Attachment D Biota, 2023 Collie Battery Energy Storage System Targeted Biological Survey

Biota Environmental Sciences

Collie Battery Energy Storage System Targeted Biological Survey

Prepared for Synergy

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1.0 Executive Summary

Synergy Renewable Energy Development is proposing to develop a lithium-ion battery energy storage system to the north and northwest of the existing Collie Power Station. The proposed project involves the construction of a transmission line between the existing Shotts terminal and a new substation in the vicinity of the Collie Power Station. In order to complete these works some vegetation within the 375.3 ha site may be required to be cleared.

SynergyRED commissioned Biota Environmental Sciences to conduct a reconnaissance and targeted vegetation, flora and fauna survey of the area, in October 2022. The overall objective of the study was to provide an evaluation of the environmental values of the area, to inform project planning and the environmental impact assessment for the proposed works.

Seven naturally occurring vegetation types occurred were recorded and were mapped over 60.7 ha (14.6%) of the survey area. A large proportion (87.8%) of the survey area was given a vegetation condition ranking of 'Degraded' to 'Completely Degraded'. No vegetation of significance was recorded during the survey.

A total of 75 native vascular flora taxa from 48 genera and 25 families have been recorded from the survey area. A total of 49 weed species were also recorded, including two weeds listed as Declared Pests under the WA *Biosecurity and Agriculture Management Act 2007*: **Gomphocarpus fruticosus* (Narrow-leaf Cottonbush) and **Moraea* flaccida (One-leaf Cape Tulip).

No Threatened or Priority flora species were recorded during the field survey, however one Priority 4 species, *Eucalyptus rudis* subsp. *cratyantha,* was considered 'likely to occur'. A further 16 Priority flora species were ranked as 'may occur'.

When considering the faunal value of habitats within the survey area, all of the *native remnant* vegetation patches represent valuable fauna habitat. While the remnant patches vary in their level of connectivity, none of the habitats identified are restricted to the survey area.

Five currently listed significant vertebrate species were recorded during the survey:

- Chuditch/Western Quoll, *Dasyurus geoffroii* (Vulnerable; *BC Act, EPBC Act*);
- Western Falsistrelle bat, *Falsistrellus mackenziei* (Priority 4; *BC Act*);
- Forest Red-tailed Black Cockatoo, *Calyptorhynchus banksii naso* (Vulnerable, *BC Act, EPBC Act*);
- Carnaby's Black Cockatoo, *Zanda latirostris* (Endangered; *BC Act, EPBC Act*); and
- Baudin's Black Cockatoo, *Zanda baudinii* (Endangered; *BC Act*, *EPBC Act*).

A newly described bat species, Holt's Long-eared Bat (*Nyctophilus holtorum* sp. nov), was also recorded and is of conservation significance due to its restricted distribution. A further 11 significant vertebrate species were recognized as having some potential to occur in the survey area.

Foraging evidence of all three black cockatoo species was recorded and observations were also made of all three species. Fifty hollow-bearing trees were identified; all of these would need further assessment to determine whether the hollows currently support breeding, which would result in the trees being reclassified as known nesting trees. A further 600 trees met the size criteria to be deemed potential nesting trees, but do not currently have hollows.

Approximately 21 ha of eucalypt-dominated native remnant vegetation was ranked as high-quality foraging habitat for black cockatoo species. The taller planted eucalypts in the survey area may also be utilised as night-roosting trees; especially given the proximity to high quality foraging habitat and to the Collie River and permanent wetland in the survey area, which would provide reliable water sources for black cockatoos.

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2.0 Introduction

2.1 Project Background and Scope

Synergy Renewable Energy Development (SynergyRED) is a subsidiary of Synergy, Western Australia's largest electricity generator and retailer. SynergyRED is proposing to develop a lithium-ion battery energy storage system (BESS) in the vicinity of the existing Collie Power Station (CPS). The proposed project involves the construction of a transmission line between the existing Shotts terminal and a new substation located to the north of the CPS.

In preparation for the proposed developments, which may require some clearing of native vegetation, SynergyRED commissioned Biota Environmental Sciences (Biota) to conduct a reconnaissance and targeted vegetation, flora and fauna survey of the area, including a targeted black cockatoo survey.

2.2 Objectives of the Study

The survey area (375.3 ha) incorporates three parcels of land (Lot 3001 on Deposited Plan 51101, Lot 113 on Plan 70794 and Lot 74 on Plan 70798), and contains 41.2 ha of remnant vegetation (Figure 2.1). The overall objective of the study was to provide an evaluation of the environmental values of the area to inform project planning and the environmental impact assessment (EIA) for the proposed works.

Specific objectives of the survey were to:

1. Complete a desktop study to identify any potential flora and fauna values associated with the survey area;
2. Undertake a spring reconnaissance and targeted flora and vegetation survey, consistent with Environmental Protection Authority (EPA) guidance (EPA 2016a) to:
    - Describe, photograph and map the dominant vegetation units;
    - Assess and map the condition and extent of native vegetation within the survey area;
    - Record and map populations of any significant flora species that may occur within the survey area;
    - Compile a list of vascular flora species;
    - Identify any vegetation units of significance, including assessment of potential Threatened Ecological Communities (TECs) against relevant Commonwealth conservation advice documents, and assessment of potential Priority Ecological Communities (PECs) against information available from the Department of Biodiversity, Conservation and Attractions (DBCA); and
    - Record populations of weed species listed as Declared Pests under the *Biosecurity and Agriculture Management Act 2007*, or those listed as Weeds of National Significance (WoNS).
3. Undertake a targeted black cockatoo survey, consistent with current EPA and Commonwealth guidance (DAWE 2022), to:
    - Identify potential breeding habitat trees;
    - Assess and map foraging habitat quality;
    - Assess roosting habitat; and
    - Record any opportunistic sightings of individuals, calls or signs of foraging.
4. Undertake a basic and targeted vertebrate fauna survey (EPA 2020), to:
    - Determine the presence of significant fauna species that may occur in the survey area; and

- Describe and map fauna habitats within the survey area;

5. Collate, present and discuss all data from the survey in a technical flora, vegetation and fauna report; and
6. Provide an Index of Biodiversity Surveys for Assessments data package and mapping data sets.

2.3 Legislation and Guidelines

The approach and methodology of the survey was in accordance with relevant Commonwealth and State policy documents, including the following:

- *Technical Guidance – Flora and Vegetation Surveys for Environmental Impact Assessment* (EPA 2016a);
- *Environmental Factor Guideline: Flora and Vegetation* (EPA 2016b);
- *Technical Guidance - Terrestrial Vertebrate Fauna Surveys for Environmental Impact Assessment* (EPA 2020);
- *Environmental Factor Guideline – Terrestrial Fauna* (EPA 2016c);
- *Survey Guidelines for Australia's Threatened Orchids* (Department of the Environment 2013a);
- *Referral Guideline for 3 WA Threatened Black Cockatoo Species: Carnaby's Cockatoo, Baudin's Cockatoo and Forest Red-tailed Black Cockatoo* (DAWE 2022).
- *Survey Guidelines for Threatened Mammals* (DSEWPaC 2011a);
- *Survey Guidelines for Threatened Reptiles* (DSEWPaC 2011b); and
- *Survey Guidelines for Threatened Birds* (DSEWPaC 2010).

Figure 2.1: Location and extent of the survey area.

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3.0 Methodology

To meet the objectives, a desktop study was undertaken (Section 3.1), followed by a field survey (Section 3.3).

3.1 Desktop Study

The aim of the initial desktop study was to compile and review information relevant to the survey area, and in particular to identify known features of significance (see Appendix 1 for definitions of significant species and communities). This then enabled a preliminary assessment of potential key issues relating to the vegetation, flora and fauna present, as well as black cockatoo habitat.

The desktop study considered the results of database searches (Section 3.1.1), as well as regional information and previous biological surveys completed in the locality (Section 3.1.2).

3.1.1 Database Searches

The following databases were searched to assist in the determination of vegetation, flora and fauna of significance, including black cockatoo records, relevant to the survey area:

1. The NatureMap database: this joint project of the DBCA and the WA Museum was the most comprehensive source of information regarding WA's flora and fauna before it was taken offline in December 2021. It comprised information from the Fauna Survey Returns database, the WA Threatened Flora and Fauna Databases, the WA Herbarium and WA Museum Specimen databases, and the BirdLife Australia Atlas. A search of records was requested from DBCA based on a buffer of 20 km radius around the survey area; this did not include location information for individual records.
2. The Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (the EPBC Act) Protected Matters Search Tool (PMST) was used to identify flora and fauna species and other matters of national environmental significance (MNES) that may occur in the locality. A search was completed for a buffer of 20 km radius around the survey area.
3. Atlas of Living Australia (ALA)[1] is a joint project between academic collecting institutions, private individual collectors, and community groups. It contains occurrence records, environmental data and images, and provides the conservation status of species throughout Australia. The ALA search was completed for a 10 km radius (the maximum area possible for this search) around an approximate central point for the survey area (-33.336282, 116.259373).
4. A specific search of the DBCA Threatened and Priority Flora Database was also commissioned to confirm the Threatened and Priority flora species known from within 20 km of the survey area.
5. The DBCA database of TECs, PECs and Environmentally Sensitive Areas (ESAs) was searched to identify significant communities known to occur within 20 km.
6. Local black cockatoo data were obtained from BirdLife Australia. This included location, type and birds recorded at confirmed roosts and nesting locations within a 12 km radius of an approximate central coordinate for the survey area (-33.335375, 116.258050).
7. The Index of Biodiversity Surveys for Assessments (IBSA): this database consolidates data from land-based biodiversity surveys conducted to support EIA and compliance required under the *Environmental Protection Act 1986,* and provides a publicly available online platform for data sharing (where agreed by the proponent). IBSA was searched for previous surveys within a 20 km radius of the survey area.

Individual outputs from the various database searches can be provided on request, with results summarised in Appendix 2 and discussed in Section 4.8.

[1] http://www.ala.org.au

3.1.2 Literature and Spatial Data Review

Published and unpublished reports relevant to the survey area were reviewed. Several regional-scale reports and data sets were examined, as well as bioregional data, soils and geology (Northcote et al. 1960, WA Planning Commission 2000) and John Beard's State-wide vegetation mapping (Beard et al. 2013).

Results and methodologies of 11 biological surveys in the locality were reviewed as part of the desktop study (Section 4.0):

- Bowelling Curves Offset Options – Targeted Biological Survey (Biota 2016);
- Fauna Assessment – Collie-Lake King Road "Bowelling Curves" (SLK 64.5 – 71), Shire of West Arthur (Harewood 2014);
- Wellington Myalup Water for Food Feasibility Study Flora and Fauna Survey (GHD 2017);
- Level 1 Flora and Vegetation Survey – Collie-Lake King Road between SLK 64.5 – 71, Bowelling Curves (Ecoedge 2014);
- Targeted Fauna Assessment at the Minninup Pool Project Development Investigation Area (Ecoedge 2019);
- Collie Solar Farm – Environmental Assessment Report (Matters of Environment 2018);
- Fauna Assessment of Collie Motorplex Proposed Clearing Areas Cardiff (Harewood 2013);
- Collie Urea Project - Level 1 Fauna Assessment (GHD 2009);
- Bluewaters Power Station Phase III & IV expansion - Inspection of trees in area south of the proposed pipeline route for black cockatoo nesting habitat (Strategen 2009);
- Report for Collie Shotts Industrial Park - Spring Flora and Fauna and Wetland Assessment (GHD 2008); and
- Inspection of Trees on Bluewaters Farm (Coolangatta Industrial Estate) for Nesting by Black-Cockatoos (Bamford 2005).

3.2 Assessment of Likelihood of Occurrence

Significant species identified in the desktop study were assessed for likelihood of occurrence in the survey area, both prior to and following the survey. This assessment was based on the proximity of previous records to the survey area, knowledge of the habitat preferences of each taxon, an assessment of the habitat present within the survey area, and any records obtained during the field survey. The criteria used to assess likelihood of occurrence are outlined in Table 3.1, with the assessment provided in Appendices 3 and 4. For the purposes of this report, the term "close proximity" is defined as being within 10 km of the survey area and the "locality" comprises the area up to 20 km from the survey area.

Table 3.1: Criteria used to assign the likelihood of occurrence of flora of significance.

Likelihood	Criteria
Recorded	1. The species was recorded during the field survey or has been previously recorded in the survey area.
Likely to occur	1. There are existing records of the species within 10 km of the survey area; and • the species is strongly linked to a specific habitat, which is present in the survey area; or • the species has more general habitat preferences, and suitable habitat is present.

Likelihood	Criteria
May occur	1. There are existing records of the species within 20 km of the survey area, however • the species is strongly linked to a specific habitat, of which only a small amount is present in the survey area; or • the species has more general habitat preferences, but only some suitable habitat is present in the survey area. 2. There is suitable habitat in the survey area, but the species is recorded infrequently in the locality.
Unlikely to occur	1. The species is linked to a specific habitat, which is absent in the survey area; or 2. Suitable habitat is present, however there are no existing records of the species from within 20 km of the survey area despite reasonable previous search effort in suitable habitat; or 3. There is some suitable habitat in the survey area, however the species is very infrequently recorded in the locality or the only records are historical (>40 years ago).
Would not occur	1. The species is strongly linked to a specific habitat, which is absent from the survey area; and/or 2. The species' range is very restricted and would not include the survey area.

3.3 Field Survey

3.3.1 Survey Team and Timing

The survey was conducted between the 24th and 31st of October 2022 by four suitably experienced Biota staff. The survey was led by Tom Hounsham (Botanist), with support from Scott Werner (Senior Biologist) as required. A summary of the field personnel is provided in Table 3.2.

Table 3.2: Survey personnel and experience.

Name	Survey Role	Qualification	Years of Experience	DBCA Licence #
Tom Hounsham	Flora targeted searches; vegetation mapping (team lead)	BSc (Environmental Biology)	2	FB62000390
Scott Werner	Fauna survey, black cockatoo assessment, targeted flora searches	BSc (Conservation Biology & Management) (Hons)	12	FB62000038-2
Ayesha Lapinski	Flora targeted searches; vegetation mapping	GradDipSc (Botany)	4	FB62000106-2
Jason Teuber	Fauna survey, black cockatoo assessment, targeted flora searches	BSc (Botany & Agricultural Sciences)	3	FB62000286

DBCA Flora Taking (Biological Assessment) Licence number.

3.3.2 Survey Conditions

The survey was conducted in spring, which aligned with the recommended season for botanical surveys in the Jarrah Forest bioregion (EPA 2016a).

The weather conditions (particularly rainfall) preceding biological surveys are important factors that influence both the number and type of species recorded from an area, particularly for flora. One of the more notable effects is the increased presence of annual flora species following high rainfall, in addition to a higher likelihood of plants bearing reproductive material (flowers and/or fruit). This typically results in a more complete list of species from the area, along with greater confidence in identifications.

Total monthly rainfall data were sourced from the Collie East recording station (Bureau of Meteorology station #009994), located approximately 3.3 km northwest of the survey area. Data for the six months preceding the survey were compared to the monthly median rainfall for the years 2002-2022 from the same station (Figure 3.1). A total of 489.2 mm of rainfall fell in the six months prior to the field survey (April to September), which is approximately 85% of the sum of the long-term averages for those months (578.3 mm). Based on this and the conditions observed during the field survey, the timing was considered adequate for the collection of annual and cryptic perennial flora. However, lower than usual rainfall in the months preceding the survey may have had a slight impact on the presence of annual herbs.

Figure 3.1: Total monthly rainfall from Bureau of Meteorology Collie East recording station from October 2021 to September 2022 compared to the long-term average for the same months (2002-2022).

3.3.3 Flora and Vegetation Survey

3.3.3.1 Vegetation Description and Mapping

Vegetation types in the survey area were described and mapped using information collected from mapping notes and foot traverses (see tracklogs provided in Figure 3.2). Vegetation types were described at the association level (Level V as per the NVIS[2]). The association level includes information about the dominant growth form, height and cover for up to three species in the three main layers (strata) observed. Full descriptions of the vegetation types are presented in Section 5.1.

Once the vegetation types were defined, they were compared against the published descriptions of TECs and PECs to determine whether any of the vegetation in the survey area potentially corresponded to listed community types (see Section 4.9.1). No vegetation units within the survey area were considered to align with either of the two potential PECs known to occur within 40 km, therefore no quadrats were established.

Field data and aerial imagery were reviewed to determine boundaries of vegetation types, which were then mapped at an appropriate scale (generally 1:10,000). The draft vegetation mapping was created by Tom Hounsham (Botanist) using Geographical Information System (GIS) software (QGIS). Final maps were produced by Melissa Robinson (Senior GIS Cartographer) of Biota, using MapInfo Professional GIS v12.

In addition to spatially mapping the extent of vegetation throughout the survey area, the condition of the vegetation was also assessed (Section 5.1.14). Vegetation condition is determined in relation to the perceived ability of the vegetation to maintain itself (Keighery 1994). This is commonly interpreted

2 See the NVIS Information Hierarchy: https://www.dcceew.gov.au/sites/default/files/documents/australian-vegetation-attribute-manual-v70.pdf.

from the proportion of introduced species compared to native species, however numerous other factors are also considered in the assessment of condition, including disturbance (e.g. grazing, erosion), the degree of alteration to community and habitat structure and overall site ecology. The categories of vegetation condition used were consistent with the descriptive and qualitative method developed by Keighery (1994), as presented in EPA (2016a) (Appendix 5).

3.3.3.2 Searches for Significant Flora and Weeds

The desktop study identified a subset of significant flora (i.e. Threatened and Priority listed species) from the locality that were considered to have some potential to occur in the survey area (see Section 4.9.2 and Appendix 3). Targeted systematic searches for these species were then conducted on foot throughout the entire survey area. In habitat deemed suitable for any of the Threatened orchid species known to occur in the locality, search effort was increased to five metre spacing as per the recommended survey guidelines for Threatened orchids (Department of the Environment 2013a).

Locations of potential significant species were recorded using a handheld Unistrong tablet with accuracy equivalent to a differential GPS (<1.5 m). The number of individuals and extent of the population were also recorded for each location.

Locations of any Declared Pests (weeds listed under the WA *Biosecurity and Agriculture Management Act 2007;* the BAM Act) or Weeds of National Significance (WoNS) were also recorded, along with an estimate of their population size. Opportunistic records were also made of other introduced flora species, however no attempt was made to document all such species throughout the entire survey area.

3.3.3.3 Flora Specimen Identification, Nomenclature and Data Entry

Flora species were identified either in the field, or in the office following the field survey. If a species was common and well known to the survey botanists, the identification was confirmed and recorded in the field. If the species was difficult to determine without microscopic examination, belonged to a recognised species complex, or was poorly collected or otherwise unusual, a sample specimen was collected. Specimens were pressed in the field, and then dried for further study and confirmation.

Sample specimens were identified using flora keys, reference to appropriate publications, voucher reference collections and comparison to the collections held at the WA Herbarium. Biota botanist Tom Hounsham identified most specimens, which were then confirmed by consultant botanist Greg Keighery (Agonis Botanical Consulting).

All data were entered into a Microsoft Access Vegetation Database structure held internally at Biota. The database structure employed by Biota was developed by Ted Griffin (private consultant) at the request of Malcolm Trudgen (M.E. Trudgen and Associates). Nomenclature and significance rankings used in this report are in accordance with the current listing of WA flora recognised by the WA Herbarium, as listed on Florabase[3] at the time of reporting.

A full list of vascular flora species recorded from the survey area is presented in Appendix 6.

[3] http://florabase.dpaw.wa.gov.au

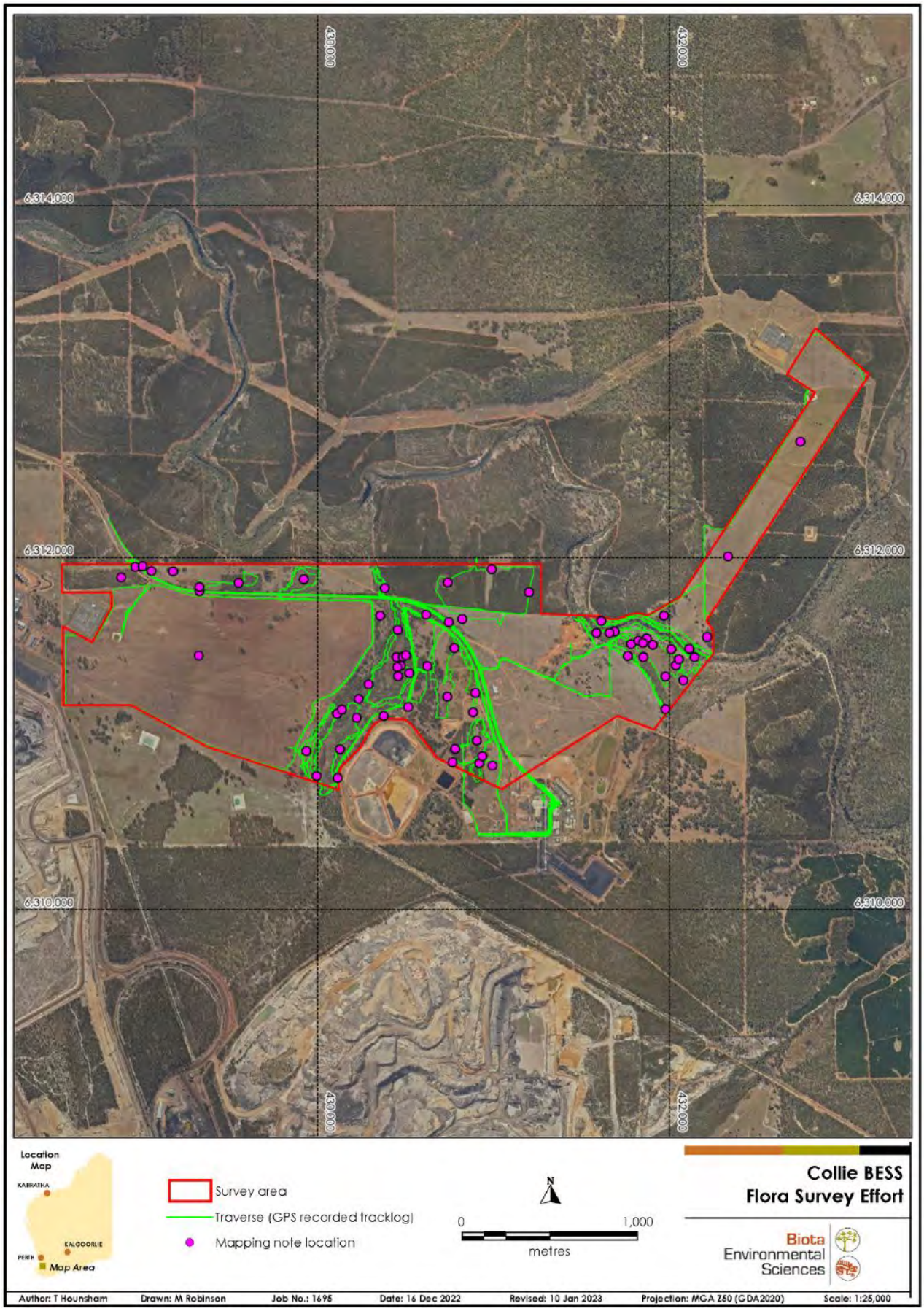

Figure 3.2: Vegetation and flora survey effort.

3.3.4 Fauna Survey

A targeted and reconnaissance fauna survey was conducted as per EPA guidance (2020). A detailed survey was deemed unnecessary, as quantitative data on species occurrence and species assemblages in the locality are widespread and readily available (see Sections 4.9.3 and 4.9.4). A Regulation 27 'Fauna taking (biological assessment) licence' was not required, as the survey did not constitute disturbance of fauna under the WA *Biodiversity Conservation Act 2016* (the BC Act).

The methodology was developed with reference to the following documents:

- Technical Guidance: Terrestrial Vertebrate Fauna Surveys for Environmental Impact Assessment (EPA 2020);
- Environmental Factor Guideline – Terrestrial Fauna (EPA 2016c);
- Survey Guidelines for Threatened Mammals (DSEWPaC 2011a);
- Survey Guidelines for Threatened Reptiles (DSEWPaC 2011b); and
- Survey Guidelines for Threatened Birds (DSEWPaC 2010).

3.3.4.1 Fauna Habitat Assessment

A preliminary review of the fauna habitats present in the survey area was conducted by examination of aerial photography and thematic layers including geology (Section 4.5) and Beard's vegetation mapping (Section 4.7.1). Ground-truthing of preliminary fauna habitat mapping was conducted in the field while driving and traversing on foot through the survey area, and completing fauna habitat descriptions wherever a distinct junction in habitat types was noted (Figure 3.3).

Habitat descriptions comprised soil type, landform, any notable microhabitats present, any disturbance (e.g., fire, weeds, grazing, evidence of introduced fauna), broad vegetation characteristics and representative photographs. Habitat descriptions and detailed vegetation mapping (Section 5.1) were then used to define and map fauna habitats.

For those significant species identified as potentially occurring via the desktop study, an assessment of habitat availability was made in the field.

For species listed as MNES under the EPBC Act, available habitat was also classified as either:

- "core"- equivalent to "habitat critical to the survival of the species" as per Department of the Environment (2013b). This comprised habitat considered to potentially contain roosting, denning or breeding sites, primary foraging areas, or refugia during drought, fire or other stress; or
- "secondary" – habitat which may be used on a transitory, dispersing or occasional basis, but does not represent core habitat.

3.3.4.2 Significant Fauna Targeted

The significant fauna to be targeted by low intensity sampling during the survey were identified by previous desktop studies of historical fauna records from within the study area. The species targeted are summarised in Table 3.3.

Additional habitat assessments were carried out for other significant fauna species that were identified as potentially occurring during the desktop study.

The species were targeted by searching for evidence while traversing the survey area, together with deployment of some electronic recording equipment at representative locations (see Figure 3.3, Figure 3.4, and following sections).

Table 3.3: Key targeted significant fauna and the survey methodologies used.

Species	Status	Survey Method
Black Cockatoos		
Baudin's Black Cockatoo *Zanda baudinii*	Endangered	Targeted survey: recording of habitat trees, including assessment of nesting hollows; assessment of foraging habitat value; recording of opportunistic sightings of individuals or other signs (e.g., feathers, chewed fruits).
Carnaby's Black Cockatoo *Zanda latirostris*	Endangered	
Red-tailed Black Cockatoo *Calyptorhynchus banksii naso*	Vulnerable	
Other Vertebrates		
Chuditch *Dasyurus geoffroii*	Vulnerable	Recording of any opportunistic sightings and secondary evidence (scats); motion cameras.
Peregrine Falcon *Falco peregrinus*	Specially Protected	Recording of any opportunistic sightings.
Quenda *Isoodon fusciventer*	Priority 4	Recording of any opportunistic sightings and secondary evidence (scats and diggings); motion cameras.
Western Brush Wallaby *Notamacropus irma*	Priority 4	Recording of any opportunistic sightings and secondary evidence (scats); motion cameras.

3.3.4.3 Motion Cameras

Single motion cameras were deployed at seven locations within the survey area (Table 3.4; Figure 3.4). Cameras were baited with universal bait (peanut butter and oats), which was sealed within an enclosed container. Total camera effort was 42 camera nights.

Table 3.4: Motion camera locations.

Site Name	Easting (mE)	Northing (mN)	Fauna Habitat	Date Deployed	Effort (nights)
Cam01MC	431541	6311570	Wandoo Woodland	25/10/2022	6
Cam02MC	432123	6311442	Flooded Gum/Paperbark Woodland	25/10/2022	6
Cam03MC	430649	6311377	Jarrah-Marri Forest	25/10/2022	6
Cam04MC	429964	6310855	Sedge Swampland	25/10/2022	6
Cam05MC	429010	6311944	Roadside Planted Verge	25/10/2022	6
Cam06MC	432214	6311568	Jarrah-Marri Forest	25/10/2022	6
Cam07MC	431913	6311653	Jarrah-Marri Forest	25/10/2022	6
				Total Effort:	42

3.3.4.4 Automated Recording Units

A combined effort of 18 nights of bat call recordings were undertaken using Wildlife Acoustics SM2+/Minibat Bat Detectors (Table 3.5; Figure 3.4). The recordings commenced 30 min before sunset and continued until 30 min past sunrise the following day. Recordings were taken from October 25 to 30.

The detectors convert ultrasonic echolocation signals produced by bats into audible electronic signals, which are then recorded. The recordings were processed by Dan Kamien (Principal Zoologist) to determine the presence of species-specific calls.

Table 3.5: SM2/Ultrasonic bat recorder locations.

Site Name	Unit	Easting (mE)	Northing (mN)	Fauna Habitat	Date Deployed	Effort (nights)
ColBAT01	SM2 14827	431526	6311637	Drainage Line (Bank)	25/10/2022	3
ColBAT02	SM2 7844	430622	6311344	Rocky Hills/Slopes	25/10/2022	3
ColBAT03	Minibat 3060	432096	6311471	Drainage Line (Bank)	25/10/2022	3
ColBAT04	SM2 7844	430050	6310795	Water Hole (Bank)	28/10/2022	3
ColBAT05	SM2 14827	430747	6311838	Rocky Hills/Slopes	28/10/2022	3
ColBAT06	Minibat 3060	429563	6311915	Flat Plain	28/10/2022	3
					Total Effort:	18

3.3.4.5 Opportunistic Records

Opportunistic observations of any potential significant species were also recorded (in the form of individuals, scats, diggings or remains).

3.3.5 Targeted Black Cockatoo Habitat Assessment

There are three threatened black cockatoo species endemic to the southwest of Western Australia: Baudin's Black Cockatoo (*Zanda baudinii*) and Carnaby's Black Cockatoo (*Zanda latirostris*), both listed as Endangered under the EPBC Act and BC Act; and the Forest Red-tailed Black Cockatoo (*Calyptorhynchus banksii naso*), which is listed as Vulnerable under the EPBC Act and BC Act.

Three types of black cockatoo habitat assessments were conducted during the field survey (for breeding, foraging and roosting habitat). Methods for each are described below.

3.3.5.1 Breeding Habitat Assessment

The field assessment aimed to determine whether black cockatoo breeding habitat was present by recording any known nesting trees, suitable nesting trees (trees with suitable hollows), and potential nesting trees (trees without hollows, but of a suitable size) in the survey area. Hollows that may be used by black cockatoos for nesting are generally found in live trees with a diameter at breast height (DBH) of greater than 500 mm, but the Commonwealth referral guideline defines potential nesting trees as including those with a DBH large enough to develop nest hollows in the future (DBH >300 mm), but do not currently have hollows (DAWE 2022).

Correspondence with the Department of Climate Change, Energy, the Environment and Water (DCCEEW) clarified that this smaller 300 m DBH criterion only applies to Wandoo and Salmon Gum and for all other tree species DBH must exceed 500 mm before the tree would be classified as a potential nesting tree (DCCEEW, pers. comm. 2022).

During the field survey, all known, suitable, and potential nesting trees were spatially located using a high-accuracy GPS and the following parameters were recorded:

- DBH;
- tree height;
- tree species;
- the number and height above the ground of observed hollows;
- the diameter of each hollow entrance; and
- any signs of cockatoo use (including wear around the hollow, nut chews, scarring, scratch marks on trunks and branches, secondary evidence of feeding sites and moulted feathers).

3.3.5.2 Foraging Habitat Assessment

Foraging habitat is defined as areas with plant species known to be food sources for black cockatoo species. While a broad range of species is utilised for foraging (including introduced species such as pines, *Pinus* spp.), Marri and Jarrah woodlands are particularly important to Baudin's Black Cockatoo and the Red-tailed Black Cockatoo; while proteaceous heaths (i.e. shrublands dominated by *Banksia, Hakea* and *Grevillea* species) are often utilised by the Carnaby's Black Cockatoo (DAWE 2022).

In considering the quality of foraging habitat, the foraging quality scoring tool detailed in the referral guidelines (DAWE 2022) was used to assess the survey area for each of the black cockatoo species. This tool considers five main attributes that are considered important determinants of foraging habitat quality (foraging potential, connectivity, proximity to breeding, proximity to roosting, and impact from significant plant disease) to give an overall habitat score. The foraging habitat score and an overall appraisal of the foraging habitat within the survey area were considered in the context of other habitat within 20 km of the survey area to provide context to the assessment of foraging habitat.

3.3.5.3 Roosting Habitat Assessment

Black cockatoos may form communal night roosts in a suitable tree or group of tall trees, usually close to a water source (within 2 km), and within an area of quality foraging habitat (DAWE 2022). Mostly outside of the breeding season, black cockatoos will fly to foraging areas each day before returning to the night roost. The Commonwealth referral guideline defines a potential roosting tree as any tall tree within close proximity to water (DAWE 2022).

During the field survey, searches were conducted for evidence of roosting (e.g. significant scat piles or feeding debris). Following the survey, those areas supporting the largest trees were considered in the context of nearby water sources, foraging habitat and proximity to known roosting locations (BirdLife Australia 2021a).

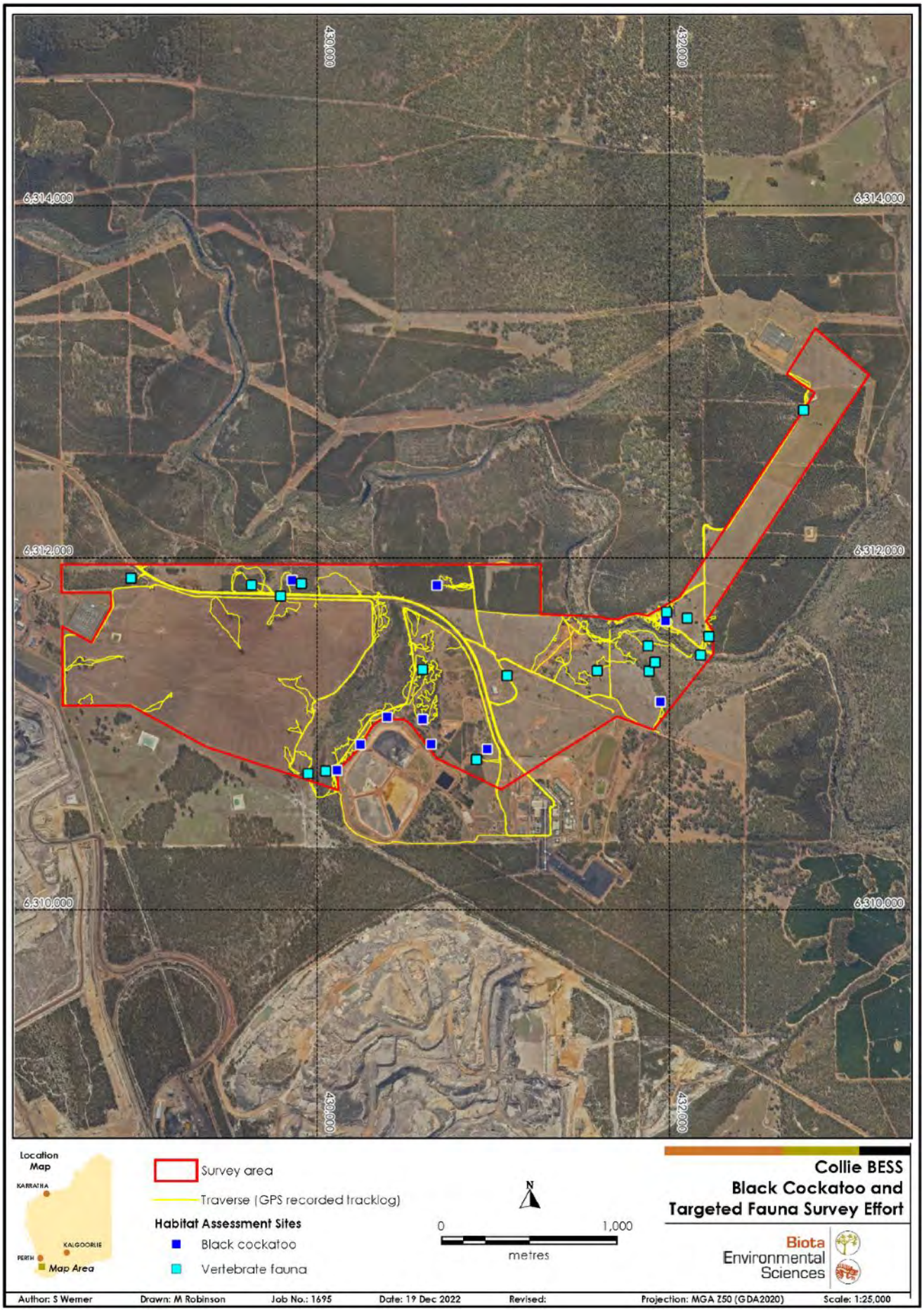

Figure 3.3: Black cockatoo and targeted fauna survey effort (habitat assessments and tracklogs).

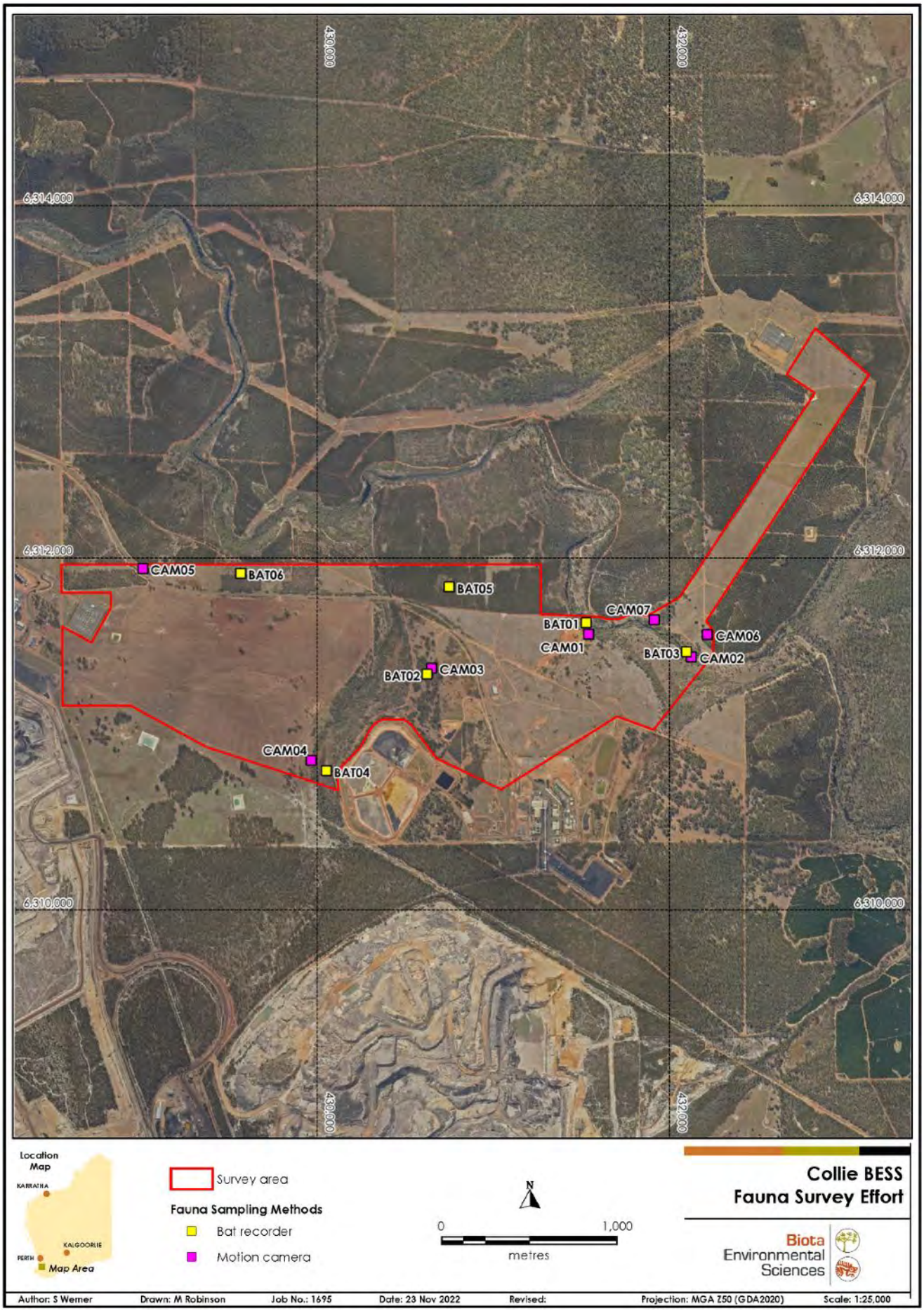

Figure 3.4: Fauna survey effort (cameras and acoustic recorders) within the survey area.

