



WESTERN
ENVIRONMENTAL

3650 Toodyay Road, Bailup

Flora, Vegetation and Black Cockatoo
Assessment

Western Environmental Pty Ltd

(08) 6162 8980

PO Box 437, Leederville, WA 6903

enquiries@westenv.com.au

westenv.com.au



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ENVIRONMENTAL

3650 Toodyay Road, Bailup

Flora, Vegetation and Black Cockatoo
Assessment

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Trico Resources Pty Ltd
945 Abernethy Road
Oakford, WA 6121

Prepared by

Western Environmental Approvals Pty Ltd
Unit 5, 162 Colin Street
West Perth WA 6005
westenv.com.au



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Author	Reviewed by	Approved by
		
Julia Burr Environmental Consultant	Dale Newsome Director	Dale Newsome Director
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Executive Summary

Trico Resources commissioned Western Environmental Pty Ltd (WEPL) to undertake a flora and vegetation survey and Black Cockatoo habitat assessment of the road reserve of 3650 Toodyay Road, Bailup (the Survey Area). The Survey Area is 5.27 ha in area. This report provides information to support a Native Vegetation Clearing Permit (NVCP).

The scope of works included:

- A “Reconnaissance” level field survey as per the Environmental Protection Authority (EPA) Technical Guidance for Flora and Vegetation Surveys (2016) comprising the following:
 - Desktop assessment including DBCA database searches for Threatened and Priority Flora locations and Threatened and Priority Ecological Communities
 - An assessment of likelihood of occurrence for Threatened and Priority Flora and Ecological Communities identified by the desktop assessment and based on survey results.
 - Reconnaissance level flora and vegetation survey.
 - Vegetation condition mapping.
- An assessment of any potentially significant habitat trees or foraging areas for threatened Black Cockatoo species which commonly occur in the area.
- Present the desktop and survey results in a concise technical report, supported by mapping displaying desktop results, vegetation type, vegetation condition, potential Black Cockatoo breeding trees and foraging habitat.
- Supply a geospatial data package prepared in accordance with Index of Biodiversity Surveys for Assessments (IBSA) requirements.

The survey was undertaken on 27 February 2024.

Flora and Vegetation

A total of 29 vascular flora species were recorded from within the Survey Area from one relevé and opportunistic observations. One of these (3.4%) was non-native. Native species diversity was observed to be moderate overall. No State or Commonwealth listed Threatened or Priority Flora were recorded in the Survey Area. Due to the survey timing outside of spring, the overall Good to Very Good condition of the Survey Area and the resulting uncertainty, the post-survey likelihood of occurrence assessment considered five species to have a high-medium likelihood of occurrence.

Grass weeds, particularly Wild oat (*Avena barbata*), occurred in the Survey Area with a low to moderate abundance.

Three vegetation types were assessed within the Survey Area and considered representative of intact native vegetation. The vegetation of the Survey Area was in Degraded to Very Good condition (1.91 ha Very Good, 0.72 ha Good, 0.21 ha Degraded). This was consistent and representative of existing broad scale vegetation, soil and land system mapping for the area. The vegetation present is not representative of a State or Commonwealth listed Threatened Ecological Community (TEC) or DBCA listed Priority Ecological Community (PEC).

Black Cockatoo Habitat Assessment

A total of 96 potential breeding trees (Diameter at Breast Height (DBH) > 500 mm) were recorded, of these 76 trees did not show signs of potential nesting hollow development. Twenty trees were assessed as possessing small hollows which are of an insufficient size to support nesting for Black Cockatoos.

1.28 ha was classified as moderate to very high quality foraging habitat for Carnaby's Black Cockatoo and 1.13 ha for Baudin's and Forest Red-tailed Black Cockatoo respectively. The remaining 1.63 ha and 1.78 ha respectively was assessed as negligible. Foraging evidence for Forest Red-tailed Black Cockatoo was identified at two locations of the Survey Area where marri trees (*Corymbia calophylla*) were located.

Known roost sites were located 1.3 km northeast and 4.4 km northwest of the Survey Area. Feather of Carnaby's Black Cockatoo and foraging evidence from Forest Red-tailed Black Cockatoo (chewed marri nuts) were found. No other evidence of night roosting (e.g. piles of scats or chewed trees) were recorded within the Survey Area. During the field survey, two flocks (five and eleven individuals) of Carnaby's Black Cockatoos was observed flying over the Survey Area, however this observation is not sufficient to determine if a regular roosting site is present. All habitat types contained stands of tall eucalypts which may provide suitable roosting habitat. Access to permanent water is present from Red Swamp Brook intersecting the Survey Area and artificial ponds within a radius of 2 km.

Impact Assessment

The proposed works necessitate the clearing of 1.25 ha of native vegetation, comprised of:

- 0.93 ha in Very Good condition,
- 0.23 ha in Good condition, and
- 0.09 ha in Degraded condition.

This includes the following impacts on black cockatoo:

- Loss of 43 potential breeding trees (DBH \geq 500 mm), comprised of:
 - 17 Wandoo
 - 14 Jarrah,
 - Five Marri, and

- Seven are stags.

None of these trees show any signs of potential breeding hollows.

- Loss of 0.69 ha of foraging habitat, of which
 - 0.61 ha is of Very High quality foraging habitat.
 - 0.08 ha is of Low-Moderate to Moderate quality foraging habitat.

The identified impacts are considered unlikely to be at variance with any of the clearing principles under Schedule 5 of the EP Act and are not considered significant under the EPBC Act.

Acronyms and Abbreviations

Abbreviation	Full Title
BAM Act	<i>Biosecurity and Agriculture Management Act 2007</i>
BC Act	<i>Biodiversity Conservation Act 2016</i>
CR	Critically Endangered
DBCA	Department of Biodiversity, Conservation and Attractions
DCCEEW	Department of Climate Change, Energy, the Environment and Water
DEWHA	Department of the Environment Water Heritage and the Arts
DPIRD	Department of Primary Industries and Regional Development
DRF	Declared Rare Flora
DWER	Department of Water and Environmental Regulation
DWER	Department of Water and Environmental Regulation
EIA	Environmental Impact Assessment
EN	Endangered
EP Act	<i>Environmental Protection Act 1986</i>
EPA	Environmental Protection Authority
EPBC Act	<i>Environment Protection Biodiversity and Conservation Act 1999</i>
ESA	Environmentally Sensitive Area
GDE	Groundwater Dependent Ecosystem
GIS	Geographic Information System
GPS	Global Positioning System
ha	Hectare
IBRA	Interim Biogeographic Regionalisation for Australia
IBSA	Index of Biodiversity Surveys for Assessments
km	Kilometres
m	Metres
MA	Marine
MI	Migratory
MNES	Matters of National Environmental Significance
NVIS	National Vegetation Information System
OS	Other Specially Protected
P	Priority
PEC	Priority Ecological Community
PF	Priority Flora
PMST	Protected Matters Search Tool

Abbreviation	Full Title
T	Threatened
TEC	Threatened Ecological Community
TPFL	Threatened and Priority Flora Database
TPFRF	Threatened and Priority Flora Report Forms
VU	Vulnerable
WA	Western Australia
WAH	Western Australian Herbarium
WC Act	<i>Wildlife Conservation Act 1950</i>
WEPL	Western Environmental Pty Ltd
WoNS	Weeds of National Significance

Table of Contents

1.	Introduction	11
1.1	Project Background and Location	11
1.2	Objectives	11
1.3	Survey Limitations and Constraints	14
2.	Existing Environment.....	16
2.1	Pre-European Vegetation Types.....	16
2.2	Wetlands and Hydrology	17
2.3	Environmentally Sensitive Areas and Conservation Estate.....	17
2.4	Land Use History.....	17
2.5	Heritage	17
3.	Methodology.....	21
3.1	Desktop Assessment.....	21
3.1.1	Database Searches	21
3.1.2	Likelihood of Occurrence.....	21
3.2	Flora and Vegetation Survey	22
3.2.1	Field Survey Timing and Survey Team	22
3.2.2	Vegetation Description and Classification	22
3.2.3	Vegetation Condition Assessment.....	22
3.3	Fauna Survey	23
3.3.1	Black Cockatoo Habitat Assessment.....	23
4.	Results.....	26
4.1	Desktop Assessment and Likelihood of Occurrence	26

4.1.1	Flora	26
4.1.2	Ecological Communities.....	26
4.2	Flora and Vegetation	33
4.2.1	Flora	33
4.2.2	Vegetation	35
4.3	Black Cockatoo Habitat Assessment	46
4.3.1	Breeding Habitat Assessment.....	46
4.3.2	Foraging Habitat Assessment	49
4.3.3	Roosting Habitat Assessment	53
5.	Impact Assessment	58
5.1	Impacts to Aboriginal Heritage Site ID 15979	58
5.2	Impacts to Native Vegetation.....	58
5.3	Impacts to Black Cockatoo	59
5.5	Assessment Against Clearing Principles	61
6.	Discussion	67
7.	References	69

Tables

Table 1: Limitations and Constraints of the Flora and Vegetation Survey	14
Table 2: Pre-European Vegetation Association and Complex Representation within the Northern Jarrah Forest	16
Table 3: Database Searches of the Survey Area	21
Table 4: Likelihood of Occurrence Criteria	22
Table 5: Black Cockatoo Potential Breeding Tree Class.....	24
Table 6: Flora Database Search Results (DBCA Database Search using 10 Km Buffer, PMST 10 km buffer) and Likelihood of Occurrence	27
Table 7: Threatened Ecological Communities Database Search Results (DBCA Database Search using 10 km buffer, PMST 10 km buffer)	31
Table 8: Flora Inventory.....	34

Table 9: Vegetation Types Present in Survey Area.....	36
Table 10: Vegetation Condition Extents (as per EPA, 2016 condition scale)	42
Table 11: Black Cockatoo Nesting Hollow Characteristics	46
Table 12: Foraging Quality Scoring Tool (DAWE, 2022)	50
Table 13: Habitat Quality Scoring Tool - Site Condition Extent.....	51
Table 14: Habitat Quality Scoring Tool - Site Context	51
Table 15: Final Habitat Quality Scoring Tool Score.....	52
Table 16: Impacts to Black Cockatoo Habitat.....	59
Table 17: Assessment against Ten Clearing Principles	62

Figures

Figure 1: Survey Area.....	13
Figure 2: Surface Water Features and Topography.....	19
Figure 3: Heritage Sites.....	20
Figure 4: Database Search Results Flora and Communities	32
Figure 5: Vegetation Types	44
Figure 6: Vegetation Condition.....	45
Figure 7: Black Cockatoo Potential Breeding Habitat.....	48
Figure 8: Black Cockatoo Foraging Habitat Score.....	54
Figure 9: Black Cockatoo Foraging Habitat Extent 12 km Buffer.....	57
Figure 10: Clearing Impact on Black Cockatoo Habitat	60

Appendices

Appendix A	Legislation
Appendix B	Definitions and Criteria
Appendix C	Potential Black Cockatoo Breeding Habitat
Appendix D	Black Cockatoo Foraging Habitat Scoring Tool

1. Introduction

1.1 Project Background and Location

Tricon Resources Pty Ltd (the “Proponent”) has been granted development approval WAPC 27-50106-1 by the Western Australian Planning Commission (WAPC) for the extraction of gravel at 3650 Toodyay Road, Bailup (the Site).

In order for heavy vehicles and machinery to safely access the Site without disrupting traffic on Toodyay Road, a road widening and construction of an acceleration lane is required. The proposed action necessitates the clearing of native vegetation within the Toodyay Road road reserve. WEPL has undertaken a flora and vegetation survey and black cockatoo assessment of the road reserve (the Survey Area) as presented in Figure 1 to provide information to support a Native Vegetation Clearing Permit (NVCP).

The Survey Area is situated within the Jarrah Forest IBRA bioregion and the Northern Jarrah Forest (JAF01) subregion. It covers 5.27 ha.

1.2 Objectives

The purpose of the survey was to delineate key flora, vegetation and Black Cockatoo habitat values within the Survey Area and identify potential environmental sensitivities and values that may occur.

The scope of works included:

- Undertake a “Reconnaissance” level field survey as per the Environmental Protection Authority (EPA) *Technical Guidance for Flora and Vegetation Surveys* (2016) comprising the following:
 - Desktop assessment including DBCA database searches for Threatened and Priority Flora locations and Threatened and Priority Ecological Communities.
 - An assessment of likelihood of occurrence for Threatened and Priority Flora and Ecological Communities identified by the desktop assessment and based on survey results.
 - Reconnaissance level flora and vegetation survey.
 - Vegetation condition mapping and significant weed survey.
- Undertake an assessment of any potentially significant habitat trees or foraging areas for threatened fauna, specifically Black Cockatoo species which may occur in the area.
- Present the desktop and survey results in a concise technical report, supported by mapping displaying desktop results, vegetation type, vegetation condition, potential Black Cockatoo breeding trees and foraging habitat.

- Supply a geospatial data package prepared in accordance with Index of Biodiversity Surveys for Assessments (IBSA) requirements.

This report presents the results of the field survey undertaken to support the above objectives.

