Targeted Black-cockatoo Survey
Greenbushes Mining Leases

Prepared for Talison Lithium Pty Ltd
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EXECUTIVE SUMMARY

Talison Lithium Pty Ltd (Talison) currently operates a lithium mine at Greenbushes, situated approximately 250 kilometres (km) south of Perth in south-west Western Australia. Talison is proposing to undertake ongoing expansion to increase output from the Greenbushes Mine. The proposed expansion activities may require clearing of native vegetation over coming decades which will remove habitat for conservation significant species. Species likely impacted include three species of black-cockatoo: Forest Red-tailed Black-cockatoo (listed as Vulnerable under the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* [EPBC Act] and Western Australian *Biodiversity Conservation Act 2016* [BC Act]), Baudin's Black-cockatoo and Carnaby's Black-cockatoo (listed as Endangered under the EPBC Act and BC Act). Onshore Environmental Consultants Pty Ltd (Onshore Environmental) was commissioned by Talison to undertake a Species Needs Analysis (SNA) for black-cockatoos which will be utilised as a conservation planning document to identify and prioritise suitable conservation actions to be pursued as offsets by Talison. The SNA identified a lack of regional knowledge for black-cockatoos in the Greenbushes region and specifically native vegetation surrounding Talison's proposed impact footprint which has been subject to biological surveys for environmental impact assessment in recent years.

In Spring 2024 Onshore Environmental was commissioned by Talison to undertake a targeted black-cockatoo survey of state forest blocks within mining leases held by Talison that surround the current mining operations; herein this is referred to as the study area. The field survey was undertaken in November 2024 and included approximately 3,000 hectares (ha) of native vegetation.

The Forest Red-tailed Black-cockatoo was commonly recorded throughout the study area from observations, calls and foraging evidence. Baudin's Black-cockatoo was recorded only from foraging evidence at one location and Carnaby's Black-cockatoo was recorded from two observations, calls and foraging evidence.

A total of sixty-eight known nesting hollows were identified within the study area including ten active Forest Red-tailed Black cockatoo nests.

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1.0 INTRODUCTION

1.1 Background

Talison is proposing to continue expansion of the Greenbushes mining operations in response to ongoing growth in global demand for lithium. The mine is located approximately 250 km south of Perth in the Southern Jarrah Forest subregion of the Jarrah Forest bioregion in south-west Western Australia. The proposed expansion activities may require clearing of native vegetation over coming decades which will remove habitat for conservation significant species, including those listed as Matters of National Environmental Significance (MNES). MNES likely to be impacted include three black-cockatoo taxa endemic to the south-west:

- Forest Red-tailed Black-cockatoo listed as Vulnerable under the EPBC Act and BC Act;
- Baudin's Black-cockatoo listed as Endangered under the EPBC Act and BC Act; and
- Carnaby's Black-cockatoo listed as Endangered under the EPBC Act and BC Act.

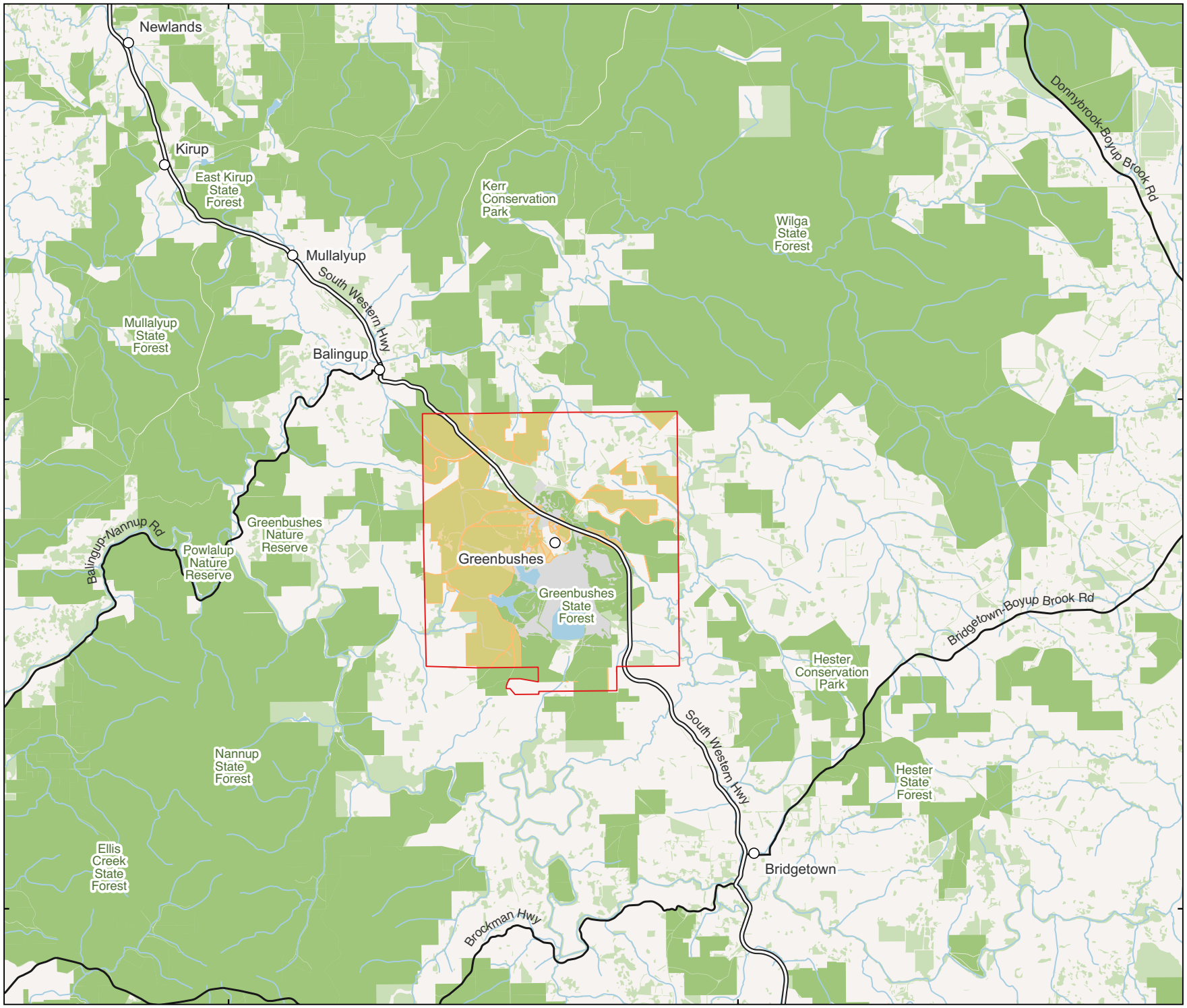
Black-cockatoo's are the most common MNES species within and surrounding the Greenbushes Mine and are therefore most likely to be impacted by Talison's operations and proposed clearing. Recently Talison commissioned Onshore Environmental to undertake a SNA for the three black-cockatoo taxa. The SNA will be utilised as a conservation planning document to identify and prioritise suitable conservation actions to be pursued as offsets by Talison.

Environmental approvals for the ongoing expansion of the mine have required numerous vertebrate fauna surveys within proposed impact areas surrounding the mining operations. However, the SNA highlighted a relative lack of understanding of the broader habitat use by black-cockatoos outside potential impact areas associated with the current mine. In order to improve knowledge and understanding of the local black-cockatoo population, Onshore Environmental was commissioned to undertake a targeted black-cockatoo survey of previously unsurveyed areas of state forest within mining leases held by Talison around the current mining operation, i.e. outside potential impact areas previously surveyed (Figure 1). The survey was undertaken in November 2024 and covered over 3,000 ha of native vegetation. Results from the targeted survey will be used to inform offset planning and increase the knowledge of specific impacts to be mitigated through offsets.

The targeted black-cockatoo survey aimed to increase knowledge of black-cockatoos in the local area by:

- Quantifying and clarifying the abundance of the three black-cockatoo species in the Greenbushes area;

- Identifying areas of high priority habitat for black-cockatoos within the Greenbushes area, i.e. important breeding, night roosting and foraging habitats;
- Identifying the extent of black-cockatoo breeding activity occurring in the Greenbushes area;
- Quantifying the relative importance of habitat for black-cockatoos inside and outside potential disturbance areas;
- Identifying factors that determine the suitability and use of habitats for black-cockatoos in the Greenbushes area; and
- Identifying threatening processes potentially impacting the local black-cockatoo population and quantifying the magnitude of these threats, i.e. threats to breeding, hollow availability.



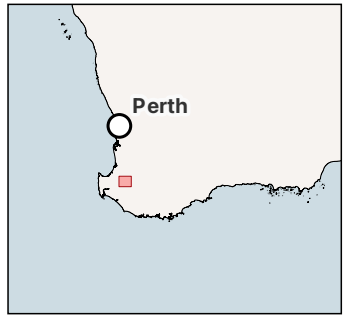
ONSHORE ENVIRONMENTAL

TALISON LITHIUM BLACK-COCKATOO SURVEY

Figure 1: Location of the study area

Legend

- Talison Lithium Tenements
- Study Area
- Native Vegetation (DPIRD 2017)
- DBCA Lands (DBCA 2024)



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Datum: GDA 2020
Projection: MGA Zone 50

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. Since 2022 rainfall data has not been 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 2024 has ranged from 582.6 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). Above average rainfall was received in June, August and November 2024 (Figure 2).

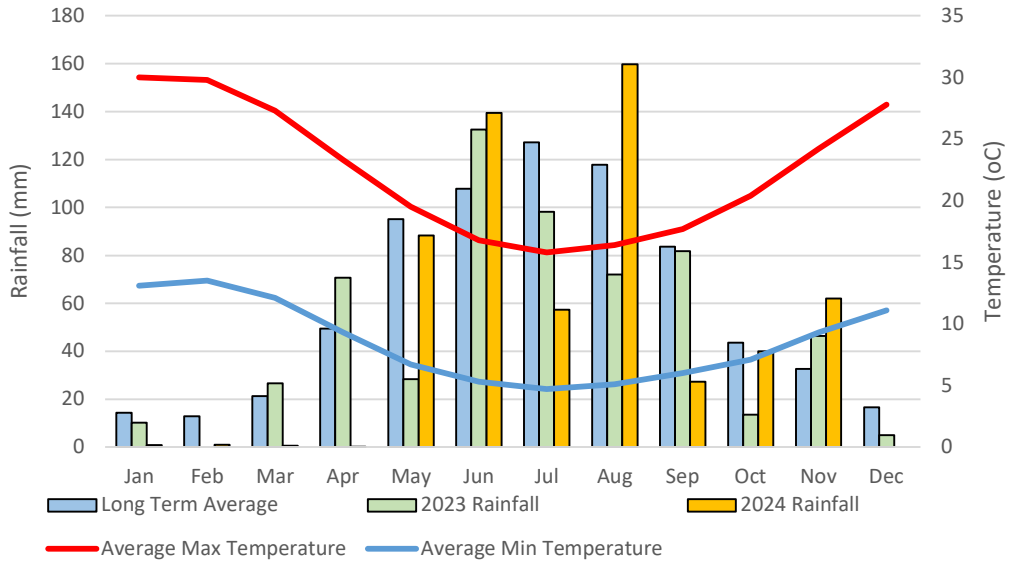


Figure 2 Rainfall and temperature data from the Bridgetown Weather Station (Bureau of Meteorology 2024).

2.2 Biogeographic Regions

The latest version of the Interim Biogeographic Regionalisation for Australia (IBRA) 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 2018). 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, Comer and Beecham 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 native vegetation blocks that form the Greenbushes State Forest. There are privately owned rural lots occurring in the south-west and eastern sector 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.

The geology of the Greenbushes area is described as Archean granite of the Yilgarn Block (Wilde and Walker 1982) and the major soil types have been mapped by Tille (1996). The study area intersects four subsystems, all of the Darling Plateau system within the Western Darling Range zone:

- Dwellingup subsystem (DW) - broad, undulating lateritic divides with gravels and sands;

- Grimwade (GR) - valleys (30-70 m deep) with low gradients (5-20%), loams and loamy gravels;
- Hester (HR) - lateritic and granitic ridges and hill crests with gravels and loams; and
- Yarragil (YG) - minor valleys in lateritic terrain with gentle to low slopes and swampy floors. Soils are mainly loamy gravels and sandy gravels with some loamy earths and deep sands.

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.