3.4 Limitations of the Study

The field survey provided an adequate representation of the vegetation, flora, and fauna values of the survey area. However, there are limitations to this study that must be considered when reviewing the results detailed in this report. As per the relevant EPA Technical Guidance Statements (EPA 2016a, 2020), potential constraints and consequent limitations of this study are summarised in Table 3.6.

Table 3.6: Assessment of potential limitations for this study.

Potential Limitation	Assessment
1. Availability of contextual information at a regional and local scale	Numerous biological surveys have been completed near the survey area in the last 10 years. Databases of information relating to rare species and communities were also searched. Contextual information was not a limiting factor for this study.
2. Competency/ experience of the team carrying out the survey, including experience in the bioregion surveyed	All field personnel had a sufficient level of qualification and experience to fulfill their role in the survey. There were no limitations due to experience of personnel.
3. Proportion of flora recorded and/or collected, any identification issues	All vascular flora encountered in the survey area were recorded and the majority of the flora specimens collected during the field survey were of sufficient quality to be fully determined to the lowest relevant taxonomic level. Fungi and non-vascular flora (algae, mosses and liverworts) were not systematically surveyed, which is consistent with the accepted level of effort for a survey of this type and scale. The proportion of flora recorded was not considered to be a limitation.
4. Appropriate area fully surveyed (effort and extent)	The scope of the study was to complete a reconnaissance and targeted flora survey, and a basic and targeted fauna survey (terms as described in EPA 2016a). The survey area was traversed on foot such that its full extent could be examined. The study also required a black cockatoo habitat assessment (DAWE 2022). All trees forming part of potential black cockatoo breeding habitat were assessed. The survey area is considered to have been adequately surveyed.
5. Access restrictions within the survey area	The entire survey area was accessible and there were no access restrictions. Access was not a limitation.
6. Survey timing, rainfall, season of survey	The flora and vegetation survey was completed in October 2022 and timing was considered adequate for recording annual and cryptic perennial species. However, lower than usual rainfall in the months preceding the survey may have had a slight impact on the presence of annual herbs (see Section 3.3.2). The survey timing was within the breeding window for black cockatoos, and assessment of breeding and foraging habitat can be conducted independently of breeding season. Survey timing is not considered a significant limitation for the study.
7. Disturbance that may have affected the results of survey such as fire, flood or clearing	A large amount of the survey area has been previously cleared, and it was noted that some areas have been subject to earthworks and revegetation. These disturbances were expected and did not affect the results of the survey. Disturbance to vegetation is not considered to be a limitation to the study.

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4.0 Desktop Study

4.1 IBRA Bioregion and Subregion

The survey area is located in the Jarrah Forest bioregion, as defined by the Interim Biographic Regionalisation for Australia (IBRA) (DSEWPaC 2012). It lies near the southern border of the Northern Jarrah Forest (JAF01) subregion, described by Williams and Mitchell (2003) as:

> *"Duricrusted plateau of Yilgarn Craton characterised by Jarrah-Marri forest on laterite gravels and, in the eastern part, by woodlands of Wandoo – Marri on clayey soils. Eluvial and alluvial deposits support Agonis shrublands. In areas of Mesozoic sediments, Jarrah forests occur in a mosaic with a variety of species-rich shrublands. The climate is Warm Mediterranean."*

4.2 Conservation Areas

Eleven named DBCA Legislated Lands occur in the locality of the survey area, in addition to 25 Section 34a freehold areas, two unnamed reserves and one unnamed national park. The survey area is situated within 1 km of both the Collie State Forest and the Harris River State Forest (Figure 4.1).

The 11 named legislated lands that occur in the locality are:

- Collie State Forest (0.3 km N)
- Harris River State Forest (0.8 km N)
- Lane Poole Reserve (4 km N)
- Muja Conservation Park (20 km SE)
- Muja State Forest (1 km W)
- Mumballup State Forest (11 km SW)
- Wellington National Park (16 km W)
- Wellington State Forest (20 km SW)
- Westralia Conservation Park (9 km SW)
- Wyvern Road Nature Reserve (11 km SW)
- Yallatup Nature Reserve (15 km SE)

4.3 Surface Hydrology

The eastern half of the survey area intersects an 800 m stretch of the Collie River (Figure 4.2). A permanent water body fed by the Collie River is also present in the central part of the survey area.

4.4 Heritage Areas

The survey area intersects one Aboriginal Heritage Place known as the Collie River Waugal, which occupies 3 ha within the survey area (Figure 4.3).

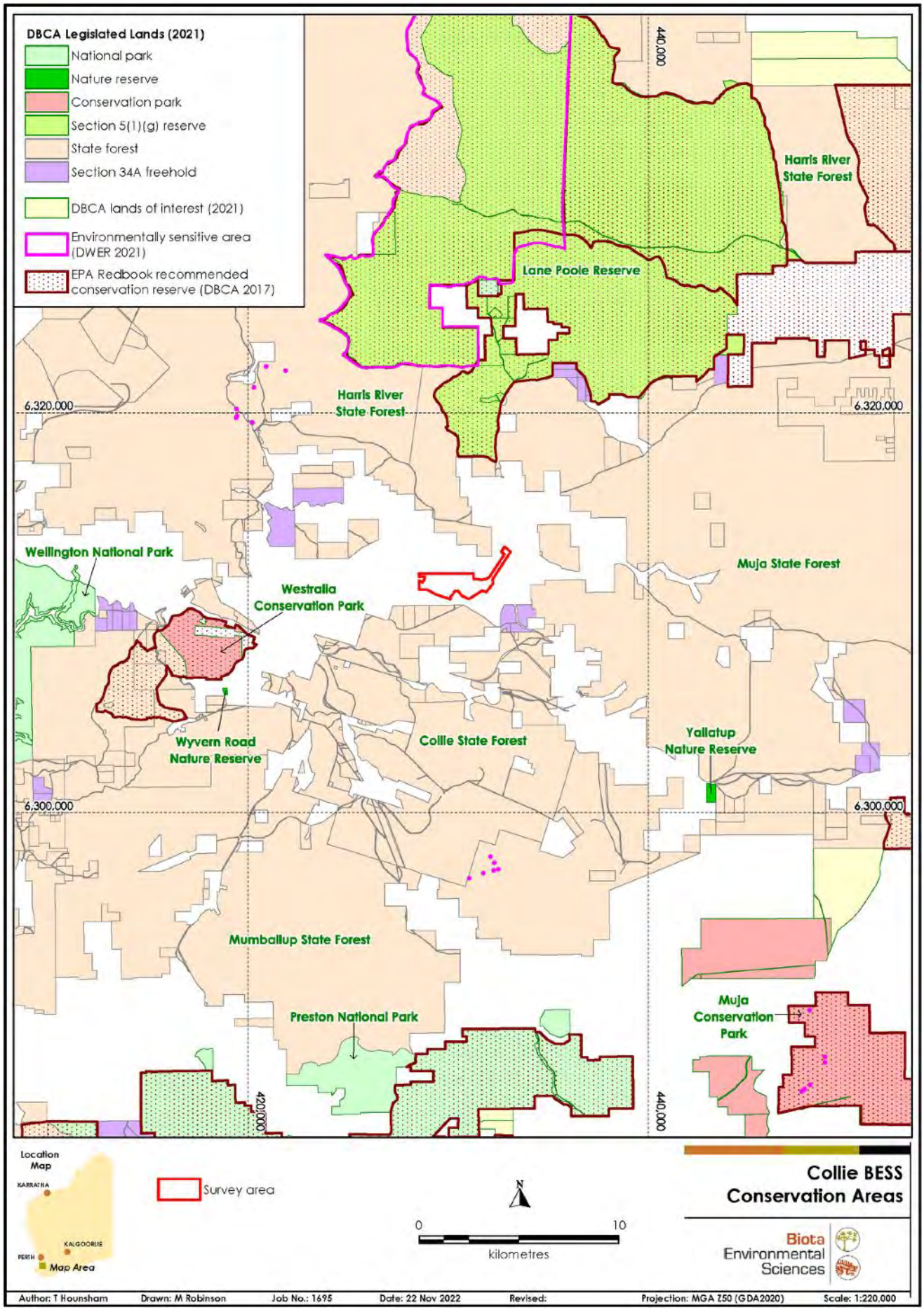

Figure 4.1: Conservation areas in the locality of the survey area.
Data from DBCA (2021).

Figure 4.2: Surface hydrology of the survey area.
Data from Landgate (2022).

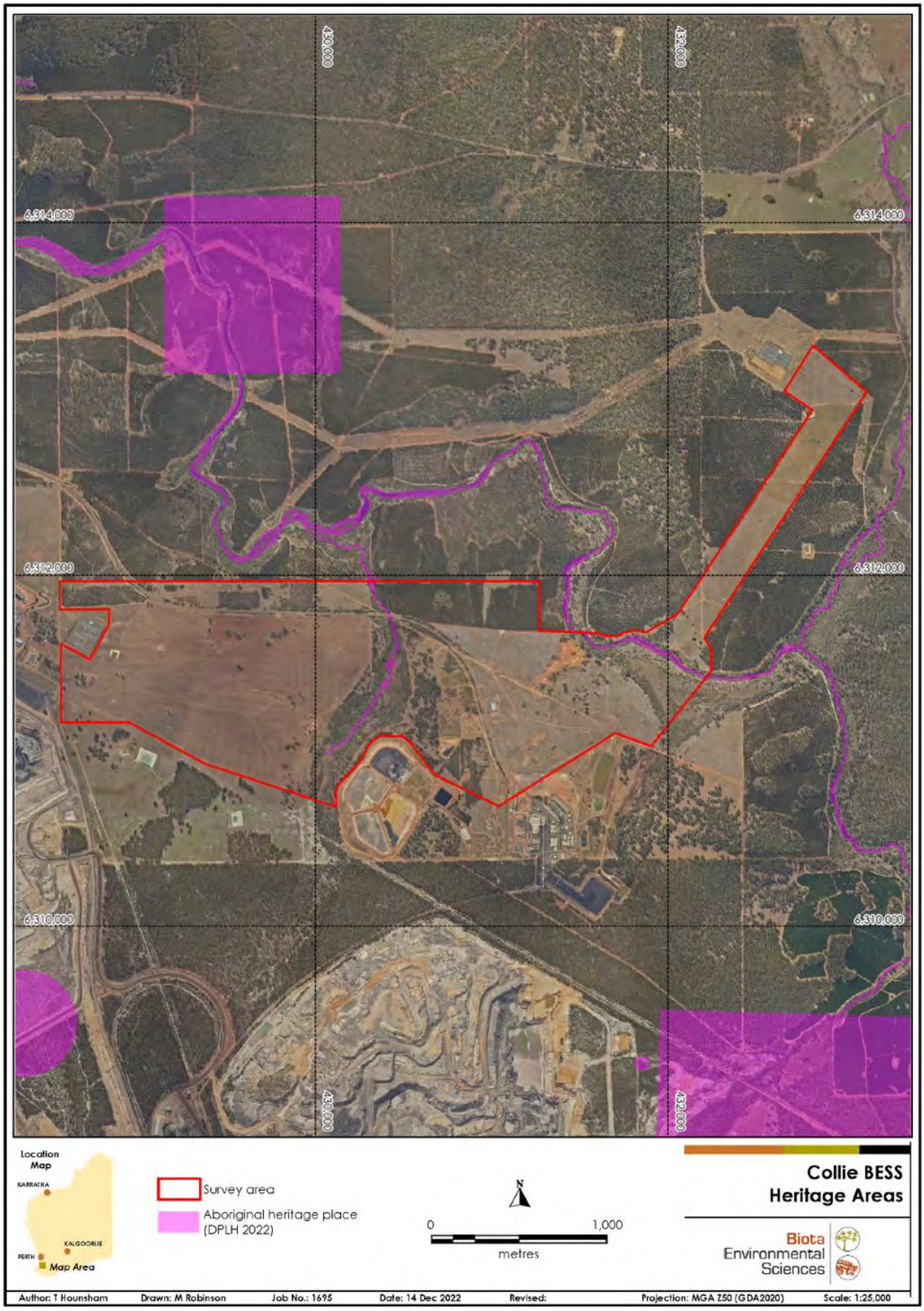

Figure 4.3: Heritage areas in the survey area.
Data from DPLH (2022).

4.5 Geology and Soils

Geological units for the locality were mapped at 1:1,000,000 scale as part of the Geological Survey of WA series (Geoscience Australia 2008). The survey area intersected three geological units, with ferruginous duricrust being the most abundant (Table 4.1; Figure 4.4).

Table 4.1: Surface geological units mapped in the survey area.
Data from Geoscience Australia (2008).

Unit	Name	Description	Extent within Survey Area (ha)	Proportion of Survey Area (%)
Ag	Felsic intrusives	Undifferentiated felsic intrusive rocks, including monzogranite, granodiorite, granite, tonalite, quartz monzonite, syenogranite, diorite, monzodiorite, pegmatite. Locally metamorphosed, foliated, gneissic. Local abundant mafic and ultramafic inclusions.	21.0	5.6
An	Gneiss, granulite, migmatite	Banded granitic gneiss (monzogranitic to granodioritic), quartzofeldspathic gneiss with mafic bands, migmatite, granofels, mafic and felsic granulites, hypersthene-plagioclase-quartz granulite; schist, pelitic or mafic granofels.	104.2	27.8
Czl	Ferruginous duricrust	Pisolitic, nodular or vuggy ferruginous laterite; some lateritic soils; ferricrete; magnesite; ferruginous and siliceous duricrusts and reworked products, calcrete, kaolinised rock, gossan; residual ferruginous saprolite.	250.1	66.6

Soil units were mapped at 1:1,000,000 scale by Northcote et al. (1967) as part of the Atlas of Australian Soils. One soil unit, Cb44, covered the entire survey area. Cb44 is described as: *"The Collie basin area, generally flat to strongly undulating land with many sandy flats and swamps: chief soils seem to be leached sands (Uc2.33) in the lower and more swampy sites and (Uc2.21), often containing ironstone gravels, on flat to gently sloping areas. Associated are (Dy3.61 and Dy3.62), (Dy3.8), and (Dy5.8) soils all containing ironstone gravels on the undulating areas. As mapped, areas of the adjoining units may be included."*

4.6 Soil Landscapes

Soil landscapes have been mapped at a scale of 1:250,000 by DPIRD (2018). The survey area intersected three units, with the Darling Plateau being the most widespread (Table 4.2; Figure 4.5).

Table 4.2: Soil landscapes mapped within the survey area.
Data from DPIRD (2018).

Name	Description	Extent within Survey Area (ha)	Proportion of Survey Area (%)
Coalfields System	Gently undulating plain over coal basins, in the south of the Western Darling Range. Sandy gravel, deep sand and non-saline wet soils. Jarrah-marri-paperbark woodland.	0.7	0.2
Darling Plateau System	Lateritic plateau. Duplex sandy gravels, loamy gravels and wet soils. Jarrah-marri-wandoo forest and woodland.	317.3	84.6
Lowden Valleys System	Deep gneissic valleys, in the south of the Western Darling Range. Loamy earth, loamy duplex, gravel and stony soils. Jarrah-marri forest.	57.3	15.2

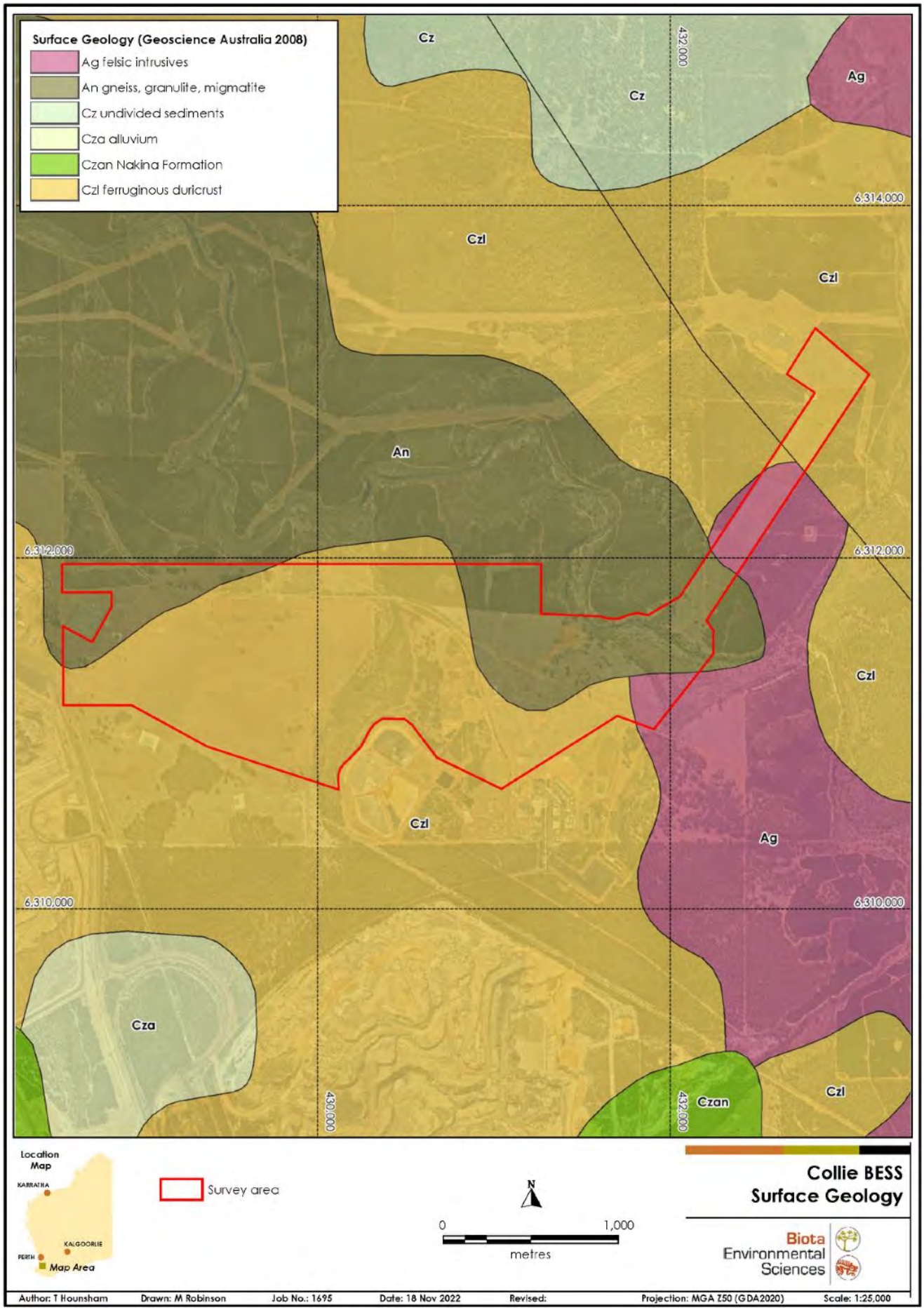

Figure 4.4: Surface geology of the survey area.
Data from Geoscience Australia (2008).

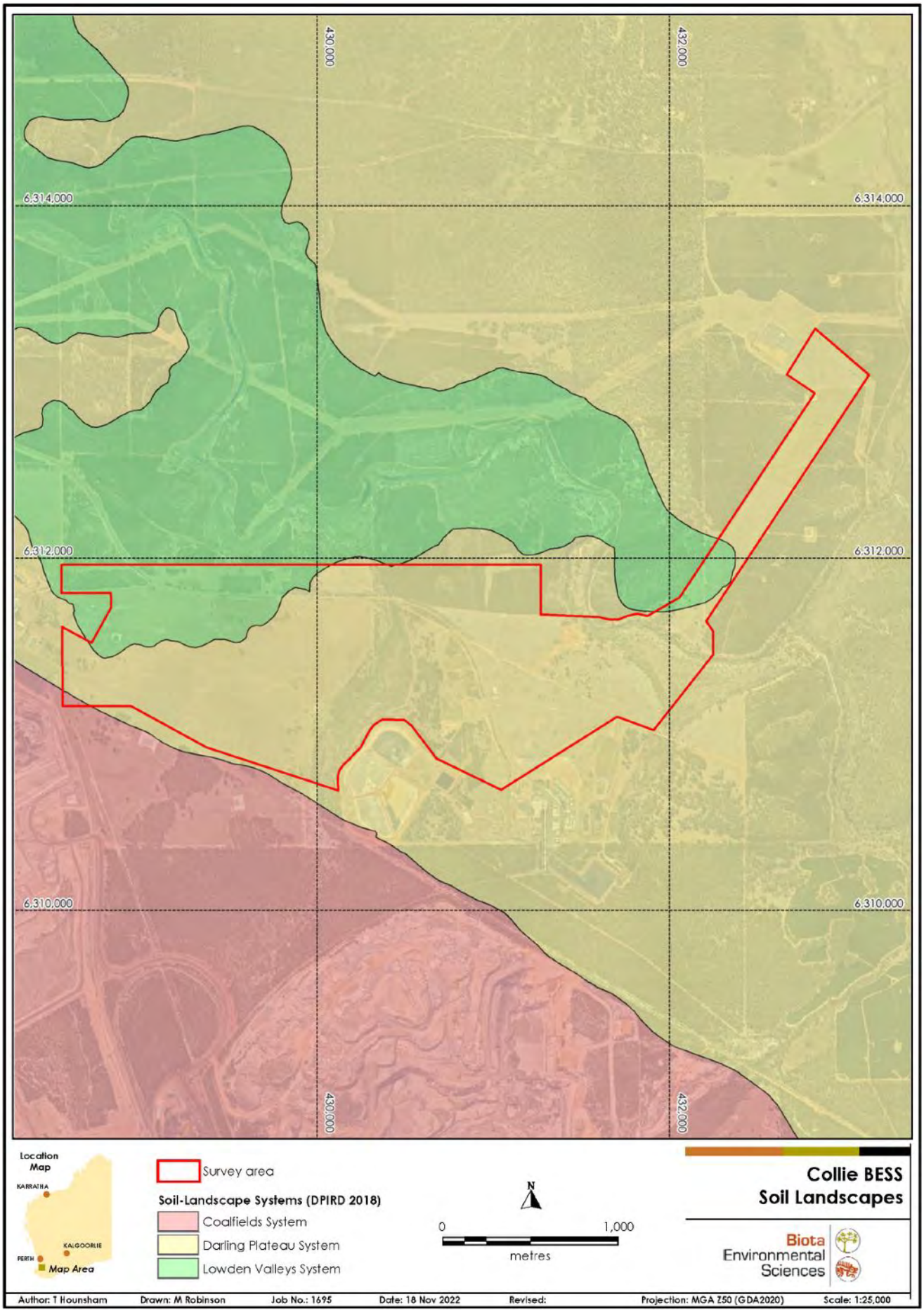

Figure 4.5: Soil landscapes of the survey area.
Data from DPIRD (2018).

4.7 Regional Vegetation Mapping

4.7.1 Pre-European Vegetation Mapping by Beard

John Beard mapped broad "vegetation associations" for the locality at 1: 250,000 scale, with each vegetation association divided into finer scale “system associations” (Beard et al. 2013). The entirety of the survey area was mapped as system association West Darling 3.3, comprising forest of mainly Jarrah (*Eucalyptus marginata*) and Marri (*Corymbia calophylla*).

Given the necessarily broad scale of Beard's mapping (contributing to a State-wide data set), this unit is only broadly applicable to the vegetation types occurring on site (see Section 5.1).

4.7.2 Remnant Vegetation

Clearing of native vegetation in the Northern Jarrah Forest subregion has occurred mainly for forestry, grazing, cultivation and mining (Williams and Mitchell 2003), and has led to loss of native vegetation, and fragmentation of the remaining areas into narrow roadside corridors or small remnants of bushland, many of which are not protected.

The (then) current extent of native vegetation was mapped for the southwest of Western Australia at a scale of 1:20,000 by the Department of Agriculture (DAFWA 2016). This indicated that approximately 41.2 ha of remnant native vegetation was present within the survey area at that time (Figure 4.1).

From 2007 to 2018, the DBCA and Department of Water and Environmental Regulation (DWER) published regular updates regarding the current and pre-European extents of each of Beard’s vegetation associations in WA. Based on the most recent data from 2018 (Government of Western Australia 2019), approximately 15% of the West Darling 3.3 association had been cleared across the Northern Jarrah Forest subregion and the Shire of Collie (Table 4.3). The statistics for the Northern Jarrah Forest IBRA subregion also represent statewide statistics, as the West Darling 3.3 association occurs entirely within this subregion (Government of Western Australia 2019).

Table 4.3: Statistics for the extent of Beard's West Darling 3.3 system association. Data from Government of Western Australia (2019).

	Northern Jarrah Forest IBRA Subregion	Shire of Collie
Total Pre-European Extent		
Total Pre-European Extent	485,010.2	70,227.1
Current Extent (2018)	416,466.2	58,828.4
Percentage Remaining	85.8%	83.8%
Extent in DBCA-managed Lands		
Pre-European Extent in DBCA-managed Lands	403,148.8	52,193.2
Current Extent	376,822.7	49,635.6
% Current Extent in All DBCA-Managed Land (proportion of Pre-European Extent)	77.7%	70.7%
% Current Extent in All DBCA-Managed Land (proportion of Current Extent)	90.5%	84.4%

Figure 4.6: Remnant vegetation within the survey area.
Data from DPIRD (2020).

4.7.3 Vegetation Complex Mapping

Vegetation complexes were mapped at a scale of 1:50,000 by Heddle et al. (1980) and updated by Mattiske and Havel (1998) and Webb et al. (2016). Four vegetation complexes are intersected by the survey area, with the D1 complex being the most abundant (Table 4.4, Figure 4.7).

Table 4.4: Vegetation complexes of the survey area.
Data from DBCA (2018a).

Class	Name	Description	Extent within Survey Area (ha)	Proportion of Survey Area (%)
Cl	Collie	Open forest of *Eucalyptus marginata* subsp. *marginata-Corymbia calophylla-Allocasuarina fraseriana* on gravelly-sandy upland soils in the subhumid zone.	5.3	3.0
D1	Dwellingup	Open forest of *Eucalyptus marginata* subsp. *marginata-Corymbia calophylla* on lateritic uplands in mainly humid and subhumid zones.	191.8	51.1
My1	Murray 1	Open forest of *Eucalyptus marginata* subsp. *marginata-Corymbia calophylla-Eucalyptus patens* on valley slopes to woodland of *Eucalyptus rudis-Melaleuca rhaphiophylla* on the valley floors in humid and subhumid zones.	90.5	24.1
Yg2	Yarragil 2	Open forest of *Eucalyptus marginata* subsp. *thalassica-Corymbia calophylla* on slopes, woodland of *Eucalyptus patens-Eucalyptus rudis* with *Hakea prostrata* and *Melaleuca viminea* on valley floors in subhumid and semiarid zones.	87.9	23.4

4.8 Previous Biological Surveys

Biological surveys conducted since 2005 in the locality were reviewed for the desktop study, as summarised in Table 4.5.

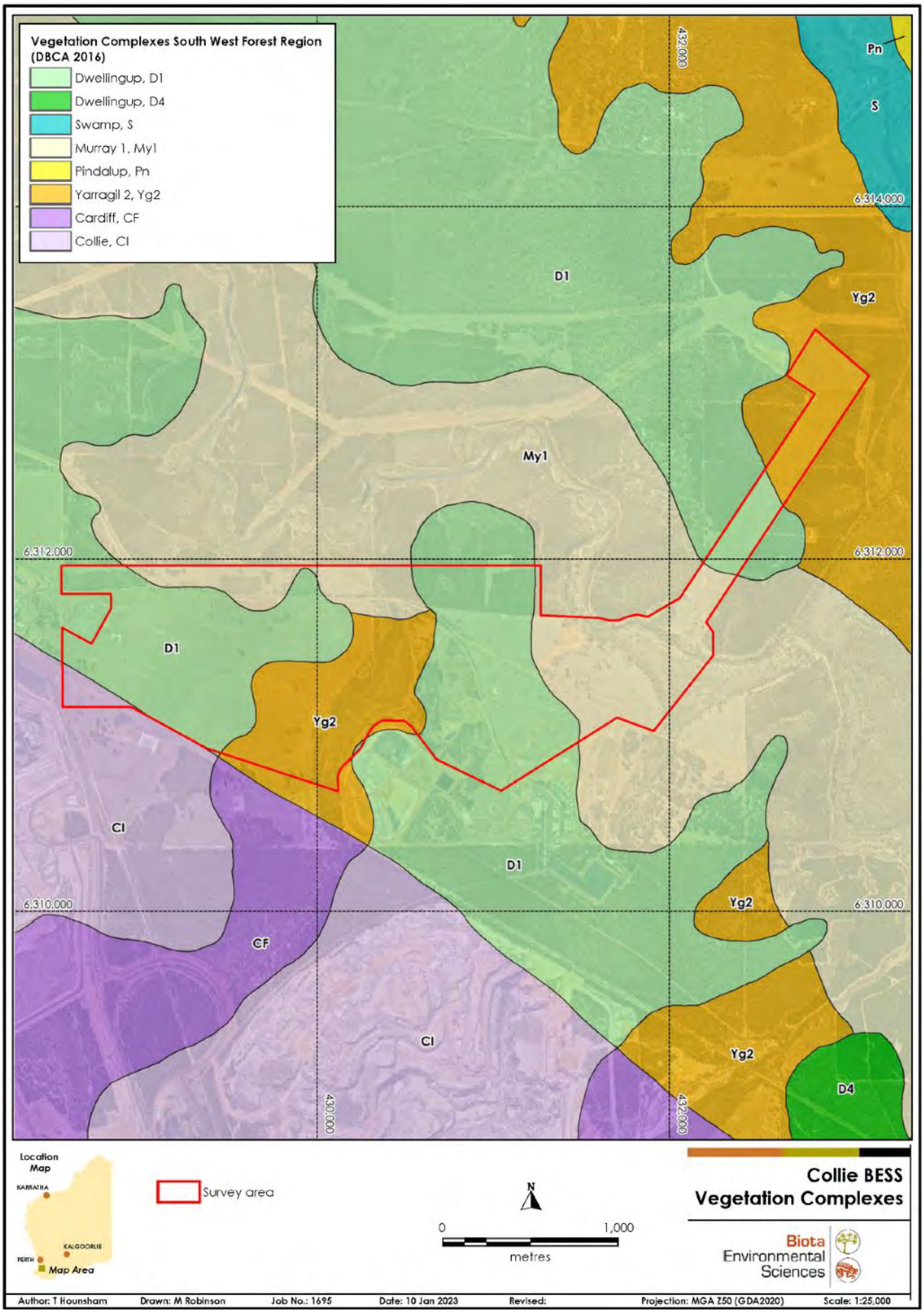

Figure 4.7: Vegetation complexes of the survey area.
Data from DBCA (2018a).

Table 4.5: Previous relevant biological surveys conducted in proximity the survey area.

Report/Survey	Survey Timing	Area	Significant Findings
Wellington Myalup Water for Food Feasibility Study Flora and Fauna Survey (GHD 2017)	Nov 2016	166.2 ha	• Two Threatened flora recorded - *Grevillea rara* - *Caladenia leucochila* • Two Priority flora recorded - *Synaphea hians* (P3) - *Grevillea ripicola* (P4)
Level 1 Flora and Vegetation Survey – Collie-Lake King Road between SLK 64.5 – 71, Bowelling Curves (Ecoedge 2014)	Sep-Oct 2014	58.4 ha	• Two Priority flora recorded: - *Leucopogon subsejunctus* (P2) - *Synaphea hians* (P3) • One regionally significant ecological community recorded: - *Melaleuca viminea* shrubland (1.0 ha) • One declared pest recorded: - *Moraea flaccida*
Targeted Fauna Assessment at the Minninup Pool Project Development Investigation Area (Ecoedge 2019)	Sep 2018 – Jan 2019	72.5 ha	• Three listed fauna recorded: - Western Brush Wallaby - Western False Pipistrelle - Forest Red-tailed Black Cockatoo • 13 trees identified as 'breeding habitat trees', containing hollows suitable for black cockatoos.
Collie Solar Farm – Environmental Assessment Report (Matters of Environment 2018)	Nov/Dec 2017	18 ha	• Two listed Threatened fauna recorded: - Baudin's Black Cockatoo - Forest Red-tailed Black Cockatoo • One migratory species recorded: - Rainbow Bee-Eater • 32 trees identified as black cockatoo 'habitat trees'. • 7 trees identified as 'breeding habitat trees', containing hollows suitable for black cockatoos.
Bowelling Curves Offset Options – Targeted Biological Survey (Biota 2016)	Jan/Feb 2016	24.2 ha	• One regionally significant ecological community recorded: - *Melaleuca viminea* shrubland (1.0 ha) • Two listed Threatened fauna recorded: - Carnaby's Black Cockatoo - Forest Red-tailed Black Cockatoo • 590 trees identified as black cockatoo 'habitat trees'. • 93 trees identified as 'breeding habitat trees', containing hollows suitable for black cockatoos.

Report/Survey	Survey Timing	Area	Significant Findings
Fauna Assessment – Collie-Lake King Road "Bowelling Curves" (SLK 64.5 – 71), Shire of West Arthur (Harewood 2014)	Sep/Oct/Nov 2014	83 ha	• Two listed Threatened fauna recorded: - Carnaby's Black Cockatoo - Forest Red-tailed Black Cockatoo • One migratory species recorded: - Rainbow Bee-Eater • 1,348 trees identified as black cockatoo 'habitat trees'. • 24 trees identified as 'breeding habitat trees', containing hollows suitable for black cockatoos.
Fauna Assessment of Collie Motorplex Proposed Clearing Areas Cardiff (Harewood 2013)	2013	42.7 ha	• Two listed Threatened fauna recorded: - Baudin's Black Cockatoo - Forest Red-tailed Black Cockatoo • 25 trees identified as 'breeding habitat trees', containing hollows suitable for black cockatoos.
Collie Urea Project – Level 1 Fauna Assessment (GHD 2009)	Jun 2009	Not stated	• Five listed fauna recorded: - Baudin's Black Cockatoo - Carnaby's Black Cockatoo - Forest Red-tailed Black Cockatoo - Chuditch - Western Brush Wallaby
Bluewaters Power Station Phase III & IV expansion - Inspection of trees in area south of the proposed pipeline route for black cockatoo nesting habitat (Strategen 2009)	Jan 2008	Not stated	• Two listed Threatened fauna recorded: - Baudin's Black Cockatoo - Forest Red-tailed Black Cockatoo • 49 trees identified as black cockatoo 'habitat trees'. • 22 trees identified as 'breeding habitat trees', containing hollows suitable for black cockatoos.
Report for Collie Shotts Industrial Park - Spring Flora and Fauna and Wetland Assessment (GHD 2008)	Oct 2007	Not stated	• Two listed fauna recorded: - Baudin's Black Cockatoo - Western Brush Wallaby
Inspection of Trees on Bluewaters Farm (Coolangatta Industrial Estate) for Nesting by Black-Cockatoos (Bamford 2005)	Oct 2005	Not stated	• Two listed Threatened fauna recorded: - Baudin's Black Cockatoo - Forest Red-tailed Black Cockatoo • 25 trees identified as 'breeding habitat trees', containing hollows suitable for black cockatoos.

4.9 Factors of Environmental Significance

4.9.1 Significant Vegetation in the Locality

Based on database search results and a review of regional vegetation mapping and associated literature, one Commonwealth-listed TEC, which is also listed as a Priority 1 PEC at State level, occurs in the locality. This community is described as 'Claypans with mid dense shrublands of *Melaleuca lateritia* over herbs'.

The DBCA database search returned three mapped occurrences of this community within 20 km, the closest being 15 km to the southeast of the survey area (Figure 4.8). Based on inspection of aerial imagery, no habitat for this community was apparent in the survey area prior to the field survey.

4.9.2 Significant Flora in the Locality

While no significant flora have been recorded previously from the survey area, a total of seven Threatened flora species and 32 Priority flora species were identified through the desktop study as having been recorded from the locality (Appendix 3). Figure 4.9 shows the spatial location of all significant flora returned by the DBCA database search.

An assessment of the likelihood that each of these species would occur within the survey area was completed during the desktop study, based on the habitats and vegetation types that appeared to be present on aerial imagery, as well as the currency of records (see Appendix 3). Of the 39 Threatened and Priority species, the following eight species were assigned a ranking of "likely to occur":

- *Drakaea confluens* (Threatened);
- *Caladenia validinervia* (Priority 1);
- *Leucopogon extremus* (Priority 2);
- *Adenanthos cygnorum* subsp. *chamaephyton* (Priority 3);
- *Synaphea decumbens* (Priority 3);
- *Acacia semitrullata* (Priority 4);
- *Eucalyptus rudis* subsp. *cratyantha* (Priority 4); and
- *Pultenaea skinneri* (Priority 4).

In addition to the species listed above, a further 25 species were ranked as "may occur". Together, these comprised the target species for the field survey.