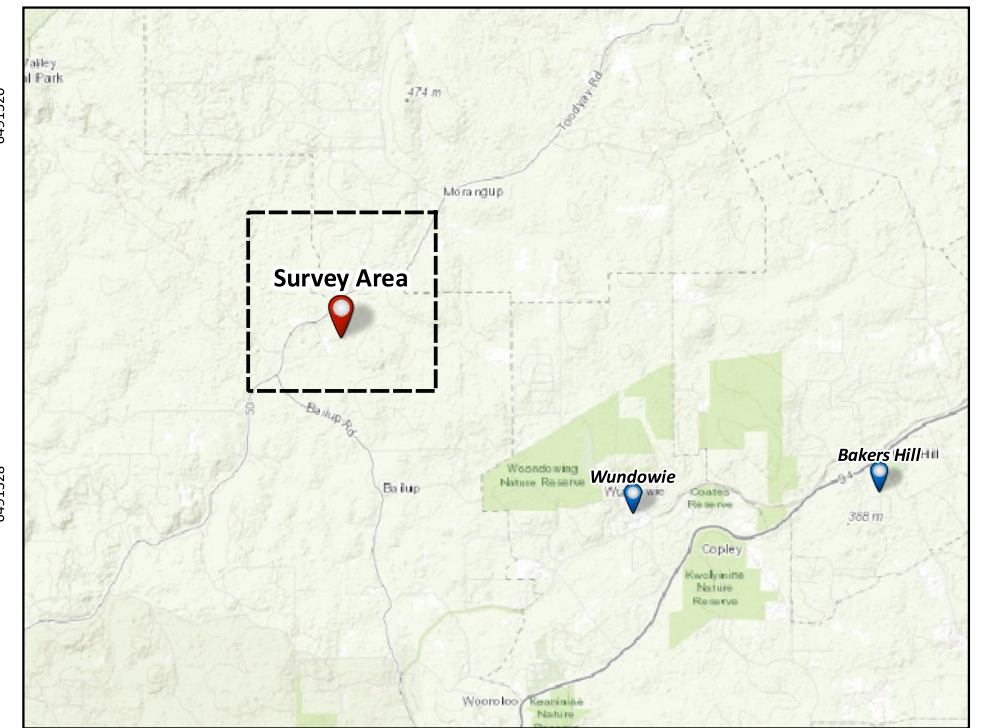
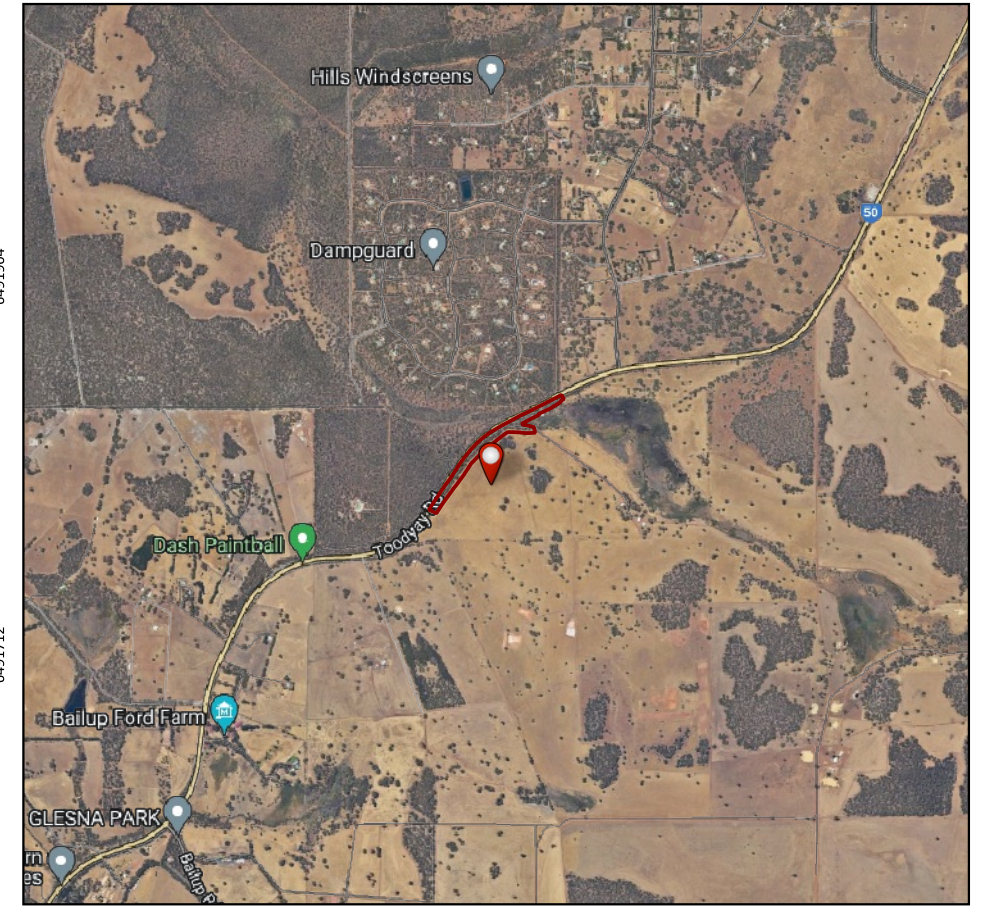


Figure 1: Survey Area

SCALE 1:3,839	SHEET SIZE A3 COLOUR
COORDINATE REFERENCE SYSTEM GDA2020 / MGA zone 50	
DATA SOURCE LANDGATE AERIAL IMAGERY Summer 2023	

PROJECT/REPORT NAME Flora, Vegetation and Black Cockatoo Assessment 3650 Toodyay Road, Bailup	
CLIENT Trico Resources Pty Ltd	
PROJECT NUMBER A24.011	VERSION 0
DRAWN BY / REVIEWED BY MD/JB	DATE 12/4/2024

Legend

	Survey Area
	Clearing Extent Boundary

No	Description	Drawn	Approved	Date
A	Original issue	MD	JB	12/4/2024

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



1.3 Survey Limitations and Constraints

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

Table 1: Limitations and Constraints of the Flora and Vegetation 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 in accordance with the Flora and Vegetation Technical Guidance and was considered appropriate to provide broad information required to support the development of the master plan.
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 reviewed as part of the desktop assessment.
Site Access	Negligible	The Survey Area was accessed by vehicle and on foot. The entire of the Survey Area containing vegetation was traversed by foot. Survey effort for the reconnaissance flora and vegetation survey was suitable with one relevè sampled across the Survey Area with additional mapping notes, undertaken to aid vegetation and condition mapping and delineation.
Survey Intensity and Extent	Negligible	Survey effort for specific targeted habitat assessments for Black Cockatoos was suitable to adequately sample habitats present. Assessment of potential Black Cockatoo nesting hollows was from ground-based assessment only. A follow up detailed hollow inspection may be required to confirm suitability.
Experience	Moderate	The ecologist leading the field survey (Lovisa Thambert) has been conducting flora and vegetation surveys and fauna habitat assessments in Western Australia for two years.
Timing, weather, season	Moderate	The recommended primary survey period for flora and vegetation surveys for the region as per the EPA Technical Guidance occurs in spring (September-November). The survey was completed in late February. The seasonal timing was originally considered appropriate considering the location of the Survey Area directly adjacent to a major state road and a cleared paddock. There was therefore a high likelihood of significant disturbance and the condition of the Site was expected to be Degraded or lower. The result of the survey showed that the condition was higher than expected (Degraded to Very Good) and therefore there is a chance that perennials or annuals were missed due to potentially being sterile during the survey.
Proportion of the flora and fauna recorded and/or	Moderate	23 vascular flora taxa were recorded, but a comprehensive flora inventory was not collected due to the timing of the survey outside flowering season. Native species diversity was observed to be moderate for the Survey Area. There is however a potential that some species were missed.

Possible Limitation	Degree of Limitation (Significant, Moderate or Negligible)	Potential Constraints on Survey Outcomes
collected, and any identification issues		
Mapping Reliability	Negligible	The majority of the Survey Area was traversed by foot and mapping reliability is considered high.
Disturbances (fire, flood etc.)	Negligible	Areas of disturbance associated with historic clearing for residential purposes and weeds were recorded but were not a constraint on the results of the survey.

2. Existing Environment

2.1 Pre-European Vegetation Types

During the 1970s, John Beard and associates conducted a systematic survey of native vegetation, describing the vegetation systems in Western Australia. Beard (1980) mapped the vegetation of the Jarrah Forest at 1:1,000,00 scale (Beard, 1980).

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 DPIRD (DPIRD-006). Extents are updated periodically by Department of Biodiversity, Conservation and Attractions (DBCA) (Government of Western Australia, 2019a). This mapping indicates that the Survey Area intersects one pre-European vegetation association:

- East Darling_3003: Medium forest; jarrah & marri on laterite with wandoo in valleys, sandy swamps with teatree and Banksia

Regional vegetation for the South West forest region of Western Australia (at vegetation complex level) was mapped by Matiske and Havel (1998) and are maintained in digital form by DBCA (DBCA-047). The mapping indicates that the Survey Area intersects one pre-European regional vegetation complex:

- Pindalup (224): Open forest of *Eucalyptus marginata* subsp. *thalassica* - *Corymbia calophylla* on slopes and open woodland of Eucalyptus wandoo with some Eucalyptus patens on the lower slopes in semiarid and arid zones.
- Dwellingup (81): Open forest to woodland of *Eucalyptus marginata* subsp. *thalassica* - *Corymbia calophylla* on lateritic uplands in semiarid and arid zones.

The pre-European vegetation association and vegetation complexes identified from the Survey Area and its pre-European and current extents within the Northern Jarrah Forest bioregion are listed in Table 2 (Government of Western Australia, 2019a; Government of Western Australia, 2019b).

Table 2: Pre-European Vegetation Association and Complex Representation within the Northern Jarrah Forest

Vegetation	Original Extent (ha)	Current Extent (ha)	% Remaining	% Managed for Conservation
East Darling_3003 Association (Government of Western Australia, 2019a)	66,451.58	39,061.78	58.78	7.81
Pindalup Complex PN (Unit 224) (Government of Western Australia, 2019b)	167,151.00	128,358.24	76.79	14.32

Vegetation	Original Extent (ha)	Current Extent (ha)	% Remaining	% Managed for Conservation
Dwellingup Complex D4 (Unit 81) (Government of Western Australia, 2019b)	132,415.59	115,661.52	87.35	12.03

2.2 Wetlands and Hydrology

The Survey Area is located outside mapped wetland datasets by DBCA. Review of aerial imagery indicates that no wetlands are located within the vicinity of the Site.

A drainage line runs east to west passing through the northern portion of the Survey Area as shown in Figure 2 (*DWER-031, DPIRD-072*). This drainage line, Red Swamp Brook, is classed as major tributary to the Avon River 12 km northwest of the Survey Area. It is associated with the registered Aboriginal heritage site ID 15979 (see Section 2.5).

2.3 Environmentally Sensitive Areas and Conservation Estate

Environmentally Sensitive Areas (ESAs) are declared by the Department of Water and Environmental Regulation (DWER) to prevent the degradation of important environmental values such as Threatened Flora, Threatened Ecological Communities (TECs) or significant wetlands.

The Survey Area does not overlap with mapped ESAs (*DWER-046*), Bush Forever sites (*DPLH-019*) or land otherwise managed by DBCA (*DBCA-011*).

2.4 Land Use History

The project area adjacent to the Survey Area has been historically cleared for agricultural purposes prior to 1965 (Landgate, 2024). The Survey Area itself has been partially cleared during the construction of Toodyay Road in the 19th century with potential revegetation and/or regrowth occurring. Vegetation around the drainage line appears to be remnant (*DPIRD-005*).

2.5 Heritage

According to the Aboriginal Cultural Heritage Inquiry System (ACHIS), one registered Aboriginal heritage site intersects with the Survey Area (Figure 3):

- Aboriginal heritage site (Place ID 15979): Avon River - Mythological, Camp, Natural Feature, Water Source, Other: Food Resource

The heritage site is associated with Red Swamp Brook and passes through the northern portion of the Survey Area flowing from east to west. The site is potentially impacted by the proposal. Further details are discussed in Section 5.1.

Other registered sites within the vicinity of the Survey Area are:

- Place ID 3435: Regal Hill - Artefacts / Scatter, Fish Trap, Modified Tree, Camp, Hunting Place, Plant Resource, 427 m north-west of the Survey Area
- Place ID 3797: Bailup - Ceremonial, Camp, Hunting Place, Meeting Place, 1.7 km south-west of the Survey Area

These sites are not going to be impacted. No other heritage sites have been identified within or in the vicinity of the Survey Area.



Figure 2: Surface Water Features and Topography


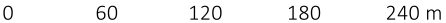





 	PROJECT/REPORT NAME Flora, Vegetation and Black Cockatoo Assessment 3650 Toodyay Road, Bailup		Legend  Survey Area Hydrography Linear (Hierarchy) (DWER-031)  Major Tributary 2m Contours (DPIRD_072)  Each 5m  Each 1m	<table border="1"> <thead> <tr> <th>No</th> <th>Description</th> <th>Drawn</th> <th>Approved</th> <th>Date</th> </tr> </thead> <tbody> <tr> <td>A</td> <td>Original issue</td> <td>MD</td> <td>JB</td> <td>11/4/2024</td> </tr> <tr> <td> </td> <td> </td> <td> </td> <td> </td> <td> </td> </tr> <tr> <td> </td> <td> </td> <td> </td> <td> </td> <td> </td> </tr> <tr> <td> </td> <td> </td> <td> </td> <td> </td> <td> </td> </tr> </tbody> </table>	No	Description	Drawn	Approved	Date	A	Original issue	MD	JB	11/4/2024															
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SCALE 1:4,598	SHEET SIZE A3 COLOUR	CLIENT Trico Resources Pty Ltd	NOTES: Cadastral boundary from LANDGATE 2022. Label corresponds to the vegetation association number.																										
COORDINATE REFERENCE SYSTEM GDA2020 / MGA zone 50	PROJECT NUMBER A24.011	VERSION 0	 WESTERN ENVIRONMENTAL Western Environmental Pty Ltd 08 6244 2310 enquiries@western.com.au Level 3/25 Prowse St, West Perth WA 6005 western.com.au																										
DATA SOURCE LANDGATE AERIAL IMAGERY Summer 2023	DRAWN BY / REVIEWED BY MD/JB	DATE 11/4/2024																											



Figure 3: Heritage

SCALE 1:3,839	SHEET SIZE A3 COLOUR
COORDINATE REFERENCE SYSTEM GDA2020 / MGA zone 50	
DATA SOURCE LANDGATE AERIAL IMAGERY Summer 2023	

PROJECT/REPORT NAME Flora, Vegetation and Black Cockatoo Assessment 3650 Toodyay Road, Bailup	
CLIENT Trico Resources Pty Ltd	
PROJECT NUMBER A24.011	VERSION 0
DRAWN BY / REVIEWED BY MD/JB	DATE 11/4/2024

Legend				
	Survey Area			
	Aboriginal Cultural Heritage - Register (DPLH-099)			
	Aboriginal Cultural Heritage - Historic (DPLH-098)			

No	Description	Drawn	Approved	Date
A	Original issue	MD	JB	11/4/2024

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

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Western Environmental Pty Ltd
08 6244 2310 | enquiries@western.com.au
Level 3/25 Prowse St, West Perth WA 6005
western.com.au

3. Methodology

3.1 Desktop Assessment

3.1.1 Database Searches

Database searches were undertaken to compile a list of potential conservation significant flora and ecological communities within or surrounding the Survey Area (Table 3). In addition, an EPBC Protected Matters Search Tool (PMST) was undertaken to identify the potential for Matters of National Environmental Significance (MNES) to occur within or surrounding the Survey Area (DEECCW, 2022).

