S2/S7 Future Waste Rock Landform
Terrestrial Vertebrate Fauna Survey

Prepared for Talison Lithium
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EXECUTIVE SUMMARY

Talison Lithium Pty Ltd (Talison) currently operates a lithium mine at Greenbushes, situated approximately 250 km south of Perth in south-west Western Australia. Talison is proposing to increase output from the Greenbushes Mine and has proposed the Future S2/S7 Waste Rock Landform to accommodate storage of waste rock from mining operations; herein this is referred to as the 'study area'. To support environmental approvals, Onshore Environmental Consultants Pty Ltd (Onshore Environmental) was commissioned by Talison to review data from all previous fauna surveys, and undertake a reconnaissance field survey to previous findings and complete additional targeted searches for conservation significant fauna.

Previous survey work within the study area included a recent two phase detailed vertebrate fauna survey in October 2022 and April 2023, as well as three basic level fauna surveys and five targeted fauna surveys (including black cockatoo habitat assessments) undertaken between 2011 and 2024.

There was a total of 87 vertebrate fauna species recorded from the study area, including one amphibian, 13 reptiles, 55 birds and 18 mammals.

Three vertebrate fauna species were listed under the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) and the Western Australian *Biodiversity Conservation Act 2016* (BC Act): Baudin's Black Cockatoo *(Zanda baudinii)* and Carnaby's Black Cockatoo *(Zanda latirostris)* are both listed as Endangered, and Forest Red-tailed Black-Cockatoo *(Calyptorhynchus banksii naso)* is listed as Vulnerable.

One additional species listed as Conservation Dependant under the BC Act was recorded from the study area; South-western Brush-tailed Phascogale *(Phascogale tapoatafa wambenger).* Additionally, two Priority 4 fauna species, as recognised by the Department of Biodiversity Conservation and Attractions (DBCA) were recorded: Quenda (*Isoodon fusciventer*) and Western Brush Wallaby *(Notamacropus irma).*

The total fauna included five introduced fauna species (feral animals); European Rabbit (*Oryctolagus cuniculus*), Red Fox (*Vulpes vulpes),* House Mouse (*Mus musculus*), Cat (*Felis catus*) and Pig *(Sus scrofa).*

There was one species determined as likely to occur within the study area during the desktop and literature review: Chuditch, listed as Vulnerable under the EPBC Act and BC Act. However, despite nine fauna surveys intersecting the study area including a two phase detailed fauna survey, and a total of 61 motion sensor cameras installed to monitor fauna movements, there was no evidence of Chuditch.

One naturally occurring fauna habitat occurred within the study area: Jarrah-Marri forest on Hillslopes. This habitat was not determined to be regionally or locally restricted. The study area also included areas of cleared annual pasture (farmland paddocks) that had minimal value as habitat for native fauna. The Jarrah-Marri forest on Hillslopes habitat was deemed to be high quality foraging habitat for all three species of cockatoo. Two known nesting trees and 13 suitable nesting trees were recorded within the study area.

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1.0 INTRODUCTION

1.1 Background

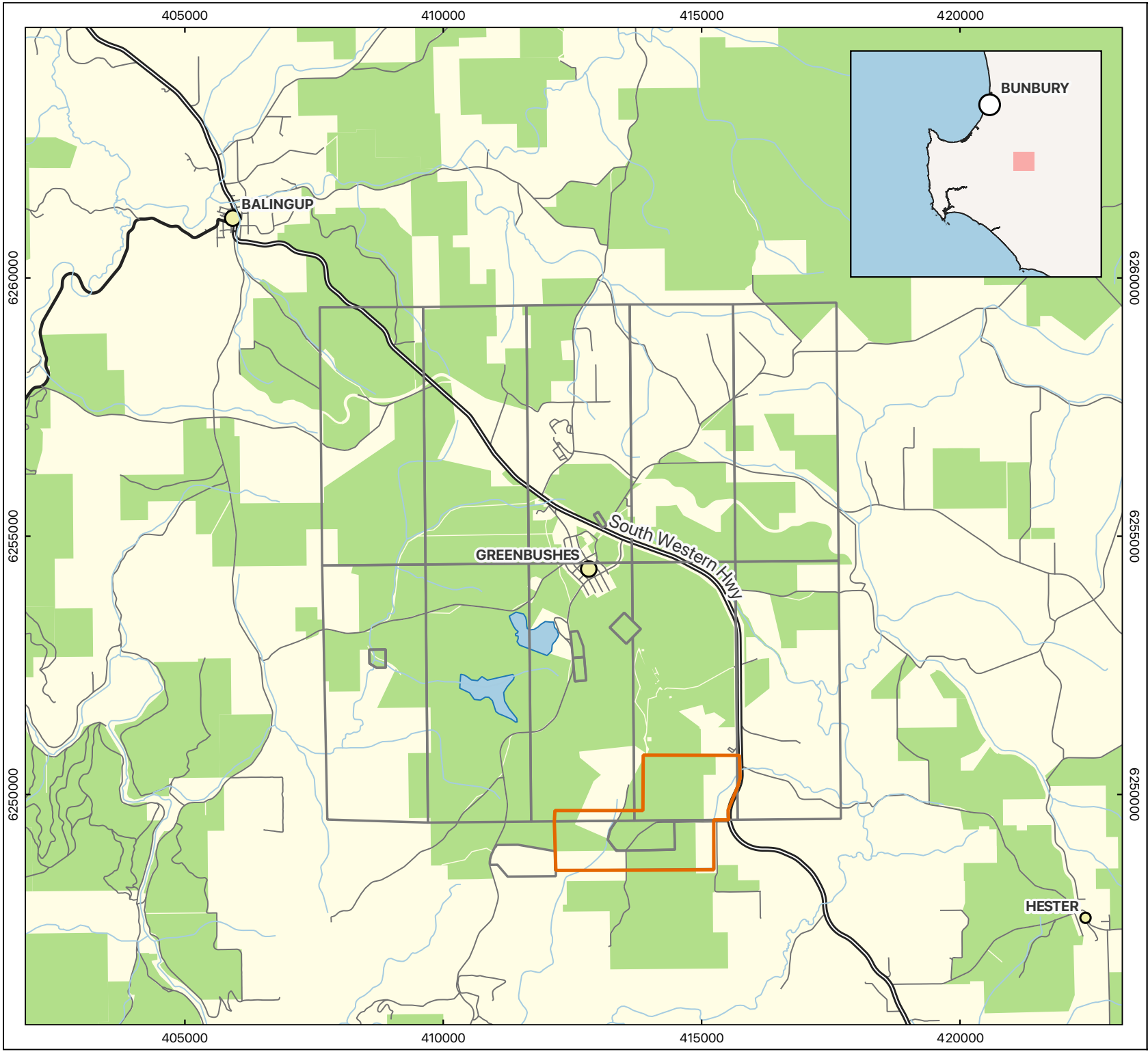
Talison is a Western Australian mining company with operations based adjacent to the town of Greenbushes in south-west Western Australia. The Greenbushes Mine is located approximately 250 km south of Perth and 80 km south-east of the port of Bunbury (Figure 1). The site comprises a number of open cut mining operations for tantalum, tin and spodumene (lithium). An underground tantalum operation has also been developed but is currently under care and maintenance. The Greenbushes pegmatitie is the world's largest hard rock tantalum resource and the largest and highest-grade lithium minerals resource in the world. Minerals produced at Talison's Greenbushes Mine can be found in many different applications including mobile phones, computers, surgical implants, electronic devices, glassware, ceramics and batteries.

Talison is proposing an expansion at the Greenbushes Mine aimed at increasing supply of lithium to the world market. Longer term mine planning has identified the requirement for additional storage capacity for waste rock from mining operations and construction of the Future S2/S7 Waste Rock Landform, herein referred to as the study area. The study area is located to the east and south of tailings storage facility (TSF) cells 1 and 4, and extends south of the existing approved Mine Development Envelope (MDE) onto privately owned farmland (to the west) and into the Greenbushes and Hester State Forest blocks (to the east) (Figure 1).

A two phase detailed vertebrate fauna survey was recently completed across a large portion of the study area supporting native vegetation (Onshore Environmental 2023), with three basic level fauna surveys (Onshore Environmental 2019b, 2022b, Biologic 2011) and five targeted fauna surveys (including black cockatoo habitat assessments) covering the remaining areas (Kirkby 2018, Harewood 2018a, Biologic 2018b, Onshore Environmental 2022a, 2023b).

1.2 Survey Objective

To support future environmental approvals, Onshore Environmental was commissioned by Talison to undertake a basic level vertebrate fauna survey aimed at collating data from all previous survey work within the revised study area boundary, and undertaking a reconnaissance field survey to review currency of previously recorded data. It is noted that access onto the privately owned farmland lot in the southwest sector was not granted.



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TALISON LITHIUM
S2S7 Future Waste Rock Landform

Figure 1
Location of Study Area

Legend

- S2S7 Study Area
- Talison Lithium Tenements
- State Forest

0 1 2 3 4 km

1:100,000

Datum: GDA 94
Projection: MGA Zone 50

Date: 14/06/2024
Status: Final
Figure: 1
Sheet Size: A4
File Name Reference: TA_S2S7_Fig1_location.pdf
Drawn by: JW
Requested by: DB

2.0 EXISTING ENVIRONMENT

2.1 Climate

The study area occurs on a boundary between the dry Mediterranean region to the north which experiences six dry months per year, and the moderate Mediterranean region to the south which experiences four dry months per year (Beard 1981). The Greenbushes region has cool wet winters and hot dry summers. Average annual rainfall for the town of Greenbushes is 923.0 mm (1893-2021) (Bureau of Meteorology [BOM] 2024), with the majority of falls occurring during the winter months of June and July associated with cold fronts moving across the south-west of Western Australia. No rainfall data from 2022 onwards was recorded at the Greenbushes weather station. The nearest available rainfall data is from Bridgetown (approximately 10 km south-east of the study area). Average annual rainfall for Bridgetown is 723.4 mm (1998-2024) (Bureau of Meteorology [BOM] 2024).

Annual rainfall at Bridgetown between 2018 and 2023 has ranged from 585.4 mm to 945.2 mm, with four of the six years recording below average annual totals. The 2023/2024 Summer and Autumn period at Bridgetown was very dry with just 7.6 mm recorded for the five-months from December 2023 to April 2024, compared to the long-term average of 114.5 mm for the same period (Figure 2).

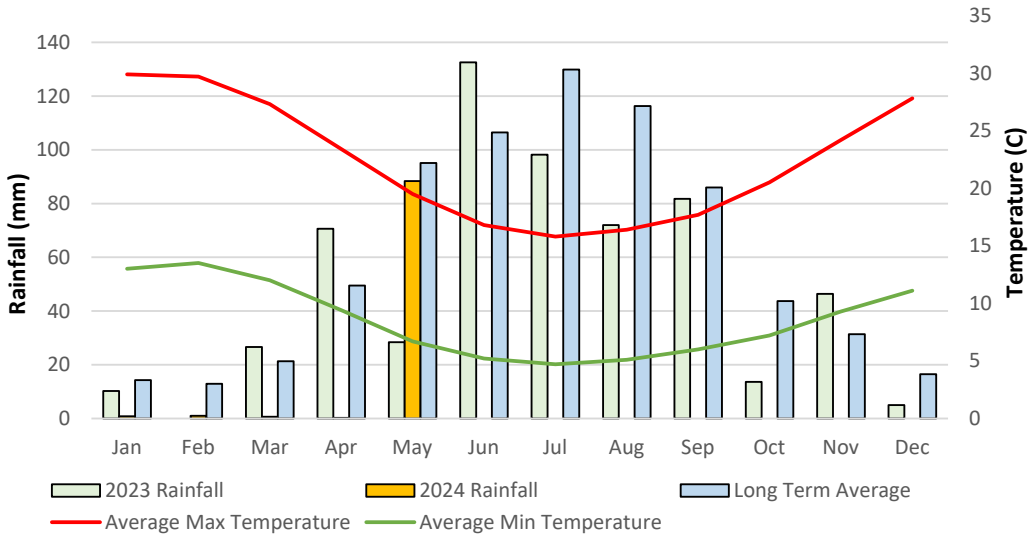


Figure 2 Rainfall and temperature data from the Bridgetown Weather Station (Bureau of Meteorology 2024).

2.2 Biogeographic Regions

The latest version of the Interim Biogeographic Regionalisation for Australia divides Australia into 89 bioregions based on climate, geology, landform, native vegetation and species information, and includes 419 sub-regions (Department of the Environment and Energy 2013). The bioregions and sub-regions are the reporting unit for assessing the status of native ecosystems and their level of protection in the National Reserve System. The study area is

located within the Southern Jarrah Forest (JF2) sub-region within the Jarrah Forest bioregion. The Southern Jarrah Forest sub-region is described as "Duricrusted plateau of Yilgarn Craton characterised by Jarrah-Marri forest on laterite gravels and, in the eastern part, by Marri-Wandoo woodlands 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" (Hearn *et al*. 2002). The vegetation of the sub-region is described as "Jarrah-Marri forest in the west grading to Marri and Wandoo woodlands in the east. There are extensive areas of swamp vegetation in the south-east, dominated by Paperbarks and Swamp Yate. The understorey component of the forest and woodland reflects the more mesic nature of this area. The majority of the diversity in the communities occurs on the lower slopes or near granite soils where there are rapid changes in site conditions" (Hearn *et al*. 2002).

2.3 Land Use

The major land uses in the Greenbushes region are state forest, residential, mining and agriculture. The study area intersects the Greenbushes State Forest, with the northern sector excised for the current MDE. There are privately owned rural lots occurring in the eastern, and south-western sectors of the study area, all predominantly cleared for annual pasture. Nearby towns include Bridgetown (10 km to the south-east) and Balingup (10 km to the north-west).

2.4 Landforms and Soils

Tille (1996) has mapped soils of the Wellington-Blackwood District, which includes the town sites of Greenbushes and Bridgetown on its southern boundary. The study area occurs within the Hester Sub-system of the Darling Plateau System, and consists of undulating ridges and hill crests formed on laterite and gneiss which typically slope downwards off the main plateau into the surrounding Lowden Valleys System. The soils are mostly loamy gravels, sandy gravels and loamy earths.

2.5 Flora and Vegetation

The study area occurs in the Menzies Sub-district of the Darling Botanical District, in the South-West Botanical Province (Beard 1981). The Menzies Sub-district (southern jarrah forest) covers a total area of 26,572 km^2, of which 18,715 km^2 (70%) originally supported jarrah and jarrah-marri forest (Beard 1990). It is estimated that approximately 61% of the total area has been cleared since European settlement, mainly in the valleys, which are free of laterite, leaving the forest intact on laterised higher plateau levels.

The Menzies Sub-district is characterised by Jarrah stands on laterite with some Marri *(Corymbia calophylla)* and Wandoo (*Eucalyptus wandoo*) woodlands. Valley soils are often richer and Blackbutt (*Eucalyptus patens)* is more dominant in these areas. Flooded Gum (*Eucalyptus rudis)* is common along stream banks and Bullich (*Eucalyptus megacarpa)* is also present in some areas. Within the Greenbushes area vegetation is dominated by Jarrah *(Eucalyptus marginata)* and Marri forest over the tall shrubs bull banksia *(Banksia grandis)* and snotty gobble *(Persoonia longifolia).* The lower understorey strata generally contains a range of plant genera including *Hakea, Acacia, Xanthorrhoea, Adenanthos, Hovea,*

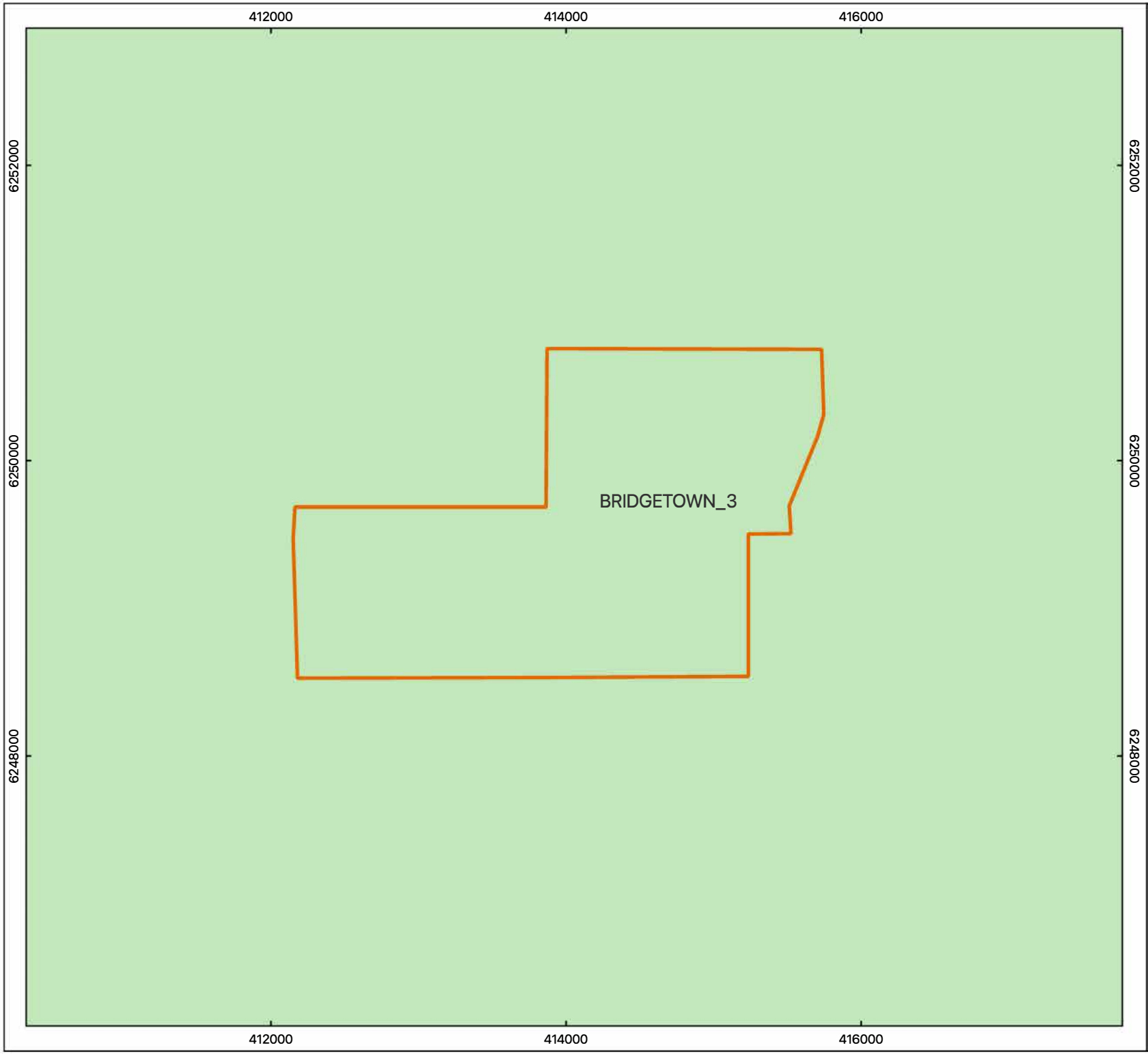
Macrozamia, Leucopogon, Bossiaea, Daviesia, Grevillea, Patersonia, Styphelia and *Kennedia.*

Vegetation of the study area was mapped by Beard during mapping of the Swan area (Beard 1981, Figure 3). Vegetation forms part of the Bridgetown 3 vegetation association described as Medium Jarrah-Marri forest.

Vegetation complexes of the southern jarrah forest have most recently been defined by Heddle *et al.* (1980) and updated by Mattiske and Havel (1998). Mattiske and Havel (1998) describe the study area as occurring within the Dwellingup, Hester, Catterick and Grimwade complexes (Table 1, Figure 4). Vegetation of these complexes is generally Open Forest of *Eucalyptus marginata* subsp. *marginata-Corymbia calophylla* on lateritic uplands with *Eucalyptus rudis* and *Banksia littoralis* on valley floors.

Table 1 Vegetation complexes occurring within the study area (Mattiske and Havel 1998).