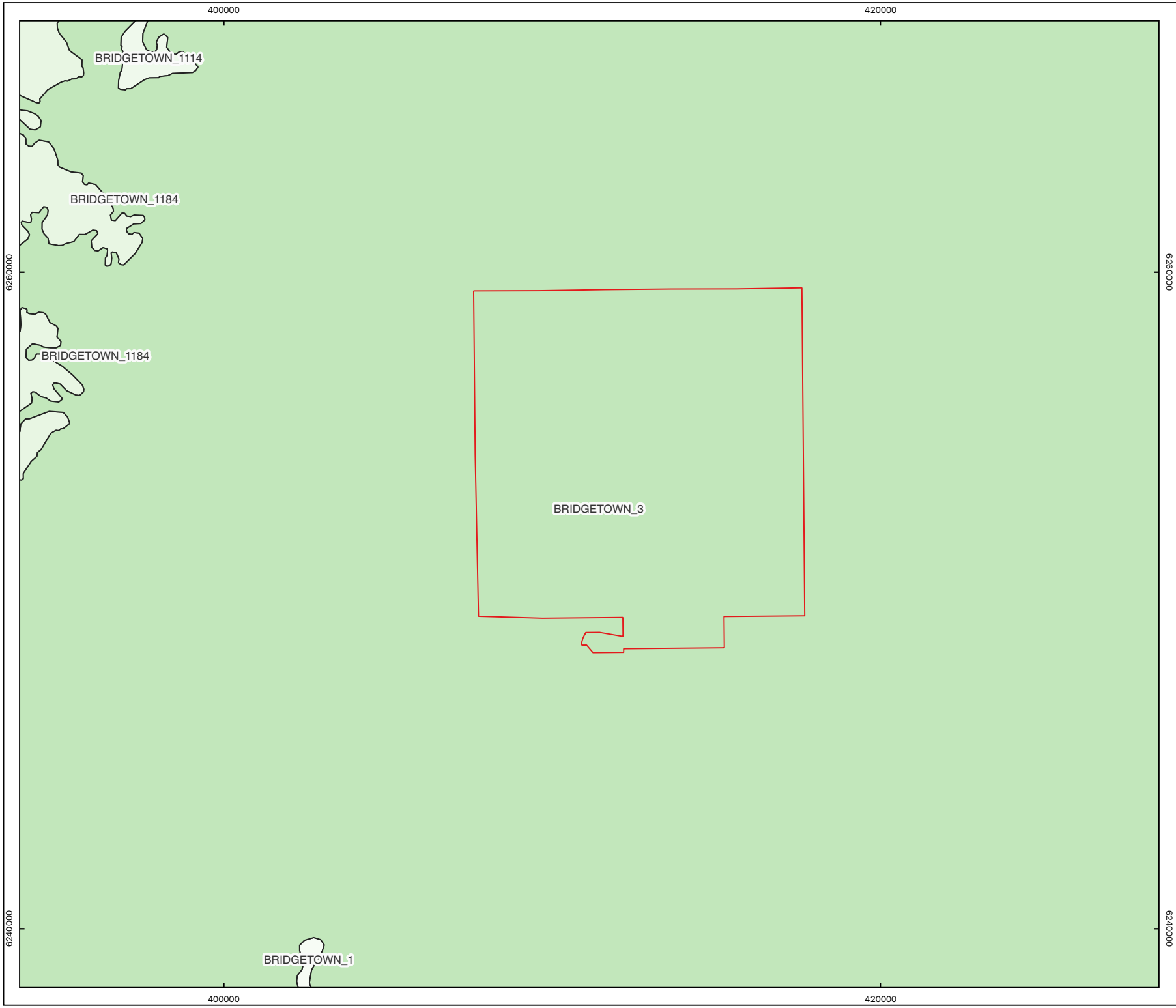
The Menzies Sub-district is characterised by Jarrah stands on laterite with some Marri and Wandoo woodlands. Valley soils are often richer and Blackbutt (*Eucalyptus patens)* is more dominant in these areas. Flooded Gum (*Eucalyptus rudis)* is common along stream banks and Bullich (*Eucalyptus megacarpa)* is also present in some areas. Within the Greenbushes area vegetation is dominated by Jarrah *(Eucalyptus marginata)* and Marri *(Corymbia calophylla)* 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 has been mapped as part 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, Balingup, Catterick, Grimwade and Goonaping 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.
Balingup	Open forest of *Eucalyptus marginata* subsp. *marginata-Corymbia calophylla* on slopes and woodland of *Eucalyptus rudis* on the valley floor in the humid zone.
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.
Goonaping	Mosaic of open forest of *Eucalyptus marginata* subsp. marginata (humid zones) and *Eucalyptus marginata* subsp. *thalassica* (semiarid to perarid zones) on the sandy-gravels, low woodland of *Banksia attenuata* on the drier sandier sites (humid to perarid zones) with some *Banksia menziesii* (northern arid and perarid zones) and low open woodland of *Melaleuca preissiana-Banksia littoralis* on the moister sandy soils (humid to perarid zones).



ONSHORE ENVIRONMENTAL

TALISON LITHIUM BLACK-COCKATOO SURVEY

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

Talison Mining Tenements

Beard Vegetation Associations

- BRIDGETOWN_1
- BRIDGETOWN_1114
- BRIDGETOWN_1184
- BRIDGETOWN_3

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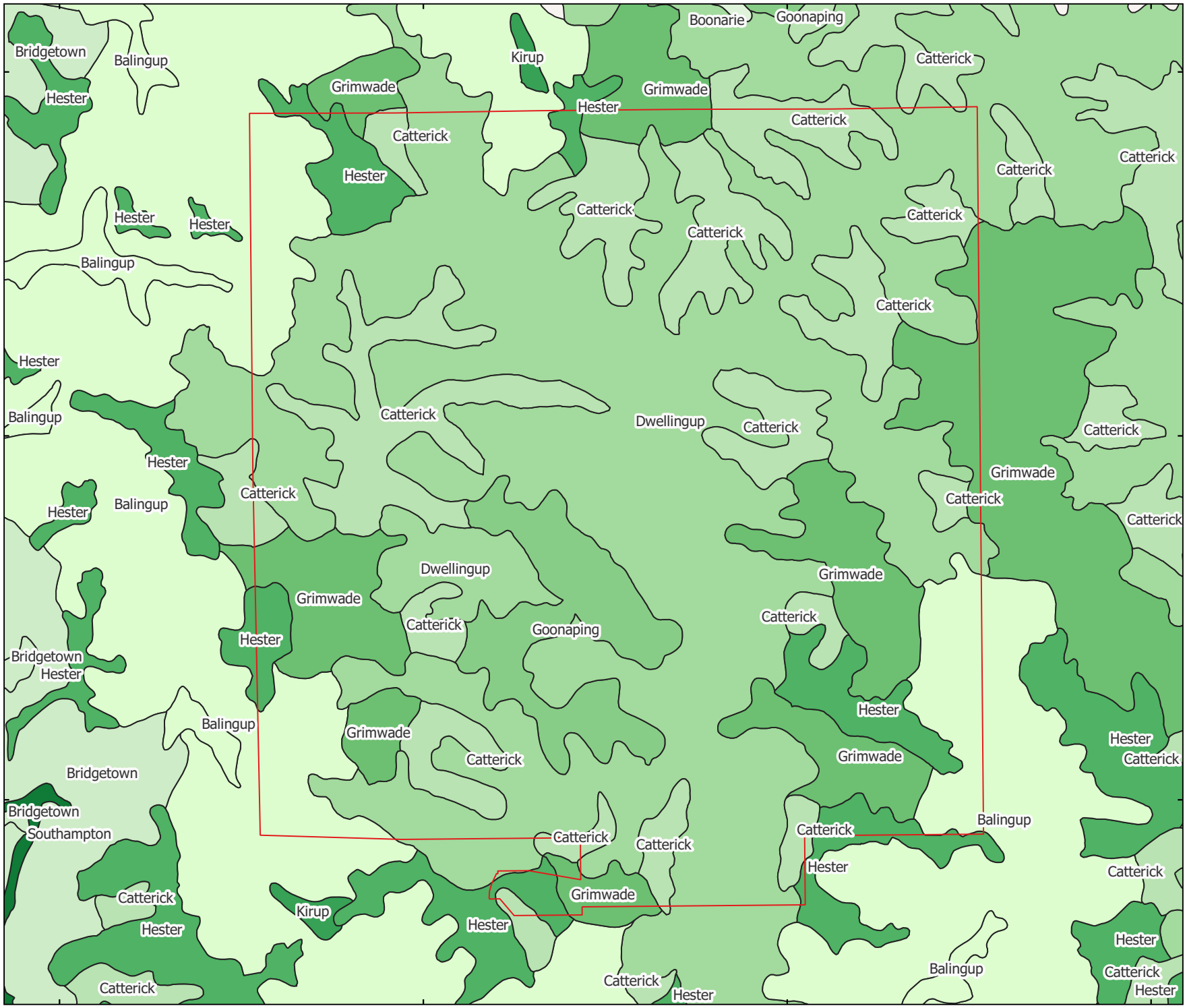

ONSHORE ENVIRONMENTAL

TALISON LITHIUM BLACK-COCKATOO SURVEY

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

Legend

- Talison Mining Tenements

Vegetation Complexes

- Balingup
- Boonarie
- Bridgetown
- Catterick
- Dwellingup
- Goonaping
- Grimwade
- Hester
- Kirup
- Southampton

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Data sources: Data WA - Vegetation Complexes - South West forest region of Western Australia (DBCA-047)

Datum: GDA 2020
Projection: MGA Zone 50

3.0 METHODOLOGY

3.1 Legislation and Guidance Statements

The targeted 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:

- DEWHA (2010b) Survey Guidelines for Australia's Threatened Birds; and
- DCCEEW (2022) Referral Guidelines for three WA threatened black-cockatoo species.

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 2023). Previous surveys were reviewed to provide context for the survey and to inform an assessment of habitat types potentially occurring within the study area. Regional scale reports relevant to the study area locality were reviewed, including:

- A survey of vertebrate fauna in the southern forests of Western Australia (Christensen, Annels, Liddelow and Skinner 1985); and
- A summary of bioregional data (Hearn *et al*. 2002).

Onshore Environmental has undertaken numerous targeted black cockatoo surveys and detailed vertebrate fauna surveys within proposed impact areas at Greenbushes in recent years. Results from recent surveys are described in more detail in Section 4.1.1. Associated flora and vegetation surveys have also provided fine-scale vegetation type mapping which was used to inform fauna habitat mapping.

As part of the SNA, Onshore Environmental consolidated results from baseline biological surveys completed for Talison into a single consolidated database. The database includes fine and broad scale vegetation type mapping, vegetation condition mapping and records of conservation significant fauna, including black-cockatoos and habitat trees. A summary of the consolidated database is provided in Section 4.1.1.

3.2.2 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. A number of species are assigned an additional level of conservation significance based on a limited number of known populations and the perceived threats to these locations (Appendix 1); and
- DBCA Priority list: DBCA produces a list of Priority species 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 and Personnel

The targeted black-cockatoo survey was undertaken by Principal Ecologist Ms Jessica Waters, Principal Botanists Dr Darren Brearley and Dr Jerome Bull and Ecologists Mr Thomas Mott and Mr Tim Wallace between the 11th and 18th of November 2024. An additional visit to the study area was undertaken to retrieve an infra-red motion sensor camera trap and audio recorder on the 1st of December 2024.

3.3.2 Surveying of Study Area

The targeted fauna survey employed a variety of systematic and opportunistic sampling techniques across the study area. The entire study area was ground truthed to document habitat characteristics including presence and evaluation of habitats suitable for black cockatoos, habitat trees, water sources and the presence of birds and foraging evidence. The study area was ground truthed by walking transects predominantly in a north-south direction at 250 metre (m) intervals (Figure 5). Opportunistic records were also made while driving or walking through the study area during the survey.

The following parameters were recorded for all black-cockatoo observations:

- Co-ordinate location;
- Abundance;
- Record methodology, i.e. observation, calls/heard, foraging evidence, or other secondary evidence;
- Description of habitat in which the species was located; and
- Photograph of the species, evidence of species and/or habitat.

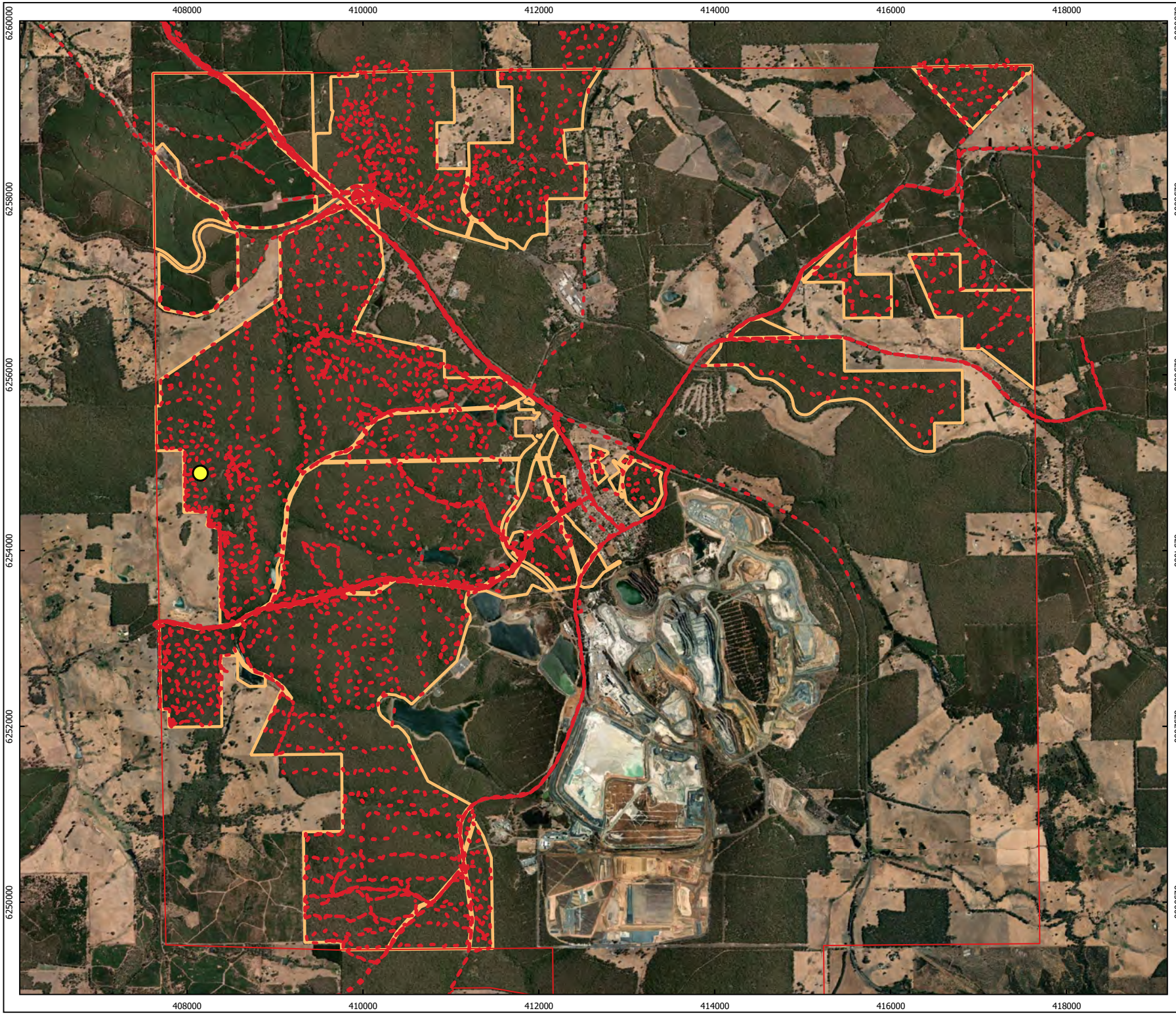
3.3.3 Assessment of Black Cockatoo Breeding Habitat

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 centimetres (cm) or greater (or 30 cm or greater for *Eucalyptus wandoo)*. Due to the large size of the study area all trees with a DBH >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 *Corymbia calophylla* (Marri), *Eucalyptus marginata* (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). 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 3).