Table 3: Database Searches of the Survey Area

Database Name	Date Received and Reference Number	Search Type	Search Area
Threatened and Priority Ecological Communities database search (Department of Biodiversity Conservation and Attractions)	1/03/2024 56-0224EC	TECs and PECs	10 km buffer around the Survey Area
Threatened and Priority Flora (TPFL) database search (Department of Biodiversity Conservation and Attractions)	5/03/2024 10-0324FL	Threatened and Priority Flora	10 km buffer around the Survey Area
Western Australian Herbarium (WAHerb) flora database search (Department of Biodiversity Conservation and Attractions)	5/03/2024 10-0324FL	Threatened and Priority Flora	10 km buffer around the Survey Area
Protected Matters Search Tool Department of Agriculture Water and the Environment, 2022a)	11/03/2024	Commonwealth listed Threatened Flora and fauna and TECs	10 km buffer around the Survey Area

3.1.2 Likelihood of Occurrence

Conservation listed flora communities identified from the desktop assessment were assessed to determine the likelihood of their occurrence within the Survey Area, both prior to and post field survey. The assessment was completed based on the likelihood of occurrence criteria presented in Table 4.

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

Table 4: Likelihood of Occurrence Criteria

Likelihood	Criteria
Recorded	Recorded in the Survey Area from database searches (if confident record is accurate), previous survey by others or by current survey.
High	Suitable habitat occurs within the Survey Area; and <ul style="list-style-type: none"> Records of flora species <5 km from the Survey Area. With record <30 years old.
Medium	Suitable or marginally suitable habitat occurs within the Survey Area; and <ul style="list-style-type: none"> Records of flora species <5 km from the Survey Area with record >30 years old. Records 5-20 km from the Survey Area. Species is strongly linked to a specific habitat, which occurs within the Survey Area and records are present >20 km from the Survey Area.
Low	<ul style="list-style-type: none"> Records are >20km from the Survey Area The species has a well understood and specific habitat preference/ requirements, which is absent from the Survey Area. Records are historical only, or are pre mapping procedures (e.g. records assigned to towns or place names). Suitable habitat is present, but there are no existing records of the species from the region despite reasonable previous search effort.

3.2 Flora and Vegetation Survey

3.2.1 Field Survey Timing and Survey Team

The field survey was conducted on 27 February 2024. The survey was undertaken by WEPL graduate environmental scientist Lovisa Thambert (Flora Licence FB62000468) and WEPL environmental scientist Julia Burr.

Relevés (unmeasured area of approximately the same size as 10 m x 10 m quadrats) were used to record vegetation as per requirements of a Reconnaissance level survey.

3.2.2 Vegetation Description and Classification

Vegetation within the Survey Area was described 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 vegetation type.

3.2.3 Vegetation Condition Assessment

Vegetation condition within the Survey Area was assessed during traverses and through relevés of the Survey Area using the Vegetation Condition Scale for the appropriate bioregion as per the *Technical Guidance for Flora and Vegetation Surveys for Environmental Impact Assessment* (EPA, 2016).

Mapping notes were also used to record changes in vegetation and condition.

3.3 Fauna Survey

A habitat assessment for Black Cockatoos were undertaken as per *Commonwealth referral guidelines for Threatened Black Cockatoos* (DCCEEW, 2022).

3.3.1 Black Cockatoo Habitat Assessment

The Swan Coastal Plain is used by Black Cockatoos primarily for foraging resources, with some small patches of breeding habitat. Vegetation used by Black Cockatoos is dominated by *Banksia* spp. and tuart (*Eucalyptus gomphocephala*) woodlands, as well as marri (*Corymbia calophylla*) and jarrah (*E. marginata*) (DCCEEW, 2022).

On the Swan Coastal Plain, Baudin's Black Cockatoo and Carnaby's Black Cockatoo are most commonly present from February through to September, with Forest Red-tailed Black Cockatoo presence being flexible across the year. The timing of the survey in February provided good opportunity to record foraging individuals and nesting for Carnaby's Black Cockatoo. 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) (DCCEEW, 2022).

The Black Cockatoo habitat field survey followed the *Commonwealth referral guidelines for Threatened Black Cockatoos* (DCCEEW, 2022) for identifying breeding, foraging and roosting habitat.

Breeding Habitat Assessment

The Commonwealth defines breeding habitat as trees species, 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) (1.3 m from the ground) to develop a hollow, including:

- Greater than 500 mm DBH for most Eucalypts (jarrah, marri or tuart); or
- 300 mm in the case of wandoo and salmon gum (MRWA, 2022).

All trees of species with the potential to form hollows (typically jarrah, marri and tuart) and with sufficient diameter (i.e. DBH >500 mm) were recorded using a GPS. The following was recorded for each such tree:

- Species.
- DBH (approximately 1.3 m from the ground).
- Tree health (such as presence of dieback (*Phytophthora cinnamomi*) or marri canker (*Quambalaria coyrecup*) and other threatening processes); and
- Presence of hollows (as observable from the ground).

In addition to Commonwealth guidelines for assessing potential breeding trees, a scoring system based on that developed by Dr Mike Bamford was applied to class potential breeding trees.

Table 5: Black Cockatoo Potential Breeding Tree Class

Class	Description of Tree and Hollows/Activity
1	Active nest observed; adult (or immature) bird seen entering or emerging from hollow, eggs present.
2	Hollow of suitable size and angle visible with chew marks around entrance.
3	Potentially suitable hollow visible but no chew marks present; or potentially suitable hollow present (as suggested by structure of tree, such as large, vertical trunk broken off at a height of >10m).
4	Tree with hollows or broken branches that might contain hollows, but hollows or potential hollows are not of a suitable size, or are aligned or obstructed so as to prevent access
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.

Foraging Habitat Assessment

The Commonwealth 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 Black Cockatoo and the Forest Red-tailed Black Cockatoo, while proteaceous heaths (shrublands dominated by *Banksia*, *Hakea* and *Grevillea* species) are primarily utilised by Carnaby's Black Cockatoo (DEECCW 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.

Vegetation mapping of the Survey Area was used in conjunction with the site assessment to determine the foraging quality using the Foraging Habitat Scoring Tool (DCCEEW, 2022). The Foraging Habitat Scoring Tool (DCCEEW, 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 DCCEEW 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 D for detailed scoring tool methodologies.

Information collected for the Survey Area was also contextualised with consideration to the wider availability of foraging habitat for black cockatoos in the surrounding area (12 km radius). 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 (DCCEEW, 2022). Analysis utilises Remnant Native Vegetation Extent mapping (DPIRD-005) and Vegetation Complexes- Swan Coastal Plain and South West forest region (DBCA-046 and DBCA-047) mapping to define extent and type of remnant vegetation.

Roosting Habitat Assessment

Roosting habitat was assessed based on 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 and Likelihood of Occurrence

4.1.1 Flora

DBCA database searches identified ten conservation listed flora species occurring within 10 km of the Survey Area or identified by Commonwealth PMST as potentially occurring in the region (see Figure 4 and Table 6). No Threatened or Priority Flora species have been previously recorded within the Survey Area.

The likelihood of occurrence assessment identified that three species had a 'High' likelihood of occurrence and six species had a 'Medium' likelihood of occurrence.

4.1.2 Ecological Communities

One State listed Threatened Ecological Communities (TEC) and Priority Ecological Community (PEC) occur within 20 km of the Survey Area or are identified by Commonwealth PMST as potentially occurring in the region (see Figure 4 and Table 7). This community has a low likelihood of occurrence within the Survey Area due to unsuitable habitat and the location of the Survey Area outside the community's natural distribution.

Table 6: Flora Database Search Results (DBCA Database Search using 10 Km Buffer, PMST 10 km buffer) and Likelihood of Occurrence

Species	Conservation Status		Source		Species information (WAH 2022)		Habitat Occurs Within the Survey Area	Pre-Survey Likelihood of Occurrence	Post-Survey Likelihood of Occurrence
	State	Federal	PMST	DBCA	Flowering Period	Preferred Habitat			
<i>Thelymitra stellata</i>	EN	EN	x		Oct-Nov	Sand, gravel, lateritic loam	Yes	Low Survey Area is located outside the distribution range of the species. No DBCA record within 10 km.	Low
<i>Grevillea corrugata</i>	VU	EN	x		Aug-Sep	Gravelly Roadsides. loam.	Potentially	Low Survey Area is located outside the distribution range of the species. No DBCA record within 10 km.	Low
<i>Verticordia fimbrialepis</i> subsp. <i>fimbrialepis</i>	VU	EN	x		Oct-Dec/Jan	Gravelly sandy or clayey soils. Flats, road verges.	Potentially	Low Survey Area is located outside the distribution range of the species. No DBCA record within 10 km.	Low
<i>Diplolaena andrewsii</i>	EN	EN	x		Jul-Oct	Loam, clay. Granite outcrops & hillsides.	No	Low No DBCA records within 10 km.	Low
<i>Thelymitra dedmaniarum</i>	CR	EN	x		Nov-Dec/Jan	Granite	No	Low No DBCA records within 10 km.	Low
<i>Grevillea christineae</i>	EN	EN	x		Aug-Sep	Clay loam, sandy clay, often moist.	No	Low Survey Area is located outside the distribution range of the species. No DBCA record within 10 km.	Low

Species	Conservation Status		Source		Species information (WAH 2022)		Habitat Occurs Within the Survey Area	Pre-Survey Likelihood of Occurrence	Post-Survey Likelihood of Occurrence
	State	Federal	PMST	DBCA	Flowering Period	Preferred Habitat			
<i>Andersonia gracilis</i>	VU	EN	x		Sep-Nov	White/grey sand, sandy clay, gravelly loam. Winter-wet areas, near swamps.	No	Low Survey Area is located outside the distribution range of the species. No DBCA record within 10 km.	Low
<i>Diuris purdiei</i>	EN	EN	x		Sep-Oct	Grey-black sand, moist. Winter-wet swamps.	No	Low	Low
<i>Grevillea flexuosa</i>	VU	VU	x		Jul-Oct	Red-brown sand with laterite & gravel, sand over granite. Ridgetop plateau & associated breakaways.	Potentially	Low No DBCA records within 10 km, potential habitat present, Survey Area is within distribution range.	Low
<i>Acacia aphylla</i>	VU	VU	x		Aug-Oct	Sand, loam, clay loam. Granite outcrops, hills.	No	Low No DBCA records within 10 km.	Low
<i>Diuris micrantha</i>	VU	VU	x		Sep-Oct	Brown loamy clay. Winter-wet swamps, in shallow water.	No	Low No DBCA records within 10 km.	Low
<i>Anthocercis gracilis</i>	VU	VU	x		Sep-Oct	Sandy or loamy soils. Granite outcrops.	No	Low No DBCA records within 10 km.	Low
<i>Eleocharis keigheryi</i>	VU	VU	x		Aug-Nov	Clay, sandy loam. Emergent in freshwater: creeks, claypans.	No	Low No DBCA records within 10 km.	Low
<i>Schoenus</i> sp. Toodyay (G.J. Keighery & N. Gibson 2918)	P1			x	Unknown	Brown loam over gravel. Flat upland areas	No	Low Closest record is 8.4 km north from Survey Area.	Low

Species	Conservation Status		Source		Species information (WAH 2022)		Habitat Occurs Within the Survey Area	Pre-Survey Likelihood of Occurrence	Post-Survey Likelihood of Occurrence
	State	Federal	PMST	DBCA	Flowering Period	Preferred Habitat			
<i>Banksia nivea</i> subsp. Morangup (M. Pieroni 94/2)	P2			x	Apr or Jun or Aug or Sep	Not well understood. It has a highly restricted distribution as it is found at one location in the centre of subsp. <i>nivea</i> 's range (Sampson & Byrne, 2022).	Yes	High Closest record 4.6 km north-east from Survey Area.	High A prostrate shrub <i>Banksia</i> was recorded within the Survey Area. There is a slight potential it could be the P2 species. Due to the survey timing the specimen was sterile and could not be confidently identified.
<i>Drosera sewelliae</i>	P2			x	Oct	Laterite & silica sand soils	Yes	Medium Closest record is 8.6 km north from Survey Area.	Medium Due to survey timing and condition of Survey Area
<i>Grevillea candolleana</i>	P2			x	Aug-Sep	Laterite, lateritic loam. Hillsides.	Yes	Medium Closest record 6.1 km north-east from Survey Area.	Medium Due to survey timing and condition of Survey Area. <i>Grevillea</i> spp. were present.
<i>Verticordia citrella</i>	P2			x	Oct-Nov	Gravelly loam or sand. Low-lying damp areas, swamps.	No	High Closest record 1.5 km north-east from Survey Area.	Low Habitat confirmed not to be present

Species	Conservation Status		Source		Species information (WAH 2022)		Habitat Occurs Within the Survey Area	Pre-Survey Likelihood of Occurrence	Post-Survey Likelihood of Occurrence
	State	Federal	PMST	DBCA	Flowering Period	Preferred Habitat			
<i>Asteridea gracilis</i>	P3			x	Sep-Dec	Sand, clay, gravelly soils.	Potentially	Medium Closest record 8.9 km east from Survey Area.	Low
<i>Beaufortia purpurea</i>	P3			x	Oct-Dec Jan-Feb	or Lateritic or granitic soils. Rocky slopes.	Yes	High Closest record is 4.6 km north-east from Survey Area.	Medium Due to survey timing and condition of Survey Area.
<i>Tetratecha pilifera</i>	P3			x	Aug-Oct	Gravelly soils	Potentially	Medium Closest record 6.7 km south-east from Survey Area.	Low Habitat not present
<i>Verticordia huegelii</i> var. <i>tridens</i>	P3			x	Sep-Nov	Sandy or gravelly loam. Winter-wet areas, low hills.	No	Low Closest record 5 km north from the Survey Area.	Low
<i>Cyanicula ixiooides</i> subsp. <i>ixiooides</i>	P4			x	Aug-Oct	Laterite, gravel	Yes	Medium Closest record 8.1 km north from the Survey Area.	Medium Due to survey timing and condition of Survey Area. Species is hard to identify if not flowering.