Complex	Description
Dwellingup	Open forest of *Eucalyptus marginata* subsp. *marginata-Corymbia calophylla* on lateritic uplands in mainly humid and subhumid zones.
Hester	Tall open forest to open forest of *Eucalyptus marginata* subsp. *marginata-Corymbia calophylla* on lateritic uplands in perhumid and humid zones.
Catterick	Open forest of *Eucalyptus marginata* subsp. *marginata-Corymbia calophylla* mixed with *Eucalyptus patens* on slopes, *Eucalyptus rudis* and *Banksia littoralis* on valley floors in the humid zone.
Grimwade	Tall open forest to open forest of *Corymbia calophylla-Eucalyptus marginata* subsp. *marginata* with *Eucalyptus patens* on slopes and *Eucalyptus rudis* over some *Agonis flexuosa* on lower slopes in the humid zone.



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TALISON LITHIUM
S2S7 Future Waste Rock Landform

Figure 3
Beard (1981) vegetation associations represented within the study area

Legend

S2 S7 Study Area

Bread Vegetation Associations

BRIDGETOWN_3

0 0.5 1 1.5 km

1:35,000

Datum: GDA 94
Projection: MGA Zone 50

Date: 14/06/2024
Status: Final
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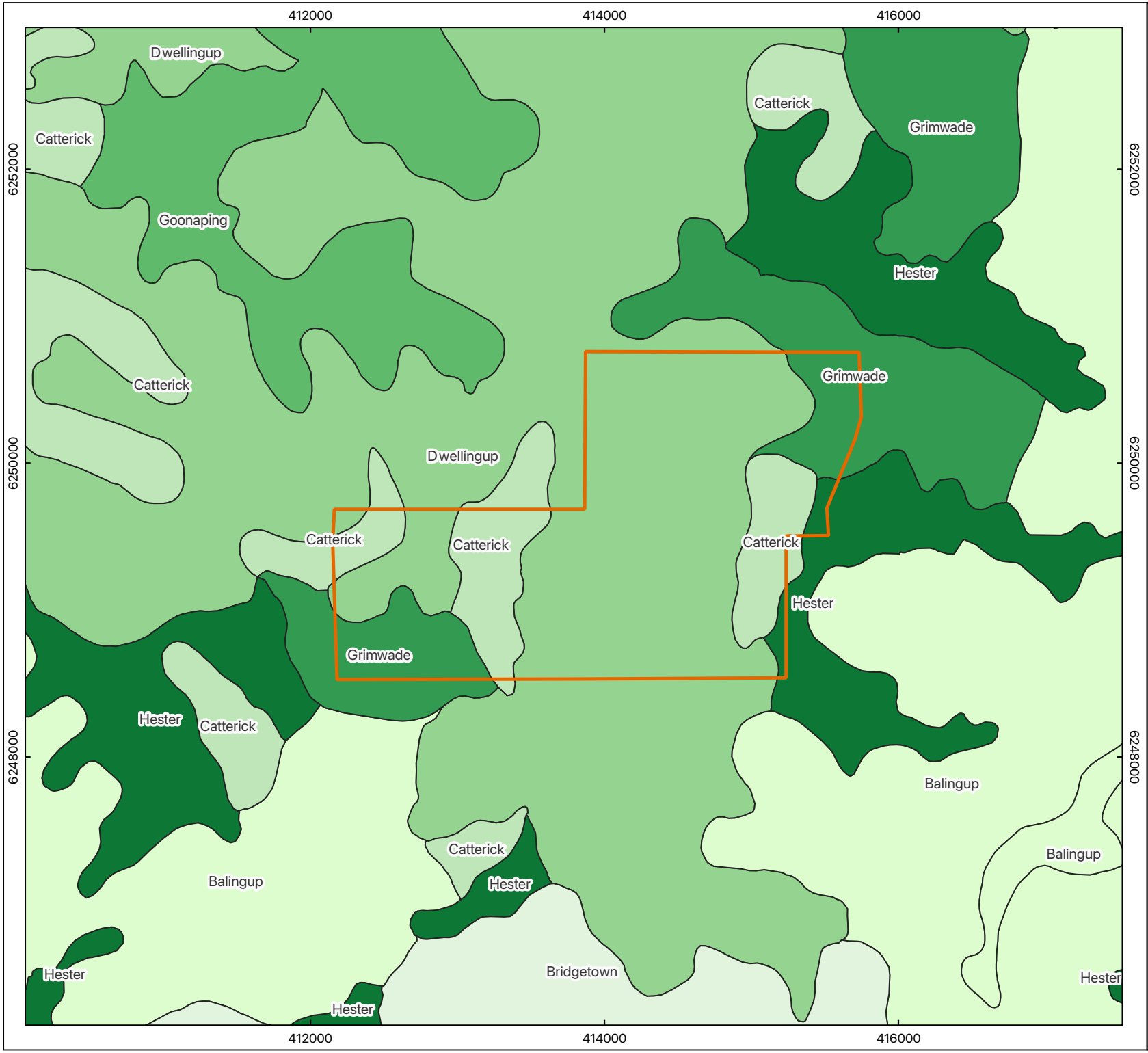

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TALISON LITHIUM
S2S7 Future Waste Rock Landform

Figure 4
Mattiske and Havel (1998) vegetation complexes represented within the study area

Legend

- S2 S7 Study Area

Vegetation Complexes

- Balingup
- Catterick
- Dwellingup
- Goonaping
- Grimwade
- Hester

0 0.5 1 1.5 km

1:35,156

Datum: GDA 94
Projection: MGA Zone 50

Date: 14/06/2024
Status: Final
Figure: 4
Sheet Size: A4
File Name Reference: TA_S2S7_Fig5_mattiske.pdf
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Requested by: DB

3.0 METHODOLOGY

3.1 Legislation and Guidance Statements

The vertebrate fauna survey was carried out in a manner that was compliant with EPA requirements for the environmental surveying and reporting of vertebrate fauna in Western Australia:

- Statement of Environmental Principles, Factors and Objectives (EPA 2020a);
- Technical Guidance - Terrestrial vertebrate fauna surveys for environmental impact assessment (EPA 2020b); and
- Environmental Factor Guideline Terrestrial Fauna (EPA 2016).

Other guidelines relevant to the survey include:

- Department of the Environment, Water, Heritage and the Arts (DEWHA) (2010a) Survey Guidelines for Australia's Threatened Bats;
- DEWHA (2010b) Survey Guidelines for Australia's Threatened Birds;
- DCCEEW (2022) Referral guidelines for three WA threatened black cockatoo species;
- DEWHA (2010c) Survey Guidelines for Australia's Threatened Frogs;
- Department of Sustainability, Environment, Water, Population and Communities (DSEWPC) (2011a) Survey Guidelines for Australia's Threatened Mammals; and
- DSEWPC (2011b) Survey Guidelines for Australia's Threatened Reptiles.

3.2 Desktop Assessment

3.2.1 Literature Review

A review of all relevant publicly available literature in close proximity to the study area was undertaken, including a search of the Department of Water and Environmental Regulation's Index of Biodiversity Surveys for Assessment (DWER 2022). Previous surveys were reviewed to provide context for the survey and to inform an assessment of habitat types potentially occurring within the study area.

Nine previous fauna surveys intersect the study area, including detailed, basic and targeted level surveys (Biologic 2011, 2018b, Kirkby 2018, Harewood 2018a, Onshore Environmental 2019b, 2022a, 2022b, 2023a, 2023b). The current fauna survey has collated relevant data from the nine previous surveys, and included a reconnaissance level field survey component aimed at updating previous mapping content. It also included additional targeted conservation significant fauna searches using infra-red motion sensor cameras. Results from all previous surveys are described in more detail in Section 4.1.1.

In addition to the above fauna survey work, Onshore Environmental has recently undertaken a flora and vegetation survey within the study area (Onshore Environmental 2024e). This survey provided fine-scale vegetation type mapping which was used to inform fauna habitat mapping and the positioning of motion sensor cameras during the May 2024 field assessment.

3.2.2 Database Searches

The desktop assessment included searches of several databases relating to significant fauna previously collected or described within, or in close proximity to, the study area. For this report the search was extended beyond the study area to place fauna values into a local and regional context. The following databases were searched:

- DBCA Threatened and Priority Fauna database search (30 km radial search);
- EPBC Act Protected Matters database (50 km radial search);
- DBCA Dandjoo Biodiversity Repository (50 km radial search);
- BirdLife Australia's Birdata dataset (50 km radial search); and
- Atlas of Living Australia database (50 km radial search).

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

3.2.3 Assessment of Likelihood of Occurrence in the Study Area

A list of conservation significant species occurring within a 50 km radius of the study area was compiled from the above database searches and literature review. The likelihood of each conservation significant species occurring within the study area was assessed based on habitat availability, the age, proximity and number of previous records, previous assessments and the regional occurrence of the species. Habitat availability and suitability was assessed based on aerial imagery and previous knowledge of the study area and surrounds.

3.2.4 Assessment of Conservation Significance

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

International Level:

- IUCN: The IUCN 'Red List' lists species at risk under nine categories (status codes) (Appendix 1); and
- International Conventions: Migratory taxa listed under the Japan-Australia Migratory Bird Agreement (JAMBA), China-Australia Migratory Bird Agreement (CAMBA), Republic of Korea-Australia Migratory Bird Agreement (ROKAMBA), and Convention on the Conservation of Migratory Species of Wild Animals (Bonn Convention).

Commonwealth Level:

- EPBC Act: The Department of Climate Change, Energy, the Environment and Water (DCCEEW) lists Threatened fauna, which are determined by the Threatened Species Scientific Committee according to criteria set out in the Act. The Act lists fauna that are considered to be of conservation significance under one of six categories (Appendix 1).

State Level:

- BC Act: At a State level, native fauna species are protected under the BC Act - Wildlife Conservation Notice. Species are assigned a level of conservation significance based on the number of known populations and the perceived threats to these locations (Appendix 1); and

- DBCA Priority list: DBCA produces a list of Priority species that have not been assigned statutory protection under the BC Act. Possibly threatened species that do not meet survey criteria, or are otherwise data deficient, are added under Priorities 1, 2 or 3. Species that are adequately known, are rare but not threatened, or meet criteria for near threatened, or that have been removed from the threatened species list for other taxonomic reasons, are placed in Priority 4. These species require regular monitoring (see Appendix 1).

Local Level:

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

3.3 Survey Methodology

3.3.1 Timing

There have been nine fauna surveys undertaken between October 2011 and October 2023 that intersect with the study area. They include a two phase detailed survey, three basic level surveys, and five targeted surveys. They are described in more detail in Section 4.1.1. The timing of the surveys are listed below:

- 13-17 October 2011 (Biologic 2011);
- 22 January - 12 February 2018 (Kirkby 2018);
- 12 - 21 February 2018 (Biologic 2018b);
- 11 - 19 June 2018 (Harewood 2018a);
- 4 - 7 October 2018 (Onshore Environmental 2019b);
- 26 October - 2 November, 29 November 2021 (Onshore Environmental 2022b);
- 22 August 2022 (Onshore Environmental 2022a);
- 18-28 October 2022, 12-20 April 2023 (Onshore Environmental 2023a); and
- 10 October 2023 (Onshore Environmental 2023b).

The current fauna assessment was completed between the 15th and 16th of May 2024, noting that motion sensor cameras remained in place through to the 19th of June 2024.

3.3.2 Surveying of Study Area

The combination of fauna surveys employed a variety of systematic and opportunistic sampling techniques. Systematic sampling refers to data methodically collected over a fixed time period in a discrete habitat type, using an equal or standardised sampling effort. Opportunistic sampling includes data collected non-systematically within and outside fixed sampling sites. Sampling techniques included a combination of trapping, opportunistic searching, bird censusing, nocturnal surveying, and specialist equipment that included bioacoustics audio recorders (to detect bat echolocation calls) and infra-red motion sensor cameras.

The entire study area was ground truthed and assessed on multiple occasions to document habitat characteristics and record any observations of fauna species via primary or secondary

evidence. Targeted searches (as detailed below) were also undertaken for conservation significant fauna species identified during the database review.

3.3.3 Targeted Fauna Searches

Targeted searches were undertaken for conservation significant fauna species throughout the study area. The study area was traversed on foot, providing an opportunity to opportunistically record evidence of Threatened and Priority listed fauna and undertake closer examination of specific habitat features likely to support conservation significant fauna. The following parameters were recorded for all conservation significant fauna:

- Co-ordinate location;
- Description of habitat in which the species was located; and
- Photograph of the species, evidence of species and/or habitat.

Further details of specific methods used to target conservation significant species are described below.

3.3.4 Camera Traps

Motion cameras were set up throughout the study area. Cameras were strategically placed to target habitat features that were most likely to be utilised by species of conservation significance, including potential den sites (Chuditch), trees with suitable hollows (Phascogales), and dense undergrowth in drainage areas (Quenda). Motion cameras were baited with universal bait. A total of 61 motion sensor cameras were installed throughout the study area between 2011 and 2024 (Figure 5).

3.3.5 Trapping Program

A two phase detailed vertebrate fauna survey was undertaken in 18-28 October 2022 and 12-20 April 2023 (Onshore Environmental 2023a) Two trapping sites were established targeting high quality habitat with consideration of habitat features likely to support a variety of species. Each trapping site consisted of split trap lines comprising five drift fences. Trap lines were split to provide greater spatial representation within the habitat and to target areas of high-quality microhabitats (i.e. areas with shade, dense vegetation cover, logs and leaf litter cover). Each drift fence comprised two pit-fall traps (20 litre buckets), two funnel traps and one small Elliot (Elliot A) trap. Pit fall traps were located approximately four meters apart, with funnels at each end of the drift fence. A small Elliot trap was strategically located at each trap line. Funnel traps were covered with branches and debris was placed in the bottom of pit fall traps to provide shade for captures. Debris was also used to provide refuges for captures from rising water within pitfall traps when significant rainfall was expected. Traps were checked early in the day and were cleared within four hours of sunrise.

A total of 50 traps (20 pit-falls, 20 funnel and 10 small Elliot) were deployed for eight nights at Site 1 and seven nights at Site 2 during the first phase of the survey. Ten additional small Elliot traps were deployed situated between the two sites during the first phase of the survey. The additional traps were set primarily to target Brush-tailed Phascogales and were deployed for five nights. The same two trap sites with a total of 50 traps were deployed for eight nights during the second phase of the survey. There were no additional traps deployed during the second phase of the survey.

3.3.6 Fauna Habitat Mapping

Habitat assessments were undertaken throughout the study area to document habitat characteristics and map the fauna habitat types. The fauna habitat mapping utilised high-resolution aerial photography of the study area at a scale of 1:10,000. Ground-truthing of the study area was completed during the survey with habitat characteristics recorded. Vegetation type mapping undertaken by Onshore Environmental during a previous flora and vegetation survey was utilised to further aid in characterising habitat mapping across the full extent of the study area (Onshore Environmental 2022a). The suitability of habitat and presence of habitat features for species of conservation significance was noted as part of the habitat assessment.

3.3.7 Assessment of Black Cockatoo Breeding Habitat

The DCCEEW provides guidelines for the study of actions that may result in impact to black cockatoos (for assessment under the EPBC Act). The survey and analysis reported here has been conducted with reference to the existing guidelines (DAWE 2022).

The suitability of habitat for breeding was assessed by recording known, suitable and potential nesting trees for black cockatoos within the study area. A ranking system developed by Onshore Environmental was utilised, with scores later converted to match categories as described within the EPBC Act referral guidelines for black cockatoos (DAWE 2022, Table 2). The field survey focused on identifying breeding habitat for black cockatoos assessed by targeting habitat trees that had a diameter at breast height (DBH) of 50 cm or greater (or 30 cm or greater for *Eucalyptus wandoo)*. Due to the large size of the study area all trees >50 cm were not identified and marked. The survey focused on identifying trees of a size and structure likely to support large hollows. Target tree species included Marri, Jarrah and any other *Corymbia* and *Eucalyptus* species of a suitable size. Large trees with the potential to contain hollows were marked using a handheld GPS. These trees were examined using binoculars to identify the presence of hollows and evidence of use by black cockatoos (e.g. chewing around hollow entrance, scarring and scratch marks on trunks and branches).

Where suitable or chewed hollows were identified, trees were further inspected using a drone where possible to further assess the suitability of hollows for nesting and to confirm signs of use. The following data was recorded:

- tree location;
- tree species;
- DBH; and
- Nest tree rank and corresponding category defined in the EPBC Act referral guidelines for black cockatoos (DAWE 2022, Table 2).

Additionally, in order to determine approximate densities of potential future breeding habitat (i.e. trees with a DBH ≥50 cm, or ≥30 cm for *Eucalyptus wandoo*), tree counts were conducted at randomly located points within the study area. Tree counts provide an indication of the current and future value of fauna habitats for use as black cockatoo breeding habitat. Tree counts were conducted within a 0.25 hectare area and tree numbers within these areas were then extrapolated to provide an average density per hectare.

Table 2 **Ranking system used for the assessment of potential nest trees for black cockatoos** (adapted from Bamford Consulting Ecologists 2020) and equivalent category defined in the federal referral guideline (DAWE 2022).

Adapted from Bamford Consulting Ecologists (2020)		**Referral guideline for 3 WA threatened black cockatoo species (DAWE 2022)**	
Category	**Description**	**Category**	**Description**
Used	Black cockatoo breeding activity recorded	Known nesting trees	Trees (live or dead but still standing) which contains a hollow where black cockatoo breeding has been recorded or which demonstrates evidence of breeding (i.e. showing evidence of use through scratches, chew marks or feathers).
Chewed	Hollow of suitable size and orientation for use by black cockatoos and shows evidence of chew marks on edge of hollow or trunk indicating likely recent or historical usage.		
Suitable	Tree with a hollow of suitable size and orientation considered to be of sufficient depth for use by black cockatoos. However, there is no evidence of use.	Suitable nesting trees	Trees with suitable nesting hollows present, although no evidence of use. Note that any species of tree may develop suitable hollows for breeding.
		Suitable nest hollow	Any hollow with dimensions suitable for use for nesting by black cockatoos. Characteristics of hollows used by each species is available in the SPRAT database. Suitable nest hollows are only found in live trees with a DBH of at least 500 mm.
Potentially suitable	Tree contains a hollow that is potentially suitable for nesting i.e. diameter of 10 cm or greater. However, these hollows are considered unlikely to be used by black cockatoos as nesting sites for one or more of the following reasons: • small entrance (generally <20cm); • deemed unlikely to have a large internal space for nesting, or sufficient depth inside the hollow (i.e. less than 0.5 m); • evidence of use by other competitive species i.e. bees or other birds; • orientation of the hollow; • and/or the presence of branches or other obstructions. While these hollows are not currently high-quality nest sites they have the potential to become nest sites in the future and may support other species of conservation significance.	Potential nesting trees	Trees that have a suitable DBH to develop a nest hollow, but do not currently have hollows. Trees suitable to develop a nest hollow in the future are 300-500 mm DBH. Note that many species of eucalypt may develop suitable hollows for breeding.
Unsuitable	Tree contains hollows unsuitable for nesting due to hollow entrance diameter <10cm or hollow examined by drone and determined to be unsuitable for nesting. These hollows may be utilised by other species and have the potential to become black cockatoo nest sites in the longer term.		

3.3.8 Assessment of Black Cockatoo Foraging Habitat

Vegetation within the study area was assessed for foraging value. Black cockatoos forage widely in suitable vegetation in the southwest region and leave distinctive marks on dropped feeding material such as Marri fruit. Targeted searches were made for these signs throughout the study area, and the location of recent feeding residue was recorded. Results from the field survey were used to calculate foraging habitat scores using the foraging quality scoring tool template recommended within the EPBC Act referral guidelines for Black-Cockatoos (DAWE 2022).

The foraging quality scoring tool has been developed to allow habitat quality to be quantified. The tool identifies habitat as high-quality foraging habitat (score of 5-10) or lower quality foraging habitat (score of 0-4). If the survey area contains native vegetation used for foraging at any time by one or more of the black cockatoo species, and is larger than one hectare in size, it is considered at face value to be of very high quality, important for recovery and therefore as having a score of ten. The scoring tool then considers the following five contextual factors that may lessen the quality of that habitat (Appendix 2):

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

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

3.3.9 Survey Constraints

The EPA Technical Guidance (EPA 2020b) list potential limitations that field surveys may encounter. Limitations associated with the detailed vertebrate fauna survey are addressed in Table 3.

Table 3 Relevance of limitations, as identified by EPA (2020b), to the vertebrate fauna survey.

Variable	Impact on Survey Outcomes
Availability of data and information	NOT A LIMITATION The desktop searches provided an extensive species list, background information and regional context for the study area. Numerous fauna surveys have been completed in close proximity to the study area, including basic level surveys previously completed by Onshore Environmental in surrounding areas. No significant issues with the reliability or accuracy of the desktop searches or previous surveys were identified. However, it is acknowledged that there may be errors in the data presented from these sources. Where required species lists from previous surveys and database searches were reviewed and nomenclature and conservation significance were updated.

