodland with weedy grasses.	High - the Site is mapped as sandy, however not lateritic. Contains low lying wet areas and flats. Multiple recent records within 2 km of the Site.	Low
Synaphea sp. Pinjarra (R. Davis 6578)	CR	CR	Sep	White, grey clayey sand on the edges of seasonally inundated	High - the Site contains suitable habitat, given it is mapped as pale or grey sands over clay, and within a low-lying wetland and floodplain. Species was recorded in 2003 within the Site. Multiple records of the species within 2 km of the Site.	Low
Diuris drummondii	EN	VU	Nov to Dec or Jan	Low-lying depressions, swamps.	Medium - Site contains suitable habitat, including low lying areas and almost entirely mapped as a wetland. Recent record within 10 km of the Site.	Low

Species	Conservation Status		Species Information		Post-survey Likelihood of Occurrence	
	State	Federal	Flowering Period	Species Preferred habitat	Habitat within the foreshore reserve: Degraded condition	Habitats outside of the foreshore reserve: Completely Degraded to Cleared conditions
Synaphea sp. Pinjarra Plain (A.S. George 17182)	EN	EN	Oct	Grey sandy loam or clay, grey-brown clayey sand, brown clayey loam, laterite. Flats, seasonally wet areas, railroad reserves often with wet depressions or drains.	High - Site is mapped as a suitable soil type, including grey sandy loam, and includes mapped wetlands and inundation areas. Multiple records within 2 km of the Site.	Low
Synaphea stenoloba	EN	EN	Aug to Oct	Sandy or sandy clay soils. Winter-wet flats, granite.	Medium - Site is mapped as suitable soil type, including grey sandy loam and contains mapped wetlands and low lying wet areas. Multiple recent records within 5 km of the Site.	Low
Morelotia australiensis	VU	VU	Dec	Grey sand over clay; also described as yellow and sandy or clayey lateritic soils. Winter-wet swampy depressions, drainage lines or rises surrounding swamps. Open forest or woodland over low shrubs, herbs and sedges.	High - the Site is mapped as grey sand and yellow duplex in sections. Partly mapped as a wetland. Recent record within 2 km of the Site.	Low
Acacia lasiocarpa var. bracteolata long peduncle variant (G.J. Keighery 5026)	P1	-	May or Aug	Grey or black sand over clay. Swampy areas, winter wet lowlands.	Medium - Site is mapped as grey and clayey sands. Mapped floodplain and low lying areas. Recent record within 10 km of the Site.	Low
Acacia benthamii	P2	-	Aug to Sep	Sand. Typically on limestone breakaways.	Medium - Site is mapped as sandy, and a recent record exists within 5 km of the Site	Low

Species	Conservation Status		Species Information		Post-survey Likelihood of Occurrence	
	State	Federal	Flowering Period	Species Preferred habitat	Habitat within the foreshore reserve: Degraded condition	Habitats outside of the foreshore reserve: Completely Degraded to Cleared conditions
Grevillea ornithopoda	P2	-	Sep to Oct	South-west Botanical Province, in the Swan Coastal Plain or Jarrah Forest IBRA subregion	Medium - limited information available on habitat type, however recent record exists within 10 km of the Site.	Low
Johnsonia pubescens subsp. cygnorum	P2	-	Sep	Grey-white-yellow sand. Flats, seasonally-wet sites.	Medium - Site is mapped as a suitable soil type, including grey, yellow and white sands, includes low lying areas associated with a river and wetlands. Recent record within 10 km of the Site.	Low
Leucopogon sp. Busselton (D. Cooper 243)	P2	-	Aug to Sep	Perth IBRA subregion	High - Little information available on habitat, however has been recorded within the bioregion. Recent record within 2 km of the Site.	Low
Boronia capitata subsp. gracilis	P3	-	Jun to Nov	White/grey or black sand. Winter-wet swamps, hillslopes.	Medium - Site is partially mapped as grey or bleached sands. Contains a mapped river and wetland. Recent record within 10 km.	Low
Myriophyllum echinatum	P3	EN	Oct to Nov	Clay. Winter-wet flats.	Medium - the Site contains a mapped wetland, and low lying wet areas. A recent record exists within 5 km.	Low
Schoenus pennisetis	P3	-	Aug to Sep	Grey or peaty sand, sandy clay. Swamps, winter-wet depressions.	Medium - Site is mapped as a suitable soil type, and includes low lying areas and wetlands. Recent record within 5 km.	Low

Species	Conservation Status		Species Information		Post-survey Likelihood of Occurrence	
	State	Federal	Flowering Period	Species Preferred habitat	Habitat within the foreshore reserve: Degraded condition	Habitats outside of the foreshore reserve: Completely Degraded to Cleared conditions
Styphelia filifolia	P3	-	Mar and May	Occurs sporadically from north of Eneabba to the Harvey area in	Medium - Site is mapped as sandy soils on low lying areas, and likely contains remnant woodland. Recent record within 5 km.	Low
Parsonsia diaphanophleba	P4	-	Jan to Feb or Apr to Jun or Sep	Alluvial soils. Along rivers.	Medium - the Site contains a mapped river, and is mapped as alluvial soils. A recent record exists within 10 km of the Site.	Low
Stylidium ireneae	P4	-	Oct to Nov	Sandy loam. Valleys near creek lines, woodland, often with Agonis.	Medium - Site contains potentially suitable habitat, including woodland near creek line, and mapped as sandy loam. Recent record within 5 km.	Low

4.2.3 Flora of Other Significance

Flora may be considered of other conservation significance if it is a novel taxon or represents a range extension.

No species were identified as representing range extensions or flora of other significance.

4.2.4 Introduced Species

A total of 11 introduced taxa were recorded within the Survey Area. These are listed in Table 14 along with their status under the BAM Act or WoNS listing. A comprehensive weed inventory was not collected in cleared and Completely Degraded areas. Listed species are common/widespread.

One species recorded, Narrowleaf Cottonbush (**Gomphocarpus fruticosus*), is listed as a Declared Pest under the BAM Act in Western Australia. This species is discussed further below.

Table 14: Introduced Species

Taxon	Common Name	Status Under BAM Act/WoNS
Gomphocarpus fruticosus	Narrowleaf Cottonbush	Declared Pest
Hypochaeris glabra	Flatweed, Smooth Catsear	
Corrigiola litoralis	Strapwort	
Lythrum hyssopifolia	Lesser Loosestrife	
Eucalyptus grandis	Flooded gum, Rose gum	
Avena barbata	Bearded Oat	
Briza maxima	Blowfly Grass	
Bromus diandrus	Great Brome	
Ehrharta calycina	Perennial Veldtgrass, Perennial Veldt Grass	
Ehrharta longiflora	Annual Veldt Grass	
Vulpia myuros	Rat's Tail Fescue	

Narrowleaf Cottonbush (**Gomphocarpus fruticosus*)-Declared Pest

The Narrowleaf cottonbush is an erect perennial, herb or shrub that grows between 0.5-1.5 m high. It Flowers in white or cream from February to July in disturbed sites commonly in the swan coastal plain (WAH 1998). Nine individuals were recorded to the east of the Survey Area within the riparian vegetation of VT04, see Figure 9.

Table 15: Declared Weed Abundance and Location

Taxon Name	Common Name	Status under the BAM Act/WoNS	Abundance	Easting	Northing
Gomphocarpus fruticosus	Narrowleaf Cottonbush	Declared Pest	2	399119.4	6400447
Gomphocarpus fruticosus	Narrowleaf Cottonbush	Declared Pest	2	399163.2	6400434
Gomphocarpus fruticosus	Narrowleaf Cottonbush	Declared Pest	3	399179.9	6400443
Gomphocarpus fruticosus	Narrowleaf Cottonbush	Declared Pest	2	399187.1	6400460

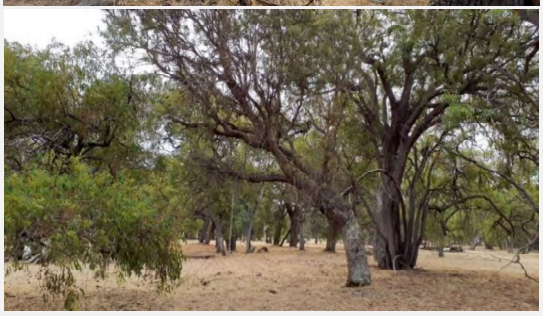
Plate 1: Narrowleaf Cottonbush (Gomphocarpus fruticosus*)**

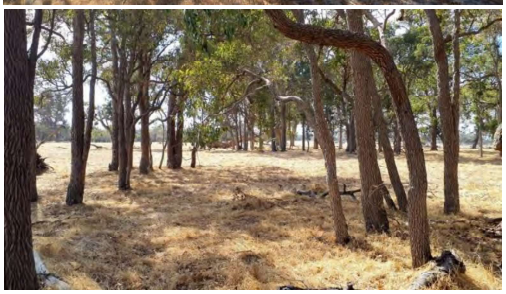
4.3 Vegetation Mapping

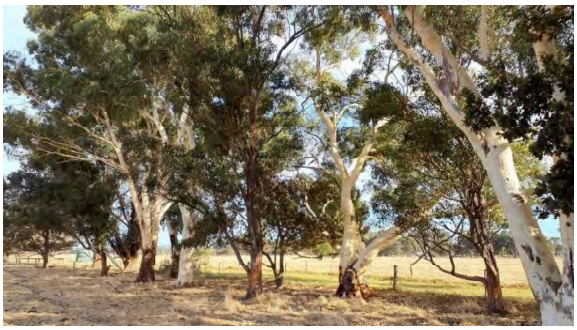
4.3.1 Vegetation Types

A total of four vegetation types were identified within the Survey Area, as described in Table 16. Majority of the mapped vegetation types were highly disturbed as a result of clearing and grazing, and overall, majority of the Survey Area did not contain native vegetation - these areas were considered Cleared and had no vegetation types assigned.

Table 16: Vegetation Types and Descriptions

Vegetation Unit Description	Vegetation Condition	Sampling Sites	Area (ha) % of Survey Area	Representative Photo
Veg Code: VT01 **Description: *Eucalyptus marginata* open woodland with scattered Banksia spp.** *Eucalyptus marginata* open woodland with scattered individuals of *Banksia attenuata, Banksia menziesii, Allocasuarina fraseriana* mid stratum over **Xanthorrhoea gracilis* individual shrubs over **Bromus diandrus, *Ehrharta calycina* and **Hypochaeris glabra* grasses/herbs. Highly disturbed from cattle presence and grazing. TECs/PECs: None identified. Historical clearing and grazing have resulted in the loss of all potentially occurring communities.	Completely Degraded	R02 R03 R09	4.39 ha 2.2%	 

Vegetation Unit Description	Vegetation Condition	Sampling Sites	Area (ha) % of Survey Area	Representative Photo
Veg Code: VT02 **Description: *Corymbia calophylla/Kingia australis* woodland** *Corymbia calophylla* mid open forest with scattered *Kingia australis* over paddock grassland. Occurs in lower landscapes on margins of wetlands and atop of heavy soils of southern Swan Coastal Plain. Heavily degraded due to historical clearing and agricultural grazing presence. TECs/PECs: None identified. Historical clearing and grazing have resulted in the loss of all potentially occurring communities.	Completely Degraded	R01 R04	16.35 ha 8.3%	 

Vegetation Unit Description	Vegetation Condition	Sampling Sites	Area (ha) % of Survey Area	Representative Photo
Veg Code: VT03 **Description: Riparian vegetation** *Melaleuca preissiana* riparian woodland over *Juncus pallidus* rushes over *Alternanthera denticulata* and**Ehrharta calycina, *Hypochaeris glabra* and *Vulpia myuros* weedy grasses. Highly degraded with mainly introduced species in the ground stratum. TECs/PECs: None identified	Degraded to Completely Degraded	R05	33.36 ha 17.0%	
Veg Code: VT04 **Description: Mixed non-native planting** Planted *Eucalyptus grandis* over **Avena barbata, *Ehrharta calycina, *Vulpia myuros* weedy grasses. Highly degraded due to cattle presence and grazing.	Completely Degraded	R08	9.67 ha 4.9%	

Vegetation Unit Description	Vegetation Condition	Sampling Sites	Area (ha) % of Survey Area	Representative Photo
Paddock* Scattered individual *Corymbia calophylla, Eucalyptus marginata, Eucalyptus rudis, Xylomelum occidentale* and *Melaleuca preissiana* over **Vulpia myuros and *Bromus diandrus* grasses. *These areas contain scattered foraging species for black cockatoo. These values have therefore been mapped and considered as foraging habitat in section 4.5.	Completely Degraded	R06 R07	132.71 ha 67.5%	 
Total			196.48 ha	

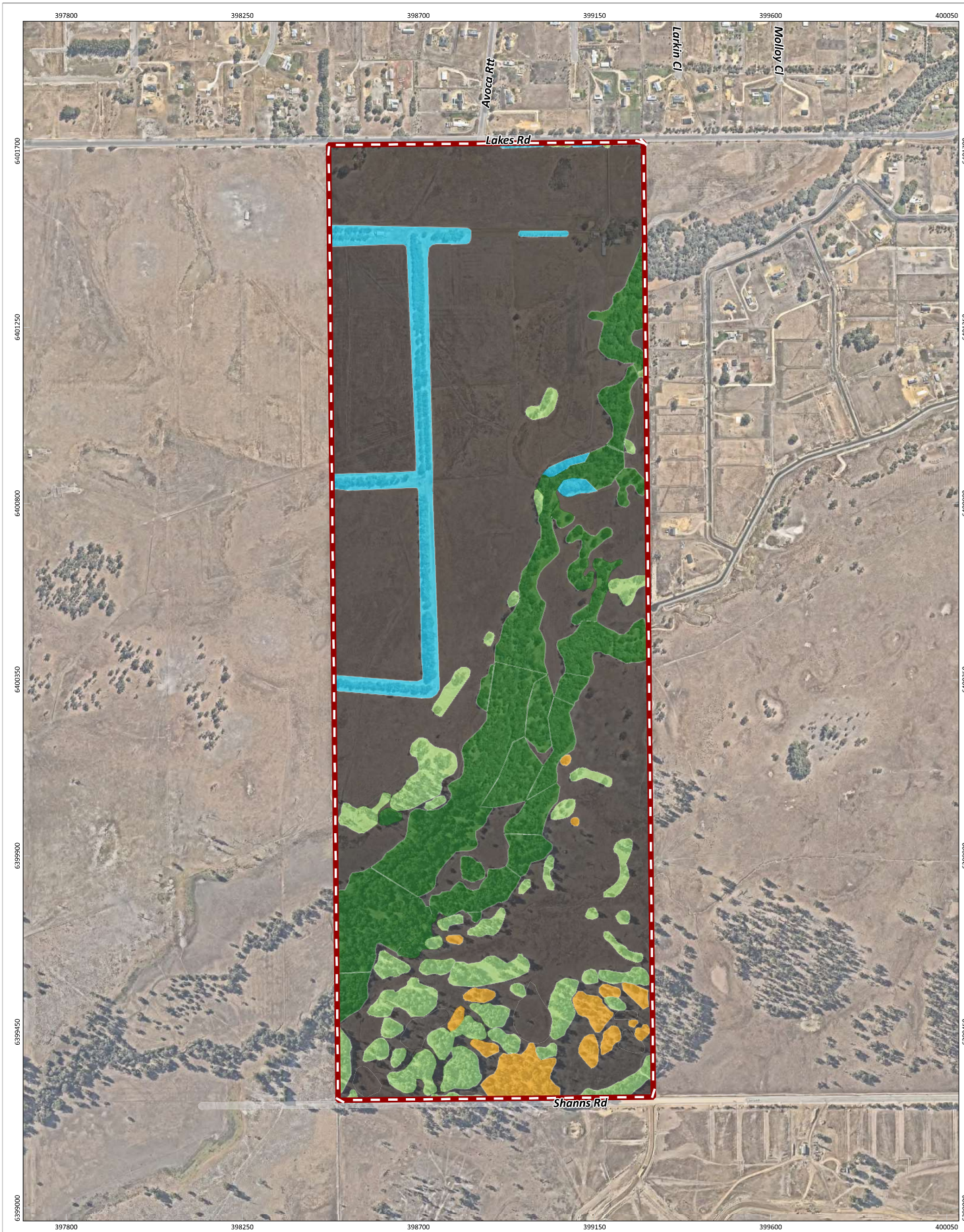


Figure 8: Vegetation Types

N 0 75 150 225 300 m		PROJECT/REPORT NAME: Flora, Vegetation and Black Cockatoo Habitat Assessment 1818 Lakes Road, North Dandalup	
SCALE: 1:9,000	SHEET SIZE: A3 COLOUR	CLIENT: Harley Dykstra	
COORDINATE REFERENCE SYSTEM: GDA2020 / MGA zone 50		PROJECT NUMBER: A25.034	VERSION: 0
DATA SOURCE: NEARMAPS		DRAWN BY / REVIEWED BY: JP/JB	DATE: 1/7/2025

Legend

Survey Area

Vegetation Type
- Paddock
- VT01
- VT02
- VT03
- VT04

No	Description	Drawn	Approved	Date
A	Original issue	JP	JB	1/7/2025

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

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4.3.2 Vegetation Condition

The vegetation of the Survey Area ranged from Degraded to Completely Degraded, with the majority being in Completely Degraded condition (Table 17; Figure 9). The Survey Area has been affected by degrading factors including clearing, cattle and weed invasion. Vegetation condition is worse in the northern portion of the Survey Area, where more intensive historical clearing and agriculture grazing has occurred.

Table 17: Vegetation Condition of the Survey Area (as per EPA, 2016 condition scale)

Vegetation Condition	Area (ha)	Proportion of Survey Area (%)
Excellent	-	-
Very Good	-	-
Good	-	-
Degraded	24.71	12.6
Completely Degraded	171.77	87.4
Total	196.48	100.0

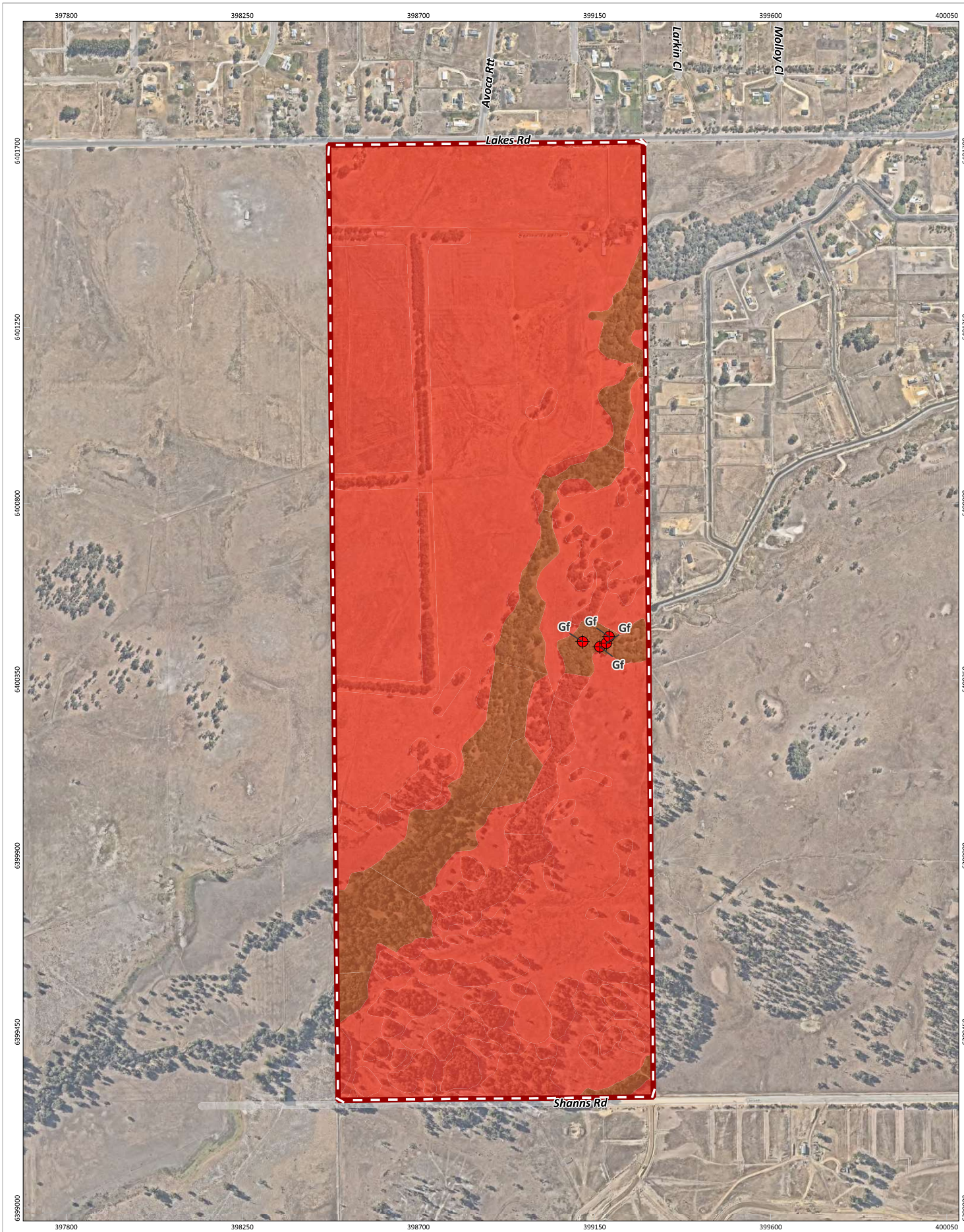

Figure 9: Vegetation Condition and Conservation Significant Flora Species and Declared Weeds

N

0 80 160 240 320 m

SCALE	1:9,000
SHEET SIZE	A3 COLOUR
PROJECT/REPORT NAME	Flora, Vegetation and Black Cockatoo Habitat Assessment 1818 Lakes Road, North Dandalup
CLIENT	Harley Dykstra
COORDINATE REFERENCE SYSTEM	GDA2020 / MGA zone 50
PROJECT NUMBER	A25.034
VERSION	0
DATA SOURCE	NEARMAPS
DRAWN BY / REVIEWED BY	JP/JB
DATE	1/7/2025

Legend

- Survey Area
- Vegetation Condition
  - Completely Degraded
  - Degraded
- Declared Pest
  - Gf - Gomphocarpus fruticans

No	Description	Drawn	Approved	Date
A	Original issue	JP	JB	1/7/2025

NOTES:

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

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4.3.3 Threatened and Priority Ecological Communities

The presence or absence of TECs and PECs was determined as per the following guidance:

- Methods for survey and identification of Western Australian threatened ecological communities (DBCA, 2023a).
- Comparison of species to the Gibson et al. (1994) report and Keighery et al. (2012) reports, particularly the list of taxa presented in Appendix 1 of Gibson et al. (1994).
- Listing in the Priority Ecological Communities for Western Australia version 35 (DBCA, 2023b).
- Where applicable, Commonwealth Approved Conservation Advice including Listing Advice was also applied for EPBC Act listed communities.

Threatened and Priority Ecological Communities with a medium or high likelihood of occurrence, as identified in the desktop assessment, are discussed in Table 18 below. No extant occurrence of TECs or PECs were identified as likely to occur within the Survey Area.

Given the level of degradation present within the Survey Area and survey timing, Floristic Community Type (FCT) analysis is not considered suitable for TEC/PEC determination.

Table 18: Assessment of TEC PEC Presence or Absence

Floristic Community Type/ Comm ID	Community Name	Conservation Status		Presence/ Absence	Justification
		State	Federal		
SCP3c	*Corymbia calophylla* - *Xanthorrhoea preissii* woodlands and shrublands, Swan Coastal Plain (floristic community type 3c as originally described in Gibson et al. 1994)	CR	EN	Absent	Suitable soil and landform characteristics, comprising a heavy sandy loam to clayey loam with waterlogging are present within the southern portion of the Survey Area, intersecting with the mapped extents of VT01 and VT02. Soils intersecting the northern portion of the Survey Area within mapped extent of VT03 and VT04 are not suitable and comprise of deep acidic mottled yellow duplex soils, thus were excluded from consideration on this basis. VT01 did not contain characteristic native species associated with floristic community type SCP3c and was excluded from consideration on this basis. VT02 is comprised of *Corymbia calophylla* open woodland with over grazed paddock in Completely Degraded condition. The vegetation has been subjected to prolonged agricultural grazing, resulting in very low native species diversity in the lower stratum, which is now dominated by introduced grass species A species list from relevé (R01 and R04) recorded only seven native species. Comparison against typical and common species listed in Appendix 1 of Gibson et al. (1994) identified three of the 28(10.71%) listed species occur comprising: • *Corymbia calophylla* • *Kingia australis* • **Briza maxima* Note that with the exception of *Corymbia calophylla*, other native species listed above are occurring as singular plants or scattered groups. The mid and ground stratums are dominated by weeds primarily **Bromus diandrus*, **Vulpia myuros* and **Ehrharta longiflora.* While comparison demonstrates some similarities to Gibson et al. (1994) typical and common species for SCP 3c, the percentage similarities are low, being 15% or less. It is considered logical to conclude based on location, soil association and the presence of some typical and common species that VT02 may have previously represented an occurrence of SCP 3c. However, due to the low percentage similarities to FCT

Floristic Community Type/ Comm ID	Community Name	Conservation Status		Presence/ Absence	Justification
		State	Federal		
					description, the Completely Degraded condition and ongoing degradation from weeds and disturbance, it was concluded that the vegetation no longer represents an extant occurrence of SCP 3c.
SCP3b	*Corymbia calophylla - Eucalyptus marginata* woodlands on sandy clay soils of the southern Swan Coastal Plain (floristic community type 3b as originally described in Gibson et al. 1994)	EN	EN	Absent	Suitable soil and landform characteristics, comprising a moderately well drained deep bleached grey sand within the southern portion of the Survey Area, intersecting with the mapped extents of VT01 and VT02. VT01 comprises of *Jarrah marginata* open woodland and VT02 comprises of *Corymbia calophylla* open woodland, both which are in Completely Degraded Condition. The vegetation was previously cleared for agricultural purposes and now has very low native species diversity and is dominated by weeds. A combined species list from five relevés (R01, R02, R03, R04, R09) recorded only 12 native species. Comparison against typical and common species listed in Appendix 1 of Gibson et al. (1994) identified that four of the 38 (10.52 %) listed species occur comprising: • *Corymbia calophylla* • *Eucalyptus marginata* • **Briza maxima* • **Hypochaeris glabra* Note that with the exception of *Corymbia calophylla* and *Eucalyptus marginata*, other native species listed above are occurring as singular plants or scattered groups. The mid and ground stratums are dominated by weeds. While comparison demonstrates some similarities to Gibson et al. (1994) typical and common species for SCP 3b, the percentage similarities are low, being 15% or less. It is considered logical to conclude based on location, soil association and the presence of some typical and common species that VT01 and VT02 may have previously represented an occurrence of SCP 3b. However, due to the low percentage similarities to FCT description, the Completely Degraded condition and ongoing degradation from weeds

Floristic Community Type/ Comm ID	Community Name	Conservation Status		Presence/ Absence	Justification
		State	Federal		
					and disturbance, it was concluded that the vegetation no longer represents an extant occurrence of SCP 3b.
Banksia WL SCP	Banksia Woodlands of the Swan Coastal Plain ecological community	P3	EN	Absent	Soils intersecting the southern portion of the Survey Area within the mapped extent of VT01, occurs in the uplands of the Bassendean system, characterised by well-draining, low nutrient soils. These landform and soil characteristics are considered suitable for potentially supporting banksia woodland. Majority of VT02, VT03 and VT04 was completely degraded and did not contain native species characteristics of banksia woodland, with <2% banksia species cover recorded. As such, these vegetation types were excluded from consideration on this basis. Vegetation type VT01 contained two individual Banksia species (*Banksia attenuata* and *Banksia menziesii*) which covers less than 2% foliage cover of the vegetation type. The lower stratum was in completely degraded condition due to agricultural grazing.