4.9.3 Significant Vertebrate Fauna from the Locality

The results of the database searches for listed significant fauna species (either State or Commonwealth) are provided in Appendix 2), while the likelihood of occurrence assessments are provided in Appendix 4, Prior to undertaking the field survey, it was considered that seven of the 26 species were 'likely to occur' in the survey area and 10 species 'may occur'; a further eight species were considered unlikely to occur, and one species would not occur (Appendix 4).

The 18 significant fauna species identified as potentially occurring in the locality of the survey area are listed below[4]:

[4] Significant species that once occurred in the locality but are now considered locality extinct (outside of fenced conservation reserves) are omitted from this list.

Mammals

- Woylie/Brush-Tailed Bettong (*Bettongia penicillata ogilbyi)* – Critically Endangered;
- Chuditch/Western Quoll (*Dasyurus geoffroii*) – Vulnerable;
- Quokka (*Setonix brachyurus*) – Vulnerable;
- Quenda/Southwestern Brown Bandicoot (*Isoodon fusciventer*) – Priority 4;
- Tammar Wallaby (*Notamcropus eugenii derbianus*) – Priority 4;
- Western Brush Wallaby (*Notamacropus irma*) – Priority 4;
- Rakali/Water Rat (*Hydromys chrysogaster*) – Priority 4;
- Western False Pipistrelle (*Falsistrellus mackenziei*) – Priority 4; and
- South-western Brush-tailed Phascogale (*Phasogale tapoatafe wambenger*) – Specially Protected.

Birds

- Curlew Sandpiper (*Calidris ferruginea*) – Critically Endangered/Wetlands Migratory/Marine;
- Australian Bittern (*Botaurus poiciloptilus*). – Endangered;
- Baudin's Black Cockatoo (*Zanda baudinii*) – Endangered;
- Carnaby's Black Cockatoo (*Zanda latirostris*) – Endangered;
- Forest Red–tailed Black Cockatoo (*Calyptorhynchus banksia naso*) – Vulnerable;
- Pacific Swift (*Apus pacificus*) – Marine/Migratory;
- Grey Wagtail (*Motacilla cinerea*) – Terrestrial Migratory/Marine;
- Rainbow Bee-eater (*Merops ornatus*) – Migratory/Marine; and
- Peregrine Falcon (*Falco peregrinus*) – Specially Protected.

4.9.4 Significant Black Cockatoo Species Known from the Locality

All three Threatened black cockatoo species (Carnaby's Black Cockatoo, Baudin's Black Cockatoo and the Forest Red-tailed Black Cockatoo) are known to breed in the Jarrah Forest bioregion where the survey area is located. The main breeding habitat in the area comprises Marri or Marri-Wandoo woodlands. Woodland areas would also provide foraging areas for black cockatoos, with Marri being identified as a primary foraging species for both Baudin's Black Cockatoo and Forest Red-tailed Black Cockatoo (DAWE 2022).

The BirdLife Australia database search returned two confirmed roost sites (DONCOLR001 and DONCOLR002); one for white-tailed black cockatoos (which may include both Carnaby's and Baudin's cockatoo counts), and one for both white-tailed and Forest Red-tailed black cockatoos. Both occurred outside of the 12 km search radius centred on the survey area. Twenty white-tailed black cockatoos were counted at site DONCOLR001 between 2010 and 2021, and 21 white-tailed and Forest Red-tailed Black Cockatoos were counted between 2010 and 2021, and 2014 and 2021 respectively.

Given that the survey area falls within the known breeding range of all three black cockatoo species, and habitats in the survey area appeared likely to consist of Marri and Wandoo woodlands, all three black cockatoo species were considered likely to occur in the survey area prior to the field survey. The three species are described briefly in Sections 4.9.4.1 to 4.9.4.3.

4.9.4.1 Carnaby's Black Cockatoo (*Zanda latirostris*)

Conservation Status: EPBC Act Endangered, BC Act Endangered

Distribution and Habitat: Carnaby's Black Cockatoo is endemic to the southwest region of Western Australia, approximately southwest of a line from Kalbarri to Esperance. This species inhabits mainly proteaceous shrubs and heaths, and eucalypt woodlands and forests (Johnstone and Storr 1998).

Ecology: Carnaby's Black Cockatoo is a long-lived species and breeds annually from four years of age (Saunders 1986). Breeding takes place from July to mid-December, primarily in the Wheatbelt, however there has been a noted shift in breeding distribution further west and south. Following breeding, many disperse towards the coast, and during this time they are common in the Perth metropolitan area. The species feeds primarily on the seeds of hakeas, banksias, grevilleas, eucalypts and introduced pines, as well as insect larvae (Johnstone and Storr 1998).

4.9.4.2 Baudin's Black Cockatoo (*Zanda baudinii)*

Conservation Status: EPBC Act Endangered, BC Act Endangered

Distribution and Habitat: Baudin's Black Cockatoo is endemic to the higher rainfall parts of the southwest of WA, with a distribution from Albany in the south to Gidgegannup in the north and inland towards the Stirling Ranges and Kojonup. This species prefers dense Jarrah (*Eucalyptus marginata*), Marri (*Corymbia calophylla*) and Karri (*Eucalyptus diversicolor*) forests and is also found less frequently in woodlands of Wandoo, Blackbutt (*Eucalyptus patens*), Flooded Gum (*Eucalyptus rudis*) and Yate (*Eucalyptus cornuta*) (Johnstone and Kirkby 2008).

Ecology: The diet of Baudin's Black Cockatoo consists primarily of Marri seeds, but they also feed on seeds of other eucalypts, and species of banksia, hakea, fruit orchards and pine plantations. Baudin's Black Cockatoo breeds in Karri, Marri, Jarrah, Wandoo, Bullich (*Eucalyptus megacarpa*) and Tuart (*Eucalyptus gomphocephala*), with eggs laid between August and December (DBCA 2017b).

4.9.4.3 Forest Red-tailed Black Cockatoo (*Calyptorhynchus banksii naso*)

Conservation Status: EPBC Act Vulnerable, BC Act Vulnerable.

Distribution and Habitat: Forest Red-tailed Black Cockatoos are restricted to the southwest corner of WA, from Gingin to the Albany area. This species occurs primarily in eucalypt forests of the Darling Scarp and the far southwest region, but has become more common in suburban Perth in the last 10 years.

Ecology: Forest Red-tailed Black Cockatoos nest in hollows in Jarrah, Marri and Karri trees, with eggs laid in October and November. They feed primarily on seeds of eucalypts, and other species such as *Allocasuarina* (Johnstone and Storr 1998). More recently, they have begun foraging on Cape Lilac (**Melia azedarach*) on the coastal plain.

Figure 4.8: Priority ecological communities in the locality of the survey area.

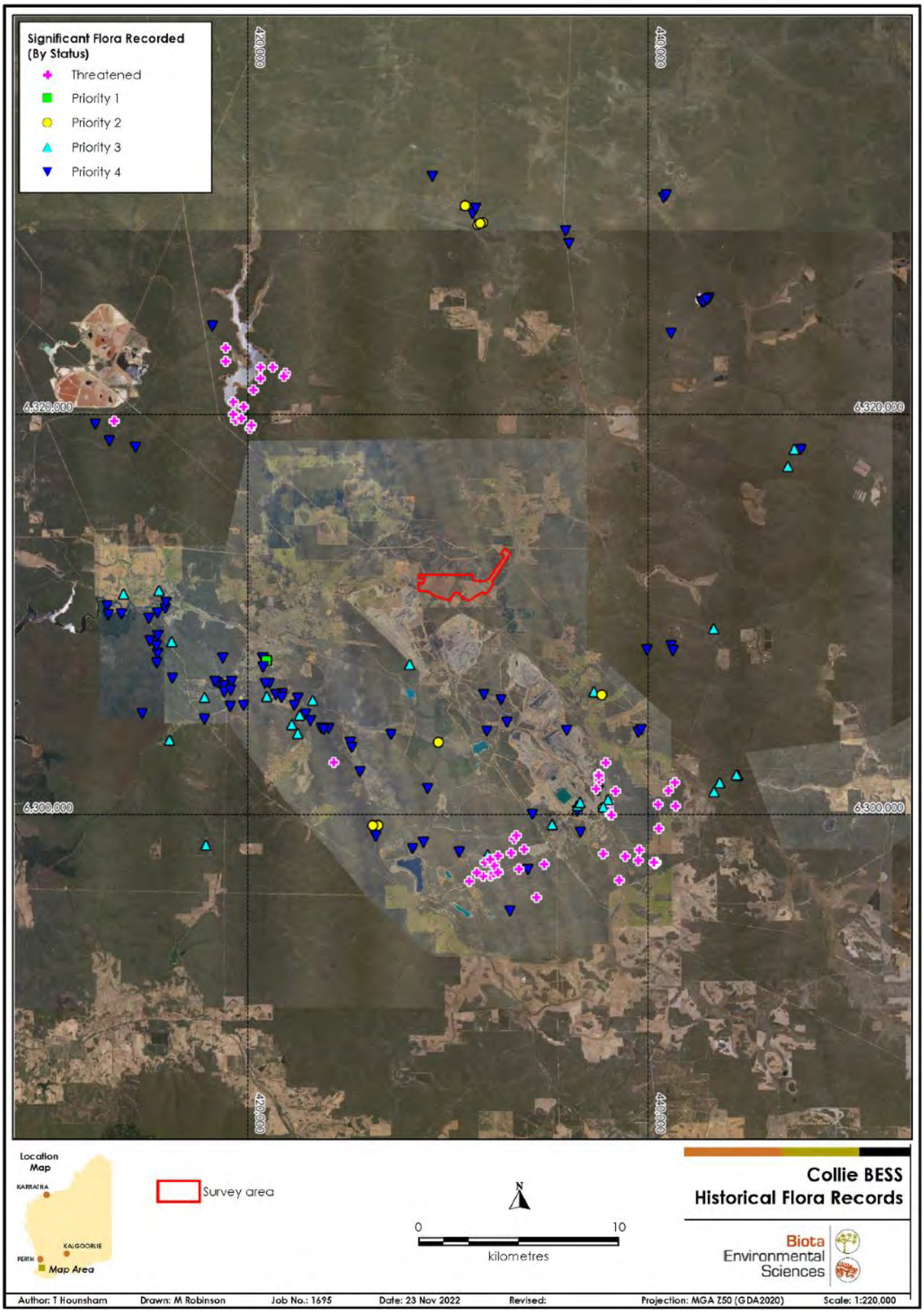

Figure 4.9: Historical flora records from the vicinity of the survey area.

5.0 Flora and Vegetation Results

5.1 Vegetation

5.1.1 Overview

Seven naturally occurring vegetation types within the survey area were identified, mapped, and described at the association level according to the NVIS (Sections 5.1.2 to 5.1.8). Three modified vegetation units were also identified and described at a broad level (Sections 5.1.9 to 5.1.11), along with previously cleared areas (Section 5.1.12) and water bodies (Section 5.1.13). The extent of the mapping units within the survey area are shown in Table 5.1 and Figure 5.1.

Remnant native vegetation accounted for 14.6% of the survey area and occurred predominantly in or near the two low-lying areas (i.e. the Collie River and the associated wetland catchment area). The remainder of the survey area comprised modified vegetation, cleared land, and water bodies (Table 5.1).

Table 5.1: Extent of the mapping units within the survey area.

Mapping Unit Code	Description	Extent in Survey Area	
		Area (ha)	Proportion (%)
Vegetated Areas			
BU	Bulrush sedgeland	2.1	0.6
FG	Flooded Gum over Swamp Paperbark woodland	10.7	2.9
JM	Jarrah-Marri woodland	16.9	4.5
MA	Marsh Club-rush sedgeland	4.1	1.1
MO	Mohan shrubland	0.4	0.1
SP	Spearwood shrubland	13.4	3.6
WA	Wandoo woodland	6.8	1.8
Modified Areas			
PL	Plantations	34.0	9.0
PR	Planted roadside verges	6.3	1.7
RE	Historical revegetation	17.3	4.6
Cleared Areas			
PC	Previously cleared	261.6	69.7
Other			
WB	Water bodies	1.7	0.5
	Total	375.3	100%

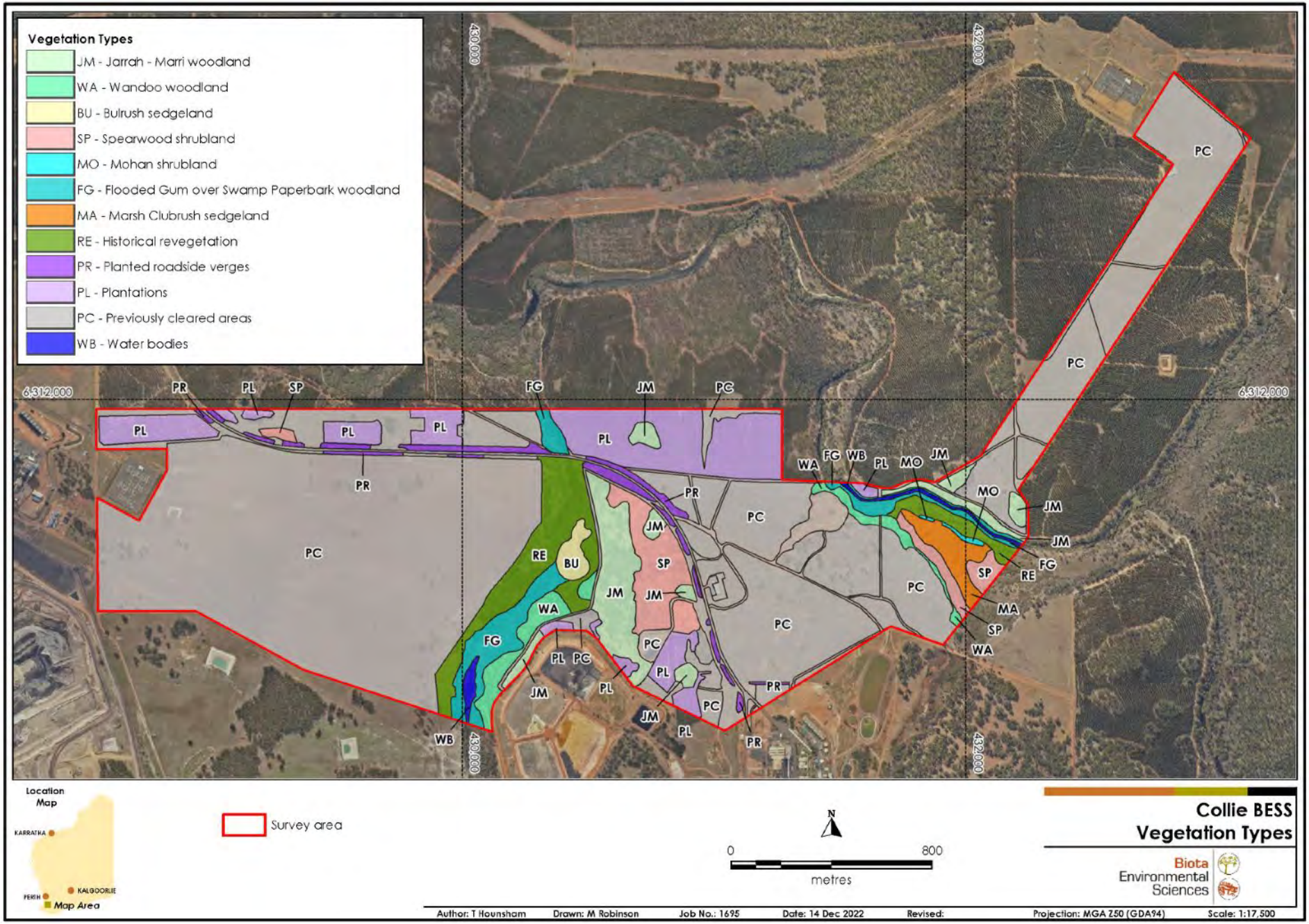

Figure 5.1: Vegetation types mapped in the survey area.

5.1.2 BU: Bulrush Sedgeland

Vegetation unit BU was described as *Typha orientalis* sedgeland (Plate 5.1 and Plate 5.2). The unit was characterised by large patches of dense sedgeland dominated by *Typha orientalis* (Bulrush), with small intermittent areas of bare ground and shallow water. *Bolboschoenus caldwellii* was the only associated species.

A single occurrence of the BU vegetation unit was observed in a low-lying seasonal wetland.

This vegetation type was somewhat affected by nearby ground disturbance, and therefore given a condition ranking of 'Very Good'.

Plate 5.1: Bulrush sedgeland.

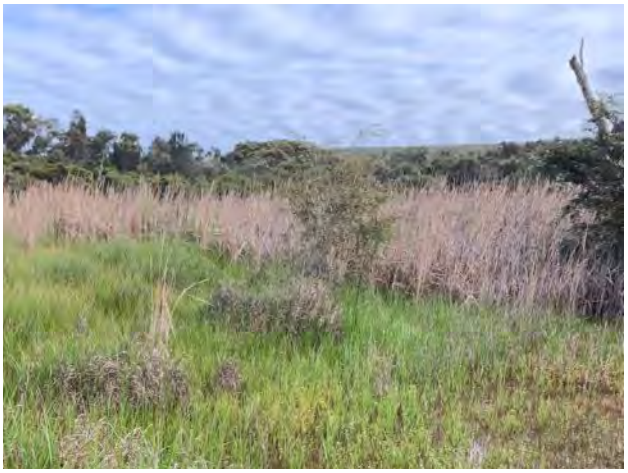

Plate 5.2: Bulrush sedgeland (midground; with Marsh Club-rush sedgeland in foreground).

5.1.3 FG: Flooded Gum/Swamp Paperbark Woodland

Vegetation unit FG was described as *Eucalyptus rudis* subsp. *rudis, (Corymbia calophylla)* scattered trees to open forest over *Melaleuca rhaphiophylla, (M. incana* subsp. *incana)* scattered low trees to low woodland (Plate 5.3 to Plate 5.5). This vegetation type showed notable variation across the survey area, although *Eucalyptus rudis* subsp. *rudis* (Flooded Gum) and *Melaleuca rhaphiophylla* (Swamp Paperbark) were consistently dominant in the canopy strata. Associated native species included *Acacia pulchella, A. saligna*, *Casuarina obesa, Cassytha racemosa, Lepidosperma longitudinale*, *Machaerina juncea*, *Juncus pallidus, Kunzea glabrescens, Astartea leptophylla, Typha orientalis*, *Thelymitra macrophylla* and *Microtis media*. It is suspected that the northernmost occurrence of this vegetation type may be partially comprised of infill revegetation, due to an unusual species mix and minor ground disturbance.

This vegetation type was associated with low-lying wet areas, occurring on creek banks and the edge of a wetland.

Weed cover varied between 2-70% across this vegetation type. Notable weed species included **Acacia longifolia* subsp. *longifolia*, **Gladiolus caryophyllaceus, *Ehrharta calycina, *Carex divisa, *Disa bracteata, *Briza* spp. *and *Hypochaeris* spp. Evidence of the presence of feral pigs (*Sus scrofa*) was observed in the southernmost occurrence of this vegetation type. Based on these factors the vegetation condition in this unit was ranked as 'Good' to 'Very Good'.

Plate 5.3: Flooded Gum/Swamp Paperbark woodland.

Plate 5.4: Flooded Gum/Swamp Paperbark woodland.

Plate 5.5: Flooded Gum/Swamp Paperbark woodland.

5.1.4 JM: Jarrah-Marri Woodland

Vegetation unit JM was described as *Eucalyptus marginata* subsp. *marginata*, *Corymbia calophylla* open woodland to open forest (Plate 5.6 to Plate 5.8). *Eucalyptus marginata* subsp. *marginata* (Jarrah) and *Corymbia calophylla* (Marri) were co-dominant within the upper stratum, while the lower stratum was characterised by non-native grasses. Middle stratum species were uncommon in this vegetation type. Associated native species included *Hibbertia hypericoides, H. vaginata, Poranthera microphylla, Acacia pulchella, Macrozamia riedlei, Ptilotus polystachyus, Austrostipa mollis* and *Caladenia flava* subsp. *sylvestris*.

This vegetation type was associated with higher points of elevation within the survey area, relative to the other native vegetation types. Jarrah-Marri woodlands were the most prevalent native vegetation type, occurring on flats, slopes, and low rises.

A high cover (30-70%) and diversity of understorey weeds (including **Avena barbata, *Bromus* sp., **Briza maxima, *Hypochaeris* spp. and **Romulea* sp.), together with rabbit scats and fox diggings, collectively contributed to an overall vegetation condition ranking of 'Good' for this vegetation type.

Plate 5.6: Jarrah-Marri woodland.

Plate 5.7: Jarrah-Marri woodland.

Plate 5.8: Jarrah-Marri woodland.

5.1.5 MA: Marsh Club-rush Sedgeland

Vegetation unit MA was described as *Bolboschoenus caldwellii* sedgeland (Plate 5.9). *Bolboschoenus caldwellii* (Marsh Club-rush) was the only dominant species in this vegetation type. Associated species included *Isolepis cernua* var. *setiformis* and *Lobelia anceps.*

This vegetation formed a marsh on a seasonally wet floodplain near the Collie River.

Vegetation condition was ranked as 'Excellent'. The weeds **Juncus bufonius* and **Cotula coronopifolia* were present at low cover (2-10%).

Plate 5.9: Marsh Club-rush Sedgeland.

5.1.6 MO: Mohan Shrubland

Vegetation unit MO was described as *Melaleuca viminea* subsp. *viminea* (Mohan) tall shrubland (Plate 5.10, Plate 5.11). Flooded Gum was scattered in the upper canopy and the understorey was dominated by weeds.

The landform associated with this vegetation type was a shallow flowline bordered by a seasonally wet marsh.

A high cover (30-70%) of the weeds **Lolium rigidum* and **Avena barbata* resulted in a condition ranking of 'Good' for this vegetation type.

Plate 5.10: Mohan shrubland.

Plate 5.11: Mohan shrubland.

5.1.7 SP: Spearwood Shrubland

Vegetation unit SP was described as *Kunzea glabrescens* (Spearwood) tall shrubland to tall scrub (Plate 5.12 to Plate 5.14). Flooded Gum and Swamp Paperbark were scattered among the Spearwood in some areas.

This vegetation type occurred on floodplains and in disturbed areas. Associated species were dependent on landform, and were limited in naturally occurring communities. Associated species of disturbed areas included *Melaleuca rhaphiophylla*, *M. preissiana, Calothamnus quadrifidus*, *Pimelea angustifolia, Allocasuarina fraseriana, Kennedia prostrata, Hibbertia hypericoides, H. commutata, Acacia pulchella, Ptilotus polystachyus, Microtis media*, and *Kunzea recurva*. Based on an unusual species composition and evidence of ground disturbance it is likely that disturbed areas may have been enhanced by revegetation efforts.

Vegetation condition ranged from 'Very Good' to 'Degraded'; the former applying to seasonally wet areas and the latter to disturbed areas with higher weed cover (**Briza maxima, *Vulpia myuros* and **Arctotheca calendula).*

Plate 5.12: Spearwood shrubland.

Plate 5.13: Spearwood shrubland.

Plate 5.14: Spearwood shrubland.

5.1.8 WA: Wandoo Woodland

Vegetation unit WA was described as *Eucalyptus wandoo* subsp. *wandoo, (E. rudis* subsp. *rudis)* open woodland to open forest (Plate 5.15 to Plate 5.17). *Eucalyptus wandoo* (Wandoo) was dominant in the canopy layer, with Flooded Gum often occurring as a sub-dominant. Mixed *Melaleuca* species were scattered in the lower canopy stratum in some areas. The understorey comprised mostly non-native tussock grasses and annual herbs. Associated species included *Corymbia calophylla, Hakea prostrata, Casuarina obesa, Melaleuca preissiana, M. viminea* subsp. *viminea, M. rhaphiophylla, Acacia saligna, A. pulchella, Lechenaultia floribunda, Hypocalymma angustifolium, Bossiaea eriocarpa,* and *Austrostipa mollis.* The lower canopy and upper shrub layer appeared to have been enhanced by infill revegetation in some areas.

Wandoo woodlands were found on gentle slopes near seasonally wet areas.

Moderate to high weed cover (10-70%) and the occasional presence of vehicle tracks contributed to a vegetation condition ranking of 'Good' to 'Very Good'. Dominant weed species included **Avena barbata, *Bromus hordeaceus* and **Lotus* sp.

Plate 5.15: Wandoo woodland.

Plate 5.16: Wandoo woodland.

Plate 5.17: Wandoo woodland.

5.1.9 PL: Plantations

Vegetation unit PL was separated into five different sub-units with the following vegetation descriptions:

- PL1: **Eucalyptus globulus* closed forest to tall open forest (Plate 5.18).
- PL2: *Eucalyptus occidentalis* woodland (Plate 5.19)[5].
- PL3: **Eucalyptus saligna* tall open forest.
- PL4: **Eucalyptus polybractea*, *Eucalyptus ? loxophleba* woodland (Plate 5.20)[5].
- PL5: **Pinus* spp. open forest.

The native species *Corymbia calophylla* or *Acacia pulchella* were often present as scattered individuals, however the vegetation structure was no longer intact and the plantation areas were therefore ranked as 'Completely Degraded'. All sub-units had an understorey with a medium to high cover (10-70%) of weedy grasses such as **Briza maxima*, **Lolium rigidum* and **Eragrostis curvula.*

Plate 5.18: Plantation (PL1).

5 Note that some species recorded during the survey, such as *Eucalyptus occidentalis*, *E. loxophleba, E. myriadena* and *Calothamnus quadrifidus* subsp. *quadrifidus*, are native to WA but are introduced to the Collie area.

Plate 5.19: Plantation (PL2).

Plate 5.20: Plantation (PL4).

5.1.10 PR: Planted Roadside Verges

Vegetation unit PR was divided into two sub-units, PR1 and PR2. Unit PR1 was described as *Kunzea glabrescens* tall scrub. **Calothamnus quadrifidus* subsp. *quadrifidus*[5] and *Callistemon glaucus* were associated species (Plate 5.21).

Unit PR2 was described as *Eucalyptus* spp. woodland (Plate 5.22). Associated species included **Eucalyptus ? loxophleba*[5], **E. ? myriadena*[5] and *E. wandoo* subsp. *wandoo.*

Roadside vegetation condition was classified as 'Degraded', due to the dominance of introduced species, including a sparse to moderate cover (2-30%) of introduced grasses.

Plate 5.21: Planted roadside verge (PR1).

Plate 5.22: Planted roadside verge (PR2).

5.1.11 RE: Historical Revegetation

Vegetation unit RE was characterized by historical revegetation (Plate 5.23 to Plate 5.25). The vegetation in this unit was inconsistent due to its artificial nature, but broadly fit a description of *Melaleuca rhaphiophylla* (*Acacia saligna)* low open woodland to low open forest. Scattered *Eucalyptus rudis* subsp. *rudis* and *E. wandoo* trees occurred in areas fringed by FG and WA vegetation units respectively. The lower stratum predominantly comprised invasive grasses.

Vegetation of this type was ranked as 'Degraded'. In some areas the vegetation was beginning to approach the composition of vegetation unit FG, however all areas were subject to considerable ground disturbance and high weed cover.

Plate 5.23: Historical revegetation.

Plate 5.24: Historical revegetation.

Plate 5.25: Historical revegetation.

5.1.12 PC: Previously Cleared Areas

A large proportion of the survey area (69.7%) had been cleared (Plate 5.26 and Plate 5.27). These areas consisted of roads, cropping land, buildings, dams, a quarry, and open areas.

Some of the cropping and open areas retained scattered Jarrah, Marri and Wandoo trees, as well as scattered Spearwood shrubs, however the vegetation structure was not intact and vegetation condition was ranked as 'Completely Degraded'.

Plate 5.26: Previously cleared areas.

Plate 5.27: Previously cleared areas.

5.1.13 Water Bodies

Two water bodies occurred in the survey area, including an 800 m stretch of the Collie River (Plate 5.28) and a permanent wetland fed by the Collie River (Plate 5.29). These areas were not assessed for vegetation condition.

Plate 5.28: Water body (Collie River).

Plate 5.29: Water body (wetland fed by Collie River).

5.1.14 Vegetation Condition

The condition of the vegetation in the survey area is summarised in Table 5.2 and mapped in Figure 5.2 (see Appendix 5 for condition scale).

Over 80% of the survey area was classed as 'Degraded' or 'Completely Degraded' (Table 5.2). These areas comprised cleared land (including one area that had since been colonised by *Kunzea glabrescens*), cropping areas, buildings, roads, access tracks, dams, planted roadside verges and organised plantations. Areas devoid of native species (or almost so) were classed as 'Completely Degraded', while areas of highly modified vegetation were classed as 'Degraded'.

Naturally occurring vegetation units (BU, FG, JM, MA, MO, SP and WA) made up the remainder of the vegetation. Naturally occurring vegetation areas were ranked as 'Good' (5.9%), 'Very Good' (4.9%) or 'Excellent' (1.1%).

The primary causes of degradation in the survey area were the spread of introduced flora species (particularly grasses), and ground disturbance. Various commonly occurring introduced grasses were prevalent in the understorey and occurred throughout the entire survey area. **Ehrharta calycina, *Ehrharta longiflora, *Avena barbata, *Bromus diandrus*, **Lolium rigidum* and **Briza*

maxima were present in varying density in the remnant vegetation, as well as along access tracks and within cleared areas.

Water bodies made up 0.5% of the survey area, and were not assessed for vegetation condition.

Table 5.2: Extent of vegetation condition categories within the survey area.

Condition Ranking	Extent in Study Area	
	Area (ha)	Proportion (%)
Pristine	-	-
Excellent	4.1	1.1
Very Good	18.3	4.9
Good	22.0	5.9
Degraded	33.6	9.0
Completely Degraded	295.6	78.8
N/A	1.7	0.5
Total	375.3	100%

5.1.15 Threatened Ecological Communities and Priority Ecological Communities

Communities listed as TECs are of significance at the State level and are protected as ESAs under the EP Act. Twenty-five of the 69 TECs listed in WA are also nationally recognised and listed under the Commonwealth EPBC Act. The description, area and condition thresholds that apply to any EPBC-listed TEC also apply to any corresponding equivalent State-listed PEC of the same name.

PECs are added to the DBCA's PEC list under Priorities 1 (highest priority), 2 and 3. Ecological communities that are: 1) adequately known; 2) rare but not threatened, or meet criteria for Near Threatened; or 3) have been recently removed from the Threatened list, are placed in Priority 4. Conservation dependent ecological communities are placed in Priority 5 (see Appendix 1).

The latest State listing of TECs (DBCA 2018b) recognises one such community from the Jarrah Forest bioregion, the *'Calothamnus graniticus* heaths on south west coastal granites' TEC. This TEC is currently not listed under the EPBC Act. In addition, 'Eucalypt Woodlands of the Western Australian Wheatbelt' are also listed as a Commonwealth TEC, although the component communities are only listed as PECs in WA.

None of the vegetation types present for the survey area comprise TECs listed under the EPBC Act, or TECs or PECs listed at State-level.

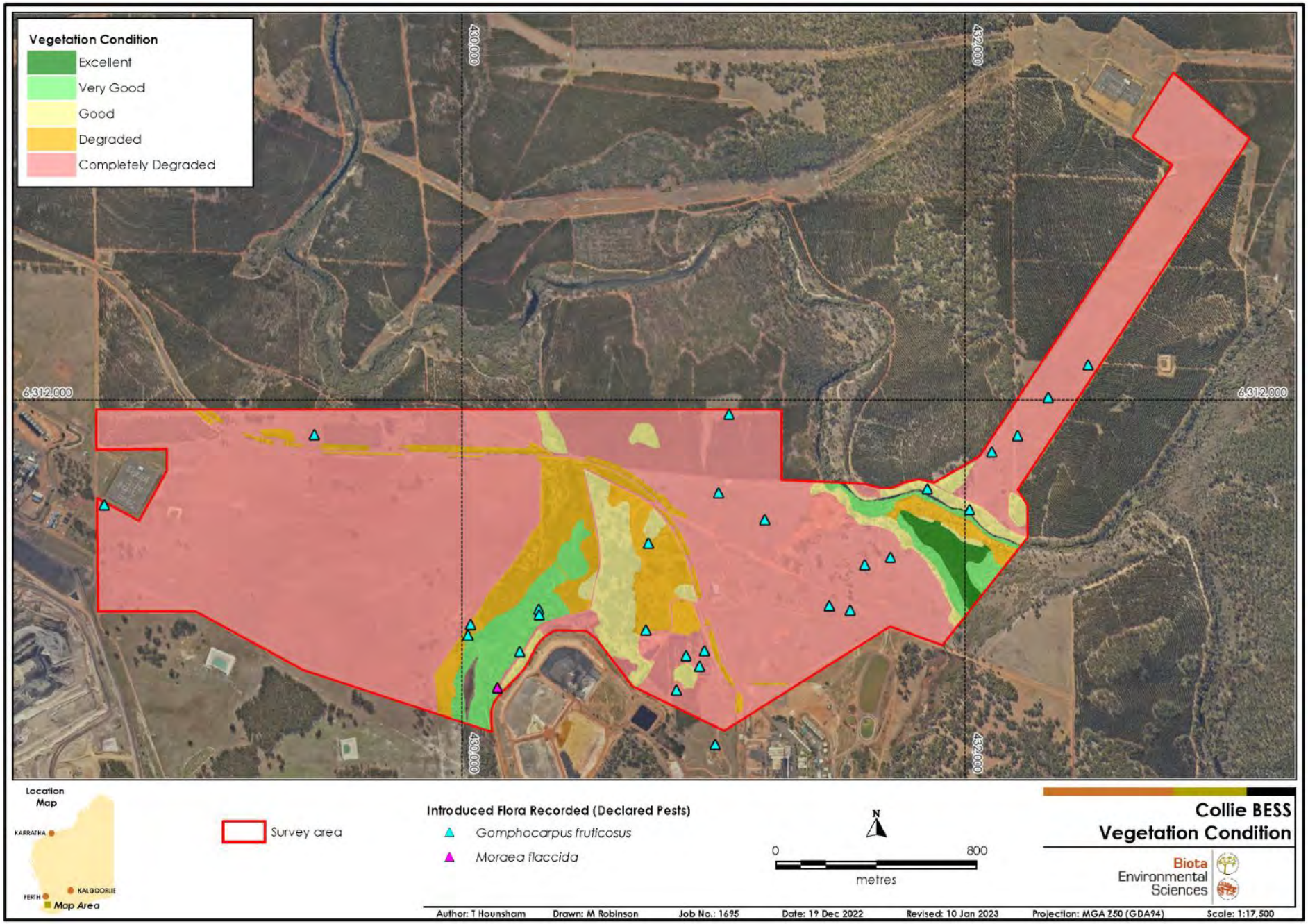

Figure 5.2: Vegetation condition and introduced flora locations.

5.2 Flora

5.2.1 Overview

A non-exhaustive flora species list is provided in Appendix 6. A total of 75 native vascular flora species from 48 genera and 25 families were recorded in the survey area, although it should be noted that some of these are native WA species that are not native to the Collie area. A total of 49 introduced flora species were recorded, which are discussed in Section 5.2.3.

The dominant plant families and genera recorded from the survey area are presented in Table 3.1. While these families and genera are well represented in locality, other typically common families from the Jarrah Forest, such as Poaceae, were not highly represented in the survey area.

Table 5.3: Dominant families and genera recorded from the survey.

Family	No. of Native Species	Genus	No. of Native Species
Myrtaceae	24	*Eucalyptus*	9
Fabaceae	10	*Acacia*	5
Cyperaceae	7	*Melaleuca*	5
		Hibbertia	3

5.2.2 Flora of Significance

No Threatened or Priority flora species were recorded during the field survey. Although potentially suitable habitat for several of the significant flora species was identified through the desktop study, once in the field it was apparent that the highly disturbed understorey of much of the area would render many of the species unlikely to occur.

Eucalyptus rudis subsp. *cratyantha* (Priority 4) was not confirmed from the survey area but was considered 'likely to occur', as many *Eucalyptus rudis* trees were observed, but few were determined to subspecies level due to the absence of fruit. Subspecies *cratyantha* has similar habitat preferences to *E. rudis* subsp. *rudis*, and has been recorded from the Collie area; it was therefore considered likely that *E. rudis* subsp. *cratyantha* was present.

Sixteen Priority species were ranked as 'may occur' following the survey based on their detectability, habitat preferences and proximity to the survey area:

- *Leucopogon extremus* (Priority 2);
- *Angianthus drummondii* (Priority 3);
- *Blennospora doliiformis* (Priority 3);
- *Eryngium* sp. Ferox (G.J. Keighery 16034) (Priority 3);
- *Juncus meianthus* (Priority 3);
- *Meionectes tenuifolia* (Priority 3);
- *Stylidium lepidum* (Priority 3);
- *Stylidium rhipidium* (Priority 3);
- *Synaphea petiolaris* subsp. *simplex* (Priority 3);
- *Tetratheca parvifolia* (Priority 3);
- *Thysanotus unicupensis* (Priority 3);
- *Acacia semitrullata* (Priority 4);
- *Drosera occidentalis* (Priority 4);
- *Hydrocotyle lemnoides* (Priority 4);
- *Ornduffia submersa* (Priority 4); and
- *Schoenus natans* (Priority 4).

Based on the level of on-ground survey effort (Figure 3.2), the vegetation types mapped for the survey area (Figure 5.1), and the degraded condition of the majority of the vegetation (Figure 5.2) all of the remaining significant flora identified in the desktop study was ranked as 'unlikely to occur' or 'would not occur' after the survey (Appendix 3).

5.2.3 Introduced Flora

A total of 42 introduced flora species were recorded within the survey area and were common in the understorey of the native remnant vegetation. Weed species are listed in the species list in Appendix 6 (denoted with an asterisk).

Two introduced species listed as Declared Pests under the *WA Biosecurity and Agriculture Management Act 2007* were recorded during the survey: **Gomphocarpus fruticosus* (Narrow-leaf Cottonbush) and **Moraea flaccida* (One-leaf Cape Tulip). Locations of both species are presented on Figure 5.2 and coordinates are provided in Appendix 7.

Twenty-six populations of **Gomphocarpus fruticosus* were mapped within the survey area, with populations ranging in size from one to approximately 500 individuals. One additional population of approximately 70 individuals was mapped just outside the survey area, west of the Collie Power Station, which has the potential to spread north into the survey area. **Gomphocarpus fruticosus* is assigned to control category 'C3 – Management' under the *WA Biosecurity and Agriculture Management Act 2007*.

One population of 25 individuals of **Moraea flaccida* was recorded during the survey, near the southern edge of the survey area. **Moraea flaccida* is not assigned to a control category under the *WA Biosecurity and Agriculture Management Act 2007*.