Table 2 Ranking system used for the assessment of potential nest trees for black cockatoos (adapted by Onshore Environmental) and equivalent category defined in the federal referral guideline (DAWE 2022).

Adapted by Onshore Environmental		Referral guideline for 3 WA threatened black cockatoo species (DAWE 2022)	
Category	**Description**	**Category**	**Description**
Active	Black cockatoo breeding activity recorded		
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.	Known nesting trees	Trees (live or dead but still standing) which contains a hollow where black cockatoo breeding has been recorded or which demonstrates evidence of breeding (i.e. showing evidence of use through scratches, chew marks or feathers).
Suitable	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.		



TALISON LITHIUM BLACK-COCKATOO SURVEY

Figure 5
Locations of tracks within the study area

Legend

- Talison Mining Tenements
- Study Areas
- Transect walks
- Montion Camera and PAM

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3.3.4 Motion Sensor Camera and Passive Acoustic Recorder

A motion sensitive camera and audio recorder were deployed at an active nesting hollow identified during the survey (Figure 5). A motion sensor camera with infrared illumination to 30 m (Browning Spec Ops Elite HP5 model) was placed on a nearby tree facing the active hollow. The Songmeter Micro 2 passive acoustic recorder was secured to the nesting tree. The camera and acoustic recorder were deployed on the 15th November 2024 and retrieved on the 1st December 2024 (16 nights). The motion sensitive camera was set to a timelapse function with a photograph was taken every two minutes during daylight hours. The acoustic recorder schedule recorded for a total of eight hours a day for three hours after sunrise, two hours at midday (1100-1300) and three hours before sunset.

3.3.5 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 at 250 m intervals in a north-south direction with changes in habitat characteristics recorded and mapped. Vegetation type mapping undertaken from the consolidated mapping completed by Onshore Environmental was utilised to further aid in characterising habitat mapping across the full extent of the study area (Onshore Environmental 2024). The suitability of habitat and presence of habitat features for species of conservation significance was noted as part of the habitat assessment.

3.3.6 Assessment of Black Cockatoo Foraging Habitat

Vegetation within the study area was assessed for foraging value. Black cockatoos forage widely in suitable vegetation in the south-west 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 two different methodologies:

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

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

The foraging quality scoring tool has been developed to allow habitat quality to be quantified. The 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.

Offset Habitat Scoring System - DCCEEW in consultation with species experts in Western Australia

The score used to calculate the value of an offset provides a numerical value that reflects the significance of vegetation as foraging habitat for each of the black cockatoo species, and was recently developed by the DCCEEW in consultation with species experts in Western Australia. The foraging value of the vegetation depends upon the type, percentage foliar cover and health of trees and/or vegetation condition, and can be influenced by the context of the site such as the availability of foraging habitat nearby. The scoring system has three components drawn from the DCCEEW offset calculator (DCCEEW 2020, see Appendix 3):

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

Site condition is considered the key factor in determining the quality of habitat for the three black cockatoo species. Species stocking rate is considered only in terms of presence or absence of the species and does not add to the total score. The species, or strong indicators of the species, must be present for an offset to be considered suitable.

3.3.7 Assessment of Black Cockatoo Night Roosting Habitat

DAWE (2022) defines known roosting trees as a tree (generally the tallest), native or introduced known to be used for night roosting or which demonstrates evidence of roosting. Potential roosting trees are defined as tall trees of any species within close proximity to water sources. Night roosting habitat is defined as habitat that contains one or more known or potential roosting trees. Known roosting trees are typically situated close to important water sources within areas of high-quality foraging habitat. The availability of night roosting habitat within the study area was assessed during the field survey. Any evidence of roosting was noted during the field survey, e.g. branch

clippings, droppings or moulted feathers, as well as the presence of black cockatoos within the study area or nearby at dawn and dusk.

Known night roosting habitat is recorded within databases managed by the DBCA, the Western Australian Museum and Birdlife Australia (Great Cocky Count). These records were accessed to determine if known sites occurred nearby to the study area and to assess regional context. Database searches were undertaken to determine known roosting locations within a 20 km radius of the study area (DBCA 2024).

3.3.8 Species Identification and Nomenclature

Vertebrate fauna species were identified at the time of observation in the field or from photographs, motion sensor camera traps and audio recordings. All species were able to be fully identified with no specimens needed to be taken for further examination. Nomenclature and conservation significance rankings used in this report are in accordance with the current listing of WA fauna recognised by the WA Museum (WAM), as listed on the Checklist of the Terrestrial Vertebrae of Western Australia (WAM 2022) for mammals and herpetofauna, and the Australian Faunal Directory for birds (ABRS 2022).

3.3.9 Survey Constraints

The EPA Technical Guidance (EPA 2020b) list potential limitations that field surveys may encounter. Limitations associated with the basic level vertebrate fauna survey are addressed in Table 3. No significant access or timing restrictions impacted the survey, and the study area was adequately surveyed. The survey provides an assessment of habitat and the black-cockatoo activity at the time of survey during the single survey period with no seasonal component (noting that foraging evidence persists and indicates foraging activity for over previous months/years).

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

Variable	Impact on Survey Outcomes
Availability of data and information	The desktop searches provided an extensive species list, background information and regional context for the study area. A number of fauna surveys have been completed in close proximity to the study area, including basic and detailed 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.

Variable	Impact on Survey Outcomes
Experience levels	The personnel who executed the survey are practitioners suitably qualified in their respective fields; • Ms Jessica Waters (Principal Ecologist >10 years' experience); • Dr Darren Brearley and Dr Jerome Bull (Principal Botanists, 25 and 20 years' experience respectively); and • Mr Thomas Mott and Mr Tim Walace (Ecologists >1 years' experience). All personnel have undertaken numerous surveys in the south-west and throughout Western Australia and are familiar with the fauna of the south-west. Less experienced personnel were adequately supervised and mentored during the survey.
Scope (fauna groups sampled)	All allocated tasks were achieved during the survey, with targeted searches and ground truthing undertaken across the entire study area. The assessment aimed primarily to document habitat characteristics for and the presence of black-cockatoos across the entire study area. The study area was adequately sampled for a targeted level survey.
Timing, weather, and season.	The field survey was completed in November 2024. The survey timing is within the recommended timing for survey of breeding habitat and foraging habitat in close proximity for black-cockatoos within the Jarrah Forest region (DCCEEW 2022).
Disturbance to site which may affect survey results	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	Tasks completed from the scope of works included ground truthing across the extent of the study area. The survey effort is considered adequate for a targeted level survey.
Remoteness and/or access	There were no access restrictions experienced during the survey. The study area was accessible by vehicle and on foot.
Proportion of fauna identified, recorded or collected	The survey was a targeted level survey only and did not aim to characterise the full faunal assemblage within the study area. Sampling was considered adequate to characterise habitats that may be utilised by species of conservation significance and targeted sampling was undertaken to identify these species within the study area.
Problems with data and analysis, including sampling biases	No significant problems with the data recorded or the analysis of the data were identified during the survey.

The survey was within the recommended survey timing for assessment of breeding habitat for black-cockatoos in the Jarrah Forest Region (DCCEEW 2022). Black-cockatoos may move in to or investigate hollows at any time and while there may be no evidence of them currently using a hollow there remains a possibility that activity may commence in the future.

Trees were initially examined from the ground and as internal dimensions are difficult to determine the survey may overestimate or underestimate the number of hollows that are suitable for use within the study area (Whitford 2002). Various characteristics of hollows may not be visible from the ground including the internal dimensions, opening size, obstructions and signs of use. Hollows identified as *potentially suitable* reflect this uncertainty. Additionally, hollows within trees may not be visible from ground level due to orientation or may be obstructed by branches and surrounding trees. Due to the large number of trees and large area being surveyed, hollows within the study area

were not assessed by drone. It is likely that the number of suitable hollows would be reduced following further examination with a drone, as some hollows identified may lack sufficient depth or internal space for use as nesting hollows. Given the large size of the study area all potentially suitable nesting trees, i.e. trees with DBH >50cm, were not recorded. Survey effort focused on identifying trees with a structure and size likely to contain suitable or chewed hollows.

4.0 RESULTS

4.1 Desktop Review

4.1.1 Previous Targeted Black-cockatoo Surveys

Twenty-one fauna-related surveys have been completed within the active mining area and surrounding leases held by Talison at Greenbushes between 2011 and 2024 (Table 4, Figure 6). The results from previous vertebrate fauna surveys completed within the vicinity of the study area are summarised below and presented in Table 4. Forest Red-tailed Black-cockatoos were recorded from 12 of these surveys and Baudin's or Carnaby's Black-cockatoos were recorded from nine previous surveys.

Numerous surveys for black-cockatoos have been undertaken within Talison leases and the surrounding areas. In 2018 Kirkby 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 extension areas at the Greenbushes Mine (Kirkby 2018). Evidence of feeding residues from all three black-cockatoo species were observed within the area surveyed.

Harewood (2018a) undertook a review of previously identified hollows within and near the Mine Development Envelope (MDE). Trees with hollows previously identified as being suitable for use by black-cockatoos were examined more closely 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.

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 total of 30 known nesting hollows (showing signs of use) were identified from the consolidation of data undertaken as part of the SNA. Seven of the known nesting trees identified have been felled in recent clearing operations. However, only a single nesting hollow that was confirmed as being used by Forest Red-tailed Black-cockatoos was cleared under approval as part of the TSF4 development in 2022.

Numerous additional targeted surveys for black-cockatoo breeding hollows have been completed between 2013 to 2020 within the vicinity of Greenbushes but outside of Talison's mining leases. 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.

