



Reconnaissance Flora and Vegetation Survey CBH Group Potential Offset Site, Miling

**Prepared for Co-Operative Bulk Handling Ltd
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EXECUTIVE SUMMARY

Co-Operative Bulk Handling Ltd (CBH) is undergoing significant growth over the next decade, including expansion, upgrades and inclusion of new sites within its optimised distribution network. The clearing of native vegetation associated with this expansion has the potential to directly impact Protected Matters listed under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act), including the Carnaby's Black Cockatoo (*Zanda latirostris*). In compliance with business values and regulatory requirements, CBH must conduct comprehensive surveys of potential offset sites across the Wheatbelt, assessing the existing flora, vegetation and fauna values within these sites and documenting their condition, species classification and conservation status.

As part of CBH's expansion activities a 25 hectare (ha) potential offset site was identified on private farmland approximately 2.5 km north northeast of the Miling townsite, herein referred to as the 'study area'. Miling is a small Wheatbelt town in the Mid-West region of Western Australia located 160 km north northeast of Perth and 250 km south-east of Geraldton. CBH engaged Onshore Environmental Consultants Pty Ltd (Onshore Environmental) to undertake a reconnaissance flora and vegetation survey along with an assessment of black-cockatoo foraging habitat within the study area. The field survey was conducted by a Principal Botanist between the 9th and 10th of June 2025.

None of the plant taxa recorded from the study area were listed as Threatened Flora under the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) or the Western Australian *Biodiversity Conservation Act 2016* (BC Act), or listed as Priority flora by the Department of Biodiversity, Conservation and Attractions (DBCA).

None of the plant taxa recorded from the study area were listed as Declared Plants under the *Biosecurity and Agriculture Management Act 2007* (BAM Act).

There were four vegetation types mapped from the study area, with two of the vegetation types aligned with the Commonwealth listed Threatened Ecological Community (TEC) 'Eucalypt woodlands of the Western Australian Wheatbelt', and Western Australian Priority Ecological Community (PEC) of the same name. Vegetation condition across most of the unfenced study area was rated as degraded, with disturbances including grazing by sheep, kangaroos and rabbits, historical ground disturbance including access tracks, weed incursion and edge effects from adjacent agricultural land, and evidence of dryland salinity on drainage flats. Vegetation condition improved to good in the northeast sector of the study area which supported *Eucalyptus* low woodlands.

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1.0 INTRODUCTION

1.1 Preamble

Onshore Environmental was commissioned by CBH to undertake a reconnaissance flora and vegetation survey and assessment of black-cockatoo foraging habitat within a 25 ha native vegetation remnant occurring within Lot 291 on Plan No. 418426. The remnant occurs within 500 metres (m) of Great Northern Highway and 2.5 km north northeast of Miling in the Avon Wheatbelt bioregion of Western Australia (Figure 1). The remnant represents a potential environmental offset to compensate for residual impacts resulting from native vegetation clearing required for expanding operations in the region by CBH.

1.2 Climate

The closest official weather station to Miling is at Dalwallinu, a small wheatbelt town approximately 50 km to the northeast of Miling where reliable climate data has been collected since 1997 (BOM 2025, Dalwallinu - Station 008297). A longer running but now defunct weather station collected data from 1912-2012 (named Dalwallinu Comparison, Station 00839) (BOM, 2025). The climate data used here is derived from the currently running Dalwallinu Weather Station.

The Miling-Dalwallinu region experiences a dry warm Mediterranean climate with the majority of rainfall falling through the winter months and followed by a dry summer period where rainfall is restricted to sporadic thunderstorms. The highest maximum temperatures occur during summer, with January the hottest month (mean maximum temperature 35.5°C). Winters are mild with lowest mean maximum temperatures recorded in July (17.1°C). Temperatures rarely fall below 0°C in winter, with a mean minimum of 6.1°C recorded in July. The long-term annual rainfall average for Dalwallinu is 298.1 mm (1997-2025) with the highest monthly falls occurring between May (33.6 mm) and August (40.9 mm) and peaking in July (50.5 mm), and the lowest monthly falls occurring in October (13.4 mm), November (14.1 mm) and December (10.1 mm) (BOM 2025).

Annual rainfall for the 2024 calendar year totalled 315.4 mm and was slightly above the long-term average of 298.1 mm. The early-June 2025 field survey followed a typical dry summer and early autumn period where rainfall for the January to May period totalled 67.6 mm compared to the long-term average of 108.0 mm for the same period. However the three months preceding the field survey (March-May) recorded 26.2 mm, 23.4 mm and 14.6 mm respectively resulting in fair seasonal conditions.

1.3 Biogeographic Regions

Miling is located within the Katanning sub-region (AVW02) of the Avon Wheatbelt bioregion (AVW) in the central west of Beard's South-West Province (IBRA 1995, Beard 1990). The typical sequences of vegetation comprise Proteaceous scrub-heath on residual lateritic uplands and in yellow sand on sandplains; mixed eucalypt, *Allocasuarina huegeliana* and Jam (*Acacia acuminata*) - York Gum (*Eucalyptus loxophleba*) woodlands on Quaternary alluvial

and eluvial soils; Salmon Gum (*Eucalyptus salmonophloia*), York Gum (*Eucalyptus loxophleba*) and Wandoo (*Eucalyptus wandoo*) woodlands on hard setting loams, and halophytes on saline soils (Beecham 2001).

1.4 Land Use

The study area occurs within a freehold agricultural lot and is bounded by cereal cropping paddocks to the north, west and south and an intact saline drainage system to the east. There is no direct access to the native vegetation remnant from public roads. The nearest formed public roads are the Lyons East Road 1.7 km to the south, Miling East Road 2.7 km to the north, and the Great Northern Highway 4.5 km to the west. The town of Miling is situated approximately 4 km northwest of the study area.

The perimeter of the native vegetation remnant is unfenced from adjacent cropping land, but there is evidence of old historical fence lines, minor access tracks and small machinery laydown pads throughout the remnant. There is also evidence of high grazing intensity by kangaroos and rabbits throughout the study area.

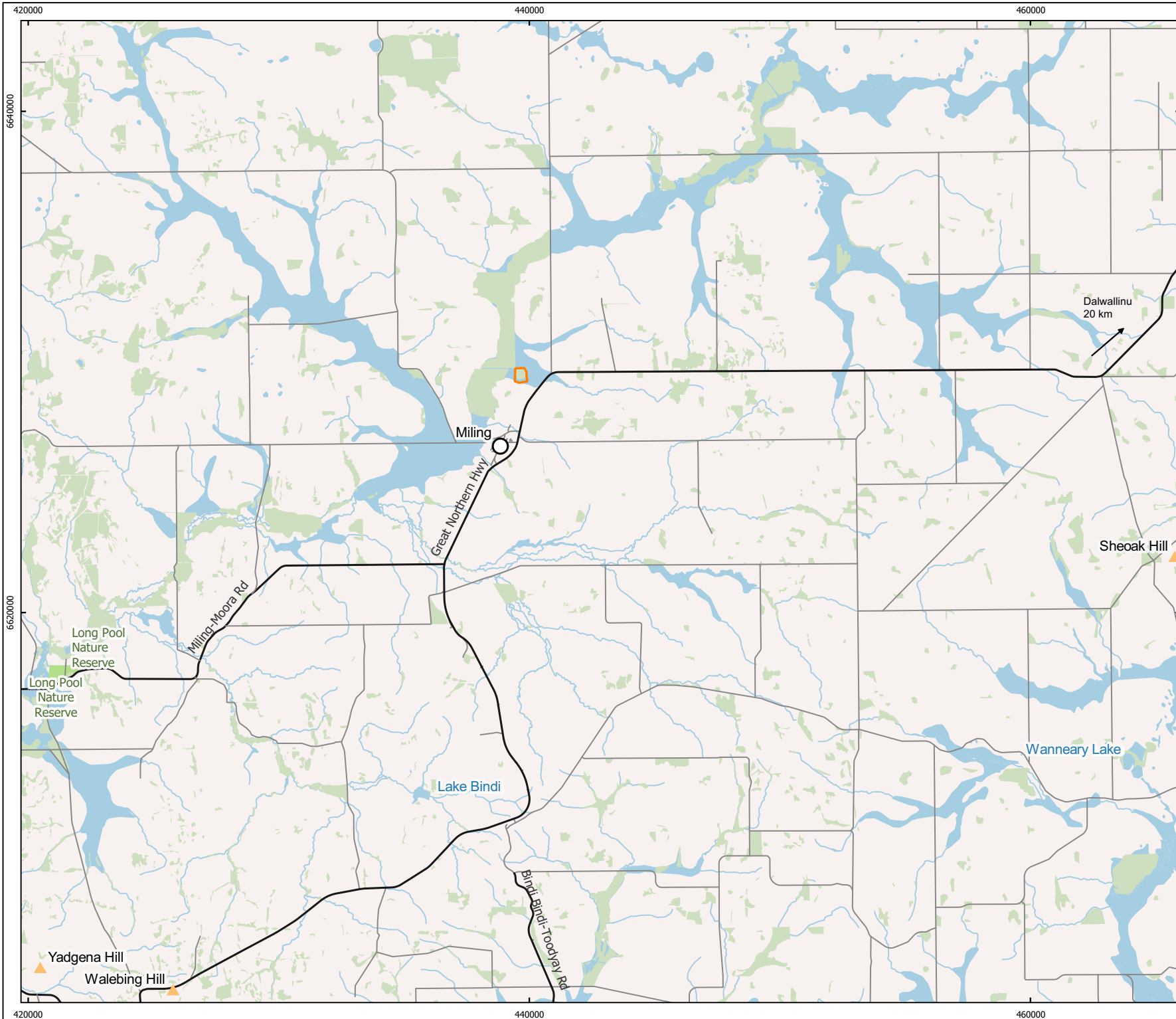
1.5 Soils and Geology

The study area is within the Avon Province which is described as laterised plateau (dissected at fringes and with saline drainage lines inland) on deeply weathered mantle and alluvium over granitic rocks of the Yilgarn Craton (and Albany-Fraser Orogen). The Avon Province is divided into eight soil-landscape zones and the study area lies within the Northern Zone of Ancient Drainage (258), which is described as 'Gently undulating terrain (with some sandplains and salt lakes chains) on deeply weathered mantle and alluvium over granitic rocks of the Yilgarn Craton' (Tille 2006).

1.6 Flora and Vegetation

The study area is located within the Avon Botanical District within the Avon Wheatbelt IBRA region of the Southwest Botanical Province (Beard 1990). Beard (1976) described and mapped vegetation of the Murchison area at a scale of 1:1,000,000. The original vegetation mapping undertaken by Beard (1974) was refined by Shepherd *et al.* (2002) who defined two vegetation associations intersecting the study area:

- 142 Medium woodland, York Gum and Salmon Gum; and
- 631 Succulent steppe with woodland and thicket; York gum over *Melaleuca thyoides* and samphire.