Table 7: Threatened Ecological Communities Database Search Results (DBCA Database Search using 10 km buffer, PMST 10 km buffer)

Floristic Community Type	Community Description	Conservation Status		Database		Likelihood of Occurrence	Justification
		State	Federal	PMST	DBCA		
Eucalyptus Woodlands of the Western Australian Wheatbelt	The woodlands are dominated by a complex mosaic of eucalypt species with a tree or mallet1 form over an understorey that is highly variable in structure and composition.	P3	CR		x	Low	Survey Area is outside of distribution range of the community. Suitable habitat does not occur within the Survey Area. The closes buffered TEC record provided by DBCA is located 16 km north-east from the Survey Area.

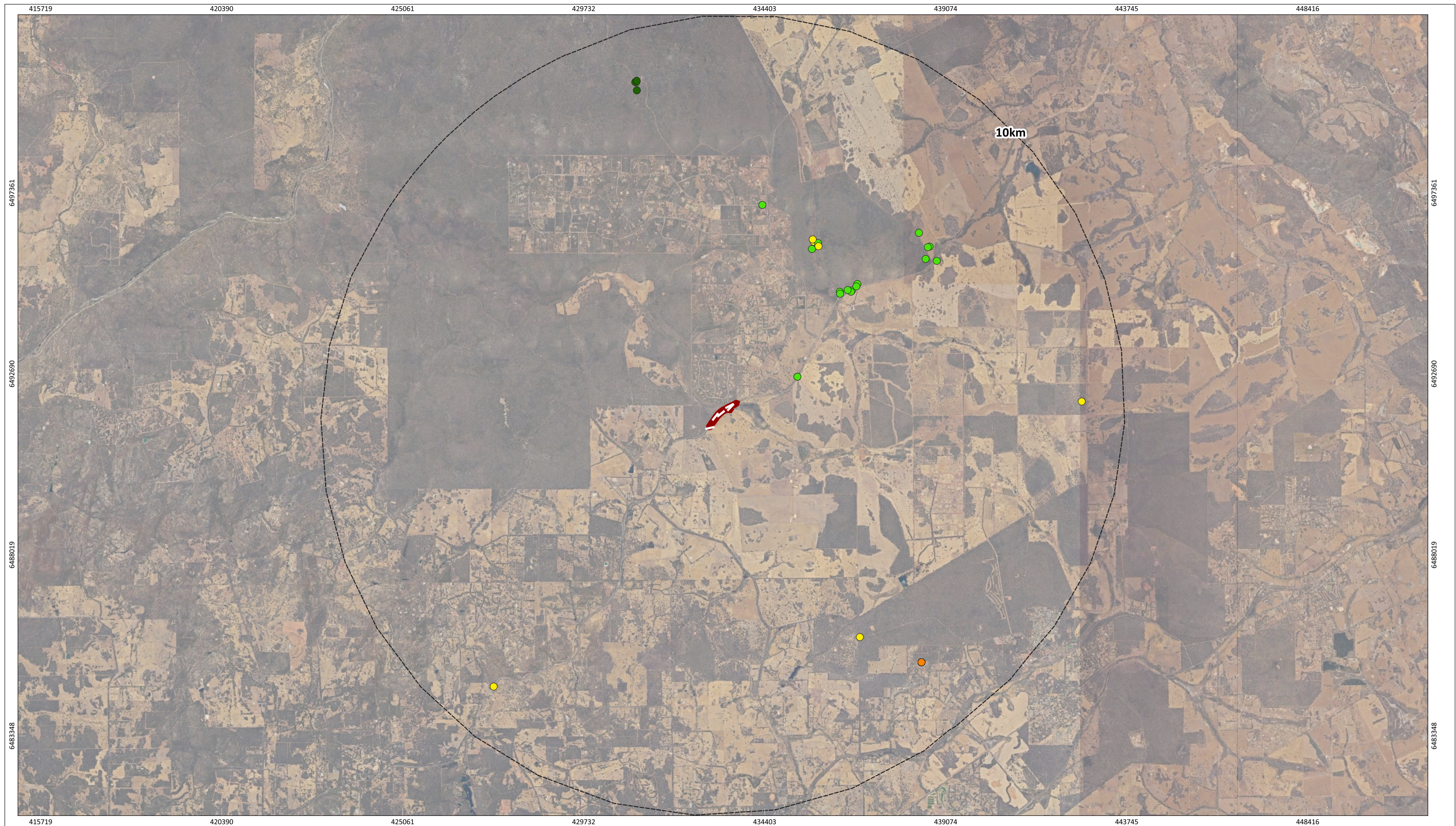


Figure 4: DBCA Database Search Results Flora and Communities

	PROJECT/REPORT NAME Flora, Vegetation and Black Cockatoo Assessment 3650 Toodyay Road, Bailup		Legend SurveyArea DBCA Database <ul style="list-style-type: none"> ● Priority 1 (DBCA) ● Priority 2 (DBCA) ● Priority 3 (DBCA) ● Priority 4 (DBCA) 	<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th>No</th> <th>Description</th> <th>Drawn</th> <th>Approved</th> <th>Date</th> </tr> </thead> <tbody> <tr> <td>A</td> <td>Original issue</td> <td>MD</td> <td>JB</td> <td>11/4/2024</td> </tr> <tr> <td> </td> <td> </td> <td> </td> <td> </td> <td> </td> </tr> <tr> <td> </td> <td> </td> <td> </td> <td> </td> <td> </td> </tr> <tr> <td> </td> <td> </td> <td> </td> <td> </td> <td> </td> </tr> </tbody> </table>	No	Description	Drawn	Approved	Date	A	Original issue	MD	JB	11/4/2024															
	No	Description		Drawn	Approved	Date																							
A	Original issue	MD	JB	11/4/2024																									
SCALE 1:93,430	SHEET SIZE A3 COLOUR	CLIENT Trico Resources Pty Ltd	NOTES: Cadastral boundary from LANDGATE 2022. Label corresponds to the vegetation association number.																										
COORDINATE REFERENCE SYSTEM GDA2020 / MGA zone 50	PROJECT NUMBER A24.011	VERSION 0	 Western Environmental Pty Ltd 08 8242 2310 enquiries@western.com.au Level 3/25 Prowse St, West Perth WA 6005 western.com.au																										
DATA SOURCE LANDGATE AERIAL IMAGERY Summer 2023	DRAWN BY / REVIEWED BY MD/JB	DATE 11/4/2024																											

4.2 Flora and Vegetation

4.2.1 Flora

Flora Species

A total of 29 vascular flora species were recorded from within the Survey Area from two relevés and opportunistic observations. One of these (3.4%) were non-native. Native species diversity was observed to be moderate. As per requirements for a Reconnaissance level survey, flora sampling focused on dominant and characteristic species.

Given the overall good condition of the Survey Area, there is a potential that not all species were detected due to the survey timing and dry conditions.

The flora inventory, presented as a site by species table is provided below in Table 8.

Threatened and Priority Flora

No Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (EPBC) listed or State *Biodiversity Conservation Act 2016* (BC Act) listed Threatened or Priority Flora species were recorded during the survey.

One honeypot Banksia was recorded, which could not be accurately identified due to its sterile nature at the time of the survey. Some individuals were identified in the field as *Banksia dallanneyi*, while others had the potential to be a subspecies of *Banksia nivea*.

Banksia nivea subsp. Morangup is listed by DBCA as Priority 2 species. The species had been assessed to have a 'High' likelihood of occurrence within the Survey Area. Given that the specimens were sterile at the time of the assessment, there is uncertainty if *Banksia nivea* subsp. Morangup is present within the Survey Area.

Due to the high condition of habitat, survey timing outside of flowering season and the therefore high degree of uncertainty the post-field assessment considered one Priority 2 species to have a 'High' likelihood of occurrence and four Threatened and Priority flora species to have a 'Medium' likelihood of occurrence within the Survey Area (Table 6).

Flora of Other Significance

Flora may be considered of other conservation significance if it is a novel taxon or represents a range extension. None of the recorded taxa may be considered flora of other conservation significance. Due to the timing of the survey, there is however a slight residual uncertainty about the presence of such taxa.

Introduced Flora

One introduced taxon was recorded within the Survey Area, representing 3.4% of the total taxa recorded, see Table 8. The grass weed *Avena barbata* was present within VT02 and VT03, with 5-20% ground cover. Some other grassy weed species were present in areas with higher disturbance.

Table 8: Flora Inventory

Family	Species	Introduced
Asphodelaceae	<i>Xanthorrhoea preissii</i>	
Cyperaceae	<i>Lepidosperma sp.</i>	
Dilleniaceae	<i>Hibbertia hypericoides</i>	
Dilleniaceae	<i>Hibbertia sp.</i>	
Ericaceae	<i>Ericaceae</i>	
Fabaceae	<i>Acacia ?cochlearis</i>	
Fabaceae	<i>Acacia pulchella</i>	
Fabaceae	<i>Davesia sp.</i>	
Fabaceae	<i>Acacia sp.</i>	
Fabaceae	<i>Acacia saligna</i>	
Haemodoraceae	<i>Conostylis sp.</i>	
Iridaceae	<i>Patersonia occidentalis</i>	
Lauraceae	<i>Cassytha sp.</i>	
Myrtaceae	<i>Euclayptus marginata</i>	
Myrtaceae	<i>Eucalyptus wandoo</i>	
Myrtaceae	<i>Melaleuca ?viminea</i>	
Myrtaceae	<i>Eucalyptus rudis</i>	
Myrtaceae	<i>Corymbia calophylla</i>	
Phyllanthaceae	<i>Lysiandra calycina</i>	
Poaceae	<i>Avena barbara</i>	*
Poaceae	<i>Cynodon dactylon</i>	
Poaceae	<i>Briza maxima</i>	
Proteaceae	<i>Banksia squarrosa</i>	
Proteaceae	<i>Banksia ?dallanneyi</i> , potentially <i>Banksia nivea</i>	
Proteaceae	? <i>Grevillea sp.</i>	
Proteaceae	<i>Hakea lissocarpa</i>	
Restionaceae	<i>Desmocladius flexuosus</i>	
Typhaceae	<i>Typha orientalis</i>	
Zamiaceae	<i>Macrozamia riedlei</i> , could be <i>M. fraseri</i>	

4.2.2 Vegetation

Vegetation Types

The vegetation present throughout the Survey Area was considered to be representative of intact native vegetation.


An assessment of aerial photography suggested that the vegetation may have been cleared historically for the construction of Toodyay Road prior to 1965, which is the earliest date for which aerial photography is available. The species composition however suggested that the majority of the vegetation is either remnant native or regrowth as it represents remnant vegetation from surrounding areas.


Due to the timing of the survey, it was not possible for all species to be identified. Given the overall good condition of the Survey Area, it is likely that more species would be detected during flowering period in spring. Therefore, floristic analysis was not undertaken as the data was considered incomplete.

The vegetation present within the Survey Area is described below in Table 9 and shown in Figure 5.


Table 9: Vegetation Types Present in Survey Area


Vegetation Unit Description	Total Area, Proportion (%) of vegetation within Survey Area	Vegetation Condition	Photograph
<p>VT01 - Jarrah-marri open forest</p> <p><i>Eucalyptus marginata</i> and <i>Corymbia calophylla</i> over <i>Banksia squarrosa</i> and <i>Xanthorrhoea preissii</i> over native sedges and herbs.</p>	<p>1.34 ha 46.0%</p>	<p>Very Good</p>	

Vegetation Unit Description	Total Area, Proportion (%) of vegetation within Survey Area	Vegetation Condition	Photograph
			

Vegetation Unit Description	Total Area, Proportion (%) of vegetation within Survey Area	Vegetation Condition	Photograph
			

Vegetation Unit Description	Total Area, Proportion (%) of vegetation within Survey Area	Vegetation Condition	Photograph
<p>VT02 - Wandoo woodland</p> <p><i>Eucalyptus wandoo</i> woodland over <i>Banksia squarrosa</i> and <i>Xanthorrhoea preissii</i> over native and weedy herbs and sedges.</p> <p>Laterite outcrops and gravel</p>	<p>1.39 ha</p> <p>47.8%</p>	<p>Good</p>	

Vegetation Unit Description	Total Area, Proportion (%) of vegetation within Survey Area	Vegetation Condition	Photograph
<p>VT03 - <i>Eucalyptus rudis</i> over <i>Melaleuca</i> sp.</p> <p><i>Eucalyptus rudis</i> over <i>Melaleuca</i> ?<i>viminea</i> over native sedges and weedy herbs and grasses. Vegetation associated with drainage line.</p>	<p>0.18 ha 6.2%</p>	<p>Good</p>	

Vegetation Unit Description	Total Area, Proportion (%) of vegetation within Survey Area	Vegetation Condition	Photograph
			
TOTAL	2.91 ha 100.0%		

Vegetation Condition

The majority of vegetation in the Survey Area was considered to be in Good to Very Good condition (93.7%) (Table 10).

Table 10: Vegetation Condition Extents (as per EPA, 2016 condition scale)

Vegetation Condition	Extent (ha)	Extent (%)
Excellent	-	-
Very Good	1.91	65.6
Good	0.79	27.1
Degraded	0.21	7.2
Completely Degraded	-	-
Total	2.91	100

Threatened and Priority Ecological Communities

No vegetation types were identified as comprising a State or Commonwealth listed Threatened Ecological Community (TEC) or DBCA listed PEC.