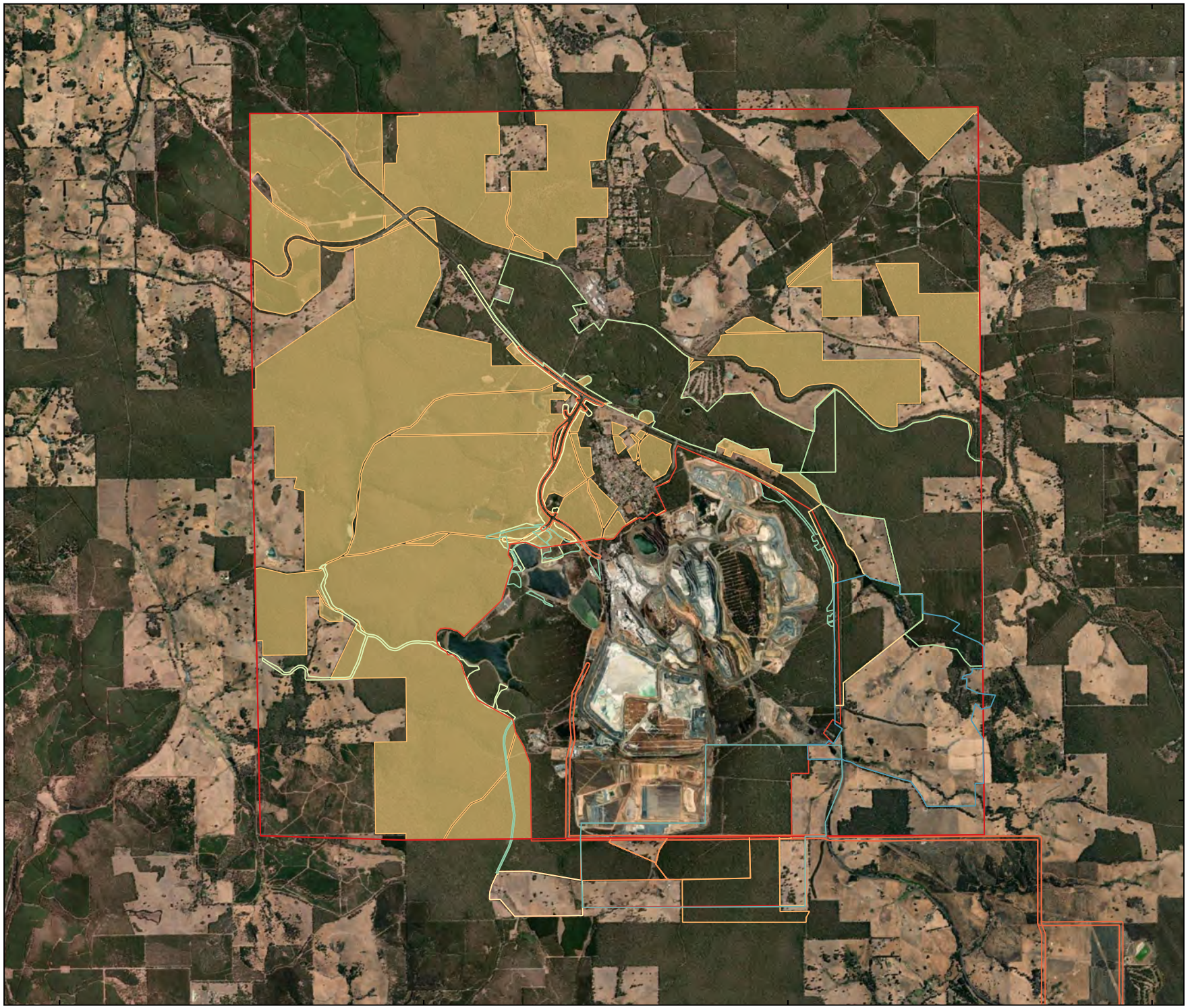
Table 4 Results from vertebrate fauna surveys previously completed within the vicinity of the study area.

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 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

[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
Significant Tree Survey (Onshore Environmental 2019a)	10-11 September 2018	Black-cockatoo Habitat Tree Assessment	Recording potential habitat tree density
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
New Water Storages Detailed Vertebrate Fauna Survey (Onshore Environmental 2023a)	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
Floyd's Waste Rock Landform Extension Detailed Vertebrate Fauna Survey (Onshore Environmental 2023b)	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 2023c)	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
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

Survey	Field Survey Date	Survey Level	Conservation Significant Fauna Species
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
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 April - 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
Terrestrial Vertebrate Fauna Survey Salt Water Gully Combined and Extended (Onshore Environmental 2024d)	18 - 28 October 2022, 12 -20, 17- 19 May 2024, 19 June 2024. 8 November 2024.	Basic and Detailed covering part of the study area	Forest Red-tailed Black-cockatoo - Vulnerable Carnaby's Cockatoo - Endangered Baudin's Cockatoo - Endangered Australasian Bittern – Endangered (outside study area) South-western Brush-tailed Phascogale - Conservation Dependent Quenda - DBCA Priority 4 Rakali/Water Rat - DBCA Priority 4



TALISON LITHIUM BLACK-COCKATOO SURVEY

Figure 6
Previous fauna surveys surrounding the study area

Legend

- Talison Mining Tenements
- Study Area

Previously Surveyed Areas

- Onshore Environmental 2011
- Onshore Environmental 2018
- Onshore Environmental 2019a
- Onshore Environmental 2021
- Onshore Environmental 2022a
- Onshore Environmental 2022b
- Onshore Environmental 2022c
- Onshore Environmental 2022d
- Onshore Environmental 2022e
- Onshore Environmental 2023a
- Onshore Environmental 2023b
- Onshore Environmental 2024a
- Onshore Environmental 2024b
- Onshore Environmental 2024c
- Onshore Environmental 2024d

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4.2 Fauna of Conservation Significance

Three black-cockatoo species listed under the Commonwealth EPBC Act and the Western Australian BC Act were recorded from the study area: the Forest Red-tailed Black-cockatoo (listed as Vulnerable), Baudin's Black-cockatoo and Carnaby's Black-cockatoo (both listed as Endangered).

4.2.1 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). The total population count has been estimated at approximately 15,000 birds (Johnstone and Kirkby 1999).

Although not considered as mobile as Carnaby's and Baudin's Black-cockatoos, the Forest Red-tailed Black-cockatoo has been known to exhibit population fluctuations and movements 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 greater than 600 mm average annual rainfall (DSEWPC 2012). Breeding can occur throughout the year (producing one or rarely two eggs) with two distinct peaks from April to June (Winter) and August to October (Spring).

The Forest Red-tailed Black-cockatoo feeds primarily on Marri and Jarrah fruit (DSEWPC 2012). They have also been known to feed on Blackbutt *(Eucalyptus patens),* Albany Blackbutt *(Eucalyptus staeri),* Karri (*Eucalyptus diversicolor*), Sheoak *(Allocasuarina fraseriana)* and Snottygobble *(Persoonia longifolia).* Marri and Jarrah make up 90% of their diet (Johnstone and Kirkby 1999).

Forest Red-tailed Black-cockatoos are the most commonly encountered black-cockatoo species at Greenbushes (Onshore Environmental 2024) and were common throughout the study area during the field survey. A total of 73 direct observations (222 birds) were made during the November 2024 survey period (Figure 7). An additional 44 records were identified from calls of this species along with 246 occurrences of foraging evidence on Marri or Jarrah, and three records from other secondary evidence (droppings, feathers or branch clippings) (Figure 7).

Approximately 52% of the observations were single birds (26%) or pairs (26%) while 20% of observations were groups of three (likely a pair with juvenile). Only 10% of observations were of groups of five or more. The highest number of birds recorded was 21 birds flying adjacent to Southwestern Highway on the 12th November 2024. Birds were recorded from both hillslope and drainage line habitats (Figure 7). Direct observations of Forest Red-tailed Black-cockatoos were often in close proximity to water sources and drainage lines with foraging evidence more widely recorded throughout the study area.

4.2.2 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 Black-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 Black-cockatoo is estimated to be about 15,000 birds (Johnstone and Kirkby 2008).

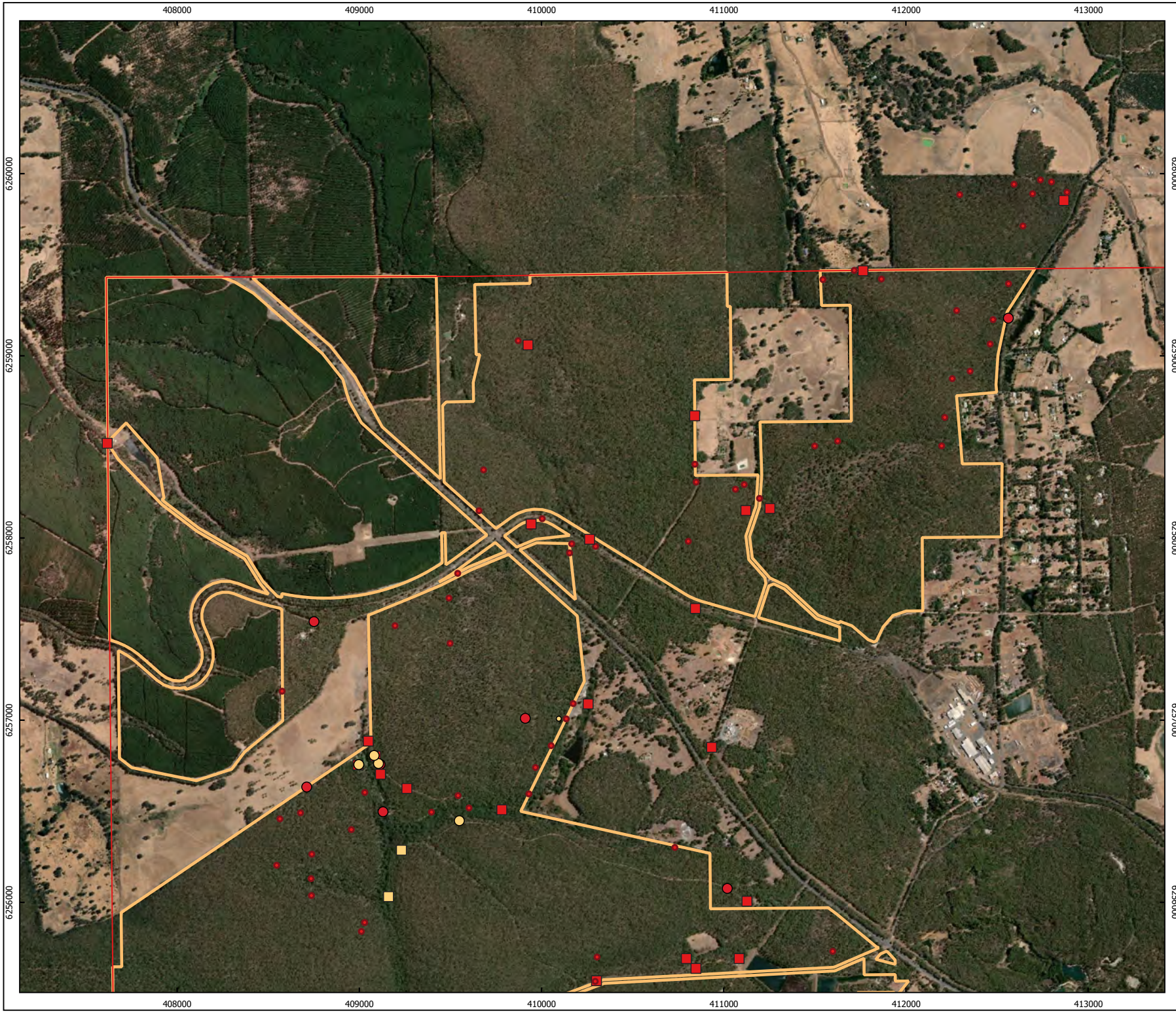
This species forages primarily in eucalypt forest, where it feeds on Marri seeds, flowers, nectar and buds (Johnstone and Kirkby 2008). Baudin's Black-cockatoo also feed on a wide range of seeds of *Eucalyptus, Banksia* and *Hakea,* as well as the fruits of apples, pears, persimmons, pines, and beetle 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 Black-cockatoo are able to quickly extract the seeds from the nut using their long bill (Cooper *et al.* 2002). Baudin's Cockatoo nests in tree hollows in the deep southwest of Western Australia. Primary nesting trees are Karri, Marri, and Wandoo. Baudin's Black-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).

Foraging evidence from Baudin's Black-cockatoo was observed at one location within the study area (Figure 7), however no individuals or calls were recorded during the November 2024 field survey. The consolidated database identified a total of 94 records of Baudin's Black-cockatoo, however these are predominantly records from foraging evidence with only five direct observations.

4.2.3 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. It occurs in the south-west of Western Australia extending from Kalbarri to Cape Arid and inland to the Wheatbelt. Breeding habitat 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).

Two observations were recorded within 250 m of each other along a drainage line within the study area (Figure 7). This included a single female bird on lookout and 12 birds in flight. Calls were also heard in the same general area as the observations on four occasions (Figure 7). In addition, foraging evidence from feeding activity on Pine or Marri was observed at nine locations. The consolidated database includes an additional 16 records for Carnaby's Black-cockatoos of which three were direct observations of between 10-25 birds.