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6.0 Fauna Results

6.1 Fauna Habitats

Thirteen fauna habitat types were identified and mapped within the survey area (Table 6.1,Figure 6.1), including Eucalypt forest, Wandoo and Flooded Gum woodland, Myrtaceous heaths, Paperbarks over shrubland, Dampland, Revegetated and planted vegetation, Eucalypt plantations, Pinus stands, and water bodies (including the Collie River). A large portion of the survey area comprised existing cleared areas and cropping.

The Eucalypt woodland habitat type is well represented in the immediate vicinity of the survey area and in the broader Collie district. The Wandoo woodland and Flooded Gum/Swamp Paperbark habitats appear to be somewhat less common in the local and broader area.

Table 6.1: Extent of fauna habitats and other mapping units in the survey area.

Code	Mapping Unit	Extent in Survey Area	
		Area (ha)	Proportion of Survey Area (%)
Vegetated			
JM	Jarrah-Marri Forests	12.09	3.2
WA	Wandoo Woodland	6.24	1.7
FG	Flooded Gum/Swamp Paperbark Fringing Woodland	2.68	0.7
MA	Melaleuca/Astartea Heath	4.23	1.1
ST	Paperbark over Swamp Teatree and Spearwood Shrubland	10.12	2.7
SS	Seasonal Sedge/Shrub Swampland	10.65	2.8
Modified/Planted Areas			
CT	Cleared with Remnant Trees	33.27	8.9
RV	Revegetated Areas	6.34	1.7
PR	Planted Roadside Verges	6.12	1.6
PE	Plantation – *Eucalyptus* Mallee	8.03	2.1
PB	Plantation – Tasmanian Blue Gum	23.89	6.4
PI	Stands of *Pinus* sp.	1.13	0.3
Water			
WB	Water Bodies	1.74	0.5
Other			
CL	Cleared	20.89	5.6
CM	Cleared; Highly Modified	5.59	1.5
CR	Cropping/Pasture	143.48	38.2
	Total	375.30	100.0

6.1.1 JM: Jarrah – Marri Forest

This habitat is comprised of Jarrah (*Eucalyptus marginata*) and Marri (*Corymbia calophylla*) open forest with an understorey of primarily introduced grasses and herbs (Plate 6.1, Plate 6.2). Some scattered native shrubs were present but provided no continuous mid-stratum. A thick leaf litter was present in this habitat, together with a large number of hollow logs of varying sizes (Plate 6.3).

The above Eucalypt species are recognised as valuable habitat for black cockatoos for breeding, feeding and roosting. Hollows suitable for breeding for a variety of fauna taxa were recorded in the Eucalypts within this habitat type.

Carnaby's Black Cockatoo (*Zanda latirostris*), Forest Red-tailed Black Cockatoo (*Calyptorhynchus banksii naso*), Baudin's Black Cockatoo (*Zanda baudinii*), and Chuditch (*Dasyurus geoffroii*) (via scats) were all recorded in this habitat type. The black cockatoos were recorded feeding and loafing in this habitat within the survey area. Additionally, 552 potential black cockatoo nesting trees were recorded within this mapped habitat.

This habitat would also provide resources for significant mammals such as the Southern Brush-tailed Phascogale (*Phascogale tapoatafa wambenger*), Western False Pipistrelle (*Falsistrellus mackenziei*), Quenda (*Isoodon fusciventer*) and Western Brush Wallaby (*Macropus irma*).

This habitat type covered 12.09 ha (3.2%) of the survey area (Figure 6.1) and would be of value to fauna assemblages.

Plate 6.1: Jarrah-Marri Forest.

Plate 6.2: Jarrah-Marri Forest.

Plate 6.3: Jarrah-Marri Forest.

6.1.2 WA: Wandoo Woodland

This habitat comprised a Wandoo (*Eucalyptus wandoo* subsp. *wandoo*) open woodland to woodland with a variable understorey of scattered *Acacia* and *Melaleuca* shrubs (Plate 6.4). It occurred south of the Collie River on a rocky substrate, bordering the eastern side of the permanent water body in the central section of the survey area (Figure 6.1). This fauna habitat had a thick layer of leaf litter and woody debris, with large logs scattered on the woodland floor.

Individuals of the Threatened Forest Red-tailed Black Cockatoo (*Calyptorhynchus banksii naso*) and Carnaby's Black Cockatoo (*Zanda latirostris*) were both recorded from this habitat type (see Section 6.2.2). Additionally, 69 potential black cockatoo nesting trees were recorded within this habitat (Figure 6.3), and the Forest Red-Tailed Black Cockatoo is known to feed on Wandoo seed.

This habitat would also provide resources for significant mammals such as the Western Brush Wallaby (*Macropus irma*), Chuditch (*Dasyurus geoffroii*), Southern Brush-tailed Phascogale (*Phascogale tapoatafa wambenger*), Western False Pipistrelle (*Falsistrellus mackenziei*), and Quenda (*Isoodon fusciventer*).

This habitat type covered 6.24 ha (1.7%) of the survey area (Figure 6.1) and would be of value to fauna assemblages.

Plate 6.4: Wandoo Woodland.

6.1.3 FG: Flooded Gum/Swamp Paperbark Fringing Woodland

This habitat occurred to the immediate north and south of the Collie River in the eastern section of the survey area, as a relatively narrow band of fringing woodland (Figure 6.1).

Comprising an upper stratum of Flooded Gum (*Eucalyptus rudis* subsp. *rudis*) over Swamp Paperbark (*Melaleuca* rhaphiophylla), with a ground cover of Bare Twigrush (*Machaerina juncea*) (Plate 6.5, Plate 6.6), this habitat would provide foraging resources and refuge for the Western Brush Wallaby (*Macropus irma*), Chuditch (*Dasyurus geoffroii*), Western False Pipistrelle (*Falsistrellus mackenziei*), and Quenda (*Isoodon fusciventer*). Flooded Gums also represent potential night roosting trees for all three black cockatoo species.

This habitat type covered 2.68 ha (0.7%) of the survey area (Figure 6.1) and would be of value to fauna assemblages.

Plate 6.5: Flooded Gum/Swamp Paperbark Fringing Woodland.

Plate 6.6: Flooded Gum/Swamp Paperbark Fringing Woodland.

6.1.4 MA: Melaleuca/Astartea Heath

This habitat is comprised a Melaleuca/Astartea heath (Plate 6.7) on waterlogged soils situated south of the Collie River in the eastern Section of the survey area (Figure 6.1). Minimal understorey vegetation was present, with only scattered sedges, herbs, and grasses beneath the heath canopy (Plate 6.8). A variety of small birds would utilise this habitat for nesting and foraging, with smaller mammals utilising the area as refuge or for transiting between surrounding woodlands.

This habitat type covered 4.23 ha (1.1%) of the survey area (Figure 6.1) and would be of value to fauna assemblages.

Plate 6.7: Melaleuca/Astartea Heath.

Plate 6.8: Melaleuca/Astartea Heath.

6.1.5 ST: Paperbark over Swamp Teatree and Spearwood Shrubland

This habitat consisted of Paperbark (*Melaleuca rhaphiophylla*) over a closed tall shrubland to open tall shrubland of Swamp Tea Tree (*Pericalymma ellipticum*) and Spearwood (*Kunzea glabrescens*) (Plate 6.9, Plate 6.10), surrounding the permanent water body in the central section of the survey area (Figure 6.1).

Significant species that would utilise this habitat for foraging, refuge and/or nesting include the Quenda (*Isoodon fusciventer*), Rakaii (*Hydromys chrysogaster*), Western False Pipistrelle (*Falsistrellus mackenziei*), Rainbow Bee-eater (*Merops ornatus*), and Curlew Sandpiper (*Callidris ferruginea*).

This habitat type covered 10.12 ha (2.7%) of the survey area (Figure 6.1) and would be of value to fauna assemblages.

Plate 6.9: Paperbark over Swamp Teatree and Spearwood Shrubland.

Plate 6.10: Paperbark over Swamp Teatree and Spearwood Shrubland.

6.1.6 SS: Seasonal Sedge/Shrub Swampland

This habitat was a seasonally inundated depression bordering the Collie River in the eastern section of the survey area (Figure 6.1). Standing water was present during the survey and was retained well due to a substrate containing clay. Scattered myrtaceous shrubs were present over a lower stratum dominated by a *Bolboschoenus* sedgeland with intermittent *Lepidosperma* sedges (Plate 6.11 and Plate 6.12).

This habitat would provide foraging and feeding resources for insectivorous birds, and secondary foraging habitat for ground-dwelling mammals such as the Chuditch (*Dasyurus geoffroii*).

This habitat type covered 10.65 ha (2.8%) of the survey area (Figure 6.1) and would be of value to fauna assemblages.

Plate 6.11: Seasonal Sedge/Shrub Swampland.

Plate 6.12: Seasonal Sedge/Shrub Swampland.

6.1.7 CT: Cleared with Remnant Trees

This habitat comprised mature Eucalypts either in previously cleared areas or cropping (Plate 6.13, Plate 6.14) and was scattered throughout the entire survey area (Figure 6.1). Marri (*Corymbia calophylla*), Jarrah (*Eucalyptus marginata*), and Wandoo (*Eucalyptus wandoo* subsp. *wandoo*) were recorded in this habitat type. All three species of Eucalypt represent valuable habitat for black cockatoos for breeding, feeding and roosting. A total of 131 black cockatoo habitat trees were recorded throughout this habitat.

Various migratory birds and significant bird species may utilise the mature trees in this habitat and it would be of value to bird species, especially black cockatoos. This habitat type covered 33.27 ha (8.9%) of the survey area (Figure 6.1).

Plate 6.13: Cleared with Remnant Trees.

Plate 6.14: Cleared with Remnant Trees.

6.1.8 PR: Planted Roadside Verges

This habitat consisted primarily of a myrtaceous heath that had been planted on roadside verges (Plate 6.15, Plate 6.16), mainly comprised of *Melaleuca* (flowering at the time of the survey), with introduced Eucalypt species also co-dominant in certain sections of the road verge.

This habitat type covered 6.12 ha (1.6%) of the survey area (Figure 6.1) and occurred as intermittent patches on either side of Boys Home Road. Nectar-feeding birds (e.g. honeyeaters, parrots, and silvereyes) would utilise this habitat and vegetation when flowering during spring and summer, with other birds such as Willie Wagtails also utilising this habitat for nesting and to feed on insects.

Plate 6.15: Planted Roadside Verges.

Plate 6.16: Planted Roadside Verges.

6.1.9 PE: Plantation – Eucalyptus Mallee

This habitat comprised *Eucalyptus polybractea* trial/research plantations on the northern survey area border to the north of Boys Home Road (Figure 6.1). Consisting of an upper strata of mallee eucalypts and a ground cover of introduced weeds and grasses (Plate 6.17), this habitat would provide little value for fauna assemblages other than refugia for small birds and feeding resources when in flower.

This habitat type covered 8.03 ha (2.1%) of the survey area (Figure 6.1).

Plate 6.17: Plantation – Eucalyptus Mallee.

6.1.10 PB: Plantation – Tasmanian Blue Gum

This habitat comprised *Eucalyptus globulus* (Tasmanian Blue Gum) plantations (Plate 6.18 and Plate 6.19) on the northern survey area border to the northeast and west of Boys Home Road (Figure 6.1).

The above Eucalypt species, when mature, would represent potential secondary night roosting habitat for black cockatoos within the survey area. This habitat would additionally provide refugia for significant bird species, especially when present in areas surrounding cleared land.

This habitat type covered 23.89 ha (6.4%) of the survey area (Figure 6.1) and would be of particular value to black cockatoos.

Plate 6.18: Plantation – Tasmanian Blue Gum.

Plate 6.19: Plantation – Tasmanian Blue Gum.

6.1.11 PI: Stands of Pinus spp.

This habitat was comprised of stands of *Pinus* sp. located in the central section of the survey area, in areas that had been previously cleared and highly modified (Figure 6.1). This habitat had an upper stratum of mature pines with an dense ground cover of allelopathic pine needles, resulting in no native understorey (Plate 6.20).

Introduced pine stands are recognised as a valuable secondary foraging resource for black cockatoos.

This habitat type covered 1.13 ha (0.3%) of the survey area (Figure 6.1) and would be of particular value to threatened black cockatoos.

Plate 6.20: Stands of Pinus spp.

6.1.12 WB: Water Bodies

This habitat comprised permanent and semi-permanent water bodies occurring within the survey area. The Collie River runs west to east through the northeastern section of the survey area (Plate 6.21), with an additional wetland system branching south of the Collie River (Plate 6.22), located within the central section of survey area (Figure 6.1).

This habitat would provide resources for threatened mammals such as the Woylie (*Bettongia penicillata ogilbyi*), Chudtch (*Dasyurus geoffroii*), Tammar Wallaby (*Notamcropus eugenii derbianus),* Western Brush Wallaby (*Notamacropus irma*), Rakali/Water Rat (*Hydromys chrysogaster*), South-western Brush-tailed Phascogale (*Phascogale tapoatafa wambenger*), Western False Pipistrelle (*Falsistrellus mackenziei*), and all potentially occurring bird species including the three Threatened black cockatoos.

This habitat type covered 1.74 ha (0.5%) of the survey area (Figure 6.1) and would be of value to fauna assemblages.

Plate 6.21: Water Body – Collie River.

Plate 6.22: Water Body – Wetland System.

6.1.13 CR: Cropping

This habitat comprised a monoculture of either Wild Oat (**Avena* spp.) (Plate 6.23) or Common Wheat (**Triticum aestivum* cv.) (Plate 6.24), excluding stands of remnant mature Eucalypt trees in the western half of the survey area. This habitat type covered 143.48 ha (38.2%) of the survey area (Figure 6.1) and would be of little value to fauna assemblages.

Plate 6.23: Cropping (Wild Oat).

Plate 6.24: Cropping (Wheat).

6.1.14 CM: Cleared; Highly Modified

This habitat consisted of areas that had been previously cleared and remained in a degraded state, being devoid of native vegetation (Plate 6.25). The structure of this habitat comprised only an introduced herbland and a perennial grassland of mainly introduced species, with no leaf litter or woody debris providing shelter for fauna.

The Peregrine Falcon (*Falco peregrinus*) and Pacific Swift (*Apus p*acificus) may utilise this habitat opportunistically. Black cockatoos (both Baudin's and Carnaby's) were observed in this highly modified habitat drinking water from standing pools following rain.

This habitat type covered 78.81 ha (21.0%) of the survey area (Figure 6.1) and would be of little value to fauna assemblages.

Plate 6.25: Cleared; Highly Modified.

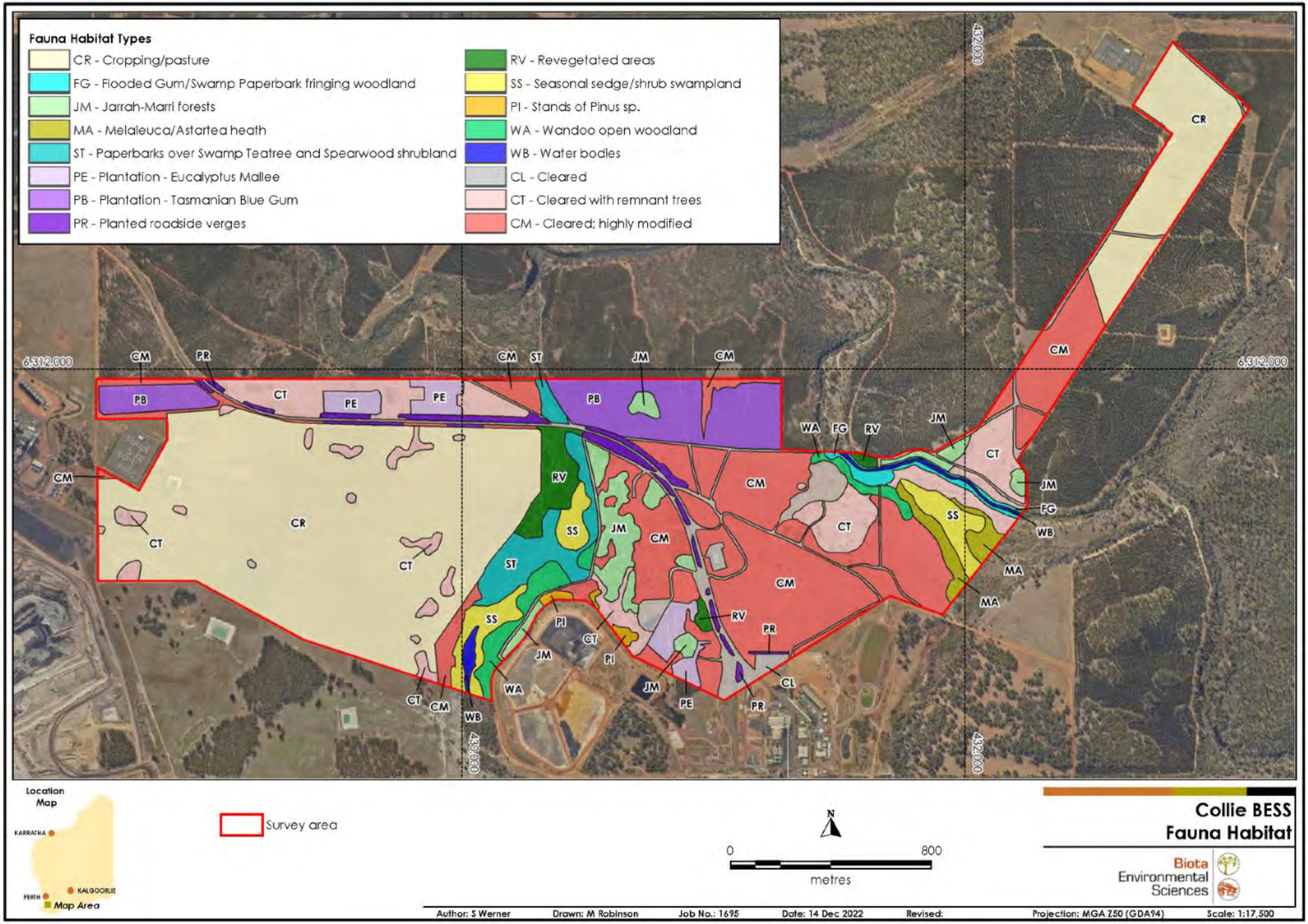

Figure 6.1: Fauna habitats of the survey area.

6.2 Vertebrate Fauna

A total of 48 vertebrate fauna species were recorded during the survey, comprising 11 mammal species, two reptile species and 35 bird species (Table 6.2). See Appendix 8 for a full list of species recorded during the survey.

Table 6.2: Vertebrate fauna recorded during the survey.

Fauna Group	No. of Species	No. of Significant Species
Ground-dwelling mammals	2	1
Bats	9	2†
Birds	35	3
Reptiles	2	0
Total	48	6

† Including a new species that is not currently listed but has a narrow distribution (see Section 6.2.3).

6.2.1 Listed Significant Vertebrate Fauna Species Recorded

Five currently listed significant vertebrate species were recorded:

- Chuditch/Western Quoll, *Dasyurus geoffroii* (Vulnerable): scats collected at one site (see Table 6.3; Figure 3.4);
- Western Falsistrelle bat, *Falsistrellus mackenziei* (Priority 4): acoustic calls recorded 49 times across four separate sites – BAT01, BAT02, BAT03, and BAT06 (Table 6.3 and Figure 3.4);
- Forest Red-tailed Black Cockatoo, *Calyptorhynchus banksii naso* (Vulnerable): recorded throughout the survey area;
- Carnaby's Black Cockatoo, *Zanda latirostris* (Endangered): recorded throughout the survey area;
- Baudin's Black Cockatoo, *Zanda baudinii* (Endangered): recorded throughout the survey area (see Section 6.2.2 for all black cockatoo records);

Table 6.3: Records of significant mammal species recorded during the survey.

Species (Common Name)	Site	Source of Record	Latitude	Longitude
Dasyurus geoffroii (Chuditch/Western Quoll)	Opportunistic	Scats	-33.332266	116.267745
Falsistrelle mackenziei (Western Falsistrelle Bat)	BAT01	Acoustic recording	-33.332252	116.264233
	BAT02	Acoustic recording	-33.334836	116.254502
	BAT03	Acoustic recording	-33.333789	116.270351
	BAT06	Acoustic recording	-33.329615	116.243167

6.2.2 Black Cockatoos

6.2.2.1 Observations and Signs of Use

During the field survey sight and/or call records were made of 21 individuals of Carnaby's Black Cockatoos, eight Red-tailed Black Cockatoos, four individuals of Baudin's Black Cockatoos, and two other instances of white-tailed black cockatoo (either Carnaby's or Baudin's Cockatoo) (Table 6.4; Figure 6.2).

Table 6.4: Records of black cockatoos recorded during the survey.

Species (Common Name)	Site	Count	Observation	Latitude	Longitude
Zanda latirostris (Carnaby's Black Cockatoo)	Opportunistic	2	Individuals	-33.3365152	116.268599
	Opportunistic	4	Individuals (overhead flying; heard)	-33.3403931	116.2488948
	Opportunistic	15	Individuals	-33.3407565	116.2587224
Zanda baudinii (Baudin's Black Cockatoo)	Opportunistic	4	Individuals	-33.3355513	116.2539128
Calyptorhynchus banksii naso (Forest Red-tailed Black Cockatoo)	Opportunistic	3	Individuals	-33.3303247	116.2553957
	Opportunistic	1	Individual (overhead flying; heard)	-33.3332204	116.2622537
	Opportunistic	3	Individuals	-33.3370574	116.2686785
	Opportunistic	1	Individual (overhead flying; heard)	-33.3340739	116.2667662
White-tailed Black Cockatoo (Carnaby's or Baudin's)	Opportunistic	2	Individuals	-33.33636985	116.2583331

There were also numerous records of evidence of black cockatoos foraging on Marri (*Corymbia calophylla*) nuts throughout the entirety of the survey area, mainly within the 'JM' fauna habitat (Figure 6.1). Based on the chew patterns of the nuts[6], all three species of black cockatoo were identified as having foraged on Marri nuts in the survey area (see Plate 6.26 to Plate 6.28).

Twenty-eight habitat assessments were completed in the survey area (see Figure 3.3 for locations). These assessments formed the basis of evaluating the extent and quality of black cockatoo foraging, roosting, and breeding habitat present in the survey area (see Sections 6.2.2.2 to 6.2.2.4).

Plate 6.26: Chew marks of Baudin's Black Cockatoo on a Marri nut.

Plate 6.27: Chew marks of Carnaby's Black Cockatoo on a Marri nut.

Plate 6.28: Chew marks of a Forest Red-tailed Black Cockatoo on a Marri nut.

6 A chewed Marri nut identification guide has been produced by the WA Museum and can be found online: https://museum.wa.gov.au/explore/online-exhibitions/cockatoo-care/marri-nut-identification

Figure 6.2: Black cockatoo observations within the survey area.

6.2.2.2 Breeding Habitat

Within the survey area, a total of 650 trees (Appendix 9) met the criteria for 'potential nesting trees' (Table 6.5; Figure 6.3) as defined by DAWE (2022), with 50 of these being hollow-bearing trees (Table 6.5; Figure 6.4). Hollow suitability was only assessed from ground level, however, and closer inspection with a pole-mounted camera or drone might refine the number of suitable hollows further. No hollows were observed in use by black cockatoos during the survey.

Most potential nesting trees recorded in the survey area were Marri (53% of all tree species recorded), and most suitable nesting hollows were also recorded in Marri trees (44% of all trees with suitable hollows) (Table 6.5). Whilst potential nesting trees were recorded in a range of habitats across the entirety of the survey area, the majority of trees with hollows were located in the central area within mature Jarrah and Marri woodland with a degraded understorey, and also to the northeast of the Collie river in two isolated patches of remnant Jarrah/Marri woodland (Figure 6.3; Figure 6.4).

A combined total of 67.2 ha of black cockatoo core habitat (breeding and roosting) was mapped within the survey area (Figure 6.5).

The Galah (*Eolophus roseicapilla*) and introduced European Honeybee (*Apis mellifera*) were both observed utilising potentially 'suitable nest hollows'. Both of these species represent significant competition with black cockatoos for hollow occupancy (Johnstone and Kirkby 2007, Johnstone et al. 2013).

Table 6.5: Breeding habitat tree species and hollows.

Tree Species	Number of Potential Nesting Trees	Number of Trees with Hollows
Flooded Gum (*Eucalyptus rudis* subsp. *rudis*)	19	6
Jarrah (*Eucalyptus marginata*)	169	11
Marri (*Corymbia calophylla*)	343	22
Tuart (*Eucalyptus gomphocephala)*	1	0
Wandoo (*Eucalyptus wandoo* subsp. *wandoo*)	117	10
Dead / stag	1	1
Total	650	50

6.2.2.3 Night Roosting Habitat

Although no evidence of night roosting was recorded from the survey area, all three species of black cockatoos would potentially utilise the survey area for this purpose. A section of the Collie River, together with the permanent wetland fed by the Collie River, are both located within the survey area and represent reliable water sources. In addition, foraging species are present in the survey area (see Section 6.2.2.4). As a result, the taller native Eucalypt species, introduced *Eucalyptus* species (Blue Gums) or introduced *Pinus* species would constitute potentially suitable roosting habitat.

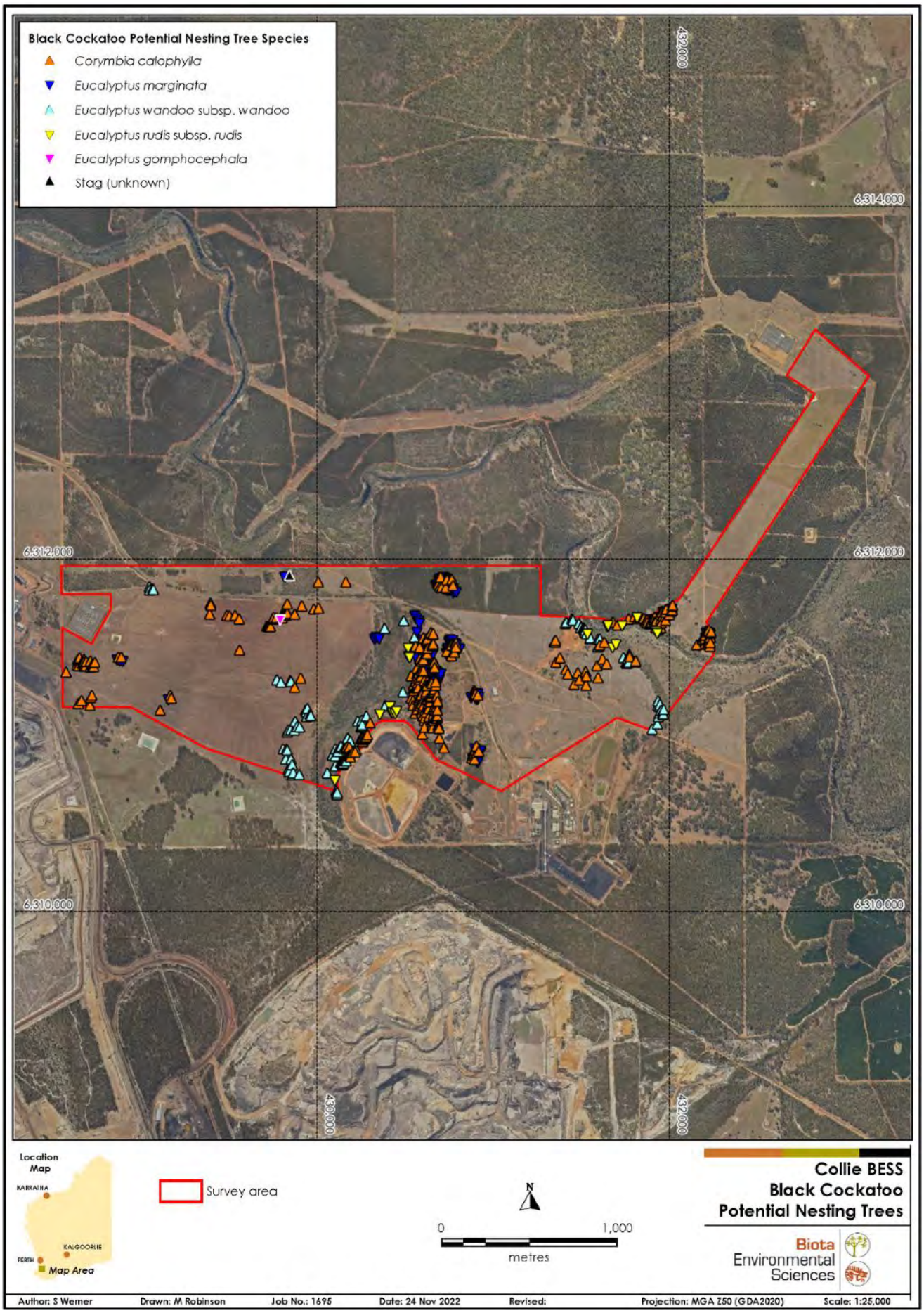

Figure 6.3: Black cockatoo potential nest trees.

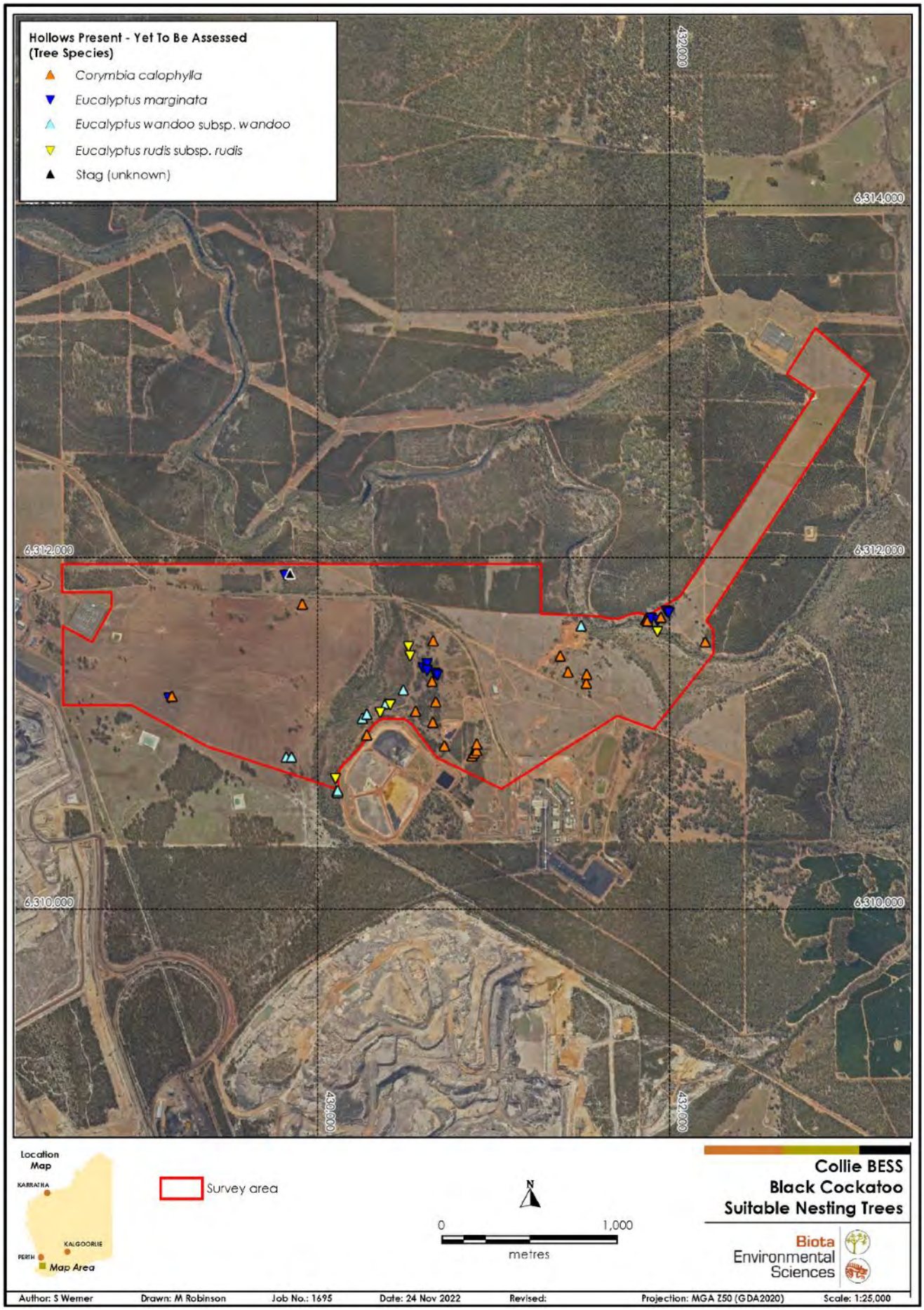

Figure 6.4: Black cockatoo hollow-bearing trees.

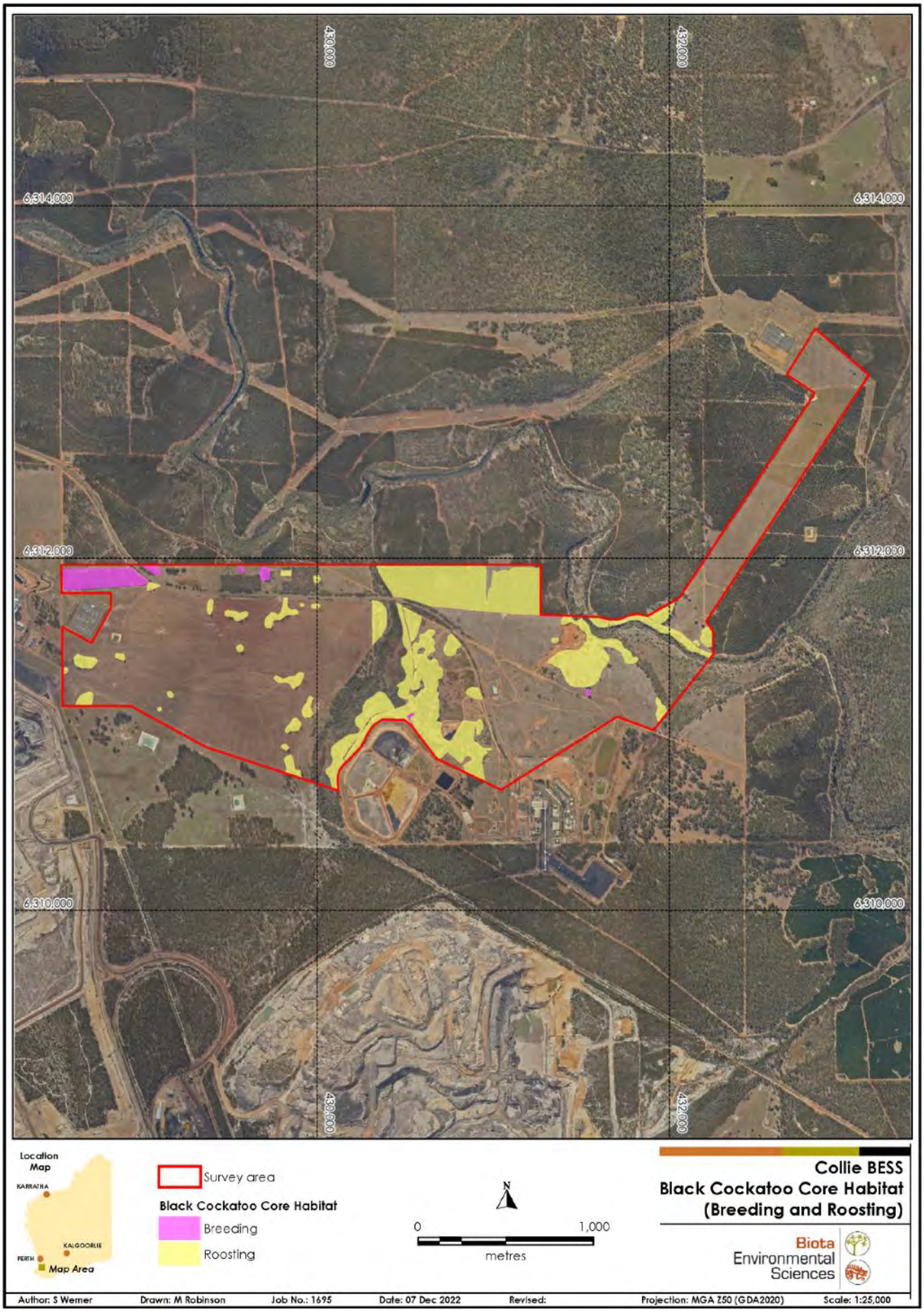

Figure 6.5: Black cockatoo core habitat (breeding and roosting).

6.2.2.4 Foraging Habitat

While the entire survey area is not vegetated, there is 38 ha of eucalypt-dominated vegetation mapped within it (see Section 6.1; Figure 6.6), which would provide foraging resources for black cockatoos. In particular Marri (*Corymbia calophylla*), which is listed as the primary food source for both Baudin's and Forest Red-tailed Black Cockatoos, was mapped over 12.09 ha of the survey area (fauna habitat type 'JM'; Section 6.1.1 and Figure 6.1); this is an important foraging resource, with evidence of foraging of Marri nuts by all three species found during the survey (Section 6.2.2.1). Other vegetation (particularly vegetation types 'CT' and 'PB'; remnant mature eucalypts and blue gum plantations) would also be available as foraging habitat for black cockatoo species (Figure 6.6).

None of the vegetation within the survey area was dominated by Proteaceous species (e.g. *Banksia, Hakea,* or *Grevillea*), which represent common food sources for Baudin's and Carnaby's Black Cockatoos. However, some associated species recorded that may provide additional sources of food in the survey area included *Banksia littoralis* and *Hakea prostrata*.

In general, vegetation in the survey area was in good condition, with a high density of mature trees over a mostly poor to degraded understorey. The proximity of the vegetation to the Collie River and associated water body in the central section of the survey area would provide a permanent water source.

The foraging quality scoring tool, as outlined in the current black cockatoo referral guideline (DAWE 2022), was applied to the survey area to assess the quality of the vegetation as a foraging resource taking into account other contextual factors. Based on this tool, the remnant vegetation in the survey area was given a score of 10, indicating that the survey area contained 38 ha of high quality foraging habitat for all three black cockatoo species (Table 6.6, Figure 6.6).

Table 6.6: Black Cockatoo Foraging Quality Scoring Tool.
Taken from DAWE (2022) (grey text = adjustors that were not applied).

Starting Score		Baudin's Black Cockatoo	Carnaby's Black Cockatoo	Forest Red-tailed Black Cockatoo
		10	10	10
Attribute	Subtractions	Context Adjustor (attributes reducing functionality of foraging habitat)		
Foraging potential	-2	Subtract 2 from your score if there is no evidence of feeding debris	Subtract 2 from your score if there is no evidence of feeding debris	Subtract 2 from your score if there is no evidence of feeding debris
Connectivity	-2	Subtract 2 from your score if you have evidence to conclude that there is no other foraging habitat within 12 km	Subtract 2 from your score if you have evidence to conclude that there is no other foraging habitat within 12 km	Subtract 2 from your score if you have evidence to conclude that there is no other foraging habitat within 12 km
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. *Phytophthora* 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. *Phytophthora* 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. *Phytophthora* spp. or Marri canker) and the disease is affecting more than 50% of the preferred food plants present
	Total Score	10	10	10

The pine stand habitats (fauna habitat unit 'Pl'; see Figure 6.1) would also represent suitable foraging habitat. The pine stands comprised a small proportion of the survey area and are likely to offer less food mass per unit area. The value of this habitat may be elevated at times when native species are not seeding.