Variable	Impact on Survey Outcomes
Experience levels	NOT A LIMITATION The personnel who executed the field survey work are practitioners suitably qualified in their respective fields; Mr Mike Brown (Principal Zoologist >fifteen years' experience) and Ms Jessica Waters (Principal Ecologist >10 years' experience). Both have undertaken numerous surveys in close proximity to the study area and throughout Western Australia.
Scope (fauna groups sampled)	NOT A LIMITATION The study area has been covered by a two phase detailed fauna survey, three basic level fauna surveys, and five targeted fauna surveys across a variety of seasonal conditions between 2011 and 2024. It represents a comprehensive scope that has recorded consistent results throughout.
Timing, weather, and season	NOT A LIMITATION The study area has included nine fauna surveys conducted across a variety of seasonal conditions between 2011 and 2024. The first phase of the detailed fauna survey was undertaken in October 2022 which was within the primary survey period for the region for reptiles, birds and mammals (EPA 2020b). The second phase of the detailed survey was undertaken in April 2023.
Disturbance to site which may affect survey results	NOT A LIMITATION None of the disturbances within the study area were a constraint to the completeness of the survey.
Adequacy of the survey intensity and proportion of survey achieved	NOT A LIMITATION There were nine fauna surveys completed including a detailed level survey, three basic level surveys and five targeted surveys. The detailed survey was completed over two phases with seven or eight nights for all sites as recommended under the technical guidelines (EPA 2020b). Additional tasks completed from the scope of works included camera trapping, nocturnal surveys, bioacoustics recordings and habitat mapping across the extent of the study area.
Remoteness and/or access	NOT A LIMITATION The majority of the study area was accessible by vehicle and on foot. It is noted that access onto the privately owned farmland lot in the south-west sector was not granted.
Proportion of fauna identified, recorded or collected	NOT A LIMITATION A large proportion of the total fauna present is likely to have been recorded within the study area given the high number of surveys completed (nine) over a relatively period of time (2011-2024).
Problems with data and analysis, including sampling biases	NOT A LIMITATION There were no problems encountered with the collection or analysis of survey data. All previous survey data recorded at the Greenbushes mining operations has recently been collated into a single consistent database which will vastly improve the ability to analyse data and identify trends.

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S2/7 Future Waste Rock Landform

Figure 5
Location of trap sites and motion sensor cameras within the study area

Legend

- S2S7 Study Area
- Sampling Locations

0 250 500 750 m

1:20,000

Datum: GDA 94
Projection: MGA Zone 50

Date: 29/06/2024
Status: Final
Figure: 5
Sheet Size: A4
File Name Reference: TA_S2S7_Fig5_sample_sites.pdf
Drawn by: JW
Requested by: DB

4.0 RESULTS

4.1 Desktop Review

4.1.1 Previous Fauna Surveys

Twenty fauna-related surveys have been completed within the active mining area and surrounding leases held by Talison between 2011 and 2024 (Table 4, Figure 6). Nine of the surveys intersect the current study area (Biologic 2011, 2018b, Kirkby 2018, Harewood 2018a, Onshore Environmental 2019b, 2022a, 2022b, 2023a, 2023b). The results from previous vertebrate fauna surveys completed within the vicinity of the study area are summarised below and presented in Table 4.

Black Cockatoo Surveys

There are six previous surveys that have targeted black cockatoos and associated nesting trees within the study area (Table 4). Kirkby (2018) undertook a black cockatoo survey with the aim of locating and documenting feeding, breeding and roosting habitat used by black cockatoos within the proposed mining mine extension areas. Evidence of feeding residues for Forest Red-tailed Black Cockatoo, Baudin's Cockatoo and Carnaby's Cockatoo were observed. A total of 50 trees (49 Marri and one Jarrah) with a hollow entrance of suitable size, shape and position to be considered suitable for use as a black cockatoo breeding hollow were recorded. Twenty-four of these trees had entrances which showed evidence of use. No roost sites were located during the survey.

Harewood (2018a) undertook a review of previously identified hollows within and near the Greenbushes MDE. Trees with hollows previously identified as being suitable for use by black cockatoos were examined using a drone. The hollows were photographed and assessed to determine the potential to represent actual or possible black cockatoo breeding hollows. A total of 70 trees were re-inspected with 14 positively identified as showing evidence of previous use by black cockatoos in the form of chew marks. An additional 16 trees were assessed as being possibly suitable but showed no conclusive evidence of actual use for nesting purposes. The remaining 40 trees inspected did not appear to have suitable hollows for black cockatoo use. A total of eight trees inspected by Harewood are located within the current study area. These trees are discussed further in Section 4.6.

Significant habitat tree surveys were conducted by Onshore Environmental in areas surrounding the MDE in 2018 (Onshore Environmental 2018). Significant habitat tree density was estimated by walking transects and identifying all trees with a DBH >50 cm within the transect area. Significant tree density within state forest outside the MDE ranged from 10.6 to 21.7 trees per hectare, with between 7% and 34% of significant trees supporting hollows or potential hollows.

A single known nesting hollow used by Red-tailed Black Cockatoos occurred within the TSF4 area (approximately 1 km west of the study area) (Onshore Environmental *unpublished data*). The hollow has since been cleared under approval as part of the TSF4 development in 2022. A chewed hollow likely used by Red-tail Black Cockatoos was identified during a recent survey of the New Water Storages area (Onshore Environmental 2023). The hollow is situated approximately 1 km to the north of the study area boundary.

Numerous additional targeted surveys for black cockatoo breeding hollows have been completed within the vicinity of the study area between 2013 to 2024. These surveys generally identified a small proportion of trees with DBH >50 cm and supporting hollows that were potentially suitable for nesting by black cockatoos. None of the surveys identified any hollows with chew marks consistent with use by black cockatoos as nesting trees. These surveys are listed below:

- Ecoedge (2018) Gavins Road Gravel Pit and Offset Area Fauna Survey Report;
- Ecoedge (2014) Level 1 Fauna Survey - Grimwade Road and Scrubbird Gravel Pit, Wilga West;
- Ecoedge (2016) Report of a Level 1 Fauna Survey at the proposed expanded Grimwade-Palmer Gravel Pit;
- Harewood (2020) Habitat Tree Assessment of Proposed Clearing Areas (CPS 8967/1);
- Astron Environmental Services (2013) Greenbushes to Kirup Pipeline Route Vegetation, Flora and Fauna Assessment;
- GHD (2017) Water Corporation Greenbushes to Kirup Link Biological Assessment;
- GHD (2018) Water Corporation Greenbushes to Kirup Link Additional Flora and Fauna Survey and Targeted Black Cockatoo Assessment;
- Harewood (2018a) Black Cockatoo Habitat Tree Assessment CPS 8158/1 Lot 8749 Yornup; and
- Harewood (2019) Black Cockatoo Habitat Tree Survey CPS 8178/1 Crooked Brook Rd Shire of Dardanup.

Western Ringtail Possum Surveys

Harewood (2018c) was commissioned to undertake a preliminary Western Ringtail Possum (*Pseudocheirus occidentalis*) survey within and around the Greenbushes MDE. Day time and nocturnal surveys were completed with no conclusive evidence of Western Ringtail Possums found during the survey. Much of the vegetation observed was assessed as representing poor or marginal habitat for Western Ringtail Possums. Large areas of forest surrounding the MDE have been historically logged and therefore lack a coherent mid-storey component which is a structural unit favoured by Western Ringtail Possums.

Recent Trapping Programs

As part of vegetation clearing works for the ongoing expansion of the Greenbushes Mine, Onshore Environmental has recently undertaken numerous pre-clearing trapping programs. The following species have been caught, relocated or observed during these trapping programs, and subsequent fauna spotting during clearing works (Onshore Environmental *unpublished data*).

Mammals:

- Southern Brush-tailed Phascogale (*Phascgale tapaotafa wambenger*) - Conservation Dependant;
- Quenda (*Isoodon fusciventer*) - Priority 4;
- Common Brushtail Possum (*Trichosurus vulpecula*);
- Western Grey Kangaroo (*Macropus fuliginosus*);
- Rabbit (*Oryctolagus cuniculus*);
- Red Fox (*Vulpes vulpes*);

- Cat (*Felis catus*); and
- Pig (*Sus scrofa*).

Reptiles:

- Marbled Gecko (*Christinus marmoratus*);
- Shrubland Pale-flecked Morethia (*Morethia obscura*);
- Western Bobtail (*Tiliqua rugosa*);
- Heath Monitor (*Varanus rosenbergii*);
- South-western Crevice Skink (*Egernia napoleonis*);
- Four-toed Mulch Skink (*Hemiergis peronii peronii*); and
- Dugite (*Pseudonaja affinis*).

Birds:

- Australian Ringnecks (*Barnardius zonarius*).

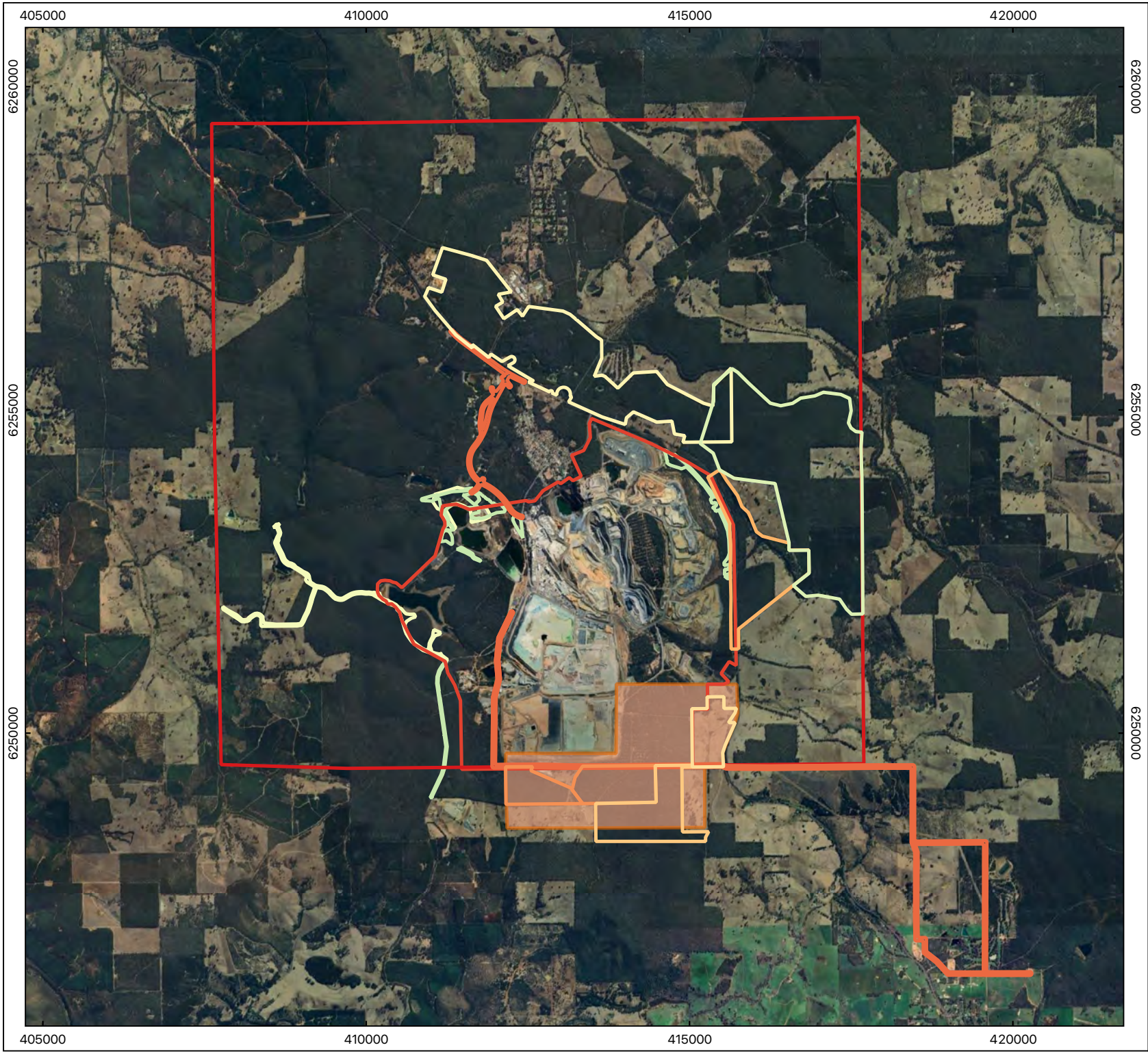
Table 4 Results from vertebrate fauna surveys previously completed within the vicinity of the study area. Shaded rows indicate surveys that intersect the study area.

Survey	Field Survey Date	Survey Level	Conservation Significant Fauna Species
Greenbushes Level 1 Fauna Survey (Biologic 2011)	13 - 17 October 2011	Basic	South-western Brush-tailed Phascogale- BC Act Conservation Dependant Forest Red-tailed Black Cockatoo - EPBC Act and BC Act Vulnerable Baudin's Cockatoo - EPBC Act and BC Act Endangered Carnaby's Cockatoo - EPBC Act and BC Act Endangered
Black Cockatoo Survey (Kirkby 2018)	22 January - 12 February 2018	Targeted	Forest Red-tailed Black Cockatoo - EPBC Act and BC Act Vulnerable Baudin's Cockatoo - EPBC Act and BC Act Endangered Carnaby's Cockatoo - EPBC Act and BC Act Endangered
Greenbushes Black Cockatoo Tree Hollow Review (Harewood 2018a)	11 - 19 June 2018	Targeted	14 known nesting trees 16 suitable nesting trees
Greenbushes Preliminary Western Ringtail Possum Surveys (Harewood 2018c)	11, 13 and 15 June 2018	Targeted	South-western Brush-tailed Phascogale - BC Act Conservation Dependant
Greenbushes Vertebrate Fauna, SRE and Subterranean Fauna Desktop Assessment (Biologic Environmental Survey 2018a)	Not relevant	Desktop	Not recorded
Greenbushes Targeted Vertebrate and SRE Invertebrate Fauna Survey (Biologic 2018b)	12 - 21 February 2018	Targeted	Chuditch - EPBC Act and BC Act Vulnerable Western Ringtail Possum - EPBC Act and BC Act Critically Endangered[1] South-western Brush-tailed Phascogale - BC Act Conservation Dependant Quenda - DBCA Priority 4 Western Brush Wallaby - DBCA Priority 4 Forest Red-tailed Black Cockatoo - EPBC Act and BC Act Vulnerable
Targeted Western Ringtail Possum Survey Greenbushes Mine (Onshore Environmental 2018)	20-22 September , 3-5 November 2018	Targeted WRP	None
Significant Tree Survey (Onshore Environmental 2019a)	10-11 September 2018	Black Cockatoo Habitat Tree Assessment	Recording potential habitat tree density

[1] This record is of scats possibly belonging to the species, and therefore the record is unconfirmed.

Survey	Field Survey Date	Survey Level	Conservation Significant Fauna Species
Level 1 Vertebrate Fauna Survey Greenbushes Infrastructure Corridors (Onshore Environmental 2019b)	4 - 7 October 2018	Basic	One suitable nesting tree
Black Cockatoo Habitat Tree Assessment Greenbushes Mine Rehabilitation Materials Stockpiles (Onshore Environmental 2022a)	22 August 2022	Black Cockatoo Habitat Tree Assessment	Cleared farmland with no suitable nesting trees No black cockatoos recorded by direct observation
Basic Vertebrate Fauna Survey Greenbushes Mine Expansion Area 2 and Area 4 (Onshore Environmental 2022b)	26 October - 2 November, 29 November 2021	Basic	Forest Red-tailed Black Cockatoo - EPBC Act and BC Act Vulnerable Carnaby's Black Cockatoo - EPBC Act and BC Act Endangered South-western Brush-tailed Phascogale - BC Act Conservation Dependant Western Brush Wallaby - DBCA Priority 4
Floyd's Waste Rock Landform Extension Detailed Vertebrate Fauna Survey (Onshore Environmental 2023a)	18-28 October 2022, 12-20 April 2023	Detailed (two phase)	Forest Red-tailed Black Cockatoo - EPBC Act and BC Act Vulnerable South-western Brush-tailed Phascogale - BC Act Conservation Dependant Quenda - DBCA Priority 4
Mine Rehabilitation Stockpile and Haul Road Black Cockatoo Habitat Tree Assessment (Onshore Environmental 2023b)	10 October 2023	Black Cockatoo Habitat Tree Assessment	One suitable nesting tree Forest Red-tailed Black Cockatoo - EPBC Act and BC Act Vulnerable Baudin's Cockatoo - EPBC Act and BC Act Endangered
New Water Storages Detailed Vertebrate Fauna Survey (Onshore Environmental 2023c)	18-28 October 2022, 12-20 April 2023	Detailed	Forest Red-tailed Black Cockatoo - Vulnerable Baudin's Cockatoo - Endangered Australasian Bittern - Endangered (500 m outside the study area) South-western Brush-tailed Phascogale - Conservation Dependent Quenda - DBCA Priority 4 Rakali/Water Rat - DBCA Priority 4
Targeted Camera Trap Fauna Survey New Zealand Gully (Onshore Environmental 2023d)	3 October, 4 November 2023	Targeted	South-western Brush-tailed Phascogale - Conservation Dependent Quenda - DBCA Priority 4
New Zealand Gully Black Cockatoo Habitat Tree Assessment (Onshore Environmental 2023e)	3-6 & 9 October 2023	Black Cockatoo Habitat Tree Assessment	Forest Red-tailed Black Cockatoo - Vulnerable Carnaby's Cockatoo - Endangered Baudin's Cockatoo - Endangered
Black Cockatoo Habitat Tree Assessment Additional Clearing Areas at Water Storages (Onshore Environmental 2023f)	8-9 & 15-16 December 2022	Black Cockatoo Habitat Tree Assessment	Forest Red-tailed Black Cockatoo - Vulnerable

Survey	Field Survey Date	Survey Level	Conservation Significant Fauna Species
Detailed Vertebrate Fauna Survey, Additional Areas North (Onshore Environmental 2024a)	25 November - 5 December 2023	Detailed	Forest Red-tailed Black Cockatoo - Vulnerable Carnaby's Cockatoo - Endangered Baudin's Cockatoo - Endangered Quenda - DBCA Priority 4 Rakali/Water Rat - DBCA Priority 4 Western Brush Wallaby - DBCA Priority 4
Greenbushes Operations Upcoming Clearing Approvals Targeted Vertebrate Fauna Survey (Onshore Environmental 2024b)	27 March - 6 May 2024	Targeted	South-western Brush-tailed Phascogale - Conservation Dependent Quenda - DBCA Priority 4
Greenbushes Operations Upcoming Clearing Approvals Black Cockatoo Habitat Assessment (Onshore Environmental 2024c)	28 March - 5 April 2024	Black Cockatoo Habitat Tree Assessment	Forest Red-tailed Black Cockatoo - Vulnerable Baudin's Cockatoo - Endangered



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S2 S7 Future Waste Rock Landform

Figure 6
Previous fauna surveys intersecting or nearby the study area

Legend

- S2 S7Study Area

Previous Fauna Surveys

- Biologic (2011)
- Biologic (2018a)
- Onshore Environmental (2019b)
- Onshore Environmental (2022b)
- Onshore Environmental (2023a)
- Onshore Environmental (2023b)
- Onshore Environmental (2023c)
- Onshore Environmental (2023d and (2023e)
- Onshore Environmental (2023f)
- Onshore Environmental (2024a)
- Onshore Environmental (2024b and 2024c)

0 1 2 3 4 km

1:80,000

Datum: GDA 94
Projection: MGA Zone 50

Date: 29/06/2024
Status: Final
Figure: 6
Sheet Size: A4
File Name Reference: TA_S2S7_Fig6_surveys.pdf
Drawn by: JW
Requested by: DB

4.1.2 Potentially Occurring Significant Fauna Species

Database searches were undertaken around the study area (as detailed in Section 3.2.2) to identify conservation significant vertebrate fauna previously collected or identified within, or in the vicinity of, the study area.

The EPBC database search identified a total of 16 fauna species listed as Threatened Fauna under the EPBC Act or listed as Migratory species (DCCEEW 2024).