4.3.4 Vegetation of Other Significance

As detailed in the Flora and Vegetation Technical Guidance as well as the EPA's *Environmental Factor Guideline for Flora and Vegetation*, vegetation may be considered of significance for a range of reasons, other than a listing as a TEC or a PEC, including:

- Pre-European vegetation extent being below a threshold level.
- Scarcity.
- Unusual species.
- Novel combinations of species.
- A role as a refuge.
- A role as a key habitat for threatened species or large populations representing a significant proportion of the local to regional total population of a species.
- A restricted distribution.

The Survey Area is within the mapped extent of the Guildford Complex and contains key species for the complex as per the structural description in Heddle et. al (1980). The state-wide vegetation statistics (GoWA, 2018) indicates that, of the estimated pre-European extent for Guildford Complex, approximately 5.09 % remains. This is below the 30 % retention threshold identified in the national objective and targets for biodiversity conservation in Australia (Commonwealth of Australia, 2001). In recognition of past land use planning decisions, areas within the Greater Bunbury Region Scheme, Perth and Peel Region Scheme, and within the Bush Forever study area have been identified as 'constrained' areas. Within these constrained areas, native vegetation retention objectives may be varied to “at least 10 %”. However, other principles do apply within these constrained areas, subject to exemptions for assessed schemes and deemed works of subdivisions (DER, 2014).

Due to the Completely Degraded condition of all vegetation types, VT01, VT02, VT03 and VT04 are not considered to represent an extant occurrence of the Guildford Complex vegetation type, and therefore the Survey Area is not considered to comprise an occurrence of vegetation of other significance.

No other reasons are present to consider the vegetation as of other significance.

4.4 Fauna Desktop Assessment

4.4.1 Fauna Assemblage

The primary objectives of a basic fauna survey, as detailed in the Fauna Technical Guidance, are to verify the overall adequacy of the desktop study, and to map and describe habitats with a focus on habitat for conservation listed fauna.

A desktop assessment of expected conservation significant fauna assemblage was undertaken through searches of DBCA database records and the EPBC Act PMST, shown in Figure 10. Results are summarised in Appendix F.

Database searches identified 37 conservation listed fauna species that potentially occur, or habitat likely occurs within the Survey Area, comprising:

- Twenty-six bird species.
- Eight mammal species.
- Two invertebrate species.
- One reptile species.

4.4.2 Fauna Likelihood of Occurrence

The likelihood of occurrence for conservation listed fauna species found that:

- Three species had a high likelihood of occurrence.
- Four species had a medium likelihood of occurrence.
- Thirty species had a low likelihood of occurrence.

The three species that had a high likelihood of occurrence were:

- *Zanda baudinii* (Baudin's black cockatoo)—EN.
- *Zanda latirostris* (Carnaby's black cockatoo)—EN.
- *Calyptorhynchus* b*anksii naso* (forest red-tailed black cockatoo)—VU.

The four species that had a medium likelihood of occurrence were:

- *Isoodon fusciventer* (quenda)—P4.
- *Notamacropus irma* (western brush wallaby)—P4.

- *Phascogale tapoatafu wambenger* (south-western brush-tailed phascogale)—CD.
- *Westralunio carteri* (Carter's freshwater mussel)—VU.

The species assessed as having a low likelihood of occurrence were those that are locally extinct, have no recent records or for which no suitable habitat is present (e.g. wading birds). Species recorded or assessed as having a high or medium likelihood of occurrence are discussed in detail in Section 4.5.2

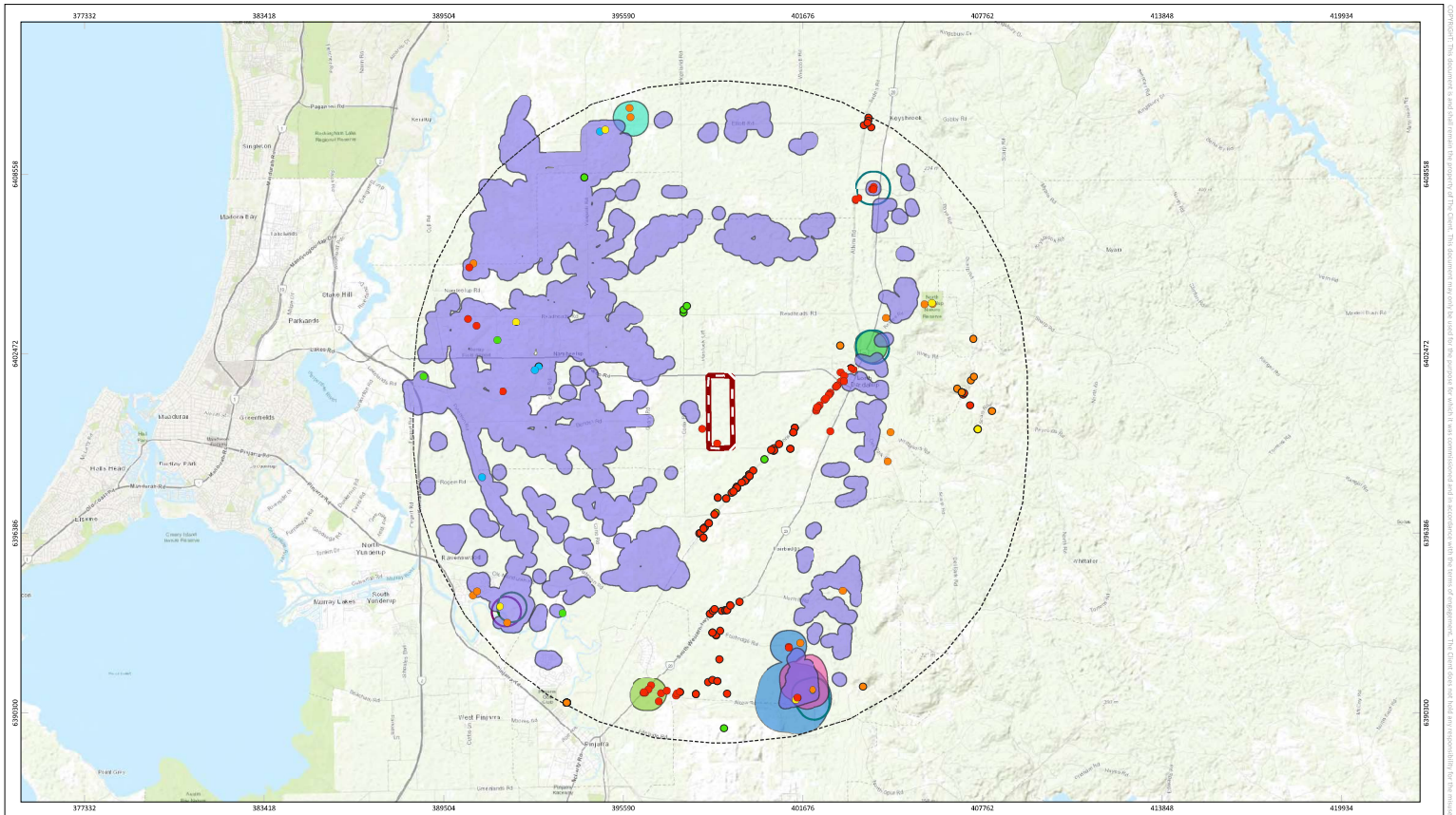

Figure : DBCA Database Search Results Flora and Communities

N 0 1,800 3,600 5,400 7,200 m	PROJECT/REPORT NAME: Flora, Vegetation and Black Cockatoo Habitat Assessment 1818 Lakes Road, North Dandalup	Legend: Project Area, 10km Buffer	
SCALE: 1:121,729	SHEET SIZE: A3 COLOUR	CLIENT: Harley Dykstra	
COORDINATE REFERENCE SYSTEM: GDA2020 / MGA zone 50		PROJECT NUMBER: A25.034	VERSION: 0
DATA SOURCE: ESRI Topographic Map		DRAWN BY / REVIEWED BY: JP/JB	DATE: 18/6/2025

No	Description	Drawn	Approved	Date
A	Original issue	JP	JB	18/6/2025

NOTES:
Cadastral boundary from LANDGATE - 2022. Label corresponds to the vegetation association number.

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4.5 Fauna Field Survey

4.5.1 Fauna Habitat Types

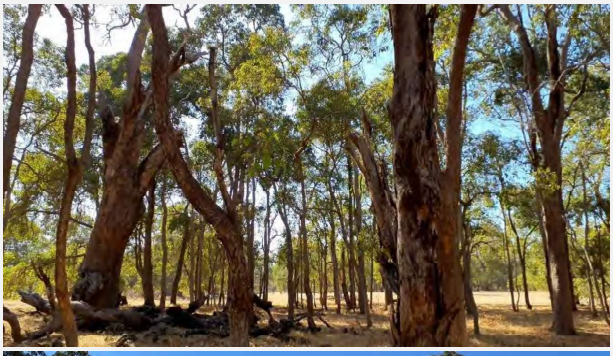
There are nine fauna types within the Survey Area. These broadly align with the mapped vegetation type boundaries. The fauna habitat types are described below in Table 19 and shown in Figure 11.

For possibly occurring conservation listed fauna species, habitat types are assessed as either core, supporting or non-significant habitat. In accordance with the *MNES – Significant Impact Guidelines 1.1*, "core" habitat is defined as that critical to the survival of the species and considered to contain denning or breeding sites, primary foraging areas and refuge from drought, fire and other stresses (DotE, 2013). "Supporting" habitat is defined as that which is likely used for foraging and dispersing or connective purposes but is not essential habitat for the continuation of a local population. "Non-significant" habitat is that which would be used only very infrequently for foraging or dispersing.

Table 19: Fauna Habitat Type Description within the Survey Area.

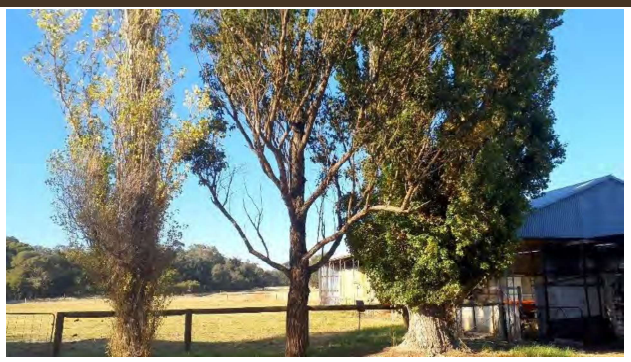
Fauna Habitat Type	Habitat Description	Area (ha); Proportion of Survey Area (%)	Representative Photo
FHT-01 **Jarrah Woodland**	Patches of *Eucalyptus marginata* (jarrah) woodland over grazed paddock. Degraded with some connective canopy and minimal understory species. Minimal amount of leaf litter, dominated by paddock grasses, limiting ground-based fauna from utilising the habitat. Several trees have small hollows (Class 4). **Soil substrate:** Deep bleached grey sands Supporting habitat for: • Carnaby's black cockatoos • Forest red-tailed black cockatoos • Baudin's black cockatoos • Western brush wallaby • South-western brush-tailed phascogale Non-significant for: • Quenda	1.83 ha; 0.93%	

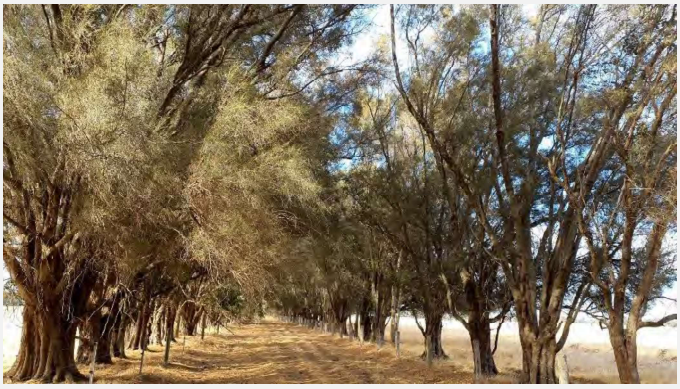
Fauna Habitat Type	Habitat Description	Area (ha); Proportion of Survey Area (%)	Representative Photo
FHT-02 **Planted Eucalyptus spp. and Flooded Gums**	Planted windbreak rows of small-fruited smooth bark Eucalyptus and *Eucalyptus rudis* (Flooded gum) over cleared/grazed paddock. Limited understory species due to agricultural grazing, dominated by paddock grasses. No evidence of foraging was observed. **Soil substrate:** Shallow pale sand/sandy loam over clay No core habitat for all species. Supporting habitat for: • Forest red-tailed black cockatoos Non-significant for: • Carnaby's black cockatoos • Baudin's black cockatoos • Western brush wallaby • South-western brush-tailed phascogale • Quenda	3.16 ha; 1.61%	 

Fauna Habitat Type	Habitat Description	Area (ha); Proportion of Survey Area (%)	Representative Photo
FHT-03 Open Marri Woodland with Scattered Jarrah	Woodlands of *Corymbia calophylla* (marri) with scattered jarrah over cleared/grazed paddock. Degraded condition with some connective canopy. No understory species observed, minimal ground leaf cover, mostly dominated by paddock grasses. Scattered hollow fallen logs and branches on ground, with older growth portions containing individual trees with suitable hollows for black cockatoos (Class 3). Some foraging evidence was observed, no roosting evidence. **Soil substrate:** deep bleached grey sands/sandy loam over clay Core habitat for: • Forest red-tailed black cockatoos • Carnaby's black cockatoos • Baudin's black cockatoos Supportive habitat for: • South-western brush-tailed phascogale • Western brush wallaby • Quenda	7.43 ha; 3.78%	 

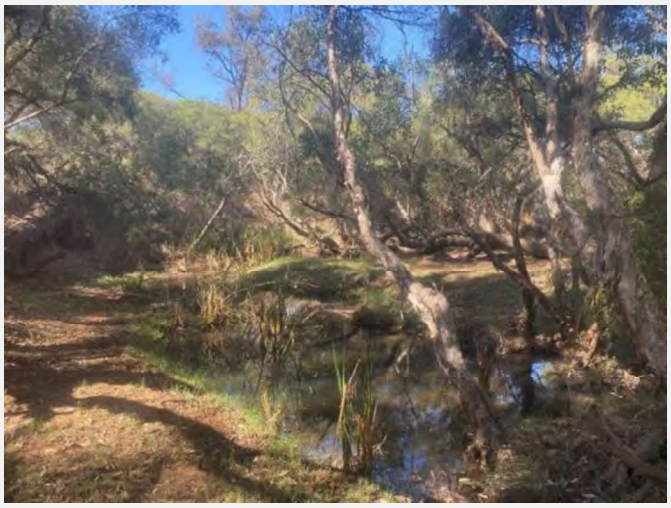
Fauna Habitat Type	Habitat Description	Area (ha); Proportion of Survey Area (%)	Representative Photo
FHT-04 **Scattered Individual Banksias**	Scattered individual *Banksia attenuata* and *B. menziesii* over cleared/grazed paddock. The entire area is completely degraded with banksia species showing upper canopy banksia death. No native understory species were observed, mostly dominated by paddock grasses due to grazing/clearing. **Soil substrate:** Deep sandy loam soils No core habitat for all species. Supporting habitat for: • Carnaby's black cockatoos • Baudin's black cockatoos Non-significant for: • Forest red-tailed black cockatoos • Western brush wallaby • South-western brush-tailed phascogale • Quenda	0.01 ha; 0.00 %	

Fauna Habitat Type	Habitat Description	Area (ha); Proportion of Survey Area (%)	Representative Photo
FHT-05 Individual Xylomelum	Individual *Xylomelum occidentale* over cleared/grazed paddock. No understory species, dominated by paddock grasses. **Soil substrate:** Deep sandy loam soils No core or supportive habitat for all species. Non-significant for: • Carnaby's black cockatoos • Forest red-tailed black cockatoos • Baudin's black cockatoos • Western brush wallaby • South-western brush-tailed phascogale • Quenda	0.03 ha 0.02%	
FHT-06 Planted Garden	Mix non-native and exotic eucalyptus and garden species over cleared paddock and built infrastructure (paved areas). **Soil substrate:** yellow duplex soils No core or supportive habitat for all species. Non-significant for: • Forest red-tailed black cockatoos • Carnaby's black cockatoos • Baudin's black cockatoos • Western brush wallaby • South-western brush-tailed phascogale • Quenda	0.36 ha 0.18%	

Fauna Habitat Type	Habitat Description	Area (ha); Proportion of Survey Area (%)	Representative Photo
			

Fauna Habitat Type	Habitat Description	Area (ha); Proportion of Survey Area (%)	Representative Photo
FHT-07 Planted Rows of Allocasuarina spp.	Planted rows of non-native casuarina over cleared/grazed paddocks. No understory species, dominated by paddock grasses. **Soil substrate:** shallow pale sand to sandy loam over clay No core habitats for all species. Supportive habitat for: • Forest red-tailed black cockatoos Non-significant habitat for: • Baudin's black cockatoos • Carnaby's black cockatoo • Western brush wallaby • South-western brush-tailed phascogale • Quenda	0.49 ha 0.25%	

Fauna Habitat Type	Habitat Description	Area (ha); Proportion of Survey Area (%)	Representative Photo
FHT-08 Paddock and Residential Use	Cleared pasture grassland, dominated by paddock grasses. Areas of residential use includes buildings and cleared vehicle access paths. Non-significant habitat for all species.	152.92 ha 77.83%	 

Fauna Habitat Type	Habitat Description	Area (ha); Proportion of Survey Area (%)	Representative Photo
FHT-09 Riparian Foreshore Reserve*	*Melaleuca preissiana* woodland with scattered Marri and non-native Eucalyptus trees near bank edges, understory is dominated by weedy grasses. **Soil substrate**: deep acidic mottled yellow duplex soils Core habitat for: • Quenda • Western brush wallaby • South-western brush-tailed phascogale • Carter's freshwater mussel Supportive habitat for: • Forest red-tailed black cockatoos • Carnaby's black cockatoos • Baudin's black cockatoos *Breeding habitat was not assessed for Baudin's, Carnaby's and Forest red-tailed black cockatoos due to proposed retention of foreshore reserve. No detailed assessment of foraging habitat present within FHT-09 has been undertaken. It has therefore been excluded from the application of the black cockatoo foraging habitat scoring tool (refer to section 4.5.3).	30.25 ha 15.4%	
Total		**196.48 ha**	

4.5.2 Threatened and Priority Fauna

Specific targeted assessments for black cockatoo species were undertaken and are presented in Section 4.5.3.

No previous DBCA fauna records have been recorded within the Survey Area. Other fauna species of conservation significance which were recorded or assessed as having a high or medium likelihood of occurrence are discussed in detail below:

Isoodon fusciventer (Quenda, south-west brown bandicoot)—P4

Quendas are widely distributed in south-west WA and are associated with wetlands and fringing areas with dense cover of shrubs and sedges adjoining areas of woodland and grassland. Quenda will forage in grassland or paddocks when adjacent to dense cover. Quendas are commonly recorded in bushlands <5km from the Survey Area. Due to presence of suitable habitat within the foreshore reserve and numerous previous records close by, the species is expected to be present in the foreshore reserve and occasionally present in paddocks adjacent to the foreshore reserve.

Fauna habitat type FHT-09 is considered to provide core habitat to this species due to presence of native understory that provides cover and foraging opportunities. Fauna habitat type FHT-03 is considered to provided supporting habitat due to its connectivity to FHT-09.

All other habitats are considered non-significant for this species due to lack of understory plant species to support tunnelling, denning and foraging.

Notamacropus irma (Western brush wallaby)—P4

The western brush wallaby's suitable habitat is open forest or woodland, particularly favouring open seasonally wet flats with low grasses and open scrubby thickets for foraging. The species also inhabits some areas of mallee and heathland where moderate ground level vegetation persists. This species has been recorded >5km east of the Survey Area along the creek line. Fauna habitat FHT-09 can be considered core habitat for the species due to moderate vegetation cover and opportunities for foraging.

Fauna habitat type FHT-01, FHT-02 and FHT-03 are considered suitable supporting habitat for the species. These habitat types have a moderate vegetation and are adjacent to the foreshore reserve in FHT-09.

Phascogale tapoatafa wambenger (South-western brush-tailed phascogale)—CD

The south-western brushed-tailed phascogale is known to occur in the southwest between Perth and Albany, occurring at low densities in the northern Jarrah Forest and high densities in the lower southwest in isolated populations. Their preferred habitat is in dry sclerophyll forests and open woodlands that contain hollows-bearing trees. This species has been recorded >8km east of the Survey Area in denser forests, the lack of records may suggest lack of targeted surveys and nocturnal cryptic nature of the species making it not easily detected.

Within the Survey Area, FHT-09 is considered suitable core habitats for the species as these habitats offer connective tree canopy and tree hollows to support nesting. FHT-03 and FHT-01 can be considered supportive habitat due to connectivity with FHT-09 in certain areas and providing opportunities for foraging.

Westralunio carteri (Carter's Fresh Water Mussels)—VU

This species occurs in greatest abundance in slower flowing waters where sediments are stable and soft enough to allow the species to burrow (<10 cm depth) but are usually visible from the surface to facilitate filter feeding. Carter's freshwater mussel has a complex life cycle involving a parasitic larval stage, which it attaches to a fish host before it metamorphoses into the juvenile form that drop off the fish host to begins its life on the sediment. The period of attachment to a fish host functions as an effective dispersal mechanism for this otherwise sessile animal.

This species has been recorded approximately 5 km upstream of the North Dandalup River which flows through the Survey Area with the two most recent records being 9 years old and therefore considered relevant. Due to the hydrological connectivity of the nearest record and downstream streamflow direction to FHT-09 within the Survey Area, it is considered suitable core habitat for Carter's freshwater mussels.

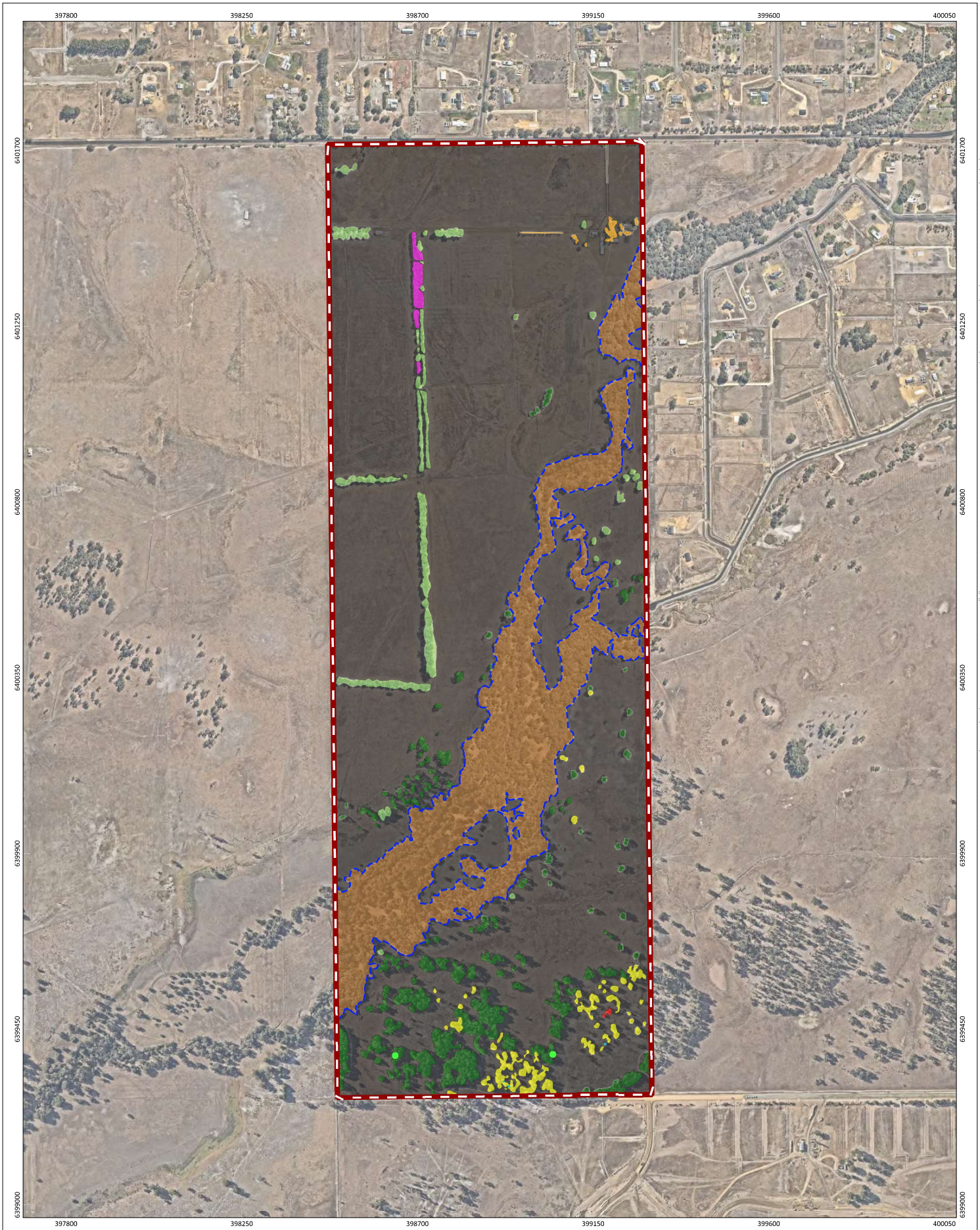


Figure 11: Fauna Habitat Types And Conservation Significant Fauna Observations

0 80 160 240 320 m

N

SCALE	1:9,000
SHEET SIZE	A3 COLOUR
PROJECT/REPORT NAME	Flora, Vegetation and Black Cockatoo Habitat Assessment 1818 Lakes Road, North Dandalup
CLIENT	Harley Dykstra
COORDINATE REFERENCE SYSTEM	GDA2020 / MGA zone 50
PROJECT NUMBER	A25.034
VERSION	0
DATA SOURCE	NEARMAPS
DRAWN BY / REVIEWED BY	JP/JB
DATE	18/6/2025

Legend

- Survey Area
- Calyptorhynchus banksii (EN) - Foraging or digging evidence
- Potential Foreshore Reserve

Fauna Habitat

- FHT_1
- FHT_2
- FHT_3
- FHT_4
- FHT_5
- FHT_6
- FHT_7
- FHT_8
- FHT_9

No	Description	Drawn	Approved	Date
A	Original issue	JP	JB	18/6/2025

NOTES:

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

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4.5.3 Black Cockatoo Habitat Assessment

Areas within the planned foreshore area have not been assessed in detail for the presence and extent of black cockatoo habitat due to the planned retention of the area and a particular focus on potential impacts of the project. These areas are comprised of FHT-09 and a small portion of FHT-08 as described in sections 4.5.1 and 4.5.3. Additional black cockatoo habitat is likely to be present within the retention area.