Table 6.7: Black cockatoo foraging resources within the survey area by habitat.

Habitat	Baudin's	Carnaby's	Red-tailed
Flooded Gum/Swamp Paperbark woodland	–	–	–
Jarrah/Marri Woodland	Marri, Jarrah seeds	Marri seeds	Marri, Jarrah seeds
Wandoo open woodland	–	–	Wandoo seeds
Melaleuca/Astartea heath	*Banksia* seeds	*Banksia* seeds	*Banksia* seeds
Paperbark/Teatree/Spearwood	*Banksia* seeds	*Banksia* seeds	*Banksia* seeds
Plantation (Blue Gum)	–	–	–
Plantation (Mallee)	–	–	–
Sedge/Shrub Swampland	–	–	–
Water bodies	–	–	–
Pine stands	Pinecones	Pinecones	–
Cleared with isolated mature Marri/Jarrah trees	Marri, Jarrah seeds	Marri seeds	Marri, Jarrah seeds
Cropping/pasture	–	–	–
Cleared/Highly Modified areas	–	–	–

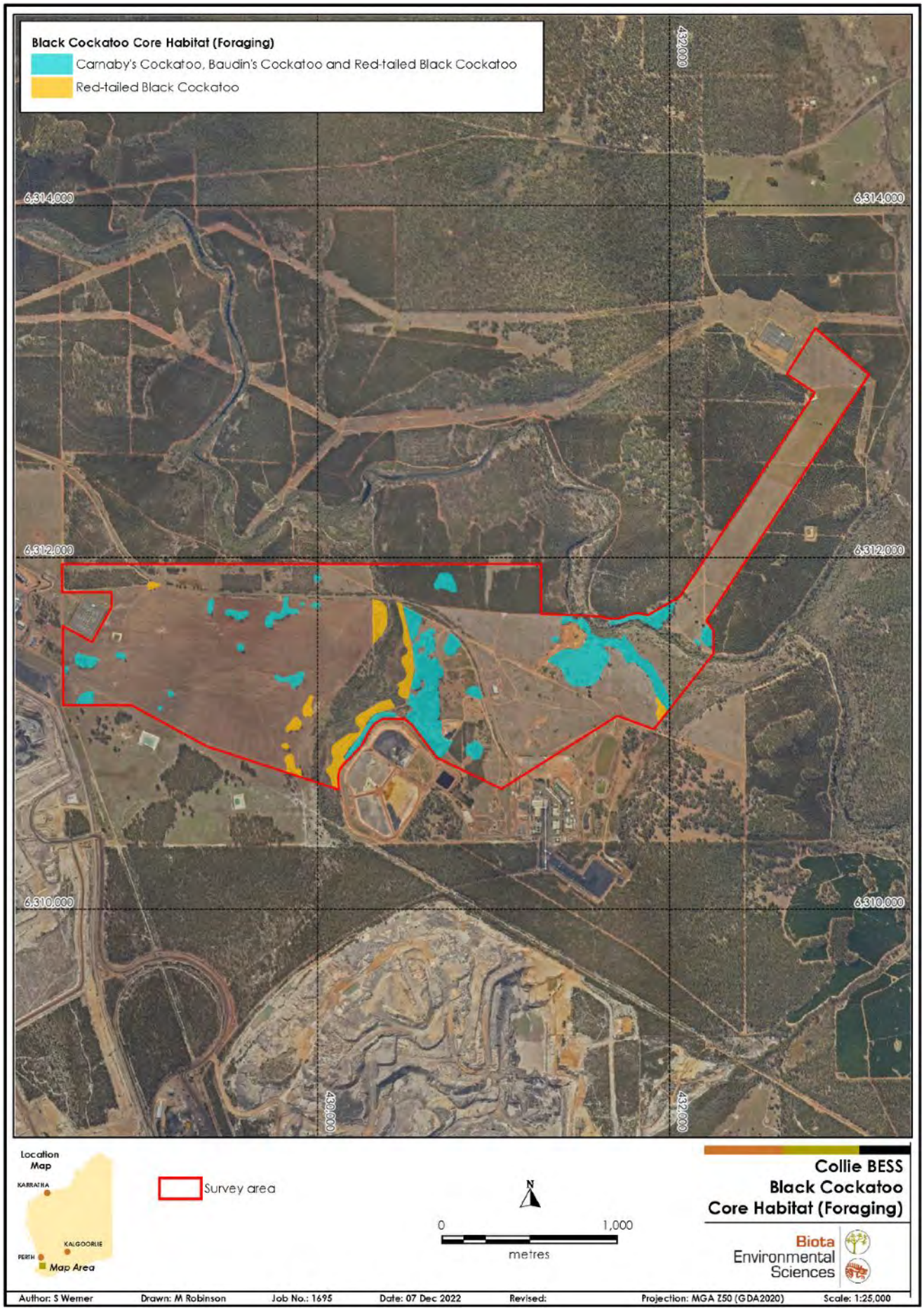

Figure 6.6: Black cockatoo core habitat (foraging).

6.2.3 Species of Potential Conservation Significance

A newly described species, Holt's Long-eared Bat (*Nyctophilus holtorum* sp. nov) was recorded 17 times across four separate sites (Table 6.8; Figure 3.4)

The taxon is a distributional isolate in southwestern Western Australia; it was previously assigned to Gould's Long-eared Bat (*Nyctophilus gouldi*), but has been demonstrated to be a distinct and previously unnamed cryptic species (Parnaby et al. 2021).

The new species has one of the most restricted geographic ranges of any Australian Vespertilionidae, and aspects of its ecology make it vulnerable to human impacts (Parnaby et al. 2021). It is suggested that *N. holtorum* sp. nov requires a shrubby understorey, and that hollows in large old trees are a critical roost resource for the species (Burgar et al. 2015). Additionally, Long-eared bats with low intensity echolocation calls that are "gleaners" in cluttered vegetation (such as *N. holtorum* sp. nov) have been identified globally as a particularly vulnerable group (Safi and Kerth 2004).

Populations of N. *holtorum* sp. nov. face threats from loss of hollow trees, increased fire frequency and intensity and increased aridity arising from trends of gradual drying that have been documented during the past four decades (CSIRO and BOM 2020).

Table 6.8: Records of Holt's Long-eared Bat recorded during the survey.

Species (Common Name)	Site	Source of Record	Latitude	Longitude
Holt's Long-eared Bat (*Nyctophilus holtorum* sp. nov)	BAT01	Acoustic recording	-33.332252	116.264233
	BAT02	Acoustic recording	-33.334836	116.254502
	BAT03	Acoustic recording	-33.333789	116.270351
	BAT06	Acoustic recording	-33.329615	116.243167

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7.0 Key Findings

7.1 Vegetation and Flora

No Threatened or Priority flora were recorded from the survey area, however *Eucalyptus rudis* subsp. *cratyantha* (Priority 4) was considered 'likely to occur'. A further 16 species were ranked as 'may occur':

- *Leucopogon extremus* (Priority 2);
- *Angianthus drummondii* (Priority 3);
- *Blennospora doliiformis* (Priority 3);
- *Eryngium* sp. Ferox (G.J. Keighery 16034) (Priority 3);
- *Juncus meianthus* (Priority 3);
- *Meionectes tenuifolia* (Priority 3);
- *Stylidium lepidum* (Priority 3);
- *Stylidium rhipidium* (Priority 3);
- *Synaphea petiolaris* subsp. *simplex* (Priority 3);
- *Tetratheca parvifolia* (Priority 3);
- *Thysanotus unicupensis* (Priority 3);
- *Acacia semitrullata* (Priority 4);
- *Drosera occidentalis* (Priority 4);
- *Hydrocotyle lemnoides* (Priority 4);
- *Ornduffia submersa* (Priority 4); and
- *Schoenus natans* (Priority 4).

No vegetation types mapped for the survey area represented Commonwealth or State-listed TECs or State-listed PECs.

Two species listed as Declared Pests under the BAM ACT were recorded in the survey area: **Gomphocarpus fruticosus* (Narrow-leaf Cottonbush) was recorded at 26 locations, and **Moraea flaccida* (One-leaf Cape Tulip) was recorded at one location.

7.2 Fauna Habitats

When considering the faunal value of habitats within the survey area, the following criteria can be used to assess areas of higher habitat value. These are habitats that:

- support fauna of significance;
- support unique faunal assemblages; and/or
- are uncommon in the region.

Using these criteria, in combination with the habitat preferences of the Threatened species either recorded during the survey or identified as potentially occurring within the survey area, all of the native remnant vegetation patches represent valuable fauna habitat.

Some of these patches are fragmented and lack connectivity to contiguous habitat, i.e. the remnant mature trees within the cropping in the western area, and those trees surrounded by cleared areas south of the Colie River, however the majority of the native vegetation patches

extend continuously outside of the survey area and form part of much more expansive areas of woodland.

While the remnant patches vary in their level of connectivity, based on examination of aerial imagery, soil landscapes mapping and vegetation mapping, none of the habitats identified are restricted to the survey area and their attributes are typical of habitat types in the region.

7.3 Vertebrate Fauna

Five currently listed significant vertebrate species were recorded during the survey, comprising:

- Chuditch/Western Quoll, *Dasyurus geoffroii* (Vulnerable; *BC Act, EPBC Act*);
- Western Falsistrelle bat, *Falsistrellus mackenziei* (Priority 4; *BC Act*);
- Forest Red-tailed Black Cockatoo, *Calyptorhynchus banksii naso* (Vulnerable, *BC Act, EPBC Act*);
- Carnaby's Black Cockatoo, *Zanda latirostris* (Endangered; *BC Act, EPBC Act*); and
- Baudin's Black Cockatoo, *Zanda baudinii* (Endangered; *BC Act*, *EPBC Act*).

A newly described bat species, Holt's Long-eared Bat (*Nyctophilus holtorum* sp. nov), was also recorded and is of potential conservation significance due to its restricted distribution and ecology.

A further 11 significant vertebrate species were recognized as having some potential to occur in the survey area (Appendix 8).

7.3.1 Black Cockatoos

Prior to the field survey, all three black cockatoo species were considered to have a high likelihood of occurring in the survey area, based on their known distributions (DAWE 2022) and as indicated by the results of the desktop study.

During the survey, foraging evidence of all three black cockatoo species was recorded and observations were also made of all three species. The targeted assessment identified 50 hollow-bearing trees in the survey area, all of which will need further assessment to determine whether this hollow currently supports breeding, which would result in it being reclassified as a known nesting tree. A further 599 trees were identified in the survey area that meet the size criteria to be deemed potential nesting trees, but do not currently have hollows.

Approximately 21 ha of eucalypt-dominated native remnant vegetation was mapped for the survey area, and was ranked as high-quality foraging habitat for black cockatoo species. Marri is a preferred food source for all three species, and Jarrah and Wandoo would also likely be utilised by Baudin's Black Cockatoos and Forest Red-tailed Black Cockatoos. The taller planted eucalypts (e.g. monoculture Blue Gum plantations) in the survey area may also be utilised as night-roosting trees; especially given the proximity to high quality foraging habitat and to the Collie River and permanent wetland in the survey area, which would provide reliable water sources.

In general, vegetation in the survey area was in good condition, with a high density of mature trees over mostly poor to degraded understory vegetation. The proximity of the vegetation to the Collie River and associated water body in the central section of the survey area, would provide a permanent reliable water source for black cockatoos.

8.0 Glossary

BAM Act	Western Australian *Biosecurity and Agriculture Management Act 2007*
BC Act	Western Australian *Biodiversity Conservation Act 2016.*
Biota	Biota Environmental Sciences.
CPS	Collie Power Station.
DBCA	Department of Biodiversity, Conservation and Attractions.
EIA	Environmental Impact Assessment.
EPA	Environmental Protection Authority of Western Australia.
EPBC Act	Commonwealth *Environment Protection and Biodiversity Conservation Act 1999.*
IBRA	Interim Biogeographic Regionalisation for Australia.
Landform	A geomorphological unit that is largely defined by its surface form and location in the study area.
MNES	Matter of National Environmental Significance.
PEC	Priority Ecological Community.
SM Mini Bat	Song Meter Mini acoustic bat call recorder.
sp. (plural: spp.)	Abbreviation of "species".
Survey area	The area in which the on-ground survey was conducted.
SynergyRED	Synergy Renewable Energy Development.
Taxon (plural: taxa)	A taxonomic entity, typically at species level or below.
TEC	Threatened Ecological Community.
WAM	Western Australian Museum.
WoNS	Weed of National Significance.

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Appendix 1

Framework for Significance Rankings of Communities and Species of WA

A. Categories for Threatened and Priority Ecological Communities

A1. Categories and Criteria for Threatened Ecological Communities under the BC Act

Division 2

Subdivision 1 — Threatened ecological communities

27. Listing of threatened ecological communities

(1) The Minister may, by order, list an ecological community as a threatened ecological community in one of the following categories —

(a) critically endangered ecological community;

(b) endangered ecological community;

(c) vulnerable ecological community.

(2) An ecological community is not eligible for listing as a threatened ecological community if it is a collapsed ecological community.

(3) When deciding whether or not to list an ecological community as a threatened ecological community or to amend or repeal such a listing, the Minister must have regard only to matters relating to the survival of the ecological community.

(4) An order made under subsection (1) may describe or identify an ecological community by reference to a map or plan held in the Department.

(5) Section 258 applies to an order made under subsection (1).

28. Criteria for categorisation as critically endangered ecological community
An ecological community is eligible for listing in the category of critically endangered ecological community at a particular time if, at that time —

(a) it is facing an extremely high risk of becoming eligible for listing as a collapsed ecological community in the immediate future, as determined in accordance with criteria set out in the ministerial guidelines; and

(b) listing in that category is otherwise in accordance with the ministerial guidelines.

29. Criteria for categorisation as endangered ecological community
An ecological community is eligible for listing in the category of endangered ecological community at a particular time if, at that time —

(a) it is not a critically endangered ecological community; and

(b) it is facing a very high risk of becoming eligible for listing as a collapsed ecological community in the near future, as determined in accordance with criteria set out in the ministerial guidelines; and

(c) listing in that category is otherwise in accordance with the ministerial guidelines.

30. Criteria for categorisation as vulnerable ecological community
An ecological community is eligible for listing in the category of vulnerable ecological community at a particular time if, at that time —

(a) it is not a critically endangered ecological community or an endangered ecological community; and

(b) it is facing a high risk of becoming eligible for listing as a collapsed ecological community in the medium-term future, as determined in accordance with criteria set out in the ministerial guidelines; and

(c) listing in that category is otherwise in accordance with the ministerial guidelines.

Subdivision 2 — Collapsed ecological communities

31. Listing of collapsed ecological communities

(1) The Minister may, by order, list an ecological community as a collapsed ecological community.

(2) Section 258 applies to an order made under subsection (1).

32. Criteria for listing as collapsed ecological community
An ecological community is eligible for listing as a collapsed ecological community at a particular time if, at that time —

(a) there is no reasonable doubt that the last occurrence of the ecological community has collapsed; or

(b) the ecological community has been so extensively modified throughout its range that no occurrence of it is likely to recover —

(i) its species composition or structure; or

(ii) its species composition and structure.

33. Rediscovered ecological communities
If a collapsed ecological community is discovered in a state that no longer makes it eligible for listing as a collapsed ecological community, it is to be regarded as a threatened ecological community for the purposes of this Act until —

(a) it is listed as a threatened ecological community; or

(b) the Minister declares, by instrument published in the Gazette, that it is not to be so listed.

A2. Categories and Criteria for Priority Ecological Communities (DEC 2010)

Possible threatened ecological communities that do not meet survey criteria or that are not adequately defined are added to the DBCA Priority Ecological Community Lists under Priorities 1, 2 and 3. These three categories are ranked in order of priority for survey and/or definition of the community, and evaluation of conservation status, so that consideration can be given to their declaration as threatened ecological communities. 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 One: Poorly-known ecological communities
Ecological communities with apparently few, small occurrences, all or most not actively managed for conservation (e.g. within agricultural or pastoral lands, urban areas, active mineral leases) and for which current threats exist. Communities may be included if they are comparatively well-known from one or more localities but do not meet adequacy of survey requirements, and/or are not well defined, and appear to be under immediate threat from known threatening processes across their range.

Priority Two: Poorly-known ecological communities
Communities that are known from few small occurrences, all or most of which are actively managed for conservation (e.g. within national parks, conservation parks, nature reserves, State forest, unallocated Crown land, water reserves, etc.) and not under imminent threat of destruction or degradation. Communities may be included if they are comparatively well known from one or more localities but do not meet adequacy of survey requirements, and/or are not well defined, and appear to be under threat from known threatening processes.

Priority Three: Poorly known ecological communities

(i) Communities that are known from several to many occurrences, a significant number or area of which are not under threat of habitat destruction or degradation or:

(ii) communities known from a few widespread occurrences, which are either large or within significant remaining areas of habitat in which other occurrences may occur, much of it not under imminent threat, or;

(iii) communities made up of large, and/or widespread occurrences, that may or not be represented in the reserve system, but are under threat of modification across much of their range from processes such as grazing by domestic and/or feral stock, and inappropriate fire regimes.

Communities may be included if they are comparatively well known from several localities but do not meet adequacy of survey requirements and/or are not well defined, and known threatening processes exist that could affect them.

Priority Four: Ecological communities that are adequately known, rare but not threatened or meet criteria for Near Threatened, or that have been recently removed from the threatened list. These communities require regular monitoring.

(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 Five: Conservation Dependent ecological communities
Ecological communities that are not threatened but are subject to a specific conservation program, the cessation of which would result in the community becoming threatened within five years.

B. Categories for Flora and Fauna Species

B1. Western Australian BC Act, and Priority Species Classification

In Western Australia, 'Threatened', 'Extinct' and 'Specially Protected' fauna and flora species are protected under the *Biodiversity Conservation Act 2016* (the BC Act), making it an offence to take or disturb these species without Ministerial approval. The definition of 'take' is broad, and includes killing, injuring, harvesting or capturing fauna, and gathering, cutting, destroying, harvesting or damaging flora.

Such species are classified within a framework of several categories.

Species of the highest significance are designated as Threatened species and are protected under sections 19(1)(a), 19(1)(b) and 19(1)(c) of the BC Act. Species are listed within one of three categories:

- Critically endangered (CR), Endangered (EN), or Vulnerable (V), representing those species listed in Schedules 1 to 3 respectively of the *Wildlife Conservation (Specially Protected Fauna) Notice 2018* or the *Wildlife Conservation (Rare Flora) Notice 2018*.

Presumed extinct species are protected under sections 24 and 25 of the BC Act and are listed in one of two categories:

- Extinct (EX), representing those species listed in Schedule 4 of the *Wildlife Conservation (Specially Protected Fauna) Notice 2018* or the *Wildlife Conservation (Rare Flora) Notice 2018*; or
- Extinct in the wild (EW); there are currently no listed species under this category.

Specially protected species are protected under section 13(1) of the BC Act, and include species of special conservation interest, migratory species, cetaceans, species subject to international agreement, or species otherwise in need of special protection. Of these:

- Migratory species (MI) are those listed under schedule 5 of the *Wildlife Conservation (Specially Protected Fauna) Notice 2018*;
- Species of special conservation interest (conservation dependent fauna) (CD) are those listed under schedule 6 of the *Wildlife Conservation (Specially Protected Fauna) Notice 2018*; and
- Other specially protected fauna (OS) are those listed under schedule 7 of the *Wildlife Conservation (Specially Protected Fauna) Notice 2018*;

In addition to the species formally designated as protected under the BC Act, the WA Department of Biodiversity, Conservation and Attractions (DBCA) also maintains a list of 'Priority species'.

Species that appear to be rare or threatened, but for which there is insufficient information to properly evaluate their significance, are assigned to one of three Priority categories (Priority 1 to Priority 3), while species that are adequately known but require regular monitoring are assigned to Priority 4.

Note that of the above classifications, only 'Threatened', 'Extinct' and 'Specially Protected' species have statutory standing. The Priority flora and fauna classifications are employed by the WA DBCA to manage and classify their database of species considered potentially rare or at risk, but these categories have no legislative status.

Further explanations of the categories is provided in more detail in the following pages.

B2. Commonwealth *Environment Protection and Biodiversity Conservation Act 1999*

Many of the species that are specially protected at State level are also listed as Threatened species at the Federal level, as one of the Matters of National Environmental Significance (MNES) identified under the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (the EPBC Act). These may be classified as 'critically endangered', 'endangered', 'vulnerable' or 'lower risk', consistent with IUCN categories:

1. Critically Endangered (CR): a taxon is Critically Endangered when it is facing an extremely high risk of extinction in the wild in the immediate future.
2. Endangered (EN): a taxon is Endangered when it is not Critically Endangered but is facing a very high risk of extinction in the wild in the near future.
3. Vulnerable (VU): a taxon is Vulnerable when it is not Critically Endangered or Endangered but is facing a high risk of extinction in the wild in the medium-term future.
4. Lower Risk (LR): a taxon is Lower Risk when it has been evaluated, does not satisfy the criteria for any of the categories Critically Endangered, Endangered or Vulnerable. Taxa included in the Lower Risk category can be separated into three subcategories:
    - Conservation Dependent (CD). Taxa which are the focus of a continuing taxon-specific or habitat-specific conservation program targeted towards the taxon in question, the cessation of which would result in the taxon qualifying for one of the threatened categories above within a period of five years.
    - Near Threatened (NT). Taxa which do not qualify for Conservation Dependent, but which are close to qualifying for Vulnerable.
    - Least Concern (LC). Taxa which do not qualify for Conservation Dependent or Near Threatened.

In addition, numerous Migratory (MI) species are listed as MNES under the EPBC Act (some of which are also listed as Threatened). Migratory species are those animals that migrate to Australia and its external territories, or pass through or over Australian waters during their annual migrations. The list of migratory species consists of those species listed under the following international conventions:

1. Convention on the Conservation of Migratory Species of Wild Animals (Bonn Convention);
2. China-Australia Migratory Bird Agreement (CAMBA);
3. Japan-Australia Migratory Bird Agreement (JAMBA); and,
4. Republic of Korea-Australia Migratory Bird Agreement (ROKAMBA).

Marine (MA) species are also protected under the EPBC Act, and are listed to ensure the long-term conservation of the species. Marine species include all Australian sea snakes, seals, crocodiles, dugongs, marine turtles, seahorses and seabirds that naturally occur in the Commonwealth marine area.

Under the terms of the EPBC Act, an action (e.g. a project or development) is required to be referred to the Australian Government Environment Minister for approval if it has, will have, or is likely to have, a significant impact on an MNES. The term 'action' includes projects and developments subsequent to commencement of the Act, however there are a number of exemptions (e.g. projects in Commonwealth areas). According to Department of the Environment (2013), a 'significant impact' is an impact which is important, notable, or of consequence, having regard to its context or intensity. Whether or not an action is likely to have a significant impact depends upon the sensitivity, value, and quality of the environment which is impacted, and upon the intensity, duration, magnitude and geographic extent of the impacts.

References:

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CONSERVATION CODES

For Western Australian Fauna and Flora

Threatened, Extinct and Specially Protected fauna or flora[1] are species[2] which have been adequately searched for and are deemed to be, in the wild, threatened, extinct or in need of special protection, and have been gazetted as such.

The *Wildlife Conservation (Specially Protected Fauna) Notice 2018* and the *Wildlife Conservation (Rare Flora) Notice 2018* have been transitioned under regulations 170, 171 and 172 of the *Biodiversity Conservation Regulations 2018* to be the lists of Threatened, Extinct and Specially Protected species[3] under Part 2 of the *Biodiversity Conservation Act 2016.*

Categories of Threatened, Extinct and Specially Protected fauna and flora are:

T Threatened species

Listed by order of the Minister as Threatened in the category of critically endangered, endangered or vulnerable under section 19(1), or is a rediscovered species to be regarded as threatened species under section 26(2) of the *Biodiversity Conservation Act 2016* (BC Act).

Threatened fauna is the species of fauna that are listed as critically endangered, endangered or vulnerable threatened species.

Threatened flora is the species of flora that are listed as critically endangered, endangered or vulnerable threatened species.

The assessment of the conservation status of threatened species is in accordance with the BC Act listing criteria and the requirements of Ministerial Guideline (Number 1) and Ministerial Guideline (Number 2) that adopts the use of the International Union for Conservation of Nature (IUCN) Red List of Threatened Species Categories and Criteria[4], and is based on the national distribution of the species.

CR Critically endangered species

Threatened species considered to be "*facing an extremely high risk of extinction in the wild in the immediate future, as determined in accordance with criteria set out in the ministerial guidelines*".

Listed as critically endangered under section 19(1)(a) of the BC Act in accordance with the criteria set out in section 20 and the ministerial guidelines.

Examples of use:

- The western ringtail possum (*Pseudocheirus occidentalis*) is listed as a critically endangered threatened species under the *Biodiversity Conservation Act 2016.*
- Western ringtail possum is listed as critically endangered under the *Biodiversity Conservation Act 2016.*
- Listing reference in a table: column heading: BC Act, row text: CR.

EN Endangered species

Threatened species considered to be "*facing a very high risk of extinction in the wild in the near future, as determined in accordance with criteria set out in the ministerial guidelines*".

Listed as endangered under section 19(1)(b) of the BC Act in accordance with the criteria set out in section 21 and the ministerial guidelines.

Examples of use:

- *Caladenia hopperiana* is listed as an endangered threatened species under the *Biodiversity Conservation Act 2016.*
- *Caladenia hopperiana* is listed as endangered under the *Biodiversity Conservation Act 2016.*
- Listing reference in a table: column heading: BC Act, row text: EN.

VU Vulnerable species

Threatened species considered to be "*facing a high risk of extinction in the wild in the medium-term future, as determined in accordance with criteria set out in the ministerial guidelines*".

Listed as vulnerable under section 19(1)(c) of the BC Act in accordance with the criteria set out in section 22 and the ministerial guidelines.

Examples of use:

- The forest red-tailed black cockatoo (*Calyptorhynchus banksii naso*) is listed as a vulnerable threatened species under the *Biodiversity Conservation Act 2016.*
- Forest red-tailed black cockatoo is listed as vulnerable under the *Biodiversity Conservation Act 2016.*
- Listing reference in a table: column heading: BC Act, row text: VU.

Extinct species

Listed by order of the Minister as extinct under section 23(1) of the BC Act as extinct or extinct in the wild.

EX Extinct species

Species where "*there is no reasonable doubt that the last member of the species has died*", and listing is otherwise in accordance with the ministerial guidelines (section 24 of the BC Act).

Examples of use:

- *Acacia kingiana* is listed as an extinct species under the *Biodiversity Conservation Act 2016.*
- *Acacia kingiana* is listed as extinct under the *Biodiversity Conservation Act 2016.*
- Listing reference in a table: column heading: BC Act, row text: EX.

EW Extinct in the wild species

Species that *"is known only to survive in cultivation, in captivity or as a naturalised population well outside its past range; and it has not been recorded in its known habitat or expected habitat, at appropriate seasons, anywhere in its past range, despite surveys over a time frame appropriate to its life cycle and form*", and listing is otherwise in accordance with the ministerial guidelines (section 25 of the BC Act).

Currently there are no fauna or flora species listed as extinct in the wild.

SP Specially protected species

Listed by order of the Minister as specially protected under section 13(1) of the BC Act. Meeting one or more of the following categories: species of special conservation interest; migratory species; cetaceans; species subject to international agreement; or species otherwise in need of special protection.

Species that are listed as threatened species (critically endangered, endangered, or vulnerable) or extinct species under the BC Act cannot also be listed as specially protected species.

MI Migratory species

Fauna that periodically or occasionally visit Australia or an external Territory or the exclusive economic zone; or the species is subject of an international agreement that relates to the protection of migratory species and that binds the Commonwealth; and listing is otherwise in accordance with the ministerial guidelines (section 15 of the BC Act).

Migratory species include birds that are subject to an agreement between the government of Australia and the governments of Japan (JAMBA)[5], China (CAMBA)[6] or The Republic of Korea (ROKAMBA)[7], and fauna subject to the *Convention on the Conservation of Migratory Species of Wild Animals* (Bonn Convention)[8], an environmental treaty under the United Nations Environment Program. Migratory species listed under the BC Act are a subset of the migratory animals, that are known to visit Western Australia, protected under the international agreements or treaties, excluding species that are listed as Threatened species.

Examples of use:

- The wedge-tailed shearwater (*Ardenna pacifica*) is listed as a specially protected migratory species under the *Biodiversity Conservation Act 2016.*
- Wedge-tailed shearwater is listed as migratory under the *Biodiversity Conservation Act 2016.*
- Listing reference in a table: column heading: BC Act, row text: MI.

CD **Species of special conservation interest (conservation dependent)**

Species of special conservation need that are dependent on ongoing conservation intervention to prevent it becoming eligible for listing as threatened, and listing is otherwise in accordance with the ministerial guidelines (section 14 of the BC Act).

Currently only fauna are listed as species of special conservation interest.

Examples of use:

- The wambenger, south-western brush-tailed phascogale (*Phascogale tapoatafa wambenger*) is listed as a specially protected species of special conservation interest under the *Biodiversity Conservation Act 2016.*
- Wambenger, south-western brush-tailed phascogale, is listed as conservation dependent under the *Biodiversity Conservation Act 2016.*
- Listing reference in a table: column heading: BC Act, row text: CD.

OS **Species otherwise in need of special protection (other specially protected)**

Species otherwise in need of special protection to ensure their conservation, and listing is otherwise in accordance with the ministerial guidelines (section 18 of the BC Act).

Currently only fauna are listed as species otherwise in need of special protection.

Examples of use:

- The dugong (*Dugong dugon*) is listed as a specially protected species otherwise in need of special protection under the *Biodiversity Conservation Act 2016.*
- Dugon is listed as other specially protected fauna under the *Biodiversity Conservation Act 2016.*
- Listing reference in a table: column heading: BC Act, row text: OS.

P **Priority species**

Priority is not a listing category under the BC Act.

All fauna and flora are protected in WA following the provisions in Part 10 of the BC Act. The protection applies even when a species is not listed as threatened or specially protected, and regardless of land tenure (State managed land (Crown land), private land, or Commonwealth land).

Species that may possibly be threatened species that do not meet the criteria for listing under the BC Act because of insufficient survey or are otherwise data deficient, are added to the Priority Fauna or Priority Flora Lists under Priorities 1, 2 or 3. These three categories are ranked in order of prioritisation for survey and evaluation of conservation status so that consideration can be given to potential listing as threatened.

Species that are adequately known, meet criteria for near threatened, or are rare but not threatened, or that have been recently removed from the threatened species list or conservation dependent or other specially protected fauna lists for other than taxonomic reasons, are placed in Priority 4. These species require regular monitoring.

Assessment of priority status is based on the Western Australian distribution of the species, unless the distribution in WA is part of a contiguous population extending into adjacent States, as defined by the known spread of locations.

1 **Priority 1: Poorly-known species - known from few locations, none on conservation lands**

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, for example, 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 for threatened listing and appear to be under immediate threat from known threatening processes. These species are in urgent need of further survey.

Examples of use:

- *Borya stenophylla* is listed as a Priority 1 species by the Department of Biodiversity, Conservation and Attractions.
- *Borya stenophylla* is listed as Priority 1 on the DBCA Priority Flora List.
- Listing reference in a table: column heading: DBCA, row text: P1.

2 Priority 2: Poorly-known species - known from few locations, some on conservation lands

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, for example, 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 for threatened listing and appear to be under threat from known threatening processes. These species are in urgent need of further survey.

Examples of use:

- *Caladenia nivalis* is listed as a Priority 2 species by the Department of Biodiversity, Conservation and Attractions.
- *Caladenia nivalis* is listed as Priority 2 on the DBCA Priority Flora List.
- Listing reference in a table: column heading: DBCA, row text: P2.

3 Priority 3: Poorly-known species - known from several locations

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. These species need further survey.

Examples of use:

- *Acacia nitidula* is listed as a Priority 3 species by the Department of Biodiversity, Conservation and Attractions.
- *Acacia nitidula* is listed as Priority 3 on the DBCA Priority Flora List.
- Listing reference in a table: column heading: DBCA, row text: P3.

4 Priority 4: Rare, Near Threatened and other species in need of monitoring

(a) Rare. Species that are considered to have been adequately surveyed, or for which sufficient knowledge is available, and that are considered not currently threatened or in need of special 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 a conservation dependent specially protected species.

(c) Species that have been removed from the list of threatened species or lists of conservation dependent or other specially protected species, during the past five years for reasons other than taxonomy.

(d) Other species in need of monitoring.

Examples of use:

- *Banksia aculeata* is listed as a Priority 4 species by the Department of Biodiversity, Conservation and Attractions.
- *Banksia aculeata* is listed as Priority 4 on the DBCA Priority Flora List.
- Listing reference in a table: column heading: DBCA, row text: P4.

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

[2] Species includes all taxa (plural of taxon - a classificatory group of any taxonomic rank, e.g. a family, genus, species or any infraspecific category i.e. subspecies or variety, or a distinct population).

[3] Schedules are not referred to when stating the listing status of threatened, extinct or specially protected species under the BC Act. See the examples provided under each listing category.

[4] Western Australia has assigned species to threat categories using the *IUCN Red List of Threatened Species Categories and Criteria* since 1996 (referencing all criteria). At the national level, threatened species listings under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) reference only some of the IUCN criteria (http://www.environment.gov.au/biodiversity/threatened/nominations/forms-and-guidelines).

[5] JAMBA - first included in the WA migratory species list in 1980.

[6] CAMBA - first included in the WA migratory species list in 2010.

[7] ROKAMBA - first included in the WA migratory species list in 2010.

[8] Bonn Convention (Birds) - first included in the WA migratory species list in 2015.

Appendix 2

Database Searches

Australian Government
Department of Agriculture, Water and the Environment

EPBC Act Protected Matters Report

This report provides general guidance on matters of national environmental significance and other matters protected by the EPBC Act in the area you have selected. Please see the caveat for interpretation of information provided here.

Report created: 15-Aug-2022

Summary

Matters of National Environment Significance

This part of the report summarises the matters of national environmental significance that may occur in, or may relate to, the area you nominated. Further information is available in the detail part of the report, which can be accessed by scrolling or following the links below. If you are proposing to undertake an activity that may have a significant impact on one or more matters of national environmental significance then you should consider the Administrative Guidelines on Significance.

World Heritage Properties:	None
National Heritage Places:	None
Wetlands of International Importance (Ramsar	None
Great Barrier Reef Marine Park:	None
Commonwealth Marine Area:	None
Listed Threatened Ecological Communities:	None
Listed Threatened Species:	19
Listed Migratory Species:	7

Other Matters Protected by the EPBC Act

This part of the report summarises other matters protected under the Act that may relate to the area you nominated. Approval may be required for a proposed activity that significantly affects the environment on Commonwealth land, when the action is outside the Commonwealth land, or the environment anywhere when the action is taken on Commonwealth land. Approval may also be required for the Commonwealth or Commonwealth agencies proposing to take an action that is likely to have a significant impact on the

The EPBC Act protects the environment on Commonwealth land, the environment from the actions taken on Commonwealth land, and the environment from actions taken by Commonwealth agencies. As heritage values of a place are part of the 'environment', these aspects of the EPBC Act protect the Commonwealth Heritage values of a Commonwealth Heritage place. Information on the new heritage laws can be found at http://www.environment.gov.au/heritage

A permit may be required for activities in or on a Commonwealth area that may affect a member of a listed threatened species or ecological community, a member of a listed migratory species, whales and other cetaceans, or a member of a listed marine species.

Commonwealth Lands:	2
Commonwealth Heritage Places:	None
Listed Marine Species:	12
Whales and Other Cetaceans:	None
Critical Habitats:	None
Commonwealth Reserves Terrestrial:	None
Australian Marine Parks:	None
Habitat Critical to the Survival of Marine Turtles:	None

Extra Information

This part of the report provides information that may also be relevant to the area you have

State and Territory Reserves:	3
Regional Forest Agreements:	1
Nationally Important Wetlands:	None
EPBC Act Referrals:	17
Key Ecological Features (Marine):	None
Biologically Important Areas:	None
Bioregional Assessments:	None
Geological and Bioregional Assessments:	None

Details

Matters of National Environmental Significance

Listed Threatened Species [Resource Information]

Status of Conservation Dependent and Extinct are not MNES under the EPBC Act.
Number is the current name ID.