The DBCA searches identified a total of 30 significant fauna species including 15 species listed as Threatened Fauna under the BC Act, one species listed as Extinct, three Migratory bird species and eleven species listed as Priority Fauna or other specially protected fauna under the BC Act (DBCA 2022).

A total of 40 conservation significant species were identified from the combined desktop assessments, comprising 13 mammals, 21 birds, four fish, one reptile and one amphibian (Table 5). Based on the literature review, six of these species have previously been recorded within the study area:

- Forest Red-tailed Black Cockatoo (*Calyptorhynchus banksii naso*) listed as Vulnerable under the EPBC Act and BC Act;
- Baudin's Cockatoo (*Zanda baudinii*) listed as Endangered under the EPBC Act and BC Act;
- Carnaby's Cockatoo (*Zanda latirostris*) listed as Endangered under the EPBC Act and BC Act;
- South-western Brush-tailed Phascogale (*Phascogale tapoatafa wambenger*) listed as Conservation Dependant under the BC Act;
- Quenda (*Isoodon fusciventer*) listed as Priority 4 by the DBCA; and
- Western Brush Wallaby (*Notamacropus irma*) listed as Priority 4 by the DBCA.

One additional taxon was determined as *likely* occurring within the study area: Chuditch (*Dasyurus geoffroii)* listed as Vulnerable under the EPBC Act and BC Act. Seven species were determined as "possibly" occurring within the study area with the remaining 26 species identified as "unlikely" to occur in the study area (Table 5). Further discussion of the suitability of habitat for these species is provided in Section 4.5.

Table 5 Significant fauna previously recorded from desktop searches surrounding the study area.

Taxon Name	Common Name	EPBC Act	BC Act	DBCA	Habitat Preference	Suitable Habitat Present	Likelihood in the study area	Rationale
AMPHIBIANS								
Geocrinia lutea	Walpole Frog			P4	Dense vegetation of swamps	No	Unlikely	No suitable habitat. Only known from the Walpole Nornalup area. Nearby record is historical.
BIRDS								
Actitis hypoleucos	Common Sandpiper	Mi			Edge of sheltered waters, salt or fresh, estuaries, river pools, claypans, drying swamps (Johnstone & Storr 1998)	No	Unlikely	No suitable habitat.
Botaurus poiciloptilus	Australasian Bittern	EN	EN		Reedbeds, and other vegetation in water such as cumbungi, lignum and sedges	No	Unlikely	No suitable habitat.
Calidris ferruginea	Curlew Sandpiper	CR & MI			Intertidal mudflats and ephemeral and permanent lakes	No	Unlikely	No suitable habitat.
Calyptorhynchus banksii naso	Forest Red-tailed Black-cockatoo	VU	VU		Eucalypt forests, areas of seeding Marri, Jarrah, Blackbutt, Karri and Sheoak (Johnstone & Storr 1998)	Yes	Recorded	Previous records within the study area (Biologic 2018)
Zanda baudinii	Baudin's Black Cockatoo	EN	EN		Eucalypt forest, areas of Marri, Karri and Wandoo (Johnstone & Storr, 1998, Johnstone & Kirkby 2008)	Yes	Recorded	Recent records in close proximity.
Zanda latirostris	Carnaby's Black-cockatoo	EN	EN		Eucalypt woodlands and forests and adjacent area of *Proteaceous* scrubs and heaths (Johnstone & Storr 1998)	Yes	Recorded	Recent records in close proximity.
Chlidonias leucopterus	White-winged Tern	Mi			Coastal and inland wetlands, estuaries, salt fields, coasts, sewage ponds	No	Unlikely	No suitable habitat.
Dasyornis broadbenti litoralis	South-western Rufous Bristlebird	EX	EX		Poorly known, likely dense low coastal heath (DPAW 2014)	No	Unlikely	Presumed Extinct.
Falco hypoleucos	Grey Falcon	VU	VU		Shrubland, grassland and wooded watercourses, wetlands	No	Unlikely	No suitable habitat or recent records in close proximity.

Taxon Name	Common Name	EPBC Act	BC Act	DBCA	Habitat Preference	Suitable Habitat Present	Likelihood in the study area	Rationale
Falco peregrinus	Peregrine Falcon		OS		Inhabits areas with cliffs, gorges, timbered watercourses, drainage lines and rivers, wetlands, plains, and open woodlands	Yes	Possible	Records in the general area. May occasionally utilise study area.
Ixobrychus flavicollis australis	Black Bittern			P2	Shadowy leafy waterside trees in areas like tidal creeks, sheltered mudflats and oyster-slats	No	Unlikely	No suitable habitat.
Leipoa ocellata	Malleefowl	VU	VU		Semi-arid mallee scrub on the fringes of the relatively fertile areas of southern Australia	No	Unlikely	No suitable habitat or recent records in close proximity.
Lewinia pectoralis	Lewin's Rail		EX		Swamp woodlands, rushes, reeds, swamps, creeks and saltmarshes	No	Unlikely	Presumed Extinct.
Numenius madagascariensis	Eastern Curlew	CR & MI			Tidal mudflats, also reef flats, sandy beaches (Johnstone & Storr 1998)	No	Unlikely	No suitable habitat.
Oxyura australis	Blue-billed Duck			P4	Well vegetated dams, lakes and swamps	No	Unlikely	No suitable habitat.
Pandion haliaetus	Osprey	Mi			Sheltered seas around islands, tidal creeks, estuaries and saltwork ponds, and large river pools (Johnstone et al. 2013)	No	Unlikely	No suitable habitat.
Plegadis falcinellus	Glossy Ibis	MI			Lakes and wetlands	No	Unlikely	No suitable habitat.
Thalasseus bergii	Crested Tern	MI			Ocean beaches, offshore islands, pelagic waters, estuaries, bays, harbours, coastal lagoons, inland on major rivers	No	Unlikely	No suitable habitat.
Tringa glareola	Wood Sandpiper	MI			Lakes and wetlands	No	Unlikely	No suitable habitat.
Tringa nebularia	Common Greenshank	Mi			Intertidal mudflats and ephemeral and permanent lakes	No	Unlikely	No suitable habitat.
Tyto novaehollandiae	Masked Owl			P3	Forests, woodlands, timbered waterways and open country	Yes	Possible	Multiple records in close proximity, however has not recently been recorded in the area.
FISH								
Galaxiella munda	Mud Minnow		VU		Permanent streams, favouring small, gently flowing creeks and streams	No	Unlikely	No suitable habitat.

Taxon Name	Common Name	EPBC Act	BC Act	DBCA	Habitat Preference	Suitable Habitat Present	Likelihood in the study area	Rationale
Galaxiella nigrostriata	Black-stripe Minnow	EN			Ephemeral wetlands of the south-west (Bray and Gomon 2020)	No	Unlikely	No suitable habitat.
Lepidogalaxias salamandroides	Salamanderfish		EN		Generally recorded from highly acidic, shallow, temporary pools and swamps in coastal heathland	No	Unlikely	No suitable habitat.
Nannatherina balstoni	Balston's Pygmy Perch	VU	VU		Coastal peat flats, rivers	No	Unlikely	No suitable habitat.
MAMMALS								
Bettongia penicillata ogilbyi	Woylie	EN	CR		Woodlands and adjacent heaths with a dense understorey of shrubs (Woinarski *et al.* 2014)	Yes	Possible	Scattered records exist in the area, however most are >20 years old.
Dasyurus geoffroii	Chuditch	VU	VU		Jarrah forest, in moist, densely vegetated, steeply sloping forest and drier, open, gently sloping forest particularly in riparian vegetation (Orell & Morris 1994)	Yes	Likely	Recorded nearby (Biologic 2018a). Re-survey in 2024 failed to locate any evidence.
Falsistrellus mackenziei	Western False Pipistrelle			P4	Wet sclerophyll forests of Karri, Jarrah and Tuart eucalypts	Yes	Possible	Multiple records in the general area, no recent records in close proximity
Hydromys chrysogaster	Water-rat			P4	Permanent bodies of fresh or brackish water, subalpine streams to lakes and farm dams (Van Dyck & Strahan 2008)	No	Unlikely	No suitable habitat.
Isoodon fusciventer	Quenda			P4	Jarrah forest and swamp habitats, preferring dense vegetation around wetland fringes and heathland (Woinarski *et al.* 2014).	Yes	Recorded	Previous records in close proximity (Biologic 2018a, Onshore Environmental unpublished data).
Macrotis lagotis	Bilby	VU	VU		Mixture of woodland including Jarrah, Marri and Wandoo in the south-west (Abbott 2001).	Yes	Unlikely	Not within current known distribution. No recent records in close proximity.

Taxon Name	Common Name	EPBC Act	BC Act	DBCA	Habitat Preference	Suitable Habitat Present	Likelihood in the study area	Rationale
Myrmecobius fasciatus	Numbat	EN	EN		Eucalypts forests and woodland, notably wandoo and jarrah woodland (Van Dyck & Strahan 2008)	Yes	Unlikely	Recorded ~10km to the north-west of the study area in 2006 (DBCA 2022). Additional records in the general area, however none are recent.
Notamacropus eugenii derbianus	Tammar Wallaby			P4	Dense, low vegetation for daytime shelter and open grassy areas for feeding. This species inhabits coastal scrub, heath, dry sclerophyll forest and thickets in mallee and woodland (Maxwell et al. 1996)	Yes	Possible	Records within 50km.
Notamacropus irma	Western Brush Wallaby			P4	Wide-range of habitats including low Banksia woodlands, Jarrah/Marri woodlands and moist Melaleuca lowlands, favours open, grassy areas (Wann & Bell 1997, Woinarski et al. 2014)	Yes	Recorded	Previously recorded within the study area (Onshore 2022c).
Phascogale calura	Red-tailed Phascogale	VU	CD		Wandoo-rock sheoak uplands, and lowland habitat with riverine fringing vegetation of swamp sheoak, York Gum and Wandoo (Short et al. 2011)	No	Unlikely	No suitable habitat.
Phascogale tapoatafa wambenger	Brush-tailed Phascogale		CD		Dry sclerophyll forests and open woodlands that contain hollow-bearing trees with a sparse ground cover (Woinarski *et al.* 2014)	Yes	Recorded	Previously recorded within the study area (Biologic 2018)
Pseudocheirus occidentalis	Western Ringtail Possum	CR	CR		Coastal *Agonis flexuosa* forest or eucalypt woodland or forest with a mid-story of *Agonis flexuosa* (DPaW 2017, Jones et al. 1994). Additionally, inland forest areas that have been unlogged and unburnt for long periods (Wayne et al. 2006)	Yes	Unlikely	Scats possibly identified by Biologic (2018), however targeted surveys have failed to locate the species and indicated that habitat in the general area is marginal for this species.
Setonix brachyurus	Quokka	VU	VU		Habitat varies, but prefer Acacia and Melaleuca thickets. Associated with *Taxandria linearifolia* in Jarrah Forest (de Tores 2008)	No	Unlikely	No suitable habitat.

Taxon Name	Common Name	EPBC Act	BC Act	DBCA	Habitat Preference	Suitable Habitat Present	Likelihood in the study area	Rationale
REPTILES								
Ctenotus delli	Darling Range South-west Ctenotus			P4	Jarrah and Marri woodlands with shrub dominated understorey on laterite, sand or clay soils (Bush *et al* 2010).	Yes	Possible	Historical record in close proximity

4.2 Fauna Habitats

4.2.1 Fauna Habitat Types

There were two broad fauna habitat mapped and described within the study area during the field survey: Jarrah-Marri Forest on Hillslopes, and Cleared Farmland (Paddocks) (Tables 6 and 7, Figure 7). The Jarrah-Marri Forest on Hillslopes habitat occurred on lateritic hill slopes with an understorey comprising the low shrubs *Bossiaea ornata* and *Leucopogon capitellatus,* scattered mid shrubs of *Pteridium esculentum* and *Macrozamia riedlei,* and the tall shrub/low tree *Banksia grandis* present on crests where outcropping was evident. The habitat occurred over 346.25 ha (62.5% of the study area). Cleared farmland (mapped as paddocks) occurred over 151.61 ha (27.4% of the study area) (Figure 7). These areas were predominantly cleared for annual pasture and grazed by cattle. Isolated paddock trees and small parkland cleared stands of Jarrah and Marri occurred within the paddocks. The remainder of the study area had been cleared for roads and infrastructure corridors (56.06 ha or 10.1%).

Table 6 Summary of the Jarrah-Marri Forest on Hillslopes fauna habitat (see Plate 1).

Name	Description	
Hillslopes	Jarrah-Marri Forest on hillslopes with brown sandy loam	
Area (ha)	346.25 ha (62.5% of the study area)	
Landform	Hill slopes and hill crests	
Vegetation Description	Forest of *Eucalyptus marginata* subsp. *marginata* and *Corymbia calophylla* over Low Woodland A of *Banksia grandis* over Open Dwarf Scrub C of *Pteridium esculentum* and *Macrozamia riedlei* over Dwarf Scrub D of *Bossiaea ornata* and *Leucopogon capitellatus,* on brown loamy sand on lateritic hill crests and hill slopes	
% GroundCover	Rock	<2%
	Leaf Litter	30-70%
	Logs	2-10%
	Vegetation	30-70%
Rocks	Type	Laterite
	Size	1-5 cm
Soil	Type	Sandy-loam
	Colour	Brown
Habitat Features Habitat includes areas with moderate logs and dense leaf litter, larger trees occur within this habitat providing some hollows.	Slope	Low to Moderate
	Water	None
	Woody Debris	Minor
	Peeling Bark	Minor
	Rock Crevices	Absent
	Burrowing Suitability	Poor
	Tree Hollows (<10cm)	Present
	Tree Hollows (>10cm)	Present
Condition	Condition	Good-Very Good
	Disturbances	Fire, roads/access tracks, logging, firewood cutting, rubbish, weeds, feral animals, adjacent to farmland
	Fire Age	Moderate-Old

Table 7 Summary of the Cleared farmland fauna habitat (see Plate 2).

Name	Description	
Hillslopes	Cleared Farmland (annual pasture with small parkland cleared remnants)	
Area (ha)	151.61 ha (27.4% of the study area)	
Landform	Hill slopes and hill crests	
Vegetation Description	Cleared annual pasture (majority of the area). Small localised remnants comprising Forest (to Woodland) of *Eucalyptus marginata* subsp. *marginata* and *Corymbia calophylla* over introduced pasture grasses (parkland cleared).	
% GroundCover	Rock	<2%
	Leaf Litter	<2% (pasture), 2-10% (remnants)
	Logs	<2%
	Vegetation	<2% (pasture), 30-70% (remnants)
Rocks	Type	Laterite
	Size	1-5 cm
Soil	Type	Sandy-loam
	Colour	Brown
Habitat Features Habitat includes areas with moderate logs and dense leaf litter, larger trees occur within this habitat providing some hollows.	Slope	Low to Moderate
	Water	Small dam in north-east corner of study area
	Woody Debris	Minor
	Peeling Bark	Minor
	Rock Crevices	Absent
	Burrowing Suitability	Poor
	Tree Hollows (<10cm)	Present (in remnants)
	Tree Hollows (>10cm)	Present (1 suitable hollow in remnants)
Condition	Condition	Completely Degraded

4.2.2 Fauna Habitat Condition

Habitat condition within the study area ranged from ‘very good’ in native vegetation to ‘completely degraded’ in cleared farmland (Figure 8). Parts of the study area that were adjacent to Forest Park Road and cleared farmland showed edge effects and supported reduced vegetation condition (rated as ‘good’). The major disturbances within these areas were from vehicle tracks, hardwood logging, weeds and fire. In southern and central parts of the study area habitat condition was rated as very good. Disturbances within this area were relatively minor with few vehicle tracks and less disturbance from logging, fire and weeds. Paddocks, roads and cleared powerline corridors were rated as ‘completely degraded’.

Plate 1 Representative photos of the hillslope habitat within the study area.

Plate 2 Representative photos of cleared farmland habitat within the study area.

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S2/7 Future Waste Rock Landform

Figure 7
Fauna habitat map for the study area

Legend

- S2S7 Study Area

Fauna Habitat

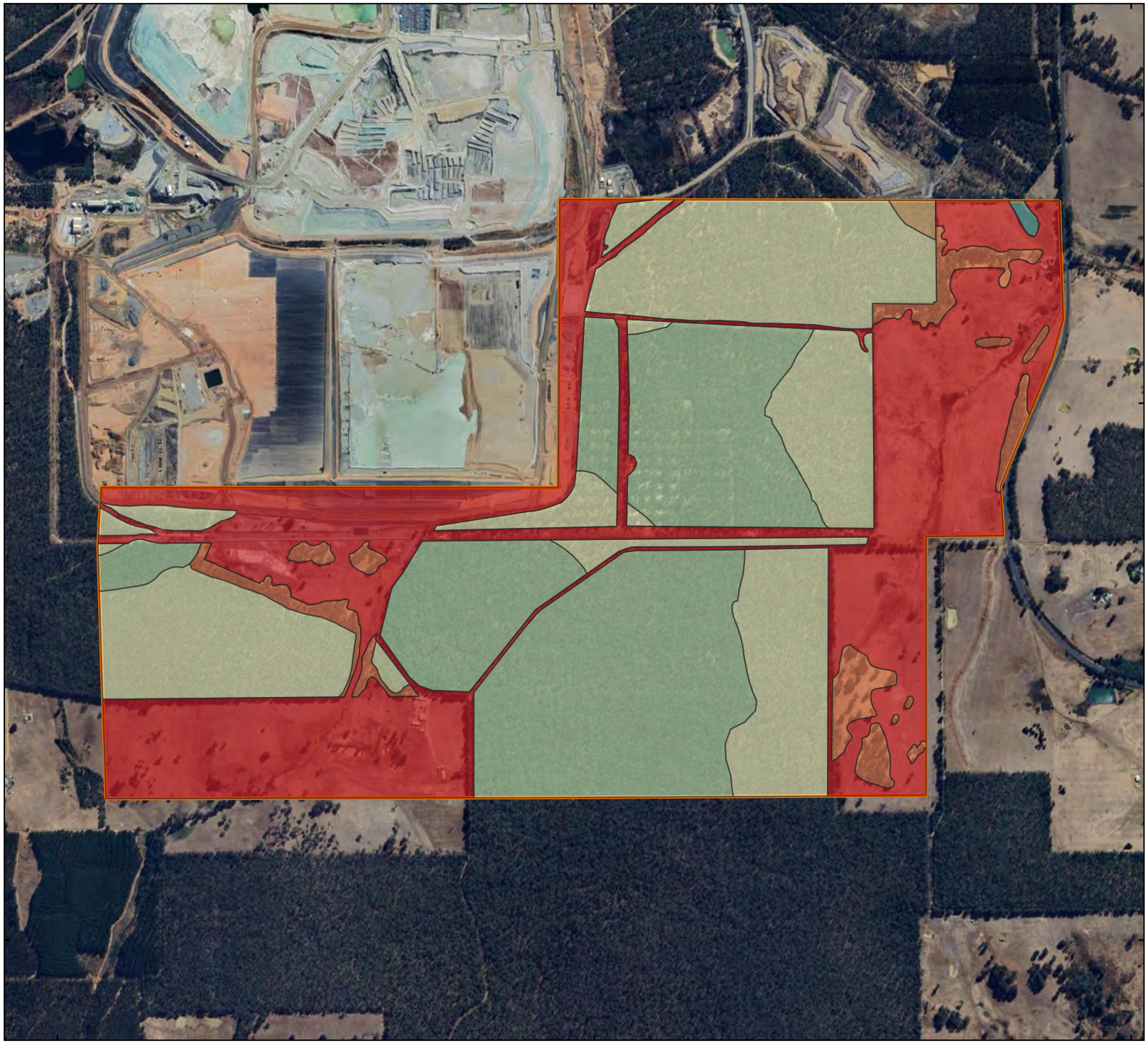
- Jarrah-Marri Forest on hillslopes
- Mine Disturbance
- Paddocks
- Parkland Cleared
- Roads/tracks
- Shelter belt
- Waterbodies

0 250 500 750 m

1:20,000

Datum: GDA 94
Projection: MGA Zone 50

Date: 29/06/2024
Status: Final
Figure: 7
Sheet Size: A4
File Name Reference: TA_S2S7_Fig7_fauna_habitat.pdf
Drawn by: JW
Requested by: DB



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S2/7 Future Waste Rock Landform

Figure 8
Fauna habitat condition for the study area

Legend

- S2S7 Study Area

Clipped

- Cleared
- Completely Degraded
- Degraded
- Good
- Very Good
- Water

0 250 500 750 m

1:20,000

Datum: GDA 94
Projection: MGA Zone 50

Date: 29/06/2024
Status: Final
Figure: 8
Sheet Size: A4
File Name Reference:
TA_S2S7_Fig8_fauna_habitat_condition.pdf
Drawn by: JW
Requested by: DB

4.3 Vertebrate Fauna Assemblage

4.3.1 Fauna Assemblage

The combined desktop searches identified a total of 291 vertebrate fauna taxa including 17 amphibians, 26 reptiles, 210 birds and 38 mammals (see Appendix 3). The database results were reviewed and 91 species were excluded as they were considered unlikely to occur within the study area due to absence of habitat or other factors. The remaining list comprised 200 species that potentially occur within the study area including nine amphibians, 128 birds, 37 mammals and 26 reptiles.