The Survey Area falls within the modelled distribution range for Baudin's black cockatoo, Carnaby's black cockatoo and the Forest red-tailed black cockatoo (DAWE, 2022).

During the field survey, no observations were recorded for the three species of black cockatoos. Three points of foraging evidence for black cockatoo species was detected within the Survey Area during the field survey, with foraged marri nuts observed in fauna habitat FHT-03 (open marri woodland with scattered jarrah). All observations were in a habitat consistent with the known use of high-quality foraging habitat by Baudin's, Carnaby's and Forest Red-tailed Black Cockatoos. Given the quantity of available records, it is considered highly likely that all three species utilise the Survey Area for foraging on occasion.

There are no confirmed Carnaby's black cockatoo breeding areas within 12 km of the Survey Area (DBCA-054). However, there are numerous observation records for Baudin's, Carnaby's and the forest red-tailed black cockatoo identified in the DBCA database within a 10 km buffer of the Survey Area, with 12, 147 and 37 records, respectively. The closest record is less than 2 km northeast of the Survey Area, recorded near the North Dandalup river for forest red-tailed black cockatoo. Seven mapped black cockatoo roosting sites are present within 12km of the Survey Area (DBCA-064). All are confirmed Carnaby's black cockatoo roost sites (DBCA-064), see Figure 12.

Breeding Habitat Assessment

Breeding habitat is defined as that which contains known, suitable or potential nesting trees (DAWE, 2022). Breeding typically occurs in native eucalypt species particularly marri, jarrah, wandoo and tuart, however many species of eucalypt including non-endemic species may develop suitable hollows for breeding (DAWE, 2022). A summary of suitable nesting hollow characteristics for the three species is provided below in Table 20.

Table 20: Black Cockatoo Nesting Hollow Characteristics

Species	Baudin's Black cockatoo	Carnaby's Black cockatoo	Forest Red-tailed Black cockatoo
Tree species and hollow characteristic	Nesting in mainly karri, jarrah wandoo, bullich and tuart. Utilise hollows from 10-65 cm diameter (average 26 cm) and >1 m deep.	Nesting mainly in salmon gum, wandoo, tuart, jarrah, flooded gum, karri and marri. Utilise hollows from 10-65 cm diameter (average 26 cm) and >1 m deep	Nesting mainly in jarrah, marri, karri, wandoo, bullich, blackbutt and tuart Utilise hollow from 12-150 cm diameter (average 34 cm) and >1 m depth

Species	Baudin's Black cockatoo	Carnaby's Black cockatoo	Forest Red-tailed Black cockatoo
	Hollow depth ranges from 0.1 to 2.5+ m (Johnstone and Kirkby 2011).		
Sources	Johnstone and Kirkby,2011.	DAWE, 2022, Saunders et al., 2014a, Saunders et al., 2014b.	DAWE, 2022, Johnstone et al., 2013.

A total of 853 potential nesting trees were recorded within the Survey Area. Please refer to Figure 13 for tree locations and Appendix G for a summary of tree locations, species, DBH and tree health. No evidence of current or previous nesting behaviour, such as chew marks at hollow entrance attributed to black cockatoos, or flushed individuals were recorded.

The large majority of potential nesting trees (685 trees) did not show signs of potential nesting hollow development (Class 5 trees). One hundred and sixty-seven trees were assessed as possessing small hollows which are of an insufficient size to support nesting (<10 cm entrance); or which have an entrance of >10 cm but the internal dimensions are not suitable, or the hollow is not accessible (Class 4 trees). These Class 4 trees are however of sufficient age and growth form to be developing hollows. One tree (Tree number 315) was confirmed to have a hollow with suitable dimensions for use by black cockatoos (Class 3), however tree is in poor condition. See Table 21 for a summary of trees inspected via pole camera. A summary of all potential nesting trees, including species and Bamford class is provided in Table 22.

Table 21: Suitable Nesting Tree Hollow Description

Tree Number	Tree Specie	DBH (cm)	Bamford Class	Hollow Comments	Camera Pole photo
315	Dead	180	3	One confirmed spout hollow on NW side 10cm diameter opening, suitable depth, checked with pole and drone, large barn owl was flushed out. Tree is in poor condition. Side opening and chimney hollow were inspected with pole camera and drone. Both confirmed unsuitable for use due trunk being in poor condition with exposed vertical cracking.	

Tree Number	Tree Specie	DBH (cm)	Bamford Class	Hollow Comments	Camera Pole photo
					Spout hollow 
					Side entrance hollow  

Tree Number	Tree Specie	DBH (cm)	Bamford Class	Hollow Comments	Camera Pole photo
				Chimney hollow	

Table 22: Summary of Potential Nesting Trees Recorded

Bamford Class and DAWE (2022) Terminology	Class 1 / Class 2 Known Nesting Tree		Class 3 Suitable Nesting Tree	Class 4 Potential Nesting Tree	Class 5 Potential nesting tree	Totals (Trees)
Tree Species						
Jarrah	-	-	-	42	83	**125**
Marri			-	84	360	**444**
Flooded Gum	-	-	-	1	111	**112**
Eucalyptus	-	-	-	-	102	**102**
Dead	-	-	1	40	28	**69**
River Red Gum	-	-	-	-	1	**1**
Total (Bamford Class	**0**	**0**	**1**	**167**	**685**	**853**

Foraging Habitat Assessment

Habitats within the Survey Area contain species which comprise suitable foraging habitat. Fauna habitat types FHT-01 to FHT-09 all contain a proportion of foraging species for all three black cockatoo species including jarrah, marri, *Banksia* spp. and other *Eucalyptus* species.

FHT-09 and a small portion of FHT-08 are located within the foreshore reserve have not been assessed in detail for the presence and extent of foraging species for black cockatoo. These areas have therefore been excluded from application of the habitat quality scoring tools as described below. For the purpose of regional foraging habitat assessment, it was inferred that those areas will score between 1 and 7.

The Commonwealth referral guidelines provide a foraging quality scoring tool to guide referral information (DAWE, 2022). The tool advises that if the Survey Area contains native vegetation used for foraging at any time by a black cockatoo species and is >1 ha in size, that it is considered at face value to be of very high quality and assigned a starting score of 10. The tool then allows for subtractions if attributes are present which reduce the functionality of the foraging habitat. The Commonwealth referral guidelines specify that the tool is to be applied once to the entire impact area even if there is more than one type of foraging habitat present. The calculated foraging habitat quality score is shown below in Table 23.

Table 23: Foraging Quality Scoring Tool (DAWE, 2022)

Attribute	Baudin's Black Cockatoo	Carnaby's Black Cockatoo	Forest Red-tailed Black Cockatoo
Starting score	10- Jarrah/Marri woodland and scattered Banksia	10- Jarrah/Marri woodland and scattered Banksia	10- Jarrah/Marri woodland and scattered Banksia

Attribute	Baudin's Black Cockatoo	Carnaby's Black Cockatoo	Forest Red-tailed Black Cockatoo
Foraging potential (-2 if no foraging evidence)	No change, foraging evidence recorded.	No change, foraging evidence recorded.	No change, foraging evidence recorded.
Connectivity (-2 if no other foraging habitat in 12km)	No change, other foraging habitat <12 km away	No change, other foraging habitat <12 km away	No change, other foraging habitat <12 km away
Proximity to breeding habitat (-2 if no breeding habitat in 12km)	-2, No recorded breeding habitat within 12 km	-2, No recorded breeding habitat within 12 km	-2, No recorded breeding habitat within 12 km
Proximity to roosting (-1 if >20km from known night roost)	No change, known roosting site <20 km distant	No change, known roosting site <20 km distant	No change, known roosting site <20 km distant
Impact from significant plant disease (-1 if >50% impact)	No change, impact from plant disease affecting <50 % of foraging plants	No change, impact from plant disease affecting <50 % of foraging plants	No change, impact from plant disease affecting <50 % of foraging plants
Total score	8	8	8

The Commonwealth referral guidance allows for the inclusion of additional information for foraging habitat which may be considered during an assessment, such as the extent and density of recognised foraging plants within a Survey Area. As an additional source of information, WEPL provides an assessment of foraging habitat quality using a more detailed scoring tool developed by DCCEEW (n.d.) referred to as the Habitat Quality Scoring Tool to produce a numerical foraging habitat score. The Habitat Quality Scoring Tool allows for a score of 0 (none) to 7 (very high) for Site Condition. This is assessed based on density of known foraging species and health of vegetation. The 0-7 Site Condition score is applied to each mapped polygon of fauna habitat. The Habitat Quality Scoring Tool then applies a Site Context score out of three, this is applied only once to the whole Survey Area.

The Site Condition habitat quality score for each species, and the total area of that score present within the Survey Area are listed in Table 24.

Table 24: Habitat Quality Scoring Tool - Site Condition Extent

Site Condition	Baudin's Black Cockatoo (ha)	Carnaby's Black Cockatoo (ha)	Forest Red-tailed Black Cockatoo (ha)
7- Very High	7.43	7.43	9.26
6- High	-	-	-
5-Moderate-High	-	-	-
4-Moderate	-	-	-
3-Low-Moderate	1.84	1.84	3.65

Site Condition	Baudin's Black Cockatoo (ha)	Carnaby's Black Cockatoo (ha)	Forest Red-tailed Black Cockatoo (ha)
2-Low	0.49	0.52	0.24
1-Negligable to Low	153.32	153.32	150.16
0-None	0.71	0.68	0.48
Not Assessed		32.69	
Total	**196.48**	**196.48**	**196.48**

* Shaded cells are classified as not comprising suitable foraging habitat

The Habitat Quality Scoring Tool then requires the application of a Site Context score (out of 3) (see Table 25) which is added to the Site Condition score for a final score (out of 10).

Table 26 provides the final Habitat Quality Scoring Tool score. It should be noted that habitat with a Site Condition score of 2 or less is extremely unlikely to be suitable habitat, and do not have a Site Context score added.

Table 25: Habitat Quality Scoring Tool - Site Context

Site Context					
Proximity of the site in relation to other habitat	3	Site is within 6 km of known breeding site.	or	Site is within 12 km of other foraging resources with site condition of at least 3.	3
	2	Site is within 12 km of known breeding site.		Site is within 15 km of other foraging resources with site condition of at least 4.	
	1	Site is within 15 km of known breeding site.		Site is between 15 km and 20 km of other foraging resources with site condition of at least 5.	
	0	Site is further than 15 km from known breeding site.		Site is further than 20 km from other foraging resources.	
Total					**3**

Table 26: Final Habitat Scoring Tool Score

Survey Area Condition	Baudin's Black Cockatoo (ha)	Carnaby's Black Cockatoo (ha)	Forest Red-tail Black Cockatoo (ha)
10	7.43	7.43	9.26
9	-	-	-
8	-	-	-
7	-	-	-
6	1.84	1.84	3.65
5	-	-	-
4	-	-	-
3	-	-	-
2	0.49	0.52	0.24
1	153.32	153.32	150.16
0	0.71	0.68	0.48
Not Assessed		32.69	
Total	**196.48**	**196.48**	**196.48**

* Shaded cells are classified as not comprising suitable foraging habitat

As per the Habitat Quality Scoring Tool areas with a site condition score of 2 or lower (shaded cells) are "extremely unlikely to be considered as suitable habitat". These areas are therefore classified as not comprising suitable foraging habitat in this assessment.

Regional Foraging Habitat Assessment

Analysis of the estimated foraging habitat extent within the local area was also undertaken to provide further context. The estimated extent of foraging habitat is calculated for a buffer of 12 km around and including the Survey Area. This buffer is selected as recommended in the Commonwealth referral guidelines due to black cockatoos mainly foraging within 12 km of their nest site during the breeding season and their reliance on this proximity of foraging resources to successfully raise chicks (DAWE, 2022).

Analysis considers Remnant Native Vegetation Extent mapping (*DPIRD-005*) and Vegetation Complexes-Swan Coastal Plain and South West forest region (*DBCA-046* and *DBCA-047*). See summary of regional vegetation complexes and extents in Table 27 and Figure 17.

Analysis indicates there is 16,757.81 ha of remnant native vegetation mapped within a 12 km buffer of the Survey Area. It is expected that the majority of this vegetation would contain suitable foraging species at the same or greater rate than that present within the Survey Area. Much of this regional remnant native vegetation is located within the jarrah forest in the east.

For the purpose of regional foraging habitat assessment, it was inferred that the portion of FHT-08 and FHT-09, which have not been assessed in detail for the presence of foraging species, will score a weighted average of 3/7 or above and is therefore considered to provide suitable foraging habitat. FHT-09 (30.25 ha) contains patches of *Corymbia calophylla*, which provide very high foraging value, as well as large patches of *Melaleuca preissiana*, providing negligible foraging value. This fauna habitat type is however located within the foreshore area and will therefore be retained.

Consequently, within the Survey Area there is 45.60 ha of foraging habitat scoring between 3 (low to moderate) and 7 (very high) on the Habitat Quality Scoring Tool - Site Condition scale. This represents 0.27 % of the estimated regional habitat extent.

The habitat quality within the Survey Area is considered likely to be of lesser quality than much of the regional foraging habitat, which includes high quality marri-jarrah woodlands of the Jarrah Forest bioregion.

Table 27: Regional Foraging Habitat Extent within 12 km of the Survey Area

Vegetation Complex	Remnant Extent (ha)
Dwellingup, D1	4384.16
Bassendean Complex-Central and South	4176.68
Darling Scarp, DS2	1924.63
Yarragil 1, Yg1	1362.56
Murray 1, My1	1149.17
Guildford Complex	1103.40
Helena 1, He1	719.58
Southern River Complex	718.35
Herdsman Complex	316.38
Swan Complex	293.16
Yarragil 2, Yg2	246.00
Forrestfield Complex	221.74
Vasse Complex	86.09
Swamp, S	55.92
Total	16,757.81

Roosting Habitat Assessment

Three known roost sites are present 3.6 km north-east and 4.5 km north (Object ID 127) of the Survey Areas (DBCA-064). No evidence of roosting within the Survey Area was recorded.

Night roosting locations are typically in proximity to foraging habitat (black cockatoos mainly foraging within 20 km of night roosts) and with access to water points <2 km from roosting location (DAWE, 2022). Any groups of tall trees, particularly large native eucalypts in proximity to water sources may provide night

roosting habitat (DAWE, 2022). Within the Survey Area, fauna habitat types FHT-01 and FHT-03 provides the most suitable roosting habitat as they contain medium and large stands of eucalypts with medium canopies. Access to permanent water is within the Survey Area from the North Dandalup River.

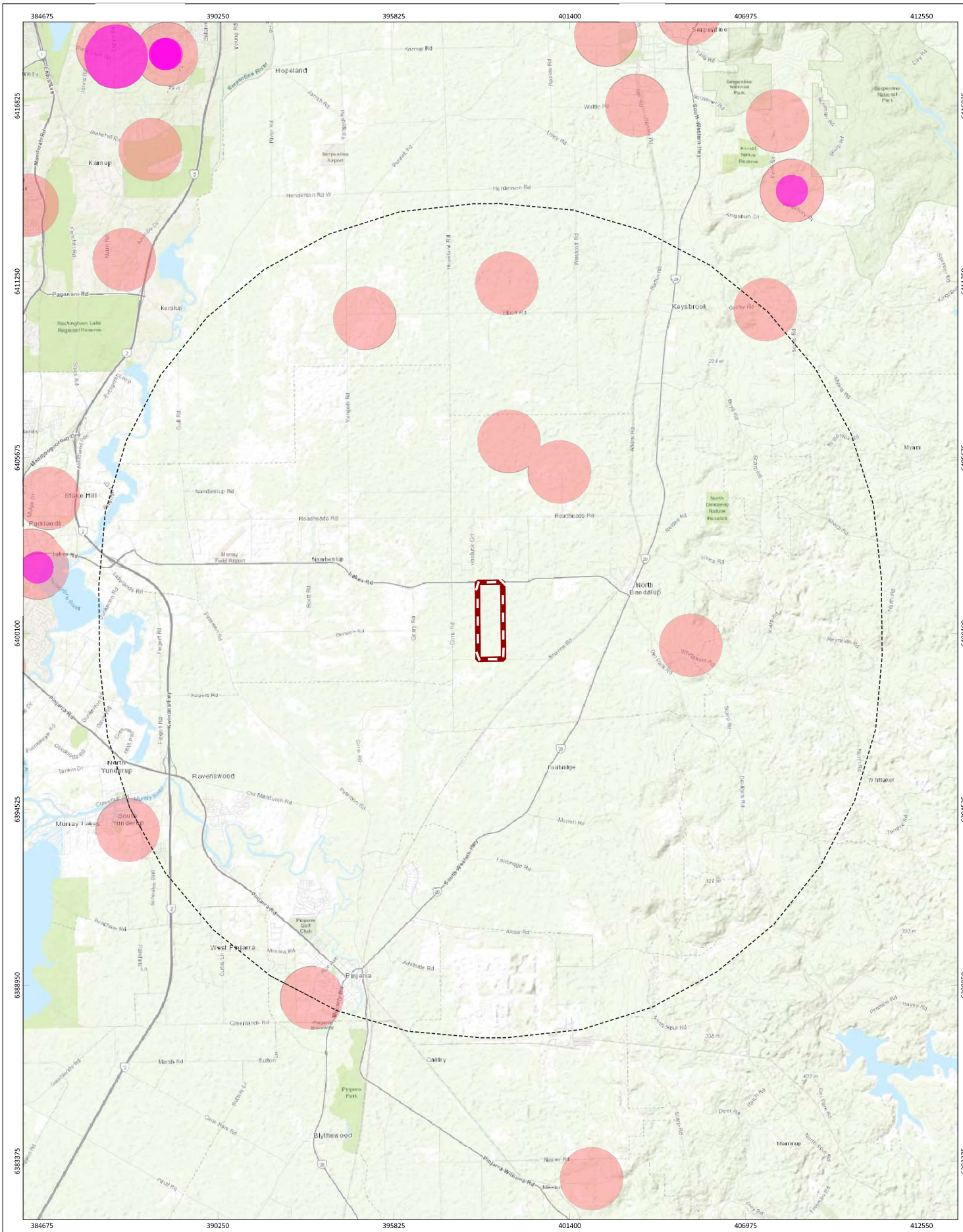

Figure 12: Known Black Cockatoo Roosting and Breeding Sites within 12 km Buffer

N

0 1 2 3 km

SCALE	1:111,500
SHEET SIZE	A3 COLOUR
PROJECT/REPORT NAME	Flora, Vegetation and Black Cockatoo Habitat Assessment 1818 Lakes Road, North Dandalup
CLIENT	Harley Dykstra
COORDINATE REFERENCE SYSTEM	GDA2020 / MGA zone 50
PROJECT NUMBER	A25.034
VERSION	0
DATA SOURCE	LANDGATE AERIAL IMAGERY NOW
DRAWN BY / REVIEWED BY	JP/JB
DATE	18/6/2025

Legend

- Survey 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)

No	Description	Drawn	Approved	Date
A	Original issue	JP	JB	18/6/2025

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

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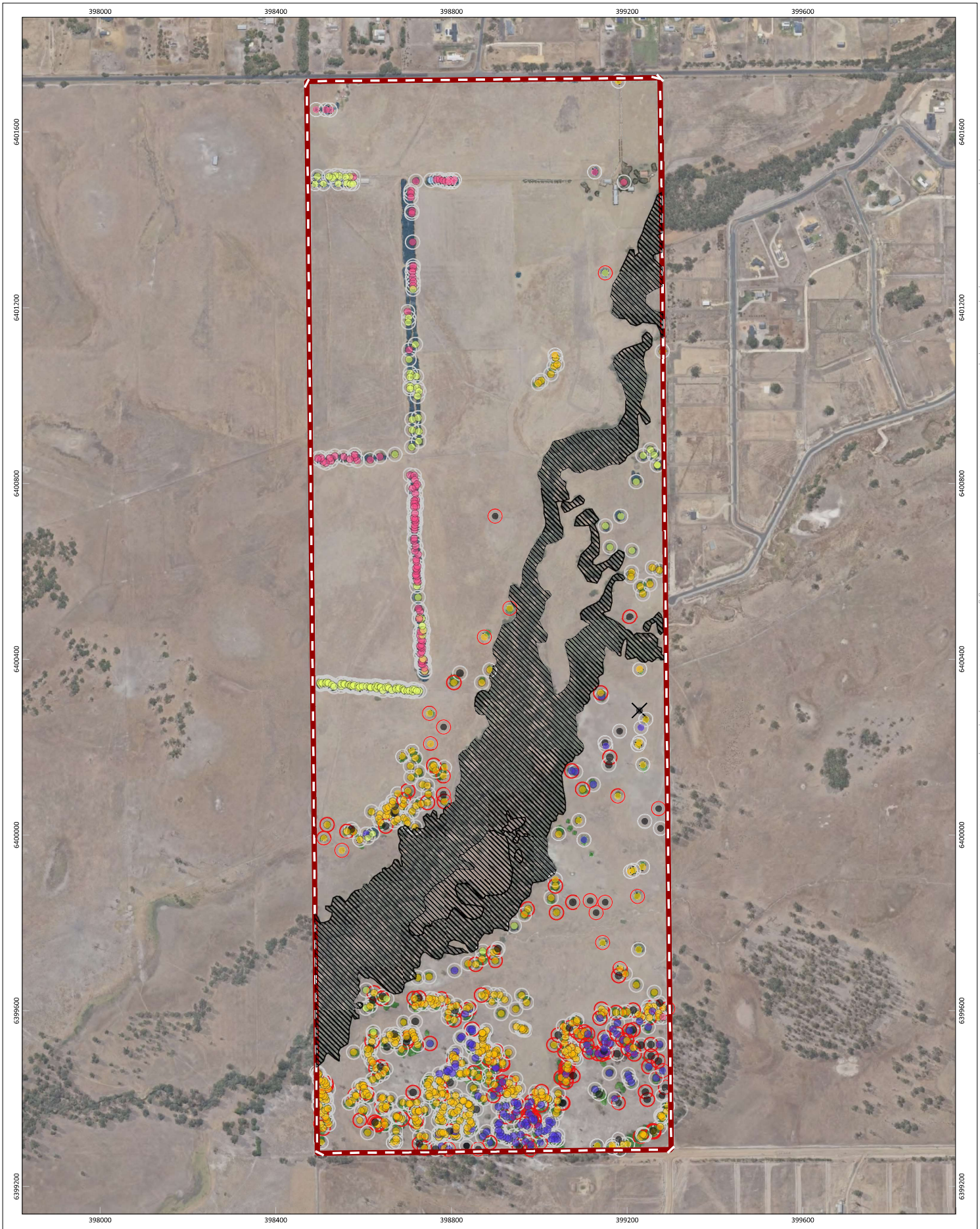

Figure 14: Black Cockatoo Potential Breeding Habitat

0 50 100 150 200 m

N

SCALE	1:8,000
SHEET SIZE	A3 COLOUR
PROJECT/REPORT NAME	Flora, Vegetation and Black Cockatoo Habitat Assessment 1818 Lakes Road, North Dandalup
CLIENT	Harley Dykstra
COORDINATE REFERENCE SYSTEM	GDA2020 / MGA zone 50
PROJECT NUMBER	A25.034
VERSION	0
DATA SOURCE	NEARMAPS
DRAWN BY / REVIEWED BY	JP/JB
DATE	8/7/2025

Legend

- Survey Area

Tree Species

- Dead
- Eucalyptus
- Flooded Gum
- Jarrah
- Marri
- River Red Gum

Bamford Tree Class

- 3
- 4
- 5
- Not Assessed

No	Description	Drawn	Approved	Date
A	Original issue	JP	JB	8/7/2025

NOTES:

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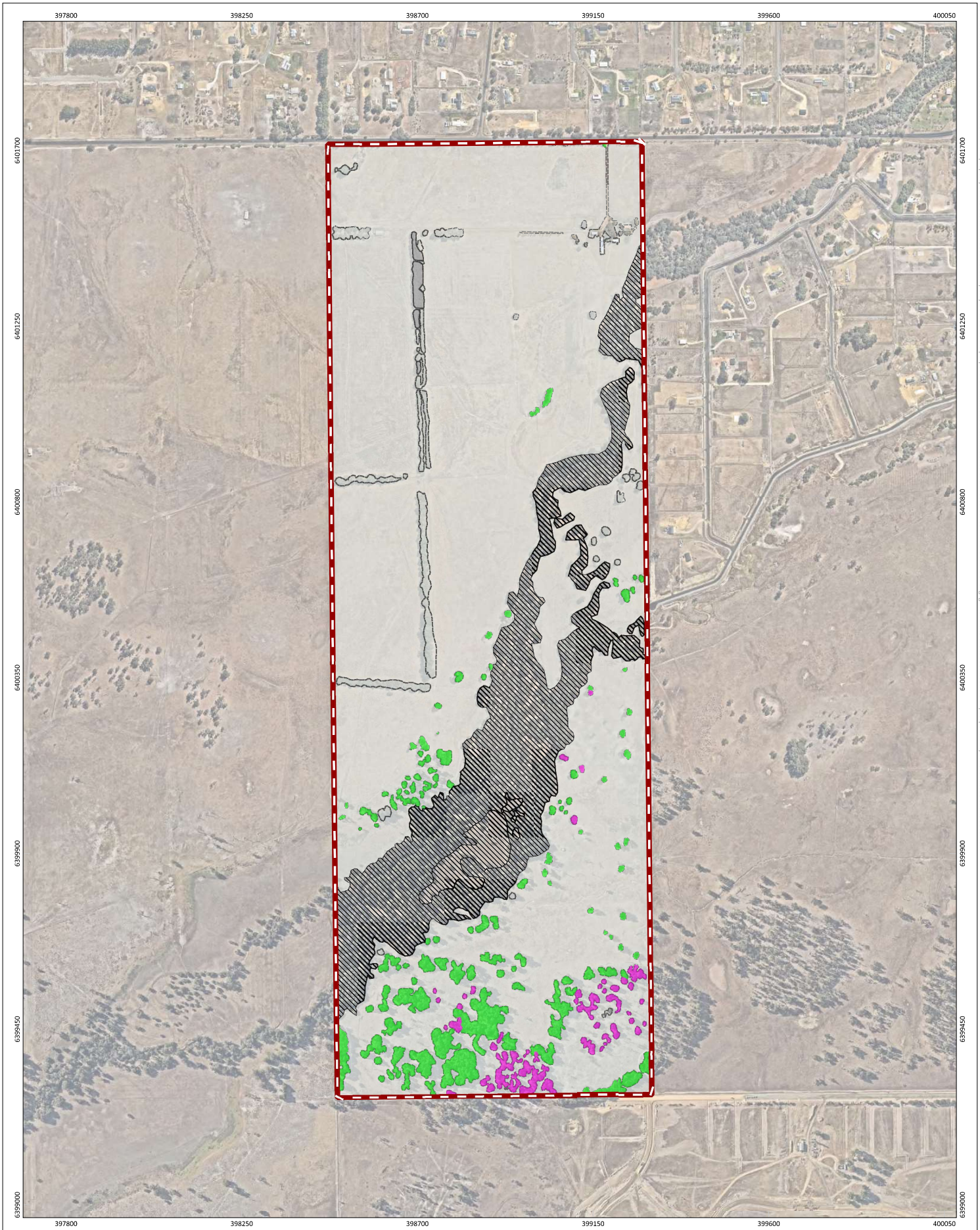