CBH MILING OFFSET AREA

**Figure 1: Location of the
study area**

Legend

- Offset Area
- Native Vegetation Extent (DPIRD 2017)
- DBCA Managed Lands



1:200,293

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2.0 METHODOLOGY

2.1 Legislation and Guidance Statements

The reconnaissance flora and vegetation survey was carried out in a manner that was compliant with Environmental Protection Authority (EPA) requirements for the environmental surveying and reporting of flora and vegetation in Western Australia:

- Technical Guidance Flora and Vegetation Surveys for Environmental Impact Assessment (EPA 2016a);
- Environmental Factor Guideline: Flora and Vegetation (EPA 2016b); and
- Statement of Environmental Principles, Factors and Objectives (EPA 2020).

2.2 Desktop Assessment

2.2.1 Literature Review

A review of all publicly available literature in close proximity to the study area was undertaken, including a search of the Department of Water and Environmental Regulation's Index of Biodiversity Surveys for Assessment (DWER 2025). Several surveys have been completed around Miling. Results from these surveys are described in detail in Section 3.1.1.

2.2.2 Database Searches

The desktop assessment included databases relating to conservation significant flora, TECs and PECs previously collected or described within or near to the study area. The search was extended beyond the study area to place flora values into a local and regional context. The following databases were searched:

- DBCA's Threatened and Priority flora database (30 km radial search) (DBCA 2025a);
- DBCA's TEC, PEC and Environmentally Sensitive Areas (ESAs) database was searched to identify significant communities (30 km radial search) (DBCA 2025b);
- Environmental Protection and Biodiversity Conservation (EPBC) Act Protected Matters Database (10 km radial search) (DCCEEW 2025);
- International Union for Conservation of Nature (IUCN) database (IUCN 2025); and
- Atlas of Living Australia (2025) database (10 km radial search conducted).

The results from the above database searches were compiled to provide a list of significant flora species that could potentially occur within or surrounding the study area.

2.2.3 Assessment of Likelihood of Occurrence in the Study Area

A list of conservation significant species occurring within a 30 km radius of the study area was compiled during the desktop searches. The likelihood of each taxon occurring within the study area was assessed using a set of rankings and criteria based on presence of suitable landform (inferred from aerial imagery with contours overlaid and knowledge of the adjacent areas) and distance to known records (Table 1).

Table 1 Ranking system used to assign the likelihood that a species would occur in the study area.

Rank	Criteria
Recorded	The species has been recorded in the study area.
Likely to occur	The species has previously been recorded from a landform/habitat which is present within the study area, and there are previous records within a 10 km radius of the study area.
Possible to occur	The species has previously been recorded from a landform/habitat which is present within the study area, and there are previous records within a 10-20 km radius of the study area.
Unlikely to occur	The landform/habitat from which the species has previously been recorded is absent within the study area, and/or there are no previous records within a 20 km radius of the study area.

2.2.4 Assessment of Conservation Significance

The conservation significance of flora, fauna and ecological communities are classified at a Commonwealth, State and Local level based on various Acts and Agreements, including:

International Level:

- IUCN: The IUCN 'Red List' lists species at risk under nine categories (status codes) (Appendix 1).

Commonwealth Level:

- EPBC Act: The DCCEEW lists Threatened flora and ecological communities, which are determined by the Threatened Species Scientific Committee according to criteria set out in the Act. The Act lists flora that are of conservation significance under one of six categories (Appendix 1).

State Level:

- BC Act: At the State level, native flora species are protected under the BC Act - Wildlife Conservation Notice. A number of species are assigned an additional level of conservation significance based on a limited number of known populations and the perceived threats to these locations (Appendix 1); and
- DBCA Priority list: DBCA produces a list of Priority species and ecological communities that have not been assigned statutory protection under the BC Act. Possibly threatened species that do not meet survey criteria, or are otherwise data deficient, are added under Priorities 1, 2 or 3. Species that are adequately known, are rare but not threatened, or meet criteria for near threatened, or that have been removed from the threatened species list for other taxonomic reasons, are placed in Priority 4. These species require regular monitoring (see Appendix 1). The list of PECs identifies those that need further investigation before nomination for TEC status at the State level.

Local Level:

- Species may be considered of local conservation significance because of their patterns of distribution and abundance. Although not formally protected by legislation, such species are acknowledged to be in decline because of threatening processes, primarily habitat loss through land clearing.

2.3 Survey Methodology

2.3.1 Timing and Personnel

The reconnaissance flora and vegetation survey and assessment of black-cockatoo foraging habitat was completed by Principal Botanist Dr Jerome Bull on the 9th and 10th of June 2025.

2.3.2 Sampling of Study Sites

The field survey involved opportunistic sampling using relevé sites to confirm vegetation type mapping boundaries and provide site descriptions for points of interest. The study area was extensively ground truthed and relevé descriptions were made in areas with native vegetation blocks. Vegetation condition was determined using a recognised rating scale (based on Keighery 1994, see Appendix 2).

2.3.3 Vegetation Type Mapping

The classification of vegetation types within the study area follows the height, life form and density classes of Muir (1977) (see Appendix 3). This is largely a structural classification suitable for broader scale mapping but takes all ecologically significant strata into account. Vegetation type mapping utilised high-resolution aerial photography at a scale of 1:2,500 with definition of vegetation polygons based on contrasting shading patterns. Ground-truthing of the study area was completed during the field survey to confirm and/or change vegetation polygons. Where ground truthing revealed new vegetation types not observable from a prior analysis of aerial photography, these were described and demarcated accordingly. The field survey also provided vegetation descriptions for selected vegetation polygons by describing dominant structural layers (strata) and associated plant taxa. Where relevant, the relevé points were overlaid onto the aerial photography and associated flora and vegetation data was used to update vegetation type descriptions for the individual polygons.

2.3.4 Targeted Surveys for Conservation Significant Species

Targeted searches for species of conservation significance were completed in areas where it was anticipated that significant flora might occur based on habitat preferences (according to the database searches) and from previous knowledge of the local flora and vegetation. Ground truthing conducted across the study area provided an opportunity to record locations of conservation significant flora and therefore undertake a closer examination of specific landforms where conservation significant flora may be expected to occur.

2.3.5 Vouchering

Voucher specimens were taken for taxa where the identification could not be confirmed in the field. Taxonomy was completed by Dr Jerome Bull, and use was made of the Western Australian Herbarium.

2.3.6 Assessment of Black-cockatoo Foraging Habitat

Vegetation within the study area was assessed for foraging value. Black-cockatoos forage widely in suitable vegetation throughout the southwest region of Western Australia and leave distinctive marks on dropped feeding material such as eucalypt fruit. Targeted searches were

made for these signs throughout the study area. Results from the field survey were used to calculate foraging habitat scores using two different methodologies:

- the foraging quality scoring tool template recommended within the EPBC Act referral guidelines for black-cockatoos (DAWE 2022); and
- the foraging habitat score recently developed by the DCCEEW in consultation with species experts in Western Australia and used to calculate the value of an offset site.

Foraging Habitat Quality Score - EPBC Act referral guidelines for black-cockatoos (DAWE 2022)

The foraging quality scoring tool has been developed to allow habitat quality to be quantified. The assessment of foraging habitat tool identifies habitat as high-quality foraging habitat (score of 5-10) or lower quality foraging habitat (score of 0-4). If the survey area contains native vegetation used for foraging at any time by one or more of the black-cockatoo species, and is larger than one hectare in size, it is considered at face value to be of very high quality, important for recovery and therefore as having a score of ten.

The scoring tool then considers the following five contextual factors that may lessen the quality of that habitat (Appendix 4):

- Foraging potential;
- Connectivity to other foraging areas;
- Proximity to breeding areas;
- Proximity to night roosting areas; and
- Impacts from significant plant disease.

To provide a final habitat quality score points are subtracted (from the starting score of ten) for each of the contextual factors where the required evidence is not proven to occur at the site.

Offset Habitat Scoring System - DCCEEW in consultation with species experts in WA

The score used to calculate the value of an offset provides a numerical value that reflects the significance of vegetation as foraging habitat for each of the black cockatoo species, and was recently developed by the DCCEEW in consultation with species experts in Western Australia. The foraging value of the vegetation depends upon the type, percentage foliar cover and health of trees and/or vegetation condition, and can be influenced by the context of the site such as the availability of foraging habitat nearby. The scoring system has three components drawn from the DCCEEW offset calculator (DCCEEW 2020, see Appendix 5):

- A score between zero and seven relating to site condition;
- A score between zero and three relating to site context; and
- Species stocking rate which is related to confirmation of presence or absence at the site for each of the three species of black cockatoo.

Site condition is considered the key factor in determining the quality of habitat for the three 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. The species, or strong indicators of the species, must be present for an offset to be considered suitable.

2.3.7 Field Survey Constraints

The EPA Technical Guidance for Flora and Vegetation Surveys for Environmental Impact Assessment in Western Australia (EPA 2016a) lists seven potential limitations that field surveys may encounter. These limitations are addressed in Table 2.

Table 2 Relevance of limitations, as identified by EPA (2016a), to the reconnaissance flora and vegetation survey.

Constraint	Relevance
Availability of contextual information at a regional and local scale	NOT A LIMITATION There are a limited number of surveys that have been completed within the Miling area, likely due to the large proportion of native vegetation historical cleared for cropping. However, the DBCA rare flora, rare fauna and community databases provide a significant amount of data for a 30 km radius around the study area. While no issues with the reliability or accuracy of the desktop searches or previous surveys were identified, it is acknowledged that there may be errors in the data presented from some of these historical sources.
Proportion of flora recorded and/or collected, any identification issues	NOT A LIMITATION The reconnaissance flora and vegetation survey was undertaken under fair seasonal conditions and included extensive ground truthing of the study area by an experienced Principal Botanist. It is likely that a high proportion of the annual and ephemeral flora component was not present due to the field work occurring outside the optimum Spring flowering period.
Survey timing, rainfall, season of survey	NOT A LIMITATION The field survey was completed on the 9 th and 10 th of June 2025 with the three months preceding the field survey recording 26.2 mm, 23.4 mm and 14.6 mm resulting in fair seasonal conditions.
Disturbance that may have affected the results of the survey such as fire, flood or clearing	NOT A LIMITATION There has been historical clearing for broadacre grazing and cropping surrounding the study area with edge effects resulting from elevated weed loading evident around the perimeter of native vegetation remnants. The localised nature of the native remnant and absence of perimeter fencing has also resulted in grazing impacts from sheep, kangaroos and rabbits. However, these disturbances did not influence survey outcomes.
Was the appropriate area fully surveyed (effort and extent)	NOT A LIMITATION The entire study area was comprehensively ground truthed by a Principal Botanist.
Access restrictions within the survey area	NOT A LIMITATION The entire study area was accessed on foot. Access did not pose any restrictions to completing tasks for the field survey.
Competency/experience of the team carrying out the survey, including experience in the bioregion surveyed	NOT A LIMITATION The Principal Botanist working on the survey (Dr Jerome Bull) have more than 20 years' experience working in the region.