A total of 87 vertebrate fauna species have been recorded within the study area from the combined survey effort, including one amphibian, 13 reptiles, 55 birds and 18 mammals. A list of all vertebrate fauna species recorded during the field survey is provided in Appendix 4. A comparison of the species recorded from the desktop searches and those recorded within the study area is presented in Appendix 5.

4.3.2 Motion Sensitive Cameras

A total of 61 motion sensor cameras have been installed within the study area over five surveys between 2011 and 2024 (Figure 5).

In May 2024 camera traps were placed in target habitats throughout the study area for a 30 night period. A total of 13 species were recorded including six birds and seven mammals. The mammals identified from the cameras included two species of conservation significance: Brush-tailed Phascogale (*Phascogale tapoatafa wambenger*) and Quenda (*Isoodon fusciventer*). There were also two introduced species recorded from the motion sensor cameras: Red Fox (*Vulpes vulpes*) and Cat (*Felis catus*).

4.4 Fauna of Conservation Significance

4.4.1 Threatened Fauna listed under the EPBC Act and BC Act

The three species of black cockatoo were recorded from the study area and are listed under the EPBA Act and the BC Act, and a fourth species (South-western Brush-tailed Phascogale) is listed under the BC Act:

- Forest Red-tailed Black Cockatoo (*Calyptorhynchus banksii naso*) listed as Vulnerable under the EPBC Act and BC Act;
- Baudin's Cockatoo (*Zanda baudinii*) listed as Endangered under the EPBC Act and BC Act;
- Carnaby's Cockatoo (*Zanda latirostris*) listed as Endangered under the EPBC Act and BC Act; and
- South-western Brush-tailed Phascogale (*Phascogale tapoatafa wambenger*) listed as Conservation Dependant under the BC Act.

The occurrence of these two species within the study area is discussed below.

Forest Red-tailed Black Cockatoo

The Forest Red-tailed Black Cockatoo is currently listed as Least Concern on the international IUCN Red List, and Vulnerable under the Commonwealth EPBC Act and Western Australian BC Act. It occurs throughout the south western humid and subhumid zones, extending from Gingin in the north through the Darling Ranges and throughout the southwest from approximately Bunbury to Albany (Johnstone and Storr 1998). Their population has been estimated at approximately 15,000 birds (Johnstone and Kirkby 1999). Although not nomadic like Carnaby's and Baudin's Cockatoos, the Forest Red-tailed Black Cockatoo has been known to exhibit extreme population fluctuations in response to food availability and fire. The Forest Red-tailed Black Cockatoo occurs in pairs or small flocks, or occasionally large flocks of up to 200 birds (Johnstone and Storr 1998). It inhabits dense Jarrah, Karri and Marri forests that receive more than 600 mm average annual rainfall (DSEWPaC 2012), and breeds (producing one or two eggs) in the southwest of Western Australia between October and November. The Forest Red-tailed Black Cockatoo feeds primarily on Marri and Jarrah fruit (DSEWPaC 2012). They have also been known to feed on Blackbutt *(Eucalyptus patens),* Albany Blackbutt *(Eucalyptus staeri),* Karri, Sheoak *(Allocasuarina fraseriana)* and Snottygobble *(Persoonia longifolia).* Marri and Jarrah make up 90% of their diet (Johnstone and Kirkby 1999).

The Forest Red-tailed Black Cockatoo has been directly observed at eleven points (15 birds) within the study area (Figure 9). Birds were recorded from calls at two locations, and there were 195 records of feeding residue (Marri nuts) (Figure 9). There is evidence of the Forest Red-tailed Black Cockatoo utilising the study area extensively over a long period.

Baudin's Black Cockatoo

Baudin's Black Cockatoo is currently listed as Critically Endangered on the international IUCN Red List, and Endangered under the Commonwealth EPBC Act and Western Australian BC Act. It occurs throughout the south western humid and subhumid zones, extending from the northern Darling Range and adjacent far east of the Swan Coastal Plain (south of the Swan River), south to Bunbury and east to Albany (Johnstone and Storr 1998). Baudin's Cockatoo usually occur in small flocks of up to 30 birds, occasionally up to 50 birds, or rarely in aggregations of up to 1,200 birds (Johnstone and Kirkby 2008). The total population of Baudin's Cockatoo is estimated to be about 15,000 birds (Johnstone and Kirkby 2008).

This species forages primarily in eucalypt forest, where it feeds on Marri seeds, flowers, nectar and buds (Johnstone and Kirkby 2008). Baudin's Cockatoo also feed on a wide range of seeds of *Eucalyptus, Banksia* and *Hakea,* as well as the fruits of apples, pears, persimmons, pines, and beetle larvae from under the bark of trees (Johnstone and Kirkby 2008, Johnstone and Storr 1998). Marri seed provides a high energetic yield and Baudin's Cockatoo are able to quickly extract the seeds from the nut using their long bill (Cooper *et al.* 2002). Baudin's Black Cockatoo nests in tree hollows in the deep south-west of Western Australia. Primary nesting trees are Karri, Marri, and Wandoo. Baudin's Cockatoo is mostly a postnuptial nomad (Johnstone and Kirkby 2008) breeding from around October to December. After breeding, Baudin's Cockatoos leave nesting areas and amalgamate to form large foraging flocks. These flocks generally migrate north to the main non breeding wintering area in the northern Darling Range between Collie and Mundaring (Johnstone and Kirkby 2008).

Baudin's Black Cockatoo has not been directly observed within the study area, but has been recently observed from adjacent survey areas (Onshore Environmental 2023b, 2023c, 2023e, 2024a, 2024c). Foraging evidence from Baudin's Black Cockatoo was recorded from ten locations within the study area (Figure 9), confirming that it occasionally forages within the study area.

Carnaby's Black Cockatoo

Carnaby's Black Cockatoo is one of two white-tailed black cockatoos listed as Endangered under the EPBC Act and BC Act. This species occurs in south-western Western Australia extending from Kalbarri to Cape Arid and inland to the Wheatbelt. Breeding habitat for the species generally occurs within the Wheatbelt region in hollows provided by smooth barked Eucalyptus species such as Wandoo and Salmon Gum (Saunders 1982). More recently there has been an expansion in the breeding range of Carnaby's Black Cockatoo to the west and south with breeding recorded from the Darling Scarp and as far south as Capel (Johnstone and Kirby 2019).

Carnaby's Black Cockatoo has been recorded on one occasion within the study area when a flock of 20 birds was observed flying overhead in late October 2021 (Onshore Environmental 2022b). It has also been recorded from calls on one occasion, with two records of feeding residue. Carnaby's Black Cockatoo infrequently uses the study area foraging.

South-western Brush-tailed Phascogale

The South-western Brush-tailed Phascogale is listed as conservation dependant fauna under the Western Australian BC Act. Its present distribution is believed to have been reduced to approximately 50% of its former range with the current distribution extending west of a line from Perth to Albany. It occurs at low densities in the northern Jarrah forest and at highest densities in the Perup/Kingston area, Collie River valley, and near Margaret River and Busselton. Records are less common from wetter forests.

The South-western Brush-tailed Phascogale has been observed in dry sclerophyll forests and open woodlands that contain hollow-bearing trees but a sparse ground cover. It relies on tree hollows as nest sites. The home range for a female is estimated at between 20 ha and 70 ha, whilst that for males is estimated as twice that of females. In addition, they tend to utilise a large number (approximately 20) of different nest sites throughout their range (Soderquist and Rhind 2008).

The South-western Brush-tailed Phascogale was recorded at 12 locations throughout the study area including four motion sensitive cameras in May 2024 (Figure 9). It has a preference for the Jarrah-Marri Hillslope habitat which contains an abundance of hollow bearing trees suitable as nest sites for this species.

4.4.2 Priority Fauna recognised by the DBCA

Two Priority 4 fauna species, as recognised by the DBCA, was recorded from the study area: Quenda (*Isoodon fusciventer*) and Western Brush Wallaby (*Notamacropus irma*) (Figure 9).

Quenda

The Quenda (or Southern Brown Bandicoot) is listed as a Priority 4 fauna species by the DBCA. It has a wide but patchy distribution in the south-west of Western Australia, extending

from Cervantes in the north to Esperance in the south and inland as far as Hyden. The species inhabits dense scrubby, often swampy, vegetation with dense cover up to one metre high. It often feeds in adjacent forest and woodland that is burnt on a regular basis, and in areas of pasture and cropland lying close to dense cover. Populations inhabiting Jarrah and Wandoo forests are usually associated with watercourses.

Quenda have been recorded from eleven locations within the study area, including four motion sensor cameras in May 2024 (Figure 9). Quenda prefer deeper sandier soils found on lower hill slopes, foot slopes and drainage lines, particularly where a dense understorey cover occurs.

Western Brush Wallaby

The Western Brush Wallaby is known to inhabit a wide-range of habitats including low *Banksia* woodlands, Jarrah/Marri woodlands and moist *Melaleuca* lowlands, favouring open, grassy areas (Wann and Bell 1997, Woinarski *et al.* 2014). It has previously been recorded from the Jarrah-Marri forest habitat type at nearby survey areas (Biologic 2018b, Onshore Environmental 2024a).

The Western Brush Wallaby was observed at two locations within the study area, with one observation made in the Jarrah-Marri on Hillslopes habitat in May 2024 (Figure 9).

4.4.3 Threatened and Priority Fauna Potentially Occurring

Seven species of conservation significance were identified from the desktop searches as previously recorded or likely to occur within the study area. Six of the seven species have been recorded within the study area, with no evidence of Chuditch.

Chuditch

The Chuditch inhabits Jarrah forest in moist, densely vegetated, steeply sloping forest and drier, open, gently sloping forest particularly in riparian vegetation (Orell and Morris 1994). Habitat within the study area was suitable for this species and in 2018 it was recorded approximately 3 km north-west of the study area (Biologic Environmental 2018a). Subsequent surveys have failed to relocate Chuditch around the Greenbushes mining operations. The fragmented nature of vegetation, extent of historical disturbances and the absence of riparian habitat may reduce the likelihood that Chuditch will utilise the study area. Chuditch has not been detected within the study area despite 61 motion sensor camera being deployed within the study area between 2011 and 2024.

4.5 Black Cockatoo Habitat Assessment

4.5.1 Tree Hollow Assessment

Tree hollow assessments focused on identifying potential nesting trees. Large trees were identified and further assessed as to the suitability for breeding for black cockatoos, as per criteria outlined in Table 2. Details of the trees and hollows assessed within the study area are provided in Appendix 6 and locations of the trees are shown in Figure 10.

Nine potential nesting trees within the study area were previously identified by Kirkby (2018) and re-assessed by Harewood (2018a) using a drone. These trees have also been assessed by Onshore Environmental as part of ongoing habitat tree monitoring between 2019 and

2024[2]. Four additional habitat trees were recorded during the two phase detailed fauna survey in 2002 and 2023 (Onshore Environmental 2023a). These 12 trees were reassessed in May 2024 and the entire study area was ground truthed to record any additional habitat trees that may have previously been missed or unsurveyed.

Three trees within the study area were identified as supporting *known* nesting trees, with chew marks clearly evident around the perimeter of each nest hollow (Figure 10). A total of 13 trees were identified as supporting hollows that were *suitable* for use by black cockatoos. These hollows were considered of a size, orientation and depth to be suitable for use by black cockatoos as breeding hollows. However, an assessment of the hollows from the ground did not confirm evidence of the hollows being actively used by black cockatoos. A total of 69 trees were identified as *potential nesting trees*. These trees contained hollows that were above the minimum entrance size suitable for black cockatoos but were considered less likely to be suitable due to depth of hollow, orientation or other factors (see Table 2 and Appendix 6). The remaining 12 trees supporting hollows were confirmed to be *unsuitable* for nesting by black cockatoos, primarily due to size, orientation and/or depth. Three trees previously recorded had fallen over and hence were not reassessed.

Additional factors may affect the suitability of the study area for breeding. These factors include the proximity of water sources and the availability of adequate foraging habitat in close proximity. The availability and connectivity of nearby foraging habitat is important for successful breeding of black cockatoos (Saunders 1977, 1986); this does exist in close proximity to the study area (discussed further below). A dam located within a paddock in the north-east sector of the study area may also provide a reliable water resource for breeding black cockatoos potentially utilising the area.

4.5.2 Habitat Tree Density Assessment

A total of eight, 50 m by 50 m plots were assessed within the study area, with an average density of 29.0 habitat trees per hectare (Table 8). The density of potential habitat trees within the study area was higher compared to adjacent state forest where densities ranged from 11 to 22 trees per hectare (mean 17.3 per hectare) (Onshore Environmental 2018). Habitat tree density was lower in the central sector of the study area which had been subject to more frequent and recent logging.

Table 8 Habitat tree density from eight 50m by 50m plots assessed within the study area.

Plot	No. trees per ha	Easting	Northing
1	16	413725	6248769
2	24	413795	6248534
3	64	414223	6248474
4	16	414376	6248814
5	16	414798	6249343
6	32	414808	6248725
7	16	414509	6249071
8	48	414665	6248462

[2] It is noted that the branch supporting the hollow on one of these habitat trees fell in Spring 2023.

4.5.3 Foraging and Roosting Habitat Assessment

The study area provides suitable foraging habitat for all three species of black cockatoo. Forest Red-tailed Black Cockatoos were observed foraging extensively within the study area during the field survey and evidence of foraging on Marri and Jarrah nuts was observed at several locations. Baudin's and Carnaby's Black Cockatoos are also likely to use the study area for foraging, however limited evidence was observed during the field surveys. Based on the foraging quality scoring tool, the study area was given a score of eight for Baudin's and Carnaby's Black Cockatoos, and a score of ten for Forest Red-tailed Black Cockatoos (Table 9). Hence the study area was considered to contain high quality foraging habitat for all three species. The lower score for Baudin's and Carnaby's Black Cockatoos was due to the absence of foraging evidence within the study area in May 2024, and sparse evidence across the 13 year survey period (Table 9).

The foraging quality score tool includes an assessment of the connectivity and availability of foraging habitat within a 12 km radius of the study area, and the proximity of breeding and roosting sites. Approximately 37% (13,886 ha) of the land area within a 12 km radius of the study area is native vegetation (DPIRD 2017) (Figure 11). The vast majority of native vegetation is likely to represent suitable foraging habitat for black cockatoos, however the surrounding native vegetation is fragmented by farmland. Significant areas of suitable foraging habitat (relatively continuous) occur to the north and north-west of Greenbushes. Based on the proximity and connectivity of significant foraging resources no points were deducted for connectivity.

Baudin's and Carnaby's Black Cockatoos are both known to breed within 50 km of the study area (DAWE 2022) and Red-tailed Black Cockatoos are known to breed in close proximity to the study area (Onshore Environmental *unpublished data*). While there was no direct evidence of Baudin's and Carnaby's Black Cockatoos breeding in close proximity, there are large areas of suitable breeding habitat for both species within a 12 km radius of the study area. Therefore, based on the availability of breeding habitat no points were deducted from the foraging quality score for breeding proximity.

No evidence of night roosting was observed during the survey. Database searches indicate that there are 19 known roosting sites within 30 km of the study area (DBCA 2022). The study area is within 5 km of known Carnaby's Black Cockatoo roosting sites (Schwenkes Dam and the Greenbushes Pool) (DBCA 2019, Figure 11). The location of nearby Carnaby's Black Cockatoo roosting sites within a 1 km buffer is shown in Figure 11. Based on the close proximity of roosting sites, no points were deducted from the foraging quality score for night roosting.

No significant impacts from dieback or Marri canker disease were observed within the study area and no points were deducted for impacts from significant plant disease.

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

Score	Baudin's Cockatoo	Carnaby's Black Cockatoo	Forest Red-tail Black Cockatoo
Initial Score	10	10	10
Foraging evidence **Subtract 2** from your score if there is no evidence of feeding debris on your site.	0	0	0
Connectivity **Subtract 2** from your score if you have evidence to conclude that there is no other foraging habitat within 12 km of your site.	0	0	0
Proximity to breeding **Subtract 2** if you have evidence to conclude that your site is more than 12 km from breeding habitat	0	0	0
Proximity to roosting **Subtract 1** if you have evidence to conclude that your site is more than 20 km from a known night roosting habitat.	0	0	0
Impact from significant plant disease **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.	0	0	0
Final Score	**8**	**8**	**10**

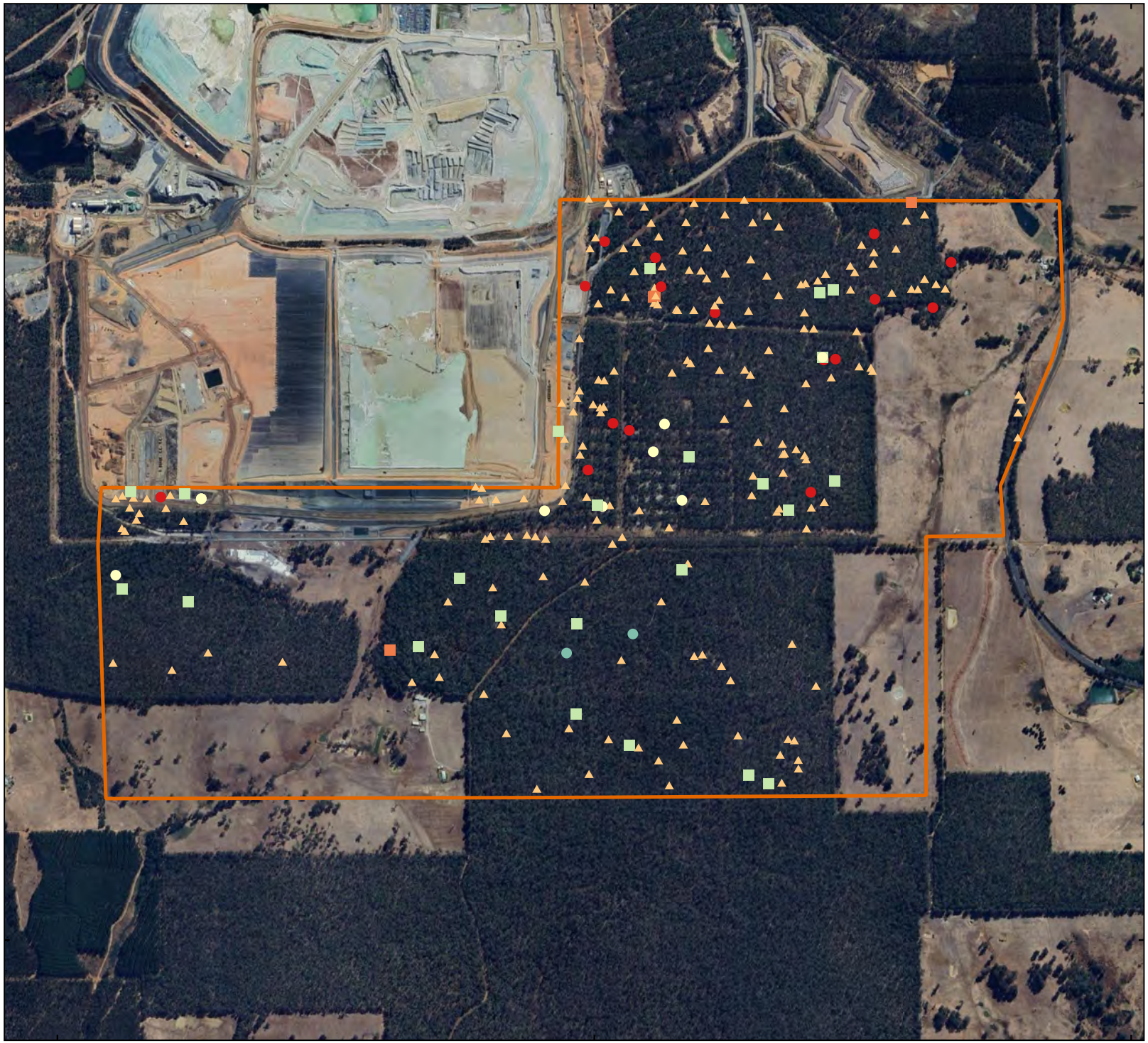

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Figure 9
Locations of significant fauna recorded within the study area