Figure 14: Baudin's Black Cockatoo Foraging Habitat

N

0 75 150 225 300 m

PROJECT/REPORT NAME: Flora, Vegetation and Black Cockatoo Habitat Assessment 1818 Lakes Road, North Dandalup		
SCALE: 1:9,000	SHEET SIZE: A3 COLOUR	CLIENT: Harley Dykstra
COORDINATE REFERENCE SYSTEM: GDA2020 / MGA zone 50	PROJECT NUMBER: A25.034	VERSION: 0
DATA SOURCE: NEARMAPS	DRAWN BY / REVIEWED BY: JP/JB	DATE: 31/7/2025

Legend

- Survey Area

Site Condition Score (Habitat Quality Score Tool)

- Not Assessed
- 0 - None
- 1 -Negligible
- 2 - Low
- 3 - Low to Moderate
- 7 - High

No	Description	Drawn	Approved	Date
A	Original issue	JP	JB	31/7/2025

NOTES:

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

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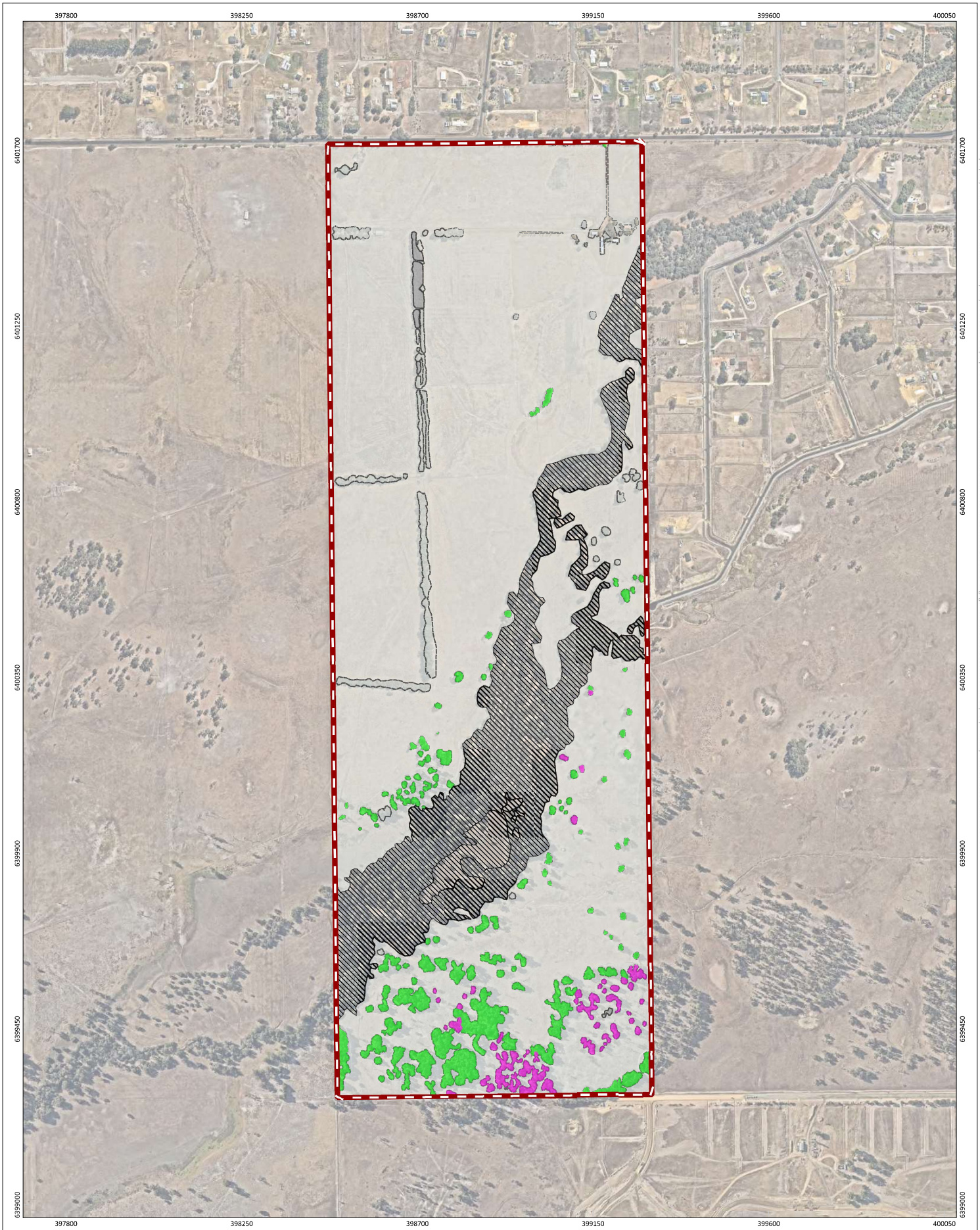

Figure 15: Carnaby's Black Cockatoo Foraging Habitat

N

0 75 150 225 300 m

PROJECT/REPORT NAME	Flora, Vegetation and Black Cockatoo Habitat Assessment 1818 Lakes Road, North Dandalup
SCALE	1:9,000
SHEET SIZE	A3 COLOUR
CLIENT	Harley Dykstra
COORDINATE REFERENCE SYSTEM	GDA2020 / MGA zone 50
PROJECT NUMBER	A25.034
VERSION	0
DATA SOURCE	NEARMAPS
DRAWN BY / REVIEWED BY	JP/JB
DATE	31/7/2025

Legend

- Survey Area

Site Condition Score (Habitat Quality Score Tool)

- Not Assessed
- 0 - None
- 1 - Negligible
- 2 - Low
- 3 - Low to Moderate
- 7 - High

No	Description	Drawn	Approved	Date
A	Original issue	JP	JB	31/7/2025

NOTES:

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

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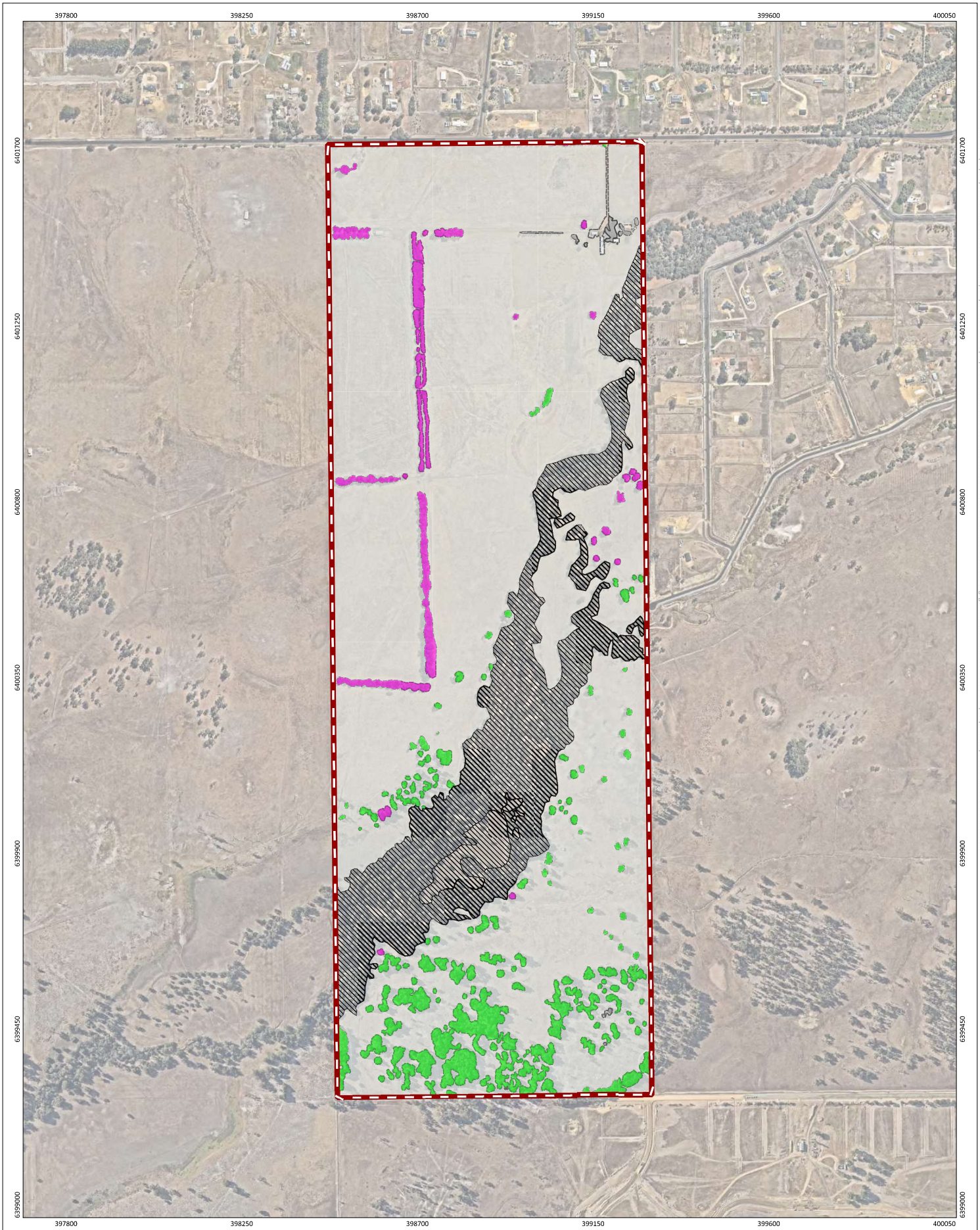

Figure 16: Forest Red-tailed Black Cockatoo Foraging Habitat

N

0 75 150 225 300 m

SCALE	1:9,000
SHEET SIZE	A3 COLOUR
PROJECT/REPORT NAME	Flora, Vegetation and Black Cockatoo Habitat Assessment 1818 Lakes Road, North Dandalup
CLIENT	Harley Dykstra
COORDINATE REFERENCE SYSTEM	GDA2020 / MGA zone 50
PROJECT NUMBER	A25.034
VERSION	0
DATA SOURCE	NEARMAPS
DRAWN BY / REVIEWED BY	JP/JB
DATE	31/7/2025

Legend

- Survey Area
- Site Condition Score (Habitat Quality Score Tool)
  - Not Assessed
  - 0 - None
  - 1 - Negligible
  - 2 - Low
  - 3 - Low to Moderate
  - 7 - High

No	Description	Drawn	Approved	Date
A	Original issue	JP	JB	31/7/2025

NOTES:

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

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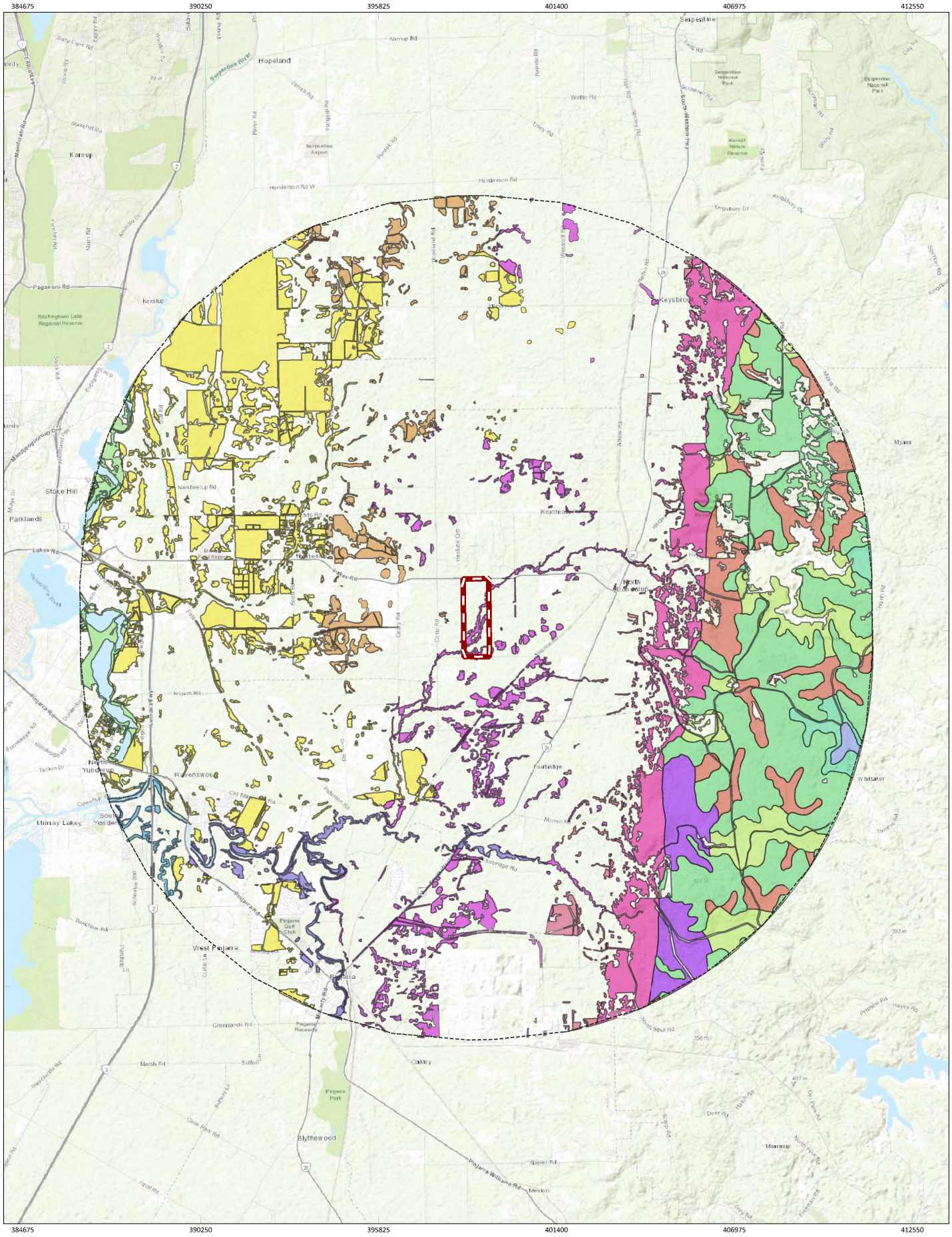

Figure 17: Black Cockatoo Foraging Habitat Extent 12 km Buffer

N

0 1 2 3 km

SCALE	1:111,500
SHEET SIZE	A3 COLOUR
PROJECT/REPORT NAME	Flora, Vegetation and Black Cockatoo Habitat Assessment 1818 Lakes Road, North Dandalup
CLIENT	Harley Dykstra
COORDINATE REFERENCE SYSTEM	GDA2020 / MGA zone 50
PROJECT NUMBER	A25.034
VERSION	0
DATA SOURCE	ESRI Topographic Map
DRAWN BY / REVIEWED BY	JP/JB
DATE	18/6/2025

Legend

- Survey Area
- 12km Buffer

Native Vegetation (DPIRD-005)
Intersect with Vegetation Complexes
(DBCA-046 and DBCA-047)

- Bassendean Complex-Central and South
- Darling Scarp, DS2
- Dwellingup, D1
- Forrestfield Complex
- Guildford Complex
- Helena 1, He1
- Herdsman Complex
- Murray 1, My1
- Southern River Complex
- Swamp, S
- Swan Complex
- Vasse Complex
- Yarragil 1, Yg1
- Yarragil 2, Yg2

No	Description	Drawn	Approved	Date
A	Original issue	JP	JB	18/6/2025

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

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5. Discussion

5.1 Flora of Conservation Significance

No conservation significant flora were recorded within the Survey Area. One Threatened flora, *Synaphea sp. Pinjarra R. Davis* 6578 (CR)(T), has previously been recorded within the Survey Area. This record is considered to be inaccurate as the locality description attribute does not match the data point locality and that the location has been cleared for over 50 years.

Post-survey assessments were completed for all species identified in the desktop likelihood of occurrence assessment, both within and outside the foreshore reserve. Species within the foreshore reserve that were assigned a high or medium likelihood of occurrence retained their classifications, as the survey was undertaken outside their flowering period. However, species outside of the foreshore reserve with an initial high or medium likelihood were reclassified to low due to the completely degraded vegetation condition, which makes their presence in the Survey Area unlikely.

5.2 Vegetation Significance

Four vegetation types were identified, with the majority of the Survey Area being cleared, degraded or in completely degraded condition.

Of the three TECs and PECs identified by the desktop assessment as having a high or medium likelihood of occurrence, none were identified as present within the Survey Area.

5.3 Fauna Habitat Significance

The three species that are identified as having a high likelihood of occurrence were:

- *Zanda baudinii* (Baudin's black cockatoo)—EN.
- *Zanda latirostris* (Carnaby's black cockatoo)—EN.
- *Calyptorhynchus banksii naso* (forest red-tailed black cockatoo)—VU.

The four species that had a medium likelihood of occurrence were:

- *Isoodon fusciventer (*quenda)—P4.
- *Notamacropus irma* (western brush wallaby)—P4.
- *Phascogale tapoatafu wambenger* (south-western brush-tailed phascogale)—CD.
- *Westralunio carteri (*Carter's freshwater mussel)—VU

Extant of core and supporting habitat present within the Survey Area by species is summarised in Table 28.

Table 28: Summary of Habitat Value

Species	Extent Core Habitat (ha)	Extent Supporting Habitat (ha)	Contained within Retained Foreshore Area (ha)
Zanda baudinii **(Baudin's black cockatoo)**	7.43	32.09	30.25 (supporting habitat)
Zanda latirostris **(Carnaby's black cockatoo)**	7.43	32.09	30.25 (supporting habitat)
Calyptorhynchus banksia naso **(Forest red-tailed black cockatoo)**	7.43	35.73	30.25 (supporting habitat)
Isoodon fusciventer **(Quenda)**	30.25	7.43	30.25 (core habitat)
Notamacropus irma **(Western brush wallaby)**	30.25	9.26	30.25 (core habitat)
Phascogale tapoatafu wambenger **(South-western brush-tailed phascogale)**	1.83	37.67	30.25 (supporting habitat)
Westralunio carteri **(Carter's Freshwater Mussel)**	-	30.25	30.25 (supporting habitat)

5.4 Black Cockatoos

Areas within the planned foreshore area have not been assessed in detail for the presence and extent of black cockatoo habitat due to the planned retention of the area and a particular focus on potential impacts of the project. Additional black cockatoo habitat is likely to be present within the retention area.

The Survey Area falls within the Swan Coastal Plain which is within the modelled distribution range of all three species of black cockatoos: Baudin's black cockatoo (*Zanda baudinii*), Carnaby's black cockatoo (*Zanda latirostris*), Forest red-tailed (*Calyptorhynchus banksii naso*) (DAWE, 2022). No known breeding sites are present within or immediately adjacent to the Survey Area. The nearest roost site is 3.6 km north-east and 4.5 km north (Object ID 127) outside of the Survey Areas (DBCA-064). No evidence of roosting was observed within the Survey Area.

One potential nest tree was recorded within the Survey Area.

Eight-hundred and fifty-two potential nesting trees were recorded within the Survey Area.

Nine fauna habitat types were described within the Survey Area. Habitats within the Survey Area that contain suitable foraging habitat are jarrah woodlands (FHT-01), open marri woodland (FHT-03), individual Banksias (FHT-04), planted *Eucalyptus spp*. (FHT-03) and planted *Allocasuarina spp*. (FHT-07). These habitats are characterised by foraging species for Baudin's, Carnaby's and forest red-tailed black cockatoo species including marri, jarrah, *Banksia attenuata, Banksia ilicifolia* and *Allocasuarina spp*. The remainder of the

Survey Area comprised cleared areas with scattered individual flooded gums and non-native *Eucalyptus spp*. which have low foraging habitat value.

Foraging habitat quality was rated using the Commonwealth Habitat Quality Scoring Tool (DCCEEW, n.d.). As per the Habitat Quality Scoring Tool areas with a site condition score of 2 or lower (low, negligible or none value) are "extremely unlikely to be considered as suitable habitat". These areas are therefore classified as not comprising suitable foraging habitat in this assessment. Foraging habitat quality extents within the Survey Area out of ten are:

- Baudin's black cockatoo: 7.43 ha (10/10), 1.84 ha (6/10), and 154.53 ha (Low 2 to None 0). Total of 9.27 ha of suitable foraging habitat and 154.53 ha of unsuitable foraging habitat.
- Carnaby's black cockatoo: 7.43 ha (10/10), 1.84 ha (6/10), and 154.53 ha (Low 2 to None 0). Total of 9.27 ha of suitable foraging habitat and 154.53 ha of unsuitable foraging habitat.
- Forest red-tailed black cockatoo: 9.26 ha (10/10), 3.65 ha (6/10), and 150.88 ha (Low 2 to None 0). Total of 12.91 ha of suitable foraging habitat and 150.88 ha of unsuitable foraging habitat.
- A total of 32.69 ha within the retained foreshore area was not allocated a foraging habitat quality score. It is recommended that this area will be assessed for the presence and extent of black cockatoo foraging species.

No evidence of roosting was recorded. Within the Survey Area, fauna habitat types FHT-01 and FHT-03 provides the most suitable roosting habitat as they contain medium and large stands of eucalypts with medium canopies. Access to permanent water is within the Survey Area from the North Dandalup River.

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Appendix A
Legislation

Environment Protection and Biodiversity Conservation Act 1999

The EPBC Act aims to protect matters of national environmental significance (MNES). Under the EPBC Act, the Commonwealth Department of Climate Change, Energy and the Environment lists Threatened species and communities in categories determined by criteria set out in the EPBC Act.

Projects likely to cause a significant impact on MNES should be referred to the DCCEEW for assessment under the EPBC Act.

Biodiversity Conservation Act 2016

The Biodiversity Conservation Act 2016 aims to conserve and protect biodiversity and biodiversity components within the State and to promote ecologically sustainable use of biodiversity components in the State.

Environmental Protection Act 1986

Declared Rare Flora (DRF) and Threatened Ecological Communities (TECs) are given special consideration in environmental impact assessments and have special status as Environmentally Sensitive Areas (ESAs) under the EP Act and the Environmental Protection (Clearing of Native Vegetation) Regulations 2004. Exemptions for a clearing permit do not apply in an ESA. In addition, habitat necessary for the maintenance of indigenous fauna is considered in the clearing principles and assessed during consideration of applications for a clearing permit.

Biosecurity and Agricultural Management Act 2007

Plants may be 'Declared' by the Minister for Agriculture and Food under the BAM Act. The Western Australian Organism List contains information on the area(s) in which a plant is declared and the control and keeping categories to which it has been assigned in Western Australia. A declaration may apply to the whole State, to districts, individual properties or even to single paddocks. If a plant is 'Declared', landholders are obliged to control that plant on their properties.

Weeds of National Significance

The Australian Government along with the State and Territory governments has endorsed 32 WoNS. Four major criteria were used in determining WoNS:

- The invasiveness of a weed species.
- A weed's impacts.
- The potential for spread of a weed.
- Socio-economic and environmental values.

Each WoNS has a national strategy and a national coordinator, responsible for implementing the strategy. WoNS are regarded as the worst weeds in Australia because of their invasiveness, potential for spread, and economic and environmental impacts.

Department of Biodiversity, Conservation and Attractions Priority Lists

DBCA lists 'Priority' flora and fauna that have not been assigned statutory protection as "Threatened" under the BC Act and are under consideration for declaration as Threatened. Flora and fauna assessed as Priority 1-3 are considered to be in urgent need of further survey. Priority 4 flora requires monitoring every 5 -10 years.

DBCA maintains a list of Priority Ecological Communities (PECs) which identifies plant communities that require further investigation before possible nomination for TEC status. Once listed, a community becomes a PEC and, when endorsed by the WA Minister for Environment, becomes a TEC and protected as an ESA under Environmental Protection (Clearing of Native Vegetation) Regulations 2004.

Informal Recognition of Flora and Fauna

Certain populations or communities of flora and/or fauna may be of local significance or interest because of their patterns of distribution and abundance. For example, specific locations of flora and may be locally significant because they are range extensions to the previously known distribution, or are newly discovered taxa (and have the potential to be of more than local significance). In addition, many species are in decline as a result of threatening processes (land clearing, grazing, and changed fire regimes) and relict populations of such species assume local importance for DBCA. It is not uncommon for DBCA to make comment on these species of interest.

Appendix B
Definition and Criteria

EPBC Act Categories for Flora, Fauna and Ecological Communities

Category	Threatened Species	Threatened Ecological Communities
Extinct	A native species is eligible to be included in the extinct category at a particular time if, at that time, there is no reasonable doubt that the last member of the species has died.	N/A.
Extinct in the wild	A native species is eligible to be included in the extinct in the wild category at a particular time if, at that time: (a) it is known only to survive in cultivation, in captivity or as a naturalised population well outside its past range; or (b) it has not been recorded in its known and/or expected habitat, at appropriate seasons, anywhere in its past range, despite exhaustive surveys over a time frame appropriate to its life cycle and form.	N/A.
Critically Endangered (CE)	A native species is eligible to be included in the critically endangered category at a particular time if, at that time, it is facing an extremely high risk of extinction in the wild in the immediate future, as determined in accordance with the prescribed criteria.	An ecological community is eligible to be included in the critically endangered category at a particular time if, at that time, it is facing an extremely high risk of extinction in the wild in the immediate future, as determined in accordance with the prescribed criteria.
Endangered (EN)	A native species is eligible to be included in the endangered category at a particular time if, at that time: (a) it is not critically endangered; and (b) it is facing a very high risk of extinction in the wild in the near future, as determined in accordance with the prescribed criteria.	An ecological community is eligible to be included in the endangered category at a particular time if, at that time: (a) it is not critically endangered; and (b) it is facing a very high risk of extinction in the wild in the near future, as determined in accordance with the prescribed criteria.
Vulnerable (VU)	A native species is eligible to be included in the vulnerable category at a particular time if, at that time: (a) it is not critically endangered or endangered; and (b) it is facing a high risk of extinction in the wild in the medium term future, as determined in accordance with the prescribed criteria.	An ecological community is eligible to be included in the vulnerable category at a particular time if, at that time: (a) it is not critically endangered or endangered; and (b) it is facing a high risk of extinction in the wild in the medium term future, as determined in accordance with the prescribed criteria.
Conservation Dependent	A native species is eligible to be included in the conservation dependent category at a particular time if, at that time: (a) the species is the focus of a specific conservation program the cessation of which would result in the species becoming vulnerable, endangered or critically endangered; or (b) the following subparagraphs are satisfied: (i) the species is a species of fish.	N/A.