Scientific Name	Threatened Category	Presence Text	Buffer Status
BIRD			
Botaurus poiciloptilus			
Australasian Bittern [1001]	Endangered	Species or species habitat may occur within area	In feature area
Calidris ferruginea			
Curlew Sandpiper [856]	Critically Endangered	Species or species habitat may occur within area	In feature area
Calyptorhynchus banksii naso			
Forest Red-tailed Black-Cockatoo, Karrak [67034]	Vulnerable	Species or species habitat known to occur within area	In feature area
Leipoa ocellata			
Malleefowl [934]	Vulnerable	Species or species habitat may occur within area	In feature area
Numenius madagascariensis			
Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat may occur within area	In feature area
Rostratula australis			
Australian Painted Snipe [77037]	Endangered	Species or species habitat may occur within area	In buffer area only
Zanda baudinii listed as Calyptorhynchus baudinii			
Baudin's Black-Cockatoo, Long-billed Black-cockatoo [87736]	Endangered	Species or species habitat known to occur within area	In feature area
Zanda latirostris listed as Calyptorhynchus latirostris			
Carnaby's Black Cockatoo, Short-billed Black-cockatoo [87737]	Endangered	Species or species habitat known to occur within area	In feature area
FISH			

Scientific Name	Threatened Category	Presence Text	Buffer Status
Nannatherina balstoni			
Balston's Pygmy Perch [66698]	Vulnerable	Species or species habitat likely to occur within area	In feature area
MAMMAL			
Bettongia penicillata ogilbyi			
Woylie [66844]	Endangered	Species or species habitat likely to occur within area	In buffer area only
Dasyurus geoffroii			
Chuditch, Western Quoll [330]	Vulnerable	Species or species habitat known to occur within area	In feature area
Myrmecobius fasciatus			
Numbat [294]	Endangered	Translocated population known to occur within area	In buffer area only
Pseudocheirus occidentalis			
Western Ringtail Possum, Ngwayir, Womp, Woder, Ngoor, Ngoolangit [25911]	Critically Endangered	Species or species habitat may occur within area	In feature area
Setonix brachyurus			
Quokka [229]	Vulnerable	Species or species habitat likely to occur within area	In buffer area only
OTHER			
Westralunio carteri			
Carter's Freshwater Mussel, Freshwater Mussel [86266]	Vulnerable	Species or species habitat known to occur within area	In feature area
PLANT			
Caladenia leucochila			
Collie Spider Orchid [88196]	Endangered	Species or species habitat known to occur within area	In feature area
Caladenia lodgeana			
Lodge's Spider-orchid [68664]	Critically Endangered	Species or species habitat known to occur within area	In buffer area only
Diuris micrantha			
Dwarf Bee-orchid [55082]	Vulnerable	Species or species habitat known to occur within area	In feature area
Grevillea rara			
Rare Grevillea [64911]	Endangered	Species or species habitat may occur within area	In buffer area only

Listed Migratory Species			[Resource Information]
Scientific Name	Threatened Category	Presence Text	Buffer Status
Migratory Marine Birds			
Apus pacificus			
Fork-tailed Swift [678]		Species or species habitat likely to occur within area	In feature area
Migratory Terrestrial Species			
Motacilla cinerea			
Grey Wagtail [642]		Species or species habitat may occur within area	In feature area
Migratory Wetlands Species			
Actitis hypoleucos			
Common Sandpiper [59309]		Species or species habitat may occur within area	In feature area
Calidris acuminata			
Sharp-tailed Sandpiper [874]		Species or species habitat may occur within area	In feature area
Calidris ferruginea			
Curlew Sandpiper [856]	Critically Endangered	Species or species habitat may occur within area	In feature area
Calidris melanotos			
Pectoral Sandpiper [858]		Species or species habitat may occur within area	In feature area
Numenius madagascariensis			
Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat may occur within area	In feature area

Other Matters Protected by the EPBC Act

Commonwealth Lands		[Resource Information]

The Commonwealth area listed below may indicate the presence of Commonwealth land in this vicinity. Due to the unreliability of the data source, all proposals should be checked as to whether it impacts on a Commonwealth area, before making a definitive decision. Contact the State or Territory government land department for further information.

Commonwealth Land Name	State	Buffer Status
Unknown		
Commonwealth Land - [50964]	WA	In buffer area only
Commonwealth Land - [50962]	WA	In buffer area only

Listed Marine Species			[Resource Information]
Scientific Name	Threatened Category	Presence Text	Buffer Status
Bird			
Actitis hypoleucos Common Sandpiper [59309]		Species or species habitat may occur within area	In feature area
Apus pacificus Fork-tailed Swift [678]		Species or species habitat likely to occur within area overfly marine area	In feature area
Bubulcus ibis as Ardea ibis Cattle Egret [66521]		Species or species habitat may occur within area overfly marine area	In feature area
Calidris acuminata Sharp-tailed Sandpiper [874]		Species or species habitat may occur within area	In feature area
Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	Species or species habitat may occur within area overfly marine area	In feature area
Calidris melanotos Pectoral Sandpiper [858]		Species or species habitat may occur within area overfly marine area	In feature area
Haliaeetus leucogaster White-bellied Sea-Eagle [943]		Species or species habitat may occur within area	In feature area
Merops ornatus Rainbow Bee-eater [670]		Species or species habitat may occur within area overfly marine area	In feature area
Motacilla cinerea Grey Wagtail [642]		Species or species habitat may occur within area overfly marine area	In feature area
Numenius madagascariensis Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat may occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Rostratula australis as Rostratula benghalensis (sensu lato)			
Australian Painted Snipe [77037]	Endangered	Species or species habitat may occur within area overfly marine area	In buffer area only
Thinornis cucullatus as Thinornis rubricollis			
Hooded Plover, Hooded Dotterel [87735]		Species or species habitat may occur within area overfly marine area	In buffer area only

Extra Information

State and Territory Reserves [Resource Information]

Protected Area Name	Reserve Type	State	Buffer Status
Lane Poole Reserve	5(1)(g) Reserve	WA	In buffer area only
NTWA Bushland covenant (0041)	Conservation Covenant	WA	In buffer area only
Westralia	Conservation Park	WA	In buffer area only

Regional Forest Agreements [Resource Information]

Note that all areas with completed RFAs have been included.

RFA Name	State	Buffer Status
South West WA RFA	Western Australia	In feature area

EPBC Act Referrals [Resource Information]

Title of referral	Reference	Referral Outcome	Assessment Status	Buffer Status
Controlled action				
Bluewaters Power Station Expansion Phases 3 & 4	2008/4113	Controlled Action	Proposed Decision	In feature area
Coal Mine Expansion	2001/376	Controlled Action	Post-Approval	In feature area
Collie Motorplex Dragstrip, WA	2015/7455	Controlled Action	Completed	In buffer area only
Extension of coal mine, abutting Muja Mine, Collie, WA	2009/5014	Controlled Action	Assessment Approach	In buffer area only
Proposed land clearing for Shotts Industrial Park	2009/5086	Controlled Action	Post-Approval	In buffer area only
Stage 2 Buckingham Way- Collie Residential Development	2011/6049	Controlled Action	Post-Approval	In buffer area only
Not controlled action				
300MW Coal-fired Power Station Expansion	2005/2233	Not Controlled Action	Completed	In feature area

Title of referral	Reference	Referral Outcome	Assessment Status	Buffer Status
Not controlled action				
Collie Solar Farm, WA	2018/8160	Not Controlled Action	Completed	In buffer area only
Construction and operation of Bluewaters II power station	2004/1632	Not Controlled Action	Completed	In feature area
Construction of Bluewaters Power Station	2003/1289	Not Controlled Action	Completed	In feature area
Discharge of Water From Reverse Osmosis Treatment	2003/1154	Not Controlled Action	Completed	In feature area
Improving rabbit biocontrol: releasing another strain of RHDV, sthrn two thirds of Australia	2015/7522	Not Controlled Action	Completed	In feature area
INDIGO Central Submarine Telecommunications Cable	2017/8127	Not Controlled Action	Completed	In feature area
Premier Coal Mine Pit 3 North Extension, Collie, WA	2015/7493	Not Controlled Action	Completed	In buffer area only
Water Corporation, Storage and Pipeline, Collie, WA	2021/8936	Not Controlled Action	Completed	In buffer area only
Not controlled action (particular manner)				
Construction of urea production plant and supporting infrastructure	2009/5067	Not Controlled Action (Particular Manner)	Post-Approval	In buffer area only
INDIGO Marine Cable Route Survey (INDIGO)	2017/7996	Not Controlled Action (Particular Manner)	Post-Approval	In feature area

Caveat

1 PURPOSE

This report is designed to assist in identifying the location of matters of national environmental significance (MNES) and other matters protected by the Environment Protection and Biodiversity Conservation Act 1999 (Cth) (EPBC Act) which may be relevant in determining obligations and requirements under the EPBC Act.

The report contains the mapped locations of:

- World and National Heritage properties;
- Wetlands of International and National Importance;
- Commonwealth and State/Territory reserves;
- distribution of listed threatened, migratory and marine species;
- listed threatened ecological communities; and
- other information that may be useful as an indicator of potential habitat value.

2 DISCLAIMER

This report is not intended to be exhaustive and should only be relied upon as a general guide as mapped data is not available for all species or ecological communities listed under the EPBC Act (see below). Persons seeking to use the information contained in this report to inform the referral of a proposed action under the EPBC Act should consider the limitations noted below and whether additional information is required to determine the existence and location of MNES and other protected matters.

Where data are available to inform the mapping of protected species, the presence type (e.g. known, likely or may occur) that can be determined from the data is indicated in general terms. It is the responsibility of any person using or relying on the information in this report to ensure that it is suitable for the circumstances of any proposed use. The Commonwealth cannot accept responsibility for the consequences of any use of the report or any part thereof. To the maximum extent allowed under governing law, the Commonwealth will not be liable for any loss or damage that may be occasioned directly or indirectly through the use of, or reliance

3 DATA SOURCES

Threatened ecological communities

For threatened ecological communities where the distribution is well known, maps are generated based on information contained in recovery plans, State vegetation maps and remote sensing imagery and other sources. Where threatened ecological community distributions are less well known, existing vegetation maps and point location data are used to produce indicative distribution maps.

Threatened, migratory and marine species

Threatened, migratory and marine species distributions have been discerned through a variety of methods. Where distributions are well known and if time permits, distributions are inferred from either thematic spatial data (i.e. vegetation, soils, geology, elevation, aspect, terrain, etc.) together with point locations and described habitat; or modelled (MAXENT or BIOCLIM habitat modelling) using

Where little information is available for a species or large number of maps are required in a short time-frame, maps are derived either from 0.04 or 0.02 decimal degree cells; by an automated process using polygon capture techniques (static two kilometre grid cells, alpha-hull and convex hull); or captured manually or by using topographic features (national park boundaries, islands, etc.).

In the early stages of the distribution mapping process (1999-early 2000s) distributions were defined by degree blocks, 100K or 250K map sheets to rapidly create distribution maps. More detailed distribution mapping methods are used to update these distributions

4 LIMITATIONS

The following species and ecological communities have not been mapped and do not appear in this report:

- threatened species listed as extinct or considered vagrants;
- some recently listed species and ecological communities;
- some listed migratory and listed marine species, which are not listed as threatened species; and
- migratory species that are very widespread, vagrant, or only occur in Australia in small numbers.

The following groups have been mapped, but may not cover the complete distribution of the species:

- listed migratory and/or listed marine seabirds, which are not listed as threatened, have only been mapped for recorded
- seals which have only been mapped for breeding sites near the Australian continent

The breeding sites may be important for the protection of the Commonwealth Marine environment.

Refer to the metadata for the feature group (using the Resource Information link) for the currency of the information.

Acknowledgements

This database has been compiled from a range of data sources. The department acknowledges the following custodians who have contributed valuable data and advice:

-Office of Environment and Heritage, New South Wales
-Department of Environment and Primary Industries, Victoria
-Department of Primary Industries, Parks, Water and Environment, Tasmania
-Department of Environment, Water and Natural Resources, South Australia
-Department of Land and Resource Management, Northern Territory
-Department of Environmental and Heritage Protection, Queensland
-Department of Parks and Wildlife, Western Australia
-Environment and Planning Directorate, ACT
-Birdlife Australia
-Australian Bird and Bat Banding Scheme
-Australian National Wildlife Collection
-Natural history museums of Australia
-Museum Victoria
-Australian Museum
-South Australian Museum
-Queensland Museum
-Online Zoological Collections of Australian Museums
-Queensland Herbarium
-National Herbarium of NSW
-Royal Botanic Gardens and National Herbarium of Victoria
-Tasmanian Herbarium
-State Herbarium of South Australia
-Northern Territory Herbarium
-Western Australian Herbarium
-Australian National Herbarium, Canberra
-University of New England
-Ocean Biogeographic Information System
-Australian Government, Department of Defence
Forestry Corporation, NSW
-Geoscience Australia
-CSIRO
-Australian Tropical Herbarium, Cairns
-eBird Australia
-Australian Government – Australian Antarctic Data Centre
-Museum and Art Gallery of the Northern Territory
-Australian Government National Environmental Science Program
-Australian Institute of Marine Science
-Reef Life Survey Australia
-American Museum of Natural History
-Queen Victoria Museum and Art Gallery, Inveresk, Tasmania
-Tasmanian Museum and Art Gallery, Hobart, Tasmania
-Other groups and individuals

The Department is extremely grateful to the many organisations and individuals who provided expert advice and information on numerous draft distributions.

Please feel free to provide feedback via the Contact Us page.

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Appendix 3

Likelihood of Significant Flora Occurring in the Survey Area

Taxon	Habit and Habitat (WA Herbarium 2022)	Database Searches			Previous Surveys			Likelihood of Occurrence Within the Survey Area	
		DBCA TPFL	WAH	EPBC	GHD (2017)	Ecoedge (2014)	GHD (2008)	Initial Ranking Based on Desktop Study	Final Ranking Based on Results of Survey
Threatened									
Caladenia dorrienii	Tuberous perennial herb to 0.2 m, growing in wet areas near rivers and seasonal creeks.	✓						May occur; suitable habitat potentially present and records in locality (NR 12 km S).	Unlikely to occur; potential habitat is degraded.
Caladenia leucochila	Herb found on slopes near borders between damp lowlands and lateritic substrates.	✓	✓	✓				May occur; suitable habitat present and records in locality (NR 10 km SE).	Unlikely to occur; not recorded despite thorough survey effort.
Diuris micrantha	Tuberous perennial herb to 0.6 m, growing in brown loamy clay in winter wet swamps and in shallow water.			✓				Unlikely to occur; suitable habitat present but no records in locality.	Unlikely to occur.
Drakaea confluens	Tuberous perennial herb to 0.3 m, growing in white-grey sand, often in Banksia/Jarrah/Marri woodland.	✓						Likely to occur; suitable habitat present and records in close proximity (NR 9 km SW).	Unlikely to occur; potential habitat is degraded.
Eleocharis keigheryi	Rhizomatous, clumped perennial sedge, growing in freshwater creeks and claypans.		✓					May occur; suitable habitat present and records in locality (NR 16 km NW).	Unlikely to occur; potential habitat is degraded.
Grevillea rara	Dense prickly shrub to 2 m, growing on lateritic loam in creek lines.	✓	✓	✓	✓			May occur; suitable habitat present and records in locality (NR 11 km NW).	Unlikely to occur; not recorded despite thorough survey effort.
Jacksonia velveta	Upright or sprawling shrub to 2 m, growing on slight hillslopes and ridges.	✓	✓					Unlikely to occur; limited suitable habitat present but records in locality (NR 13 km S).	Unlikely to occur; not recorded despite thorough survey effort.
Priority 1									
Caladenia validinervia	Tuberous herb to 0.3 m, growing in sandy soils over laterite.		✓					Likely to occur; suitable habitat present and records in close proximity (NR 8 km SW).	Unlikely to occur; suitable habitat is degraded.
Priority 2									
Leucopogon extremus	Spreading shrub to 0.4 m, growing in wet areas.		✓					Likely to occur; suitable habitat present and records in close proximity (NR 7 km S).	May occur; not recorded despite thorough survey effort, however species is somewhat inconspicuous.
Leucopogon subsejunctus	Erect shrub to 0.7 m growing on dry slopes, rises and flats.					✓		May occur; suitable habitat present and records in locality (NR 19 km SE).	Unlikely to occur; suitable habitat is degraded.
Logania sylvicola	Erect shrub to 0.5 m, growing on or near slopes.		✓					Unlikely to occur; limited suitable habitat present but records in close proximity (NR 8 km SE).	Unlikely to occur.
Sphaerolobium benetectum	Slender, caespitose shrub to 1 m, growing on ridges, swamps and undulating rises.	✓	✓					May occur; suitable habitat present and records in locality (NR 12 km SW).	Unlikely to occur; not recorded despite thorough survey effort.
Priority 3									
Adenanthos cygnorum subsp. *Chamaephyton*	Prostrate mat-forming shrub to 0.3 m, growing in grey sand and lateritic gravel.	✓	✓					Likely to occur; suitable habitat present and records in close proximity (NR 8 km SW).	Unlikely to occur; potential habitat is degraded.
Angianthus drummondii	Erect annual herb to 0.1 m, growing on seasonally wet flats.		✓					May occur; suitable habitat present and records in locality (NR 15 km SE).	May occur.
Blennospora doliiformis	Erect annual herb to 0.1 m, growing in seasonally wet flats.		✓					May occur; suitable habitat present and records in locality (NR 15 km SE).	May occur.
Eryngium sp. Ferox (G.J. Keighery 16034)	Annual herb to 0.3 m, growing in wet areas.		✓					May occur; suitable habitat present and records in locality (NR 15 km SE).	May occur.
Grevillea prominens	Spreading shrub to 1.7 m tall, growing along creek lines.		✓					May occur; suitable habitat present and records in locality (NR 16 km SW).	Unlikely to occur; not recorded despite thorough survey effort.
Juncus meianthus	Tufted perennial herb to 0.2 m, growing in creeks and seepage areas.	✓	✓					May occur; suitable habitat present and records in locality (NR 14 km SW).	May occur.
Lomandra whicherensis	Erect herb to 0.3 m, growing on slopes.		✓					Unlikely to occur; limited suitable habitat present but records in locality (NR 15 km W).	Unlikely to occur.
Meionectes tenuifolia	Shrub to 0.2 m, growing in swamps.	✓	✓					May occur; suitable habitat present and records in locality (NR 15 km SE)	May occur.
Stylidium lepidum	Spreading, rosetted perennial herb to 5 cm, forming densely packed colonies in winter-wet depressions.		✓					May occur; suitable habitat present and records in locality (NR 15 km SE).	May occur.
Stylidium rhipidium	Slender annual herb to 5 cm, growing in wet creek flats, swamps and granite outcrops.	✓	✓					May occur; suitable habitat present and records in locality (NR 11 km SE).	May occur.
Synaphea decumbens	Decumbent shrub to 0.5 m, growing in sand over laterite.		✓					Likely to occur; suitable habitat present and records in close proximity (NR 7 km SE).	Unlikely to occur; potential habitat is degraded.

Taxon	Habit and Habitat (WA Herbarium 2022)	Database Searches			Previous Surveys			Likelihood of Occurrence Within the Survey Area	
		DBCA TPFL	WAH	EPBC	GHD (2017)	Ecoedge (2014)	GHD (2008)	Initial Ranking Based on Desktop Study	Final Ranking Based on Results of Survey
Synaphea hians	Prostrate or decumbent shrub to 0.6 m, growing on rises.	✓	✓		✓	✓		Unlikely to occur; limited suitable habitat present but records in close proximity (NR 7 km SW).	Unlikely to occur; not recorded despite thorough survey effort; suitable habitat is limited and degraded.
Synaphea petiolaris subsp. *simplex*	Tufted shrub to 0.6 m, growing in sandy soils on flats and winter-wet areas.		✓					May occur; suitable habitat present and records in locality (NR 12 km SE).	May occur.
Tetratheca parvifolia	Small shrub to 0.5 m, growing on ridges and near riverbanks.		✓					May occur; suitable habitat present and records in locality (NR 12 km SW).	May occur.
Thysanotus unicupensis	Caespitose annual herb to 0.3 m, with general habitat preferences.		✓					May occur; suitable habitat present and records in locality (NR 13 km W).	May occur.
Priority 4									
Acacia semitrullata	Slender, erect, pungent shrub to 0.7 m, growing on sandplains and swampy areas.	✓	✓				✓	Likely to occur; suitable habitat present and records in close proximity (NR 5 km S).	Unlikely to occur; not recorded despite thorough survey effort.
Calothamnus graniticus subsp. *leptophyllus*	Erect, multi-stemmed shrub to 2 m, growing on hillsides.		✓					Unlikely to occur; limited suitable habitat present and records in close proximity (NR 8 km SW).	Unlikely to occur; not recorded despite thorough survey effort; suitable habitat is limited and degraded.
Calytrix pulchella	Shrub to 0.7 m, growing on ridges and flats in sand over laterite.		✓					May occur; limited suitable habitat present but records in close proximity (NR 3 km S).	Unlikely to occur; not recorded despite thorough survey effort.
Drosera occidentalis	Fibrous rooted perennial herb to 2 cm, growing on flats and swamps.	✓	✓					May occur; suitable habitat present and records in locality (NR 15 km N).	May occur.
Eucalyptus rudis subsp. *cratyantha*	Tree to 20 m with rough, box-type bark, growing on flats, hillsides and river banks; distinguished from common subspecies by fruit..	✓	✓					Likely to occur; suitable habitat and records in close proximity (NR 7 km S).	Likely to occur; not recorded during field survey, however many individuals of *E. rudis* were sterile.
Grevillea ripicola	Spreading, much-branched shrub to 3 m, growing in swampy flats, granite outcrops and along watercourses.	✓	✓		✓			May occur; suitable habitat present and records in locality (NR 8 km SW).	Unlikely to occur; not recorded despite thorough survey effort.
Hydrocotyle lemnoides	Aquatic, floating annual herb growing in swamps.	✓	✓					May occur; suitable habitat present and records in locality (NR 16 km NE).	May occur.
Hypolaena robusta	Rhizomatous perennial herb to 0.5 m, growing on sandplains.		✓					May occur; limited suitable habitat may be present but records in close proximity (NR 8 km SW).	Unlikely to occur; no suitable habitat present.
Lasiopetalum cardiophyllum	Erect, multi-stemmed shrub to 0.5 m, growing in gravelly soil or sandy clay on flats and hillslopes.		✓					May occur; limited suitable habitat present but records in close proximity (NR 8 km SE).	Unlikely to occur; not recorded despite thorough survey effort; suitable habitat is limited and degraded.
Ornduffia submersa	Aquatic herb growing in wet areas.	✓	✓					May occur; suitable habitat present and records in locality (NR 16 km NE).	May occur.
Pultenaea skinneri	Slender shrub to 2 m, growing in winter-wet depressions.	✓	✓				✓	Likely to occur; suitable habitat present and records in close proximity (NR 4 km S).	Unlikely to occur; not recorded despite thorough survey effort.
Schoenus natans	Aquatic annual sedge to 0.3 m, growing in winter-wet depressions.		✓					May occur; suitable habitat present and records in locality (NR 14 km NE).	May occur.
Senecio leucoglossus	Erect annual herb to 1.3 m, growing on granite outcrops and slopes.	✓	✓					Unlikely to occur; limited suitable habitat present and records in locality (NR 16 km NW).	Would not occur; not recorded despite thorough survey effort; suitable habitat is limited and degraded.

Appendix 4

Likelihood of Significant Fauna Occurring in the Survey Area

Taxon	Common Name	Conservation Status		Preferred Habitat	Habitat Available in Survey Area?	Regional Records	Likelihood of Occurrence (Prior to Survey)	Likelihood of Occurrence (Post–survey)
		State	Commonwealth					
Mammals								
Pseudocheirus occidentalis	Western Ringtail Possum	Critically Endangered	Critically Endangered	Peppermint forests and woodlands, Tuart woodlands with Peppermint mid-storey, and Jarrah and Marri woodland.	(marginal)	Nearest record is 3.1 km WNW of the survey area.	Unlikely to occur	May occur (marginal habitat present)
Bettongia penicillata	Brush–tailed Bettong, Woylie	Critically Endangered	Endangered	Eucalypt forests and woodlands, dense myrtaceous shrublands, and kwongan or mallee heath in areas with strong predator control. Formerly occupied a much broader range of habitats across its historical distribution.	✓ (limited)	Nearest record is 8.1 km NW of the survey area. Translocated population known to occur in the broader locality.	May occur	May occur
Myrmecobius fasciatus	Numbat	Endangered	Endangered	Woodland dominated by eucalypt species with abundant hollow logs. Current populations in Dryandra Woodland and Upper Warren, with nine translocated populations in the southwest.	(marginal)	Translocated population known to occur in the broader locality.	Unlikely to occur	May occur (marginal habitat present)
Dasyurus geoffroii	Western Quoll, Chuditch	Vulnerable	Vulnerable	Now primarily restricted to Jarrah forest and woodland, with smaller numbers in other eucalypt woodland and mallee.	✓	The nearest record is 4.7 km N of the survey area.	Likely to occur	Recorded – current survey
Setonix brachyurus	Quokka	Vulnerable	Vulnerable	In northern part of mainland range, thickets of tea-tree (Taxandri linearifolia) around swamps with a mosaic of vegetation structure determined by fire age. Further south, broader range of forest, woodland and swampland habitats. Strongly linked to complex vegetation structure (three layers), low densities of woody debris and habitat patchiness.	✓	Currently two small sub-populations (<50 individuals each) known from the Harris River State Forest in very close proximity to the survey area	May occur	May occur
Isoodon fusciventer	Southern Brown Bandicoot, Quenda	Priority 4	–	Variety of forest, woodland, shrubland and heath communities, but prefer areas of denser vegetation, including wetland fringes and heathland.	✓	Nearest record is 1.3 km SW of the survey area.	Likely to occur	Likely to occur
Notamacropus eugenii derbianus	Tammar Wallaby	Priority 4	–	Dry sclerophyll forest and woodlands, mallee, and heathlands, typically with dense vegetation for shelter and grassy areas for foraging.	✓	Nearest record is 9.4 km ENE of the survey area.	May occur	May occur
Notamacropus irma	Western Brush Wallaby	Priority 4	–	Preferred habitat open forest or woodland, especially with open seasonally wet flats with low grasses and scrubby thickets. Also larger areas of mallee, heathland, and wet schlerophyll forest.	✓	Nearest record is 3 km WSW of the survey area.	May occur	May occur
Hydromys chrysogaster	Water–rat	Priority 4	–	Variety of permanent fresh water bodies, ranging from subalpine streams to lakes, creeks, and farm dams. Also on sheltered coastal beaches, mangroves and offshore islands.	✓	Nearest record is 7.5 km W of the survey area.	May occur	May occur
Falsistrellus mackenziei	Western Falsistrelle	Priority 4	–	Karri forest, Jarrah and Tuart and woodlands of the Swan Coastal Plain.	✓	Nearest record is 7.6 km WSW of the survey area.	Likely to occur	Recorded – current survey
Phascogale tapoatafa wambenger	South-western Brush-tailed Phascogale	Conservation Dependent	–	Jarrah forests.	✓	Nearest record is 6.7 km WSW of the survey area.	Likely to occur	Likely to occur
Birds								
Numenius madagascariensis	Far Eastern Curlew	Critically Endangered	Critically Endangered/ Migratory	Inhabits intertidal mudflats, sandflats (often with beds of seagrass on sheltered coasts), estuaries, mangrove swamps, bays, harbours and lagoons.	–	Not recorded within 40 km..	Would not occur	Would not occur
Calidris ferruginea	Curlew Sandpiper	Critically Endangered	Critically Endangered/ Migratory	Prefers tidal flats but will also utilise coastal beaches, shallow freshwater and estuarine wetlands or wetland margins.	✓	Nearest record is 34 km WSW of the survey area.	May occur	Unlikely to occur (preferred habitat not present)
Botaurus poiciloptilus	Australasian Bittern	Endangered	Endangered	Freshwater wetlands with dense reed beds of *Baumea* or *Typha* for breeding and roosting, and more open sedgelands and grassed areas for foraging.	✓	Nearest record is 30.6 km WNW of the survey area.	May occur	Unlikely to occur (preferred habitat not present)
Zanda baudinii	Baudin's Black Cockatoo	Endangered	Endangered	Marri, Jarrah and Karri forests or woodlands.	✓	The nearest records are ~8 km W of the survey area.	Likely to occur	Recorded – current survey
Zanda latirostris	Carnaby's Black Cockatoo	Endangered	Endangered	Eucalypt woodlands, proteaceous heathlands, pine plantations.	✓	The nearest records are ~3 km S of the survey area.	Likely to occur	Recorded – current survey
Calyptorhynchus banksia naso	Forest Red–tailed Black Cockatoo	Vulnerable	Vulnerable	Marri, Jarrah and Karri forests or woodlands.	✓	The nearest records are ~1.1 km SW of the survey area.	Likely to occur	Recorded – current survey
Leipoa ocellata	Malleefowl	Vulnerable	Vulnerable	Dry open forest and mallee on sandy or gravelly soils and with dense understorey forming leaf litter.	–	Nearest record is 20.5 km NNW of the survey area.	Unlikely to occur	Unlikely to occur
Ixobrychus falvicollis	Black Bittern (SW population)	Priority 2	-	In the south-west, primarily rivers and streams with dense fringing or overhanging vegetation.	✓	Not recorded within 40 km..	Unlikely to occur	Unlikely to occur
Apus pacificus	Pacific Swift	Migratory	Migratory/Marine	Aerial over most habitat types. Overall occurrence in southern WA is sparse; would only be a rare or occasional visitor to airspace over the survey area.	✓	Nearest record is 34 km WSW of the survey area.	May occur	May occur (occasional visitor)
Calidris acuminata	Sharp–tailed Sandpiper	Migratory	Migratory/Marine	Shallow freshwater and estuarine wetlands or wetland margins; less commonly coastal mudflats.	✓	Nearest record is 34 km WSW of the survey area.	Unlikely to occur	Unlikely to occur
Calidris melanotos	Pectoral Sandpiper	Migratory	Migratory/Marine	Shallow freshwater wetlands, occasionally estuarine and coastal wetlands.	✓	Not recorded within 40 km.	Unlikely to occur	Unlikely to occur

Taxon	Common Name	Conservation Status		Preferred Habitat	Habitat Available in Survey Area?	Regional Records	Likelihood of Occurrence (Prior to Survey)	Likelihood of Occurrence (Post–survey)
		State	Commonwealth					
Actitis hypoleucos	Common Sandpiper	Migratory	Migratory/Marine	Margins of sheltered coasts, estuaries and freshwater wetlands.	✓	Not recorded within 40 km.	Unlikely to occur	Unlikely to occur
Motacilla cinerea	Grey Wagtail	Migratory	Migratory/Marine	Margins of watercourses and wetlands, particularly fast–flowing freshwater waterways.	✓	Not recorded within 40 km.	Unlikely to occur	Unlikely to occur
Falco peregrinus	Peregrine Falcon	Other Specially Protected Fauna	–	Wide range of habitats including forests, woodlands, wetlands, and open country.	✓	Nearest record is 3.8 km S of the survey area.	May occur	May occur (occasional visitor)
Herpetofauna								
Ctenotus delii	Dell's Skink	Priority 4	–	Coastal heaths characterised by Banksia or Mallee woodlands with pale sand plains	–	Nearest record is 2.3 km SW of the survey area.	May occur	May occur

Migratory listing under the BC Act has been repealed for species also listed as threatened (i.e. Endangered, Vulnerable etc.), but note that these species still satisfy all other criteria for Migratory listing in addition to the criteria for their threatened listings.

Appendix 5

Vegetation Structural Classification and Condition Ranking

Vegetation Structural Classes*

Stratum	Canopy Cover (%)				
	70-100%	30-70%	10-30%	2-10%	<2%
Trees over 30 m	Tall closed forest	Tall open forest	Tall woodland	Tall open woodland	Scattered tall trees
Trees 10-30 m	Closed forest	Open forest	Woodland	Open woodland	Scattered trees
Trees under 10 m	Low closed forest	Low open forest	Low woodland	Low open woodland	Scattered low trees
Tree Mallee	Closed tree mallee	Tree mallee	Open tree mallee	Very open tree mallee	Scattered tree mallee
Shrub Mallee	Closed shrub mallee	Shrub mallee	Open shrub mallee	Very open shrub mallee	Scattered shrub mallee
Shrubs over 2 m	Tall closed scrub	Tall open scrub	Tall shrubland	Tall open shrubland	Scattered tall shrubs
Shrubs 1-2 m	Closed heath	Open heath	Shrubland	Open shrubland	Scattered shrubs
Shrubs under 1 m	Low closed heath	Low open heath	Low shrubland	Low open shrubland	Scattered low shrubs
Hummock grasses	Closed hummock grassland	Hummock grassland	Open hummock grassland	Very open hummock grassland	Scattered hummock grasses
Grasses, Sedges, Herbs	Closed tussock grassland / bunch grassland / sedgeland / herbland	Tussock grassland / bunch grassland / sedgeland / herbland	Open tussock grassland / bunch grassland / sedgeland / herbland	Very open tussock grassland / bunch grassland / sedgeland / herbland	Scattered tussock grasses / bunch grasses / sedges / herbs

* Based on Keighery (1994), adapted from Muir (1977), and Aplin's (1979) modification of the vegetation classification system of Specht (1970):

- Keighery B.J. (1994). *Bushland Plant Survey: A Guide for Community Surveys*. Wildflower Society of Western Australia, Perth WA;
- Aplin T.E.H. (1979). The Flora. Chapter 3 *In* O'Brien, B.J. (ed.) (1979). *Environment and Science.* University of Western Australia Press;
- Muir B.G. (1977). Biological Survey of the Western Australian Wheatbelt. Part II: Vegetation and habitat of Bendering Reserve. *Records of the Western Australian Museum, Suppl*. No. 3;
- Specht R.L. (1970). Vegetation. *In The Australian Environment.* 4th edn (Ed. G.W. Leeper). Melbourne.

Vegetation condition scale taken from EPA (2016a), based on scales developed by Keighery (1994) and Trudgen (1988)

Vegetation Condition	South West and Interzone Botanical Provinces	Eremaean and Northern Botanical Provinces
Pristine	Pristine or nearly so, no obvious signs of disturbance or damage caused by human activities since European settlement.	
Excellent	Vegetation structure intact, disturbance affecting individual species and weeds are non-aggressive species. Damage to trees caused by fire, the presence of non-aggressive weeds and occasional vehicle tracks.	Pristine or nearly so, no obvious signs of damage caused by human activities since European settlement.
Very Good	Vegetation structure altered, obvious signs of disturbance. Disturbance to vegetation structure caused by repeated fires, the presence of some more aggressive weeds, dieback, logging and grazing.	Some relatively slight signs of damage caused by human activities since European settlement. For example, some signs of damage to tree trunks caused by repeated fire, the presence of some relatively non-aggressive weeds, or occasional vehicle tracks.
Good	Vegetation structure significantly altered by very obvious signs of multiple disturbances. Retains basic vegetation structure or ability to regenerate it. Disturbance to vegetation structure caused by very frequent fires, the presence of very aggressive weeds, partial clearing, dieback and grazing.	More obvious signs of damage caused by human activity since European settlement, including some obvious impact on the vegetation structure such as that caused by low levels of grazing or slightly aggressive weeds.
Poor		Still retains basic vegetation structure or ability to regenerate it after very obvious impacts of human activities since European settlement, such as grazing, partial clearing, frequent fires or aggressive weeds.
Degraded	Basic vegetation structure severely impacted by disturbance. Scope for regeneration but not to a state approaching good condition without intensive management. Disturbance to vegetation structure caused by very frequent fires, the presence of very aggressive weeds at high density, partial clearing, dieback and grazing.	Severely impacted by grazing, very frequent fires, clearing or a combination of these activities. Scope for some regeneration but not to a state approaching good condition without intensive management. Usually with a number of weed species present including very aggressive species.
Completely Degraded	The structure of the vegetation is no longer intact and the area is completely or almost completely without native species. These areas are often described as 'parkland cleared' with the flora comprising weed or crop species with isolated native trees and shrubs.	Areas that are completely or almost completely without native species in the structure of their vegetation; i.e. areas that are cleared or 'parkland cleared' with their flora comprising weed or crop species with isolated native trees or shrubs.