TALISON LITHIUM BLACK-COCKATOO SURVEY

Figure 7
Locations of black-cocaktoo records within the study area

Legend

- Talison Mining Tenements

Forest Red-tailed Black-cockatoo
- Observation
- Calls
- Foraging evidence

Carnaby's Black Cockatoo
- Calls
- Foraging evidence
- Observation

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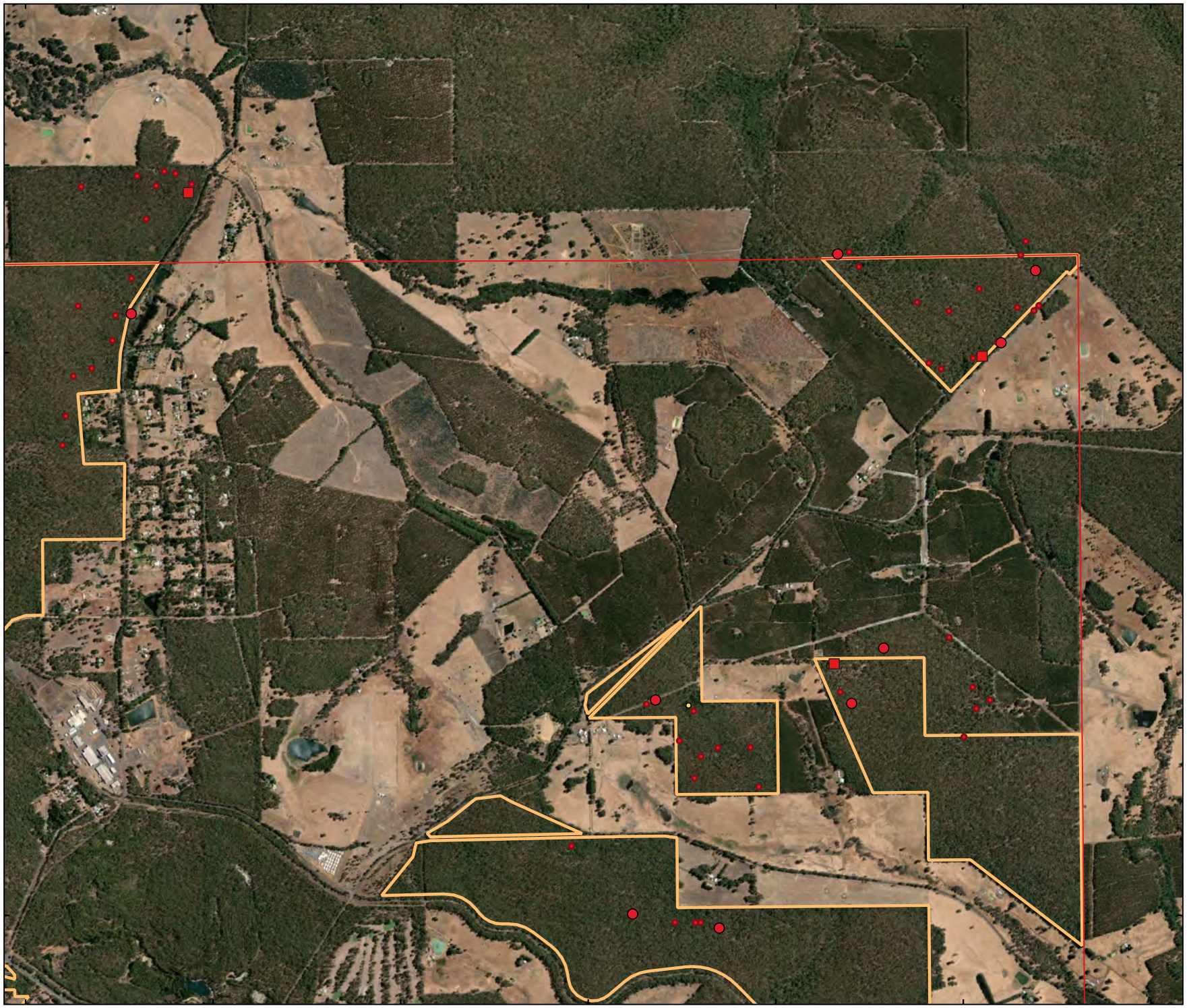


TALISON LITHIUM BLACK-COCKATOO SURVEY

Figure 7
Locations of black-cocaktoo records within the study area

Legend

- Talison Mining Tenements

Forest Red-tailed Black-cockatoo

- Observation
- Calls
- Foraging evidence

Carnaby's Black Cockatoo

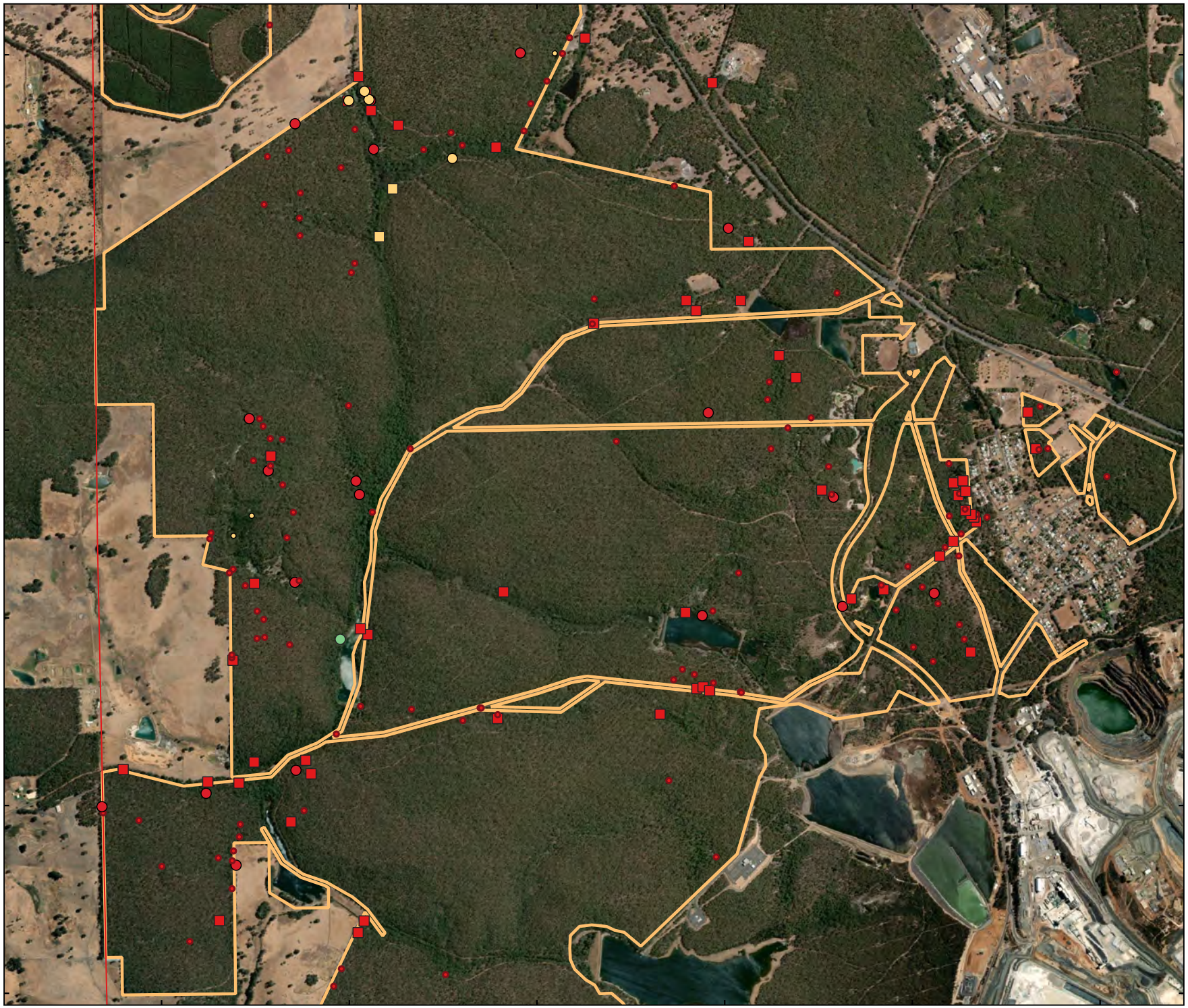
- Foraging evidence

0 500 1,000 m

1:27,162

Document Control	
Date:	20th December 2024
Status:	Final
Figure:	7
Sheet Size:	A4
File Reference:	TA_TBC_Fig7_records

Datum: GDA 2020
Projection: MGA Zone 50



ONSHORE ENVIRONMENTAL

TALISON LITHIUM BLACK-COCKATOO SURVEY

Figure 7
Locations of black-cocaktoo records within the study area

Legend

- Talison Mining Tenements

Forest Red-tailed Black-cockatoo
- Observation
- Calls
- Foraging evidence

Carnaby's Black Cockatoo
- Calls
- Foraging evidence
- Observation

Baudin's Black-cocaktoo
- Foraging evidence

0 500 1,000 m

1:27,162

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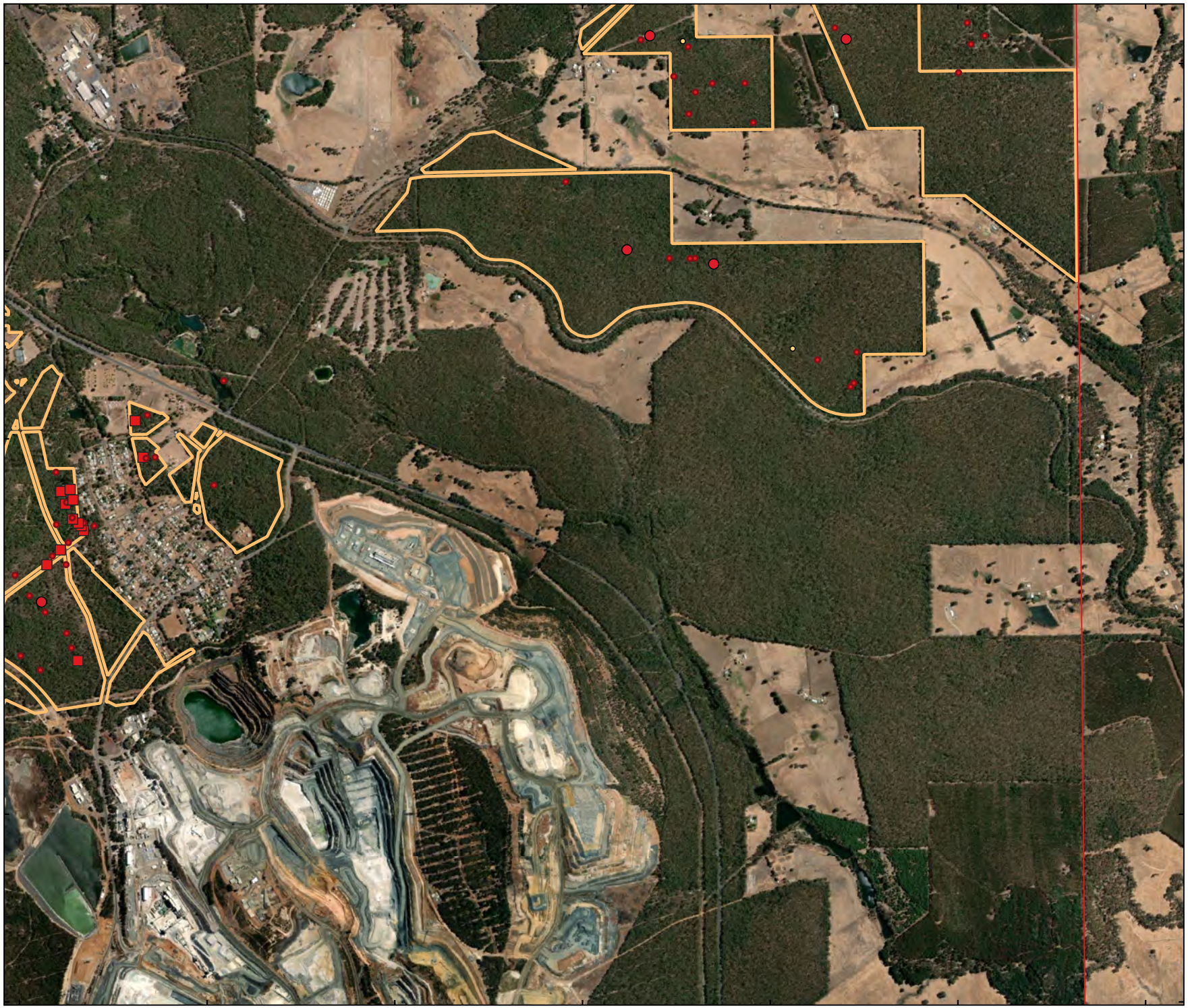

ONSHORE ENVIRONMENTAL

TALISON LITHIUM BLACK-COCKATOO SURVEY

Figure 7
Locations of black-cocaktoo records within the study area

Legend

- Talison Mining Tenements

Forest Red-tailed Black-cockatoo

- Observation
- Calls
- Foraging evidence

Carnaby's Black Cockatoo

- Foraging evidence

0 500 1,000 m

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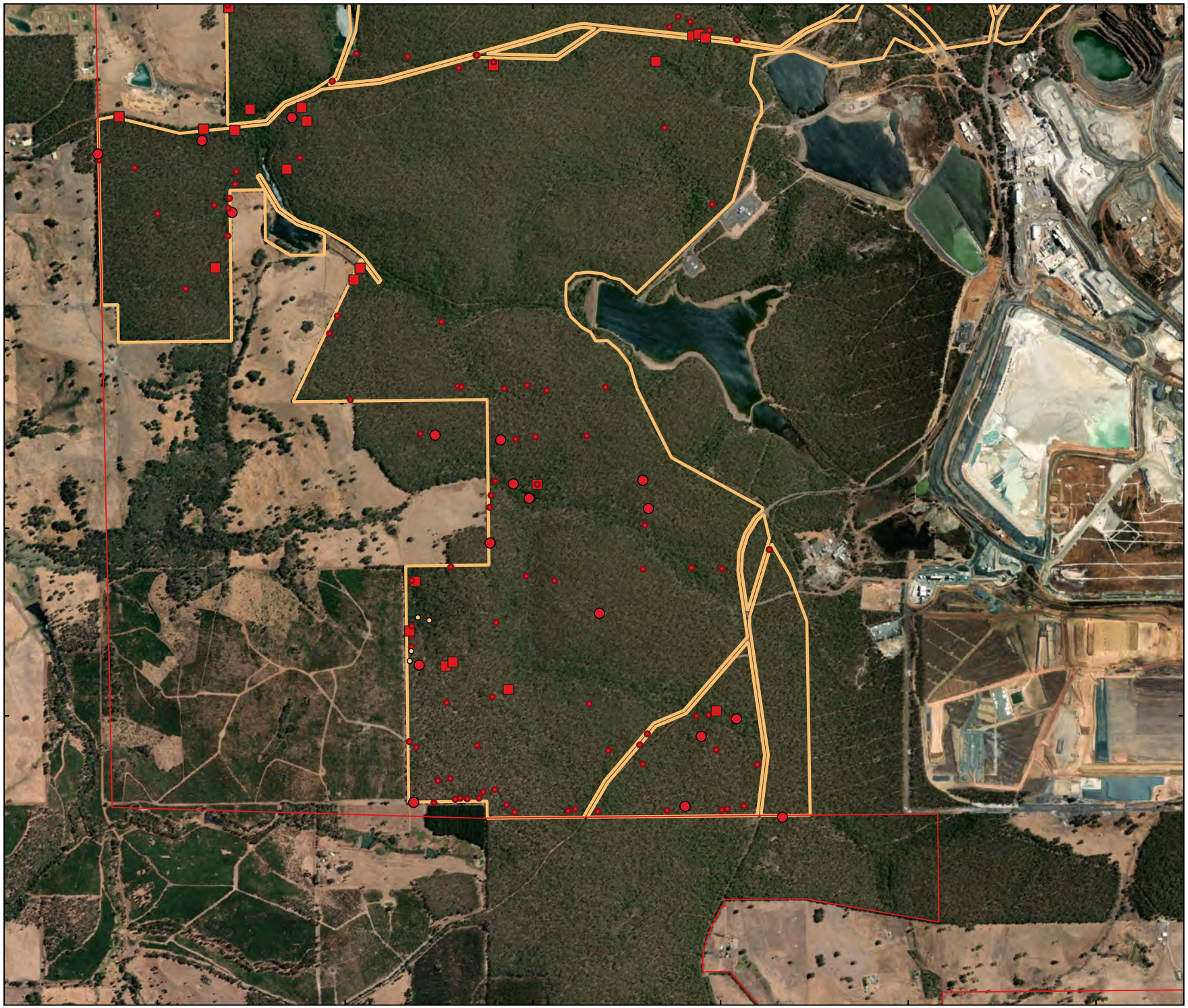