Vegetation of Other Significance

As per the EPA Flora and Vegetation Technical Guidance (EPA, 2016), 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.

A portion of the Survey Area intersects with the mapped extent of the Pindalup complex and contains some key species as per the structural description in Heddle *et. al*, 1980. Key species are *Eucalyptus marginata* subsp. *thalassica* and *Corymbia calophylla* as well as *Eucalyptus wandoo*.

The current extent of this vegetation complex is 76.79 % of the pre-European extent as per Government of Western Australia 2019 report. This is above the 30% of pre-European extent national objective and targets for biodiversity conservation in Australia (Commonwealth of Australia, 2001). Due to the small proportion of intact native vegetation within the Survey Area it is not considered to represent a significant proportion of the regional pre-European extent.



Figure 5: Vegetation Types Present within the Survey Area


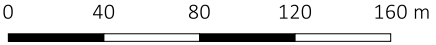






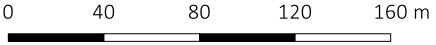





 	PROJECT/REPORT NAME Flora, Vegetation and Black Cockatoo Assessment 3650 Toodyay Road, Bailup		Legend  Survey Area Vegetation Type  VT01 - Jarrah-marri open forest  VT02 - Wandoo woodland  VT03 - Eucalyptus rudis over Melaleuca sp.	<table border="1"> <thead> <tr> <th>No</th> <th>Description</th> <th>Drawn</th> <th>Approved</th> <th>Date</th> </tr> </thead> <tbody> <tr> <td>A</td> <td>Original issue</td> <td>MD</td> <td>JB</td> <td>11/4/2024</td> </tr> <tr> <td> </td> <td> </td> <td> </td> <td> </td> <td> </td> </tr> <tr> <td> </td> <td> </td> <td> </td> <td> </td> <td> </td> </tr> <tr> <td> </td> <td> </td> <td> </td> <td> </td> <td> </td> </tr> </tbody> </table>	No	Description	Drawn	Approved	Date	A	Original issue	MD	JB	11/4/2024															
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DATA SOURCE LANDGATE AERIAL IMAGERY Summer 2023	DRAWN BY / REVIEWED BY MD/JB	DATE 11/4/2024																											



Figure 6: Vegetation Condition

 	PROJECT/REPORT NAME Flora, Vegetation and Black Cockatoo Assessment 3650 Toodyay Road, Bailup		Legend  Survey Area Vegetation  Degraded  Good  Very Good	<table border="1"> <thead> <tr> <th>No</th> <th>Description</th> <th>Drawn</th> <th>Approved</th> <th>Date</th> </tr> </thead> <tbody> <tr> <td>A</td> <td>Original issue</td> <td>MD</td> <td>JB</td> <td>11/4/2024</td> </tr> <tr> <td> </td> <td> </td> <td> </td> <td> </td> <td> </td> </tr> <tr> <td> </td> <td> </td> <td> </td> <td> </td> <td> </td> </tr> <tr> <td> </td> <td> </td> <td> </td> <td> </td> <td> </td> </tr> </tbody> </table>	No	Description	Drawn	Approved	Date	A	Original issue	MD	JB	11/4/2024															
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4.3 Black Cockatoo Habitat Assessment

The Survey Area falls within the modelled distribution for all three Black Cockatoo species (DAWE, 2022). Numerous records of the three species were present in DBCA database search results within 1 km of the Survey Area. Foraging evidence (chewed marri nuts) for Forest Red-tailed Black Cockatoo was opportunistically recorded during the field survey at one location on the fringe of the Survey Area and several feathers of Carnaby's Black Cockatoo were found adjacent to thickets of *Banksia squarrosa* within VT01 along Toodyay Road. Additionally, calls were heard, and two flocks (five and eleven individuals) of Carnaby's Black Cockatoo were seen flying over the Survey Area.

4.3.1 Breeding Habitat Assessment

Potential Black Cockatoo breeding trees are defined as those which either have a suitable nest hollow or are of a suitable DBH (> 500 mm for most species) to develop a hollow (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 understood suitable nesting hollow characteristics for the three species is provided below in Table 11.

Table 11: 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 mainly in karri, marri, jarrah, wandoo, bullich, and tuart Preferred hollow dimensions have not been specifically studied but are considered likely to be similar to that of the Carnaby's Black Cockatoo	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
Sources	DAWE, 2022.	DAWE, 2022, Saunders <i>et al.</i> , 2014a, Saunders <i>et al.</i> , 2014b.	DAWE, 2022, Johnstone <i>et al.</i> , 2013.

A total of 96 potential breeding trees (DBH > 500 mm) were recorded. Of these the large majority (76 trees) did not show signs of potential nesting hollow development (Class 5 trees). These 76 trees were comprised of:

- 15 *Corymbia calophylla* (marri).
- 32 *Eucalyptus marginata* (jarrah).
- 26 *Eucalyptus wandoo*, and
- Three stags.

Twenty trees were assessed as possessing small hollows which are of an insufficient size to support nesting, however these trees are of sufficient age and growth form to be developing hollows (Class 4 trees). These 20 trees were comprised of:

- One *Corymbia calophylla* (marri).
- Seven *Eucalyptus marginata* (jarrah).
- Three *Eucalyptus wandoo*.
- Eight stags, and
- One *Eucalyptus rudis* (flooded gum).

No trees were assessed as actually possessing a hollow with sufficient entry diameter to potentially support a suitable nesting hollow. See Figure 7 for locations. See Appendix D for summary of tree locations, species, DBH and tree health.

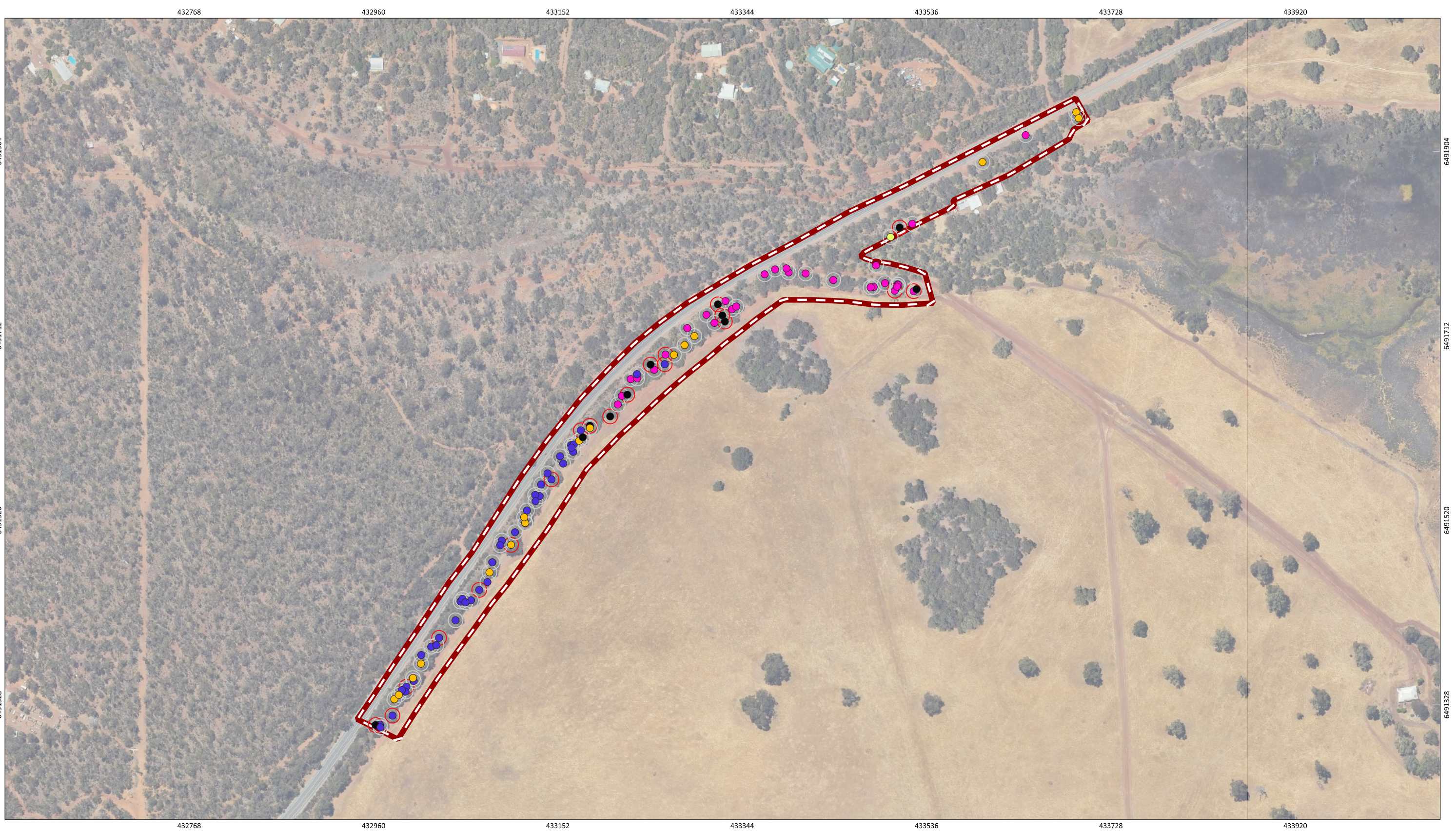


Figure 7: Black Cockatoo Potential Breeding Habitat

	PROJECT/REPORT NAME Flora, Vegetation and Black Cockatoo Assessment 3650 Toodyay Road, Bailup	Legend <div style="display: flex; justify-content: space-between;"> <div style="width: 45%;"> <p>Survey Area</p> <p>Tree Species</p> <ul style="list-style-type: none"> ● Dead ● Flooded Gum ● Jarrah ● Marri </div> <div style="width: 45%;"> <p>● Wandoo</p> <p>Bamford Tree Class</p> <ul style="list-style-type: none"> ○ 4 ○ 5 </div> </div>	<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th>No</th> <th>Description</th> <th>Drawn</th> <th>Approved</th> <th>Date</th> </tr> </thead> <tbody> <tr> <td>A</td> <td>Original issue</td> <td>MD</td> <td>JB</td> <td>16/4/2024</td> </tr> <tr> <td> </td> <td> </td> <td> </td> <td> </td> <td> </td> </tr> <tr> <td> </td> <td> </td> <td> </td> <td> </td> <td> </td> </tr> <tr> <td> </td> <td> </td> <td> </td> <td> </td> <td> </td> </tr> <tr> <td> </td> <td> </td> <td> </td> <td> </td> <td> </td> </tr> </tbody> </table> <p>NOTES: Cadastral boundary from LANDGATE 2022. Label corresponds to the vegetation association number.</p>	No	Description	Drawn	Approved	Date	A	Original issue	MD	JB	16/4/2024																				
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4.3.2 Foraging Habitat Assessment

The vegetation present within the Survey Area contains primarily marri, jarrah, wandoo and patches of banksia. Some foraging evidence from Forest red-tailed Black Cockatoos (chewed marri nuts) was found within VT01 in the southern portion of the Site and within VT02 at the most northern end of the Survey Area. The majority of the Survey Area is therefore considered to comprise significant foraging habitat for Black Cockatoo.

Habitats within the Survey Area contain species which comprise suitable foraging habitat. The jarrah-marri woodlands of VT-01 and wandoo woodlands of VT-02 are characterised by foraging species for all three black cockatoo species including marri and jarrah. They also contained *Bankisa squarrosa*, which is used as foraging species by Carnaby's Black Cockatoo. The remainder of the Survey Area is comprised by wandoo as well as a foreshore area dominated by flooded gum and melaleuca which have low to no foraging habitat value.

The Commonwealth referral guidelines provides 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 guidance identifies that "loss of greater than or equal to 1 ha of foraging habitat scoring 5-10 using the foraging quality scoring tool is likely to require referral". A referral to the Commonwealth is therefore recommended if >1ha of vegetation or High value foraging tree canopy is to be impacted. The calculated foraging habitat quality score is shown below in Table 12.

Table 12: Foraging Quality Scoring Tool (DAWE, 2022)

Attribute	Baudin's Black Cockatoo	Carnaby's Black Cockatoo	Forest Red-tailed Black Cockatoo
Starting score	10- contains native eucalypt woodland with marri	10- eucalypt woodland/paddock trees with marri and wandoo	10- eucalypt woodland/paddock trees with marri and wandoo
Foraging potential (-2 if no foraging evidence)	-2, foraging evidence not present	-2, foraging evidence not present	No change, foraging evidence present
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	No change, recorded breeding habitat present 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	6 - High	8 - High	6 - High

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 DCCEW (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 13 below and shown in **Error! Reference source not found.** The score was calculated as per the criteria listed in Appendix J.

Table 13: Habitat Quality Scoring Tool - Site Condition Extent

Site Condition	Carnaby's Black Cockatoo (ha)	Baudin's Black Cockatoo (ha)	Forest Red-tailed Black Cockatoo (ha)
7- Very High	1.15	0.78	0.78
6- High	-	0.17	0.17
5-Moderate-High	-	-	-
4-Moderate	0.09	0.05	0.05
3-Low-Moderate	0.04	0.13	0.13
2-Low	0.38	0.13	0.13
1-Negligable to Low	0.03	0.39	0.39
0-None	1.22	1.26	1.26
Total	2.91	2.91	2.91

The Habitat Quality Scoring Tool then requires the application of a Site Context score out of three (see Table 14) which is added to the Site Condition score for a final x/10 score. See Table 15 for final Habitat Quality Scoring Tool score. Note that habitat with a Site Condition starting score of 2 or less are extremely unlikely to be suitable habitat and do not have a Site Context score added.