Legend

- S2 S7 Study Area

Significant Fauna

- Baudin's Black Cockatoo
- Carnaby's Black Cockatoo
- Forest Red-tailed Black Cockatoo
- Quenda
- South-western Brush-tailed Phascogale
- Western Brush Wallaby

0 250 500 750 m

1:20,000

Datum: GDA 94
Projection: MGA Zone 50

Date: 29/06/2024
Status: Final
Figure: 9
Sheet Size: A4
File Name Reference: TA_S2S7_Fig9_sig_fauna.pdf
Drawn by: JW
Requested by: DB

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S2/7 Future Waste Rock Landform

Figure 10
Habitat trees identified within the study area

Legend

- S2 S7 Study Area

Habitat Trees

- Cleared/Fallen
- Known nesting tree
- Suitable nesting tree
- Potential nesting tree
- Unsuitable

0 250 500 750 m

1:20,000

Datum: GDA 94
Projection: MGA Zone 50

Date: 29/06/2024
Status: Final
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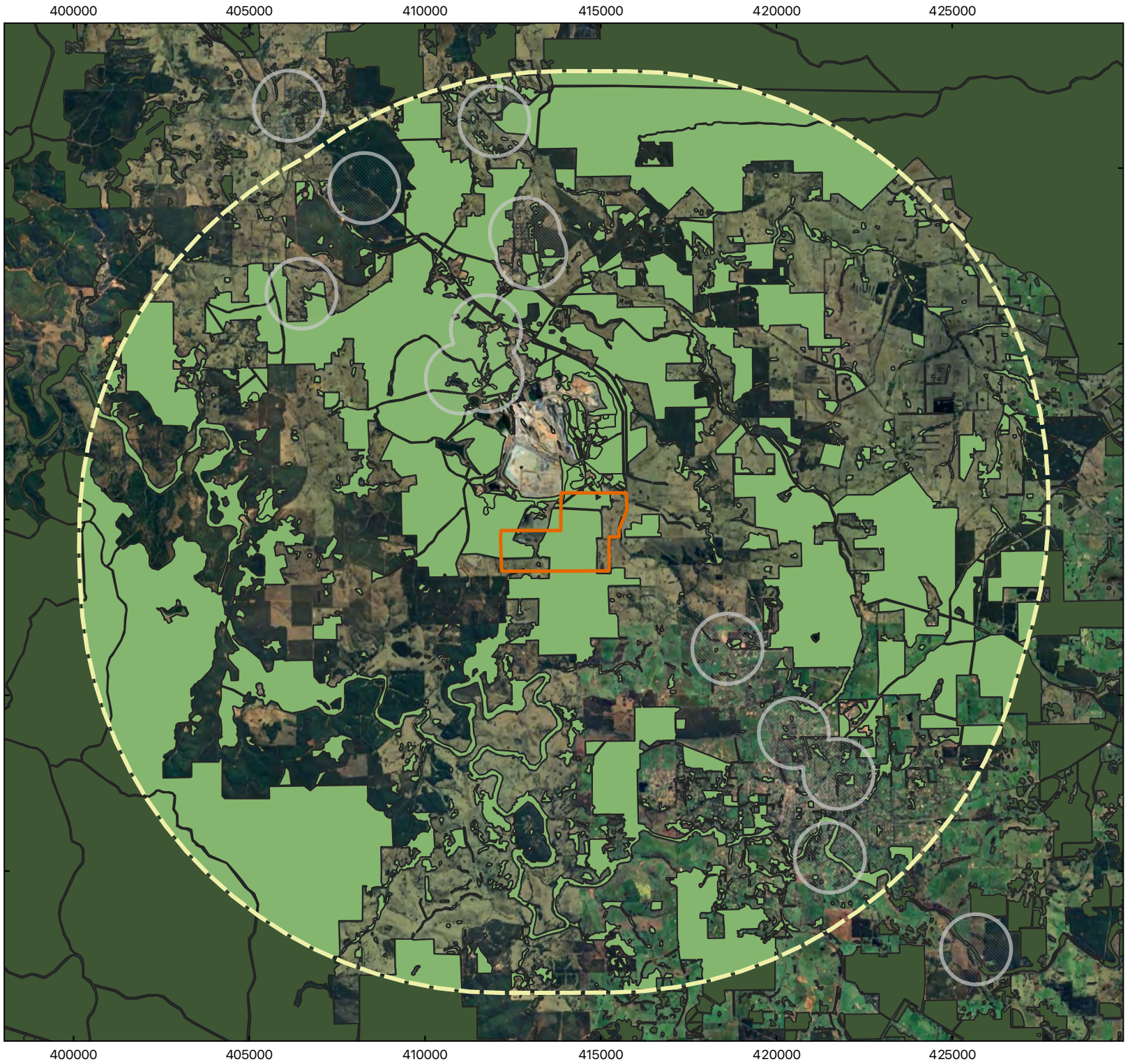

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S2 S7 Future Waste Rock Landform

Figure 11
Black Cockatoo foraging areas and roosting sites within 12km of the study area

Legend

- S2 S7 Study Area
- Roosting Sites (1km buffer)
- 12km Study Area Buffer
- Native Vegetation Extent (DPIRD 2017)

0 2 4 6 8 km

1:150,000

Datum: GDA 94
Projection: MGA Zone 50

Date: 29/06/2024
Status: Final
Figure: 11
Sheet Size: A4
File Name Reference: TA_S2S7_Fig11_foraging.pdf
Drawn by: JW
Requested by: DB

4.6 Introduced Fauna Species

Five introduced fauna species (feral animals) were recorded within the study area during the field survey:

- European Rabbit *(Oryctolagus cuniculus);*
- Red Fox *(Vulpes vulpes);*
- House Mouse *(Mus musculus);*
- Cat *(Felis catus);* and
- Pig *(Sus scrofa).*

Feral animals were detected from a range of sampling methods. Pigs and rabbits were observed opportunistically during the survey and Red Foxes and Cats were detected from camera traps. The presence of cats was also identified from tracks. Pigs were also identified from scats within the study area.

The Laughing Kookaburra (*Dacelo novaeguineae*) was also recorded during the field survey. This species was previously referred to as an introduced species but is now considered naturalised in the area.

5.0 DISCUSSION

5.1 Regional Context

The vertebrate fauna assemblage recorded from the study area was typical of the bioregion with 85 out of the 87 taxa recorded from the survey identified as potentially occurring from the database searches. The species not recorded from the database searches were the South-Western Free-Tailed Bat *(Ozimops kitcheneri)* and Holt's Long-eared Bat *(Nyctophilus holtorum).* While there were no records from the database searches in close proximity, the study area is within the known distribution for both species.

5.2 Proportion of Species Recorded

The two phase detailed fauna survey identified 11% of potentially occurring amphibians (one out of nine), 41% of potentially occurring bird species (53 out of 128), 40% of potentially occurring mammal species (15 out of 37), and 46% of potentially occurring reptile species (12 out of 26). The proportion of species recorded from the study area was considered to represent an adequate sample of the species within the study area from a two phase survey, considering weather conditions and the relative continuity of the habitat. The list from the database searches included migratory or vagrant species, species on the edge of their distribution, and species with specialised habitat requirements (particularly amphibians). These species would only utilise the study area occasionally or are unlikely to be found within the study area.

Disturbances present within the study area were likely to have negatively impacted on the diversity and abundance of species present within the study area. These include the disturbed nature of vegetation in some areas, the proximity to farmland and the presence of weeds and feral animals (particularly foxes and cats).

6.0 SUMMARY

Nine of the 20 previous fauna-related surveys completed at the Greenbushes mining leases between 2011 and 2024 intersect the study area. A total of 87 vertebrate fauna species have been recorded during the field surveys, including one amphibian, 13 reptiles, 55 birds and 18 mammals.

Six conservation significant fauna species have been recorded:

- Baudin's Black Cockatoo and Carnaby's Black Cockatoo, both listed as Endangered under the Commonwealth EPBC Act and Western Australian BC Act;
- Forest Red-tailed Black Cockatoo listed as Vulnerable under the Commonwealth EPBC Act and Western Australian BC Act;
- South-western Brush-tailed Phascogale listed as Conservation Dependant under the BC Act; and
- Quenda and Western Brush Wallaby, both listed as a Priority 4 fauna species by the DBCA.

There was one species determined as likely to occur within the study area during the desktop and literature review: Chuditch, listed as Vulnerable under the EPBC Act and BC Act. However, there was no evidence of Chuditch despite a two phase detailed fauna survey and a total of 61 motion sensor cameras installed to monitor fauna movements.

There were five feral animals recorded from the study area; European Rabbit, Red Fox, House Mouse, Cat and Pig.

One naturally occurring fauna habitat occurred within the study area: Jarrah-Marri forest on Hillslopes. This habitat was not determined to be regionally or locally restricted. Furthermore, based on state-wide vegetation mapping completed by Beard (1981), the vegetation type associated with the fauna habitat was determined to be well represented and well reserved at state-wide, bioregional and local government authority levels. Habitat condition ranged from good to very good, impacted by native timber logging, frequent fire, infrastructure corridors including roads, forestry tracks, powerlines and firebreaks, and edge effects from adjacent cleared pasture. The study area also included areas of cleared annual pasture (farmland paddocks) that had minimal value as habitat for native fauna.

The Jarrah-Marri forest on Hillslopes habitat was deemed to be high quality foraging habitat for all three species of cockatoo. Two known nesting trees and 13 suitable nesting trees were recorded within the study area.

7.0 STUDY TEAM

The vertebrate fauna survey was planned, co-ordinated and executed by the following personnel:

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APPENDIX 1

Conservation codes for species and communities of conservation significance

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

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

Priority Flora and Fauna Under the BC Act		
Status	Code	Description
Priority 1: Poorly-known Species	P1	Species that are known from one or a few locations (generally five or less) which are potentially at risk. All occurrences are either: very small; or on lands not managed for conservation, e.g. agricultural or pastoral lands, urban areas, road and rail reserves, gravel reserves and active mineral leases; or otherwise under threat of habitat destruction or degradation. Species may be included if they are comparatively well known from one or more locations but do not meet adequacy of survey requirements and appear to be under immediate threat from known threatening processes. Such species are in urgent need of further survey.
Priority 2: Poorly-known Species	P2	Species that are known from one or a few locations (generally five or less), some of which are on lands managed primarily for nature conservation, e.g. national parks, conservation parks, nature reserves and other lands with secure tenure being managed for conservation. Species may be included if they are comparatively well known from one or more locations but do not meet adequacy of survey requirements and appear to be under threat from known threatening processes. Such species are in urgent need of further survey.
Priority 3: Poorly-known Species	P3	Species that are known from several locations, and the species does not appear to be under imminent threat, or from few but widespread locations with either large population size or significant remaining areas of apparently suitable habitat, much of it not under imminent threat. Species may be included if they are comparatively well known from several locations but do not meet adequacy of survey requirements and known threatening processes exist that could affect them. Such species are in need of further survey.
Priority 4: Rare, Near Threatened and other species in need of monitoring	P4	(a) Rare. Species that are considered to have been adequately surveyed, or for which sufficient knowledge is available, and that are considered not currently threatened or in need of special protection, but could be if present circumstances change. These species are usually represented on conservation lands. (b) Near Threatened. Species that are considered to have been adequately surveyed and that are close to qualifying for Vulnerable, but are not listed as Conservation Dependent. (c) Species that have been removed from the list of threatened species during the past five years for reasons other than taxonomy.

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

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

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

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

APPENDIX 2

Foraging quality scoring tool

Table A1 Foraging quality scoring tool template

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

APPENDIX 3

List of fauna species potentially occurring within and surrounding the study area.

Class	Scientific Name	Common Name	ALA	Biologic 2018	Bird data	Dandjoo	DBCA	PMST
Amphibians	*Crinia georgiana*	Quacking Frog	x					
Amphibians	*Crinia glauerti*	Rattling Froglet	x					
Amphibians	*Geocrinia rosea*	Karri Frog	x					
Amphibians	*Heleioporus eyrei*	Moaning Frog	x					
Amphibians	*Heleioporus inornatus*	Whooping Frog	x					
Amphibians	*Metacrinia nichollsi*	Forest Toadlet	x					
Amphibians	*Myobatrachus gouldii*	Turtle Frog	x					
Amphibians	*Pseudophryne guentheri*	Gunther's Toadlet	x					
Amphibians	*Limnodynastes dorsalis*	Western Banjo Frog	x					
Birds	*Falco hypoleucos*	Grey Falcon						x
Birds	*Acanthiza apicalis*	Inland Thornbill	x		x			
Birds	*Acanthiza chrysorrhoa*	Yellow Rumped Thornbill	x	x	x			
Birds	*Acanthiza inornata*	Western Thornbill	x		x			
Birds	*Acanthiza uropygialis*	Chestnut-rumped Thornbill	x					
Birds	*Acanthorhynchus superciliosus*	Western Spinebill	x		x			
Birds	*Accipiter cirrocephalus*	Collared Sparrowhawk	x		x			
Birds	*Accipiter fasciatus*	Brown Goshawk	x		x			
Birds	*Aegotheles cristatus*	Australian Owlet-nightjar	x	x	x			
Birds	*Anthochaera carunculata*	Red Wattlebird	x	x	x			
Birds	*Anthochaera lunulata*	Western Wattlebird	x		x			
Birds	*Anthus novaeseelandiae*	Australian Pipit	x		x			
Birds	*Aquila audax*	Wedge-tailed Eagle	x	x	x			
Birds	*Artamus cinereus*	Black-faced Woodswallow	x		x			
Birds	*Artamus cyanopterus*	Dusky Woodswallow	x	x	x			
Birds	*Artamus personatus*	Masked Woodswallow	x					
Birds	*Barnardius zonarius*	Australian Ringneck	x	x	x			
Birds	*Burhinus grallarius*	Bush Stone-curlew	x					
Birds	*Cacatua pastinator*	Western Corella	x		x			
Birds	*Cacatua sanguinea*	Little Corella	x					
Birds	*Cacomantis flabelliformis*	Fan-tailed Cuckoo	x		x			
Birds	*Calamanthus campestris*	Rufous Fieldwren	x		x			
Birds	*Calyptorhynchus banksii naso*	Forest Red-tailed Black-cockatoo	x	x	x		x	x
Birds	*Calyptorhynchus baudinii*	Baudin's Black-Cockatoo	x		x		x	x

Class	Scientific Name	Common Name	ALA	Biologic 2018	Bird data	Dandjoo	DBCA	PMST
Birds	*Calyptorhynchus latirostris*	Carnaby's Black Cockatoo	x		x		x	x
Birds	*Chalcites basalis*	Horsfield's Bronze-Cuckoo	x		x			
Birds	*Chalcites lucidus*	Shining Bronze-Cuckoo	x		x			
Birds	*Cincloramphus cruralis*	Brown Songlark	x		x			
Birds	*Cincloramphus mathewsi*	Rufous Songlark	x		x			
Birds	*Circus approximans*	Swamp Harrier	x		x			
Birds	*Circus assimilis*	Spotted Harrier	x		x			
Birds	*Climacteris rufus*	Rufous Treecreeper	x		x			
Birds	*Colluricincla harmonica*	Grey Shrike-thrush	x		x			
Birds	*Columba livia*	Rock Dove	x		x			
Birds	*Coracina maxima*	Ground Cuckoo-shrike	x					
Birds	*Coracina novaehollandiae*	Black-faced Cuckoo-shrike	x		x			
Birds	*Corvus bennetti*	Little Crow	x					
Birds	*Corvus coronoides*	Australian Raven	x	x	x			
Birds	*Coturnix pectoralis*	Stubble Quail	x		x			
Birds	*Cracticus nigrogularis*	Pied Butcherbird	x		x			
Birds	*Cracticus torquatus*	Grey Butcherbird	x		x			
Birds	*Dacelo novaeguineae*	Laughing Kookaburra	x	x	x	x		
Birds	*Daphoenositta chrysoptera*	Varied Sittella	x		x			
Birds	*Dicaeum hirundinaceum*	Mistletoebird	x		x			
Birds	*Dromaius novaehollandiae*	Emu	x	x	x	x		
Birds	*Elanus axillaris*	Black-shouldered Kite	x		x			
Birds	*Eolophus roseicapilla*	Galah	x		x			
Birds	*Eopsaltria griseogularis*	Western Yellow Robin	x	x	x			
Birds	*Epthianura albifrons*	White-fronted Chat	x		x			
Birds	*Eurostopodus argus*	Spotted Nightjar	x					
Birds	*Falco berigora*	Brown Falcon	x		x			
Birds	*Falco cenchroides*	Nankeen Kestrel	x		x			
Birds	*Falco longipennis*	Australian Hobby	x		x			
Birds	*Falco peregrinus*	Peregrine Falcon	x		x		x	
Birds	*Falcunculus frontatus*	Crested Shrike-tit	x		x			
Birds	*Gavicalis virescens*	Singing Honeyeater	x		x			
Birds	*Gerygone fusca*	Western Gerygone	x	x	x			

Class	Scientific Name	Common Name	ALA	Biologic 2018	Bird data	Dandjoo	DBCA	PMST
Birds	*Gliciphila melanops*	Tawny-crowned Honeyeater	x		x			
Birds	*Grallina cyanoleuca*	Magpie-lark	x		x			
Birds	*Gymnorhina tibicen*	Australian Magpie	x	x	x			
Birds	*Haliastur sphenurus*	Whistling Kite	x		x			
Birds	*Heteroscenes pallidus*	Pallid Cuckoo	x		x			
Birds	*Hieraaetus morphnoides*	Little Eagle	x		x			
Birds	*Hirundo neoxena*	Welcome Swallow	x	x	x			
Birds	*Hirundo rustica*	Barn Swallow	x					
Birds	*Lalage tricolor*	White-winged Triller	x		x			
Birds	*Lichmera indistincta*	Brown Honeyeater	x		x			
Birds	*Lophoictinia isura*	Square-tailed Kite	x	x	x			
Birds	*Malurus elegans*	Red-winged Fairy-wren	x	x	x	x		
Birds	*Malurus lamberti*	Variegated Fairy-wren	x					
Birds	*Malurus pulcherrimus*	Blue-breasted Fairy-wren	x					
Birds	*Malurus splendens*	Splendid Fairy-wren	x		x			
Birds	*Manorina flavigula*	Yellow-throated Miner	x		x			
Birds	*Melanodryas cucullata*	Hooded Robin	x		x			
Birds	*Melithreptus brevirostris*	Brown-headed Honeyeater	x		x			
Birds	*Melithreptus chloropsis*	Western White-naped Honeyeater	x		x			
Birds	*Melopsittacus undulatus*	Budgerigar	x					
Birds	*Merops ornatus*	Rainbow Bee-eater	x		x			
Birds	*Microeca fascinans*	Jacky Winter	x		x			
Birds	*Myiagra inquieta*	Restless Flycatcher	x		x			
Birds	*Neophema elegans*	Elegant Parrot	x		x			
Birds	*Ninox boobook*	Southern Boobook	x	x	x			
Birds	*Ninox connivens*	Barking Owl	x					
Birds	*Numida meleagris*	Helmeted Guineafowl	x		x			
Birds	*Nymphicus hollandicus*	Cockatiel	x					
Birds	*Ocyphaps lophotes*	Crested Pigeon	x		x			
Birds	*Pachycephala fuliginosa*	Western Whistler	x		x			
Birds	*Pachycephala rufiventris*	Rufous Whistler	x		x			
Birds	*Pardalotus punctatus*	Spotted Pardalote	x		x			
Birds	*Pardalotus striatus*	Striated Pardalote	x	x	x			