TALISON LITHIUM BLACK-COCKATOO SURVEY

Figure 7
Locations of black-cocaktoo records within the study area

Legend

- Talison Mining Tenements

Forest Red-tailed Black-cockatoo

- Observation
- Calls
- Foraging evidence

Carnaby's Black Cockatoo

- Foraging evidence

0 500 1,000 m

1:27,162

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TALISON LITHIUM BLACK-COCKATOO SURVEY

Figure 7
Locations of black-cocaktoo records within the study area

Legend

Talison Mining Tenements

Forest Red-tailed Black-cockatoo

Observation

0 500 1,000 m

1:27,162

Document Control	
Date:	20th December 2024
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Sheet Size:	A4
File Reference:	TA_TBC_Fig7_records

Datum: GDA 2020
Projection: MGA Zone 50

4.3 Breeding Habitat Assessment

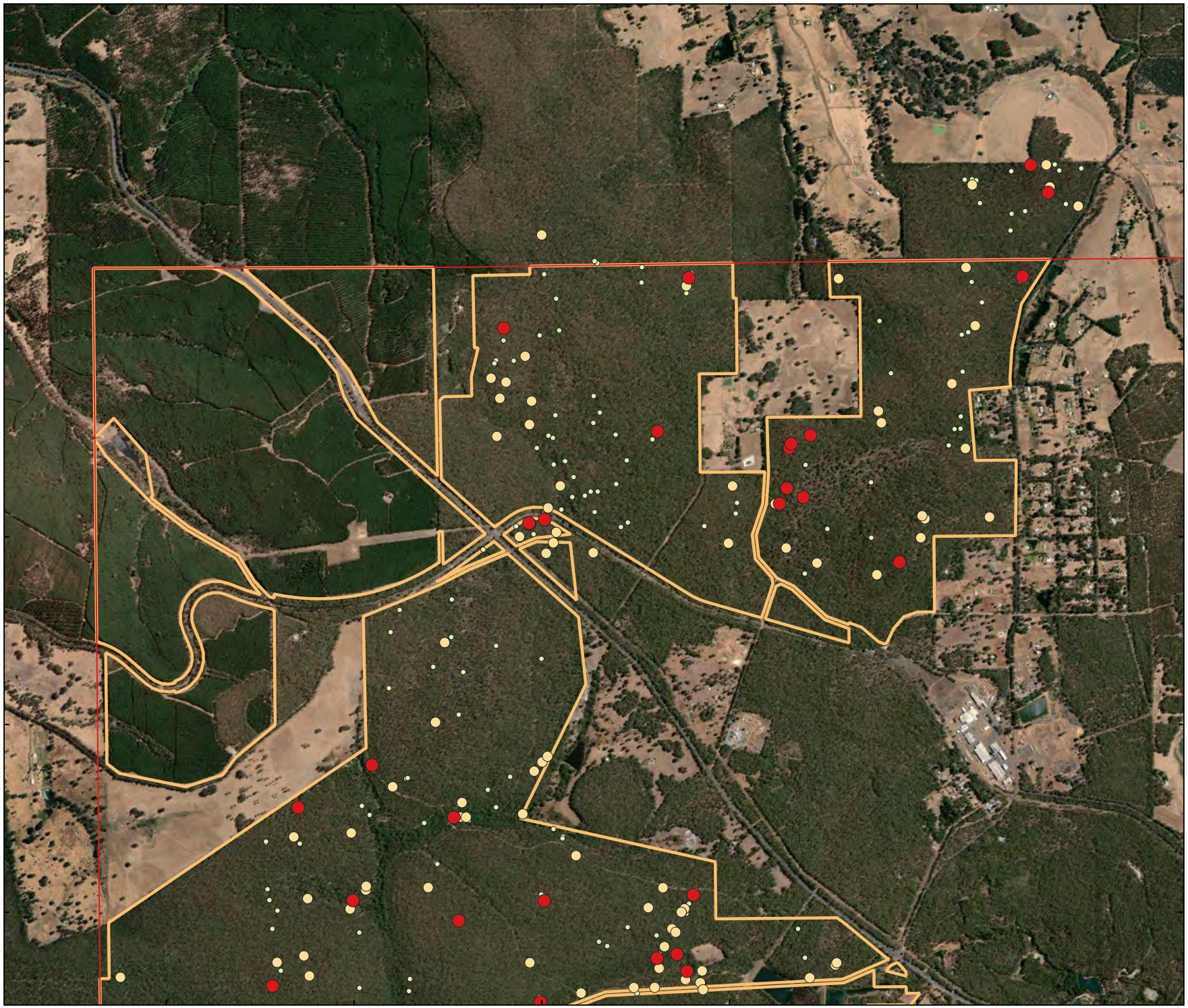
4.3.1 Tree Hollow Assessments

Tree hollow assessments focused on identifying suitable habitat trees, with larger mature and senescent trees recorded and assessed for suitability as breeding for black-cockatoos. The location of known, suitable and potentially suitable habitat trees and description and ranking of associated hollows within the study area is provided in Figure 8 and Appendix 4.

A total of 385 trees were identified as *potentially suitable nesting trees* (Figure 8). These trees contained hollows that were above the minimum entrance size suitable for black-cockatoos but the depth of hollow or other factors suggest they are unlikely to be utilised. The majority of potentially suitable nesting trees were Marri (196), with lower numbers of Jarrah (163) and dead trees (17).

A total of 215 trees were identified as *suitable nesting trees* for use by black-cockatoos (Figure 8). These hollows were considered of a size, orientation and depth to be suitable for use by black-cockatoos as breeding hollows. Hollows were identified from the ground and not examined by drone, therefore some hollows may not be of sufficient depth to support breeding. The majority of suitable nesting trees were Marri (132), with lower numbers of Jarrah (73) and dead trees (8). One suitable hollow was located in Flooded Gum (*Eucalyptus rudis)*.

Sixty-eight trees assessed within the study area were classified as *known nesting trees* as they showed signs of use by black-cockatoos in the form of chew marks or scratch marks around hollow entrances. Most chewed hollows were in Marri (53) but they also occurred in Jarrah (ten), dead/unknown tree species (four) and Yarri *(Eucalyptus patens)* (one). Ten of the known nesting trees observed during the survey were confirmed as being actively used at the time of survey.



TALISON LITHIUM BLACK-COCKATOO SURVEY

Figure 8
Location of habitat trees within the study area

Legend

- Talison Mining Tenements
- Study Area

Habitat Trees

- Chewed
- Suitable
- Potentially suitable

0 500 1,000 m

1:27,162

Document Control	
Date:	30 January 2025
Status:	Final
Figure:	8
Sheet Size:	A4
File Reference:	TA_TBC_Fig8_hollows

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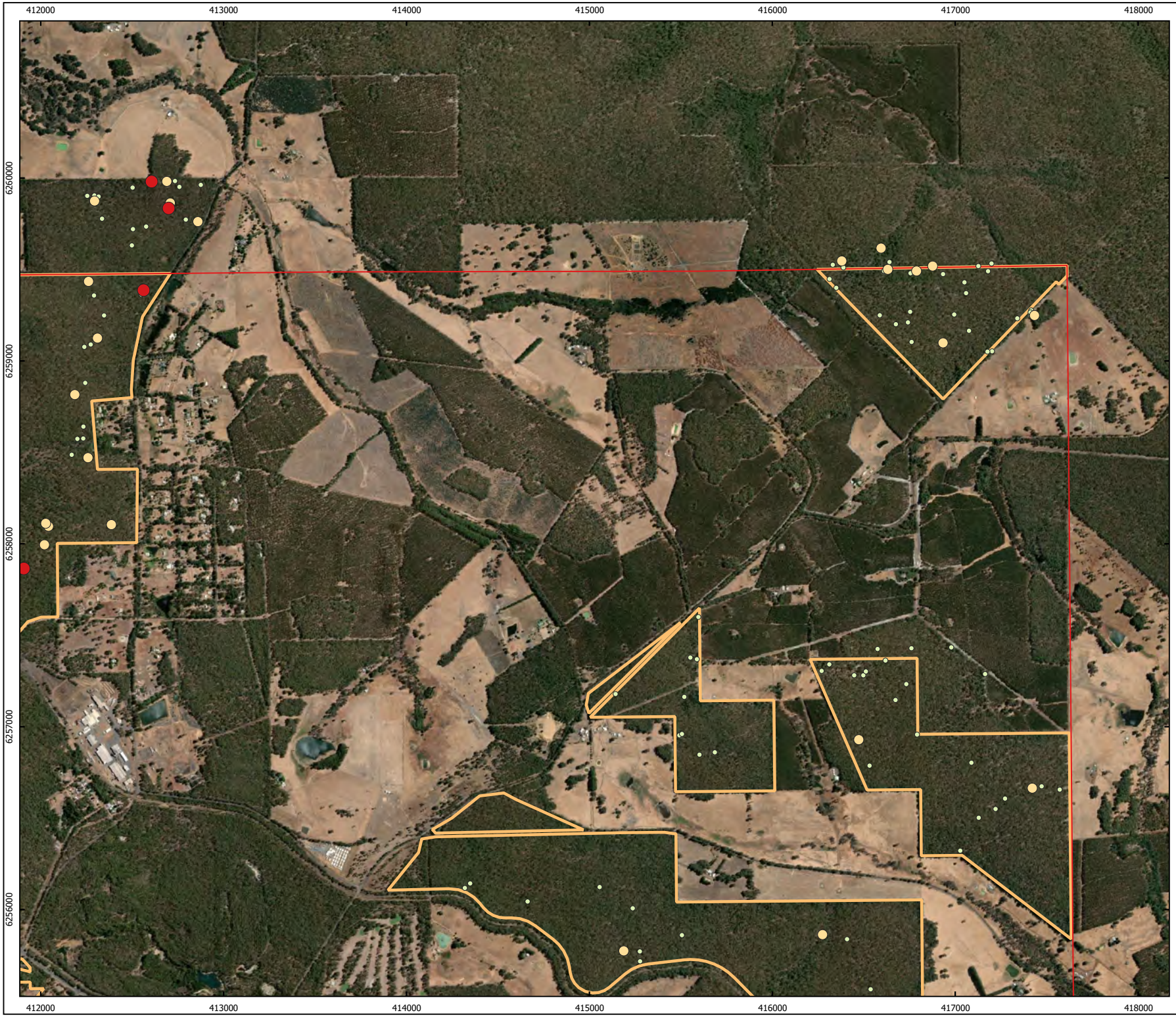