Appendix 6

Vascular Flora Species Recorded During the Current Survey

Family	Species	Status
Amaranthaceae	*Ptilotus polystachyus*	
Apocynaceae	**Gomphocarpus fruticosus*	Weed (Declared Pest)
Asteraceae	**Arctotheca calendula*	Weed
Asteraceae	**Cotula coronopifolia*	Weed
Asteraceae	**Hypochaeris glabra*	Weed
Asteraceae	**Hypochaeris radicata*	Weed
Asteraceae	**Lactuca* sp.	Weed
Asteraceae	**Ursinia anthemoides*	Weed
Campanulaceae	*Lobelia anceps*	
Caryophyllaceae	**Petrorhagia dubia*	Weed
Casuarinaceae	*Allocasuarina fraseriana*	
Casuarinaceae	*Casuarina obesa*	
Centrolepidaceae	*Aphelia cyperoides*	
Crassulaceae	**Crassula glomerata*	Weed
Cyperaceae	*Bolboschoenus caldwellii*	
Cyperaceae	**Carex divisa*	Weed
Cyperaceae	*Chorizandra enodis*	
Cyperaceae	*Isolepis cernua* var. *setiformis*	
Cyperaceae	*Isolepis marginata*	
Cyperaceae	*Lepidosperma longitudinale*	
Cyperaceae	*Machaerina ? acuta*	
Cyperaceae	*Machaerina juncea*	
Dilleniaceae	*Hibbertia commutata*	
Dilleniaceae	*Hibbertia hypericoides*	
Dilleniaceae	*Hibbertia vaginata*	
Fabaceae	*Acacia acuminata*	Native to WA but introduced to Collie area
Fabaceae	*Acacia extensa*	
Fabaceae	**Acacia longifolia* subsp. *longifolia*	Weed
Fabaceae	*Acacia myrtifolia*	
Fabaceae	*Acacia pulchella*	
Fabaceae	*Acacia saligna*	
Fabaceae	*Aotus gracillima*	
Fabaceae	*Aotus intermedia*	
Fabaceae	*Bossiaea eriocarpa*	
Fabaceae	*Jacksonia capitata*	
Fabaceae	*Kennedia prostrata*	
Fabaceae	**Lotus ? subbiflorus*	Weed
Fabaceae	**Lotus* sp.	Weed
Fabaceae	**Trifolium campestre*	Weed
Fabaceae	**Trifolium subterraneum*	Weed
Goodeniaceae	*Lechenaultia floribunda*	
Hemerocallidaceae	*Chamaescilla corymbosa*	
Iridaceae	**Gladiolus caryophyllaceus*	Weed
Iridaceae	**Gladiolus undulatus*	Weed
Iridaceae	**Moraea flaccida*	Weed (Declared Pest)
Iridaceae	**Romulea* sp.	Weed

Family	Species	Status
Juncaceae	**Juncus bufonius*	Weed
Juncaceae	*Juncus pallidus*	
Juncaginaceae	*Cycnogeton lineare*	
Lamiaceae	**Lavandula stoechas*	Weed
Lauraceae	*Cassytha racemosa*	
Myrtaceae	*Astartea leptophylla*	
Myrtaceae	*Callistemon glaucus*	
Myrtaceae	*Calothamnus quadrifidus*	Likely introduced to the Collie area
Myrtaceae	*Calothamnus quadrifidus* subsp. *quadrifidus*	Native to WA but introduced to Collie area
Myrtaceae	*Corymbia calophylla*	
Myrtaceae	*Eucalyptus diversifolia*	Native to WA but introduced to Collie area
Myrtaceae	**Eucalyptus globulus*	Weed
Myrtaceae	*Eucalyptus ? loxophleba*	Native to WA but introduced to Collie area
Myrtaceae	*Eucalyptus marginata*	
Myrtaceae	*Eucalyptus ? myriadena*	Native to WA but introduced to Collie area
Myrtaceae	**Eucalyptus polybractea*	Weed
Myrtaceae	*Eucalyptus occidentalis*	Native to WA but introduced to Collie area
Myrtaceae	*Eucalyptus rudis* subsp. *rudis*	
Myrtaceae	*Eucalyptus rudis* (sterile)	May potentially include the P4 subsp. *cratyantha*
Myrtaceae	*Eucalyptus ? rudis* (sterile)	May potentially include the P4 subsp. *cratyantha*
Myrtaceae	**Eucalyptus saligna*	Weed
Myrtaceae	*Eucalyptus wandoo* subsp. *wandoo*	
Myrtaceae	*Hypocalymma angustifolium*	
Myrtaceae	*Kunzea glabrescens*	
Myrtaceae	*Kunzea recurva*	
Myrtaceae	*Melaleuca incana* subsp. *incana*	
Myrtaceae	*Melaleuca lateritia*	
Myrtaceae	*Melaleuca preissiana*	
Myrtaceae	*Melaleuca rhaphiophylla*	
Myrtaceae	*Melaleuca viminea*	
Myrtaceae	*Pericalymma ellipticum*	
Myrtaceae	*Melaleuca viminea* subsp. *viminea*	
Onagraceae	**Oenothera stricta* subsp. *stricta*	Weed
Orchidaceae	*Caladenia flava* subsp. *flava*	
Orchidaceae	*Caladenia flava* subsp. *sylvestris*	
Orchidaceae	**Disa bracteata*	Weed
Orchidaceae	*Microtis media*	
Orchidaceae	*Thelymitra macrophylla*	
Orobanchaceae	**Orobanche minor*	Weed
Oxalidaceae	**Oxalis corniculata*	Weed
Phyllanthaceae	*Poranthera microphylla*	
Phyllanthaceae	*Poranthera* sp.	
Pinaceae	**Pinus pinaster*	Weed
Poaceae	*Austrostipa mollis*	

Family	Species	Status
Poaceae	**Avena barbata*	Weed
Poaceae	**Briza maxima*	Weed
Poaceae	**Briza minor*	Weed
Poaceae	**Bromus hordeaceus*	Weed
Poaceae	**Bromus* sp.	Weed
Poaceae	**Cynodon dactylon*	Weed
Poaceae	**Ehrharta calycina*	Weed
Poaceae	**Ehrharta longiflora*	Weed
Poaceae	**Eragrostis curvula*	Weed
Poaceae	**Glyceria maxima*	Weed
Poaceae	**Holcus lanatus*	Weed
Poaceae	**Hordeum leporinum*	Weed
Poaceae	**Lolium rigidum*	Weed
Poaceae	*Rytidosperma caespitosum*	
Poaceae	**Triticum aestivum*	Weed
Poaceae	**Vulpia myuros*	Weed
Poaceae	**Vulpia* sp.	Weed
Polygonaceae	**Rumex conglomeratus*	Weed
Primulaceae	**Lysimachia arvensis*	Weed
Primulaceae	*Samolus junceus*	
Proteaceae	*Banksia littoralis*	
Proteaceae	*Hakea prostrata*	
Restionaceae	*Desmocladus* sp.	
Restionaceae	*Lepyrodia glauca*	
Rosaceae	*Acaena echinata*	
Rubiaceae	**Galium* sp.	Weed
Solanaceae	**Solanum nigrum*	Weed
Thymelaeaceae	*Pimelea angustifolia*	
Typhaceae	*Typha domingensis*	
Typhaceae	*Typha orientalis*	
Xanthorrhoeaceae	*Xanthorrhoea preissii*	
Zamiaceae	*Macrozamia riedlei*	

Appendix 7

Locations of Introduced Flora

Species	Easting	Northing	Number of individuals
**Gomphocarpus fruticosus*	430741	6311429	10
**Gomphocarpus fruticosus*	430730	6311083	50
**Gomphocarpus fruticosus*	431061	6311942	50
**Gomphocarpus fruticosus*	431019	6311629	25
**Gomphocarpus fruticosus*	430944	6310940	5
**Gomphocarpus fruticosus*	430963	6311000	5
**Gomphocarpus fruticosus*	430891	6310981	20
**Gomphocarpus fruticosus*	430858	6310832	7
**Gomphocarpus fruticosus*	431050	6310574	65
**Gomphocarpus fruticosus*	429413	6311860	2
**Gomphocarpus fruticosus*	432018	6311562	3
**Gomphocarpus fruticosus*	432102	6311805	10
**Gomphocarpus fruticosus*	432489	6312137	3
**Gomphocarpus fruticosus*	432394	6312196	30
**Gomphocarpus fruticosus*	431058	6311425	50
**Gomphocarpus fruticosus*	431434	6311252	500
**Gomphocarpus fruticosus*	431485	6311227	100
**Gomphocarpus fruticosus*	430230	6310998	5
**Gomphocarpus fruticosus*	432198	6311864	30
**Gomphocarpus fruticosus*	431845	6311644	1
**Gomphocarpus fruticosus*	430305	6311166	2
**Gomphocarpus fruticosus*	430307	6311145	50
**Gomphocarpus fruticosus*	428577	6311558	100
**Gomphocarpus fruticosus*	430023	6311063	1
**Gomphocarpus fruticosus*	430033	6311106	25
**Gomphocarpus fruticosus*	431601	6311344	1
**Gomphocarpus fruticosus*	431662	6311388	1
**Moraea flaccida*	430140	6310855	25

Appendix 8

Fauna Recorded During the Current Survey

		Conservation Listing		Method of Detection					
Species	Common Name	State	Federal	Acoustic Recorder	Observation	Scats	Motion Camera	Remains	Diggings / Tracks
Mammals									
Dasyurus geoffroii	Chuditch / Western Quoll	VU	VU			Y			
Macropus fuliginosus melanops	Western Grey Kangaroo				Y				
Oryctolagus cuniculus	Rabbit				Y				Y
Sus scrofa	Wild Pig				Y				Y
Austronomus australis	White-striped Free-tailed Bat			Y					
Ozimops kitcheneri	Western Free-tailed Bat			Y					
Chalinolobus gouldii	Gould's Wattled Bat			Y					
Chalinolobus morio	Chocolate Wattled Bat			Y					
Falsistrellus mackenziei	Western Falsistrelle	P4		Y					
Nyctophilus geoffroyi	Lesser Long-eared Bat			Y					
Nyctophilus holtorum	Holt's Long-eared Bat			Y					
Nyctophilus major major	Greater Long-eared Bat			Y					
Vespadelus regulus	Southern Forest-bat			Y					
Reptiles									
Varanus gouldii	Gould's Goanna				Y				
Tiliqua rugosa	Shingleback				Y				
Birds									
Acanthiza inornata	Western Thornbill				Y				
Anas superciliosa	Pacific Black Duck				Y				
Anthochaera carunculata woodwardii	Red Wattlebird				Y				
Anthochaera lunulata	Western Wattlebird				Y				
Artamus cyanopterus	Dusky Woodswallow				Y				
Artamus personatus	Masked Woodswallow				Y				
Barnardius zonarius semitorquatus	Australian Ringneck (Twenty-eight)				Y		Y		
Calyptorhynchus banksii naso	Forest Red-tailed Black Cockatoo	VU	VU		Y				
Cheramoeca leucosterna	White-backed Swallow				Y				

		Conservation Listing		Method of Detection					
Species	Common Name	State	Federal	Acoustic Recorder	Observation	Scats	Motion Camera	Remains	Diggings / Tracks
Climacteris rufus	Rufous Treecreeper				Y				
Corvus coronoides	Australian Raven				Y		Y		
Cygnus atratus	Black Swan				Y				
Dacelo novaeguineae	Laughing Kookaburra				Y				
Falco cenchroides	Nankeen Kestrel		Marine		Y				
Gallinula tenebrosa	Dusky Moorhen				Y				
Gavicalis virescens	Singing Honeyeater				Y				
Gymnorhina tibicen dorsalis	Australian Magpie (Western)				Y		Y		
Hirundo neoxena	Welcome Swallow		Marine		Y				
Malurus elegans	Red-winged Fairywren				Y				
Melopsittacus undulatus	Budgerigar				Y				
Microcarbo melanoleucos	Little Pied Cormorant				Y				
Microeca fascinans assimilis	Jacky Winter				Y				
Milvus migrans	Black Kite				Y				
Pachycephala rufiventris rufiventris	Rufous Whistler				Y				
Phylidonyris niger	White-cheeked Honeyeater				Y				
Phylidonyris novaehollandiae	New Holland Honeyeater				Y				
Platalea flavipes	Yellow-billed Spoonbill				Y				
Polytelis anthopeplus	Regent Parrot				Y				
Pomatostomus superciliosus	White-browed Babbler				Y				
Rhipidura albiscapa	Grey Fantail				Y				
Rhipidura leucophrys	Willie Wagtail				Y				
Sericornis frontalis	White-browed Scrubwren				Y				
Smicrornis brevirostris	Weebill				Y				
Trichoglossus moluccanus	Rainbow Lorikeet				Y				
Zanda baudinii	Baudin's Black Cockatoo	EN	EN		Y				

Appendix 9

Black Cockatoo – Potential Nesting Tree Locations

Tree ID	Easting	Northing	Tree Species	DBH (cm)	Tree Height (m)	Status
1	428572.13	6311359.46	*Corymbia calophylla*	128	20-25	Potential nesting tree
2	428634.52	6311398.75	*Corymbia calophylla*	73	25+	Potential nesting tree
3	428636.69	6311429.13	*Corymbia calophylla*	94	20-25	Potential nesting tree
4	428642.69	6311424.63	*Corymbia calophylla*	50	15-20	Potential nesting tree
5	428642.81	6311181.35	*Corymbia calophylla*	82	20-25	Potential nesting tree
6	428643.04	6311393.46	*Corymbia calophylla*	95	25+	Potential nesting tree
7	428645.36	6311431.63	*Corymbia calophylla*	62	15-20	Potential nesting tree
8	428647.46	6311438.06	*Corymbia calophylla*	71	20-25	Potential nesting tree
9	428659.74	6311197.08	*Corymbia calophylla*	61	20-25	Potential nesting tree
10	428665.88	6311408.96	*Corymbia calophylla*	81	20-25	Potential nesting tree
11	428667.58	6311423.73	*Corymbia calophylla*	59	20-25	Potential nesting tree
12	428668.69	6311408.11	*Corymbia calophylla*	51	15-20	Potential nesting tree
13	428672.70	6311430.35	*Corymbia calophylla*	63	15-20	Potential nesting tree
14	428673.50	6311391.47	*Corymbia calophylla*	65	10-15	Potential nesting tree
15	428674.12	6311415.88	*Corymbia calophylla*	62	20-25	Potential nesting tree
16	428675.53	6311394.78	*Corymbia calophylla*	73	25+	Potential nesting tree
17	428678.66	6311413.36	*Eucalyptus marginata*	54	20-25	Potential nesting tree
18	428685.28	6311394.31	*Corymbia calophylla*	84	25+	Potential nesting tree
19	428687.47	6311418.00	*Corymbia calophylla*	66	20-25	Potential nesting tree
20	428708.35	6311170.21	*Corymbia calophylla*	84	20-25	Potential nesting tree
21	428710.47	6311388.40	*Corymbia calophylla*	111	20-25	Potential nesting tree
22	428710.59	6311421.36	*Corymbia calophylla*	52	10-15	Potential nesting tree
23	428712.58	6311214.91	*Corymbia calophylla*	57	15-20	Potential nesting tree
24	428717.22	6311227.14	*Corymbia calophylla*	83	25+	Potential nesting tree
25	428720.00	6311399.80	*Corymbia calophylla*	61	20-25	Potential nesting tree
26	428722.12	6311391.15	*Corymbia calophylla*	58	20-25	Potential nesting tree
27	428728.21	6311390.94	*Corymbia calophylla*	73	20-25	Potential nesting tree
28	428735.17	6311414.53	*Corymbia calophylla*	68	15-20	Potential nesting tree
29	428861.94	6311437.45	*Eucalyptus marginata*	83	20-25	Potential nesting tree
30	428869.67	6311443.87	*Corymbia calophylla*	78	20-25	Potential nesting tree
31	428876.63	6311430.20	*Eucalyptus marginata*	50	15-20	Potential nesting tree
32	428886.56	6311442.76	*Corymbia calophylla*	62	10-15	Potential nesting tree
33	428894.90	6311428.90	*Eucalyptus marginata*	51	15-20	Potential nesting tree
34	429045.07	6311840.88	*Eucalyptus wandoo* subsp. *wandoo*	83	15-20	Potential nesting tree
35	429046.00	6311824.39	*Eucalyptus wandoo* subsp. *wandoo*	93	15-20	Potential nesting tree
36	429063.73	6311831.61	*Eucalyptus wandoo* subsp. *wandoo*	51	15-20	Potential nesting tree
37	429066.95	6311827.13	*Eucalyptus wandoo* subsp. *wandoo*	52	15-20	Potential nesting tree
38	429105.06	6311142.55	*Corymbia calophylla*	62	20-25	Potential nesting tree
39	429153.56	6311210.08	*Eucalyptus marginata*	91	10-15	Hollow-bearing tree; potential nesting tree
40	429162.98	6311226.86	*Corymbia calophylla*	87	25+	Potential nesting tree
41	429169.52	6311211.14	*Corymbia calophylla*	127	25+	Hollow-bearing tree; potential nesting tree
42	429387.64	6311687.06	*Corymbia calophylla*	124	25+	Potential nesting tree
43	429390.95	6311746.09	*Corymbia calophylla*	93	20-25	Potential nesting tree
44	429392.57	6311751.42	*Corymbia calophylla*	96	20-25	Potential nesting tree
45	429394.82	6311737.64	*Corymbia calophylla*	73	20-25	Potential nesting tree
46	429484.32	6311681.27	*Corymbia calophylla*	112	25+	Potential nesting tree
47	429500.35	6311678.93	*Corymbia calophylla*	126	25+	Potential nesting tree
48	429530.98	6311679.81	*Corymbia calophylla*	186	25+	Potential nesting tree
49	429554.19	6311658.91	*Corymbia calophylla*	152	25+	Potential nesting tree
50	429558.12	6311483.65	*Corymbia calophylla*	173	25+	Potential nesting tree
51	429711.88	6311620.00	*Corymbia calophylla*	78	20-25	Potential nesting tree
52	429718.95	6311616.51	*Corymbia calophylla*	87	20-25	Potential nesting tree
53	429727.01	6311615.66	*Corymbia calophylla*	68	20-25	Potential nesting tree
54	429727.61	6311623.99	*Corymbia calophylla*	77	20-25	Potential nesting tree
55	429733.69	6311617.31	*Corymbia calophylla*	101	20-25	Potential nesting tree
56	429747.25	6311659.12	*Corymbia calophylla*	86	20-25	Potential nesting tree

Tree ID	Easting	Northing	Tree Species	DBH (cm)	Tree Height (m)	Status
57	429747.97	6311666.09	*Corymbia calophylla*	96	25+	Potential nesting tree
58	429751.52	6311669.17	*Corymbia calophylla*	143	25+	Potential nesting tree
59	429767.65	6311668.35	*Corymbia calophylla*	131	20-25	Potential nesting tree
60	429769.47	6311314.89	*Eucalyptus wandoo* subsp. *wandoo*	66	15-20	Potential nesting tree
61	429787.96	6311662.85	*Eucalyptus gomphocephala*	101	25+	Potential nesting tree
62	429792.89	6311301.40	*Eucalyptus wandoo* subsp. *wandoo*	56	20-25	Potential nesting tree
63	429799.48	6311665.51	*Corymbia calophylla*	81	20-25	Potential nesting tree
64	429805.58	6310922.25	*Eucalyptus wandoo* subsp. *wandoo*	62	15-20	Potential nesting tree
65	429812.75	6311711.64	*Corymbia calophylla*	84	20-25	Potential nesting tree
66	429813.03	6311906.32	*Eucalyptus marginata*	153	25+	Hollow-bearing tree; potential nesting tree
67	429814.19	6311692.92	*Corymbia calophylla*	55	20-25	Potential nesting tree
68	429817.84	6311679.97	*Corymbia calophylla*	84	20-25	Potential nesting tree
69	429820.00	6311701.69	*Corymbia calophylla*	85	20-25	Potential nesting tree
70	429820.89	6310864.08	*Eucalyptus wandoo* subsp. *wandoo*	95	20-25	Hollow-bearing tree; potential nesting tree
71	429823.99	6310921.39	*Eucalyptus wandoo* subsp. *wandoo*	62	15-20	Potential nesting tree
72	429824.13	6311688.39	*Corymbia calophylla*	88	20-25	Potential nesting tree
73	429827.07	6311699.68	*Corymbia calophylla*	54	15-20	Potential nesting tree
74	429827.70	6311747.03	*Corymbia calophylla*	84	15-20	Potential nesting tree
75	429827.71	6311019.68	*Eucalyptus wandoo* subsp. *wandoo*	87	15-20	Potential nesting tree
76	429828.46	6310915.09	*Eucalyptus wandoo* subsp. *wandoo*	70	15-20	Potential nesting tree
77	429828.58	6311690.19	*Corymbia calophylla*	81	20-25	Potential nesting tree
78	429834.03	6310805.81	*Eucalyptus wandoo* subsp. *wandoo*	65	15-20	Potential nesting tree
79	429835.79	6311029.55	*Eucalyptus wandoo* subsp. *wandoo*	81	15-20	Potential nesting tree
80	429837.23	6310812.29	*Eucalyptus wandoo* subsp. *wandoo*	72	20-25	Potential nesting tree
81	429838.10	6310815.76	*Eucalyptus wandoo* subsp. *wandoo*	67	15-20	Potential nesting tree
82	429839.15	6310794.80	*Eucalyptus wandoo* subsp. *wandoo*	82	15-20	Potential nesting tree
83	429840.95	6311907.33	Stag (Unknown)	120	25+	Hollow-bearing tree; potential nesting tree
84	429844.80	6311310.28	*Eucalyptus wandoo* subsp. *wandoo*	45	10-15	Potential nesting tree
85	429847.39	6311031.88	*Eucalyptus wandoo* subsp. *wandoo*	78	20-25	Potential nesting tree
86	429848.84	6310864.70	*Eucalyptus wandoo* subsp. *wandoo*	78	15-20	Hollow-bearing tree; potential nesting tree
87	429848.86	6311305.66	*Eucalyptus wandoo* subsp. *wandoo*	60	10-15	Potential nesting tree
88	429856.90	6310832.96	*Eucalyptus wandoo* subsp. *wandoo*	102	15-20	Potential nesting tree
89	429857.19	6310774.92	*Eucalyptus wandoo* subsp. *wandoo*	68	15-20	Potential nesting tree
90	429861.45	6310785.95	*Eucalyptus wandoo* subsp. *wandoo*	74	10-15	Potential nesting tree
91	429868.99	6311029.61	*Eucalyptus wandoo* subsp. *wandoo*	103	20-25	Potential nesting tree
92	429871.69	6311687.68	*Corymbia calophylla*	125	20-25	Potential nesting tree
93	429871.70	6311271.56	*Corymbia calophylla*	120	25+	Potential nesting tree
94	429872.31	6311078.92	*Eucalyptus wandoo* subsp. *wandoo*	69	15-20	Potential nesting tree
95	429884.23	6311048.88	*Eucalyptus wandoo* subsp. *wandoo*	73	25+	Potential nesting tree
96	429896.34	6310777.21	*Eucalyptus wandoo* subsp. *wandoo*	80	15-20	Potential nesting tree
97	429898.68	6311047.65	*Eucalyptus wandoo* subsp. *wandoo*	74	20-25	Potential nesting tree
98	429904.12	6311323.54	*Corymbia calophylla*	121	25+	Potential nesting tree
99	429910.77	6311733.43	*Corymbia calophylla*	81	10-15	Hollow-bearing tree; potential nesting tree
100	429932.06	6311141.95	*Eucalyptus wandoo* subsp. *wandoo*	64	15-20	Potential nesting tree
101	429937.52	6311134.68	*Eucalyptus wandoo* subsp. *wandoo*	58	15-20	Potential nesting tree
102	429938.29	6311107.24	*Eucalyptus wandoo* subsp. *wandoo*	68	20-25	Potential nesting tree
103	429942.38	6311153.90	*Eucalyptus wandoo* subsp. *wandoo*	45	20-25	Potential nesting tree
104	429958.73	6311119.43	*Eucalyptus wandoo* subsp. *wandoo*	52	15-20	Potential nesting tree
105	429962.39	6311109.82	*Eucalyptus wandoo* subsp. *wandoo*	64	15-20	Potential nesting tree
106	429978.55	6311716.28	*Corymbia calophylla*	96	25+	Potential nesting tree
107	430003.57	6311868.56	*Corymbia calophylla*	123	25+	Potential nesting tree
108	430006.05	6311720.57	*Corymbia calophylla*	95	25+	Potential nesting tree
109	430056.16	6310786.03	*Eucalyptus wandoo* subsp. *wandoo*	41	10-15	Potential nesting tree

Tree ID	Easting	Northing	Tree Species	DBH (cm)	Tree Height (m)	Status
110	430084.28	6310888.71	*Eucalyptus wandoo* subsp. *wandoo*	56	15-20	Potential nesting tree
111	430100.38	6310752.18	*Eucalyptus rudis* subsp. *rudis*	77	15-20	Hollow-bearing tree; potential nesting tree
112	430100.73	6310920.95	*Eucalyptus wandoo* subsp. *wandoo*	62	20-25	Potential nesting tree
113	430101.51	6310827.27	*Eucalyptus wandoo* subsp. *wandoo*	34	10-15	Potential nesting tree
114	430102.29	6310884.85	*Eucalyptus wandoo* subsp. *wandoo*	54	15-20	Potential nesting tree
115	430105.23	6310684.52	*Eucalyptus wandoo* subsp. *wandoo*	110	15-20	Potential nesting tree
116	430108.70	6310671.96	*Eucalyptus wandoo* subsp. *wandoo*	66	20-25	Hollow-bearing tree; potential nesting tree
117	430109.66	6310669.01	*Eucalyptus wandoo* subsp. *wandoo*	89	20-25	Potential nesting tree
118	430112.25	6310663.61	*Eucalyptus wandoo* subsp. *wandoo*	78	20-25	Hollow-bearing tree; potential nesting tree
119	430112.53	6310674.23	*Eucalyptus wandoo* subsp. *wandoo*	91	20-25	Hollow-bearing tree; potential nesting tree
120	430115.34	6310916.04	*Eucalyptus wandoo* subsp. *wandoo*	53	20-25	Potential nesting tree
121	430116.28	6310906.76	*Eucalyptus wandoo* subsp. *wandoo*	68	20-25	Potential nesting tree
122	430128.08	6310927.65	*Eucalyptus wandoo* subsp. *wandoo*	36	15-20	Potential nesting tree
123	430131.21	6310845.20	*Eucalyptus wandoo* subsp. *wandoo*	49	20-25	Potential nesting tree
124	430132.57	6310936.32	*Eucalyptus wandoo* subsp. *wandoo*	47	20-25	Potential nesting tree
125	430138.61	6310838.65	*Eucalyptus wandoo* subsp. *wandoo*	33	10-15	Potential nesting tree
126	430139.72	6310850.32	*Eucalyptus wandoo* subsp. *wandoo*	54	20-25	Potential nesting tree
127	430142.28	6310843.46	*Eucalyptus wandoo* subsp. *wandoo*	32	15-20	Potential nesting tree
128	430142.74	6310832.00	*Eucalyptus wandoo* subsp. *wandoo*	32	15-20	Potential nesting tree
129	430143.51	6310838.25	*Eucalyptus wandoo* subsp. *wandoo*	50	15-20	Potential nesting tree
130	430149.23	6310842.31	*Eucalyptus wandoo* subsp. *wandoo*	31	15-20	Potential nesting tree
131	430150.44	6310925.08	*Eucalyptus wandoo* subsp. *wandoo*	54	15-20	Potential nesting tree
132	430158.55	6310860.53	*Eucalyptus wandoo* subsp. *wandoo*	46	15-20	Potential nesting tree
133	430159.87	6310854.65	*Eucalyptus wandoo* subsp. *wandoo*	62	20-25	Potential nesting tree
134	430161.23	6310930.56	*Eucalyptus wandoo* subsp. *wandoo*	80	20-25	Potential nesting tree
135	430161.63	6311867.99	*Corymbia calophylla*	94	20-25	Potential nesting tree
136	430163.05	6310853.29	*Eucalyptus wandoo* subsp. *wandoo*	64	20-25	Potential nesting tree
137	430165.08	6310945.47	*Eucalyptus wandoo* subsp. *wandoo*	63	15-20	Potential nesting tree
138	430167.44	6310934.79	*Corymbia calophylla*	86	20-25	Potential nesting tree
139	430168.56	6310978.84	*Eucalyptus wandoo* subsp. *wandoo*	48	20-25	Potential nesting tree
140	430172.50	6310984.34	*Eucalyptus wandoo* subsp. *wandoo*	53	15-20	Potential nesting tree
141	430175.15	6310887.76	*Corymbia calophylla*	65	15-20	Potential nesting tree
142	430177.92	6310945.55	*Eucalyptus wandoo* subsp. *wandoo*	57	10-15	Potential nesting tree
143	430178.97	6310947.99	*Eucalyptus wandoo* subsp. *wandoo*	31	10-15	Potential nesting tree
144	430179.25	6310932.26	*Corymbia calophylla*	52	15-20	Potential nesting tree
145	430181.32	6310887.09	*Corymbia calophylla*	52	15-20	Potential nesting tree
146	430182.42	6310882.67	*Corymbia calophylla*	77	20-25	Potential nesting tree
147	430185.72	6310967.41	*Eucalyptus wandoo* subsp. *wandoo*	80	20-25	Potential nesting tree
148	430186.48	6310877.54	*Corymbia calophylla*	65	20-25	Potential nesting tree
149	430201.93	6310903.40	*Corymbia calophylla*	66	15-20	Potential nesting tree
150	430214.78	6310906.02	*Corymbia calophylla*	62	20-25	Potential nesting tree
151	430220.60	6310915.62	*Eucalyptus wandoo* subsp. *wandoo*	52	15-20	Potential nesting tree
152	430228.31	6311080.33	*Eucalyptus wandoo* subsp. *wandoo*	42	20-25	Potential nesting tree
153	430239.89	6310966.34	*Corymbia calophylla*	70	20-25	Potential nesting tree
154	430245.61	6311046.95	*Eucalyptus wandoo* subsp. *wandoo*	50	20-25	Potential nesting tree
155	430246.59	6310981.15	*Corymbia calophylla*	69	20-25	Potential nesting tree
156	430249.45	6310987.37	*Corymbia calophylla*	73	15-20	Potential nesting tree
157	430251.54	6311050.15	*Eucalyptus wandoo* subsp. *wandoo*	91	20-25	Potential nesting tree
158	430252.56	6311084.40	*Eucalyptus wandoo* subsp. *wandoo*	78	15-20	Hollow-bearing tree; potential nesting tree
159	430254.07	6311059.70	*Eucalyptus wandoo* subsp. *wandoo*	56	15-20	Potential nesting tree
160	430256.19	6310985.00	*Corymbia calophylla*	65	20-25	Potential nesting tree
161	430257.19	6310962.62	*Corymbia calophylla*	53	20-25	Potential nesting tree
162	430262.93	6310974.52	*Corymbia calophylla*	61	20-25	Potential nesting tree

Tree ID	Easting	Northing	Tree Species	DBH (cm)	Tree Height (m)	Status
163	430264.77	6310981.65	*Corymbia calophylla*	71	20-25	Potential nesting tree
164	430272.11	6310983.87	*Corymbia calophylla*	67	15-20	Potential nesting tree
165	430276.65	6310989.06	*Corymbia calophylla*	61	10-15	Hollow-bearing tree; potential nesting tree
166	430277.65	6311109.07	*Eucalyptus wandoo* subsp. *wandoo*	82	25+	Hollow-bearing tree; potential nesting tree
167	430283.49	6311002.00	*Corymbia calophylla*	81	20-25	Potential nesting tree
168	430299.73	6311070.71	*Corymbia calophylla*	136	25+	Potential nesting tree
169	430324.42	6311553.71	*Eucalyptus marginata*	59	10-15	Potential nesting tree
170	430333.77	6311563.20	*Eucalyptus marginata*	50	15-20	Potential nesting tree
171	430349.41	6311554.74	*Eucalyptus marginata*	50	10-15	Potential nesting tree
172	430354.95	6311126.57	*Eucalyptus rudis* subsp. *rudis*	117	25+	Hollow-bearing tree; potential nesting tree
173	430380.49	6311605.96	*Eucalyptus wandoo* subsp. *wandoo*	30	10-15	Potential nesting tree
174	430385.45	6311166.73	*Eucalyptus wandoo* subsp. *wandoo*	73	20-25	Hollow-bearing tree; potential nesting tree
175	430411.35	6311172.60	*Eucalyptus rudis* subsp. *rudis*	147	20-25	Hollow-bearing tree; potential nesting tree
176	430421.68	6311135.17	*Eucalyptus rudis* subsp. *rudis*	61	15-20	Potential nesting tree
177	430426.71	6311138.22	*Eucalyptus rudis* subsp. *rudis*	90	20-25	Potential nesting tree
178	430441.45	6311131.31	*Eucalyptus rudis* subsp. *rudis*	73	15-20	Potential nesting tree
179	430450.27	6311143.89	*Eucalyptus rudis* subsp. *rudis*	80	15-20	Potential nesting tree
180	430485.11	6311245.98	*Eucalyptus wandoo* subsp. *wandoo*	106	25+	Hollow-bearing tree; potential nesting tree
181	430489.10	6311650.65	*Eucalyptus wandoo* subsp. *wandoo*	54	20-25	Potential nesting tree
182	430515.60	6311502.37	*Eucalyptus rudis* subsp. *rudis*	95	20-25	Hollow-bearing tree; potential nesting tree
183	430516.77	6311456.14	*Eucalyptus rudis* subsp. *rudis*	52	20-25	Potential nesting tree
184	430523.77	6311449.18	*Eucalyptus rudis* subsp. *rudis*	89	15-20	Hollow-bearing tree; potential nesting tree
185	430530.85	6311337.18	*Corymbia calophylla*	52	10-15	Potential nesting tree
186	430532.56	6311209.11	*Corymbia calophylla*	85	15-20	Potential nesting tree
187	430542.03	6311196.39	*Corymbia calophylla*	92	20-25	Potential nesting tree
188	430542.37	6311170.34	*Corymbia calophylla*	63	20-25	Potential nesting tree
189	430543.69	6311285.44	*Corymbia calophylla*	52	20-25	Potential nesting tree
190	430543.94	6311263.45	*Corymbia calophylla*	61	20-25	Potential nesting tree
191	430547.40	6311288.87	*Corymbia calophylla*	64	25+	Potential nesting tree
192	430549.46	6311254.83	*Corymbia calophylla*	64	20-25	Potential nesting tree
193	430550.55	6311557.84	*Eucalyptus wandoo* subsp. *wandoo*	67	10-15	Potential nesting tree
194	430554.04	6311686.33	*Eucalyptus marginata*	53	15-20	Potential nesting tree
195	430554.21	6311125.67	*Corymbia calophylla*	135	25+	Hollow-bearing tree; potential nesting tree
196	430556.06	6311467.70	*Eucalyptus marginata*	78	15-20	Potential nesting tree
197	430556.40	6311306.51	*Corymbia calophylla*	53	15-20	Potential nesting tree
198	430558.09	6311503.82	*Corymbia calophylla*	74	15-20	Potential nesting tree
199	430561.41	6311323.73	*Corymbia calophylla*	65	20-25	Potential nesting tree
200	430561.51	6311267.31	*Corymbia calophylla*	51	20-25	Potential nesting tree
201	430561.66	6311446.09	*Eucalyptus marginata*	57	15-20	Potential nesting tree
202	430561.76	6311669.52	*Eucalyptus marginata*	55	15-20	Potential nesting tree
203	430563.43	6311346.94	*Corymbia calophylla*	50	15-20	Potential nesting tree
204	430565.33	6311592.84	*Eucalyptus marginata*	50	10-15	Potential nesting tree
205	430565.46	6311154.52	*Corymbia calophylla*	56	20-25	Potential nesting tree
206	430565.95	6311492.48	*Eucalyptus wandoo* subsp. *wandoo*	71	10-15	Potential nesting tree
207	430566.30	6311285.01	*Corymbia calophylla*	51	20-25	Potential nesting tree
208	430566.45	6311380.99	*Corymbia calophylla*	56	15-20	Potential nesting tree
209	430566.65	6311164.12	*Corymbia calophylla*	114	25+	Potential nesting tree
210	430566.81	6311273.45	*Corymbia calophylla*	51	20-25	Potential nesting tree
211	430567.55	6311146.97	*Corymbia calophylla*	53	20-25	Potential nesting tree
212	430568.05	6311340.00	*Corymbia calophylla*	57	20-25	Potential nesting tree

Tree ID	Easting	Northing	Tree Species	DBH (cm)	Tree Height (m)	Status
213	430569.25	6311201.96	*Corymbia calophylla*	103	25+	Potential nesting tree
214	430570.19	6311296.76	*Corymbia calophylla*	65	15-20	Potential nesting tree
215	430572.10	6311269.68	*Corymbia calophylla*	52	20-25	Potential nesting tree
216	430573.16	6311322.16	*Corymbia calophylla*	60	20-25	Potential nesting tree
217	430574.86	6311201.98	*Corymbia calophylla*	53	15-20	Potential nesting tree
218	430576.15	6311656.28	*Eucalyptus marginata*	52	20-25	Potential nesting tree
219	430577.01	6311354.10	*Corymbia calophylla*	68	20-25	Potential nesting tree
220	430578.74	6311641.76	*Eucalyptus marginata*	66	15-20	Potential nesting tree
221	430579.16	6311351.66	*Eucalyptus marginata*	70	20-25	Potential nesting tree
222	430579.59	6311168.11	*Corymbia calophylla*	92	25+	Potential nesting tree
223	430580.64	6311499.06	*Corymbia calophylla*	60	20-25	Potential nesting tree
224	430581.41	6311434.91	*Corymbia calophylla*	61	20-25	Potential nesting tree
225	430581.43	6311316.31	*Corymbia calophylla*	68	20-25	Potential nesting tree
226	430582.08	6311435.13	*Corymbia calophylla*	51	20-25	Potential nesting tree
227	430583.61	6311212.91	*Corymbia calophylla*	51	20-25	Potential nesting tree
228	430584.16	6311374.07	*Eucalyptus marginata*	58	15-20	Potential nesting tree
229	430586.42	6311343.20	*Corymbia calophylla*	52	20-25	Potential nesting tree
230	430588.38	6311222.89	*Corymbia calophylla*	59	20-25	Potential nesting tree
231	430588.96	6311136.55	*Corymbia calophylla*	63	25+	Potential nesting tree
232	430589.52	6311332.69	*Corymbia calophylla*	58	20-25	Potential nesting tree
233	430590.19	6311550.13	*Eucalyptus marginata*	65	15-20	Potential nesting tree
234	430590.90	6311244.41	*Corymbia calophylla*	62	10-15	Potential nesting tree
235	430591.05	6311192.10	*Corymbia calophylla*	60	25+	Potential nesting tree
236	430591.06	6311365.19	*Corymbia calophylla*	66	15-20	Potential nesting tree
237	430591.58	6311228.89	*Corymbia calophylla*	54	20-25	Potential nesting tree
238	430592.20	6311420.01	*Corymbia calophylla*	55	15-20	Potential nesting tree
239	430593.27	6311128.89	*Corymbia calophylla*	50	20-25	Potential nesting tree
240	430594.12	6311183.33	*Corymbia calophylla*	51	15-20	Potential nesting tree
241	430594.45	6311349.06	*Eucalyptus marginata*	68	20-25	Potential nesting tree
242	430595.47	6311006.22	*Corymbia calophylla*	79	20-25	Potential nesting tree
243	430596.73	6311382.49	*Eucalyptus marginata*	76	20-25	Hollow-bearing tree; potential nesting tree
244	430597.71	6311159.45	*Corymbia calophylla*	77	25+	Potential nesting tree
245	430598.80	6311109.62	*Corymbia calophylla*	58	20-25	Potential nesting tree
246	430599.56	6311547.02	*Eucalyptus marginata*	53	20-25	Potential nesting tree
247	430601.24	6311364.32	*Corymbia calophylla*	78	25+	Potential nesting tree
248	430601.38	6311553.05	*Corymbia calophylla*	65	20-25	Potential nesting tree
249	430601.74	6311170.22	*Corymbia calophylla*	65	25+	Potential nesting tree
250	430602.64	6311424.31	*Eucalyptus marginata*	70	20-25	Potential nesting tree
251	430602.84	6311430.99	*Corymbia calophylla*	63	20-25	Potential nesting tree
252	430603.41	6311414.52	*Eucalyptus marginata*	50	20-25	Potential nesting tree
253	430603.76	6311435.93	*Eucalyptus marginata*	67	15-20	Potential nesting tree
254	430605.38	6311374.38	*Eucalyptus marginata*	65	20-25	Potential nesting tree
255	430605.59	6311085.12	*Corymbia calophylla*	60	20-25	Potential nesting tree
256	430605.80	6311309.50	*Corymbia calophylla*	66	20-25	Potential nesting tree
257	430608.17	6311045.49	*Corymbia calophylla*	50	10-15	Potential nesting tree
258	430608.57	6311388.76	*Eucalyptus marginata*	52	20-25	Potential nesting tree
259	430610.04	6311099.58	*Corymbia calophylla*	62	20-25	Potential nesting tree
260	430610.86	6311139.30	*Corymbia calophylla*	78	20-25	Potential nesting tree
261	430611.24	6311390.46	*Eucalyptus marginata*	63	20-25	Potential nesting tree
262	430611.69	6311344.18	*Eucalyptus marginata*	95	20-25	Potential nesting tree
263	430613.13	6311389.97	*Eucalyptus wandoo* subsp. *wandoo*	41	15-20	Potential nesting tree
264	430613.29	6311510.83	*Eucalyptus marginata*	53	15-20	Potential nesting tree
265	430613.31	6311403.20	*Eucalyptus marginata*	57	20-25	Potential nesting tree
266	430613.83	6311407.41	*Eucalyptus marginata*	59	20-25	Potential nesting tree
267	430614.00	6311201.76	*Corymbia calophylla*	85	20-25	Potential nesting tree
268	430614.48	6311245.85	*Corymbia calophylla*	61	15-20	Potential nesting tree
269	430614.80	6311238.42	*Corymbia calophylla*	98	25+	Potential nesting tree