Category	Threatened Species	Threatened Ecological Communities
	(ii) the species is the focus of a plan of management that provides for management actions necessary to stop the decline of, and support the recovery of, the species so that its chances of long-term survival in nature are maximised. (iii) the plan of management is in force under a law of the Commonwealth or of a State or Territory. (iv) cessation of the plan of management would adversely affect the conservation status of the species.	

Conservation Codes for Western Australian Flora and Fauna (DBCA)

Conservation Codes for Western Australian Flora and Fauna	
Threatened, Extinct and Specially Protected fauna or flora1 are species2 which have been adequately searched for and are deemed to be, in the wild, Threatened, extinct or in need of special protection, and have been gazetted as such. **The Wildlife Conservation (Specially Protected Fauna) Notice 2018 and the Wildlife Conservation (Rare Flora) Notice 2018 have been transitioned under regulations 170, 171 and 172 of the Biodiversity Conservation Regulations 2018 to be the lists of Threatened, Extinct and Specially Protected species under Part 2 of the Biodiversity Conservation Act 2016.** **Categories of Threatened, Extinct and Specially Protected fauna and flora are:**	
T	Threatened species Listed by order of the Minister as Threatened in the category of critically endangered, endangered or vulnerable under section 19(1), or is a rediscovered species to be regarded as Threatened species under section 26(2) of the Biodiversity Conservation Act 2016 (BC Act). Threatened fauna is that subset of 'Specially Protected Fauna' listed under schedules 1 to 3 of the Wildlife Conservation (Specially Protected Fauna) Notice 2018 for Threatened Fauna. Threatened flora is that subset of 'Rare Flora' listed under schedules 1 to 3 of the Wildlife Conservation (Rare Flora) Notice 2018 for Threatened Flora. The assessment of the conservation status of these species is based on their national extent and ranked according to their level of threat using International Union for Conservation of Nature (IUCN) Red List categories and criteria as detailed below.
CR	Critically endangered species Threatened species considered to be "facing an extremely high risk of extinction in the wild in the immediate future, as determined in accordance with criteria set out in the ministerial guidelines". Listed as critically endangered undersection 19(1)(a) of the BC Act in accordance with the criteria set out in section 20 and the ministerial guidelines. Published under schedule 1 of the Wildlife Conservation (Specially Protected Fauna) Notice 2018 for critically endangered fauna or the Wildlife Conservation (Rare Flora) Notice 2018 for critically endangered flora.
EN	Endangered species Threatened species considered to be "facing a very high risk of extinction in the wild in the near future, as determined in accordance with criteria set out in the ministerial guidelines". Listed as endangered under section 19(1)(b) of the BC Act in accordance with the criteria set out in section 21 and the ministerial guidelines. Published under schedule 2 of the Wildlife Conservation

Conservation Codes for Western Australian Flora and Fauna	
	(Specially Protected Fauna) Notice 2018 for endangered fauna or the Wildlife Conservation (Rare Flora) Notice 2018 for endangered flora.
VU	Vulnerable species Threatened species considered to be "facing a high risk of extinction in the wild in the medium-term future, as determined in accordance with criteria set out in the ministerial guidelines". Listed as vulnerable undersection 19(1)(c) of the BC Act in accordance with the criteria set out in section 22 and the ministerial guidelines. Published under schedule 3 of the Wildlife Conservation (Specially Protected Fauna) Notice 2018 for vulnerable fauna or the Wildlife Conservation (Rare Flora) Notice 2018 for vulnerable flora.
Extinct species **Listed by order of the Minister as extinct under section 23(1) of the BC Act as extinct or extinct in the wild.**	
EX	Extinct species Species where "there is no reasonable doubt that the last member of the species has died", and listing is otherwise in accordance with the ministerial guidelines (section 24 of the BC Act). Published as presumed extinct under schedule 4 of the Wildlife Conservation (Specially Protected Fauna) Notice 2018 for extinct fauna or the Wildlife Conservation (Rare Flora) Notice 2018 for extinct flora.
EW	Extinct in the wild species Species that "is known only to survive in cultivation, in captivity or as a naturalised population well outside its past range; and it has not been recorded in its known habitat or expected habitat, at appropriate seasons, anywhere in its past range, despite surveys over a time frame appropriate to its life cycle and form", and listing is otherwise in accordance with the ministerial guidelines (section 25 of the BC Act). Currently there are no Threatened fauna or Threatened flora species listed as extinct in the wild. If listing of a species as extinct in the wild occurs, then a schedule will be added to the applicable notice.
Specially protected species **Listed by order of the Minister as specially protected under section 13(1) of the BC Act. Meeting one or more of the following categories: species of special conservation interest; migratory species; cetaceans; species subject to international agreement; or species otherwise in need of special protection.** **Species that are listed as Threatened species (critically endangered, endangered or vulnerable) or extinct species under the BC Act cannot also be listed as Specially Protected species.**	
MI	Migratory species Fauna that periodically or occasionally visit Australia or an external Territory or the exclusive economic zone; or the species is subject of an international agreement that relates to the protection of migratory species and that binds the Commonwealth; and listing is otherwise in accordance with the ministerial guidelines (section 15 of the BC Act). Includes birds that are subject to an agreement between the government of Australia and the governments of Japan (JAMBA), China (CAMBA) and The Republic of Korea (ROKAMBA), and fauna subject to the Convention on the Conservation of Migratory Species of Wild Animals (Bonn Convention), an environmental treaty under the United Nations Environment Program. Migratory species listed under the BC Act are a subset of the migratory animals that are known to visit Western Australia, protected under the international agreements or treaties, excluding species that are listed as Threatened species. Published as migratory birds protected under an international agreement under schedule 5 of the Wildlife Conservation (Specially Protected Fauna) Notice 2018.
CD	Species of special conservation interest (conservation dependent fauna)

Conservation Codes for Western Australian Flora and Fauna	
	Fauna of special conservation need being species dependent on ongoing conservation intervention to prevent it becoming eligible for listing as Threatened, and listing is otherwise in accordance with the ministerial guidelines (section 14 of the BC Act). Published as conservation dependent fauna under schedule 6 of the Wildlife Conservation (Specially Protected Fauna) Notice 2018.
OS	Other specially protected species Fauna otherwise in need of special protection to ensure their conservation, and listing is otherwise in accordance with the ministerial guidelines (section 18 of the BC Act). Published as other specially protected fauna under schedule 7 of the Wildlife Conservation (Specially Protected Fauna) Notice 2018.
P	Priority species Possibly Threatened species that do not meet survey criteria, or are otherwise data deficient, are added to the Priority Fauna or Priority Flora Lists under Priorities 1, 2 or 3. These three categories are ranked in order of Priority for survey and evaluation of conservation status so that consideration can be given to their declaration as Threatened fauna or flora. Species that are adequately known, are rare but not Threatened, or meet criteria for near Threatened, or that have been recently removed from the Threatened species or other specially protected fauna lists for other than taxonomic reasons, are placed in Priority 4. These species require regular monitoring. Assessment of Priority codes is based on the Western Australian distribution of the species, unless the distribution in WA is part of a contiguous population extending into adjacent States, as defined by the known spread of locations.
1	Priority 1: Poorly-known species Species that are known from one or a few locations (generally five or less) which are potentially at risk. All occurrences are either: very small; or on lands not managed for conservation, e.g. agricultural or pastoral lands, urban areas, road and rail reserves, gravel reserves and active mineral leases; or otherwise under threat of habitat destruction or degradation. Species may be included if they are comparatively well known from one or more locations but do not meet adequacy of survey requirements and appear to be under immediate threat from known threatening processes. Such species are in urgent need of further survey.
2	Priority 2: Poorly-known species Species that are known from one or a few locations (generally five or less), some of which are on lands managed primarily for nature conservation, e.g. national parks, conservation parks, nature reserves and other lands with secure tenure being managed for conservation. Species may be included if they are comparatively well known from one or more locations but do not meet adequacy of survey requirements and appear to be under threat from known threatening processes. Such species are in urgent need of further survey.
3	Priority 3: Poorly-known species Species that are known from several locations, and the species does not appear to be under imminent threat, or from few but widespread locations with either large population size or significant remaining areas of apparently suitable habitat, much of it not under imminent threat. Species may be included if they are comparatively well known from several locations but do not meet adequacy of survey requirements and known threatening processes exist that could affect them. Such species are in need of further survey.
4	Priority 4: Rare, Near Threatened and other species in need of monitoring (a) Rare. Species that are considered to have been adequately surveyed, or for which sufficient knowledge is available, and that are considered not currently Threatened or in need of special

Conservation Codes for Western Australian Flora and Fauna	
	protection but could be if present circumstances change. These species are usually represented on conservation lands. (b) Near Threatened. Species that are considered to have been adequately surveyed and that are close to qualifying for vulnerable but are not listed as Conservation Dependent. (c) Species that have been removed from the list of Threatened species during the past five years for reasons other than taxonomy.

1 The definition of flora includes algae, fungi and lichens.

DBCA Definitions and Criteria for TECs and PECs

Criteria	Definition
Threatened Ecological Communities	
Presumed Totally Destroyed (PD)	An ecological community that has been adequately searched for but for which no representative occurrences have been located. The community has been found to be totally destroyed or so extensively modified throughout its range that no occurrence of it is likely to recover its species composition and/or structure in the foreseeable future. An ecological community will be listed as presumed totally destroyed if there are no recent records of the community being extant and either of the following applies (A or B): A. Records within the last 50 years have not been confirmed despite thorough searches of known or likely habitats or B. All occurrences recorded within the last 50 years have since been destroyed.
Critically Endangered (CR)	An ecological community that has been adequately surveyed and found to have been subject to a major contraction in area and/or that was originally of limited distribution and is facing severe modification or destruction throughout its range in the immediate future, or is already severely degraded throughout its range but capable of being substantially restored or rehabilitated. An ecological community will be listed as Critically Endangered when it has been adequately surveyed and is found to be facing an extremely high risk of total destruction in the immediate future. This will be determined on the basis of the best available information, by it meeting any one or more of the following criteria (A, B or C): A. The estimated geographic range, and/or total area occupied, and/or number of discrete occurrences since European settlement have been reduced by at least 90% and either or both of the following apply (i or ii): i. geographic range, and/or total area occupied and/or number of discrete occurrences are continuing to decline such that total destruction of the community is imminent (within approximately 10 years). ii. modification throughout its range is continuing such that in the immediate future (within approximately 10 years) the community is unlikely to be capable of being substantially rehabilitated. B. Current distribution is limited, and one or more of the following apply (i, ii or iii): i. geographic range and/or number of discrete occurrences, and/or area occupied is highly restricted and the community is currently subject to known threatening processes which are likely to result in total destruction throughout its range in the immediate future (within approximately 10 years). ii. there are very few occurrences, each of which is small and/or isolated and extremely vulnerable to known threatening processes.

Criteria	Definition
	iii. there may be many occurrences but total area is very small and each occurrence is small and/or isolated and extremely vulnerable to known threatening processes. C. The ecological community exists only as highly modified occurrences that may be capable of being rehabilitated if such work begins in the immediate future (within approximately 10 years).
Endangered (EN)	An ecological community that has been adequately surveyed and found to have been subject to a major contraction in area and/or was originally of limited distribution and is in danger of significant modification throughout its range or severe modification or destruction over most of its range in the near future. An ecological community will be listed as Endangered when it has been adequately surveyed and is not Critically Endangered but is facing a very high risk of total destruction in the near future. This will be determined on the basis of the best available information by it meeting any one or more of the following criteria (A, B, or C): A. The geographic range, and/or total area occupied, and/or number of discrete occurrences have been reduced by at least 70% since European settlement and either or both of the following apply (i or ii): i. the estimated geographic range, and/or total area occupied and/or number of discrete occurrences are continuing to decline such that total destruction of the community is likely in the short term future (within approximately 20 years). ii. modification throughout its range is continuing such that in the short term future (within approximately 20 years) the community is unlikely to be capable of being substantially restored or rehabilitated. B. Current distribution is limited, and one or more of the following apply (i, ii or iii): i. geographic range and/or number of discrete occurrences, and/or area occupied is highly restricted and the community is currently subject to known threatening processes which are likely to result in total destruction throughout its range in the short term future (within approximately 20 years). ii. there are few occurrences, each of which is small and/or isolated and all or most occurrences are very vulnerable to known threatening processes. iii. there may be many occurrences but total area is small and all or most occurrences are small and/or isolated and very vulnerable to known threatening processes. The ecological community exists only as very modified occurrences that may be capable of being substantially restored or rehabilitated if such work begins in the short-term future (within approximately 20 years).
Vulnerable (VU)	An ecological community that has been adequately surveyed and is found to be declining and/or has declined in distribution and/or condition and whose ultimate security has not yet been assured and/or a community that is still widespread but is believed likely to move into a category of higher threat in the near future if threatening processes continue or begin operating throughout its range. An ecological community will be listed as Vulnerable when it has been adequately surveyed and is not Critically Endangered or Endangered but is facing a high risk of total destruction or significant modification in the medium to long-term future. This will be determined on the basis of the best available information by it meeting any one or more of the following criteria (A, B or C): A. The ecological community exists largely as modified occurrences that are likely to be capable of being substantially restored or rehabilitated.

Criteria	Definition
	B. The ecological community may already be modified and would be vulnerable to threatening processes, is restricted in area and/or range and/or is only found at a few locations. C. The ecological community may be still widespread but is believed likely to move into a category of higher threat in the medium to long term future because of existing or impending threatening processes.
Priority Ecological Communities	
Priority One	Poorly known ecological communities Ecological communities with apparently few, small occurrences, all or most not actively managed for conservation (e.g. within agricultural or pastoral lands, urban areas, active mineral leases) and for which current threats exist. Communities may be included if they are comparatively well-known from one or more localities but do not meet adequacy of survey requirements, and/or are not well defined, and appear to be under immediate threat from known threatening processes across their range.
Priority Two	Poorly known ecological communities Communities that are known from few small occurrences, all or most of which are actively managed for conservation (e.g. within national parks, conservation parks, nature reserves, state forest, unallocated Crown land, water reserves, etc.) and not under imminent threat of destruction or degradation. Communities may be included if they are comparatively well known from one or more localities, but do not meet adequacy of survey requirements, and/or are not well defined, and appear to be under threat from known threatening processes.
Priority Three	Poorly known ecological communities i. Communities that are known from several to many occurrences, a significant number or area of which are not under threat of habitat destruction or degradation or. ii. Communities known from a few widespread occurrences, which are either large or within significant remaining areas of habitat in which other occurrences may occur, much of it not under imminent threat, or. iii. Communities made up of large, and/or widespread occurrences, that may or may not be represented in the reserve system, but are under threat of modification across much of their range from processes such as grazing by domestic and/or feral stock, and inappropriate fire regimes. Communities may be included if they are comparatively well known from several localities, but do not meet adequacy of survey requirements and / or are not well defined, and known threatening processes exist that could affect them.
Priority Four	Ecological communities that are adequately known, rare but not Threatened or meet criteria for Near Threatened, or that have been recently removed from the Threatened list. These communities require regular monitoring. i. Rare. Ecological communities known from few occurrences that are considered to have been adequately surveyed, or for which sufficient knowledge is available, and that are considered not currently Threatened or in need of special protection, but could be if present circumstances change These communities are usually represented on conservation lands. ii. Near Threatened. Ecological communities that are considered to have been adequately surveyed and that do not qualify for Conservation Dependent, but that are close to qualifying for Vulnerable.

Criteria	Definition
	iii. Ecological communities that have been removed from the list of Threatened communities during the past five years.
Priority Five	Conservation Dependent Ecological Communities Ecological Communities that are not Threatened but are subject to a specific conservation program, the cessation of which would result in the community becoming Threatened within five years.

Appendix C
Desktop Assessment and Likelihood of Occurrence Flora

Species	Conservation Status		Source		Species information		Habitat Occurs Within the Survey Area	Likelihood of Occurrence
	State	Federal	PMST	DBCA	Flowering Period	Preferred Habitat		
Caladenia huegelii	CR	EN	x		Aug to Oct	Grey or brown sand, clay loam.	Yes	Low - Site is partially mapped as grey sands, however no recent or historic records within 10 km.
Drakaea elastica	CR	EN	x	x	Oct to Nov	White or grey sand. Low-lying situations adjoining winter-wet swamps	Yes	Medium - Site is mapped as a suitable soil type, including grey and white sands, includes low lying areas associated with a river and wetlands. Recent record within 10 km of the Site.
Lasiopetalum pterocarpum	CR	EN	x		Aug	Dark red-brown loam or clayey sand over granite. On sloping banks near creeklines.	Unlikely	Low - soil type mapped across the Site is unlikely to be suitable, however a river is located within the area. No records within 10 km.
Synaphea sp. Fairbridge Farm (D. Papenfus 696)	CR	CR	x	x	Oct	Sandy with lateritic pebbles. Near winter-wet flats, in low woodland with weedy grasses.	Potentially	High - the Site is mapped as sandy, however not lateritic. Contains low lying wet areas and flats. Multiple recent records within 2 km of the Site.
Synaphea sp. Pinjarra (R. Davis 6578)	CR	CR	x	x	Sep	White, grey clayey sand on the edges of seasonally inundated	Yes	High - the Site contains suitable habitat, given it is mapped as pale or grey sands over clay, and within a low-lying wetland and floodplain. Species was recorded in 2003 within the Site. Multiple records of the species within 2 km of the Site.

Species	Conservation Status		Source		Species information		Habitat Occurs Within the Survey Area	Likelihood of Occurrence
	State	Federal	PMST	DBCA	Flowering Period	Preferred Habitat		
Diuris drummondii	EN	VU	x	x	Nov to Dec or Jan	Low-lying depressions, swamps.	Yes	Medium - Site contains suitable habitat, including low lying areas and almost entirely mapped as a wetland. Recent record within 10 km of the Site.
Diuris purdiei	EN	EN	x	x	Sep to Oct	Grey-black sand, moist. Winter-wet swamps.	Yes	Low - Site is mapped as a suitable soil type, and contains wetlands. Only historic records wihin 10 km of the Site.
Drakaea micrantha	EN	VU	x		Sep to Oct	White-grey sand.	Yes	Low - Site is mapped as a suitable soil type, including grey and white sands. No records within 10 km.
Synaphea sp. Pinjarra Plain (A.S. George 17182)	EN	EN	x	x	Oct	Grey sandy loam or clay, grey-brown clayey sand, brown clayey loam, laterite. Flats, seasonally wet areas, railroad reserves often with wet depressions or drains.	Yes	High - Site is mapped as a suitable soil type, including grey sandy loam, and includes mapped wetlands and inundation areas. Multiple records within 2 km of the Site.
Synaphea stenoloba	EN	EN	x	x	Aug to Oct	Sandy or sandy clay soils. Winter-wet flats, granite.	Yes	Medium - Site is mapped as suitable soil type, including grey sandy loam and contains mapped wetlands and low lying wet areas. Multiple recent records within 5 km of the Site.
Anthocercis gracilis	VU	VU	x	x	Sep to Oct, Apr	Sandy or loamy soils. Granite outcrops.	Potentially	Low - Site potentially contains suitable soil type, however mapping does not indicate presence of

Species	Conservation Status		Source		Species information		Habitat Occurs Within the Survey Area	Likelihood of Occurrence
	State	Federal	PMST	DBCA	Flowering Period	Preferred Habitat		
								granite outcrops. Recent record within 10 km of the Site.
Diuris micrantha	VU	VU	x		Sep to Oct	Brown loamy clay. Winter-wet swamps, in shallow water.	Potentially	Low - Site is not mapped as a suitable soil type, however contains wetlands and shallow water in low lying areas. No records within 10 km.
Morelotia australiensis	VU	VU	x	x	Dec	Grey sand over clay; also described as yellow and sandy or clayey lateritic soils. Winter-wet swampy depressions, drainage lines or rises surrounding swamps. Open forest or woodland over low shrubs, herbs and sedges.	Yes	High - the Site is mapped as grey sand and yellow duplex in sections. Partly mapped as a wetland. Recent record within 2 km of the Site.
Acacia lasiocarpa var. bracteolata long peduncle variant (G.J. Keighery 5026)	P1	-		x	May or Aug	Grey or black sand over clay. Swampy areas, winter wet lowlands.	Likely	Medium - Site is mapped as grey and clayey sands. Mapped floodplain and low lying areas. Recent record within 10 km of the Site.
Hibbertia acrotoma	P1	-		x	Aug to Sep	Northern Jarrah Forest, Perth, Southern Jarrah Forest IBRA subregions	Potentially	Low - limited information available on habitat type, only historic record exists within 10 km.
Stachystemon exilis	P1	-		x	Oct to Nov	Currently known from three disjunct localities in the Swan Coastal Plain	Potentially	Low - the Site may contian suitable habitat, given the proximity of mapped Banksia woodland to the area. Historic record within 10 km of the Site.

Species	Conservation Status		Source		Species information		Habitat Occurs Within the Survey Area	Likelihood of Occurrence
	State	Federal	PMST	DBCA	Flowering Period	Preferred Habitat		
Acacia benthamii	P2	-		x	Aug to Sep	Sand. Typically on limestone breakaways.	Potentially	Medium - Site is mapped as sandy, and a recent record exists within 5 km of the Site
Grevillea ornithopoda	P2	-		x	Sep to Oct	South-west Botanical Province, in the Swan Coastal Plain or Jarrah Forest IBRA subregion	Potentially	Medium - limited information available on habitat type, however recent record exists within 10 km of the Site.
Johnsonia pubescens subsp. cygnorum	P2	-		x	Sep	Grey-white-yellow sand. Flats, seasonally-wet sites.	Yes	Medium - Site is mapped as a suitable soil type, including grey, yellow and white sands, includes low lying areas associated with a river and wetlands. Recent record within 10 km of the Site.
Leucopogon sp. Busselton (D. Cooper 243)	P2	-		x	Aug to Sep	Perth IBRA subregion	Potentially	High - Little information available on habitat, however has been recorded within the bioregion. Recent record within 2 km of the Site.
Acacia horridula	P3	-		x	May to Aug	Gravelly soils over granite, sand. Rocky hillsides.	Unlikely	Low - Site is unlikely to contain suitable habitat, however is mapped as sandy. Only historic records within 10 km of the Site.
Boronia capitata subsp. gracilis	P3	-		x	Jun to Nov	White/grey or black sand. Winter-wet swamps, hillslopes.	Yes	Medium - Site is partially mapped as grey or bleached sands. Contains a mapped river and wetland. Recent record within 10 km.

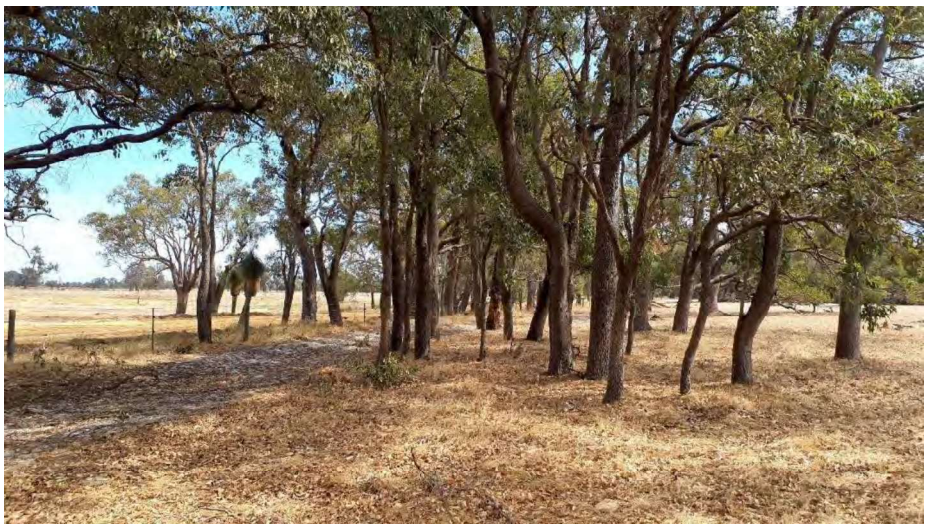
Species	Conservation Status		Source		Species information		Habitat Occurs Within the Survey Area	Likelihood of Occurrence
	State	Federal	PMST	DBCA	Flowering Period	Preferred Habitat		
Cyathochaeta teretifolia	P3	-		x	Dec	Grey sand, sandy clay. Swamps, creek edges.	Yes	Low - Site contains suitable habitat, including grey sands and sand over clay, a river and mapped wetland. Historic records only within 10 km.
Myriophyllum echinatum	P3	EN		x	Oct to Nov	Clay. Winter-wet flats.	Potentially	Medium - the Site contains a mapped wetland, and low lying wet areas. A recent record exists within 5 km.
Schoenus pennisetis	P3	-		x	Aug to Sep	Grey or peaty sand, sandy clay. Swamps, winter-wet depressions.	Yes	Medium - Site is mapped as a suitable soil type, and includes low lying areas and wetlands. Recent record within 5 km.
Stackhousia sp. Red-blotched corolla (A. Markey 911)	P3	-		x		Katanning, Lesueur Sandplain, Northern Jarrah Forest IBRA subregions.	Potentially	Low - limited information available on habitat type, only historic record exists within 10 km.
Styphelia filifolia	P3	-		x	Mar and May	Occurs sporadically from north of Eneabba to the Harvey area in	Yes	Medium - Site is mapped as sandy soils on low lyinh areas, and likely contains remnant woodland. Recent record within 5 km.
Acacia oncinophylla subsp. patulifolia	P4	-		x	Aug to Nov or Nov to Dec	Granitic soils, occasionally on laterite.	Unlikely	Low - Site does not contain suitable landscape or soil type. Historic record only, within 5 km.
Aponogeton hexatepalus	P4	-		x	Aug to Sep	Mud. Freshwater: ponds, rivers, claypans.	Yes	Low - Site contains a mapped river, however no recent records, only historic within 5 km.

Species	Conservation Status		Source		Species information		Habitat Occurs Within the Survey Area	Likelihood of Occurrence
	State	Federal	PMST	DBCA	Flowering Period	Preferred Habitat		
Caladenia speciosa	P4	-		x	Sep to Oct	White, grey or black sand.	Yes	Low - Site is mapped as suitable habitat, including white and grey sands. Historic records only, within 10 km of the Site.
Calothamnus graniticus subsp. leptophyllus	P4	-		x	Jun to Aug	Clay over granite, lateritic soils. Hillsides.	Unlikely	Low - the Site is unlikely to contain suitable habitat, alluvial and low lying. Historic records only, within 10 km of the Site.
Cyanothamnus tenuis	P4	-		x	Aug to Dec	Laterite and granite in stony soils, on the Darling Scarp, Jarrah Forest and Swan Coastal Plain.	No	Low - the Site is unlikely to contain suitable habitat, alluvial and lacks granite. However a recent record exists within 10 km of the Site.
Eucalyptus rudis subsp. cratyantha	P4	-		x	Jul to Sep	Loam. Flats, hillsides.	Unlikely	Low - Site does is not mapped as loamy, however contains flat low lying areas. Historic records only within 10 km of the Site.
Microtis quadrata	P4	-		x	Jan and Dec	Coolgardie, Esperance Plains, Jarrah Forest, Swan Coastal Plain, Warren IBRA subregions	Potentially	Low - limited information available on habitat type, only historic record exists within 10 km.
Parsonsia diaphanophleba	P4	-		x	Jan to Feb or Apr to Jun or Sep	Alluvial soils. Along rivers.	Yes	Medium - the Site contains a mapped river, and is mapped as alluvial soils. A recent record exists within 10 km of the Site.