3.0 RESULTS

3.1 Desktop Review

3.1.1 Previous Flora Surveys

A large proportion of the native vegetation extent in the Miling region has been historically cleared for broadacre cropping. At least six flora and vegetation surveys have been completed around Miling (Table 3) with two surveys focussed on remnant road verge vegetation, three surveys completed at the Miling grain receival site, and the most recent survey at a potential offset site southeast of Miling. The significant reduction in native vegetation extent has increased the conservation significance of retained vegetation. The smooth barked eucalypt vegetation types are aligned with the Commonwealth listed TEC (and synonymous State listed PEC) Eucalypt Woodlands of the Western Australian Wheatbelt where stands meet thresholds for minimum canopy cover, extent and condition.

Table 3 Previous surveys completed in close proximity to the study area.

Survey	Floristics Conservation Significant Flora	Vegetation
Miling Grain Receival Site Expansion Flora and Fauna Survey (Ecological 2021a)	79 flora taxa (27 weeds) 23 families 60 genera None of the plant taxa recorded from the study area were listed as Threatened Flora under the Commonwealth EPBC Act or the Western Australian BC Act, or listed as Priority flora by the DBCA.	Six vegetation types with three of the vegetation types, none aligned with TECs or PECs.
CBH Miling Grain Receival Site Expansion - Task 8 Targeted Flora Survey (Ecological 2021b)	Targeted flora survey did not record any conservation significant flora species, with historical disturbance being a contributing factor.	Not assessed.
Flora and Black Cockatoo Assessment for the CBH Grain Receival Site Expansion in Miling (Ecological 2024)	75 flora taxa (33 weeds) 24 families 57 genera None of the plant taxa recorded from the study area were listed as Threatened Flora under the Commonwealth EPBC Act or the Western Australian BC Act, or listed as Priority flora by the DBCA.	Eight vegetation types with three of the vegetation types, none aligned with TECs or PECs.

Survey	Floristics Conservation Significant Flora	Vegetation
Reconnaissance flora and vegetation survey CBH Group Potential Offset Site, Miling (Onshore Environmental 2025)	None of the plant taxa recorded from the study area were listed as Threatened Flora under the Commonwealth EPBC Act or the Western Australian BC Act, or listed as Priority flora by the DBCA.	Six vegetation types with three of the vegetation types aligned with the Commonwealth listed TEC 'Eucalypt woodlands of the Western Australian Wheatbelt', and Western Australian PEC of the same name.
Flora and fauna assessment for Lyons East Road to Gatti Road study area (Phoenix 2015)	253 flora taxa (37 weeds) 46 families 110 genera Grevillea bracteosa subsp. bracteosa (T) Chamelaucium sp. Wongan Hills (T) Dampiera glabrescens (P1) Frankenia glomerata (P3) Grevillea asparagoides (P3) Grevillea pinifolia (P1) Urodon capitatus (P3)	Nine vegetation types were defined locally for the study area. Broadly the vegetation types recorded represent low to mid woodlands and shrublands with Allocasuarina campestris thicket prominent, mixed shrublands, succulent steppe (samphire, Tecticornia spp.) shrublands and mosaics of these vegetation types. Sections of one of the woodland communities (Medium woodland, York Gum) recorded for the study area at quadrats may be considered representative of the Eucalypt woodlands of the Western Australian Wheatbelt TEC/PEC.
Northam-Pithara Road Threatened and Priority Targeted Flora Survey (Aecom 2015)	Floristics not recorded Eremophila viscida (T) Frankenia conferta (T) Dampiera glabrescens (Priority 1) Acacia lirellata subsp. compressa (P2) Acacia dissona var. indoloria (P3) Acacia scalene (P3) Podothea unisetia (P3)	Four vegetation types, one of which was aligned with the Eucalypt woodlands of the Western Australian Wheatbelt TEC/PEC.

3.1.2 TECs listed under Commonwealth and State Legislation

The database search results indicated that there was one Commonwealth listed TEC intersecting the study area (Figure 2, Table 4): 'Eucalypt woodlands of the Western Australian Wheatbelt' (Critically Endangered)¹. The community is described as Woodlands of eucalypt species as either trees or mallets over a variable understorey. Typical tree species occurring within the woodlands include *Eucalyptus salmonophloia* (salmon gum), *Eucalyptus loxophleba* subsp. *loxophleba* (York gum), *Eucalyptus salubris* (gimlet) and *Eucalyptus wandoo* (wandoo) (DOE 2015).

3.1.3 PECs recognised by DBCA

DBCA has generated a list of PECs occurring in the Avon Wheatbelt region of Western Australia that require further investigation prior to nomination for TEC status. A search of DBCA's ecological community database (DBCA 2025c) confirmed that the buffer of one PEC intersected the northwest sector of study area: 'Eucalypt woodlands of the Western Australian Wheatbelt'².

¹ Synonymous with the DBCA-listed PEC Eucalypt woodlands of the Western Australian Wheatbelt.

² The description, area and condition thresholds that apply to the EPBC-listed TEC of the same name.

Table 4 **TECs and PECs occurring within a 50 km radius of the study area.**

Community	Description	Closest Location	Category
Commonwealth TEC intersecting the study area			
Eucalypt woodlands of the Western Australian Wheatbelt	Woodlands of eucalypt species as either trees or mallets over a variable understorey. Typical tree species occurring within the woodlands include <i>Eucalyptus salmonophloia</i> (salmon gum), <i>Eucalyptus loxophleba</i> subsp. <i>loxophleba</i> (York gum), <i>Eucalyptus salubris</i> (gimlet) and <i>Eucalyptus wandoo</i> (wandoo).	Buffer is overlapping the northwest sector of the study area.	Critically Endangered
Western Australian PEC intersecting the study area (same community as listed above)			
Eucalypt woodlands of the Western Australian Wheatbelt	The structure of the ecological community is a woodland in which the minimum crown cover of the tree canopy in a mature woodland is 10%. The key dominant or co-dominant species of the tree canopy are species of <i>Eucalyptus</i> trees that typically have a single trunk. Native understorey is present but is of variable composition, being a combination of grasses, other herbs and shrubs.	Buffer is overlapping the northwest sector of the study area.	Priority 3



CBH MILING OFFSET AREA

**Figure 2: TECs and PECs
within a 10km radius of the
study area.**

Legend

 Offset Area

Threatened Ecological Communities
 Eucalypt woodlands of the
WA Wheatbelt
 Buffered TEC boundary
(200m)



0 1 2 3 km

1:100,000

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Datum: GDA 2020	
Projection: MGA Zone 50	
Data sources: Data WA - Native Vegetation Extent (DPIRD-005), Roads (Simplified) (L.GATE-195), Legislative Lands and Waters (DBCA-011), Geographic Names (GEONOMA) (L.GATE-013), Geoscience Australia - Surface Hydrology Lines (Regional), Surface Hydrology Polygons (Regional)	

3.1.4 Threatened Flora listed under the EPBC Act

A search of the EPBC Act Protected Matters database was undertaken for a 10 km radius around the study area (DCCEE 2025). Twenty-one Threatened flora taxa as listed under the Commonwealth EPBC Act were recorded as potentially occurring or having suitable habitat within the 10 km search radius:

- *Acacia ataxiphylla* subsp. *magna* - Endangered;
- *Acacia cochlocarpa* subsp. *cochlocarpa* - Endangered;
- *Acacia cochlocarpa* subsp. *velutinos*a - Critically Endangered;
- *Acacia vassalii* - Endangered;
- *Andersonia gracilis* - Endangered;
- *Caladenia drakeoides* - Endangered;
- *Chorizema humile* - Endangered;
- *Conospermum densiflorum* subsp. *unicephalum* - Endangered;
- *Dasymalla axillaris* - Critically Endangered;
- *Daviesia dielsii* - Endangered;
- *Daviesia euphorbioides* - Endangered;
- *Eremophila scaberula* - Endangered;
- *Eremophila viscida* - Endangered;
- *Frankenia conferta* - Endangered;
- *Gastrolobium hamulosum* - Endangered;
- *Grevillea christineae* - Endangered;
- *Grevillea pythara* - Endangered;
- *Gyrostemon reticulatus* - Critically Endangered;
- *Hemiandra gardneri* - Endangered;
- *Roycea pycnophylloides* - Endangered; and
- *Verticordia staminosa* subsp. *staminosa* - Endangered.

3.1.5 Threatened Flora listed under the IUCN Red List

A search of the International Union for Conservation of Nature (IUCN) database (IUCN 2025) determined that no Threatened flora taxon was likely to occur within the study area.

3.1.6 Threatened Flora listed under the BC Act

A total of 13 Threatened flora taxa were identified from the DBCA rare flora database search (DBCA 2025b) as occurring within a 40 km radius of the study area (Table 5).

3.1.7 Priority Flora recognised by the DBCA

The DBCA rare flora database search (DBCA 2025b) identified 34 Priority flora taxa as potentially occurring within a 50 km radius of the study area (Table 5).

3.1.8 Assessment of Likelihood of Occurrence in the Study Area

A total of 47 species of conservation significant flora were identified as occurring within a 50 km radius of the study area from all database searches (Table 5). Thirteen conservation significant flora taxa occurred within a 10 km radius of the study area (Table 5). With consideration of habitat and proximity to previous records, three of the 13 taxa were considered *likely* to occur within the study area, two were considered to possibly occur within the study area, and the remaining eight taxa were considered *unlikely* to occur within the study area (Table 5).

A further four conservation significant flora occurred within a 10 km to 20 km radius of the study area and included three Priority flora and one Threatened flora taxon (Table 5). All four taxa were determined to be *unlikely* to occur within the study area (Table 5).

Within a radius extending from 20 km to 50 km from the study area an additional 30 conservation significant flora had previously been recorded, including 23 Priority flora and seven Threatened flora taxa (Table 5). It was determined that six of these taxa may *possibly* occur within the study area, with the remaining 24 taxa *unlikely* to occur within the study area (Table 5).

Table 5 Significant flora previously recorded from a 50 km search radius around the study area (DBCA 2025a), and likelihood of those taxa occurring within the study area.