Tree ID	Easting	Northing	Tree Species	DBH (cm)	Tree Height (m)	Status
270	430615.82	6311463.71	*Eucalyptus marginata*	59	15-20	Potential nesting tree
271	430617.34	6311506.60	*Eucalyptus marginata*	58	15-20	Potential nesting tree
272	430618.43	6311286.17	*Corymbia calophylla*	63	20-25	Potential nesting tree
273	430619.38	6311247.45	*Corymbia calophylla*	74	20-25	Potential nesting tree
274	430619.63	6311130.88	*Corymbia calophylla*	83	25+	Potential nesting tree
275	430619.85	6311405.50	*Eucalyptus marginata*	75	20-25	Hollow-bearing tree; potential nesting tree
276	430620.81	6311493.98	*Eucalyptus marginata*	62	15-20	Potential nesting tree
277	430620.81	6311550.78	*Corymbia calophylla*	56	20-25	Potential nesting tree
278	430621.60	6311366.74	*Eucalyptus marginata*	101	20-25	Hollow-bearing tree; potential nesting tree
279	430622.32	6311305.17	*Corymbia calophylla*	61	20-25	Potential nesting tree
280	430622.75	6311528.10	*Eucalyptus marginata*	56	15-20	Potential nesting tree
281	430622.82	6311463.07	*Corymbia calophylla*	70	15-20	Potential nesting tree
282	430622.96	6311284.57	*Corymbia calophylla*	78	20-25	Potential nesting tree
283	430623.98	6311539.30	*Corymbia calophylla*	90	20-25	Potential nesting tree
284	430625.06	6311546.67	*Corymbia calophylla*	61	20-25	Potential nesting tree
285	430625.75	6311206.51	*Corymbia calophylla*	99	20-25	Potential nesting tree
286	430626.19	6311493.82	*Corymbia calophylla*	62	15-20	Potential nesting tree
287	430626.39	6311157.73	*Corymbia calophylla*	75	25+	Potential nesting tree
288	430628.35	6311152.13	*Corymbia calophylla*	66	20-25	Potential nesting tree
289	430629.63	6311383.58	*Eucalyptus marginata*	52	20-25	Potential nesting tree
290	430630.18	6311182.20	*Corymbia calophylla*	90	10-15	Potential nesting tree
291	430631.67	6311150.65	*Corymbia calophylla*	140	25+	Potential nesting tree
292	430632.83	6311105.98	*Corymbia calophylla*	62	15-20	Potential nesting tree
293	430632.89	6311488.76	*Eucalyptus marginata*	65	15-20	Potential nesting tree
294	430635.85	6311396.99	*Eucalyptus marginata*	112	25+	Potential nesting tree
295	430636.30	6311217.33	*Corymbia calophylla*	61	20-25	Potential nesting tree
296	430640.67	6311189.32	*Corymbia calophylla*	104	25+	Potential nesting tree
297	430641.03	6311190.88	*Corymbia calophylla*	67	20-25	Potential nesting tree
298	430641.75	6311219.94	*Corymbia calophylla*	52	20-25	Potential nesting tree
299	430642.83	6311305.82	*Corymbia calophylla*	56	20-25	Potential nesting tree
300	430642.93	6311298.63	*Corymbia calophylla*	51	20-25	Potential nesting tree
301	430643.38	6311576.35	*Corymbia calophylla*	68	20-25	Potential nesting tree
302	430643.38	6311583.64	*Corymbia calophylla*	60	0-10	Potential nesting tree
303	430644.34	6311214.79	*Corymbia calophylla*	86	20-25	Potential nesting tree
304	430647.19	6311223.22	*Corymbia calophylla*	79	25+	Potential nesting tree
305	430647.36	6311078.82	*Corymbia calophylla*	70	20-25	Potential nesting tree
306	430647.42	6311294.16	*Corymbia calophylla*	89	25+	Hollow-bearing tree; potential nesting tree
307	430649.75	6311507.93	*Corymbia calophylla*	55	20-25	Potential nesting tree
308	430650.03	6311055.11	*Corymbia calophylla*	135	15-20	Potential nesting tree
309	430651.10	6311386.01	*Eucalyptus marginata*	60	20-25	Potential nesting tree
310	430651.82	6311339.06	*Eucalyptus marginata*	75	20-25	Potential nesting tree
311	430651.86	6311512.03	*Corymbia calophylla*	63	15-20	Potential nesting tree
312	430652.04	6311508.73	*Corymbia calophylla*	57	20-25	Potential nesting tree
313	430652.72	6311362.92	*Eucalyptus marginata*	60	20-25	Potential nesting tree
314	430653.03	6311240.01	*Corymbia calophylla*	59	20-25	Potential nesting tree
315	430653.49	6311061.11	*Corymbia calophylla*	90	15-20	Hollow-bearing tree; potential nesting tree
316	430653.66	6311569.30	*Corymbia calophylla*	57	15-20	Potential nesting tree
317	430654.77	6311525.29	*Corymbia calophylla*	111	20-25	Hollow-bearing tree; potential nesting tree
318	430654.92	6311042.23	*Corymbia calophylla*	74	15-20	Potential nesting tree
319	430656.03	6311242.21	*Corymbia calophylla*	69	20-25	Potential nesting tree
320	430656.04	6311572.92	*Corymbia calophylla*	57	15-20	Potential nesting tree
321	430656.26	6311576.78	*Corymbia calophylla*	65	20-25	Potential nesting tree
322	430656.71	6311102.19	*Corymbia calophylla*	54	20-25	Potential nesting tree

Tree ID	Easting	Northing	Tree Species	DBH (cm)	Tree Height (m)	Status
323	430656.87	6311117.76	*Corymbia calophylla*	56	15-20	Potential nesting tree
324	430657.59	6311517.03	*Corymbia calophylla*	50	20-25	Potential nesting tree
325	430657.76	6311473.62	*Eucalyptus marginata*	60	15-20	Potential nesting tree
326	430657.96	6311084.55	*Corymbia calophylla*	78	20-25	Potential nesting tree
327	430658.28	6311378.70	*Eucalyptus marginata*	65	20-25	Potential nesting tree
328	430658.43	6311358.06	*Eucalyptus marginata*	62	15-20	Potential nesting tree
329	430659.61	6311144.04	*Corymbia calophylla*	76	25+	Potential nesting tree
330	430660.23	6311147.75	*Corymbia calophylla*	58	0-10	Potential nesting tree
331	430662.74	6311165.97	*Corymbia calophylla*	82	0-10	Potential nesting tree
332	430662.77	6311414.57	*Corymbia calophylla*	57	15-20	Potential nesting tree
333	430663.16	6311249.32	*Corymbia calophylla*	67	15-20	Potential nesting tree
334	430663.62	6311410.71	*Corymbia calophylla*	158	25+	Potential nesting tree
335	430665.01	6311261.99	*Corymbia calophylla*	132	20-25	Potential nesting tree
336	430665.43	6311350.55	*Eucalyptus marginata*	89	20-25	Hollow-bearing tree; potential nesting tree
337	430666.15	6311382.91	*Corymbia calophylla*	60	20-25	Potential nesting tree
338	430668.88	6311177.58	*Corymbia calophylla*	100	20-25	Hollow-bearing tree; potential nesting tree
339	430669.57	6311141.66	*Corymbia calophylla*	57	20-25	Potential nesting tree
340	430670.22	6311095.86	*Corymbia calophylla*	51	20-25	Potential nesting tree
341	430670.66	6311322.83	*Eucalyptus marginata*	63	25+	Potential nesting tree
342	430670.98	6311284.42	*Corymbia calophylla*	75	20-25	Potential nesting tree
343	430671.91	6311303.74	*Corymbia calophylla*	53	15-20	Potential nesting tree
344	430672.05	6311129.26	*Eucalyptus marginata*	76	20-25	Potential nesting tree
345	430672.55	6311856.39	*Eucalyptus marginata*	62	15-20	Potential nesting tree
346	430672.80	6311331.84	*Eucalyptus marginata*	54	20-25	Potential nesting tree
347	430674.29	6311374.00	*Eucalyptus marginata*	74	25+	Potential nesting tree
348	430674.46	6311096.50	*Corymbia calophylla*	70	20-25	Potential nesting tree
349	430674.66	6311360.02	*Eucalyptus marginata*	70	20-25	Potential nesting tree
350	430675.17	6311315.04	*Eucalyptus marginata*	52	20-25	Potential nesting tree
351	430675.23	6311118.04	*Corymbia calophylla*	64	20-25	Potential nesting tree
352	430675.52	6311162.75	*Corymbia calophylla*	66	20-25	Potential nesting tree
353	430675.61	6311112.38	*Corymbia calophylla*	55	20-25	Potential nesting tree
354	430676.25	6311219.51	*Corymbia calophylla*	86	25+	Potential nesting tree
355	430677.29	6311222.52	*Corymbia calophylla*	76	25+	Potential nesting tree
356	430677.68	6311110.96	*Corymbia calophylla*	61	20-25	Potential nesting tree
357	430678.21	6311109.58	*Corymbia calophylla*	64	20-25	Potential nesting tree
358	430679.08	6311340.69	*Eucalyptus marginata*	81	15-20	Hollow-bearing tree; potential nesting tree
359	430679.79	6311098.84	*Corymbia calophylla*	68	25+	Potential nesting tree
360	430680.35	6311184.17	*Corymbia calophylla*	60	15-20	Potential nesting tree
361	430680.58	6311861.98	*Eucalyptus marginata*	53	20-25	Potential nesting tree
362	430680.74	6311109.55	*Corymbia calophylla*	64	20-25	Potential nesting tree
363	430681.03	6311143.05	*Corymbia calophylla*	66	20-25	Potential nesting tree
364	430681.71	6311193.65	*Corymbia calophylla*	59	15-20	Potential nesting tree
365	430681.77	6311362.60	*Eucalyptus marginata*	51	20-25	Potential nesting tree
366	430682.76	6311867.21	*Corymbia calophylla*	61	10-15	Potential nesting tree
367	430683.37	6311843.81	*Eucalyptus marginata*	72	15-20	Potential nesting tree
368	430684.65	6311328.65	*Eucalyptus marginata*	63	25+	Potential nesting tree
369	430684.87	6311056.21	*Corymbia calophylla*	53	20-25	Potential nesting tree
370	430685.49	6311855.91	*Corymbia calophylla*	62	10-15	Potential nesting tree
371	430686.21	6311058.63	*Corymbia calophylla*	51	15-20	Potential nesting tree
372	430687.44	6311048.64	*Corymbia calophylla*	64	25+	Potential nesting tree
373	430689.68	6311886.78	*Eucalyptus marginata*	55	15-20	Potential nesting tree
374	430689.84	6311047.79	*Corymbia calophylla*	100	20-25	Potential nesting tree
375	430689.99	6311038.78	*Corymbia calophylla*	53	15-20	Potential nesting tree
376	430690.29	6311327.81	*Eucalyptus marginata*	52	20-25	Potential nesting tree
377	430690.66	6311896.55	*Corymbia calophylla*	53	10-15	Potential nesting tree

Tree ID	Easting	Northing	Tree Species	DBH (cm)	Tree Height (m)	Status
378	430691.91	6311891.47	*Eucalyptus marginata*	84	15-20	Potential nesting tree
379	430692.50	6311340.74	*Eucalyptus marginata*	73	25+	Potential nesting tree
380	430692.55	6311326.54	*Eucalyptus marginata*	82	25+	Potential nesting tree
381	430693.69	6310983.72	*Corymbia calophylla*	122	20-25	Potential nesting tree
382	430693.73	6311334.42	*Eucalyptus marginata*	70	20-25	Potential nesting tree
383	430694.47	6311874.21	*Eucalyptus marginata*	65	15-20	Potential nesting tree
384	430694.83	6311346.87	*Eucalyptus marginata*	67	20-25	Potential nesting tree
385	430694.90	6311851.05	*Eucalyptus marginata*	73	15-20	Potential nesting tree
386	430695.46	6311842.78	*Corymbia calophylla*	73	15-20	Potential nesting tree
387	430696.33	6311899.48	*Eucalyptus marginata*	70	15-20	Potential nesting tree
388	430699.54	6311899.14	*Corymbia calophylla*	66	15-20	Potential nesting tree
389	430701.11	6311355.43	*Eucalyptus marginata*	62	15-20	Potential nesting tree
390	430705.19	6311841.42	*Corymbia calophylla*	63	15-20	Potential nesting tree
391	430711.73	6311880.13	*Eucalyptus marginata*	55	10-15	Potential nesting tree
392	430717.77	6311904.39	*Eucalyptus marginata*	67	10-15	Potential nesting tree
393	430718.70	6310929.25	*Corymbia calophylla*	147	25+	Hollow-bearing tree; potential nesting tree
394	430718.93	6311838.55	*Eucalyptus marginata*	64	15-20	Potential nesting tree
395	430719.55	6311842.93	*Eucalyptus marginata*	73	15-20	Potential nesting tree
396	430729.17	6311837.20	*Eucalyptus marginata*	68	15-20	Potential nesting tree
397	430729.50	6311864.48	*Eucalyptus marginata*	51	15-20	Potential nesting tree
398	430729.83	6311838.05	*Corymbia calophylla*	53	15-20	Potential nesting tree
399	430731.98	6311471.79	*Eucalyptus marginata*	53	15-20	Potential nesting tree
400	430733.05	6311898.95	*Eucalyptus marginata*	63	10-15	Potential nesting tree
401	430735.21	6311475.37	*Corymbia calophylla*	82	20-25	Potential nesting tree
402	430735.21	6311831.45	*Eucalyptus marginata*	50	10-15	Potential nesting tree
403	430736.31	6311880.77	*Corymbia calophylla*	57	15-20	Potential nesting tree
404	430736.55	6311493.56	*Eucalyptus marginata*	65	20-25	Potential nesting tree
405	430736.72	6311495.27	*Eucalyptus marginata*	58	20-25	Potential nesting tree
406	430738.09	6311893.02	*Eucalyptus marginata*	67	10-15	Potential nesting tree
407	430738.54	6311501.79	*Eucalyptus marginata*	64	10-15	Potential nesting tree
408	430739.13	6311463.33	*Eucalyptus marginata*	54	15-20	Potential nesting tree
409	430740.27	6311885.90	*Eucalyptus marginata*	59	15-20	Potential nesting tree
410	430740.73	6311491.98	*Eucalyptus marginata*	67	20-25	Potential nesting tree
411	430741.75	6311455.86	*Eucalyptus marginata*	52	15-20	Potential nesting tree
412	430743.30	6311846.89	*Eucalyptus marginata*	58	10-15	Potential nesting tree
413	430746.64	6311831.54	*Eucalyptus marginata*	58	15-20	Potential nesting tree
414	430748.62	6311533.99	*Eucalyptus marginata*	62	20-25	Potential nesting tree
415	430749.94	6311541.91	*Eucalyptus marginata*	71	20-25	Potential nesting tree
416	430751.60	6311454.92	*Eucalyptus marginata*	50	15-20	Potential nesting tree
417	430751.86	6311865.23	*Eucalyptus marginata*	55	15-20	Potential nesting tree
418	430751.89	6311490.57	*Eucalyptus marginata*	53	15-20	Potential nesting tree
419	430755.33	6311550.18	*Eucalyptus marginata*	54	20-25	Potential nesting tree
420	430756.29	6311831.17	*Eucalyptus marginata*	51	15-20	Potential nesting tree
421	430756.87	6311548.96	*Eucalyptus marginata*	77	25+	Potential nesting tree
422	430758.49	6311514.86	*Corymbia calophylla*	56	15-20	Potential nesting tree
423	430758.60	6311830.45	*Eucalyptus marginata*	66	15-20	Potential nesting tree
424	430759.61	6311860.56	*Eucalyptus marginata*	58	15-20	Potential nesting tree
425	430760.16	6311452.18	*Corymbia calophylla*	63	20-25	Potential nesting tree
426	430761.57	6311510.34	*Corymbia calophylla*	54	15-20	Potential nesting tree
427	430762.48	6311463.35	*Eucalyptus marginata*	56	20-25	Potential nesting tree
428	430762.73	6311883.44	*Corymbia calophylla*	58	15-20	Potential nesting tree
429	430765.95	6311489.94	*Eucalyptus marginata*	53	15-20	Potential nesting tree
430	430768.36	6311546.37	*Eucalyptus marginata*	53	20-25	Potential nesting tree
431	430768.95	6311850.63	*Corymbia calophylla*	57	15-20	Potential nesting tree
432	430769.00	6311516.51	*Eucalyptus marginata*	69	15-20	Potential nesting tree
433	430769.17	6311826.16	*Eucalyptus marginata*	63	15-20	Potential nesting tree
434	430769.91	6311460.72	*Eucalyptus marginata*	60	20-25	Potential nesting tree

Tree ID	Easting	Northing	Tree Species	DBH (cm)	Tree Height (m)	Status
435	430770.47	6311817.31	*Eucalyptus marginata*	53	15-20	Potential nesting tree
436	430771.18	6311839.48	*Eucalyptus marginata*	78	10-15	Potential nesting tree
437	430771.31	6311512.85	*Eucalyptus marginata*	50	15-20	Potential nesting tree
438	430772.10	6311456.89	*Eucalyptus marginata*	54	15-20	Potential nesting tree
439	430772.23	6311465.05	*Eucalyptus marginata*	59	15-20	Potential nesting tree
440	430776.76	6311516.94	*Eucalyptus marginata*	55	20-25	Potential nesting tree
441	430777.95	6311470.07	*Corymbia calophylla*	90	20-25	Potential nesting tree
442	430778.88	6311471.66	*Eucalyptus marginata*	72	20-25	Potential nesting tree
443	430780.47	6311526.00	*Corymbia calophylla*	56	15-20	Potential nesting tree
444	430781.09	6311505.80	*Eucalyptus marginata*	54	15-20	Potential nesting tree
445	430784.51	6311508.06	*Corymbia calophylla*	51	15-20	Potential nesting tree
446	430784.94	6311529.07	*Eucalyptus marginata*	54	15-20	Potential nesting tree
447	430785.41	6311524.65	*Corymbia calophylla*	68	20-25	Potential nesting tree
448	430786.26	6311501.23	*Corymbia calophylla*	64	20-25	Potential nesting tree
449	430787.65	6311820.59	*Eucalyptus marginata*	72	15-20	Potential nesting tree
450	430788.33	6311521.39	*Eucalyptus marginata*	50	15-20	Potential nesting tree
451	430788.47	6311490.08	*Eucalyptus marginata*	60	20-25	Potential nesting tree
452	430800.92	6311500.14	*Eucalyptus marginata*	69	20-25	Potential nesting tree
453	430806.89	6311498.12	*Eucalyptus marginata*	83	20-25	Potential nesting tree
454	430872.63	6311222.94	*Eucalyptus marginata*	120	20-25	Potential nesting tree
455	430876.10	6310870.53	*Corymbia calophylla*	79	15-20	Hollow-bearing tree; potential nesting tree
456	430878.70	6310889.26	*Corymbia calophylla*	66	20-25	Potential nesting tree
457	430882.22	6310877.88	*Eucalyptus marginata*	56	20-25	Potential nesting tree
458	430886.82	6310888.18	*Corymbia calophylla*	99	25+	Hollow-bearing tree; potential nesting tree
459	430889.41	6311227.02	*Corymbia calophylla*	53	20-25	Potential nesting tree
460	430889.51	6310898.35	*Corymbia calophylla*	50	15-20	Potential nesting tree
461	430890.01	6311253.83	*Corymbia calophylla*	74	20-25	Potential nesting tree
462	430892.23	6310862.72	*Corymbia calophylla*	97	25+	Potential nesting tree
463	430894.35	6310931.92	*Eucalyptus marginata*	51	20-25	Potential nesting tree
464	430894.40	6311246.29	*Corymbia calophylla*	72	20-25	Potential nesting tree
465	430895.87	6311230.94	*Corymbia calophylla*	82	20-25	Potential nesting tree
466	430896.65	6310918.58	*Corymbia calophylla*	72	25+	Potential nesting tree
467	430897.45	6311236.12	*Corymbia calophylla*	70	15-20	Potential nesting tree
468	430898.24	6311217.86	*Eucalyptus marginata*	63	20-25	Potential nesting tree
469	430902.68	6310903.13	*Corymbia calophylla*	115	25+	Hollow-bearing tree; potential nesting tree
470	430902.74	6310938.47	*Corymbia calophylla*	97	25+	Hollow-bearing tree; potential nesting tree
471	430905.65	6311212.54	*Eucalyptus marginata*	78	20-25	Potential nesting tree
472	430908.92	6310853.95	*Eucalyptus marginata*	65	20-25	Potential nesting tree
473	430909.01	6311244.50	*Eucalyptus marginata*	55	15-20	Potential nesting tree
474	430909.36	6311211.79	*Eucalyptus marginata*	68	20-25	Potential nesting tree
475	430911.67	6311217.84	*Eucalyptus marginata*	62	20-25	Potential nesting tree
476	430911.90	6311227.79	*Corymbia calophylla*	93	20-25	Potential nesting tree
477	430915.06	6311225.89	*Eucalyptus marginata*	65	20-25	Potential nesting tree
478	430915.87	6310910.02	*Corymbia calophylla*	60	20-25	Potential nesting tree
479	430922.41	6310919.35	*Eucalyptus marginata*	50	20-25	Potential nesting tree
480	430925.20	6310911.35	*Eucalyptus marginata*	57	15-20	Potential nesting tree
481	430926.13	6310919.56	*Eucalyptus marginata*	59	20-25	Potential nesting tree
482	431344.65	6311529.84	*Corymbia calophylla*	71	10-15	Potential nesting tree
483	431349.31	6311528.08	*Corymbia calophylla*	84	10-15	Potential nesting tree
484	431352.49	6311537.53	*Corymbia calophylla*	95	15-20	Potential nesting tree
485	431354.06	6311413.99	*Corymbia calophylla*	162	25+	Potential nesting tree
486	431377.56	6311439.03	*Corymbia calophylla*	111	25+	Hollow-bearing tree; potential nesting tree
487	431406.38	6311634.92	*Eucalyptus wandoo* subsp. *wandoo*	49	10-15	Potential nesting tree

Tree ID	Easting	Northing	Tree Species	DBH (cm)	Tree Height (m)	Status
488	431411.72	6311373.60	*Corymbia calophylla*	115	25+	Potential nesting tree
489	431413.97	6311642.77	*Eucalyptus wandoo* subsp. *wandoo*	58	20-25	Potential nesting tree
490	431421.62	6311347.28	*Corymbia calophylla*	148	25+	Hollow-bearing tree; potential nesting tree
491	431444.37	6311659.78	*Eucalyptus wandoo* subsp. *wandoo*	70	15-20	Potential nesting tree
492	431451.05	6311652.71	*Eucalyptus wandoo* subsp. *wandoo*	58	20-25	Potential nesting tree
493	431458.81	6311289.55	*Corymbia calophylla*	167	25+	Potential nesting tree
494	431479.29	6311353.55	*Corymbia calophylla*	127	25+	Potential nesting tree
495	431485.23	6311633.01	*Eucalyptus wandoo* subsp. *wandoo*	80	15-20	Potential nesting tree
496	431487.97	6311313.08	*Corymbia calophylla*	135	25+	Potential nesting tree
497	431495.32	6311611.13	*Eucalyptus wandoo* subsp. *wandoo*	113	20-25	Hollow-bearing tree; potential nesting tree
498	431510.94	6311609.98	*Eucalyptus wandoo* subsp. *wandoo*	92	15-20	Potential nesting tree
499	431514.34	6311604.81	*Eucalyptus wandoo* subsp. *wandoo*	79	20-25	Potential nesting tree
500	431515.84	6311595.44	*Eucalyptus wandoo* subsp. *wandoo*	69	15-20	Potential nesting tree
501	431520.03	6311585.84	*Eucalyptus wandoo* subsp. *wandoo*	42	15-20	Potential nesting tree
502	431520.81	6311597.64	*Eucalyptus wandoo* subsp. *wandoo*	43	20-25	Potential nesting tree
503	431523.40	6311360.09	*Corymbia calophylla*	93	25+	Potential nesting tree
504	431525.22	6311284.15	*Corymbia calophylla*	190	25+	Hollow-bearing tree; potential nesting tree
505	431527.76	6311334.98	*Corymbia calophylla*	103	25+	Hollow-bearing tree; potential nesting tree
506	431528.21	6311575.86	*Eucalyptus wandoo* subsp. *wandoo*	66	15-20	Potential nesting tree
507	431534.99	6311583.96	*Eucalyptus rudis* subsp. *rudis*	52	15-20	Potential nesting tree
508	431547.33	6311547.66	*Eucalyptus wandoo* subsp. *wandoo*	71	15-20	Potential nesting tree
509	431549.12	6311552.54	*Eucalyptus wandoo* subsp. *wandoo*	101	20-25	Potential nesting tree
510	431587.32	6311394.19	*Corymbia calophylla*	140	25+	Potential nesting tree
511	431592.70	6311325.90	*Corymbia calophylla*	96	25+	Potential nesting tree
512	431593.87	6311544.09	*Eucalyptus wandoo* subsp. *wandoo*	49	10-15	Potential nesting tree
513	431594.32	6311502.85	*Eucalyptus wandoo* subsp. *wandoo*	48	10-15	Potential nesting tree
514	431600.85	6311511.19	*Corymbia calophylla*	150	25+	Potential nesting tree
515	431603.38	6311546.01	*Eucalyptus wandoo* subsp. *wandoo*	50	20-25	Potential nesting tree
516	431619.31	6311432.18	*Corymbia calophylla*	179	25+	Potential nesting tree
517	431629.88	6311526.92	*Corymbia calophylla*	113	20-25	Potential nesting tree
518	431641.13	6311405.10	*Corymbia calophylla*	179	25+	Potential nesting tree
519	431648.50	6311626.28	*Eucalyptus rudis* subsp. *rudis*	96	10-15	Potential nesting tree
520	431649.72	6311630.93	*Eucalyptus rudis* subsp. *rudis*	63	10-15	Potential nesting tree
521	431675.73	6311507.06	*Eucalyptus rudis* subsp. *rudis*	117	20-25	Potential nesting tree
522	431677.06	6311642.09	*Corymbia calophylla*	93	20-25	Potential nesting tree
523	431694.81	6311523.37	*Eucalyptus rudis* subsp. *rudis*	85	15-20	Potential nesting tree
524	431703.13	6311625.36	*Corymbia calophylla*	55	10-15	Potential nesting tree
525	431730.99	6311629.11	*Eucalyptus rudis* subsp. *rudis*	66	10-15	Potential nesting tree
526	431737.64	6311440.62	*Eucalyptus wandoo* subsp. *wandoo*	79	20-25	Potential nesting tree
527	431753.28	6311413.53	*Eucalyptus wandoo* subsp. *wandoo*	47	15-20	Potential nesting tree
528	431754.71	6311410.21	*Eucalyptus wandoo* subsp. *wandoo*	42	10-15	Potential nesting tree
529	431761.35	6311410.24	*Eucalyptus wandoo* subsp. *wandoo*	49	10-15	Potential nesting tree
530	431761.89	6311436.16	*Eucalyptus wandoo* subsp. *wandoo*	79	15-20	Potential nesting tree
531	431767.46	6311659.83	*Corymbia calophylla*	106	20-25	Potential nesting tree
532	431767.57	6311413.13	*Eucalyptus wandoo* subsp. *wandoo*	58	10-15	Potential nesting tree
533	431769.13	6311448.95	*Corymbia calophylla*	117	25+	Potential nesting tree
534	431770.96	6311457.69	*Eucalyptus wandoo* subsp. *wandoo*	59	10-15	Potential nesting tree
535	431774.28	6311444.70	*Corymbia calophylla*	67	15-20	Potential nesting tree
536	431801.18	6311672.28	*Corymbia calophylla*	55	15-20	Potential nesting tree
537	431806.97	6311415.30	*Corymbia calophylla*	80	10-15	Potential nesting tree
538	431808.17	6311421.37	*Corymbia calophylla*	83	10-15	Potential nesting tree
539	431816.50	6311675.61	*Eucalyptus rudis* subsp. *rudis*	103	25+	Potential nesting tree
540	431819.03	6311664.07	*Corymbia calophylla*	74	20-25	Potential nesting tree
541	431825.32	6311673.32	*Corymbia calophylla*	62	25+	Potential nesting tree

Tree ID	Easting	Northing	Tree Species	DBH (cm)	Tree Height (m)	Status
542	431832.67	6311661.28	*Corymbia calophylla*	56	20-25	Potential nesting tree
543	431838.46	6311656.45	*Eucalyptus marginata*	74	20-25	Potential nesting tree
544	431853.51	6311651.07	*Eucalyptus marginata*	51	20-25	Potential nesting tree
545	431854.64	6311664.57	*Corymbia calophylla*	51	20-25	Potential nesting tree
546	431862.18	6311645.20	*Corymbia calophylla*	98	25+	Hollow-bearing tree; potential nesting tree
547	431870.43	6311655.79	*Corymbia calophylla*	136	25+	Hollow-bearing tree; potential nesting tree
548	431872.72	6311638.99	*Corymbia calophylla*	79	25+	Hollow-bearing tree; potential nesting tree
549	431884.79	6311632.17	*Corymbia calophylla*	101	25+	Potential nesting tree
550	431887.99	6311637.03	*Corymbia calophylla*	60	25+	Potential nesting tree
551	431889.77	6311661.57	*Eucalyptus marginata*	64	25+	Potential nesting tree
552	431890.29	6311659.41	*Eucalyptus marginata*	71	25+	Potential nesting tree
553	431895.24	6311664.20	*Eucalyptus marginata*	94	20-25	Hollow-bearing tree; potential nesting tree
554	431895.48	6311642.21	*Corymbia calophylla*	96	25+	Potential nesting tree
555	431900.79	6311033.99	*Eucalyptus wandoo* subsp. *wandoo*	83	15-20	Potential nesting tree
556	431906.60	6311656.64	*Eucalyptus marginata*	88	20-25	Potential nesting tree
557	431909.79	6311659.27	*Corymbia calophylla*	51	25+	Potential nesting tree
558	431915.06	6311668.60	*Corymbia calophylla*	84	25+	Potential nesting tree
559	431915.52	6311644.96	*Corymbia calophylla*	61	25+	Potential nesting tree
560	431920.95	6311610.73	*Corymbia calophylla*	89	25+	Potential nesting tree
561	431921.11	6311628.18	*Eucalyptus marginata*	76	25+	Potential nesting tree
562	431924.73	6311597.72	*Eucalyptus rudis* subsp. *rudis*	73	10-15	Potential nesting tree
563	431925.09	6311651.46	*Corymbia calophylla*	63	25+	Potential nesting tree
564	431929.07	6311612.86	*Eucalyptus marginata*	52	20-25	Potential nesting tree
565	431929.95	6311063.16	*Eucalyptus wandoo* subsp. *wandoo*	83	10-15	Potential nesting tree
566	431930.05	6311587.44	*Eucalyptus rudis* subsp. *rudis*	116	15-20	Hollow-bearing tree; potential nesting tree
567	431930.53	6311650.83	*Eucalyptus marginata*	50	10-15	Hollow-bearing tree; potential nesting tree
568	431931.79	6311170.86	*Eucalyptus wandoo* subsp. *wandoo*	68	10-15	Potential nesting tree
569	431932.27	6311623.29	*Eucalyptus marginata*	64	25+	Potential nesting tree
570	431934.33	6311196.23	*Eucalyptus wandoo* subsp. *wandoo*	67	0-10	Potential nesting tree
571	431935.93	6311661.03	*Eucalyptus marginata*	59	25+	Potential nesting tree
572	431936.56	6311678.51	*Eucalyptus marginata*	57	15-20	Potential nesting tree
573	431937.14	6311106.39	*Eucalyptus wandoo* subsp. *wandoo*	75	15-20	Potential nesting tree
574	431937.29	6311614.51	*Eucalyptus marginata*	51	20-25	Potential nesting tree
575	431938.61	6311620.09	*Corymbia calophylla*	58	20-25	Potential nesting tree
576	431939.91	6311162.57	*Eucalyptus wandoo* subsp. *wandoo*	75	15-20	Potential nesting tree
577	431941.12	6311603.39	*Corymbia calophylla*	57	20-25	Potential nesting tree
578	431943.14	6311127.24	*Eucalyptus wandoo* subsp. *wandoo*	50	10-15	Potential nesting tree
579	431943.86	6311612.54	*Eucalyptus marginata*	55	20-25	Potential nesting tree
580	431944.97	6311175.09	*Eucalyptus wandoo* subsp. *wandoo*	46	0-10	Potential nesting tree
581	431946.96	6311676.65	*Eucalyptus marginata*	62	20-25	Potential nesting tree
582	431948.75	6311658.73	*Eucalyptus marginata*	80	15-20	Potential nesting tree
583	431949.29	6311610.45	*Corymbia calophylla*	53	15-20	Potential nesting tree
584	431949.49	6311659.26	*Corymbia calophylla*	112	15-20	Hollow-bearing tree; potential nesting tree
585	431950.32	6311686.84	*Corymbia calophylla*	64	25+	Potential nesting tree
586	431951.39	6311142.45	*Eucalyptus wandoo* subsp. *wandoo*	70	15-20	Potential nesting tree
587	431952.05	6311667.23	*Eucalyptus marginata*	55	15-20	Potential nesting tree
588	431954.52	6311637.76	*Corymbia calophylla*	97	25+	Potential nesting tree
589	431956.54	6311703.90	*Corymbia calophylla*	62	20-25	Potential nesting tree
590	431956.88	6311700.45	*Corymbia calophylla*	75	25+	Potential nesting tree
591	431959.34	6311644.61	*Eucalyptus marginata*	96	25+	Potential nesting tree
592	431960.60	6311653.91	*Eucalyptus marginata*	52	20-25	Potential nesting tree
593	431962.15	6311129.67	*Eucalyptus wandoo* subsp. *wandoo*	40	10-15	Potential nesting tree

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594	431962.62	6311116.29	*Eucalyptus wandoo* subsp. *wandoo*	69	10-15	Potential nesting tree
595	431962.68	6311678.05	*Corymbia calophylla*	53	20-25	Potential nesting tree
596	431963.08	6311121.72	*Eucalyptus wandoo* subsp. *wandoo*	55	10-15	Potential nesting tree
597	431963.74	6311706.37	*Eucalyptus marginata*	74	25+	Potential nesting tree
598	431966.98	6311147.48	*Eucalyptus wandoo* subsp. *wandoo*	31	10-15	Potential nesting tree
599	431974.85	6311677.26	*Corymbia calophylla*	50	20-25	Potential nesting tree
600	431975.02	6311709.64	*Corymbia calophylla*	56	25+	Potential nesting tree
601	431976.15	6311670.77	*Eucalyptus marginata*	65	25+	Potential nesting tree
602	431976.44	6311652.24	*Corymbia calophylla*	91	25+	Potential nesting tree
603	431977.63	6311699.44	*Corymbia calophylla*	54	20-25	Potential nesting tree
604	431979.81	6311668.62	*Eucalyptus marginata*	72	25+	Potential nesting tree
605	431980.24	6311704.66	*Eucalyptus marginata*	80	0-10	Hollow-bearing tree; potential nesting tree
606	431981.81	6311713.67	*Corymbia calophylla*	60	20-25	Potential nesting tree
607	431983.94	6311671.16	*Eucalyptus marginata*	53	20-25	Potential nesting tree
608	431994.85	6311695.09	*Eucalyptus marginata*	79	25+	Hollow-bearing tree; potential nesting tree
609	431997.26	6311685.01	*Corymbia calophylla*	65	25+	Potential nesting tree
610	432002.08	6311711.74	*Eucalyptus marginata*	55	20-25	Potential nesting tree
611	432011.08	6311705.57	*Corymbia calophylla*	94	25+	Potential nesting tree
612	432012.36	6311724.77	*Eucalyptus marginata*	62	20-25	Potential nesting tree
613	432014.42	6311715.83	*Corymbia calophylla*	64	20-25	Potential nesting tree
614	432014.88	6311711.08	*Corymbia calophylla*	61	20-25	Potential nesting tree
615	432015.82	6311733.21	*Corymbia calophylla*	93	25+	Potential nesting tree
616	432016.34	6311737.25	*Corymbia calophylla*	59	25+	Potential nesting tree
617	432155.46	6311512.21	*Corymbia calophylla*	229	25+	Potential nesting tree
618	432184.34	6311546.09	*Corymbia calophylla*	70	15-20	Potential nesting tree
619	432188.55	6311541.72	*Corymbia calophylla*	58	15-20	Potential nesting tree
620	432198.60	6311536.05	*Corymbia calophylla*	52	20-25	Potential nesting tree
621	432199.06	6311529.36	*Corymbia calophylla*	69	20-25	Potential nesting tree
622	432201.50	6311524.56	*Eucalyptus marginata*	63	10-15	Potential nesting tree
623	432201.65	6311520.40	*Corymbia calophylla*	67	0-10	Hollow-bearing tree; potential nesting tree
624	432201.73	6311548.95	*Corymbia calophylla*	68	15-20	Potential nesting tree
625	432202.72	6311567.81	*Corymbia calophylla*	59	10-15	Potential nesting tree
626	432203.65	6311558.95	*Eucalyptus marginata*	79	25+	Potential nesting tree
627	432206.83	6311592.74	*Corymbia calophylla*	92	25+	Potential nesting tree
628	432207.90	6311586.38	*Eucalyptus marginata*	86	20-25	Potential nesting tree
629	432208.53	6311514.21	*Eucalyptus marginata*	56	20-25	Potential nesting tree
630	432210.99	6311590.07	*Corymbia calophylla*	92	25+	Potential nesting tree
631	432213.43	6311550.74	*Eucalyptus marginata*	51	20-25	Potential nesting tree
632	432216.73	6311514.61	*Corymbia calophylla*	53	20-25	Potential nesting tree
633	432217.81	6311539.72	*Corymbia calophylla*	65	20-25	Potential nesting tree
634	432221.10	6311586.49	*Corymbia calophylla*	56	25+	Potential nesting tree
635	432221.42	6311529.30	*Corymbia calophylla*	54	20-25	Potential nesting tree
636	432221.61	6311595.16	*Corymbia calophylla*	57	25+	Potential nesting tree
637	432222.55	6311549.64	*Corymbia calophylla*	58	20-25	Potential nesting tree
638	432223.11	6311521.52	*Corymbia calophylla*	54	10-15	Potential nesting tree
639	432223.54	6311590.29	*Eucalyptus marginata*	75	25+	Potential nesting tree
640	432223.59	6311517.97	*Corymbia calophylla*	86	25+	Potential nesting tree
641	432224.37	6311562.58	*Eucalyptus marginata*	53	15-20	Potential nesting tree
642	432224.65	6311533.45	*Corymbia calophylla*	62	25+	Potential nesting tree
643	432228.35	6311587.16	*Eucalyptus marginata*	61	20-25	Potential nesting tree
644	432228.68	6311568.95	*Corymbia calophylla*	61	20-25	Potential nesting tree
645	432229.58	6311505.34	*Corymbia calophylla*	65	25+	Potential nesting tree
646	432230.08	6311555.95	*Corymbia calophylla*	75	25+	Potential nesting tree
647	432230.72	6311578.96	*Eucalyptus marginata*	50	15-20	Potential nesting tree
648	432231.58	6311526.48	*Corymbia calophylla*	58	25+	Potential nesting tree

Tree ID	Easting	Northing	Tree Species	DBH (cm)	Tree Height (m)	Status
649	432234.18	6311581.23	*Corymbia calophylla*	58	20-25	Potential nesting tree
650	432234.97	6311586.95	*Corymbia calophylla*	68	25+	Potential nesting tree