Species	Conservation Status		Source		Species information		Habitat Occurs Within the Survey Area	Likelihood of Occurrence
	State	Federal	PMST	DBCA	Flowering Period	Preferred Habitat		
Pimelea rara	P4	-		x	Jan	Lateritic soils.	No	Low - Site is mapped as alluvial, lacks lateritic soils. Historic record exists within 10 km.
Senecio leucoglossus	P4	-		x	Aug to Dec	Gravelly lateritic or granitic soils. Granite outcrops, slopes.	No	Low - Site does not contain suitable habitat and soil type. Historic record within 10 km of the Site.
Stylidium ireneae	P4	-		x	Oct to Nov	Sandy loam. Valleys near creek lines, woodland, often with Agonis.	Yes	Medium - Site contains potentially suitable habitat, including woodland near creek line, and mapped as sandy loam. Recent record within 5 km.
Stylidium longitubum	P4	-		x	Oct to Dec	Sandy clay, clay. Seasonal wetlands.	Potentially	Low - Site is mapped as sandy soils over clay, and contains wetlands. Historic record only, within 10 km.

Appendix D
Quadrat Data Sheet

Releve Number: Q01			
Date: 02/04/2025	Project Number: A25.034		
Collector: Daniel Rubick	Photo Number: JPEG_20250401051157532.jp		
Coordinates (GDA2020, MGA 50)	399189.71 mN	6399301.14 mN	
Slope	Flat		
Aspect	-		
Position	Lower slope		
Soil Texture	Sandy loam		
Soil Colour	Pale Grey		
Rock Type	Laterite		
Rock Cover	<1%		
Bare Ground	25-50%		
Litter	25-50%		
Surface Water	-		
Vegetation Condition	Degraded		
Weed Cover	60%		
Disturbance	Grazing		
Fire Age Years	>10		



NVIS

Species	Naturalised	Conservation code	Height	% Cover
Corymbia calophylla			18	70
Melaleuca preissiana			6	3
Eucalyptus marginata			15	3
Kingia australis			3	2
Nuytsia floribunda			7	3
Bromus diandrus	*		0.5	30
Ehrharta longiflora	*		1	30
Avena barbata	*		1	15
Briza maxima	*		0.5	5
Lepidosperma pubisquameum			1	3

Releve Number: Q01		
Lomandra caespitosa	0.2	1

Releve Number: Q02			
Date: 02/04/2025	Project Number: A25.034		
Collector: Daniel Rubick	Photo Number: JPEG_20250402060109677.jp		
Coordinates (GDA2020, MGA 50)	398935.00 mE	6399299.16 mN	
Slope	Flat		
Aspect	North		
Position	Mid slope		
Soil Texture	Sand		
Soil Colour	Pale Grey		
Rock Type	-		
Rock Cover	<1%		
Bare Ground	25-50%		
Litter	10-25%		
Surface Water	-		
Vegetation Condition	Completely Degraded		
Weed Cover	85%		
Disturbance	Grazing		
Fire Age Years	>10		

NVIS

Species	Naturalised	Conservation code	Height	% Cover
Eucalyptus marginata			22	60
Banksia attenuata			12	15
Allocasuarina fraseriana			10	10
Xanthorrhoea gracilis			1	1
Bromus diandrus	*		0.3	50
Hypochaeris glabra	*		0.1	10
Avena barbata	*		0.2	5
Ehrharta calycina	*		0.3	20
Vulpia myuros	*		0.1	3

Appendix E
Site x Species Matrix

Family	Full Taxon	Naturalised	Conservation code	Releve 1	Releve 2	Opportunistic
Amaranthaceae	*Alternanthera denticulata*			X		
Apocynaceae	*Gomphocarpus fruticosus*	*				X
Asparagaceae	*Lomandra caespitosa*				X	
Asteraceae	*Hypochaeris glabra*	*				X
Campanulaceae	*Lobelia anceps*			X		
Caryophyllaceae	*Corrigiola litoralis*	*		X		
Casuarinaceae	*Allocasuarina fraseriana*					X
Cyperaceae	*Cyathochaeta avenacea*			X		
Cyperaceae	*Lepidosperma pubisquameum*			X	X	
Cyperaceae	*Machaerina juncea*			X		
Dasypogonaceae	*Kingia australis*				X	
Fabaceae	*Acacia pulchella*			X		
Fabaceae	*Paraserianthes lophantha*			X		
Juncaceae	*Juncus pallidus*			X		
Loranthaceae	*Nuytsia floribunda*				X	
Lythraceae	*Lythrum hyssopifolia*			X		

Family	Full Taxon	Naturalised	Conservation code	Releve 1	Releve 2	Opportunistic
Myrtaceae	*Astartea scoparia*			X		
Myrtaceae	*Banksia menziesii*			X		
Myrtaceae	*Corymbia calophylla*				X	
Myrtaceae	*Eucalyptus marginata*				X	X
Myrtaceae	*Melaleuca preissiana*				X	
Myrtaceae	*Melaleuca rhaphiophylla*			X		
Myrtaceae	*Taxandria linearifolia*			X		
Myrtaceae	*Xylomelum occidentale*			X		
Poaceae	*Avena barbata*	*			X	X
Poaceae	*Briza maxima*	*			X	
Poaceae	*Bromus diandrus*	*			X	X
Poaceae	*Ehrharta calycina*	*				X
Poaceae	*Ehrharta longiflora*	*			X	
Poaceae	*Vulpia myuros*	*				X
Proteaceae	*Banksia attenuata*					X
Proteaceae	*Eucalyptus rudis*			X		

Family	Full Taxon	Naturalised	Conservation code	Releve 1	Releve 2	Opportunistic
Proteaceae	*Lomandra hermaphrodita*			X		
Xanthorrhoeaceae	*Xanthorrhoea gracilis*					X

Appendix F
Fauna Database Search Results and Likelihood of Occurrence

Scientific Name	Common Name	Conservation Status		Database		Habitat	Pre-survey LOOA	Post-survey LOOA	Justification
		WA	EPBC	PMST	DBCA				
Aves									
Zanda baudinii	Baudin's Cockatoo	EN	EN	x	x	Eucalypt forests, especially jarrah, marri and karri forest. The species is less frequently in woodlands of wandoo (E. wandoo), blackbutt (Eucalyptus patens), flooded gum (Eucalyptus rudis), yate (Eucalyptus cornuta), partly cleared farmlands and urban areas, including roadside trees and house gardens (Johnstone & Kirkby 2008). This cockatoo forages at all levels of the forest, from the canopy to the ground, often feeding in the understorey on proteaceous trees and shrubs, especially banksias, and in orchards (both in trees and on dropped or fallen fruit on the ground) (Johnstone & Kirkby 2008).	**High**	**High**	Suitable breeding and foraging habitat within the Survey Area. DBCA records <20 years, >5km east of the Survey Area in jarrah forest.
Zanda latirostris	Carnaby's Cockatoo	EN	EN	x	x	Uncleared or remnant native eucalypt woodlands, especially those that contain salmon gum and wandoo, and in shrubland or kwongan heathland dominated by hakea, dryandra, banksia and grevillea species. It also occurs in remnant patches of native vegetation on land otherwise cleared for agriculture (Saunders 1974b, 1979c, 1980, 1982, 1986). The species forages seasonally in pine plantations in areas that receive high rainfall, e.g. the Swan Coastal Plain (Davies 1966; Saunders 1974a; Sedgwick 1968, 1973) and around the Perth metropolitan area on both native and non-native plants, such as liquid amber. It also forages in forests containing marri, jarrah or karri (Nichols & Nichols 1984; Saunders 1980).	**High**	**High**	Suitable breeding and foraging habitat within the Survey Area. DBCA records <20 years, <5km north and east of the Survey Area in jarrah forest.
Actitis hypoleucos	Common Sandpiper	MI	MI	x	-	Previously recorded in estuaries and deltas of streams, banks farther upstream; around lakes, pools, billabongs, reservoirs, dams and claypans, and occasionally piers and jetties. The species generally forages in shallow water and on bare soft mud at the edges of wetlands.	Low	Low	No suitable habitat within the Survey Area, no DBCA records within 10km.

Scientific Name	Common Name	Conservation Status		Database		Habitat	Pre-survey LOOA	Post-survey LOOA	Justification
		WA	EPBC	PMST	DBCA				
						They sometimes venture into grassy areas adjoining wetlands (Higgins & Davies 1996).			
Botaurus poiciloptilus	Australasian Bittern	EN	EN	x	x	Occurs mainly in freshwater wetlands and, rarely, in estuaries or tidal wetlands. The species nests adjacent to relatively deep, densely vegetated freshwater swamps and pools, building its nests under dense cover over shallow water. The distribution in WA only occurs on the western coastal plain between Lancelin and Busselton, in the southern coastal region from Augusta to Albany.	Low	Low	No suitable habitat within the Survey Area, DBCA record is a collection specimen, not observation.
Calidris acuminata	Sharp-tailed Sandpiper	MI	VU & MI	x	x	Muddy edges of shallow fresh or brackish wetlands with inundated emergent sedges, grass, saltmarsh or low vegetation. Including lagoons, swamps, pools near the coast, dams, waterholes, swamps, saltpans and hypersaline salt lakes inland. They use flooded paddocks, sedgelands, and ephemeral wetlands but leaves when dried.	Low	Low	No suitable habitat within Survey Area. DBCA records are <20 years and >9km west towards the coast.
Calidris canutus	Red Knot	EN	VU & MI	x	-	Intertidal mudflats, sandflats and sandy beaches of sheltered coasts, in estuaries, bays, inlets, lagoons and harbours; sometimes on sandy ocean beaches or shallow pools on exposed wave-cut rock platforms or coral reefs. They are occasionally seen on terrestrial saline wetlands near the coast, such as lakes, lagoons, pools and pans, and recorded on sewage ponds and saltworks, but rarely use freshwater swamps. They rarely use inland lakes or swamps. The species does not breed in Australia.	Low	Low	No suitable habitat within the Survey Area, no DBCA records within 10km.
Calidris ferruginea	Curlew Sandpiper	CR	CR & MI	x	x	This species prefers habitats such as tidal mudflats, saltmarsh, salt fields, fresh, brackish or saline wetlands and sewerage ponds. Lagoons, mangroves, beaches, rocky shores, lakes, dams, floodwaters. This species breeds on offshore marine islands.	Low	Low	No suitable habitat within the Survey Area, DBCA records is <20 years old, >8km west towards the coast.

Scientific Name	Common Name	Conservation Status		Database		Habitat	Pre-survey LOOA	Post-survey LOOA	Justification
		WA	EPBC	PMST	DBCA				
Calidris melanotos	Pectoral Sandpiper	MI	MI	x	-	This species prefers shallow fresh to saline wetlands or wetlands that have open mudflats with low emerging vegetation. The species can be found at coastal lagoons, estuaries, bays, swamps, lakes, inundated grasslands, saltmarshes, river pools, creeks, floodplains and artificial wetlands. Sighting records suggest they can be found further inland. The species does not breed in Australia; they breed in Northern Russia and North America.	Low	Low	No suitable habitat within the Survey Area, no DBCA records within 10km.
Calidris ruficollis	Red-necked Stint	MI	MI	-	x	The Red-necked Stint is mostly found in coastal areas, including in sheltered inlets, bays, lagoons and estuaries with intertidal mudflats, often near spits, islets and banks and, sometimes, on protected sandy or coralline shores.	Low	Low	No suitable habitat within the Survey Area, DBCA record <20 years is >8.5 west of Survey Area.
Calidris subminuta	Long-toed Stint	MI	MI	-	x	This species prefers shallow freshwater or brackish wetlands including lakes, swamps, river floodplains, streams, lagoons and sewage ponds. The species is also fond of areas of muddy shoreline, growths of short grass, weeds, sedges, low or floating aquatic vegetation, reeds, rushes and occasionally stunted samphire. It has also been observed at open, less vegetated shores of larger lakes and ponds and is common on muddy frindges of drying ephemeral lakes and swamps.	Low	Low	No suitable habitat within Survey Area, DBCA record <20 years is >8.5km west of Survey Area.
Calyptorhynchus banksii naso	Forest red-tailed black cockatoos	VU	VU	x	x	Eucalypt forests, especially jarrah, marri and karri forest. The species is less frequently in woodlands of wandoo (E. wandoo), blackbutt (Eucalyptus patens), flooded gum (Eucalyptus rudis), yate (Eucalyptus cornuta), partly cleared farmlands and urban areas, including roadside trees and house gardens (Johnstone & Kirkby 2008). This cockatoo forages at all levels of the forest, from the canopy to the ground, often feeding in the understorey on proteaceous trees and shrubs, especially	**High**	**High**	Suitable foraging habitat within the Survey Area. Several DBCA records <20 years, some records <2km from Survey Area near drainage line.

Scientific Name	Common Name	Conservation Status		Database		Habitat	Pre-survey LOOA	Post-survey LOOA	Justification
		WA	EPBC	PMST	DBCA				
						banksias, and in orchards (both in trees and on dropped or fallen fruit on the ground) (Johnstone & Kirkby 2008).			
Charadrius leschenaultii	Greater Sand Plover	VU	VU & MI	x	-	The species is almost entirely coastal, inhabiting littoral and estuarine habitats. They mainly occur on sheltered sandy, shelly or muddy beaches with large intertidal mudflats or sandbanks, as well as sandy estuarine lagoons. The species does not breed in Australia.	Low	Low	No suitable habitat within the Survey Area, no DBCA records within 10km.
Diomedea amsterdamensis	Amsterdam Albatross	CR	EN & MI	x	-	Marine, pelagic seabird. It nests in open patchy vegetation (among tussocks, ferns or shrubs) near exposed ridges or hillocks (Weimerskirch et al. 1985). It sleeps and rests on ocean waters when not breeding (Marchant & Higgins 1990).	Low	Low	No suitable habitat within the Survey Area, no DBCA records within 10km.
Falco hypoleucos	Grey Falcon	VU	VU	x	-	The Grey Falcon is a wide roaming species and prefers habitats such as lightly treed inland plains, gibber deserts, sand ridges, pastoral lands, timbered watercourses. They are seldom in the driest deserts.	Low	Low	Based on known distribution, the Survey Area is unlikely used as foraging habitat. no DBCA data within 10km.
Hydroprogne caspia	Caspian Tern	MI	MI	-	x	Lives in burrows on low banks of rivers, lakes, wetlands, estuaries and even along the coast. Intact riparian vegetation and associated bank stability is critical to their survival.	Low	Low	No suitable habitat within Survey Area, DBCA is >30 years old, >5km west.
Leipoa ocellata	Malleefowl	VU	VU	x	x	Semi-arid to arid shrublands and low woodlands, especially those dominated by mallee and/or acacias. A sandy substrate and abundance of leaf litter are required for breeding	Low	Low	No suitable habitat within Survey Area to support breeding due to lack of ground level vegetation and leaf litter. DBCA

Scientific Name	Common Name	Conservation Status		Database		Habitat	Pre-survey LOOA	Post-survey LOOA	Justification
		WA	EPBC	PMST	DBCA				
									records >20 years old, >5km east in jarrah forest.
Motacilla cinerea	Grey Wagtail	MI	MI	x	-	The Grey Wagtail can be found in Australia near running water and in disused quarries. It is also found in sandy, rocky streams in escarpments and rainforests, sewage ponds, ploughed fields and airfields	Low	Low	No suitable habitat within the Survey Area. No DBCA records within 10km.
Numenius madagascariensis	Eastern Curlew	CR	CR & MI	x	-	Intertidal mudflats and sandflats, often with beds of seagrass, on sheltered coasts, especially estuaries, mangrove swamps, bays, harbours and lagoons.	Low	Low	No suitable habitat within the Survey Area. No DBCA records within 10km.
Oxyura australis	Blue-billed Duck	P4	-	-	x	Found in the temperate wetlands of the south-east and south-west parts of the continent. Wholly aquatic and is seldom seen on land.	Low	Low	No suitable habitat within Survey Area, foreshore area does not contain water year-round. DBCA records >30 years within wetlands.
Pachyptila turtur subantarctica	Fairy Prion	VU	VU	x	-	Marine islands, circumpolar distribution.	Low	Low	No suitable habitat within Survey Area, the species is marine dependent. No DBCA records within 10km of the Survey Area.
Pandion haliaetus	Osprey	MI	MI	x	x	Eastern Ospreys occur in littoral and coastal habitats and terrestrial wetlands of tropical and temperate Australia and offshore islands. They are mostly found in coastal areas but occasionally travel inland along major rivers, particularly in northern Australia (Johnstone & Storr 1998; Marchant & Higgins 1993; Olsen 1995). They require extensive areas of	Low	Low	No suitable habitat within Survey Area, the species is marine dependent. One DBCA records >30 years

Scientific Name	Common Name	Conservation Status		Database		Habitat	Pre-survey LOOA	Post-survey LOOA	Justification
		WA	EPBC	PMST	DBCA				
						open fresh, brackish or saline water for foraging. Inhabits all coastal regions of Australia.			old, >8km west of the Survey Area.
Rostratula australis	Australian Painted Snipe	EN	EN	x	-	The Australian Painted Snipe is usually found in shallow inland wetlands, either freshwater or brackish, that are either permanently or temporarily filled. Though some individuals are apparently resident in some areas, other individuals appear to be nomadic, temporarily occupying areas where suitable habitat exists (DCCEEW, 2023c).	Low	Low	No suitable habitat within the Survey Area. No DBCA records within 10km.
Sternula nereis nereis	Australian Fairy Tern	VU	VU	x	-	Sheltered sandy beaches, spits and banks above the high tide line and below vegetation. The subspecies has been found in embayments of a variety of habitats including offshore, estuarine or lacustrine (lake) islands, wetlands and mainland coastline (Higgins & Davies 1996; Lindsey 1986a). The bird roosts on beaches at night (Higgins & Davies 1996).	Low	Low	No suitable habitat within the Survey Area. No DBCA records within 10km.
Thalassarche steadi	White-capped Albatross	VU	VU & MI	x	-	Marine species and occurs in subantarctic and subtropical waters. In non-breeding season it enters inshore and offshore harbours and bays	Low	Low	No suitable habitat within the Survey Area. No DBCA records within 10km.
Tringa glareola	Wood Sandpiper	MI	MI	-	x	Well-vegetated, shallow, freshwater wetlands, such as swamps, billabongs, lakes, pools and waterholes. Occurs in all areas of national importance located in Western Australia.	Low	Low	No suitable habitat within the Survey Area. DBCA records >20 years old, >4km west.
Tringa nebularia	Common Greenshank	MI	EN & MI	x	x	Occurs in sheltered coastal habitats, typically with large mudflats and saltmarsh, mangroves or seagrass.	Low	Low	No suitable habitat within the Survey Area. Only historical DBCA records >20 years, >7km

Scientific Name	Common Name	Conservation Status		Database		Habitat	Pre-survey LOOA	Post-survey LOOA	Justification
		WA	EPBC	PMST	DBCA				
									southwest of the Survey Area.
Invertebrates									
Idiosoma sigillatum	Swan Coastal Plain shield-backed trapdoor spider	P3	-	-	x	Typically inhabits clay soils whereas the arid Midwest populations are associated with rocky habitats, primarily in positions with increased moisture retention properties like gullies and drainage lines on southern facing slopes. Leaf litter and twigs are extremely important to the species as it provides material for the burrows, reduced soil moisture loss and increased prey availability. The species avoids areas of dense leaf litter as juveniles are unable to dig their initial hole in such areas. Areas of lower grazing pressure may suport greater population abundance.	Medium	Low	Unlikely to have suitable habitat within Survey Area due to lack of ground leaf litter. DBCA records >40 years old, >9km south.
Westralunio carteri	Carter's Freshwater Mussel	VU	VU	-	x	Occurs in coastal freshwater rivers and lakes between Moore River in the north and the Waychinicup River in the south.Greatest abundance in slower flowing waters where sediments are stable and soft enough to allow the species to burrow (<10 cm depth).	Medium	Low	As the Survey Area does not include the conservation wetland, there is potentially suitable habitat within the Survey Area. DBCA record 5 km upstream of drainage line, <10 years old.
Mammals									

Scientific Name	Common Name	Conservation Status		Database		Habitat	Pre-survey LOOA	Post-survey LOOA	Justification
		WA	EPBC	PMST	DBCA				
Bettongia penicillata ogilbyi	Woylie	CR	EN	-	x	Current habitat includes tall eucalypt forest and woodland, dense myrtaceous shrubland, kwongan (proteaceous) or mallee heath. Current known distribution is within Perup forest, Tutanning Nature Reserve and Dryandra Woodland.	Low	Low	Unlikely to occur, locally extinct in the Swan Coastal Plain, last known record was in 1992, more than 30 years ago.
Dasyurus geoffroii	Chuditch	VU	VU	x	x	Dense forests, mallee shrublands, woodlands and desert. Most are found in varying densities throughout the jarrah forest and south coast of Western Australia.	Low	Low	No suitable habitat within the Survey Area, DBCA record is <20 years old and >8km east in dense forest.
Isoodon fusciventer	Quenda	P4	-	-	x	Scrubby, often swampy, vegetation with dense cover up to 1 m (3 ft 3 in) high, often feeds in adjacent forest and woodland that is burnt on a regular basis and in areas of pasture and cropland lying close to dense cover. Populations inhabiting Jarrah and Wandoo forests are usually associated with watercourses. Quenda will thrive in more open habitat subject to introduced predator control. On the Swan Coastal Plain, Quenda are often associated with wetlands	Medium	Medium	Potential supporting habitat within conservation wetland. Suitable supporting habitat within the Survey Area due to lack of ground cover vegetation. DBCA records <10 years old, 4km east.
Myrmecobius fasciatus	Numbat	EN	EN	x	x	Acacia aneura (mulga) woodland and sand plain and sand dune areas dominated by Triodia spp. (spinifex) hummock grassland in the arid zone (Friend et al., 1982; Burbidge et al., 1988) to eucalypt woodlands and forests in south-west Western Australia. Numbats seek overnight refuge in hollow logs, tree hollows and burrows, which provide protection from predators	Low	Low	No suitable habitat within the Survey Area due to lack of ground level vegetation and ground tree hollow. One DBCA record >30 years old, >8km west.

Scientific Name	Common Name	Conservation Status		Database		Habitat	Pre-survey LOOA	Post-survey LOOA	Justification
		WA	EPBC	PMST	DBCA				
Notamacropus irma	Western Brush Wallaby	P4	-	-	x	Open forest or woodland, particularly favouring open, seasonally wet flats with low grasses and open scrubby thickets. It is also found in some areas of mallee and heathland, and is uncommon in karri forest.	Medium	Medium	Some suitable supporting habitat within open woodlands of the Survey Area. Recent DBCA record <20 years old, >8km east within the Jarrah forest.
Phascogale tapoatafa wambenger	South-western brush-tailed phascogale	CD	-	-	x	In southwest Western Australia Brush-tailed Phascogale have been observed in dry sclerophyll forests and open woodlands that contain hollow-bearing trees. Records are less common in high rainfall areas.	Medium	Medium	Potential suitable habitat within woodlands with connective canopy and hollow bearing trees within the Survey Area. DBCA records <10 years old, >8km northwest of Survey Area.
Pseudocheirus occidentalis	Western Ringtail Possum	CR	CR	-	x	South-west of Western Australia, lives in coastal peppermint (Agonis flexuosa) woodlands and ludlow tuart (Eucalyptus gomphocephala) forests, where it mainly feeds on peppermint tree leaves.	Low	Low	No suitable habitat within Survey Area to support breeding and forage One DBCA records <10 years old, >5km north east.
Setonix brachyurus	Quokka	VU	VU	x	x	Dense riparian vegetation, heath and shrubland on the mainland coast and offshore islands.	Low	Low	No suitable habitat within the Survey Area. One DBCA record >20 years old, 3.7km east of Survey Area.

Scientific Name	Common Name	Conservation Status		Database		Habitat	Pre-survey LOOA	Post-survey LOOA	Justification
		WA	EPBC	PMST	DBCA				
Reptile									
Ctenotus delli	Dell's skink	P4	-	-	x	Combination of rocky outcrops, dense vegetation, open areas. Open woodlands, heathlands and shrublands.	Low	Low	No suitable habitat within the Survey Area, DBCA record is >30 years old and >6.8km east in dense forest.