TALISON LITHIUM BLACK-COCKATOO SURVEY

Figure 8
Location of habitat trees within the study area

Legend

- Talison Mining Tenements
- Study Area

Habitat Trees

- Chewed
- Suitable
- Potentially suitable

0 500 1,000 m

1:27,162

Document Control	
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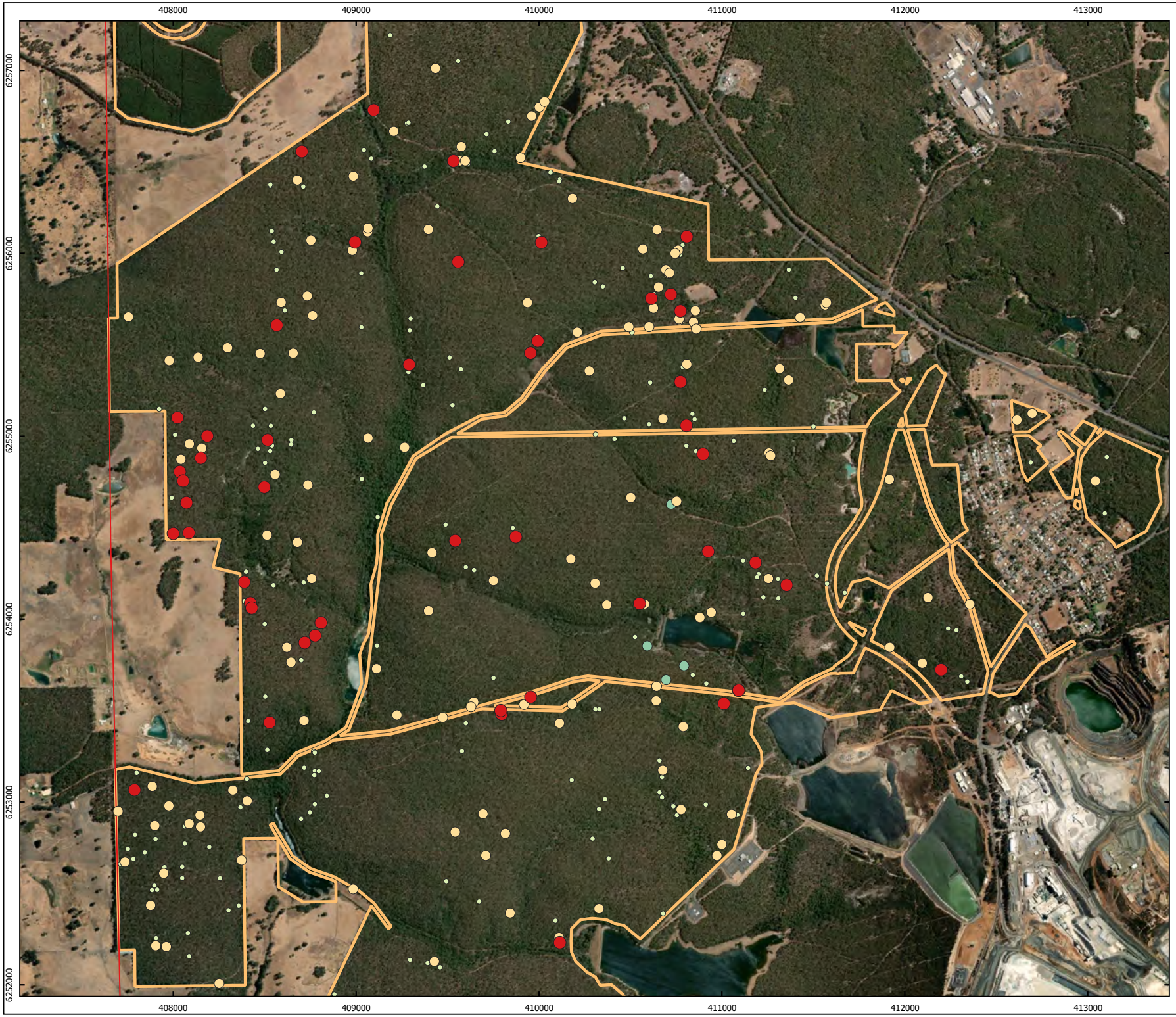

TALISON LITHIUM BLACK-COCKATOO SURVEY

Figure 8
Location of habitat trees within the study area

Legend

- Talison Mining Tenements
- Study Area

Habitat Trees

- Chewed
- Suitable
- Potentially suitable
- Artificial hollow

0 500 1,000 m

1:27,162

Document Control	
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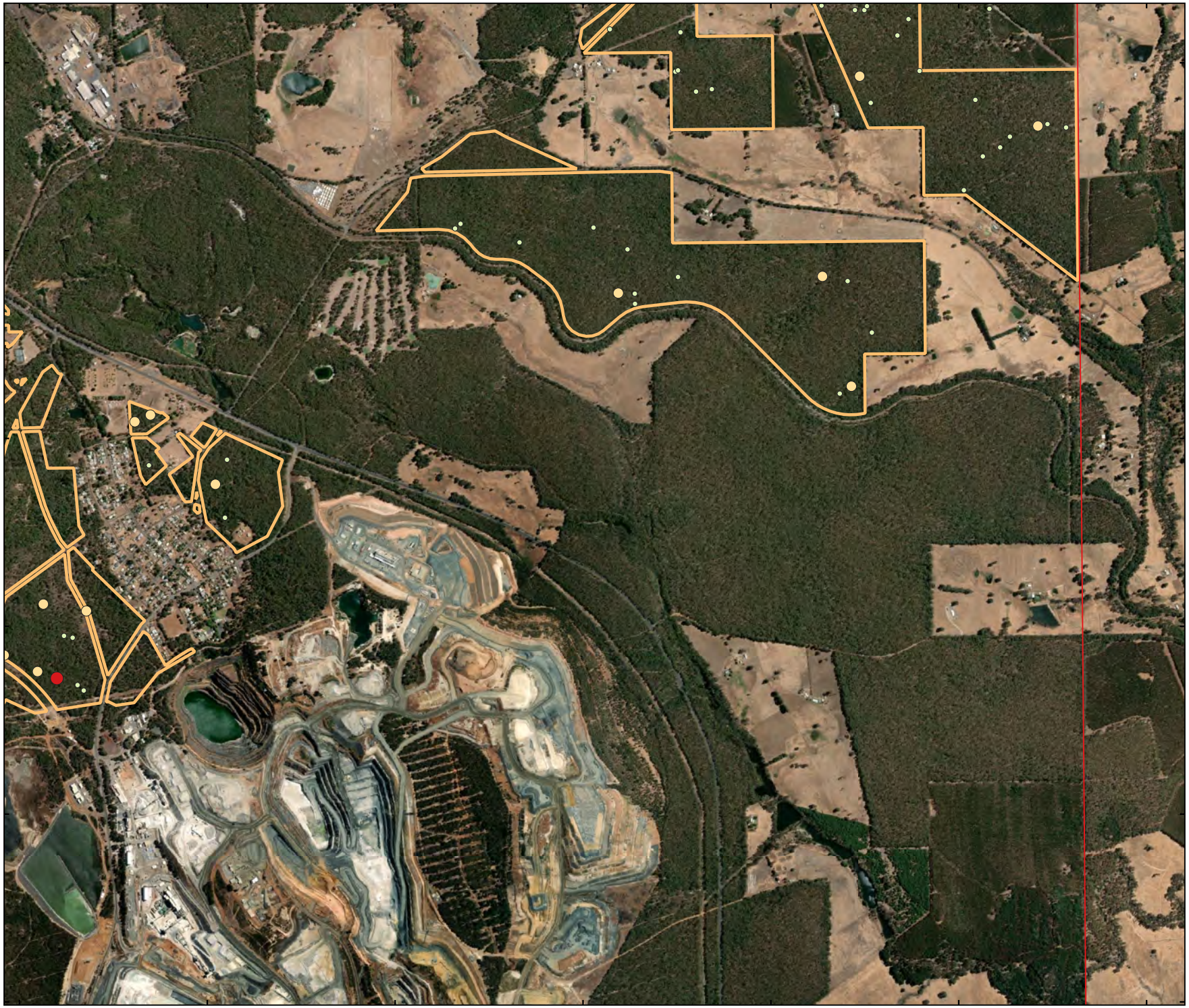

ONSHORE ENVIRONMENTAL

TALISON LITHIUM BLACK-COCKATOO SURVEY

Figure 8
Location of habitat trees within the study area

Legend

- Talison Mining Tenements
- Study Area

Habitat Trees

- Chewed
- Suitable
- Potentially suitable

0 500 1,000 m

1:27,162

Document Control	
Date:	30 January 2025
Status:	Final
Figure:	8
Sheet Size:	A4
File Reference:	TA_TBC_Fig8_hollows

Datum: GDA 2020
Projection: MGA Zone 50

ONSHORE ENVIRONMENTAL

TALISON LITHIUM BLACK-COCKATOO SURVEY

Figure 8
Location of habitat trees within the study area

Legend

- Talison Mining Tenements
- Study Area

Habitat Trees

- Chewed
- Suitable
- Potentially suitable
- Artificial hollow

0 500 1,000 m

1:27,162

Document Control	
Date:	30 January 2025
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File Reference:	TA_TBC_Fig8_hollows

Datum: GDA 2020
Projection: MGA Zone 50

TALISON LITHIUM BLACK-COCKATOO SURVEY

Figure 8
Location of habitat trees within the study area

Legend

- Talison Mining Tenements
- Study Area

Habitat Trees

- Chewed
- Suitable
- Potentially suitable

0 500 1,000 m

1:27,162

Document Control	
Date:	30 January 2025
Status:	Final
Figure:	8
Sheet Size:	A4
File Reference:	TA_TBC_Fig8_hollows

Datum: GDA 2020
Projection: MGA Zone 50

4.3.2 Hollow Monitoring Trial

A motion sensitive camera and an audio recorder were deployed at one active breeding hollow to trial hollow monitoring techniques. Camera placement was limited by the availability of trees in the area creating a poor view of the hollow entrance. The quality and usability of the images was reduced by distance to the hollow and positioning in the frame. The view of the hollow was also obscured at times by branches and leaves covering the hollow entrance. Additionally, the southerly aspect of the hollow required the camera to be positioned with a northerly aspect, hence sunlight obscured photos captured for a period in the afternoon. Despite these limitations black-cockatoos at or nearby to the hollow entrance were detected on ten occasions. Photograph quality was not high enough to decern whether the birds observed were females, males or the chick at the hollow. The majority of the detections were captured in the late evening between 1700 hrs and 1900 hrs. These records likely correspond to adults returning to the hollow to feed the chick.

Forest Red-tailed Black-cockatoo calls were common on the recordings and chick begging calls were recorded from the hollow most evenings continuing until the recorder was removed. The recorder confirmed that the hollow was in use and the chick likely had not fledged as of 1st December 2024. Calls and particularly chick begging calls were commonly recorded in the late evening corresponding with the records from the motion sensitive camera. Calls were occasionally recorded in the early morning. Due to the large amount of audio captured a full analysis of the recordings has not been completed.

4.4 Night Roosting Habitat Assessment

Database searches showed five known roost sites within Talison's mining leases (Figure 9) (DBCA 2024). A total of ten potential night roosting areas were identified during the November 2024 field survey representing locations where birds were present and at rest in the late evening and/or evidence of droppings, feathers and branch clippings (Figure 9). However, these locations remain unconfirmed as night roost counts were not undertaken due to late sunset times and time constraints during the survey. The roosting locations are likely being utilised by Forest Red-tailed Black-cockatoos but may also occasionally be utilised by the two white-tailed species.

The Greenbushes Pool is a known roosting site identified from the database and there was significant activity for Forest Red-tailed Black-cockatoos in this area during the survey. Large numbers of juvenile birds were recorded in native vegetation approximately 500 m north-east of the roost site (immediately adjacent to the Greenbushes townsite) indicating a possible creche site where juveniles remain while parents venture further field to forage. Approximately 40 birds were observed during transects in this area by two observers on the 18th November 2024.

4.5 Foraging Habitat Assessment

4.5.1 Fauna Habitats

The study area was dominated by hillslopes supporting predominantly Jarrah-Marri forest with areas of *Banksia grandis* and *Allocasuarina fraseriana* (2,722 ha or 82% of the study area, Figure 10). Additional naturally occurring fauna habitats within the study area included drainage systems (209 ha or 6% of the study area), granite areas (6.4 ha, <1% of the study area) and wetlands (2.6ha, <1% of the study area). Pine plantation (324 ha, 10% of the study area) occurred in the north-western sector of the study area and was surveyed by driving tracks rather that 250 m intervals covered within native vegetation areas. The study area also includes small areas of mine rehabilitation (12 ha, 0.4% of the study area). Descriptions of the two main habitat types, hillslopes and drainage lines, are presented in Table 6 and 7.