Species	State Cons. Code	Federal Cons. Code	Habitat Description	Likelihood within the Study Area
Previously recorded from a 10 km radius around the study area				
<i>Acacia trinalis</i>	1		Brown sand, clay loam. Salt lakes & flats, swampy areas.	Likely (5km SW)
<i>Caladenia cristata</i>	1		Sandy clay. Sandy rise above salt flats, freshwater.	Possible (3km SW)
<i>Caladenia drakeoides</i>	T	E	Grey clayey sand, red sandy loam, in damp situations. Margins of salt lakes.	Likely (4km SW)
<i>Chorizema humile</i>	T	E	Sandy clay or loam. Plains.	Likely (5km SE)
<i>Daviesia dielsii</i>	T	E	Sandy, often gravelly soils.	Unlikely (8km N)
<i>Gastrolobium appressum</i>	T	V	White/yellow sand with quartz gravel. Sandplains, low rises.	Unlikely (3km SW)
<i>Gastrolobium rotundifolium</i>	3		Heavy clay or loam soils, granite, sandstone, quartzite. Low rises, breakaways.	Unlikely (3km SW)
<i>Grevillea bracteosa</i> subsp. <i>bracteosa</i>	T		Flat or low hill. Gravelly brown loam over laterite. <i>Allocasuarina campestris</i> thicket.	Unlikely (7km E)
<i>Grevillea pinifolia</i>	1		Yellow sand, gravel.	Unlikely (8km E)
<i>Melaleuca sclerophylla</i>	3		Gravelly sand, clayey sand. Granite outcrops, rises.	Unlikely (7km E)
<i>Stylidium periscelanthum</i>	3		Loamy clay, moist soils pockets. Wet flats, low granitic hills.	Unlikely (7km E)
<i>Urodon capitatus</i>	3		Sandy gravelly soils. Plains.	Possible (3km SW)
<i>Verticordia venusta</i>	3		Yellow sand, sandy gravel. Sandplains.	Unlikely (4km SW)
Previously recorded between 10-20 km around the study area				
<i>Calothamnus accedens</i>	4		Sandy soils over laterite.	Unlikely
<i>Eucalyptus x carnabyi</i>	4		Grey sand, sandy loam. Lateritic ridges.	Unlikely
<i>Grevillea asparagoides</i>	3		Gravelly loam, white or yellow sand.	Unlikely
<i>Jacksonia pungens</i>	T	E	Yellow sand, gravelly lateritic soils. Undulating areas.	Unlikely
Previously recorded between 20-50 km around the study area				
<i>Acacia anarthros</i>	3		Lateritic gravelly soils. Slopes.	Unlikely
<i>Acacia arcuatilis</i>	2		Sand/sandy loam, sometimes with lateritic gravel. Undulating plains/rises.	Unlikely
<i>Acacia asepala</i>	2		Red-brown sandy loam. Undulating plains, along drainage lines.	Unlikely
<i>Acacia lirellata</i> subsp. <i>compressa</i>	2		Yellow sand, clayey loam. Sandplains.	Unlikely
<i>Acacia semicircularis</i>	4		Gravelly soils, laterite. Hillslopes.	Unlikely
<i>Acacia vassalii</i>	T	E	Grey/brown or yellow sand, sandy loam.	Unlikely

Species	State Cons. Code	Federal Cons. Code	Habitat Description	Likelihood within the Study Area
<i>Adenanthos cygnorum</i> subsp. <i>chamaephyton</i>	3		Grey sand, lateritic gravel.	Unlikely
<i>Androcalva fragifolia</i>	1		Flat. Brown clay/loam with lateritic gravel.	Possible
<i>Balaustion grande</i>	3		Plain. Yellow sand. Open woodland over heath with Banksia prionotes.	Unlikely
<i>Boronia ericifolia</i>	2		Sandy loam, clay, laterite. Low-lying spots.	Possible
<i>Caladenia dundasiae</i>	1		Clayey loam. Well-drained soils under scattered wandoo.	Possible
<i>Caladenia x hopperi</i>	1		Sandy rises above saline flats.	Possible
<i>Chamelaucium</i> sp. Wongan Hills (B.H. Smith 1140)	3		Gently undulating terrain, loamy sand with lateritic gravel.	Unlikely
<i>Dasymalla axillaris</i>	T	CE	Sandy soils. Plains.	Unlikely
<i>Daviesia debilior</i> subsp. <i>sinuans</i>	3		Gravelly lateritic clay.	Unlikely
<i>Eremophila pinnatifida</i>	T	E	Red loam, hillside. Grows with Salmon Gum.	Unlikely
<i>Eremophila viscida</i>	T	E	Granitic soils, sandy loam. Stony gullies, sandplains.	Unlikely
<i>Eucalyptus macrocarpa</i> x <i>pyriformis</i>	3		Sand, lateritic sandy soils. Hills, rocky ironstone ridges, sandplains.	Unlikely
<i>Frankenia conferta</i>	T	E	Clayey soils on the edge of salt lakes.	Possible
<i>Gastrolobium hamulosum</i>	T	E	Sandy, often gravelly soils or clay. Flats, slopes, ridges.	Unlikely
<i>Gompholobium wonganense</i>	3		Sand, laterite. Among hills.	Unlikely
<i>Grevillea haplantha</i> subsp. <i>recedens</i>	3		Sand, sandy loam.	Unlikely
<i>Grevillea pythara</i>	T	E	Sand or sandy loam with gravel.	Unlikely
<i>Hibbertia subvillosa</i>	3		Yellow sand, kwongan vegetation.	Unlikely
<i>Kunzea</i> sp. Wongan Hills (A.M. Coates 3045)	3		Laterite, hill slope.	Unlikely
<i>Mirbelia</i> sp. <i>Cordifolia</i> (C.A. Gardner 2712)	1		<i>Allocasuarina campestris</i> shrubland.	Unlikely
<i>Podotheca uniseta</i>	3		White/grey sand, sandy loam. Samphire flats.	Possible
<i>Thryptomene shirleyae</i>	2		Hillside. Yellow-brown sand-loam over granite.	Unlikely
<i>Verticordia dasystylis</i> subsp. <i>oestopoia</i>	1		Gritty soils over granite. Outcrops.	Unlikely
<i>Verticordia huegelii</i> var. <i>tridens</i>	3		Sandy or gravelly loam. Winter-wet areas, low hills.	Unlikely

3.2 Significant Flora

3.2.1 Threatened Flora listed under the EPBC Act and BC Act

None of the plant taxa recorded from the study area were listed as Threatened Flora (T) under the Commonwealth EPBC Act or the Western Australian BC Act.

3.2.2 Priority Flora

None of the plant taxa recorded from the study area were listed as Priority flora taxa, as listed by the DBCA.

3.3 Introduced Flora

None of the plant taxa recorded from the study area was determined to be Weeds of National Significance (Invasive Plants and Animals Committee 2016), or were listed as a Declared Plant under the BAM Act.

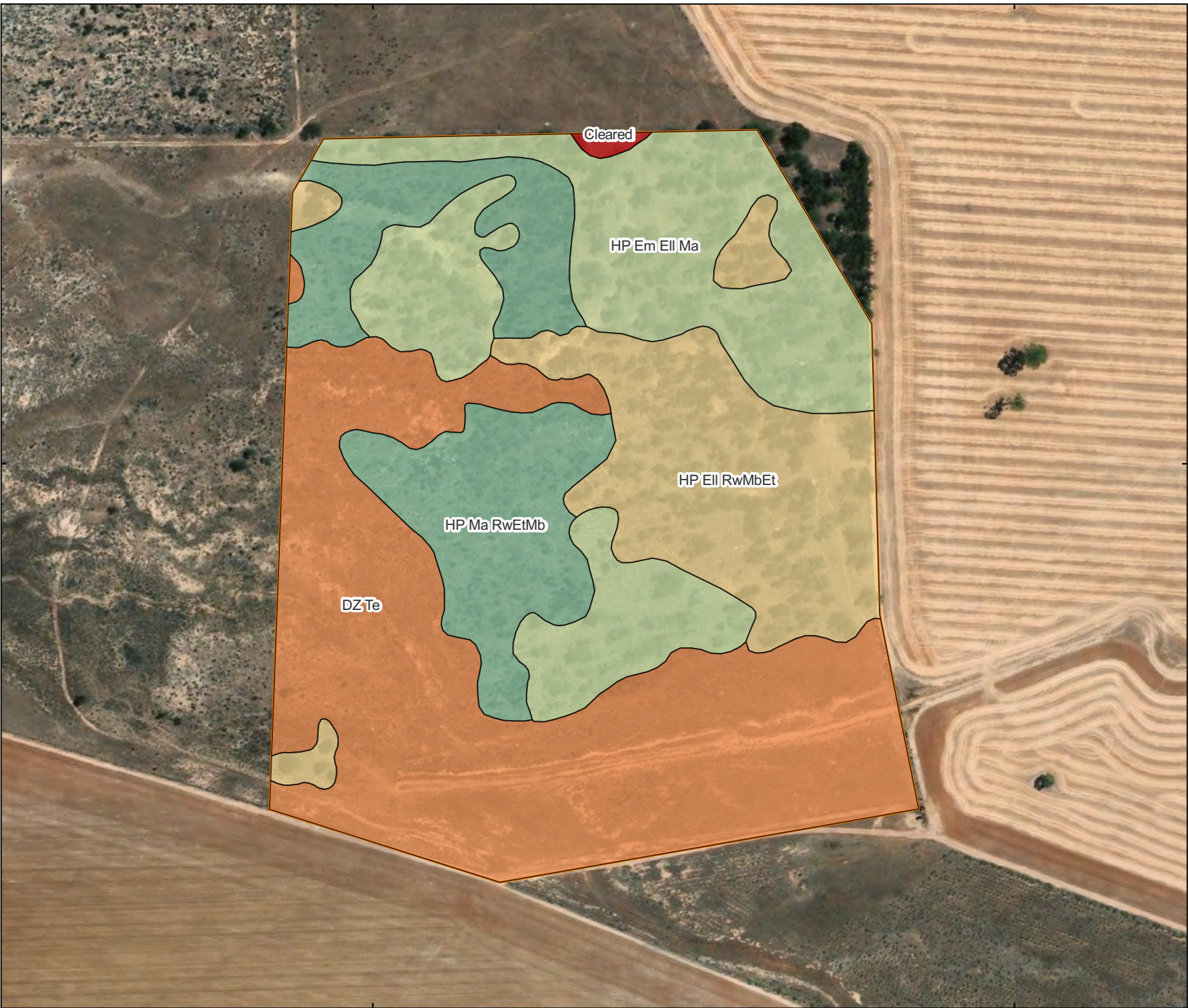
3.4 Vegetation

Vegetation within the study area was described and mapped as four vegetation types that included *Eucalyptus myriadena* Low Woodland A, *Eucalyptus loxophleba* subsp. *loxophleba* Low Woodland A, *Melaleuca eleuteractachya* Scrub and *Tecticornia* spp. Dwarf Scrub D (Figure 3, Table 6).

The two vegetation types supporting smooth-barked eucalypts were aligned with the Commonwealth listed TEC 'Eucalypt woodlands of the Western Australian Wheatbelt (Critically Endangered)', noting that this is analogous with the Western Australian listed PEC of the same name (refer to Appendix 6).

Table 6 Vegetation types mapped within the study area.