Appendix G
Black cockatoo Potential Breeding Tree Data

Tree Number	Taxon Name	Class Bamford	DBH	Hollow Comment	Easting	Northing
1	Marri	5	65	None	399179.7	6401716
2	Eucalyptus	5	90	None	399189.4	6401485
3	Eucalyptus	5	100	None	399125.8	6401509
4	Jarrah	5	60	None	399042.2	6399317
5	Jarrah	5	55	None	399035.3	6399315
6	Jarrah	5	55	None	399031.3	6399317
7	Jarrah	5	75	None	399041.9	6399306
8	Jarrah	5	50	None	399035.3	6399306
9	Jarrah	5	100	None	399027.5	6399307
10	Marri	5	75	None	399131.3	6399292
11	Marri	5	60	None	399166.4	6399288
12	Marri	5	50	None	399166.2	6399293
13	Dead	5	150	Short dead tree, hollow centre, habitat for other species	399181.1	6399307
14	Marri	5	90	None	399183.5	6399284
15	Marri	5	50	None	399191	6399296
16	Marri	5	50	None	399201.3	6399297
17	Marri	4	50	Low chimney, 5m up, not wide enough	399231.1	6399313
18	Jarrah	4	100	Small eye level hollow, good for other fauna	399002.8	6399300
19	Jarrah	5	100	None	398998.3	6399323
20	Jarrah	5	50	None	398999.3	6399338
21	Jarrah	5	55	None	399011.6	6399327
22	Jarrah	5	60	None	399019	6399330
23	Jarrah	5	100	None	399023.4	6399340
24	Jarrah	5	50	None	399029.7	6399346
25	Jarrah	5	50	None	399022.2	6399350
26	Marri	5	75	None	399038.3	6399367
27	Marri	5	60	None	399041.3	6399376

28	Dead	4	60	Small racks and hollows	399053.6	6399390
29	Dead	4	60	Small racks and hollows	399051.9	6399391
30	Marri	5	60	None	399041.1	6399395
31	Marri	5	100	None	399043.4	6399412
32	Marri	5	70	None	399021.7	6399399
33	Marri	5	50	None	399016.2	6399403
34	Marri	5	110	None	399006.9	6399403
35	Marri	5	50	None	399006.5	6399408
36	Marri	5	110	None	398992.8	6399403
37	Marri	5	50	None	398996.4	6399394
38	Jarrah	4	110	Small hollows	398981.7	6399393
39	Jarrah	4	110	Small hollows	399004.7	6399386
40	Jarrah	4	90	Small hollows	398973.8	6399383
41	Jarrah	4	50	Small hollows	398975	6399366
42	Jarrah	4	65	Small hollows	398980.5	6399363
43	Jarrah	4	65	Small hollows	398988.4	6399355
44	Jarrah	4	70	Small hollows	398989.1	6399351
45	Jarrah	4	50	Small hollows	398982.7	6399353
46	Jarrah	4	70	Small hollows	398970.7	6399348
47	Jarrah	5	50	None	398967.5	6399345
48	Jarrah	5	50	None	398971.3	6399338
49	Jarrah	5	50	None	398957.3	6399340
50	Jarrah	5	70	None	398957	6399318
51	Jarrah	4	100	Small hollows	398967.6	6399302
52	Jarrah	5	70	None	398980.3	6399296
53	Dead	4	70	Small cracks and hollows	398954.1	6399290
54	Jarrah	5	70	None	398946	6399299
55	Jarrah	5	50	None	398941.2	6399315
56	Jarrah	5	100	None	398930.8	6399308

57	Jarrah	5	50	None	398926.1	6399311
58	Jarrah	5	50	None	398916.8	6399314
59	Jarrah	5	50	None	398910	6399316
60	Jarrah	5	80	None	398911.5	6399323
61	Jarrah	5	60	None	398907.1	6399328
62	Jarrah	5	90	None	398906.6	6399341
63	Jarrah	5	80	None	398879	6399326
64	Jarrah	5	70	None	398870.5	6399315
65	Jarrah	4	200	Small hollows	398887.7	6399300
66	Jarrah	5	80	None	398909.8	6399345
67	Jarrah	4	80	Small hollows	398924.8	6399359
68	Jarrah	5	65	None	398938.1	6399357
69	Jarrah	4	50	Small hollows	398947.3	6399369
70	Jarrah	4	100	Small hollows	398950.6	6399383
71	Jarrah	5	55	None	398949.8	6399389
72	Jarrah	5	50	None	398942.6	6399392
73	Jarrah	5	50	None	398923.9	6399383
74	Jarrah	5	50	None	398917.9	6399366
75	Jarrah	5	50	None	398907.1	6399381
76	Marri	5	50	None	398941.6	6399409
77	Marri	5	50	None	398945.4	6399417
78	Marri	5	60	None	398934.4	6399422
79	Marri	5	50	None	398941.5	6399423
80	Marri	5	50	None	398938	6399418
81	Marri	5	55	None	398935	6399417
82	Marri	5	60	None	398927.6	6399415
83	Marri	5	50	None	398926.4	6399410
84	Marri	4	85	Small hollows	398931.3	6399436
85	Jarrah	4	50	Small hollows	398916	6399437

86	Jarrah	4	50	Small hollows	398908.8	6399422
87	Jarrah	4	130	Small hollows	398895.2	6399407
88	Marri	4	100	Small hollows	398898.6	6399432
89	Marri	5	55	None	398945.7	6399445
90	Marri	5	50	None	398952.2	6399423
91	Marri	5	50	None	398990.7	6399415
92	Marri	4	60	Small hollows	399005.6	6399416
93	Marri	4	125	Small hollows	399049.8	6399447
94	Marri	4	50	Small hollows	399061.4	6399446
95	Marri	4	55	Small hollows	399061	6399438
96	Dead	4	65	Small hollows	399076.7	6399452
97	Jarrah	4	70	Small hollows	399060.7	6399455
98	Marri	4	95	Small hollows	399060.9	6399469
99	Marri	4	110	Small hollows	399064.7	6399475
100	Marri	4	80	Small hollows	399064.9	6399477
101	Marri	5	55	None	399065.4	6399497
102	Marri	5	80	None	399079	6399496
103	Marri	5	50	None	399083.6	6399491
104	Marri	5	65	None	399079.6	6399502
105	Marri	5	65	None	399074.3	6399501
106	Marri	5	75	None	399087.1	6399510
107	Marri	5	60	None	399073.9	6399516
108	Marri	4	60	Small hollows	399066.1	6399511
109	Marri	4	60	Small hollows	399058.1	6399507
110	Marri	5	55	None	399057.5	6399525
111	Marri	4	130	Knot type hollow was checked with pole camera, inner diameter is <10cm and <1m depth, not suitable for black cockatoo use.	399033.5	6399521
112	Dead	4	50	Small hollows	399043.3	6399543
113	Marri	5	50	None	399059.3	6399539

114	Marri	5	80	None	399059.7	6399551
115	Marri	5	80	None	399055	6399563
116	Dead	4	65	Small hollows	399068.6	6399559
117	Marri	5	70	None	399075.2	6399570
118	Marri	5	75	None	399085.2	6399574
119	Marri	5	135	None	399085.6	6399577
120	Marri	4	110	Knot hollow 10m up, checked with pole cam, not wide enough, only 7cm or deep enough, go pro photo 250	399084.9	6399552
121	Marri	4	75	Small hollows	399095	6399544
122	Marri	4	60	Small hollows	399102.4	6399551
123	Jarrah	4	105	Small hollows	399110.1	6399547
124	Jarrah	4	95	Small hollows	399108.4	6399522
125	Jarrah	4	115	Small hollows	399114.6	6399506
126	Jarrah	4	110	Small hollows.	399133.2	6399503
127	Jarrah	4	110	Small hollows	399142.9	6399501
128	Jarrah	4	80	Small hollows	399153.7	6399506
129	Dead	4	85	Small hollows	399147.2	6399508
130	Jarrah	4	110	Small hollows	399147.7	6399515
131	Jarrah	5	90	None	399148.8	6399530
132	Jarrah	4	135	Fissure, unlikely to be bc hollow	399149.1	6399539
133	Jarrah	5	60	None	399161.3	6399526
134	Dead	5	60	None	399180.7	6399502
135	Jarrah	4	105	Small hollows	399200.6	6399512
136	Jarrah	4	60	Small hollows	399217.9	6399504
137	Jarrah	5	75	None	399202	6399455
138	Jarrah	5	80	None	399204	6399447
139	Jarrah	5	60	None	399209.4	6399437
140	Dead	4	60	Small hollows	399241	6399416
141	Dead	4	85	Small hollows	399246	6399398

142	Dead	4	130	Small hollows	399180.8	6399390
143	Jarrah	5	55	None	399171.3	6399400
144	Jarrah	5	90	None	399159.2	6399459
145	Jarrah	5	85	None	399126.8	6399422
146	Dead	5	75	None	399136.2	6399411
147	Marri	5	130	None	398970.2	6399619
148	Marri	5	115	None	398959.2	6399635
149	Marri	5	85	None	398945.9	6399604
150	Marri	5	55	None	398967.3	6399556
151	Marri	5	55	None	398963.4	6399558
152	Marri	5	50	None	398961.1	6399556
153	Marri	5	50	None	398959.1	6399560
154	Marri	5	60	None	398947.4	6399564
155	Marri	5	130	None	398913.3	6399594
156	Marri	5	60	None	398921.3	6399625
157	Marri	5	95	None	398910.2	6399636
158	Marri	5	95	None	398897.7	6399636
159	Marri	5	95	None	398891.6	6399620
160	Marri	5	85	None	398878.9	6399640
161	Marri	5	100	None	398876	6399633
162	Marri	4	130	Hollow was observed using pole camera and drone. Knot hollow had suitable entrance diameter, however inner diameter narrows to <10cm and <1m depth. Not suitable for black cockatoo use.	398867.9	6399636
163	Jarrah	4	100	Small hollows	398840.5	6399604
164	Marri	5	100	None	398841.6	6399610
165	Marri	5	80	None	398834.8	6399605
166	Jarrah	5	115	None	398831.2	6399593
167	Marri	4	115	Small hollows	398806.7	6399579
168	Dead	4	140	Small hollows	398808.8	6399601

169	Marri	5	60	None	398799.7	6399609
170	Marri	5	60	None	398812.3	6399612
171	Marri	5	60	None	398792.8	6399596
172	Marri	5	70	None	398792.5	6399583
173	Jarrah	5	100	None	398820.8	6399538
174	Jarrah	5	100	None	398842	6399558
175	Marri	5	85	None	398791.4	6399622
176	Marri	4	120	Small hollows	398777.1	6399626
177	Marri	5	50	None	398767.8	6399616
178	Marri	5	65	None	398759.3	6399613
179	Marri	5	50	None	398763.3	6399624
180	Marri	5	60	None	398755.9	6399627
181	Marri	5	60	None	398752.7	6399620
182	Marri	5	60	None	398749.1	6399627
183	Marri	5	60	None	398739.2	6399615
184	Marri	5	50	None	398731.4	6399615
185	Marri	5	55	None	398724	6399620
186	Marri	5	60	None	398718.2	6399610
187	Dead	4	200	Small hollows	398726.7	6399629
188	Marri	4	200	Small hollows	398715.7	6399628
189	Dead	5	65	None	398718.4	6399575
190	Marri	5	85	None	398691.1	6399573
191	Marri	5	60	None	398699.3	6399548
192	Marri	5	60	None	398712.7	6399545
193	Marri	5	60	None	398711.5	6399552
194	Marri	5	80	None	398715.1	6399542
195	Marri	5	55	None	398717.7	6399535
196	Jarrah	4	110	Small hollows	398751.3	6399525
197	Marri	5	90	None	398723.6	6399522

198	Dead	4	80	Small hollows	398701.1	6399536
199	Dead	4	80	Small hollows	398698.4	6399529
200	Marri	5	50	None	398698.3	6399541
201	Marri	5	60	None	398675.4	6399536
202	Marri	5	50	None	398672.7	6399532
203	Marri	5	100	None	398671	6399526
204	Marri	5	60	None	398662.2	6399536
205	Marri	5	60	None	398670	6399541
206	Dead	5	60	None	398669.5	6399546
207	Marri	5	80	None	398659.3	6399545
208	Marri	5	100	None	398648.2	6399532
209	Dead	5	65	None	398653	6399517
210	Marri	5	70	None	398686.4	6399512
211	Dead	5	130	None	398616.6	6399517
212	Marri	5	60	None	398615.1	6399510
213	Marri	5	60	None	398610.4	6399501
214	Marri	5	60	None	398609	6399513
215	Marri	5	95	None	398576.1	6399505
216	Marri	4	115	Small hollows	398619.2	6399530
217	Marri	5	75	None	398622.8	6399544
218	Flooded Gum	5	190	None	398622.2	6399551
219	Marri	5	150	None	399226	6399739
220	Marri	4	125	Small hollows	399144.3	6399755
221	Marri	4	120	Big hollows, tree was not rechecked, givena precautionary class 3. Hollow has been rechecked with drone, blocked, downgraded to class 4. see drone photos	399039.3	6399824
222	Marri	4	105	Small hollows	398973.4	6399831
223	Marri	5	70	None	398966.2	6399823

224	Flooded Gum	5	170	None	398942.6	6399793
225	Marri	4	160	Small hollows	399219.7	6399860
226	Marri	5	70	None	399207.4	6399917
227	Marri	5	70	None	399214.1	6399920
228	Marri	5	85	None	399235.2	6399927
229	Dead	5	65	None	399275.8	6400015
230	Dead	5	65	None	399240.1	6400031
231	Dead	4	65	Hollow in crook is too shallow	399271.7	6400060
232	Flooded Gum	4	150	Small hollows	399150.2	6401279
233	Eucalyptus	5	140	None	398719.6	6401487
234	River Red Gum	5	130	None	398753.3	6401489
235	Eucalyptus	5	130	None	398765.5	6401491
236	Eucalyptus	5	65	None	398772.2	6401491
237	Eucalyptus	5	75	None	398779.2	6401489
238	Eucalyptus	5	70	None	398786.3	6401487
239	Eucalyptus	5	50	None	398793.4	6401486
240	Eucalyptus	5	100	None	398795.6	6401491
241	Eucalyptus	5	95	None	398802.7	6401486
242	Eucalyptus	5	65	None	398806.2	6401491
243	Eucalyptus	5	65	None	398575.5	6401498
244	Flooded Gum	5	65	None	398567.3	6401498
245	Flooded Gum	5	65	None	398558.1	6401498
246	Flooded Gum	5	65	None	398544	6401500

247	Flooded Gum	5	55	None	398535.3	6401501
248	Flooded Gum	5	70	None	398528.7	6401496
249	Flooded Gum	5	50	None	398521	6401499
250	Flooded Gum	5	90	None	398494.9	6401499
251	Flooded Gum	5	65	None	398489.3	6401482
252	Flooded Gum	5	60	None	398508.2	6401482
253	Flooded Gum	5	55	None	398541.8	6401483
254	Flooded Gum	5	50	None	398560.8	6401484
255	Flooded Gum	5	60	None	398569	6401482
256	Flooded Gum	5	50	None	398575.2	6401482
257	Eucalyptus	5	50	None	398491.5	6401651
258	Eucalyptus	5	75	None	398513.7	6401651
259	Eucalyptus	5	75	None	398523.5	6401650
260	Eucalyptus	5	70	None	398708.9	6401465
261	Eucalyptus	5	70	None	398708	6401459
262	Eucalyptus	5	75	None	398708.5	6401450
263	Eucalyptus	5	60	None	398710.9	6401419
264	Eucalyptus	5	55	None	398710.5	6401414
265	Eucalyptus	5	60	None	398712.2	6401349
266	Eucalyptus	5	50	None	398713.4	6401288
267	Eucalyptus	5	50	None	398713.6	6401294

268	Eucalyptus	5	50	None	398711.8	6401281
269	Eucalyptus	5	50	None	398712.3	6401268
270	Eucalyptus	5	50	None	398713.5	6401259
271	Eucalyptus	5	50	None	398713.3	6401249
272	Flooded Gum	5	50	None	398713.1	6401242
273	Eucalyptus	5	50	None	398701.1	6401190
274	Flooded Gum	5	50	None	398703.4	6401176
275	Flooded Gum	5	50	None	398702.6	6401166
276	Flooded Gum	5	50	None	398718.5	6401116
277	Eucalyptus	5	70	None	398704.7	6401103
278	Flooded Gum	5	50	None	398704.2	6401082
279	Flooded Gum	5	50	None	398707.2	6401050
280	Flooded Gum	5	50	None	398706.6	6401041
281	Flooded Gum	5	50	None	398720.9	6401043
282	Flooded Gum	5	50	None	398722.5	6401018
283	Flooded Gum	5	50	None	398706.7	6401021
284	Flooded Gum	5	50	None	398706.8	6401015
285	Flooded Gum	5	50	None	398726.4	6401009
286	Flooded Gum	5	50	None	398723.2	6400998

287	Flooded Gum	5	50	None	398725.1	6400949
288	Flooded Gum	5	50	None	398711.1	6400945
289	Flooded Gum	5	50	None	398711	6400921
290	Flooded Gum	5	50	None	398726.6	6400918
291	Flooded Gum	5	50	None	398725.8	6400896
292	Flooded Gum	5	50	None	398710.3	6400882
293	Flooded Gum	5	50	None	398670.7	6400865
294	Eucalyptus	5	50	None	398636.7	6400860
295	Eucalyptus	5	50	None	398614.8	6400853
296	Eucalyptus	5	60	None	398585.3	6400852
297	Eucalyptus	5	60	None	398578.9	6400858
298	Eucalyptus	5	60	None	398579.4	6400864
299	Eucalyptus	5	55	None	398568.5	6400854
300	Eucalyptus	5	55	None	398554.6	6400860
301	Eucalyptus	5	95	None	398534.5	6400861
302	Eucalyptus	5	75	None	398525.7	6400851
303	Eucalyptus	5	75	None	398523	6400857
304	Eucalyptus	5	65	None	398514.7	6400846
305	Eucalyptus	5	65	None	398508.1	6400849
306	Eucalyptus	5	60	None	398503.4	6400857
307	Eucalyptus	5	65	None	398495.6	6400856
308	Dead	5	100	None	398819.8	6400368
309	Marri	5	80	None	398868.3	6400346

310	Marri	5	80	None	398886.7	6400375
311	Marri	5	65	None	399256.7	6400608
312	Marri	5	90	None	399272.6	6400603
313	Dead	4	70	Small hollows	399205.7	6400497
314	Marri	5	90	None	399228.7	6400377
315	Dead	3	180	Spout, 12cm diameter, good angle, checked with pole, GoPro photo 242. Rechecked with drone, one hollow on NW side 10cm opening, suitable depth, large owl was flushed out. One chimney hollow with vertical cracking, >10cm opening, 22m height.	399228	6400283
316	Marri	5	90	None	399235.5	6400160
317	Jarrah	5	100	None	399083.1	6400143
318	Jarrah	4	100	Small hollows	399074.1	6400145
319	Jarrah	5	90	None	399101.5	6399989
320	Marri	4	110	Has large (50cm) obvious but inaccessible hollow, too high and inaccessible to be checked with drone or pole, precautionary class 3. Checked with drone, spout and knot is blocked, downgraded to class 4.	399178.8	6400088
321	Marri	5	85	None	398657.3	6400046
322	Dead	5	65	None	398668.2	6400050
323	Dead	5	50	None	398671.1	6400051
324	Marri	5	65	None	398672.4	6400055
325	Dead	5	60	None	398670.7	6400066
326	Marri	5	65	None	398687.6	6400065
327	Marri	5	60	None	398691.7	6400070
328	Marri	5	85	None	398734.3	6400114
329	Marri	5	90	None	398743.7	6400100
330	Marri	5	100	None	398745.7	6400112
331	Marri	4	140	Vertical hollow	398747.5	6400213
332	Marri	5	85	None	399280.1	6401101
333	Marri	5	100	None	399235.1	6400549

334	Marri	5	110	None	399229.5	6400566
335	Marri	5	65	None	399251.4	6400571
336	Jarrah	5	160	None	399141.8	6400314
337	Marri	4	130	Jagged vertical hollow	399139.7	6400323
338	Dead	5	50	None	399182.7	6400236
339	Dead	5	50	None	399149.5	6400210
340	Jarrah	5	70	None	399151.3	6400202
341	Dead	4	150	Spout hollow 20cm 12m high	399160.6	6400175
342	Dead	5	60	None	399158.3	6400159
343	Marri	5	80	None	399223.9	6400204
344	Jarrah	5	75	None	399123.1	6400115
345	Marri	4	85		399098.8	6400103
346	Marri	5	120	None	399044	6400003
347	Marri	5	70	None	399089.7	6400033
348	Dead	4	90	Small hollows	399286.6	6399426
349	Marri	5	65	None	399274.7	6399336
350	Marri	4	55		399260.4	6399325
351	Dead	4	60		399258.8	6399327
352	Marri	5	50	None	399239.3	6399317
353	Marri	5	50	None	399239.3	6399318
354	Marri	5	55	None	399236.4	6399319
355	Jarrah	4	80		398979.4	6399284
356	Dead	4	120	Not suitable	398860.9	6399285
357	Dead	5	80	None	398834.2	6399292
358	Dead	5	80	None	398834.2	6399292
359	Marri	5	50	None	398837	6399326
360	Jarrah	5	70	None	398845.8	6399332
361	Marri	5	70	None	398844.3	6399342
362	Marri	5	65	None	398845.5	6399344

363	Marri	5	65	None	398836.3	6399335
364	Marri	5	65	None	398812.7	6399316
365	Marri	5	70	None	398805.7	6399318
366	Marri	5	60	None	398809.1	6399320
367	Jarrah	5	80	None	398809.8	6399326
368	Jarrah	5	85	None	398806.9	6399327
369	Marri	5	50	None	398810.7	6399330
370	Marri	5	50	None	398811.5	6399337
371	Dead	4	160	Hollows blocked	398797	6399327
372	Marri	5	60	None	398787.2	6399319
373	Jarrah	5	95	None	398777.1	6399291
374	Marri	5	60	None	398783.4	6399287
375	Jarrah	4	90		398793.1	6399285
376	Marri	5	105	None	398771.1	6399312
377	Jarrah	5	55	None	398770.3	6399318
378	Marri	5	50	None	398771.6	6399321
379	Marri	5	65	None	398776.3	6399323
380	Marri	5	55	None	398780.6	6399322
381	Marri	5	65	None	398770.2	6399350
382	Marri	5	55	None	398780.1	6399348
383	Marri	5	55	None	398777	6399354
384	Marri	5	75	None	398773.9	6399361
385	Marri	5	50	None	398779.2	6399371
386	Marri	5	50	None	398783.1	6399381
387	Marri	5	60	None	398801.3	6399369
388	Marri	5	50	None	398806.5	6399367
389	Marri	4	165	No suitable hollows, lots of fallen suitable hollows on ground	398818.1	6399382
390	Marri	5	60	None	398814.2	6399373
391	Marri	5	80	None	398819.5	6399351

392	Marri	5	50	None	398842.4	6399350
393	Marri	5	60	None	398832.5	6399362
394	Marri	5	60	None	398841	6399365
395	Dead	5	70	None	398856	6399376
396	Marri	5	60	None	398844.2	6399380
397	Marri	5	60	None	398840.9	6399385
398	Marri	5	50	None	398839.2	6399387
399	Marri	5	60	None	398838.8	6399388
400	Marri	5	50	None	398840.2	6399388
401	Marri	5	75	None	398838.4	6399388
402	Marri	5	70	None	398828.4	6399395
403	Marri	5	50	None	398826.6	6399396
404	Marri	5	55	None	398810.1	6399394
405	Marri	5	65	None	398805.7	6399390
406	Marri	5	65	None	398799.3	6399394
407	Marri	5	130	None	398810.1	6399408
408	Dead	5	65	None	398797.9	6399437
409	Marri	5	95	None	398775.6	6399437
410	Marri	5	75	None	398775.3	6399437
411	Marri	5	65	None	398788.7	6399447
412	Jarrah	5	65	None	398772.3	6399456
413	Marri	5	55	None	398771	6399441
414	Marri	5	145	None	398850.2	6399424
415	Jarrah	5	55	None	398859.6	6399407
416	Marri	5	70	None	398873.1	6399400
417	Marri	5	160	None	398884.1	6399440
418	Marri	5	75	None	398885.6	6399455
419	Jarrah	4	175		398900	6399470
420	Jarrah	5	50	None	398901.6	6399470

421	Marri	4	85		398916.5	6399478
422	Marri	4	80		398916.3	6399482
423	Marri	5	80	None	398930.1	6399505
424	Marri	5	70	None	398905.8	6399498
425	Marri	5	50	None	398901	6399503
426	Marri	4	100		398902.1	6399509
427	Marri	5	50	None	398903.7	6399510
428	Marri	5	50	None	398899.1	6399506
429	Marri	5	60	None	398897.9	6399503
430	Marri	5	55	None	398897	6399501
431	Marri	4	90	Small hollow, not suitable	398895.9	6399483
432	Marri	5	50	None	398883.8	6399485
433	Marri	4	120	Not suitable hollow, too small	398881.8	6399493
434	Marri	4	100		398885.6	6399502
435	Marri	5	50	None	398879.5	6399513
436	Marri	5	50	None	398880.1	6399517
437	Marri	5	65	None	398876	6399516
438	Marri	5	50	None	398869.4	6399510
439	Marri	5	70	None	398868	6399509
440	Marri	5	65	None	398861.4	6399505
441	Jarrah	5	75	None	398854.1	6399493
442	Jarrah	5	90	None	398847.6	6399516
443	Marri	5	60	None	398857.3	6399520
444	Marri	5	80	None	398870.5	6399523
445	Marri	5	60	None	398870.7	6399534
446	Marri	5	125	None	398869.6	6399538
447	Marri	5	65	None	398870.2	6399539
448	Marri	5	50	None	398870.7	6399541
449	Marri	5	50	None	398872.1	6399544

450	Marri	5	75	None	398874	6399547
451	Marri	5	80	None	398878.4	6399555
452	Marri	5	65	None	398870.2	6399549
453	Marri	5	60	None	398869.5	6399550
454	Jarrah	4	105		398846.7	6399558
455	Jarrah	5	50	None	398847.2	6399553
456	Jarrah	5	100	None	398824	6399541
457	Jarrah	5	80	None	398842.2	6399526
458	Jarrah	5	50	None	398847.3	6399524
459	Jarrah	5	70	None	398810.7	6399507
460	Marri	5	70	None	398804.7	6399500
461	Marri	5	60	None	398803.5	6399495
462	Marri	4	125	Chimney hollow, blocked. Zirui phone photo 259	398806.4	6399485
463	Marri	5	90	None	398810.1	6399493
464	Marri	5	80	None	398823.9	6399481
465	Jarrah	5	60	None	398809.7	6399480
466	Jarrah	5	75	None	398808.9	6399472
467	Jarrah	5	75	None	398788.4	6399462
468	Jarrah	5	60	None	398791.2	6399462
469	Jarrah	5	65	None	398795.9	6399466
470	Jarrah	5	75	None	398802.9	6399458
471	Marri	4	105		398776	6399423
472	Marri	5	50	None	398781.3	6399412
473	Marri	4	145		398778	6399411
474	Marri	5	50	None	398765.6	6399408
475	Marri	5	50	None	398761.8	6399414
476	Marri	5	65	None	398758.5	6399415
477	Marri	5	75	None	398750.8	6399423
478	Marri	5	90	None	398752.3	6399444

479	Marri	5	75	None	398748	6399437
480	Marri	5	70	None	398745.5	6399432
481	Marri	5	65	None	398748.7	6399411
482	Marri	5	70	None	398750.2	6399405
483	Marri	5	70	None	398765.6	6399389
484	Marri	5	55	None	398792	6399406
485	Marri	5	70	None	398821.8	6399456
486	Marri	5	50	None	398820	6399458
487	Marri	5	60	None	398833.4	6399458
488	Marri	5	50	None	398834.7	6399462
489	Marri	4	105	Blocked and not suitable size	398850.8	6399459
490	Marri	5	50	None	398861.6	6399449
491	Marri	4	75		398579.9	6399408
492	Marri	5	55	None	398581.6	6399406
493	Marri	5	55	None	398572.6	6399396
494	Marri	5	100	None	398565.8	6399391
495	Marri	5	50	None	398588.4	6399427
496	Marri	5	70	None	398595.4	6399431
497	Marri	5	55	None	398597.9	6399431
498	Marri	5	60	None	398600.1	6399430
499	Marri	5	90	None	398601	6399424
500	Marri	5	65	None	398604.1	6399414
501	Marri	5	90	None	398601.4	6399409
502	Marri	4	70		398607	6399414
503	Marri	5	60	None	398612.1	6399406
504	Marri	5	60	None	398601.7	6399375
505	Marri	5	60	None	398593.8	6399373
506	Marri	4	120	Small hollows not suitable	398590.9	6399351
507	Marri	4	120	Spout hollow not suitable, Photo 254, 270	398642	6399384