Table 14: 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.	
Totals					3

Table 15: Final Habitat Quality Scoring Tool Score

Site Condition	Carnaby's Black Cockatoo (ha)	Baudin's Black Cockatoo (ha)	Forest Red-tailed Black Cockatoo (ha)
10	1.15	0.78	0.78
9	-	0.17	0.17
8	-	-	-
7	0.09	0.05	0.05
6	0.04	0.13	0.13
5	-	-	-
4	-	-	-
3	-	-	-
2	0.38	0.13	0.13
1	0.03	0.39	0.39
0	1.22	1.26	1.26
Total	2.91	2.91	2.91

The Survey Area comprises a total of 2.91 ha of potential fauna habitat with mainly jarrah-marri forest and wandoo woodland. The DAWE 2020 foraging habitat scoring tool identified the vegetation within the Survey Area to be High quality foraging habitat for all three Black Cockatoos. The DCCEEW tool identified 1.15 ha (39.5%) of the vegetation within the Survey Area to have Very High foraging value for Carnaby's Black Cockatoo with a score of 10. Baudin's and Forest Red-tailed Black Cockatoo do not forage on *Banksia* spp., which are dominant over portions of the Survey Area. The DCCEEW foraging habitat scoring tool therefore identified 0.95 ha (32.6%) of the vegetation within Survey Area to be of High to Very High foraging value for the two species. A further 0.13 ha (4.5%) were identified as Low-Moderate to Moderate foraging value for Carnaby's Cockatoo and 0.18 ha (6.2%) for Baudin's and Forest Red-tailed Black Cockatoo respectively.

The extent with low to no foraging value (Score of ≤ 2) for Carnaby's Black Cockatoo was identified to be 1.63 ha (56.0%) and 1.78 ha (61.2%) for Baudin's and Forest Red-tailed Black Cockatoo respectively. The DCCEEW habitat quality scoring tool identifies that areas with a vegetation condition and structure score of 2 or less are unlikely to constitute suitable habitat. This is due to the low projected foliage cover (<10%) of foraging species. As such, areas within the Site that have a score of 2 or less are not considered suitable habitat for black cockatoo.

The total of foraging habitat for Carnaby's Cockatoo is therefore considered to be 1.28 ha (44.0%) of the vegetation within the Survey Area and 1.13 ha (38.8%) for Baudin's and Forest Red-tailed Black Cockatoo respectively. Foraging habitat scores are presented in Figure 8a-c.

Regional Foraging Habitat Extent

Analysis of estimated foraging habitat extent within the region indicates there 23,816 ha of remnant native vegetation mapped within a 12 km buffer of the Survey Area. The estimated canopy extent of 1.28 ha of foraging habitat present represents 0.005 % of the estimated regional habitat extent. The majority of the regional vegetation is expected to contain suitable foraging species with much of the vegetation comprising jarrah and marri forests of the Darling Plateau.

4.3.3 Roosting Habitat Assessment

Known roost sites are present 1.3 km northeast and 4.4 km northwest of the Survey Area (DBCA-064). Feather of Carnaby's Black Cockatoo and foraging evidence from Forest Red-tailed Black Cockatoo (chewed marri nuts) were found. No other evidence of night roosting (e.g. piles of scats or chewed trees) were recorded within the Survey Area.

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).

Throughout the Survey Area, several tall eucalypts (> 10 m) are present which may provide suitable roosting habitat. Adjacent bush lands with foraging potential were located < 1 km from the Survey Area. Permanent artificial watering points are located within 2 km of the Survey Area as well as wetland areas associated with the foreshore area of Red Swamp Brook.



Figure 8a: Carnaby's Black Cockatoo Foraging Habitat Quality

 	PROJECT/REPORT NAME Flora, Vegetation and Black Cockatoo Assessment 3650 Toodyay Road, Bailup		Legend Survey Area Foraging Habitat Score (Bamford, 2018 Scale) 0- None 1-Negligible 2-Low 6-7 High 8-10 Very High	<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th>No</th> <th>Description</th> <th>Drawn</th> <th>Approved</th> <th>Date</th> </tr> </thead> <tbody> <tr> <td>A</td> <td>Original issue</td> <td>MD</td> <td>JB</td> <td>16/4/2024</td> </tr> <tr> <td> </td> <td> </td> <td> </td> <td> </td> <td> </td> </tr> <tr> <td> </td> <td> </td> <td> </td> <td> </td> <td> </td> </tr> <tr> <td> </td> <td> </td> <td> </td> <td> </td> <td> </td> </tr> </tbody> </table>	No	Description	Drawn	Approved	Date	A	Original issue	MD	JB	16/4/2024															
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NOTES:
 Cadastral boundary from LANDGATE 2022.
 Label corresponds to the vegetation association number.





Figure 8b: Baudin's Black Cockatoo Foraging Habitat Quality

	PROJECT/REPORT NAME Flora, Vegetation and Black Cockatoo Assessment 3650 Toodyay Road, Bailup		Legend Survey Area Foraging Habitat Score (Bamford, 2018 Scale) 0- None 1-Negligible 2-Low 6-7 High 8-10 Very High	<table border="1"> <thead> <tr> <th>No</th> <th>Description</th> <th>Drawn</th> <th>Approved</th> <th>Date</th> </tr> </thead> <tbody> <tr> <td>A</td> <td>Original issue</td> <td>MD</td> <td>JB</td> <td>16/4/2024</td> </tr> <tr> <td> </td> <td> </td> <td> </td> <td> </td> <td> </td> </tr> <tr> <td> </td> <td> </td> <td> </td> <td> </td> <td> </td> </tr> <tr> <td> </td> <td> </td> <td> </td> <td> </td> <td> </td> </tr> </tbody> </table>	No	Description	Drawn	Approved	Date	A	Original issue	MD	JB	16/4/2024															
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Figure 8c: Forest Red-tailed Black Cockatoo Foraging Habitat Quality

		PROJECT/REPORT NAME Flora, Vegetation and Black Cockatoo Assessment 3650 Toodyay Road, Bailup	Legend <div style="display: flex; justify-content: space-between;"> <div style="width: 45%;"> <p> Survey Area</p> <p>Foraging Habitat Score (Bamford, 2018 Scale)</p> <p>0- None</p> <p> 1-Negligible</p> </div> <div style="width: 45%;"> <p> 2-Low</p> <p> 6-7 High</p> <p> 8-10 Very High</p> </div> </div>	<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th>No</th> <th>Description</th> <th>Drawn</th> <th>Approved</th> <th>Date</th> </tr> </thead> <tbody> <tr> <td>A</td> <td>Original issue</td> <td>MD</td> <td>JB</td> <td>16/4/2024</td> </tr> <tr> <td> </td> <td> </td> <td> </td> <td> </td> <td> </td> </tr> <tr> <td> </td> <td> </td> <td> </td> <td> </td> <td> </td> </tr> <tr> <td> </td> <td> </td> <td> </td> <td> </td> <td> </td> </tr> <tr> <td> </td> <td> </td> <td> </td> <td> </td> <td> </td> </tr> </tbody> </table> <p>NOTES: Cadastral boundary from LANDGATE 2022. Label corresponds to the vegetation association number.</p>	No	Description	Drawn	Approved	Date	A	Original issue	MD	JB	16/4/2024																				
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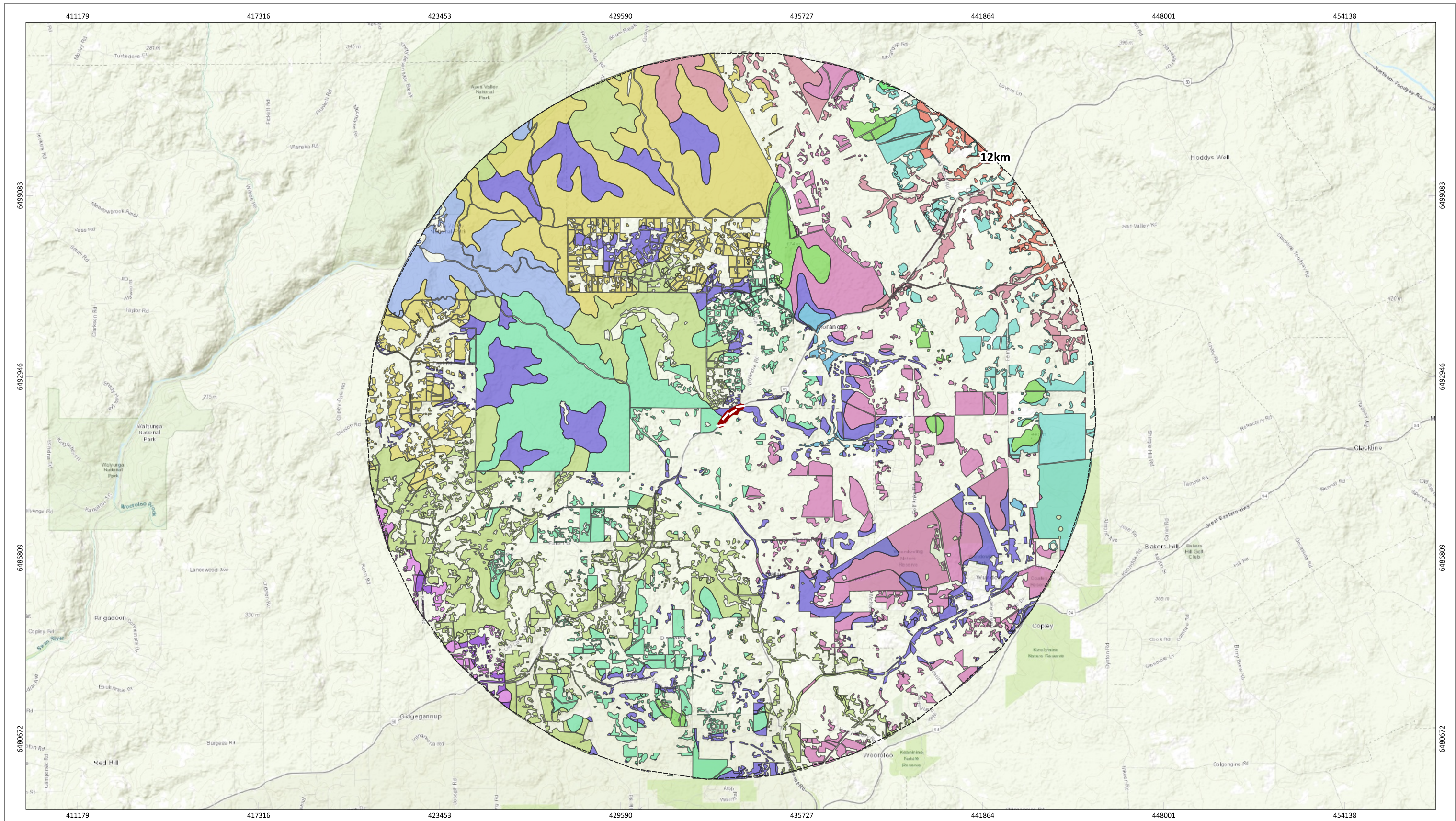


Figure 9: Black Cockatoo Foraging Habitat Extent 12 km Buffer

	PROJECT/REPORT NAME Flora, Vegetation and Black Cockatoo Assessment 3650 Toodyay Road, Bailup		Legend Survey Area Navtiev Vegetation Intersection Vegetation Complexes(DBCA-047) Bindoon, Bi Cooke, Ce Coolakin, Ck Dwellingup, D2 Dwellingup, D3 Dwellingup, D4 Helena 2, He2 Michibin, Mi Murray 2, My2 Pindalup, Pn Swamp, S Yalanbee, Y5 Yalanbee, Y6 Yarragil 1, Yg1	<table border="1"> <thead> <tr> <th>No</th> <th>Description</th> <th>Drawn</th> <th>Approved</th> <th>Date</th> </tr> </thead> <tbody> <tr> <td>A</td> <td>Original issue</td> <td>MD</td> <td>JB</td> <td>11/4/2024</td> </tr> <tr> <td> </td> <td> </td> <td> </td> <td> </td> <td> </td> </tr> <tr> <td> </td> <td> </td> <td> </td> <td> </td> <td> </td> </tr> <tr> <td> </td> <td> </td> <td> </td> <td> </td> <td> </td> </tr> </tbody> </table>	No	Description	Drawn	Approved	Date	A	Original issue	MD	JB	11/4/2024															
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5. Impact Assessment

5.1 Impacts to Aboriginal Heritage Site ID 15979

The clearing extent intersects with the mapped heritage site ID 15979, which is associated with Red Swamp Brook. The current engineering design does, however, not show any impact to the vegetation associated with the foreshore area. The drainage line is currently diverted through a culvert underneath the road. Clearing is only going to be undertaken in the area above the culvert adjacent to Toodyay Road. Impact to the heritage site is therefore considered unlikely.

An enquiry has been submitted with DPLH to receive further advice if heritage approval is required for the proposed clearing activities.

5.2 Impacts to Native Vegetation

A total of 1.25 ha of native vegetation is required to be cleared for the proposed works. The vegetation types impacted are as follows:

- 0.75 ha of VT01 Jarrah-marri open forest, condition: Very Good.
- 0.45 ha of VT02 Wandoo woodland, condition:
 - 0.19 ha Very Good,
 - 0.17 ha Good,
 - 0.09 ha Degraded.
- 0.05 ha of VT03 *Eucalyptus rudis* over *Melaleuca* sp., condition: Good.

The condition of the vegetation which requires clearing can be summarised as follows:

- 0.93 ha in Very Good condition,
- 0.23 ha in Good condition, and
- 0.09 ha in Degraded condition.

No Threatened or Priority Flora species were identified during the survey. One species however was found, which could not be identified with certainty, and which had the potential to be Priority 2 species *Banksia nivea* subsp. Morangup. Given the timing of the survey outside flowering season and the DBCA database search results, there is a slight residual potential that rare flora species were present but could not be identified.

5.3 Impacts to Black Cockatoo

The clearing footprint comprises an area of ha within the Survey Area. Impacts identified to Black Cockatoo species are summarised in Table 16 and Figure 10.