Code	Broad Floristic Formation	Vegetation Type Description	TEC/PEC	Condition	Area (ha)
HP Em Ell Ma	Eucalyptus Low Woodland A	Low Woodland A of <i>Eucalyptus myriadena</i> (<i>Eucalyptus loxophleba</i> subsp. <i>loxophleba</i>) over Open Scrub of <i>Melaleuca eleuterostachya</i> over Open Dwarf Scrub D of <i>Rhagodia</i> sp. Watheroo (R.J. Cranfield & P.J. Spencer 8183) and <i>Maireana brevifolia</i> over Open Herbs of <i>*Mesembryanthemum nodiflorum</i> and <i>Atriplex codonocarpa</i> on brown sandy loam on hardpan plains and flats	Eucalypt woodlands of the Western Australian Wheatbelt (Critically Endangered)	Good	6.30 ha (24.9%)
HP Ell RwMbEt	Eucalyptus Low Woodland A	Low Woodland A (to Open Low Woodland A) of <i>Eucalyptus loxophleba</i> subsp. <i>loxophleba</i> over Open Dwarf Scrub D of <i>Rhagodia</i> sp. Watheroo (R.J. Cranfield & P.J. Spencer 8183), <i>Maireana brevifolia</i> and <i>Enchylaena tomentosa</i> over Open Herbs of <i>*Mesembryanthemum nodiflorum</i> and <i>Sclerolaena diacantha</i> (<i>Atriplex codonocarpa</i> , <i>*Romulea rosea</i>) on brown sandy loam on hardpan plains and flats	Eucalypt woodlands of the Western Australian Wheatbelt (Critically Endangered)	Good to Degraded	4.65 ha (18.4%)
HP Ma RwEtMb	Melaleuca Scrub	Scrub (to Open Scrub) of <i>Melaleuca eleuterostachya</i> (<i>Melaleuca acuminata</i> subsp. <i>websteri</i>) over Open Dwarf Scrub D of <i>Rhagodia</i> sp. Watheroo (R.J. Cranfield & P.J. Spencer 8183), <i>Enchylaena tomentosa</i> and <i>Maireana brevifolia</i> (<i>Tecticornia</i> spp.) over Open Herbs of <i>*Mesembryanthemum nodiflorum</i> , <i>*Romulea rosea</i> and <i>Hordeum</i> sp. indet. on brown sandy loam on hardpan plains and flats	Not aligned	Good to Degraded	4.43 ha (17.5%)
DZ Te	Tecticornia Dwarf Scrub D	Dwarf Scrub D of <i>Tecticornia lepidosperma</i> , <i>Tecticornia pergranulata</i> subsp. <i>pergranulata</i> , <i>Maireana brevifolia</i> and <i>Enchylaena tomentosa</i> over Open Herbs of <i>*Mesembryanthemum nodiflorum</i> , <i>Podolepis aristata</i> , <i>Atriplex semibaccata</i> and <i>Atriplex codonocarpa</i> over Very Open Low Grass of <i>Eragrostis dielsii</i> on brown clay loam on saline drainage zones and flats	Not aligned	Degraded	9.85 ha (38.9%)

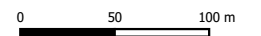


CBH MILING OFFSET AREA

**Figure 3: Vegetation types
within the study area**

Legend

- Offset Area
- Veg Mapping Dissolved**
- Cleared
- DZ Te
- HP EII RwMbEt
- HP Em EII Ma
- HP Ma RwEtMb



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Code	HP Em Ell Ma
Broad Floristic Formation	<i>Eucalyptus</i> Low Woodland A
Vegetation Type	Low Woodland A of <i>Eucalyptus myriadena</i> (<i>Eucalyptus loxophleba</i> subsp. <i>loxophleba</i>) over Open Scrub of <i>Melaleuca eleuterostachya</i> over Open Dwarf Scrub D of <i>Rhagodia</i> sp. Watheroo (R.J. Cranfield & P.J. Spencer 8183) and <i>Maireana brevifolia</i> over Open Herbs of * <i>Mesembryanthemum nodiflorum</i> and <i>Atriplex codonocarpa</i> on brown sandy loam on hardpan plains and flats



This unit is characterised by the low woodland stratum of <i>Eucalyptus myriadena</i> .	
Area (ha)	6.30 ha (24.9% of the study area)
Soils and Geology	Brown sandy loam
Land Form	Hardpan plains and flats
TEC or PEC	Eucalypt woodlands of the Western Australian Wheatbelt: EPBC listed TEC (Critically Endangered), WA listed PEC (Priority 3)
Conservation Significant Flora	None
Vegetation Condition	Good
Disturbances	Currently being grazed by sheep, farm debris, historical ground disturbance, access track, weeds, senescence of older plants
Average Fire Age	Old (6+ yrs)

Code	HP EII RwMbEt
Broad Floristic Formation	<i>Eucalyptus</i> Low Woodland A
Vegetation Type	Low Woodland A (to Open Low Woodland A) of <i>Eucalyptus</i> <i>loxophleba</i> subsp. <i>loxophleba</i> over Open Dwarf Scrub D of <i>Rhagodia</i> sp. Watheroo (R.J. Cranfield & P.J. Spencer 8183), <i>Maireana</i> <i>brevifolia</i> and <i>Enchylaena</i> <i>tomentosa</i> over Open Herbs of * <i>Mesembryanthemum</i> <i>nodiflorum</i> and <i>Sclerolaena</i> <i>diacantha</i> (<i>Atriplex</i> <i>codonocarpa</i> , * <i>Romulea</i> <i>rosea</i>) on brown sandy loam on hardpan plains and flats



This unit is characterised by the low woodland stratum of York Gum.	
Area (ha)	4.65 ha (18.36% of the study area)
Soils and Geology	Brown sandy loam
Land Form	Hardpan plains and flats
TEC / PEC	Eucalypt woodlands of the Western Australian Wheatbelt: EPBC listed TEC (Critically Endangered), WA listed PEC (Priority 3)
Conservation Significant Flora	None
Vegetation Condition	Good to Degraded
Disturbances	Currently being grazed by sheep, evidence of rabbits, farm debris, access tracks, historical ground disturbance, weeds,
Average Fire Age	Old (6+ yrs)

Code	HP Ma RwEtMb
Broad Floristic Formation	<i>Melaleuca</i> Scrub
Vegetation Type	Scrub (to Open Scrub) of <i>Melaleuca eleuteractachya</i> (<i>Melaleuca acuminata</i> subsp. <i>websteri</i>) over Open Dwarf Scrub D of <i>Rhagodia</i> sp. <i>Watheroo</i> (R.J. Cranfield & P.J. Spencer 8183), <i>Enchylaena tomentosa</i> and <i>Maireana brevifolia</i> (<i>Tecticornia</i> spp.) over Open Herbs of * <i>Mesembryanthemum nodiflorum</i> , * <i>Romulea rosea</i> and <i>Hordeum</i> sp. indet. on brown sandy loam on hardpan plains and flats



This unit was characterised by a Scrub to Open Scrub stratum dominated by tall shrubs of <i>Melaleuca eleuteractachya</i> .	
Area (ha)	4.43 ha (17.51% of the study area)
Soils and Geology	Brown sandy loam
Land Form	Sandy loam plains and flats
TEC / PEC	None
Conservation Significant Flora	None
Vegetation Condition	Good to Degraded
Disturbances	Currently being grazed by sheep and rabbits, farm debris, historical ground disturbance, access track, weeds, senescence of older plants.
Average Fire Age	Old (6+ yrs)

Code	DZ Te
Broad Floristic Formation	<i>Tecticornia</i> Dwarf Scrub D
Vegetation Type	Dwarf Scrub D of <i>Tecticornia lepidosperma</i> , <i>Tecticornia pergranulata</i> subsp. <i>pergranulata</i> , <i>Maireana brevifolia</i> and <i>Enchylaena tomentosa</i> over Open Herbs of * <i>Mesembryanthemum nodiflorum</i> , <i>Podolepis aristata</i> , <i>Atriplex semibaccata</i> and <i>Atriplex codonocarpa</i> over Very Open Low Grass of <i>Eragrostis dielsii</i> on brown clay loam on saline drainage zones and flats



Characterised by the dominance of low samphire shrubs (*Tecticornia lepidosperma*, *Tecticornia pergranulata* subsp. *pergranulata*) with mixed chenopods on salt effected flats. Evidence that it was previously the *Melaleuca eleuteractachya* Scrub unit prior to being impacted by salinisation.

Area (ha)	9.85 ha (38.92% of the study area)
Soils and Geology	Brown clay loam, clay sand and light clay
Land Form	Saline flats
TEC / PEC	None
Conservation Significant Flora	None
Vegetation Condition	Degraded (some areas bordering on being rated Completed Degraded)
Disturbances	Impacted by salinisation, currently being grazed by sheep, evidence of rabbits, farm debris, historical ground disturbance, access track, weeds, senescence of older plants.
Average Fire Age	Old (6+ yrs)

3.5 Vegetation Condition

Vegetation condition was predominantly rated as 'degraded' throughout the larger proportion of the study area (78%), with smaller patches rated as 'good' (21%) where *Eucalyptus myriadena* and *Eucalyptus loxophleba* subsp. *loxophleba* occurred in mid-dense stands (Table 7, Figure 4). Remnant vegetation was unfenced and therefore open to the surrounding farmland and being actively grazed by sheep, with added grazing pressure from kangaroos and rabbits. The lower drainage zones and saline flats were also impacted by dryland salinity, with the taller shrub vegetation strata replaced by low shrub samphire and chenopod species. There was also areas with historical ground disturbance and colonisation of pasture weeds and grasses in the ground cover.

Table 7 Summary of vegetation condition within the study area.

Vegetation Condition Rating	Area (ha)	% of Study Area
Pristine	0.00	0.00
Excellent	0.00	0.00
Very Good	0.00	0.00
Good	5.44	21.49
Degraded	19.79	78.19
Completely Degraded (Cleared)	0.08	0.31
Total	25.31	100.00

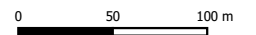


**CBH
MILING OFFSET AREA**

**Figure 4: Vegetation condition
within the study area**

Legend

-  Offset Area
- Vegetation Condition
-  Completely Degraded
-  Degraded
-  Good



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3.6 Representation and Reservation of Vegetation

Regional vegetation mapping completed by Beard (1976) was utilised to assess representation of vegetation within the study area. Two Beard vegetation associations were represented within the study area (Table 8):

- 142 Medium woodland, York Gum and Salmon Gum; and
- 631 Succulent steppe with woodland and thicket; York gum over *Melaleuca thyoides* and samphire.

In terms of representation, the Western Australian Government is committed to the National Objectives Targets for Biodiversity Conservation which includes a target that prevents clearance of ecological communities with an extent below 30% of that present at pre-European settlement (Department of Natural Resources and Environment 2002, EPA 2000). When considering representation at the State level, vegetation associations 142 and 631 have 26.44% and 47.01% of their pre-European extent remaining respectively. The study area is located within the Katanning sub-region of the Avon Wheatbelt bioregion.

When considering the representation of vegetation at the IBRA region and sub-region levels, vegetation association 142 has 12.4% and 7.2% of the pre-European extent is remaining respectively (Table 8). For vegetation association 631 the current extent is 46.00% at the IBRA region level and 14.41% at the IBRA sub-region level.

The study area falls entirely within the Shire of Moora. At this local government level 7.70% and 18.67% of the pre-European extent remains for vegetation associations 142 and 631 respectively (Table 8).