508	Marri	5	70	None	398641.8	6399377
509	Marri	5	50	None	398650.2	6399380
510	Marri	5	50	None	398651.4	6399384
511	Marri	5	65	None	398660.9	6399400
512	Marri	5	55	None	398647.4	6399349
513	Marri	5	50	None	398648.3	6399341
514	Marri	4	110		398629.7	6399343
515	Marri	4	95	Chimney hollow Blocked	398632.7	6399341
516	Dead	4	80	Chimney hollow blocked	398625.8	6399347
517	Marri	5	65	None	398609.3	6399324
518	Marri	5	50	None	398667.2	6399300
519	Marri	5	50	None	398674.2	6399302
520	Marri	5	55	None	398673.7	6399310
521	Marri	5	60	None	398673.2	6399327
522	Marri	5	55	None	398728.4	6399314
523	Dead	4	70	Chimney hollow not suitable entrance	398727.6	6399297
524	Marri	4	115	Small spout hollows with bees inside	398738.9	6399287
525	Dead	5	65	None	398763.7	6399285
526	Marri	5	55	None	398740.4	6399314
527	Marri	5	50	None	398721.7	6399337
528	Marri	5	60	None	398722.5	6399345
529	Marri	4	80		398719.7	6399348
530	Marri	5	50	None	398725.4	6399349
531	Marri	5	50	None	398718	6399356
532	Marri	4	100		398718.6	6399369
533	Marri	5	80	None	398717.9	6399372
534	Marri	5	50	None	398725.3	6399371
535	Marri	5	70	None	398726.6	6399372
536	Marri	5	75	None	398739.2	6399375

537	Marri	5	80	None	398721.9	6399391
538	Marri	5	65	None	398707.3	6399388
539	Marri	5	50	None	398704.8	6399389
540	Marri	4	70		398688.2	6399354
541	Marri	5	60	None	398680.1	6399358
542	Marri	5	90	None	398673.1	6399361
543	Marri	5	80	None	398675.2	6399359
544	Marri	5	65	None	398689.2	6399392
545	Dead	4	95	Hollows too small	398713.4	6399414
546	Marri	5	50	None	398620.2	6399491
547	Marri	5	50	None	398622.1	6399487
548	Marri	4	180		398628	6399469
549	Dead	4	75	Hollows blocked	398638.9	6399472
550	Marri	5	75	None	398650.4	6399467
551	Marri	5	95	None	398643.9	6399457
552	Marri	5	85	None	398632.9	6399451
553	Marri	5	70	None	398620.6	6399444
554	Marri	5	115	None	399027.4	6399857
555	Marri	5	145	None	399036.2	6399898
556	Dead	4	95	Chimney with rough opening, not suitable	399115.7	6399850
557	Dead	4	85	Spout hollow with bees	399129.3	6399823
558	Flooded Gum	5	75	None	398502	6400343
559	Flooded Gum	5	100	None	398501.2	6400346
560	Flooded Gum	5	60	None	398505.8	6400346
561	Flooded Gum	5	80	None	398513.5	6400345

562	Flooded Gum	5	50	None	398516.4	6400347
563	Flooded Gum	5	70	None	398520.1	6400345
564	Flooded Gum	5	50	None	398528	6400341
565	Flooded Gum	5	80	None	398532.8	6400337
566	Flooded Gum	5	75	None	398549.1	6400338
567	Flooded Gum	5	50	None	398548.9	6400344
568	Flooded Gum	5	60	None	398555.5	6400344
569	Flooded Gum	5	70	None	398556.7	6400342
570	Flooded Gum	5	60	None	398565.3	6400341
571	Flooded Gum	5	55	None	398567.3	6400341
572	Flooded Gum	5	60	None	398570.4	6400339
573	Flooded Gum	5	70	None	398572.2	6400339
574	Flooded Gum	5	90	None	398575.1	6400338
575	Flooded Gum	5	80	None	398578	6400341
576	Flooded Gum	5	75	None	398587.7	6400339
577	Flooded Gum	5	90	None	398588.6	6400335

578	Flooded Gum	5	50	None	398591.4	6400337
579	Flooded Gum	5	70	None	398597.3	6400338
580	Flooded Gum	5	50	None	398607.1	6400338
581	Flooded Gum	5	55	None	398613.1	6400337
582	Flooded Gum	5	70	None	398615.2	6400335
583	Flooded Gum	5	65	None	398616	6400336
584	Flooded Gum	5	60	None	398626.6	6400339
585	Flooded Gum	5	50	None	398625.9	6400336
586	Flooded Gum	5	65	None	398629.7	6400333
587	Flooded Gum	5	60	None	398632.4	6400338
588	Flooded Gum	5	65	None	398637.4	6400335
589	Flooded Gum	5	75	None	398639	6400336
590	Flooded Gum	5	80	None	398643.6	6400329
591	Flooded Gum	5	85	None	398650	6400336
592	Flooded Gum	5	70	None	398655.1	6400336
593	Flooded Gum	5	60	None	398657	6400334

594	Flooded Gum	5	75	None	398664	6400329
595	Flooded Gum	5	80	None	398673	6400334
596	Flooded Gum	5	70	None	398673.2	6400332
597	Flooded Gum	5	65	None	398678.7	6400331
598	Flooded Gum	5	65	None	398680.5	6400334
599	Flooded Gum	5	75	None	398689.4	6400333
600	Flooded Gum	5	65	None	398691	6400330
601	Flooded Gum	5	65	None	398692.6	6400329
602	Flooded Gum	5	75	None	398700.9	6400328
603	Flooded Gum	5	55	None	398705.5	6400328
604	Flooded Gum	5	65	None	398712.2	6400326
605	Flooded Gum	5	70	None	398713.2	6400332
606	Flooded Gum	5	50	None	398717.6	6400331
607	Flooded Gum	5	70	None	398727.2	6400328
608	Flooded Gum	5	65	None	398721.6	6400328
609	Eucalyptus	5	110	None	398739.3	6400372

610	Flooded Gum	5	50	None	398739.1	6400373
611	Eucalyptus	5	70	None	398738.9	6400380
612	Eucalyptus	5	50	None	398734.7	6400388
613	Eucalyptus	5	70	None	398732.3	6400389
614	Eucalyptus	5	90	None	398737.9	6400398
615	Eucalyptus	5	50	None	398734.5	6400398
616	Eucalyptus	5	50	None	398733.1	6400395
617	Flooded Gum	5	65	None	398735.3	6400401
618	Eucalyptus	5	80	None	398730.2	6400412
619	Eucalyptus	5	50	None	398732.8	6400417
620	Eucalyptus	5	50	None	398734.1	6400425
621	Eucalyptus	5	60	None	398730.7	6400427
622	Eucalyptus	5	60	None	398728.7	6400430
623	Eucalyptus	5	85	None	398732.1	6400433
624	Eucalyptus	5	50	None	398734.6	6400442
625	Eucalyptus	5	50	None	398731.4	6400444
626	Eucalyptus	5	60	None	398729.2	6400454
627	Flooded Gum	5	80	None	398734.2	6400454
628	Eucalyptus	5	75	None	398734.2	6400463
629	Eucalyptus	5	50	None	398730.1	6400462
630	Flooded Gum	5	50	None	398736.4	6400466
631	Flooded Gum	5	70	None	398734	6400476
632	Flooded Gum	5	85	None	398732.5	6400492

633	Flooded Gum	5	60	None	398727.6	6400494
634	Eucalyptus	5	50	None	398727.2	6400492
635	Eucalyptus	5	60	None	398729	6400509
636	Eucalyptus	5	55	None	398725.2	6400515
637	Flooded Gum	5	75	None	398724.6	6400541
638	Flooded Gum	5	75	None	398721.9	6400566
639	Eucalyptus	5	60	None	398723.8	6400576
640	Eucalyptus	5	50	None	398722	6400580
641	Eucalyptus	5	55	None	398721.7	6400588
642	Eucalyptus	5	50	None	398721.1	6400593
643	Eucalyptus	5	50	None	398719.2	6400592
644	Eucalyptus	5	65	None	398721.3	6400600
645	Eucalyptus	5	50	None	398722.1	6400604
646	Eucalyptus	5	50	None	398720	6400607
647	Eucalyptus	5	65	None	398723	6400612
648	Eucalyptus	5	50	None	398720.7	6400622
649	Eucalyptus	5	50	None	398720.4	6400626
650	Eucalyptus	5	60	None	398724.7	6400638
651	Eucalyptus	5	60	None	398717.3	6400646
652	Eucalyptus	5	50	None	398719.4	6400657
653	Eucalyptus	5	50	None	398715.8	6400669
654	Eucalyptus	5	50	None	398716	6400675
655	Eucalyptus	5	50	None	398716.7	6400694
656	Eucalyptus	5	50	None	398716.8	6400700
657	Eucalyptus	5	50	None	398717.3	6400705
658	Eucalyptus	5	65	None	398719.3	6400712

659	Eucalyptus	5	50	None	398717.5	6400716
660	Eucalyptus	5	65	None	398719.2	6400719
661	Eucalyptus	5	60	None	398715.7	6400721
662	Eucalyptus	5	50	None	398717.7	6400731
663	Eucalyptus	5	60	None	398706.7	6400819
664	Eucalyptus	5	50	None	398715.8	6400818
665	Eucalyptus	5	65	None	398717.2	6400808
666	Eucalyptus	5	50	None	398722.3	6400798
667	Eucalyptus	5	50	None	398719.4	6400793
668	Eucalyptus	5	80	None	398711.7	6400788
669	Eucalyptus	5	65	None	398718.5	6400777
670	Eucalyptus	5	55	None	398720.2	6400762
671	Eucalyptus	5	55	None	398716.4	6400761
672	Eucalyptus	5	50	None	398719.4	6400754
673	Eucalyptus	5	50	None	398715.6	6400754
674	Eucalyptus	5	50	None	398720.7	6400747
675	Eucalyptus	5	55	None	398715.8	6400746
676	Marri	4	160	Forming small hollows	398806.3	6400346
677	Marri	4	140	Two hollwss checked, neither suitabel. Check Photo 225 and 234 high up hollow maybe too high up. Can't check with drone or pole	398749.9	6400277
678	Dead	4	100	2 spout type hollows and 1 chimney, all are checked with GoPro, all lack suitable depth. None suitabe	398782	6400245
679	Marri	5	85	None	398636.7	6400047
680	Marri	5	50	None	398644.6	6400048
681	Marri	5	70	None	398648.2	6400050
682	Marri	5	90	None	398650.7	6400061
683	Marri	5	80	None	398656.4	6400064
684	Marri	5	70	None	398664.5	6400070
685	Marri	5	95	None	398665.9	6400077

686	Marri	5	80	None	398677.3	6400094
687	Marri	4	80	Small hollows	398691.3	6400080
688	Marri	4	165	Has small hollows on dead branches	398702.1	6400103
689	Marri	5	100	Small hollows on dead branches	398708.7	6400130
690	Marri	5	95	None	398725.7	6400143
691	Marri	5	85	None	398707.5	6400156
692	Marri	5	135	None	398718.2	6400174
693	Marri	5	110	None	398710.4	6400191
694	Marri	5	110	None	398688.8	6400178
695	Marri	5	140	Small hollow on branch, not suitable	398761.1	6400157
696	Marri	4	130	Small hollows on dead branches, not suitable	398763.9	6400157
697	Marri	5	95	None	398775.7	6400158
698	Marri	4	110	Small spout hollow camera poled, too small not suitable. Photo 242	398874.9	6400450
699	Marri	5	70	None	399026.7	6401049
700	Marri	5	50	None	399033.9	6401066
701	Marri	5	75	None	399040.9	6401070
702	Marri	5	85	None	399037.5	6401085
703	Marri	5	50	None	399035.6	6401092
704	Flooded Gum	5	110	None	399268.5	6400842
705	Flooded Gum	5	115	None	399268.5	6400842
706	Flooded Gum	5	80	None	399251.7	6400881
707	Flooded Gum	5	80	None	399254.9	6400876
708	Flooded Gum	5	100	None	399236.7	6400863
709	Flooded Gum	5	140	None	399221.4	6400804

710	Flooded Gum	5	110	None	399185.4	6400725
711	Flooded Gum	5	80	None	399150.5	6400703
712	Flooded Gum	5	80	None	399160.6	6400655
713	Flooded Gum	5	60	None	399210.4	6400647
714	Marri	5	80	None	399209.7	6400598
715	Marri	5	80	None	399208	6400588
716	Marri	5	50	None	398640.9	6399400
717	Marri	5	60	None	398643	6399403
718	Marri	5	60	None	399292.4	6399383
719	Marri	5	60	None	399280	6399357
720	Marri	5	50	None	399278.9	6399358
721	Dead	4	75	One too small, below 10cm	399288.4	6399603
722	Marri	5	65	None	399280.6	6399607
723	Dead	5	90	None	399273.4	6399617
724	Marri	4	95		399263.9	6399613
725	Marri	5	95	None	399261.1	6399641
726	Marri	5	50	None	399248.6	6399609
727	Marri	5	60	None	399245.5	6399602
728	Marri	5	70	None	399247.2	6399595
729	Jarrah	5	55	None	399256.7	6399598
730	Marri	5	75	None	399271.4	6399599
731	Marri	5	65	None	399273.4	6399591
732	Eucalyptus	5	75	None	399282.9	6399585
733	Marri	4	100	Branches broken, no deep enough hollow	399250.3	6399583
734	Marri	5	85	None	399233.6	6399585
735	Marri	5	80	None	399224.7	6399591

736	Jarrah	5	65	None	399227.2	6399579
737	Jarrah	5	65	None	399248.3	6399566
738	Dead	4	90		399215	6399601
739	Marri	5	70	None	399200	6399597
740	Marri	5	100	None	399191.6	6399599
741	Marri	4	125		399174.4	6399595
742	Jarrah	5	75	None	399177.7	6399576
743	Jarrah	5	70	None	399171	6399559
744	Marri	4	110		399141.4	6399603
745	Marri	5	65	None	399148	6399596
746	Marri	5	75	None	399140.6	6399590
747	Jarrah	4	70		399141.8	6399584
748	Dead	4	125	Two potential hollows, hollow located closer to bottom seems not to be deep enough, top hollow may not be large enough	399213	6399556
749	Jarrah	4	130		399206.3	6399554
750	Jarrah	4	65		399176.6	6399547
751	Jarrah	4	100		399190	6399533
752	Marri	4	70		399206.3	6399529
753	Marri	4	100		399215.5	6399519
754	Dead	5	50	None	399231.4	6399522
755	Dead	4	80		399253.5	6399523
756	Jarrah	5	100	None	399273	6399523
757	Dead	4	100		399272.1	6399487
758	Dead	4	60		399254.1	6399497
759	Jarrah	4	90		399248.7	6399473
760	Jarrah	4	85		399280.7	6399464
761	Jarrah	5	80	None	399270.2	6399453
762	Marri	5	130	None	398503.4	6399301
763	Marri	4	110		398507.6	6399333

764	Marri	4	80		398502	6399343
765	Marri	5	55	None	398520.1	6399343
766	Marri	5	110	None	398515.9	6399352
767	Marri	5	95	None	398512.7	6399359
768	Marri	4	110		398503.1	6399367
769	Marri	5	50	None	398512.5	6399374
770	Marri	5	100	None	398518.3	6399377
771	Marri	5	125	None	398498.3	6399384
772	Marri	5	70	None	398498.5	6399401
773	Marri	5	60	None	398506.9	6399399
774	Marri	5	70	None	398514.6	6399397
775	Marri	5	55	None	398511.9	6399405
776	Marri	5	50	None	398508.8	6399407
777	Marri	5	60	None	398499.3	6399409
778	Marri	5	50	None	398503.5	6399410
779	Marri	5	50	None	398505.8	6399418
780	Marri	5	85	None	398519.2	6399422
781	Marri	4	60		398514.6	6399430
782	Marri	5	60	None	398509.8	6399431
783	Marri	4	55		398513.8	6399435
784	Marri	5	110	None	398510	6399440
785	Marri	5	55	None	398503.9	6399439
786	Marri	5	60	None	398499.1	6399443
787	Marri	5	80	None	398497.9	6399454
788	Marri	5	75	None	398496.9	6399456
789	Marri	5	55	None	398495.9	6399464
790	Flooded Gum	5	130	None	398605.4	6399605
791	Marri	5	60	None	398615.3	6399610

792	Dead	5	100	None	398621	6399623
793	Marri	4	50		398623.9	6399639
794	Marri	4	65		398641.7	6399627
795	Dead	5	65	None	398643.3	6399631
796	Flooded Gum	5	110	None	398652.6	6399626
797	Flooded Gum	5	70	None	398606	6399646
798	Marri	5	85	None	398724.3	6399674
799	Marri	5	80	None	398749.2	6399677
800	Jarrah	5	100	None	398807.8	6399691
801	Marri	5	70	None	398838.2	6399707
802	Marri	4	100		398854.9	6399705
803	Marri	5	95	None	398868.6	6399717
804	Flooded Gum	5	140	None	398870.4	6399735
805	Marri	4	130		398893.7	6399733
806	Marri	4	60		398894.6	6399732
807	Marri	5	50	None	398903.2	6399736
808	Dead	5	120	None	398906.1	6399741
809	Marri	5	100	None	399220.2	6399657
810	Marri	5	65	None	399195.3	6399683
811	Dead	4	80		399180.4	6399678
812	Marri	4	80	Potential to be a suitable chimney hollow but may not be deep enough - photo 249, not deep enough, potential future hollow	399183.6	6399695
813	Dead	4	150		399076.3	6399847
814	Marri	4	110		399037	6399883
815	Dead	4	110		399150	6399847
816	Dead	4	125	Hollow not big enough	398899.5	6400725
817	Marri	5	110	None	398591.3	6399989

818	Marri	5	100	None	398576.7	6400008
819	Dead	5	55	None	398572.2	6400014
820	Marri	4	115		398561.8	6400009
821	Marri	4	85		398550.4	6399965
822	Marri	4	130	Hollow potentially just too small	398509.5	6399993
823	Marri	4	110		398516.9	6400024
824	Jarrah	5	100	None	398606	6400003
825	Flooded Gum	5	110	None	398609.6	6399994
826	Flooded Gum	5	130	None	398620.3	6400003
827	Marri	5	105	None	398616.9	6400050
828	Marri	5	70	None	398634.2	6400038
829	Marri	5	135	None	398638.4	6400029
830	Dead	4	80		398646.3	6400025
831	Marri	5	70	None	398669.2	6400030
832	Marri	5	85	None	398677.1	6400036
833	Marri	5	60	None	398691	6400039
834	Marri	5	95	None	398698.5	6400039
835	Marri	5	60	None	398699.3	6400030
836	Marri	5	50	None	398717.7	6400018
837	Marri	5	70	None	398709.1	6400055
838	Marri	5	75	None	398715.5	6400069
839	Marri	5	100	None	398726	6400075
840	Marri	4	85		398741.4	6400075
841	Marri	4	100		398781.6	6400073
842	Dead	4	50		398781.6	6400091
843	Marri	4	100		398781.3	6400134
844	Marri	5	130	None	398764.3	6400145

845	Marri	4	100		398932.8	6400516
846	Marri	5	70	None	399005.2	6401034
847	Marri	5	65	None	398998.1	6401028
848	Marri	5	140	None	399242.6	6400263
849	Jarrah	5	70	None	399231.2	6400244
850	Marri	5	110	None	399225.9	6400207
851	Marri	5	70	None	399289.2	6399371
852	Marri	5	50	None	399276.6	6399361
853	Dead	5	90	None	399279.6	6399408

Appendix H
Foraging Habitat Quality Scoring Tool (DCCEEW,n.d)

Habitat Scoring System for WA black cockatoo foraging habitat

This habitat scoring system describes elements indicative of suitable foraging habitat[1] for the three WA black cockatoo species (Carnaby's Black Cockatoo, Baudin's Black Cockatoo and the Forest Red-tailed Black Cockatoo) in WA. Its use must be supported by survey information and reporting, undertaken by suitably qualified and experienced ecologists.

Appropriate scores will best fit a description. Where all components of the 'detail' column description are not met, this must be specified, and justification provided for that score to be accepted by the Department.

For an offset site to be considered by the Department, the offset site must have a start score of 1 for each indicator (e.g., there must be a species stocking rate score of at least 1).

Indicator	Score	Detail		Impact site	Offset start quality	Without offset	With offset
Site Condition							
		Foraging value	Details				
Vegetation condition and structure. Habitat features	**7**	Very High	Carnaby's Black Cockatoo				
			Native kwongan heath and shrubland (>30% projected foliage cover), banksia and eucalypt woodlands with >50% projected foliage cover. Low percentage (< 5%) of tree deaths[2].				
			Baudin's Black Cockatoo				
			Marri-Jarrah Forest and woodlands with >50% projected foliage cover. Low percentage (< 5%) of tree deaths.				
			Forest Red-tailed Black Cockatoo				
			Marri-Jarrah-Karri Forest, other eucalypt woodlands, or allocasuarina woodlands, with >50% projected foliage cover. Low percentage (< 5%) of tree deaths.				
	6	High	Carnaby's Black Cockatoo				
			Native kwongan heath and shrubland (>25% projected foliage cover), banksia and eucalypt woodlands with >40% projected foliage cover. Low percentage (< 10%) of tree deaths.				
			Baudin's Black Cockatoo				
			Marri-Jarrah Forest and woodlands with >40% projected foliage cover. Low percentage (< 10%) of tree deaths.				
			Forest Red-tailed Black Cockatoo				
			Marri-Jarrah-Karri Forest, other eucalypt woodlands, or allocasuarina woodlands, with >40% projected foliage cover. Low percentage (< 10%) of tree deaths.				

[1] In some cases, an impact or offset site may contain or require both foraging and breeding habitat for one or more black cockatoos. Breeding habitat is species of trees known to support breeding within the range of the species which either have a suitable nest hollow or are of a suitable diameter at breast height (DBH) to develop a nest hollow. For most species of trees, suitable DBH is 500 mm. For salmon gum and wandoo, suitable DBH is 300 mm.

[2] No tree deaths indicate robustness of habitat, unlikely for the habitat to decline in the medium-term. Tree deaths may be owing to disease, water stress, fire, etc.

Vegetation condition and structure. Habitat features	**5**	Moderate to high	Carnaby's Black Cockatoo				
			Native kwongan heath and shrubland (>20% projected foliage cover), banksia and eucalypt woodlands with 30-40% projected foliage cover; OR > 60% projected foliage cover but veg. condition reduced due to tree deaths (up to 20%).				
			Baudin's Black Cockatoo				
			Marri-Jarrah Forest or woodlands with 30-40% projected foliage cover; OR > 60% projected foliage cover but veg. condition reduced due to tree deaths (up to 20%).				
			Forest Red-tailed Black Cockatoo				
			Marri-Jarrah-Karri Forest, other eucalypt woodlands, or allocasuarina woodlands, with 30-40% projected foliage cover; OR > 60% projected foliage cover but veg. condition reduced due to tree deaths (up to 20%).				
	4	Moderate	Carnaby's Black Cockatoo				
			Native kwongan heath and shrubland, banksia or eucalypt woodlands with 20-30% projected foliage cover. Moderate percentage of tree deaths (30-40%).				
			Baudin's Black Cockatoo				
			Marri-Jarrah Forest or woodlands with 20-30% projected foliage cover; OR Marri-Jarrah Forest with 40-60% projected foliage cover but vegetation condition reduced due to tree deaths (up to 30-40%).				
			Forest Red-tailed Black Cockatoo				
			Marri-Jarrah-Karri Forest, other eucalypt woodlands, or allocasuarina woodlands with: 20-30% projected foliage cover; OR 40-60% projected foliage cover but veg. condition reduced due to tree deaths (up to 30-40%).				
	3	Low to moderate	Carnaby's Black Cockatoo				
			Native kwongan heath and shrubland, banksia or eucalypt woodlands with 10-20% projected foliage cover.				
			Baudin's Black Cockatoo				
			Marri-Jarrah Forest or woodlands with 5-20% projected foliage cover.				
			Forest Red-tailed Black Cockatoo				
			Marri-Jarrah-Karri Forest, other eucalypt woodlands, or allocasuarina woodlands with 5-20% projected foliage cover.				
	2	Low	Carnaby's Black Cockatoo				
			Native kwongan heath and shrubland, banksia and eucalypt woodlands with <10% projected foliage cover; OR Paddocks and/or urban areas with scattered foraging trees such as banksias, marri.				
			Baudin's Black Cockatoo				
			Marri-Jarrah Forest or woodlands with 1-5% projected foliage cover; OR Paddocks and/or urban areas with scattered foraging trees such as banksia, hakea, dryandra.				

Vegetation condition and structure. Habitat features			Forest Red-tailed Black Cockatoo				
			Marri-Jarrah-Karri Forest, other eucalypt woodlands, or allocasuarina woodlands with 1-5% projected foliage cover; OR Paddocks and/or urban areas with scattered food plants such as Cape Lilac, *Eucalyptus caesia* and *E. erythrocorys*.				
	1	Negligible to low	All species				
			Scattered specimens of known food plants but projected foliage cover of these is <2%. May include: paddocks or urban areas with scattered foraging trees.				
	0	None	All species				
			No Proteaceae, eucalypts or other potential sources of food. May include bare ground or developed sites devoid of vegetation (e.g. infrastructure, roads, gravel pits).				
			Totals				

Site Context								
Proximity of the site in relation to other habitat.	**3**	Site is within 6km of known breeding site.	or	Site is within 12km of other foraging resources with site condition of at least 3.				
	2	Site is within 12km of known breeding site.	or	Site is within 15km of other foraging resources with site condition of at least 4.				
	1	Site is within 15km of known breeding site.	or	Site is between 15km and 20km of other foraging resources with site condition of at least 5.				
	0	Site is further than 15km from known breeding site.	or	Site is further than 20km from other foraging resources.				
				Totals				

Final Totals				

Indicator		**Species Stocking Rate[3]**	**Impact Site**			**Offset Site**		
			CBC	**BBC**	**FRT**	**CBC**	**BBC**	**FRT**
Confirm presence/ absence of species.	**Yes**	Species is seen or reported regularly and/or there is abundant foraging evidence, e.g. chewed nuts can be identified as this species. Regularly is when the species is seen at intervals of every few days or weeks for at least several months of the year.						
	No	Species is recorded or reported very infrequently and there is little or no foraging evidence.						

[3] Species stocking rate is indicated by yes or no to confirm if any of the species is frequently present or not. If yes, the presence must be for the species being impacted by the proposal, not for a species that will not be impacted.

Legend	
	If the site scores between 0-2 (low to no value) for site condition, 0 for the site context score, or is **No** for species stocking rate, it is extremely unlikely to be considered as suitable habitat. This would not be appropriate to use as an offset site.

The metrics used to determine Site Condition, Site Context, and Species Stocking Rate were developed by the Department of Climate Change, Energy, the Environment, and Water in consultation with species experts in WA.

A standard habitat quality scoring system for a species allocates scores out of 3 for both site condition and site context, and out of 4 for species stocking rate. However, as black cockatoos are very mobile, this HQS uses a score out of 7 for site condition and a score out of 3 for site context. Site condition is considered the key factor in determining the quality of habitat for these black cockatoo species. Species stocking rate is considered only in terms of presence or absence of the species and does not add to the total score. Note that the species, or strong indicators of the species, must be present, consistent with the presence/usage description above, for an offset to be considered suitable.