Table 16: Impacts to Black Cockatoo Habitat

Environmental Asset	Impact Identified
Breeding Habitat	<p>The proposal necessitates the clearing of:</p> <ul style="list-style-type: none"> • 43 native trees with a DBH \geq 500 mm, of which <ul style="list-style-type: none"> ○ 17 are Wandoo ○ 14 are Jarrah, ○ Five are Marri, and ○ Seven are stags. <p>None of those trees contains hollows of suitable size for black cockatoo breeding.</p>
Foraging Habitat	
Carnaby's Black Cockatoo	<p>The proposal necessitates the clearing of:</p> <ul style="list-style-type: none"> • 0.61 ha of Very High quality foraging habitat (score 10). • 0.08 ha of Low-Moderate to Moderate quality foraging habitat (score 6-7).
Forest Red-tailed Black Cockatoo	<p>The proposal necessitates the clearing of:</p> <ul style="list-style-type: none"> • 0.41 ha of High to Very High quality foraging habitat (score 9-10)*. • 0.14 ha of Low-Moderate to Moderate quality foraging habitat (score 6-7)*.
Baudin's Black Cockatoo	<p>The proposal necessitates the clearing of:</p> <ul style="list-style-type: none"> • 0.41 ha of High to Very High quality foraging habitat (score 9-10)*. • 0.14 ha of Low-Moderate to Moderate quality foraging habitat (score 6-7)*.

*These values are included in the higher quality foraging habitat for Carnaby's Cockatoo.

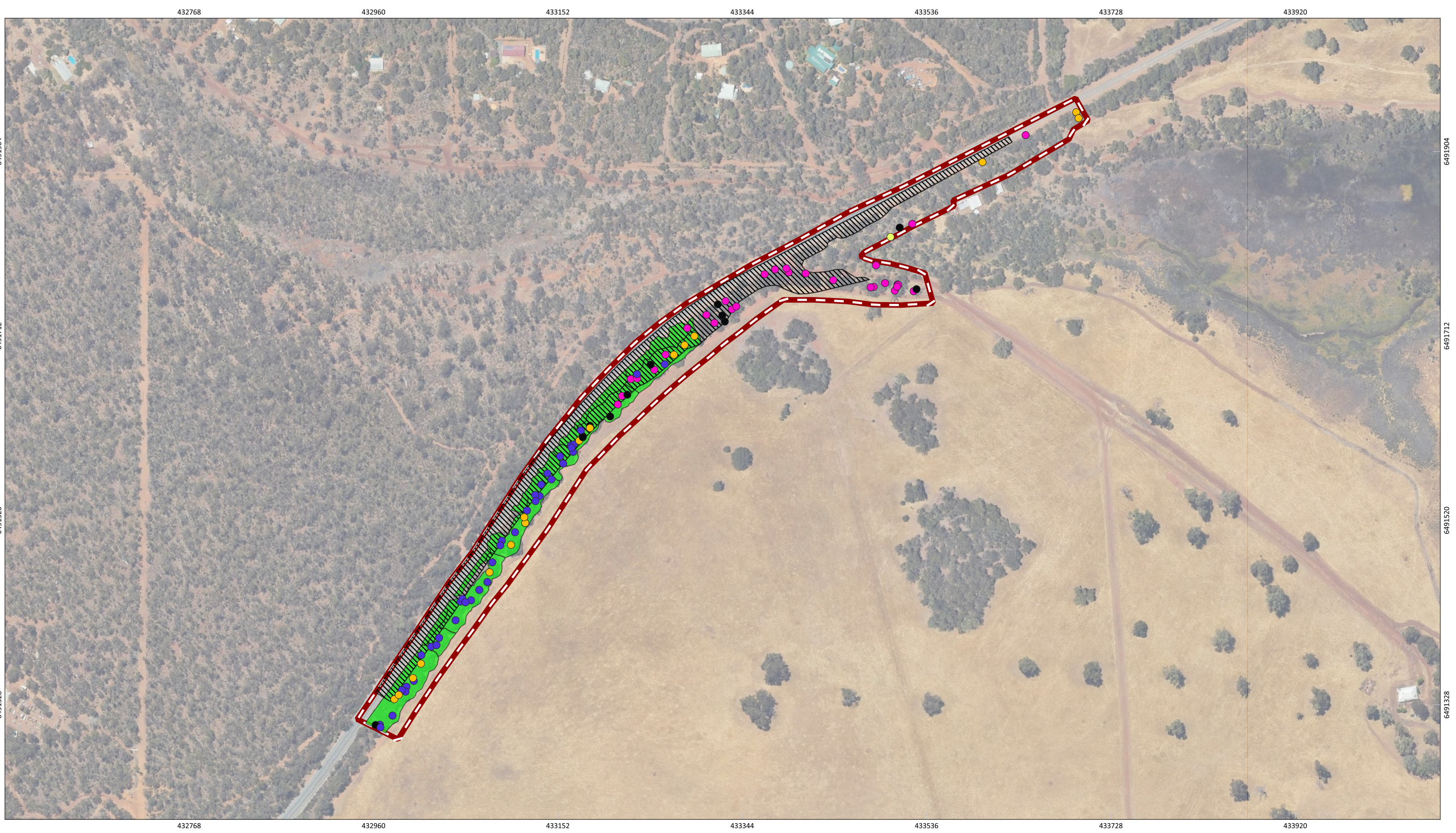


Figure 10: Clearing Impact

		PROJECT/REPORT NAME Flora, Vegetation and Black Cockatoo Assessment 3650 Toodyay Road, Bailup	Legend <div style="display: flex; justify-content: space-between;"> <div style="width: 45%;"> <ul style="list-style-type: none"> Survey Area Foraging Habitat clearing extent boundary </div> <div style="width: 45%;"> Tree Species <ul style="list-style-type: none"> Dead Flooded Gum Jarrah Marri Wandoo </div> </div>	<table border="1" style="width: 100%; border-collapse: collapse; font-size: 8px;"> <thead> <tr> <th>No</th> <th>Description</th> <th>Drawn</th> <th>Approved</th> <th>Date</th> </tr> </thead> <tbody> <tr> <td>A</td> <td>Original issue</td> <td>MD</td> <td>JB</td> <td>16/4/2024</td> </tr> <tr> <td> </td> <td> </td> <td> </td> <td> </td> <td> </td> </tr> <tr> <td> </td> <td> </td> <td> </td> <td> </td> <td> </td> </tr> <tr> <td> </td> <td> </td> <td> </td> <td> </td> <td> </td> </tr> </tbody> </table>	No	Description	Drawn	Approved	Date	A	Original issue	MD	JB	16/4/2024															
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SCALE 1:3,839	SHEET SIZE A3 COLOUR	CLIENT Trico Resources Pty Ltd	PROJECT NUMBER A24.011	VERSION 0																									
COORDINATE REFERENCE SYSTEM GDA2020 / MGA zone 50		DRAWN BY / REVIEWED BY MD/JB	DATE 16/4/2024																										

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



5.5 Assessment Against Clearing Principles

An assessment of the 1.25 ha of native vegetation clearing against the Ten Native Vegetation Clearing Principles contained in Schedule 5 of the EP Act is provided in Table 17.

The proposed clearing is considered unlikely to be at variance with any Clearing Principles.

Table 17: Assessment against Ten Clearing Principles

Principle (Schedule 5 of the EP Act)	Assessment	Outcome
<p>(a) Native vegetation should not be cleared if it comprises a high level of biological diversity</p>	<p>The impact area supports a moderate level of diversity of flora species. Most of the area has been historically cleared and supports areas of regrowth.</p> <p>The survey identified 43 mature native trees within the Survey Area to be removed, comprised by 17 <i>Eucalyptus wandoo</i>, 14 <i>Eucalyptus marginata</i>, five <i>Corymbia calophylla</i> and seven stags.</p> <p>Areas of native vegetation which require clearing were assessed to be in Degraded to Very Good condition (0.93 ha Very Good, 0.23 ha Good, 0.09 ha Degraded).</p>	<p>Proposed clearing is unlikely to be variance to this Principle.</p> <p>There is, however, a level of uncertainty due to the timing of the survey.</p>
<p>(b) Native vegetation should not be cleared if it comprises the whole or a part of, or is necessary for the maintenance of, a significant habitat for fauna indigenous to Western Australia.</p>	<p>The proposal necessitates the removal of 43 potential Black-Cockatoo habitat trees with a DBH \geq 500 mm will be removed as part of the Proposal (Figure 10).</p> <p>No suitable breeding hollows were observed from the ground.</p> <p>A total of 0.61 ha of Very High value foraging habitat and 0.08 ha of Low-Moderate to Moderate value</p>	<p>Proposed clearing is unlikely to be variance to this Principle.</p>

Principle (Schedule 5 of the EP Act)	Assessment	Outcome
	<p>foraging habitat will be removed as identified by the DCCEEW (n.d.) scoring tool. (These values include 0.</p> <p>Foraging evidence of Forest Red-tailed was observed within the Survey Area. Feathers of Carnaby's cockatoo were found. A flock of Carnaby's Cockatoo was observed flying over the Survey Area.</p> <p>Given the location of the Survey Area adjacent to Toodyay Road, the high likelihood of disturbance and the high percentage of remnant native vegetation in the surrounding area, the proposal is not expected to significantly impact the overall foraging or breeding habitat value of the area.</p>	
<p>(c) Native vegetation should not be cleared if it includes, or is necessary for the continued existence of, rare flora.</p>	<p>No Threatened flora pursuant the Commonwealth EPBC Act or the State BC Act were recorded.</p> <p>Due to the high condition of habitat, survey timing outside of flowering season and the therefore high degree of uncertainty the post-field assessment considered one Priority 2 species to have a 'High' likelihood of occurrence and four Threatened and Priority flora species to have a 'Medium' likelihood of occurrence within the Survey Area.</p>	<p>Proposed clearing is unlikely to be variance to this Principle.</p> <p>A level of uncertainty exists due to the timing of the survey.</p>

Principle (Schedule 5 of the EP Act)	Assessment	Outcome
<p>(d) Native vegetation should not be cleared if it comprises the whole or a part of, or is necessary for the maintenance of a threatened ecological community.</p>	<p>No TEC occurs within the Survey Area or in the adjacent area.</p> <p>Therefore, no TECs will be affected by the clearing.</p>	<p>Proposed clearing is not at variance to this Principle.</p>
<p>(e) Native vegetation should not be cleared if it is significant as a remnant of native vegetation in an area that has been extensively cleared.</p>	<p>The vegetation complexes within the Survey Area are the Pindalup and Dwellingup complexes. The Pindalup complex has 76.79% remaining and the Dwellingup complex 87.35% respectively.</p> <p>The proposed clearing area is mainly comprised by non-remnant vegetation. The proposed clearing is considered to not impact the maintenance of the vegetation complex.</p>	<p>Proposed clearing is not at variance to this Principle.</p>
<p>(f) Native vegetation should not be cleared if it is growing in, or in association with, an environment associated with a watercourse or wetland.</p>	<p>The proposed clearing area does not intersect any wetlands.</p> <p>The clearing footprint intersects the buffer zone of Red Swamp Brook. However, clearing will only occur on top of the culvert, which diverts the watercourse underneath the road. The vegetation associated with the foreshore area of the watercourse, where wetland species are present, is not going to be impacted.</p>	<p>Proposed clearing is not at variance to this Principle.</p>

Principle (Schedule 5 of the EP Act)	Assessment	Outcome
<p>(g) Native vegetation should not be cleared if the clearing of the vegetation is likely to cause appreciable land degradation.</p>	<p>The disturbance of native vegetation is confined to 1.25 ha. It is considered unlikely to cause appreciable land degradation given:</p> <ul style="list-style-type: none"> • Majority of the Survey Area been cleared historically. • Location of the Site within a road reserve, which is therefore likely subject to disturbance. • Stable soil type. • Relatively flat topography. 	<p>Proposed clearing is not at variance to this Principle.</p>
<p>(h) Native vegetation should not be cleared if the clearing of the vegetation is likely to have an impact on the environmental values of any adjacent or nearby conservation area</p>	<p>There are no conservation areas within the Survey Area or in close proximity. The proposed clearing activity does not impact any conservation areas.</p>	<p>Proposed clearing is not at variance to this Principle.</p>
<p>(i) Native vegetation should not be cleared if the clearing of the vegetation is likely to cause deterioration in the quality of surface or underground water.</p>	<p>Clearing above the culvert will not change the hydrology of the area, as no surface water will be taken or impacted for this project. It is therefore considered unlikely that there will be a significant impact to the surface or underground water quality of this area.</p>	<p>Proposed clearing is not at variance to this Principle.</p>
<p>(j) Native vegetation should not be cleared if clearing the vegetation is likely to cause, or exacerbate, the incidence or intensity of flooding.</p>	<p>The proposed clearing activities have no significant impact on the natural surface and groundwater</p>	<p>Proposed clearing is not at variance to this Principle.</p>

Principle (Schedule 5 of the EP Act)	Assessment	Outcome
	processes. The proposal is not likely to cause, or exacerbate, the incidence or intensity of flooding.	

6. Discussion

The findings of this flora, vegetation and black cockatoo survey suggest that the proposal requires a Native Vegetation Clearing Permit under Part V of the EP Act for the clearing of 1.25 ha of native vegetation.

No Threatened or Priority Ecological Communities were present within or adjacent to the Survey Area.

No Threatened or Priority flora species were recorded during the survey. While it is considered unlikely, there is a slight potential that one species found could have been Priority 2 species *Banksia nivea* subsp. *Morangup*. The species was identified as *Banksia dallanneyi* but given the timing of the survey outside flowering season the species could not be identified with certainty.

The proposed impact to Black Cockatoo is not considered significant under the EPBC Act.

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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

Definitions 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. (ii) the species is the focus of a plan of management that provides for management actions necessary to stop the	N/A.