Hence, vegetation association 142 is determined to be poorly represented at all levels (state-wide, bioregional [IBRA region and IBRA sub-region] and local government authority), with <30% of the pre-European extent remaining intact. Vegetation association 631 is well represented at the state-wide and IBRA region levels, but poorly represented as the IBRA sub-region and local government authority levels.

In terms of reservation, there is a benchmark for a minimum of 15% of each Beard vegetation association to be protected in Class I-IV reserves (Commonwealth of Australia 1997). The proportion of vegetation associations 142 and 631 occurring within Class I-IV reserves at a state level is 3.86% and 4.51% respectively, with 3.92% and 15.91% occurring within DBCA managed lands (Table 8).

Table 8 Pre-European extent of vegetation represented within the study area on the basis of identified datasets (Government of Western Australia 2018).

Vegetation System / Association	Pre-European Extent (ha)	Current Extent (ha)	% Pre-European Extent Remaining	Current Extent in Class I-IV Reserves (ha)	% Current Extent in Class I-IV Reserves	Current Extent DBCA Managed Lands (ha)	% Current Extent DBCA Managed Lands
State-wide							
142 Medium woodland, York Gum & Salmon Gum	787,948.47	208,347.17	26.44	8,044.80	3.86	8,177.57	3.92
631 Succulent steppe with woodland and thicket; York gum over Melaleuca thyoides & samphire	106,852.97	50,232.96	47.01	2,267.38	4.51	7,994.04	15.91
IBRA Region							
142 (Avon Wheatbelt - AVW)	637,707.53	79,309.95	12.44	2,280.18	2.88	2,381.71	3.00
631 (Avon Wheatbelt - AVW)	104,051.07	47,863.94	46.00	489.79	1.02	5,701.16	11.91
IBRA Sub-Region							
142 (Katanning - AVW02)	224,265.61	16,054.80	7.16	349.67	2.18	349.67	2.18
631 (Katanning - AVW02)	11821.43	1702.93	14.41				
Local Government - Shire of Moora							
142	164,556.36	12,666.00	7.70	186.32	1.47	186.32	1.47
631	10,329.63	1,928.79	18.67				

3.7 Conservation Significance of Vegetation

3.7.1 National Significance

There were no Threatened flora taxa listed under the Commonwealth EPBC Act recorded from the study area. However, two vegetation types supporting smooth-barked eucalypts were aligned with the Commonwealth listed TEC 'Eucalypt woodlands of the Western Australian Wheatbelt (Critically Endangered)'.

These two vegetation types were considered to be of national significance.

3.7.2 State Significance

None of the four vegetation types recorded from the study area supported Threatened Flora listed under the Western Australian BC Act. However, the same two vegetation types determined to be of national significance were also listed in Western Australia as a PEC of the same name: 'Eucalypt woodlands of the Western Australian Wheatbelt' (Priority 3).

These two vegetation types were considered to be of state significance.

3.7.3 Local Significance

None of the vegetation types supported plant taxa considered to represent range extensions or occurring at the extent of their known distribution. Hence, none of the vegetation types were determined to be of local conservation significance.

3.8 Assessment of Black-cockatoo Foraging Habitat

3.8.1 Foraging Habitat Score (DAWE 2022)

Based on the foraging quality scoring tool (DAWE 2022, Appendix 4) the study area was given a score of six for Carnaby's Black-cockatoo, and a score of four for Baudin's Black-cockatoo and Forest Red-tailed Black-cockatoo (Table 9). It is noted that the study area occurs outside the distribution of both Baudin's Black-cockatoo and Forest Red-tailed Black-cockatoo. Hence the study area was considered to support moderate to high quality foraging habitat for Carnaby's Black-cockatoo (Table 9). While there was no foraging evidence from Carnaby's Black-cockatoo at the time of the field survey, the species is considered likely to use the study area for foraging based on previous records from the local area. Factors that may affect the suitability of the study area for breeding are discussed below.

The availability and connectivity of nearby foraging habitat is important for successful breeding of black-cockatoos (Saunders 1977, 1986). Approximately 6.86% (3,216 ha) of the land area within a 12 km radius of the study area comprises native vegetation, reflecting the large area of clearing for agriculture (DPIRD 2017) (Figure 5). Only a portion of this native vegetation is likely to comprise vegetation types that represents suitable foraging habitat for black-cockatoos. The surrounding area is generally farm

land interspersed with remnant native vegetation. Drainage lines and road verges provide limited connectivity between remnants therefore one point was deducted for connectivity.

Database searches confirmed the nearest known breeding locations occur approximately 6 km northeast and 7.5 km east of the study area, hence no points were deducted for proximity to breeding sites.

Database searches did not record any known roost sites within a 12 km radius of the study area (DBCA 2025) (Figure 5). There were no known roosting trees observed within the study area. Based on the existing data points were deducted for proximity to roosting sites.

While some vegetation decline is present at the site, no severe disease was observed impacting trees during the field survey and no points were deducted for impacts from significant plant disease.

Table 9 Scoring tool for determining quality of black-cockatoo foraging habitat.

Score	Baudin's Black-cockatoo	Carnaby's Black-cockatoo	Forest Red-tail Black-cockatoo
Initial Score	10	10	10
Foraging evidence Subtract 2 from your score if there is no evidence of feeding debris on your site.	-2	-2	-2
Connectivity Subtract 2 from your score if you have evidence to conclude that there is no other foraging habitat within 12 km of your site.	-1	-1	-1
Proximity to breeding Subtract 2 if you have evidence to conclude that your site is more than 12 km from breeding habitat	-2	0	-2
Proximity to roosting Subtract 1 if you have evidence to conclude that your site is more than 20 km from a known night roosting habitat.	-1	-1	-1
Impact from significant plant disease Subtract 1 if your site has disease present (e.g. <i>Phytophthora</i> spp. or Marri canker) and the disease is affecting more than 50% of the preferred food plants present.	0	0	0
Final Score	4	6	4

3.8.2 Conservation Offset Foraging Habitat Score (DCCEEW)

The foraging habitat scoring system for black-cockatoos developed by DCCEEW to calculate the value of an offset site (Appendix 5) was applied to each of the four vegetation types represented within the study area. The final foraging habitat score ranged between three and seven (out of a possible score of ten) for Carnaby's Black-cockatoo, noting the study area occurred outside of the range for Forest Red-tailed Black-cockatoos and Baudin's Black-cockatoos (Table 10).

The site condition component of the foraging score was based primarily on the projected canopy foliage cover. The *Eucalyptus* Low Woodland A forest vegetation types were the only two units that supported a tree canopy, with projected foliar cover typically ranging from 20-40%. This correlated with a 'moderate to high' site condition score (score of five) for the *Eucalyptus loxophleba* subsp. *loxophleba* Low Woodland A, decreasing to a 'moderate' site condition score (score of five) for the *Eucalyptus myriadena* Low Woodland A (Table 10). The remaining two vegetation types represented negligible to low foraging value (site condition score one) limited to scattered introduced grasses and weeds.

The 12 km buffer for regional foraging habitat is based upon the maximum distance from a nest that breeding birds are likely to travel (DEC 2012). Approximately 6.9% (3,216 ha) of the land area within a 12 km radius of the study area comprises native vegetation (DPIRD 2017) (Figure 5). Only a small proportion of this native vegetation is likely to support high foraging value, however two known breeding sites occur within the same search radius. Therefore, a score of two (out of a possible score of three) was determined for Carnaby's Black-cockatoos for the site context component (Table 10).

In order to confirm presence of black-cockatoos within an area the scoring tool requires that the species is seen or reported regularly (intervals of every few days or weeks for at least several months of the year) and/or there is abundant foraging evidence, e.g., nuts that can be confirmed as having been chewed by the species. Based on the limited current survey effort there was no foraging evidence recorded from within the study area. However, the seasonal movements of Carnaby's Black-cockatoos are well understood, and birds are likely to utilise vegetation during later periods of each year when breeding.

Table 10 Foraging values of fauna habitats in the study area for Baudin's, Carnaby's and Forest Red-tailed Black-cockatoos, based upon vegetation characteristics, context and species density.

SITE CONDITION							
Indicator	Score	Foraging Value	Reasoning	HP Em Ell Ma	HP Ell RwMbEt	HP Ma RwEtMb	DZ Te
Vegetation condition & structure. Habitat features.	7	Very High	Marri-Jarrah or other eucalypt forest with >50% projected foliage cover OR kwongan heath and shrubland with >30% projected foliage cover.				
	6	High	Marri-Jarrah or other eucalypt forest or banksia woodland with >40% projected foliage cover OR kwongan heath and shrubland with >25% projected foliage cover.				
	5	Moderate to High	Marri-Jarrah or other eucalypt forest with 30-40% projected foliage cover OR kwongan heath and shrubland or banksia woodlands with >20% projected foliage cover.		<i>Eucalyptus loxophleba</i> 30-40%		
	4	Moderate	Marri-Jarrah or other eucalypt forest with 20-30% projected foliage cover OR kwongan heath and shrubland or banksia woodlands with 20-30% projected foliar cover.	<i>Eucalyptus myriadena</i> 20-30%			
	3	Low to Moderate	Marri-Jarrah or other eucalypt forest with 5-20% projected foliage cover OR kwongan heath and shrubland or banksia woodlands with 10-20% projected foliar cover.				
	2	Low	Marri-Jarrah or other eucalypt forest with 1-5% projected foliage cover OR paddocks with scattered food plants OR banksia woodlands with <10% projected foliar cover OR Paddocks and/or urban areas with scattered foraging trees such as banksia, hakea, dryandra.				
	1	Negligible to Low	Scattered specimens of known food plants but projected foliage cover of these is <2%. May include paddocks or urban areas.			Weeds <2%	Weeds <2%
	0	None					
Sub-Total				4	5	1	1
SITE CONTEXT							
Proximity of the site in relation to other habitat.	3						
	2	Site is within 12 km of known breeding site	Two known breeding sites approximately 6 km and 7.5 km northeast and east of the offset site.	Y	Y	Y	Y
	1						
	0						
Sub-Total				2	2	2	2
FINAL TOTAL				6	7	3	3

	Indicator	Species Stocking Rate	Carnaby's	Baudin's	FRTBC
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.	X		
	No	Species is recorded or reported very infrequently and there is little or no foraging evidence.		X	X



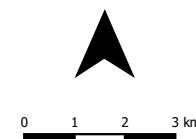
CBH MILING OFFSET AREA

**Figure 5: Black-cockatoo
breeding and foraging sites
within 12km radius of the
study area**

Legend

-  Offset Area
-  12km Offset Area Buffer
-  Black Cockatoo Breeding Sites (DBCA 2025)
-  Native Vegetation Extent (DPIRD 2017)

Dalwallinu
20 km



1:150,000

Document Control

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Data sources: Data WA - Native Vegetation Extent (DPIRD-005), ESRI Satellite Imagery, DBCA Threatened and Priority Database search request 2025

4.0 SUMMARY

A reconnaissance flora and vegetation survey and assessment of black-cockatoo foraging habitat of a 25 ha native vegetation remnant situated 2.5 km north northeast of Miling in the Avon Wheatbelt bioregion of Western Australia was conducted by a Principal Botanist between the 9th and 10th of June 2025.