Class	Scientific Name	Common Name	ALA	Biologic 2018	Bird data	Dandjoo	DBCA	PMST
Birds	*Parvipsitta porphyrocephala*	Purple-crowned Lorikeet	x	x	x			
Birds	*Petrochelidon ariel*	Fairy Martin	x		x			
Birds	*Petrochelidon nigricans*	Tree Martin	x		x			
Birds	*Petroica boodang*	Scarlet Robin	x	x				
Birds	*Petroica goodenovii*	Red-capped Robin	x		x			
Birds	*Phaps chalcoptera*	Common Bronzewing	x	x	x			
Birds	*Phaps elegans*	Brush Bronzewing	x		x			
Birds	*Phylidonyris niger*	White-cheeked Honeyeater	x		x			
Birds	*Phylidonyris novaehollandiae*	New Holland Honeyeater	x	x	x			
Birds	*Platycercus icterotis*	Western Rosella	x		x			
Birds	*Podargus strigoides*	Tawny Frogmouth	x	x	x			
Birds	*Polytelis anthopeplus*	Regent Parrot	x		x			
Birds	*Pomatostomus superciliosus*	White-browed Babbler	x		x			
Birds	*Poodytes gramineus*	Little Grassbird	x		x			
Birds	*Psephotus varius*	Mulga Parrot	x		x			
Birds	*Ptilotula ornata*	Yellow-plumed Honeyeater	x		x			
Birds	*Purpureicephalus spurius*	Red-capped Parrot	x		x			
Birds	*Quoyornis georgiana*	White-breasted Robin	x		x	x		
Birds	*Rhipidura albiscapa*	Grey Fantail	x	x	x			
Birds	*Rhipidura leucophrys*	Willie Wagtail	x	x	x			
Birds	*Sericornis frontalis*	White-browed Scrubwren	x	x	x	x		
Birds	*Smicrornis brevirostris*	Weebill	x		x			
Birds	*Stagonopleura oculata*	Red-eared Firetail	x		x			
Birds	*Stipiturus malachurus*	Southern Emu-wren	x		x			
Birds	*Strepera versicolor*	Grey Currawong	x		x			
Birds	*Streptopelia chinensis*	Spotted Turtle-dove	x					
Birds	*Streptopelia senegalensis*	Laughing Dove			x			
Birds	*Sturnus vulgaris*	Common Starling	x					
Birds	*Synoicus ypsilophora*	Partridge Quail	x					
Birds	*Taeniopygia guttata*	Zebra Finch	x					
Birds	*Todiramphus sanctus*	Sacred Kingfisher	x		x			
Birds	*Turdus merula*	Eurasian Blackbird	x					
Birds	*Turnix varius*	Painted Button-quail	x		x			

Class	Scientific Name	Common Name	ALA	Biologic 2018	Bird data	Dandjoo	DBCA	PMST
Birds	*Turnix velox*	Little Button-quail	x		x			
Birds	*Tyto alba*	Barn Owl	x		x			
Birds	*Tyto javanica*	Eastern Barn Owl	x					
Birds	*Tyto novaehollandiae novaehollandiae*	Masked Owl	x				x	
Birds	*Zosterops lateralis*	Silvereye	x		x	x		
Mammals	*Antechinus flavipes*	Yellow-footed Antechinus	x			x		
Mammals	*Austronomus australis*	White-striped Freetail-bat	x					
Mammals	*Bettongia penicillata ogilbyi*	Woylie	x				x	x
Mammals	*Canis familiaris*	Common Dog	x					
Mammals	*Capra hircus*	Goat	x					
Mammals	*Cercartetus concinnus*	Western Pygmy-possum	x	x		x		
Mammals	*Chalinolobus gouldii*	Gould's Wattled Bat	x					
Mammals	*Chalinolobus morio*	Chocolate Wattled Bat	x					
Mammals	*Dama dama*	Fallow Deer	x					
Mammals	*Dasyurus geoffroii*	Chuditch	x	x			x	x
Mammals	*Falsistrellus mackenziei*	Western False Pipistrelle	x				x	
Mammals	*Felis catus*	Cat	x	x				
Mammals	*Isoodon fusciventer*	Quenda	x	x			x	
Mammals	*Macropus fuliginosus*	Western Grey Kangaroo	x	x		x		
Mammals	*Macrotis lagotis*	Greater Bilby	x				x	
Mammals	*Mus musculus*	House Mouse	x	x				
Mammals	*Myrmecobius fasciatus*	Numbat	x				x	x
Mammals	*Notamacropus eugenii*	Tammar Wallaby	x					
Mammals	*Notamacropus irma*	Western Brush Wallaby	x	x			x	
Mammals	*Nyctophilus geoffroyi*	Lesser Long-eared Bat	x					
Mammals	*Nyctophilus major*	Greater Long-eared Bat	x					
Mammals	*Oryctolagus cuniculus*	Rabbit	x	x				
Mammals	*Phascogale calura*	Red-tailed Phascogale	x				x	x
Mammals	*Phascogale tapoatafa wambenger*	Brush-tailed Phascogale	x	x			x	
Mammals	*Pseudocheirus occidentalis*	Western Ringtail Possum	x	x			x	x
Mammals	*Rattus fuscipes*	Bush Rat	x			x		
Mammals	*Rattus rattus*	Black Rat	x	x		x		
Mammals	*Setonix brachyurus*	Quokka	x				x	x

Class	Scientific Name	Common Name	ALA	Biologic 2018	Bird data	Dandjoo	DBCA	PMST
Mammals	*Sminthopsis dolichura*	Little Long-tailed Dunnart	x					
Mammals	*Sminthopsis fuliginosus*	Dusky Dunnart	x					
Mammals	*Sminthopsis gilberti*	Gilbert's Dunnart	x					
Mammals	*Sus scrofa*	Pig	x	x				
Mammals	*Tachyglossus aculeatus*	Short-beaked Echidna	x					
Mammals	*Tarsipes rostratus*	Honey Possum	x					
Mammals	*Trichosurus vulpecula*	Common Brushtail Possum	x	x				
Mammals	*Vespadelus regulus*	Southern Forest Bat	x					
Mammals	*Vulpes vulpes*	Red Fox	x	x				
Reptiles	*Acritoscincus trilineatus*	Western Three-lined Skink	x					
Reptiles	*Anilios australis*	Southern Blind Snake	x					
Reptiles	*Aprasia pulchella*	Western Granite Worm-lizard	x					
Reptiles	*Chelodina colliei*	South-western Long-necked Turtle	x					
Reptiles	*Christinus marmoratus*	Marbled Gecko	x					
Reptiles	*Cryptoblepharus buchananii*	Buchanan's Snake-eyed Skink	x					
Reptiles	*Ctenotus delli*	Darling Range South-west Ctenotus	x				x	
Reptiles	*Ctenotus impar*	Odd-striped Ctenotus	x					
Reptiles	*Ctenotus labillardieri*	Common South-west Ctenotus	x					
Reptiles	*Diplodactylus lateroides*	Speckled Stone Gecko	x					
Reptiles	*Egernia kingii*	King's Skink	x					
Reptiles	*Egernia napoleonis*	South-western Crevice-skink	x	x		x		
Reptiles	*Hemiergis gracilipes*	South-western Mulch-skink	x					
Reptiles	*Hemiergis initialis*	Southwestern Earless Skink	x					
Reptiles	*Hemiergis peronii*	Four-toed Mulch Skink	x	x				
Reptiles	*Lerista distinguenda*	South-western Orange-tailed Slider	x	x				
Reptiles	*Lerista microtis*	South-western Slider	x					
Reptiles	*Menetia greyii*	Common Dwarf Skink	x					
Reptiles	*Morethia lineoocellata*	West Coast Morethia Skink	x					
Reptiles	*Morethia obscura*	Shrubland Morethia Skink	x	x				
Reptiles	*Notechis scutatus*	Tiger Snake	x	x				
Reptiles	*Pseudonaja affinis*	Dugite	x					
Reptiles	*Suta gouldii*	Gould's Hooded Snake	x					
Reptiles	*Suta nigriceps*	Mitchell's Short-tailed Snake	x					

Class	Scientific Name	Common Name	ALA	Biologic 2018	Bird data	Dandjoo	DBCA	PMST
Reptiles	*Tiliqua rugosa*	Shingle-back	x	x		x		
Reptiles	*Varanus rosenbergi*	Heath Monitor	x	x		x		

APPENDIX 4

Vertebrate fauna list from the study area

Group	Taxon Name	Common Name
Amphibians	*Limnodynastes dorsalis*	Western Banjo Frog
Birds	*Acanthiza apicalis*	Inland Thornbill
Birds	*Acanthiza chrysorrhoa*	Yellow-rumped Thornbill
Birds	*Acanthiza inornata*	Western Thornbill
Birds	*Accipiter fasciatus*	Brown Goshawk
Birds	*Anthochaera carunculata*	Red Wattlebird
Birds	*Aquila audax*	Wedge-tailed Eagle
Birds	*Artamus cyanopterus*	Dusky Woodswallow
Birds	*Barnardius zonarius*	Australian Ringneck
Birds	*Cacomantis flabelliformis*	Fan-tailed cuckoo
Birds	*Calyptorhynchus banksii naso*	Forest Red-tailed Black Cockatoo
Birds	*Chalcites basalis*	Horsfield's Bronze-Cuckoo
Birds	*Chalcites lucidus*	Shining Bronze-Cuckoo
Birds	*Climacteris rufus*	Rufous Treecreeper
Birds	*Colluricincla harmonica*	Grey Shrike-thrush
Birds	*Coracina novaehollandiae*	Black-faced Cuckoo-shrike
Birds	*Corvus coronoides*	Australian Raven
Birds	*Dacelo novaeguineae*	Laughing Kookaburra
Birds	*Daphoenositta chrysoptera*	Varied Sittella
Birds	*Dromaius novaehollandiae*	Emu
Birds	*Eolophus roseicapilla*	Galah
Birds	*Eopsaltria georgiana*	White-breasted Robin
Birds	*Eopsaltria griseogularis*	Western Yellow Robin
Birds	*Falco cenchroides*	Nankeen Kestrel
Birds	*Gavicalis virescens*	Singing Honeyeater
Birds	*Gerygone fusca*	Western Gerygone
Birds	*Grallina cyanoleuca*	Magpie-lark
Birds	*Gymnorhina tibicen*	Australian Magpie
Birds	*Hirundo neoxena*	Welcome Swallow
Birds	*Lichmera indistincta*	Brown Honeyeater
Birds	*Malurus elegans*	Red-winged Fairy-wren
Birds	*Malurus splendens*	Splendid Fairy-wren
Birds	*Melithreptus chloropsis*	Western White-naped Honeyeater
Birds	*Merops ornatus*	Rainbow Bee-eater
Birds	*Neophema elegans*	Elegant Parrot
Birds	*Ninox boobook*	Southern Boobook
Birds	*Pachycephala occidentalis*	Western Golden Whistler
Birds	*Pachycephala rufiventris*	Rufous Whistler
Birds	*Pardalotus punctatus*	Spotted Pardalote
Birds	*Pardalotus striatus*	Striated Pardalote
Birds	*Parvipsitta porphyrocephala*	Purple-crowned Lorikeet
Birds	*Petrochelidon nigricans*	Tree Martin
Birds	*Petroica boodang*	Scarlet Robin
Birds	*Phaps chalcoptera*	Common Bronzewing
Birds	*Phylidonyris novaehollandiae*	New Holland Honeyeater
Birds	*Platycercus icterotis*	Western Rosella
Birds	*Podargus strigoides*	Tawny Frogmouth
Birds	*Purpureicephalus spurius*	Red-capped Parrot
Birds	*Rhipidura albiscapa*	Grey Fantail
Birds	*Rhipidura leucophrys*	Willie Wagtail

Group	Taxon Name	Common Name
Birds	*Sericornis frontalis*	White-browed Scrubwren
Birds	*Smicrornis brevirostris*	Weebill
Birds	*Strepera versicolor*	Grey Currawong
Birds	*Zanda baudinii*	Baudin's Black Cockatoo
Birds	*Zanda latirostris*	Carnaby's Black Cockatoo
Birds	*Zosterops lateralis*	Silvereye
Mammals	*Austronomus australis*	White-striped Freetail-bat
Mammals	*Chalinolobus gouldii*	Gould's Wattled Bat
Mammals	*Chalinolobus morio*	Chocolate Wattled Bat
Mammals	*Felis catus*	Cat
Mammals	*Isoodon fusciventer*	Quenda
Mammals	*Macropus fuliginosus*	Western Grey Kangaroo
Mammals	*Mus musculus*	House Mouse
Mammals	*Notamacropus irma*	Western Brush Wallaby
Mammals	*Nyctophilus geoffroyi*	Lesser Long-eared Bat
Mammals	*Nyctophilus holtorum*	Holt's Long-eared Bat
Mammals	*Nyctophilus major*	Greater Long-eared Bat
Mammals	*Oryctolagus cuniculus*	Rabbit
Mammals	*Ozimops kitcheneri*	South-Western Free-Tailed Bat
Mammals	*Phascogale tapoatafa wambenger*	Brush-tailed Phascogale
Mammals	*Sus scrofa*	Pig
Mammals	*Trichosurus vulpecula*	Common Brushtail Possum
Mammals	*Vespadelus regulus*	Southern Forest Bat
Mammals	*Vulpes vulpes*	Red Fox
Reptiles	*Acritoscincus trilineatus*	Western Three-lined Skink
Reptiles	*Christinus marmoratus*	Marbled Gecko
Reptiles	*Ctenotus impar*	Odd-striped Ctenotus
Reptiles	*Ctenotus labillardieri*	Common South-west Ctenotus
Reptiles	*Egernia kingii*	King's Skink
Reptiles	*Egernia napoleonis*	South-western Crevice-skink
Reptiles	*Hemiergis initialis*	
Reptiles	*Hemiergis peronii*	Four-toed Mulch Skink
Reptiles	*Lerista distinguenda*	South-western Orange-tailed Slider
Reptiles	*Menetia greyii*	Common Dwarf Skink
Reptiles	*Morethia obscura*	Shrubland Morethia Skink
Reptiles	*Tiliqua rugosa*	Shingle-back
Reptiles	*Varanus rosenbergi*	Heath Monitor

APPENDIX 5

Comparison of species recorded during the desktop assessment and field survey

Class	Scientific Name	Common Name	Database	Recorded
Amphibians	*Crinia georgiana*	Quacking Frog	x	
Amphibians	*Crinia glauerti*	Rattling Froglet	x	
Amphibians	*Geocrinia rosea*	Karri Frog	x	
Amphibians	*Heleioporus eyrei*	Moaning Frog	x	
Amphibians	*Heleioporus inornatus*	Whooping Frog	x	
Amphibians	*Limnodynastes dorsalis*	Western Banjo Frog	x	x
Amphibians	*Metacrinia nichollsi*	Forest Toadlet	x	
Amphibians	*Myobatrachus gouldii*	Turtle Frog	x	
Amphibians	*Pseudophryne guentheri*	Gunther's Toadlet	x	
Birds	*Acanthiza apicalis*	Inland Thornbill	x	x
Birds	*Acanthiza chrysorrhoa*	Yellow Rumped Thornbill	x	x
Birds	*Acanthiza inornata*	Western Thornbill	x	x
Birds	*Acanthiza uropygialis*	Chestnut-rumped Thornbill	x	
Birds	*Acanthorhynchus superciliosus*	Western Spinebill	x	
Birds	*Accipiter cirrocephalus*	Collared Sparrowhawk	x	
Birds	*Accipiter fasciatus*	Brown Goshawk	x	x
Birds	*Aegotheles cristatus*	Australian Owlet-nightjar	x	
Birds	*Anthochaera carunculata*	Red Wattlebird	x	x
Birds	*Anthochaera lunulata*	Western Wattlebird	x	
Birds	*Anthus novaeseelandiae*	Australian Pipit	x	
Birds	*Aquila audax*	Wedge-tailed Eagle	x	x
Birds	*Artamus cinereus*	Black-faced Woodswallow	x	
Birds	*Artamus cyanopterus*	Dusky Woodswallow	x	x
Birds	*Artamus personatus*	Masked Woodswallow	x	
Birds	*Barnardius zonarius*	Australian Ringneck	x	x
Birds	*Burhinus grallarius*	Bush Stone-curlew	x	
Birds	*Cacatua pastinator*	Western Corella	x	
Birds	*Cacatua sanguinea*	Little Corella	x	
Birds	*Cacomantis flabelliformis*	Fan-tailed Cuckoo	x	x
Birds	*Calamanthus campestris*	Rufous Fieldwren	x	
Birds	*Calyptorhynchus banksii naso*	Forest Red-tailed Black-cockatoo	x	x
Birds	*Zanda baudinii*	Baudin's Black-Cockatoo	x	x
Birds	*Zanda latirostris*	Carnaby's Black Cockatoo	x	x
Birds	*Chalcites basalis*	Horsfield's Bronze-Cuckoo	x	x
Birds	*Chalcites lucidus*	Shining Bronze-Cuckoo	x	x
Birds	*Cincloramphus cruralis*	Brown Songlark	x	
Birds	*Cincloramphus mathewsi*	Rufous Songlark	x	
Birds	*Circus approximans*	Swamp Harrier	x	
Birds	*Circus assimilis*	Spotted Harrier	x	
Birds	*Climacteris rufus*	Rufous Treecreeper	x	x
Birds	*Colluricincla harmonica*	Grey Shrike-thrush	x	x
Birds	*Columba livia*	Rock Dove	x	
Birds	*Coracina maxima*	Ground Cuckoo-shrike	x	
Birds	*Coracina novaehollandiae*	Black-faced Cuckoo-shrike	x	x
Birds	*Corvus bennetti*	Little Crow	x	
Birds	*Corvus coronoides*	Australian Raven	x	x
Birds	*Coturnix pectoralis*	Stubble Quail	x	
Birds	*Cracticus nigrogularis*	Pied Butcherbird	x	
Birds	*Cracticus torquatus*	Grey Butcherbird	x	
Birds	*Dacelo novaeguineae*	Laughing Kookaburra	x	x
Birds	*Daphoenositta chrysoptera*	Varied Sittella	x	x
Birds	*Dicaeum hirundinaceum*	Mistletoebird	x	
Birds	*Dromaius novaehollandiae*	Emu	x	x
Birds	*Elanus axillaris*	Black-shouldered Kite	x	
Birds	*Eolophus roseicapilla*	Galah	x	x
Birds	*Eopsaltria griseogularis*	Western Yellow Robin	x	x
Birds	*Epthianura albifrons*	White-fronted Chat	x	
Birds	*Eurostopodus argus*	Spotted Nightjar	x	

Class	Scientific Name	Common Name	Database	Recorded
Birds	*Falco berigora*	Brown Falcon	x	
Birds	*Falco cenchroides*	Nankeen Kestrel	x	x
Birds	*Falco hypoleucos*	Grey Falcon	x	
Birds	*Falco longipennis*	Australian Hobby	x	
Birds	*Falco peregrinus*	Peregrine Falcon	x	
Birds	*Falcunculus frontatus*	Crested Shrike-tit	x	
Birds	*Gavicalis virescens*	Singing Honeyeater	x	x
Birds	*Gerygone fusca*	Western Gerygone	x	x
Birds	*Gliciphila melanops*	Tawny-crowned Honeyeater	x	
Birds	*Grallina cyanoleuca*	Magpie-lark	x	x
Birds	*Gymnorhina tibicen*	Australian Magpie	x	x
Birds	*Haliastur sphenurus*	Whistling Kite	x	
Birds	*Heteroscenes pallidus*	Pallid Cuckoo	x	
Birds	*Hieraaetus morphnoides*	Little Eagle	x	
Birds	*Hirundo neoxena*	Welcome Swallow	x	x
Birds	*Hirundo rustica*	Barn Swallow	x	
Birds	*Lalage tricolor*	White-winged Triller	x	
Birds	*Lichmera indistincta*	Brown Honeyeater	x	x
Birds	*Lophoictinia isura*	Square-tailed Kite	x	
Birds	*Malurus elegans*	Red-winged Fairy-wren	x	x
Birds	*Malurus lamberti*	Variegated Fairy-wren	x	
Birds	*Malurus pulcherrimus*	Blue-breasted Fairy-wren	x	
Birds	*Malurus splendens*	Splendid Fairy-wren	x	x
Birds	*Manorina flavigula*	Yellow-throated Miner	x	
Birds	*Melanodryas cucullata*	Hooded Robin	x	
Birds	*Melithreptus brevirostris*	Brown-headed Honeyeater	x	
Birds	*Melithreptus chloropsis*	Western White-naped Honeyeater	x	x
Birds	*Melopsittacus undulatus*	Budgerigar	x	
Birds	*Merops ornatus*	Rainbow Bee-eater	x	x
Birds	*Microeca fascinans*	Jacky Winter	x	
Birds	*Myiagra inquieta*	Restless Flycatcher	x	
Birds	*Neophema elegans*	Elegant Parrot	x	x
Birds	*Ninox boobook*	Southern Boobook	x	x
Birds	*Ninox connivens*	Barking Owl	x	
Birds	*Numida meleagris*	Helmeted Guineafowl	x	
Birds	*Nymphicus hollandicus*	Cockatiel	x	
Birds	*Ocyphaps lophotes*	Crested Pigeon	x	
Birds	*Pachycephala fuliginosa*	Western Whistler	x	x
Birds	*Pachycephala rufiventris*	Rufous Whistler	x	x
Birds	*Pardalotus punctatus*	Spotted Pardalote	x	x
Birds	*Pardalotus striatus*	Striated Pardalote	x	x
Birds	*Parvipsitta porphyrocephala*	Purple-crowned Lorikeet	x	x
Birds	*Petrochelidon ariel*	Fairy Martin	x	
Birds	*Petrochelidon nigricans*	Tree Martin	x	x
Birds	*Petroica boodang*	Scarlet Robin	x	x
Birds	*Petroica goodenovii*	Red-capped Robin	x	
Birds	*Phaps chalcoptera*	Common Bronzewing	x	x
Birds	*Phaps elegans*	Brush Bronzewing	x	
Birds	*Phylidonyris niger*	White-cheeked Honeyeater	x	
Birds	*Phylidonyris novaehollandiae*	New Holland Honeyeater	x	x
Birds	*Platycercus icterotis*	Western Rosella	x	x
Birds	*Podargus strigoides*	Tawny Frogmouth	x	x
Birds	*Polytelis anthopeplus*	Regent Parrot	x	
Birds	*Pomatostomus superciliosus*	White-browed Babbler	x	
Birds	*Poodytes gramineus*	Little Grassbird	x	
Birds	*Psephotus varius*	Mulga Parrot	x	
Birds	*Ptilotula ornata*	Yellow-plumed Honeyeater	x	
Birds	*Purpureicephalus spurius*	Red-capped Parrot	x	x