Category	Threatened Species	Threatened Ecological Communities
	<p>decline of, and support the recovery of, the species so that its chances of long-term survival in nature are maximised.</p> <p>(iii) the plan of management is in force under a law of the Commonwealth or of a State or Territory.</p> <p>(iv) cessation of the plan of management would adversely affect the conservation status of the species.</p>	

Conservation Codes for Western Australian Flora and Fauna (DBCA)

Conservation Codes for Western Australian Flora and Fauna	
<p>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.</p> <p>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.</p> <p>Categories of Threatened, Extinct and Specially Protected fauna and flora are:</p>	
	<p>Threatened species</p> <p>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 <i>Biodiversity Conservation Act 2016</i> (BC Act).</p> <p>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.</p> <p>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.</p> <p>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.</p>
T	
	<p>Critically endangered species</p> <p>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”.</p> <p>Listed as critically endangered under section 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.</p>
CR	
	<p>Endangered species</p> <p>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”.</p> <p>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 (Specially Protected Fauna) Notice 2018 for endangered fauna or the Wildlife Conservation (Rare Flora) Notice 2018 for endangered flora.</p>
EN	

Conservation Codes for Western Australian Flora and Fauna

VU	<p>Vulnerable species</p> <p>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”.</p> <p>Listed as vulnerable under section 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.</p>
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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	<p>Extinct species</p> <p>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).</p> <p>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.</p>
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Extinct in the wild species

EW	<p>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).</p> <p>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.</p>
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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.

Migratory species

MI	<p>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).</p> <p>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.</p> <p>Published as migratory birds protected under an international agreement under schedule 5 of the Wildlife Conservation (Specially Protected Fauna) Notice 2018.</p>
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CD	<p>Species of special conservation interest (conservation dependent fauna)</p> <p>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).</p> <p>Published as conservation dependent fauna under schedule 6 of the Wildlife Conservation (Specially Protected Fauna) Notice 2018.</p>
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Conservation Codes for Western Australian Flora and Fauna

OS	<p>Other specially protected species</p> <p>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).</p> <p>Published as other specially protected fauna under schedule 7 of the Wildlife Conservation (Specially Protected Fauna) Notice 2018.</p>
P	<p>Priority species</p> <p>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.</p> <p>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.</p> <p>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.</p>
1	<p>Priority 1: Poorly-known species</p> <p>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.</p>
2	<p>Priority 2: Poorly-known species</p> <p>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.</p>
3	<p>Priority 3: Poorly-known species</p> <p>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.</p>
4	<p>Priority 4: Rare, Near Threatened and other species in need of monitoring</p> <p>(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 protection but could be if present circumstances change. These species are usually represented on conservation lands.</p> <p>(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.</p> <p>(c) Species that have been removed from the list of threatened species during the past five years for reasons other than taxonomy.</p>

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)	<p>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.</p> <p>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):</p> <p>A. Records within the last 50 years have not been confirmed despite thorough searches of known or likely habitats or</p> <p>B. All occurrences recorded within the last 50 years have since been destroyed.</p>
Critically Endangered (CR)	<p>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.</p> <p>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):</p> <p>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):</p> <ol style="list-style-type: none"> 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. <p>B. Current distribution is limited, and one or more of the following apply (i, ii or iii):</p> <ol style="list-style-type: none"> 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. 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. <p>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).</p>
Endangered (EN)	<p>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.</p> <p>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):</p>

Criteria	Definition
	<p>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):</p> <ul style="list-style-type: none"> 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. <p>B. Current distribution is limited, and one or more of the following apply (i, ii or iii):</p> <ul style="list-style-type: none"> 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. <p>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).</p>

<p>Vulnerable (VU)</p>	<p>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.</p> <p>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):</p> <ul style="list-style-type: none"> A. The ecological community exists largely as modified occurrences that are likely to be capable of being substantially restored or rehabilitated. 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.
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Priority Ecological Communities

<p>Priority One</p>	<p>Poorly known ecological communities</p> <p>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.</p>
<p>Priority Two</p>	<p>Poorly known ecological communities</p> <p>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,</p>

Criteria	Definition
	<p>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.</p>
<p>Priority Three</p>	<p>Poorly known ecological communities</p> <ul style="list-style-type: none"> 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. <p>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.</p>
<p>Priority Four</p>	<p>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.</p> <ul style="list-style-type: none"> 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. iii. Ecological communities that have been removed from the list of threatened communities during the past five years.
<p>Priority Five</p>	<p>Conservation Dependent Ecological Communities</p> <p>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.</p>

Appendix C

Potential Black Cockatoo Breeding Habitat

Tree #	Species	Class BAMfo	DBH (mm)	Hollow notes	Location (GDA2020 / MGA50)		Photo
					Easting	Northing	
1	<i>Corymbia calophylla</i>	5	550		433691.835	6491944.816	
2	<i>Eucalyptus wandoo</i>	5	500		433639.111	6491921.028	
3	<i>Corymbia calophylla</i>	5	500		433594.122	6491892.945	
4	Dead	5	550		433525.453	6491760.678	
5	<i>Eucalyptus wandoo</i>	4	700	Broken off but not hollow	433522.465	6491758.574	
6	<i>Eucalyptus wandoo</i>	5	550		433505.173	6491763.277	
7	<i>Eucalyptus wandoo</i>	5	600		433506.413	6491765.151	
8	<i>Eucalyptus wandoo</i>	5	600		433505.738	6491765.610	
9	<i>Eucalyptus wandoo</i>	4	800	Broken off branches but not hollow	433502.847	6491759.154	
10	<i>Eucalyptus wandoo</i>	5	700		433492.679	6491766.921	
11	<i>Eucalyptus wandoo</i>	5	800		433480.817	6491762.977	
12	<i>Eucalyptus wandoo</i>	5	550		433477.605	6491762.564	
13	<i>Eucalyptus wandoo</i>	5	500		433438.726	6491770.147	
14	<i>Eucalyptus wandoo</i>	5	500		433409.980	6491777.019	
15	<i>Eucalyptus wandoo</i>	5	500		433483.252	6491785.489	
16	<i>Eucalyptus wandoo</i>	5	500		433306.630	6491733.918	
17	Dead	4	1000	Branches broken off entry size of any potential hollow below 15cm	433318.536	6491744.847	
18	<i>Eucalyptus wandoo</i>	5	500		433326.483	6491748.284	

Tree #	Species	Class BAMfo	DBH (mm)	Hollow notes	Location (GDA2020 / MGA50)		Photo
					Easting	Northing	
19	<i>Eucalyptus wandoo</i>	5	750		433367.230	6491776.199	
20	<i>Eucalyptus wandoo</i>	5	600		433378.117	6491781.173	
21	<i>Eucalyptus wandoo</i>	5	500		433389.934	6491782.326	
22	<i>Corymbia calophylla</i>	5	650		433294.094	6491711.801	
23	<i>Corymbia calophylla</i>	5	600		433283.842	6491702.528	
24	<i>Corymbia calophylla</i>	5	500		433272.768	6491692.369	
25	<i>Eucalyptus wandoo</i>	4	500	Broken branch, no visible hollows	433264.022	6491692.500	
26	<i>Eucalyptus marginata</i>	4	500	Signs of starting to hollow out but no distinct hollows	433263.236	6491682.559	
27	<i>Eucalyptus wandoo</i>	5	1000		433252.352	6491676.789	
28	Dead	4	550	Hollowed out but only thin branches broken off, no suitable hollows	433224.218	6491650.808	
29	<i>Eucalyptus wandoo</i>	5	600		433218.599	6491649.508	
30	<i>Eucalyptus wandoo</i>	5	500		433214.288	6491640.644	
31	Dead	4	1000	Hollows too small, entry below 10 cm, 2 of them	433206.375	6491628.164	
32	Dead	4	550	Potential chimney hollow with entrance 15-20cm, not visible from ground	433185.237	6491618.483	
33	<i>Corymbia calophylla</i>	5	500		433185.286	6491616.153	
34	Dead	5	500		433177.834	6491606.512	

Tree #	Species	Class BAMfo	DBH (mm)	Hollow notes	Location (GDA2020 / MGA50)		Photo
					Easting	Northing	
35	<i>Corymbia calophylla</i>	5	550		433174.051	6491602.946	
36	<i>Eucalyptus marginata</i>	5	500		433166.098	6491595.675	
37	<i>Eucalyptus marginata</i>	5	700		433167.831	6491591.305	
38	<i>Eucalyptus marginata</i>	5	800		433157.442	6491579.124	
39	<i>Eucalyptus marginata</i>	4	650	No hollow broken off branch	433145.208	6491562.671	
40	<i>Eucalyptus marginata</i>	5	600		433132.968	6491545.243	
41	<i>Eucalyptus marginata</i>	5	500		433128.641	6491540.072	
42	<i>Eucalyptus marginata</i>	5	750		433119.701	6491530.285	
43	<i>Corymbia calophylla</i>	5	500		433116.850	6491523.264	
44	<i>Eucalyptus marginata</i>	5	800		433117.948	6491517.274	
45	<i>Corymbia calophylla</i>	5	700		433117.948	6491517.274	
46	<i>Eucalyptus marginata</i>	5	800		433107.282	6491507.633	
47	<i>Corymbia calophylla</i>	4	1600	Broken off branches	433103.130	6491494.506	
48	<i>Corymbia calophylla</i>	5	500		433080.704	6491465.939	
49	<i>Eucalyptus marginata</i>	5	800		433078.527	6491455.808	
50	<i>Eucalyptus marginata</i>	4	1250	Split branch and hollowed out but no suitable breeding hollows	433070.027	6491447.623	
51	<i>Eucalyptus marginata</i>	5	550		433061.458	6491436.794	
52	<i>Eucalyptus marginata</i>	5	500		433055.651	6491434.650	
53	<i>Eucalyptus marginata</i>	5	500		433045.357	6491415.983	

Tree #	Species	Class BAMfo	DBH (mm)	Hollow notes	Location (GDA2020 / MGA50)		Photo
					Easting	Northing	
54	<i>Eucalyptus marginata</i>	4	850	Too small and shallow below 15 cm entry	433028.182	6491397.694	
55	<i>Eucalyptus marginata</i>	5	500		433025.509	6491390.099	
56	<i>Eucalyptus marginata</i>	5	750		433019.930	6491388.498	
57	<i>Eucalyptus marginata</i>	5	500		433009.662	6491379.829	
58	<i>Corymbia calophylla</i>	5	600		433000.951	6491355.815	
59	<i>Eucalyptus marginata</i>	5	650		433001.816	6491352.877	
60	<i>Eucalyptus marginata</i>	5	600		432989.329	6491343.285	
61	<i>Corymbia calophylla</i>	5	500		432986.194	6491338.292	
62	Dead	4	600		432962.062	6491306.979	
63	<i>Corymbia calophylla</i>	5	500		433694.258	6491938.648	
64	<i>Eucalyptus wandoo</i>	5	650	Minor dead and broken branches in canopy. No hollows.	433521.034	6491828.656	
65	Dead	4	600	Has one potential chimney hollow however would be	433507.919	6491824.796	
66	<i>Eucalyptus rudis</i>	5	500		433498.437	6491814.993	
67	<i>Eucalyptus wandoo</i>	5	500		433286.682	6491720.106	
68	<i>Eucalyptus wandoo</i>	5	500		433314.973	6491725.563	
69	Dead	4	550	Smaller broken branches, appears not to have developed hollows.	433323.162	6491733.350	

Tree #	Species	Class BAMfo	DBH (mm)	Hollow notes	Location (GDA2020 / MGA50)		Photo
					Easting	Northing	
70	Dead	4	750	Jarrah bark. Smaller broken branches, none appear to not have developed hollows.	433325.829	6491726.992	
71	<i>Eucalyptus wandoo</i>	5	550		433333.232	6491739.770	
72	<i>Eucalyptus wandoo</i>	5	500		433337.687	6491742.595	
73	<i>Eucalyptus wandoo</i>	5	650		433392.276	6491778.152	
74	Dead	4	700	Snapped off tree at 5 m, cup formation. Jarrah shoots at top.	433248.521	6491682.130	
75	<i>Eucalyptus marginata</i>	5	500		433234.290	6491672.180	
76	<i>Eucalyptus wandoo</i>	5	600		433234.444	6491667.711	
77	<i>Eucalyptus wandoo</i>	5	650		433227.734	6491667.042	
78	<i>Eucalyptus marginata</i>	4	800	Top canopy mainly dead, several broken branches. One shallow 10 cm mid branch hollow.	433175.873	6491613.687	
79	<i>Eucalyptus marginata</i>	5	650		433168.464	6491598.999	
80	<i>Eucalyptus marginata</i>	5	700		433165.683	6491598.172	
81	<i>Eucalyptus marginata</i>	5	500		433154.155	6491586.718	
82	<i>Eucalyptus marginata</i>	5	850		433141.129	6491568.896	
83	<i>Eucalyptus marginata</i>	5	700		433134.467	6491557.312	
84	<i>Eucalyptus marginata</i>	5	550		433128.258	6491546.450	
85	<i>Eucalyptus marginata</i>	5	800		433093.510	6491498.867	

Tree #	Species	Class BAMfo	DBH (mm)	Hollow notes	Location (GDA2020 / MGA50)		Photo
					Easting	Northing	
86	<i>Eucalyptus marginata</i>	5	700		433091.880	6491494.012	
87	<i>Eucalyptus marginata</i>	5	500		433083.591	6491476.347	
88	<i>Eucalyptus marginata</i>	5	500		433052.538	6491438.254	
89	<i>Eucalyptus marginata</i>	5	900		433050.537	6491435.483	
90	<i>Corymbia calophylla</i>	5	500		433009.293	6491370.830	
91	<i>Eucalyptus marginata</i>	4	1100	Has one small hollow	432994.212	6491346.792	
92	<i>Eucalyptus marginata</i>	5	750		432993.266	6491341.694	
93	<i>Corymbia calophylla</i>	5	750		432981.591	6491333.845	
94	<i>Eucalyptus marginata</i>	4	800	Half tree dead, has broken branches, none appears to have developed hollow.	432979.642	6491316.743	
95	<i>Eucalyptus marginata</i>	5	700		432966.498	6491307.234	
96	<i>Eucalyptus marginata</i>	5	500		432967.082	6491304.521	

Appendix D

Black Cockatoo 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 habitat¹ 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					
		6	High	Marri-Jarrah-Karri Forest, other eucalypt woodlands, or allocasuarina woodlands, with >50% projected foliage cover. Low percentage (< 5%) of tree deaths.				
	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.

²No 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.	1	Negligible to low	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, <i>Eucalyptus caesia</i> and <i>E. erythrocorys</i> .				
Habitat features	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								
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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.