None of the plant taxa currently identified from the study area were gazetted as Threatened Flora under the Commonwealth EPBC Act or the Western Australian BC Act, or listed as Priority flora taxa by the DBCA. Desktop searches confirmed that two Threatened flora taxa and one Priority flora taxon were likely to occur within the study area based on habitat and proximity to previous records.

There were no Declared Plants, as listed under the BAM Act, recorded from the study area. However, other introduced species may occur seasonally within the study area during Spring.

Four vegetation types representing three broad floristic formations were mapped from the study area. Two of the vegetation types were aligned with the Commonwealth listed TEC 'Eucalypt woodlands of the Western Australian Wheatbelt' and Western Australian PEC of the same name. The two vegetation types forming the TEC occurred as a consolidated remnant covering 10.95 ha.

Vegetation condition across most of the unfenced study area was rated as degraded, with disturbances including grazing by sheep, kangaroos and rabbits, historical ground disturbance including access tracks, weed incursion and edge effects from adjacent agricultural land, and evidence of dryland salinity on drainage flats. Vegetation condition improved to good in the northeast sector of the study area which supported *Eucalyptus* low woodlands.

5.0 STUDY TEAM

The reconnaissance flora and vegetation survey and assessment of black-cockatoo foraging habitat was planned, co-ordinated and executed by the following personnel:

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APPENDIX 1

Conservation codes for species and communities
of conservation significance

Categories used under the EPBC Act		
Status	Code	Description
Critically Endangered	Cr	Taxa considered to be facing an extremely high risk of extinction in the wild in the immediate future
Endangered	En	Taxa considered to be facing a very high risk of extinction in the wild in the near future
Vulnerable	Vu	Taxa considered to be facing a high risk of extinction in the wild in the medium-term future
Migratory	Mi	Species that migrate to, over and within Australia and its external territories

Conservation Codes used under the BC Act		
Status	Code	Description
Critically Endangered	CR	Taxa rare or likely to become extinct, as critically endangered taxa
Endangered	EN	Taxa rare or likely to become extinct, as endangered taxa
Vulnerable	VU	Taxa rare or likely to become extinct, as vulnerable taxa
Presumed Extinct	EX	Taxa presumed to be extinct
Migratory	IA	Birds subject to international agreements relating to the protection of migratory birds
Conservation Dependent	CD	Taxa of special conservation need, being species dependent on ongoing conservation intervention
Special Protection	OS	Taxa in need of special protection

IUCN Red List Categories		
Status	Code	Description
Extinct	EX	There is no reasonable doubt that the last individual has died.
Extinct in the Wild	EW	The taxon is known only to survive in cultivation, in captivity or as a naturalized population (or populations) well outside the past range.
Critically Endangered	CR	When the best available evidence indicates that it meets any of the criteria A to E for Critically Endangered, and it is therefore considered to be facing an extremely high risk of extinction in the wild.
Endangered	EN	When the best available evidence indicates that it meets any of the criteria A to E for Endangered, and it is therefore considered to be facing a very high risk of extinction in the wild.
Vulnerable	VU	When the best available evidence indicates that it meets any of the criteria A to E for Vulnerable, and it is therefore considered to be facing a high risk of extinction in the wild.
Near Threatened	NT	When it has been evaluated against the criteria but does not qualify for Critically Endangered, Endangered or Vulnerable now, but is close to qualifying for or is likely to qualify for a threatened category in the near future.
Least Concern	LC	When it has been evaluated against the criteria and does not qualify for Critically Endangered, Endangered, Vulnerable or Near Threatened. Widespread and abundant taxa are often included in this category.
Data Deficient	DD	When there is inadequate information to make a direct, or indirect, assessment of its risk of extinction based on its distribution and/or population status.
Not Evaluated	NE	When it has not yet been evaluated against the criteria.

Priority Flora and Fauna Under the BC Act		
Status	Code	Description
Priority 1: Poorly-known Species	P1	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.
Priority 2: Poorly-known Species	P2	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.
Priority 3: Poorly-known Species	P3	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.
Priority 4: Rare, Near Threatened and other species in need of monitoring	P4	(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. (b) Near Threatened. Species that are considered to have been adequately surveyed and that are close to qualifying for Vulnerable, but are not listed as Conservation Dependent. (c) Species that have been removed from the list of threatened species during the past five years for reasons other than taxonomy.

Definitions, Categories and Criteria for Threatened and Priority Ecological Communities	
General Definitions	
Ecological Community	A naturally occurring biological assemblage that occurs in a particular type of habitat. Note: The scale at which ecological communities are defined will often depend on the level of detail in the information source, therefore no particular scale is specified.
Threatened Ecological Community (TEC)	A threatened ecological community (TEC) is one which is found to fit into one of the following categories; "presumed totally destroyed", "critically endangered", "endangered" or "vulnerable". Possible threatened ecological communities that do not meet survey criteria are added to DEC's Priority Ecological Community (PEC) Lists under Priorities 1, 2 and 3. Ecological Communities that are adequately known, are rare but not threatened, or meet criteria for Near Threatened, or that have been recently removed from the threatened list, are placed in Priority 4. These ecological communities require regular monitoring. Conservation Dependent ecological communities are placed in Priority 5.
Assemblage	An assemblage is a defined group of biological entities.
Habitat	Habitat is defined as the areas in which an organism and/or assemblage of organisms lives. It includes the abiotic factors (e.g. substrate and topography), and the biotic factors.
Occurrence	A discrete example of an ecological community, separated from other examples of the same community by more than 20 meters of a different ecological community, an artificial surface or a totally destroyed community. By ensuring that every discrete occurrence is recognised and recorded future changes in status can be readily monitored.
Adequately Surveyed	An ecological community that has been searched for thoroughly in most likely habitats, by relevant experts.
Community structure	The spatial organisation, construction and arrangement of the biological elements comprising a biological assemblage (e.g. <i>Eucalyptus salmonophloia</i> woodland over scattered small shrubs over dense herbs; structure in a faunal assemblage could refer to trophic structure, e.g. dominance by feeders on detritus as distinct from feeders on live plants).

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

Definitions and Criteria for Presumed Totally Destroyed, Critically Endangered, Endangered and Vulnerable Ecological Communities	
Endangered (EN)	An ecological community that has been adequately surveyed and found to have been subject to a major contraction in an area and/or was originally of limited distribution and is in danger of significant modification throughout its range or severe modification or destruction over most of its range in the near future An ecological community will be listed as Endangered when it has been adequately surveyed and is not Critically Endangered but is facing a very high risk of total destruction in the near future. This will be determined on the basis of the best available information by it meeting any one or more of the following criteria (A, B, or C): A) Geographic range, and/or total area occupied, and/or number of discrete occurrences have been reduced by at least 70% since European settlement and either or both of the following apply (i or ii): i) the estimated geographic range, and/or total area occupied and/or number of discrete occurrences are continuing to decline such that total destruction of the community is likely in the short term future (within approximately 20 years); ii) modification throughout its range is continuing such that in the short term future (within approximately 20 years) the community is unlikely to be capable of being substantially restored or rehabilitated. B) Current distribution is limited, and one or more of the following apply (i, ii, iii) i) geographic range and/or number of discrete occurrences, and/or area occupied is highly restricted and the community is currently subject to known threatening processes which are likely to result in total destruction throughout its range in the short term future (within approximately 20 years); ii) There are few occurrences, each of which is small and/or isolated and all or most occurrences are very vulnerable to known threatening processes; iii) There may be many occurrences but total area is small and all or most occurrences are small and/or isolated and very vulnerable to known threatening processes. C) The ecological community exists only as very modified occurrences that may be capable of being substantially restored or rehabilitated if such work begins in the short-term future (within approximately 20 years).
Vulnerable (VU)	An ecological community that has been adequately surveyed and is found to be declining and/or has declined in distribution and/or condition and whose ultimate security has not yet been assured and/or a community that is still widespread but is believed likely to move into a category of higher threat in the near future if threatening processes continue or begin operating throughout its range. An ecological community will be listed as Vulnerable when it has been adequately surveyed and is not Critically Endangered or Endangered but is facing a high risk of total destruction or significant modification in the medium (within approximately 50 years) to long-term future. This will be determined on the basis of the best available information by it meeting any one or more of the following criteria (A, B or C): A) The ecological community exists largely as modified occurrences that are likely to be capable of being substantially restored or rehabilitated. 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.

Definitions and Criteria for Priority Ecological Communities	
Possible threatened ecological communities that do not meet survey criteria or that are not adequately defined are added to the Priority Ecological Community List under priorities 1, 2 and 3. These three categories are ranked in order of priority for survey and/or definition of the community. Ecological communities that are adequately known, and are rare but not threatened or meet criteria for Near Threatened, or that have been recently removed from the threatened list, are placed in Priority 4. These ecological communities require regular monitoring. Conservation Dependent ecological communities are placed in Priority 5.	
Priority 1 Poorly-known ecological communities	Ecological communities that are known from very few occurrences with a very restricted distribution (generally ≤ 5 occurrences or a total area of ≤ 100 ha). Occurrences are believed to be under threat either due to limited extent, or being on lands under immediate threat (e.g. within agricultural or pastoral lands, urban areas, active mineral leases) or for which current threats exist. May include communities with occurrences on protected lands. Communities may be included if they are comparatively well-known from one or more localities but do not meet adequacy of survey requirements, and/or are not well defined, and appear to be under immediate threat from known threatening processes across their range.
Priority 2 Poorly-known ecological communities	Communities that are known from few occurrences with a restricted distribution (generally ≤ 10 occurrences or a total area of ≤ 200 ha). At least some occurrences are not believed to be under immediate threat (within approximately 10 years) of destruction or degradation. Communities may be included if they are comparatively well known from one or more localities but do not meet adequacy of survey requirements, and/or are not well defined, and appear to be under threat from known threatening processes.
Priority 3 Poorly-known ecological communities	i) Communities that are known from several to many occurrences, a significant number or area of which are not under threat or habitat destruction or degradation 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 not be represented in the reserve system but are under threat of modification across much of their range from processes such as grazing by domestic and/or feral stock, and inappropriate fire regimes Communities may be included if they are comparatively well known from several localities but do not meet adequacy of survey requirements and/or are not well defined, and known threatening processes exist that could affect them
Priority 4 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	a) 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. b) 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. c) Ecological communities that have been removed from the list of threatened communities during the past five years
Priority 5 Conservation Dependent ecological communities	Ecological communities that are not threatened but are subject to a specific conservation program, the cessation of which would result in the community becoming threatened within five years

APPENDIX 2

Vegetation condition scale
(as developed by Keighery 1994)

Condition	Code	Description
Pristine	1	Pristine or nearly so, no obvious signs of disturbance.
Excellent	2	Vegetation structure intact, disturbance affecting individual species and weeds are non-aggressive species.
Very Good	3	Vegetation structure altered; obvious signs of disturbance.
Good	4	Vegetation structure significantly altered by very obvious signs of multiple disturbances. Retains basic vegetation structure or ability to regenerate it.
Degraded	5	Basic vegetation structure severely impacted by disturbance. Scope for regeneration but not to a state approaching Very Good condition without intensive management.
Completely Degraded	6	The structure of the vegetation is no longer intact and the area is completely or almost completely without native species.