Class	Scientific Name	Common Name	Database	Recorded
Birds	*Quoyornis georgiana*	White-breasted Robin	x	x
Birds	*Rhipidura albiscapa*	Grey Fantail	x	x
Birds	*Rhipidura leucophrys*	Willie Wagtail	x	x
Birds	*Sericornis frontalis*	White-browed Scrubwren	x	x
Birds	*Smicrornis brevirostris*	Weebill	x	x
Birds	*Stagonopleura oculata*	Red-eared Firetail	x	
Birds	*Stipiturus malachurus*	Southern Emu-wren	x	
Birds	*Strepera versicolor*	Grey Currawong	x	x
Birds	*Streptopelia chinensis*	Spotted Turtle-dove	x	
Birds	*Streptopelia senegalensis*	Laughing Dove	x	
Birds	*Sturnus vulgaris*	Common Starling	x	
Birds	*Synoicus ypsilophora*	Partridge Quail	x	
Birds	*Taeniopygia guttata*	Zebra Finch	x	
Birds	*Todiramphus sanctus*	Sacred Kingfisher	x	
Birds	*Turdus merula*	Eurasian Blackbird	x	
Birds	*Turnix varius*	Painted Button-quail	x	
Birds	*Turnix velox*	Little Button-quail	x	
Birds	*Tyto alba*	Barn Owl	x	
Birds	*Tyto javanica*	Eastern Barn Owl	x	
Birds	*Tyto novaehollandiae novaehollandiae*	Masked Owl	x	
Birds	*Zosterops lateralis*	Silvereye	x	x
Mammals	*Antechinus flavipes*	Yellow-footed Antechinus	x	
Mammals	*Austronomus australis*	White-striped Freetail-bat	x	x
Mammals	*Bettongia penicillata ogilbyi*	Woylie	x	
Mammals	*Canis familiaris*	Common Dog	x	
Mammals	*Capra hircus*	Goat	x	
Mammals	*Cercartetus concinnus*	Western Pygmy-possum	x	
Mammals	*Chalinolobus gouldii*	Gould's Wattled Bat	x	x
Mammals	*Chalinolobus morio*	Chocolate Wattled Bat	x	x
Mammals	*Dama dama*	Fallow Deer	x	
Mammals	*Dasyurus geoffroii*	Chuditch	x	
Mammals	*Falsistrellus mackenziei*	Western False Pipistrelle	x	
Mammals	*Felis catus*	Cat	x	x
Mammals	*Isoodon fusciventer*	Quenda	x	x
Mammals	*Macropus fuliginosus*	Western Grey Kangaroo	x	x
Mammals	*Macrotis lagotis*	Greater Bilby	x	
Mammals	*Mus musculus*	House Mouse	x	x
Mammals	*Myrmecobius fasciatus*	Numbat	x	
Mammals	*Notamacropus eugenii*	Tammar Wallaby	x	
Mammals	*Notamacropus irma*	Western Brush Wallaby	x	x
Mammals	*Nyctophilus geoffroyi*	Lesser Long-eared Bat	x	x
Mammals	Nyctophilus holtorum	Holt's Long-eared Bat		x
Mammals	*Nyctophilus major*	Greater Long-eared Bat	x	x
Mammals	*Oryctolagus cuniculus*	Rabbit	x	x
Mammals	Ozimops kitcheneri	South-Western Free-Tailed Bat		x
Mammals	*Phascogale calura*	Red-tailed Phascogale	x	
Mammals	*Phascogale tapoatafa wambenger*	Brush-tailed Phascogale	x	x
Mammals	*Pseudocheirus occidentalis*	Western Ringtail Possum	x	
Mammals	*Rattus fuscipes*	Bush Rat	x	
Mammals	*Rattus rattus*	Black Rat	x	
Mammals	*Setonix brachyurus*	Quokka	x	
Mammals	*Sminthopsis dolichura*	Little Long-tailed Dunnart	x	
Mammals	*Sminthopsis fuliginosus*	Dusky Dunnart	x	
Mammals	*Sminthopsis gilberti*	Gilbert's Dunnart	x	
Mammals	*Sus scrofa*	Pig	x	x
Mammals	*Tachyglossus aculeatus*	Short-beaked Echidna	x	
Mammals	*Tarsipes rostratus*	Honey Possum	x	
Mammals	*Trichosurus vulpecula*	Common Brushtail Possum	x	x

Class	Scientific Name	Common Name	Database	Recorded
Mammals	*Vespadelus regulus*	Southern Forest Bat	x	x
Mammals	*Vulpes vulpes*	Red Fox	x	x
Reptiles	*Acritoscincus trilineatus*	Western Three-lined Skink	x	x
Reptiles	*Anilios australis*	Southern Blind Snake	x	
Reptiles	*Aprasia pulchella*	Western Granite Worm-lizard	x	
Reptiles	*Chelodina colliei*	South-western Long-necked Turtle	x	
Reptiles	*Christinus marmoratus*	Marbled Gecko	x	x
Reptiles	*Cryptoblepharus buchananii*	Buchanan's Snake-eyed Skink	x	
Reptiles	*Ctenotus delli*	Darling Range South-west Ctenotus	x	
Reptiles	*Ctenotus impar*	Odd-striped Ctenotus	x	x
Reptiles	*Ctenotus labillardieri*	Common South-west Ctenotus	x	x
Reptiles	*Diplodactylus lateroides*	Speckled Stone Gecko	x	
Reptiles	*Egernia kingii*	King's Skink	x	x
Reptiles	*Egernia napoleonis*	South-western Crevice-skink	x	x
Reptiles	*Hemiergis gracilipes*	South-western Mulch-skink	x	
Reptiles	*Hemiergis initialis*	Southwestern Earless Skink	x	x
Reptiles	*Hemiergis peronii*	Four-toed Mulch Skink	x	x
Reptiles	*Lerista distinguenda*	South-western Orange-tailed Slider	x	x
Reptiles	*Lerista microtis*	South-western Slider	x	
Reptiles	*Menetia greyii*	Common Dwarf Skink	x	x
Reptiles	*Morethia lineoocellata*	West Coast Morethia Skink	x	
Reptiles	*Morethia obscura*	Shrubland Morethia Skink	x	x
Reptiles	*Notechis scutatus*	Tiger Snake	x	
Reptiles	*Pseudonaja affinis*	Dugite	x	
Reptiles	*Suta gouldii*	Gould's Hooded Snake	x	
Reptiles	*Suta nigriceps*	Mitchell's Short-tailed Snake	x	
Reptiles	*Tiliqua rugosa*	Shingle-back	x	x
Reptiles	*Varanus rosenbergi*	Heath Monitor	x	x

APPENDIX 6

Details of tree hollows assessed within the study area.

Description	Hollow Rank	DBH	Hollow type	No. hollows	Tree side	Species	Alive/Dead	Easting	Northing
Marri hollow. Top entry 1300mm dia. No signs of use, reviewed 2 times both classified as suitable	Suitable nesting tree	1300		1		Marri		414086	6250370
Top entry hollow in Marri. No signs of use. 900mm dia, reclassified to PS	Potential nesting tree	900	Top Entry			Marri		414095	6250194
Marri with side entry hollow. Shows no signs of use.	Potential nesting tree	1300	Side Entry			Marri		414152	6249971
Kirkby "Side entry hollow in Marri. Old chewing at entrance.	Known nesting tree	1100	Side Entry			Marri		414371	6249569
	Potential nesting tree							414575	6248874
	Potential nesting tree							414823	6249323
Top entry hollow in Marri. Slight chewing at entrance.	Potential nesting tree	1400	Top Entry			Marri		414897	6250169
Kirkby "Marri with side entry hollow. Slight chewing at entrance.	Suitable nesting tree		Side Entry			Marri		415012	6250361
Chewed side entry hollow in Marri. 1200mm dia, Reviewed, reclassifed as suitable	Suitable nesting tree	1200	Side Entry			Marri		415016	6249550
	Suitable nesting tree							415606	6250057
Might be chewed - also a potential chimney hollow	Known nesting tree		Chimney?	2		Marri		414285	6250550
	Potential nesting tree			1		Marri		414572	6249657
Bark chew/loss - needs to be checked	Potential nesting tree			1		Marri		414950	6249630
Difficult to assess suitability	Potential nesting tree		Chimney	1		Jarrah		415040	6250516
Review of historical tree data	Suitable nesting tree							412466	6249552
Review of historical tree data	Cleared							413677	6249645
Review of historical tree data	Cleared							413902	6250185
Review of historical tree data	Suitable nesting tree							413944	6250035

Description	Hollow Rank	DBH	Hollow type	No. hollows	Tree side	Species	Alive/Dead	Easting	Northing
Kirkby Chewed top entry hollow in Marri. 1200mm dia, Review of historical tree data, Reclassified as suitable	Suitable nesting tree	1200				Marri		414603	6250176
Tree check - edges appear worn but not chewed	Suitable nesting tree			1		Jarrah		414824	6249325
Tree check - unhealthy, hollow all the way through, base of hollow has potential but may be shallow	Potential nesting tree			1		Jarrah		414576	6248876
Unhealthy, uncertain of suitability	Potential nesting tree			1		Marri		414700	6248583
Uncertain of depth of both hollows, no chewing	Potential nesting tree			2		Jarrah		414647	6248592
Edges look worn, maybe possum use	Potential nesting tree			1		Jarrah		414558	6248599
Appears suitable	Suitable nesting tree			1		Jarrah		414748	6248601
Potential hollow in V of tree, may be too large	Potential nesting tree			1		Jarrah		414570	6248647
Uncertain of suitability	Unsuitable			1		Jarrah		414759	6248660
Difficult to assess suitability	Unsuitable			1+		Marri		414530	6248885
In paddock, hollow worn, unsure if BC suitable	Potential nesting tree			1		Jarrah		412190	6248868
3 chimneys, look unsued, small hollow on trunk	Potential nesting tree		Chimney/side entry	4			Dead	412279	6248905
Unused, but appears suitable	Potential nesting tree			1		Marri		412189	6248913
Long narrow entrance, unsure whether it would be used by BC, looks unused	Potential nesting tree			1		Marri		412707	6248971
Appears suitable but unused	Potential nesting tree			1		Jarrah		412824	6249018
Looks suitable, worn edges, maybe chewed? Chewed nuts around tree	Potential nesting tree			1		Marri		412840	6249034
Appears suitable if deep enough, may be slightly chewed	Potential nesting tree			1		Marri		412570	6249230
Difficult to assess suitability, might not be a hollow	Unsuitable			1		Jarrah		412692	6249268

Description	Hollow Rank	DBH	Hollow type	No. hollows	Tree side	Species	Alive/Dead	Easting	Northing
Appears suitable if deep enough	Suitable nesting tree			1		Marri		412717	6249309
Unused, unsure of depth	Unsuitable			1		Jarrah		412544	6249354
Unsure of depth but looks good	Potential nesting tree			1		Yarri		412967	6249447
Tree check - Can't find it, fallen over	Fallen							413905	6249154
Unused hollow, Reclassifed during Tree check - Recently died, appears chewed	Known nesting tree			1		Marri		413882	6249129
Tree check - no tree at this location, area has been cleared	Cleared							413665	6249666
May be slightly too small, appears deep enough	Potential nesting tree	150		1		Marri		413658	6249357
Two good hollows, worn, perhaps not right angle	Potential nesting tree			2		Jarrah		413573	6249126
Tree check - can't see hollow very well	Potential nesting tree			1		Jarrah		414328	6249382
Tree check - dead, can't see opening, appears unused	Potential nesting tree			1			Dead	414294	6249241
Ok size, uncertain of depth	Potential nesting tree			1		Marri	Dead	414292	6248719
Big dead tree	Potential nesting tree			2			Dead	414809	6248736
Long narrow hollow (1mx15cm), edges worn	Potential nesting tree			1		Jarrah		414074	6248744
Open hollow, unsure of depth, edges look like old chewing?	Potential nesting tree			1		Jarrah	Dead	413915	6248774
Good large opening, possibly too big	Suitable nesting tree			1		Marri		414387	6248778
Big entrance, appears suitable but uncertain of depth, has fresh leaves	Potential nesting tree			1		Marri		414818	6248907
Looks suitable, not chewed	Potential nesting tree			1				414834	6248986
Edges look worn, unsure if access is suitable for BC	Potential nesting tree			1		Jarrah		413459	6248979
Unsure of depth, RTBC heard in distance	Potential nesting tree	230		1		Jarrah		413395	6248991

Description	Hollow Rank	DBH	Hollow type	No. hollows	Tree side	Species	Alive/Dead	Easting	Northing
Difficult to assess suitability	Potential nesting tree		Chimney	1				414830	6249015
	Potential nesting tree			1		Jarrah		413698	6249048
Hollow at top looks suitable, looks worn, unsure of depth	Potential nesting tree			1		Marri		413804	6249087
Multiple hollows potentially suitable for BC, but unsure of depth	Potential nesting tree			3+		Marri		413709	6249101
Upper v-shaped chimney hollow, open	Potential nesting tree	240	Chimney	1		Jarrah		413547	6249154
Large entrance, probably too large	Potential nesting tree			1		Marri		413888	6249193
Edges look worn, difficult to assess depth	Potential nesting tree			1		Marri		414279	6249250
Large entrance, edges worn	Suitable nesting tree			1		Marri		414606	6249256
Good opening, uncertain of depth, no evidence of use	Potential nesting tree			1		Marri		413569	6249285
Unsure of depth, entrances appear large enough, looks unused	Potential nesting tree			3+		Marri		413449	6249301
Unsure of sutiability	Potential nesting tree		Chimney	1		Marri		412254	6249293
Uncertain of depth	Unsuitable			1		Marri		413488	6249339
Big chimney, unsure of depth	Potential nesting tree	200	Chimney	1		Marri		413811	6249352
Large enough, worn edges, likely a possum hollow	Potential nesting tree			1		Marri		413621	6249390
Chimney plus side hollows, large enough, edges worn	Suitable nesting tree			3+		Marri		413402	6249393
Big chimney, unsure of depth	Potential nesting tree		Chimney	1		Marri		413513	6249407
Big enough, but downward facing, edges worn	Unsuitable	200		2		Marri		413589	6249431
Chimney, unsure of depth	Potential nesting tree	150	Chimney	1		Marri		414030	6249456
Smooth edges, unsure of depth, potentially used by possum	Potential nesting tree	200		1		Marri		413969	6249478

Description	Hollow Rank	DBH	Hollow type	No. hollows	Tree side	Species	Alive/Dead	Easting	Northing
Hollow appears suitable	Suitable nesting tree	120		1		Marri		413531	6249543
Probs suitable, uncertain of depth	Potential nesting tree			1		Marri		412353	6249557
Possibly 3 hollows, 1 looks suitable	Unsuitable	140		3		Jarrah		414040	6249640
Large entrance, may not be suitable	Potential nesting tree	140		1		Marri		414080	6249643
28 in entrance of hollow	Potential nesting tree	200		1		Jarrah		414040	6249782
Unsure of depth, doesn't appear used	Potential nesting tree			1		Jarrah		414078	6249861
Opening is big enough, doesn't look used or chewed	Potential nesting tree	120		2		Marri		414048	6249926
Wide chimney, unsure of depth or suitability	Potential nesting tree	180	Chimney	1		Marri		413977	6249982
Small chimney, unsure of depth	Potential nesting tree	160	Chimney	1		Marri		414049	6250013
Large chimney, unsure of depth	Potential nesting tree	120	Chimney	1		Marri		414029	6250049
Tree check - large hollow, bark worn, 20x80cm hollow, looks suitable and deep, but very open, maybe too open?	Suitable nesting tree	200		1		Marri		415607	6250059
Tree check - no longer there, a stump - paddock tree	Fallen					Marri		415468	6249543
Suitable, edges look worn	Potential nesting tree	170		1		Marri		413787	6248560
Unsure of suitability	Unsuitable	190	Chimney	1		Marri		413811	6248641
Very large hollow, unsure of depth	Potential nesting tree			1		Marri	Dead	413629	6248853
Good hollow, appears suitable, may be too large	Potential nesting tree	180		1		Marri		413999	6248939
Probably suitable, unsure of depth	Suitable nesting tree	200	Chimney	1		Marri		414065	6248971
Unsure of depth, appears suitable	Potential nesting tree	100		1		Marri		414517	6248991
Two hollows, upper one appears suitable but facing downwards a bit, edges worn	Suitable nesting tree	200		2		Marri		414032	6249010

Description	Hollow Rank	DBH	Hollow type	No. hollows	Tree side	Species	Alive/Dead	Easting	Northing
One, maybe two hollows, uncertain of depth	Potential nesting tree			1 to 2		Marri	Dead	414232	6249028
Two entries, apear suitable, recently died	Potential nesting tree	200		2		Marri		414051	6249042
Appears suitable, smooth edges - not recently worn	Potential nesting tree	130		1		Marri		414145	6249141
Top entry hollow in Marri. No signs of use. 1100mm dia	Cleared	1100	Top Entry			Marri		413903	6250216
Top entry hollow in dead Marri. Slight chewing at entrance. 1200mm dia	Known nesting tree	1200	Top Entry			Marri	Dead	413946	6250049
Marri with side entry hollow. Slight chewing at entrance.	Cleared	1400	Side Entry			Marri		413665	6249680
Side entry hollow in Marri. No signs of use. 1200mm dia	Suitable nesting tree	1200	Side Entry			Marri		414413	6249617
Hollow at base of fork in Marri. No signs 1000mm dia	Suitable nesting tree	1000	Base of Fork			Marri		414652	6249615
Side entry hollow in Marri. No signs of use. 1200mm dia	Suitable nesting tree	1200	Side Entry			Marri		414832	6249608
Two hollows in Marri. Top and side entry. No signs of	Suitable nesting tree	1500	Top Entry			Marri		414932	6249523
Suitable hollow occupied by bees	Suitable nesting tree					Marri		413316	6249273
Unused hollow	Suitable nesting tree					Marri		413904	6249152
Unused hollow	Suitable nesting tree					Marri		414293	6249240
Unused hollow	Suitable nesting tree					Marri		414327	6249380
Marri hollow. Top entry. No signs of use. 1200mm dia	Suitable nesting tree	1200	Top Entry			Marri		414561	6250542
Marri with side entry hollow showing signs of old and	Suitable nesting tree	900	Side Entry			Marri		414597	6250694
Dead Marri. Side entry hollow but has bees. 1100mm	Potential nesting tree	1100	Side Entry			Marri	Dead	414976	6250407