APPENDIX 3

Vegetation classifications for the study area based on Muir (1997).

LIFE FORM / HEIGHT		CANOPY COVER		
CLASS	Dense 70 % - 100%	Mid-Dense 30% - 70%	Sparse 10% - 30%	Very Sparse 2% - 10%
Trees > 30 m	Dense Tall Forest	Tall Forest	Tall Woodland	Open Tall Woodland
Trees 15 – 30 m	Dense Forest	Forest	Woodland	Open Woodland
Trees 5 – 15 m	Dense Low Forest A	Low Forest A	Low Woodland A	Open Low Woodland A
Trees < 5 m	Dense Low Forest B	Low Forest B	Low Woodland B	Open Low Woodland B
Mallee tree form	Dense Tree Mallee	Tree Mallee	Open Tree Mallee	Very Open Tree Mallee
Mallee shrub form	Dense Shrub Mallee	Shrub Mallee	Open Shrub Mallee	Very Open Shrub Mallee
Shrubs > 2 m	Dense Thicket	Thicket	Scrub	Open Scrub
Shrubs 1.5 – 2 m	Dense Heath A	Heath A	Low Scrub A	Open Low Scrub A
Shrubs 1 - 1.5 m	Dense Heath B	Heath B	Low Scrub B	Open Low Scrub B
Shrubs 0.5 – 1 m	Dense Low Heath C	Low Heath C	Dwarf Scrub C	Open Dwarf Scrub C
Shrubs 0 - 0.5 m	Dense Low Heath D	Low Heath D	Dwarf Scrub D	Open Dwarf Scrub D
Mat plants	Dense Mat Plants	Mat Plants	Open Mat Plants	Very Open Mat Plants
Hummock grass	Dense Hummock Grass	Mid-Dense Hummock Grass	Hummock Grass	Open Hummock Grass
Bunch grass > 0.5 m	Dense Tall Grass	Tall Grass	Open Tall Grass	Very Open Tall Grass
Bunch grass < 0.5 m	Dense Low Grass	Low Grass	Open Low Grass	Very Open Low Grass
Herbaceous spp.	Dense Herbs	Herbs	Open Herbs	Very Open Herbs
Sedges > 0.5 m	Dense Tall Sedges	Tall Sedges	Open Tall Sedges	Very Open Tall Sedges
Sedges < 0.5 m	Dense Low Sedges	Low Sedges	Open Low Sedges	Very Open Low Sedges
Ferns	Dense Ferns	Ferns	Open Ferns	Very Open Ferns
Mosses, liverworts	Dense Mosses	Mosses	Open Mosses	Very Open Mosses

APPENDIX 4

Foraging Quality Scoring Tool (DAWE 2022)

Starting score		Baudin's Cockatoo	Carnaby's Cockatoo	Forest Red-tailed Black-Cockatoo
10		Start at a score of 10 if your site is native eucalypt woodlands and forest, and proteaceous woodland and heath, particularly Marri, within the range of the species, including along roadsides and parkland cleared areas. Can include planted vegetation. This tool only applies to sites equal to or larger than 1 hectare in size.	Start at a score of 10 if your site is native shrubland, kwongan heathland or woodland, dominated by proteaceous plant species such as <i>Banksia</i> spp. (including <i>Dryandra</i> spp.), <i>Hakea</i> spp. and <i>Grevillea</i> spp., as well as native eucalypt woodland and forest that contains foraging species, within the range of the species, including along roadsides and parkland cleared areas. Also includes planted native vegetation. This tool only applies to sites equal to or larger than 1 hectare in size.	Start at a score of 10 if your site is Jarrah or Marri woodland and/or forest, or if it is on the edge of Karri forest, or if Wandoo and Blackbutt occur on the site, within the range of the subspecies, including along roadsides and parkland cleared areas. This tool only applies to sites equal to or larger than 1 hectare in size.
Attribute	Sub-tractions	Context adjustor (attributes reducing functionality of foraging habitat)		
Foraging potential	-2	Subtract 2 from your score if there is no evidence of feeding debris on your site.	Subtract 2 from your score if there is no evidence of feeding debris on your site.	Subtract 2 from your score if there is no evidence of feeding debris on your site.
Connectivity	-2	Subtract 2 from your score if you have evidence to conclude that there is no other foraging habitat within 12 km of your site.	Subtract 2 from your score if you have evidence to conclude that there is no other foraging habitat within 12 km of your site.	Subtract 2 from your score if you have evidence to conclude that there is no other foraging habitat within 12 km of your site.
Proximity to breeding	-2	Subtract 2 if you have evidence to conclude that your site is more than 12 km from breeding habitat	Subtract 2 if you have evidence to conclude that your site is more than 12 km from breeding habitat.	Subtract 2 if you have evidence to conclude that your site is more than 12 km from breeding habitat.
Proximity to roosting	-1	Subtract 1 if you have evidence to conclude that your site is more than 20 km from a known night roosting habitat.	Subtract 1 if you have evidence to conclude that your site is more than 20 km from a known night roosting habitat.	Subtract 1 if you have evidence to conclude that your site is more than 20 km from a known night roosting habitat.
Impact from significant plant disease	-1	Subtract 1 if your site has disease present (e.g. <i>Phytophthora</i> spp. or Marri canker) and the disease is affecting more than 50% of the preferred food plants present.	Subtract 1 if your site has disease present (e.g. <i>Phytophthora</i> spp. or Marri canker) and the disease is affecting more than 50% of the preferred food plants present.	Subtract 1 if your site has disease present (e.g. <i>Phytophthora</i> spp. or Marri canker) and the disease is affecting more than 50% of the preferred food plants present.
Total score		<i>Enter score</i>	<i>Enter score</i>	<i>Enter score</i>
Appraisal		To support your habitat score, you should provide an overall appraisal of the habitat on the impact site and within 20km of the impact area to clearly explain and justify the score. It should include discussion on the foraging habitat's proximity to other resources (e.g. exact distance to proximate resources), frequency of use of proximate sites, the degree of evidence and description of vegetation type and condition.		

APPENDIX 5

Scoring System for Black-cockatoo Foraging Habitat (developed by the DCCEEW in consultation with species experts in WA)

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 deaths².				
			Baudin’s Black Cockatoo				
			Marri-Jarrah Forest and woodlands with >50% projected foliage cover. Low percentage (< 5%) of tree deaths.				
			Forest Red-tailed Black Cockatoo				
			Marri-Jarrah-Karri Forest, other eucalypt woodlands, or allocasuarina woodlands, with >50% projected foliage cover. Low percentage (< 5%) of tree deaths.				
	6	High	Carnaby’s Black Cockatoo				
			Native kwongan heath and shrubland (>25% projected foliage cover), banksia and eucalypt woodlands with >40% projected foliage cover. Low percentage (< 10%) of tree deaths.				
			Baudin’s Black Cockatoo				
			Marri-Jarrah Forest and woodlands with >40% projected foliage cover. Low percentage (< 10%) of tree deaths.				
			Forest Red-tailed Black Cockatoo				
			Marri-Jarrah-Karri Forest, other eucalypt woodlands, or allocasuarina woodlands, with >40% projected foliage cover. Low percentage (< 10%) of tree deaths.				

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

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.			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> .				
	1	Negligible to low	All species				
			Scattered specimens of known food plants but projected foliage cover of these is <2%. May include: paddocks or urban areas with scattered foraging trees.				
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.

APPENDIX 6

Alignment of vegetation types from the study area with the
Eucalypt Woodlands of the WA Wheatbelt ecological
community

Key diagnostic features used to broadly determine whether vegetation types mapped and described from within the study area are representative of the 'Eucalypt Woodlands of the WA Wheatbelt ecological community'.

Key Diagnostic Features	Vegetation Type (in study area)			
	HP Em Ell Ma	HP Ell RwMbEt	HP Ma RwEtMb	DZ Te
Within IBRA sub-regions - AVW01, AVW02, MAL02, or be outlying patches in the eastern parts of JAF01 and JAF02 adjacent to the Avon Wheatbelt, that are off the Darling Range, and receive less than 600 mm mean annual rainfall	AVW02	AVW02	AVW02	AVW02
Be a woodland in which the minimum crown cover of the tree canopy in a mature woodland is 10%	20-30%	30-40%	Absent	Absent
The key species of the tree canopy are species of <i>Eucalyptus</i> as identified in Appendix L, and are species that typically have a single trunk. If tree species listed in Appendix M are present in the tree canopy, then these collectively do not occur as dominants in the tree canopy.	<i>Eucalyptus myriadena</i>	York Gum	Absent	Absent
Have a native understorey present which is of variable composition, being a combination of grasses, forbs and shrubs, as specified in Appendix N	Present	Present	Absent	Absent
Likely to represent the Eucalypt Woodlands of the Western Australian Wheatbelt ecological community?	Yes	Yes	No	No

Minimum condition required for vegetation to be considered representative of 'Eucalypt Woodlands of the WA Wheatbelt ecological community'.

Category	Projected Foliar Cover for Weeds	Mature Trees ³	Minimum Patch Size (non-roadside)	Minimum Patch Width ⁴ (roadside)	Vegetation Type/s
Category A: Patches likely to correspond to a condition of Pristine / Excellent / Very good or a High RCV.	Exotic plant species account for 0 to 30 % of total vegetation cover in the understorey layers (i.e., below the tree canopy).	Mature trees may be present or absent.	2 ha or more.	5 m or more.	
Category B: Patches likely to correspond to a condition of Good or a Medium-High RCV AND retains important habitat features.	Exotic plant species account for more than 30 to 50 % of total vegetation cover in the understorey layers (i.e., below the tree canopy)	Mature trees are present with at least 5 trees per 0.5 ha.	2 ha or more.	5 m or more.	
Category C: Patches likely to correspond to a condition of Good or a Medium-High RCV.	Exotic plant species account for more than 30 to 50 % of total vegetation cover in the understorey layers (i.e., below the tree canopy).	Mature trees either absent or <5 trees per 0.5 ha are present.	5 ha or more.	5 m or more.	
Category D: Patches likely to correspond to a condition of Degraded to Good or a Medium-Low to Medium-High RCV BUT retains important habitat features.	Exotic plant species account for more than 50 to 70 % of total vegetation cover in the understorey layers (i.e., below the tree canopy).	Mature trees are present with at least 5 trees per 0.5 ha.	5 ha or more.	5 m or more.	The two vegetation types occur as a consolidated remnant covering 10.95 ha comprising: HP Em Ell Ma - 6.30 ha HP Ell RwMbEt - 4.65 ha

³ DBH >30 cm.

⁴ Based on the native understory component rather than width of the tree canopy.