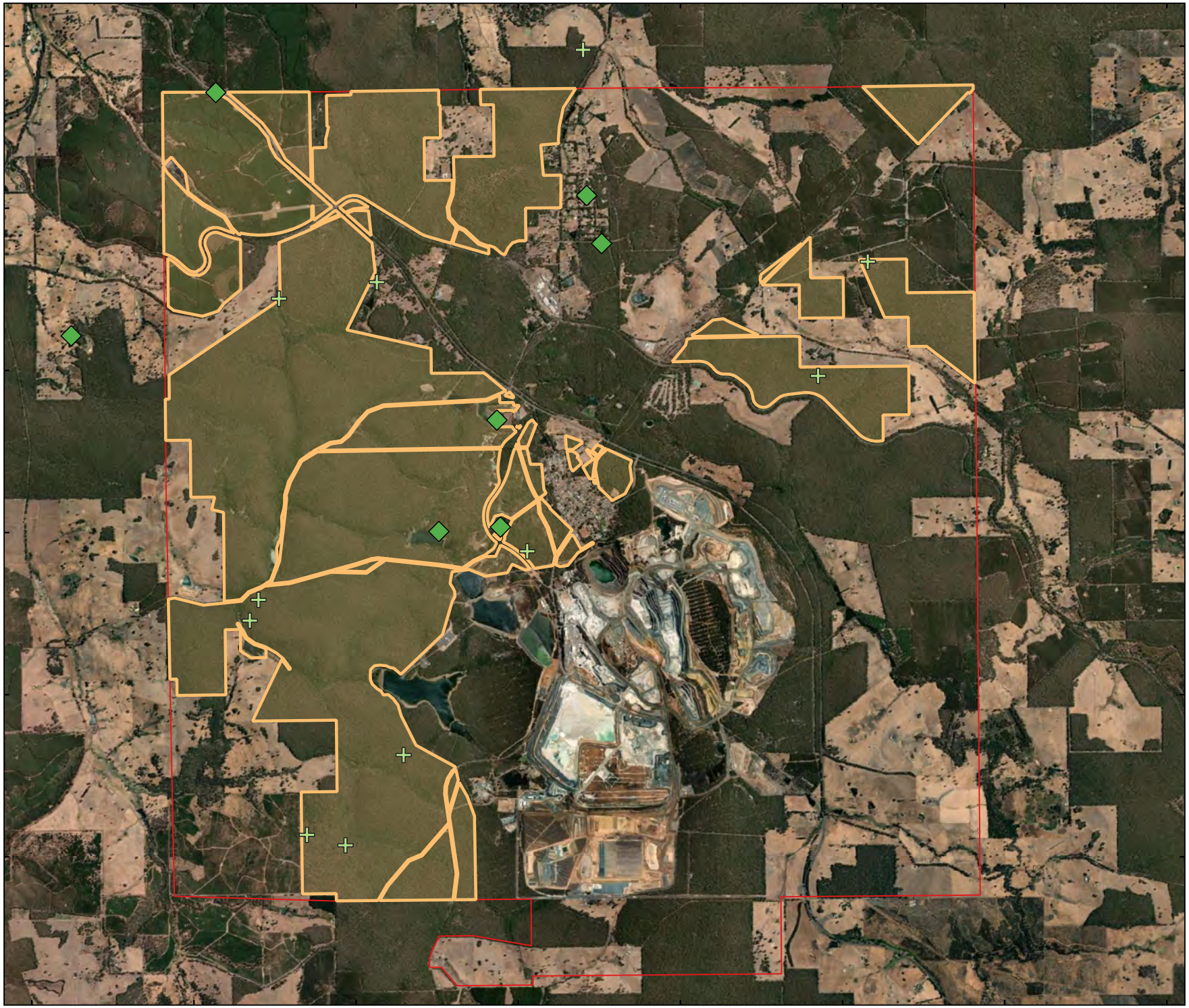
The foraging value of vegetation within the study area was assessed by identifying the number of forage species present in the vegetation description from consolidated vegetation mapping completed by Onshore Environmental (2024) (Figure 11). Drainage lines and lower slopes typically contained vegetation with a larger number of forage species and hence a higher foraging value score. Hillslope vegetation containing forage species including *Banksia grandis* and *Allocasuarina fraseriana* also had a higher foraging value score.

Habitat condition within the study area was generally rated as ‘very good’. Habitat condition within the hillslopes habitat type had been impacted by hardwood logging resulting in a lower density of old growth trees and higher density of sapling trees (some evidence of silvicultural thinning), and more open canopy structure in some areas. The connectivity of understorey vegetation was impacted by forestry and other tracks, fire, mining, rehabilitation and minor areas of soil disturbance.

Habitat condition was also generally rated as ‘very good’ within the drainage lines habitat type. Disturbances observed included the presence of introduced weed species and evidence of feral animals (pigs).

Table 5 Areas for habitat types occurring within the study area.

Habitat	Area (ha)	% of Study Area
Hillslopes	2722.21	82.02
Plantation	324.26	9.77
Drainage systems	209.39	6.31
Waterbodies / Dams	27.28	0.82
Mine Rehabilitation	11.78	0.35
Farmland (Annual Pasture)	9.14	0.28
Granite	6.37	0.19
Roads/Infrastructure	3.25	0.10
Wetland	2.61	0.08
Townsite	2.02	0.06
Mine Disturbance	0.72	0.02
Total	**3,319.02**	



TALISON LITHIUM BLACK-COCKATOO SURVEY

Figure 9
Locations of black-cocaktoo roosting locations within the study area

Legend

- Talison Mining Tenements
- Study Area
- Roosting Locations (DBCA 2024)
- Potential Roosting Locations (Onshore - current survey)

0 1 2 km

1:62,934

Document Control	
Date:	30 January 2025
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Figure:	9
Sheet Size:	A4
File Reference:	TA_TBC_Fig9_roosting

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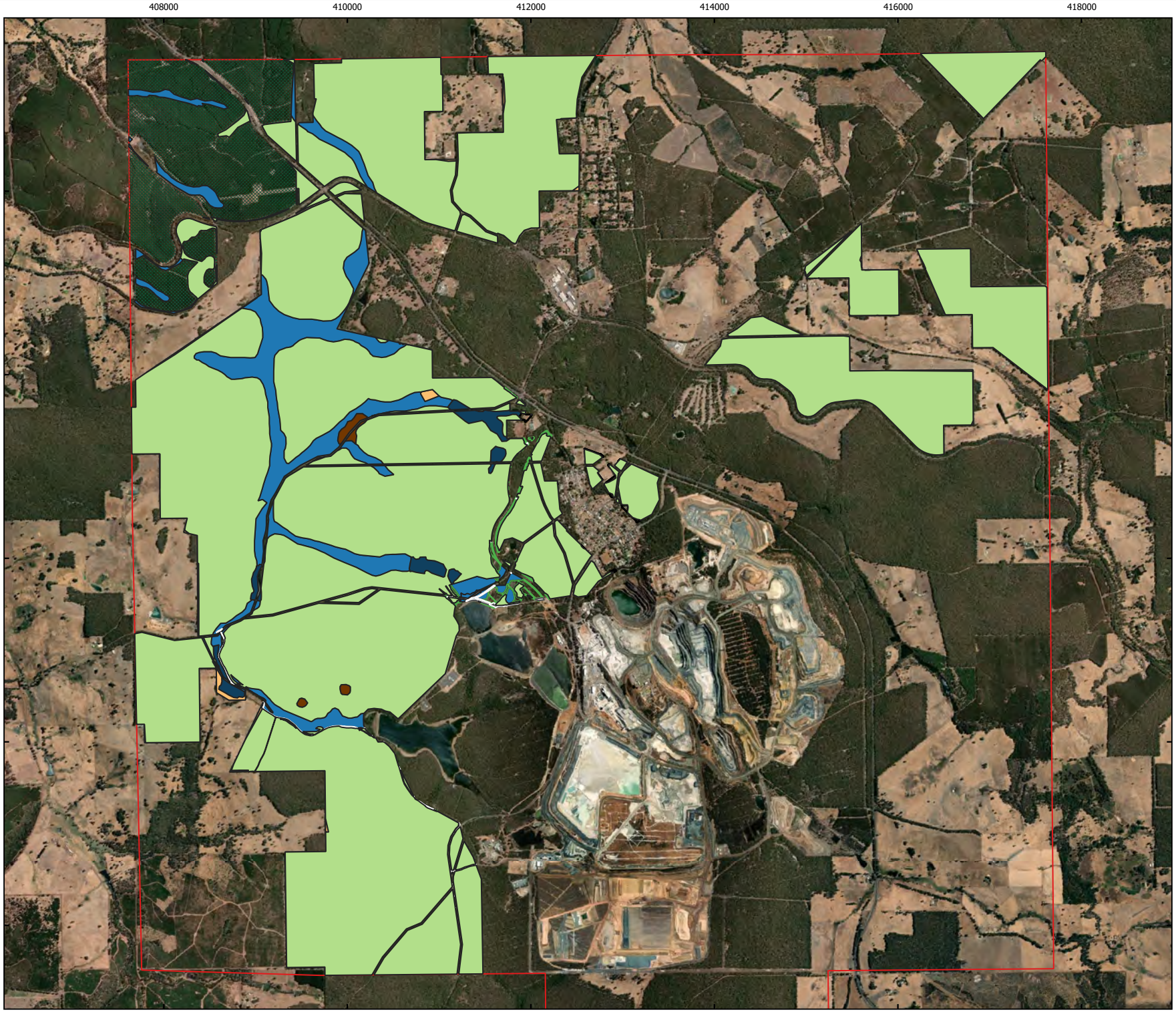

TALISON LITHIUM BLACK-COCKATOO SURVEY

Figure 10
Fauna habitats within the study area

Legend

- Talison Mining Tenements

Habitat -Surveyed Areas

- Hillslopes
- Drainage systems
- Granite
- Farmland (Annual Pasture)
- Roads/Infrastructure
- Mine Rehabilitation
- Plantation
- Waterbodies / Dams

0 1 2 km

1:55,000

Document Control	
Date:	30 January 2025
Status:	Final
Figure:	9
Sheet Size:	A4
File Reference:	TA_TBC_Fig9_habitats

Datum: GDA 2020
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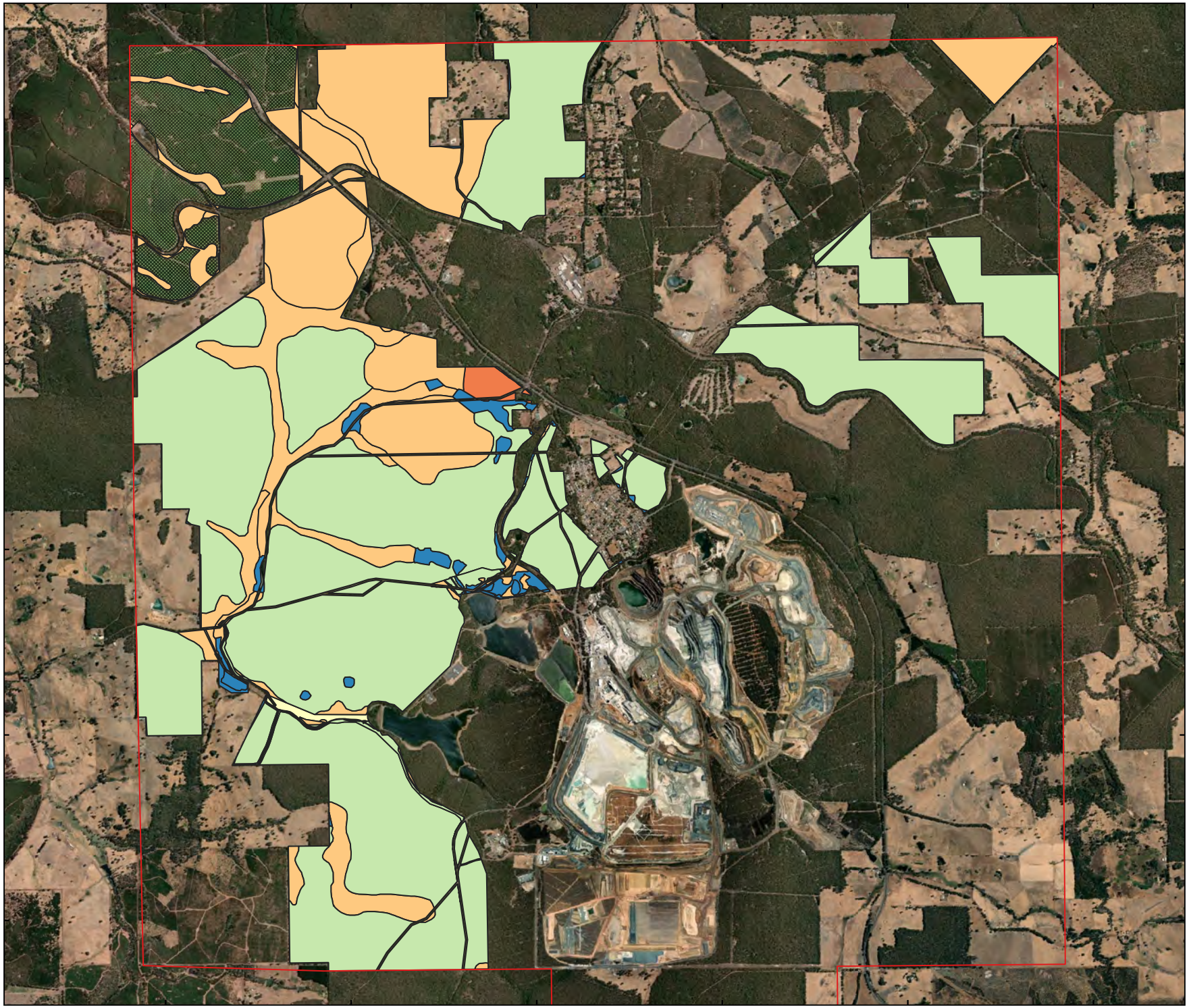


TALISON LITHIUM BLACK-COCKATOO SURVEY

Figure 11
Foraging value of fauna habitats within the study area

Legend

- Talison Mining Tenements

Foraging habitat

- 0 - low value
- 1
- 2
- 3
- 4
- 5 - high value
- Pine

0 1 2 km

1:55,000

Document Control	
Date:	30 January 2025
Status:	Final
Figure:	11
Sheet Size:	A4
File Reference:	TA_TBC_Fig11_foraging_value

Datum: GDA 2020
Projection: MGA Zone 50

Table 6 Description of the Hillslopes with Jarrah-Marri Forest fauna habitat.

Name	Description	
Hillslopes	Hillslopes with Jarrah-Marri Forest	
Area (ha)	642 ha	
Landform	Hillslopes and hillcrests	
Vegetation Description	Forest of *Eucalyptus marginata* subsp. *marginata* and *Corymbia calophylla* over Low Heath D of *Bossiaea ornata* and *Leucopogon capitellatus* on grey/brown sandy loam on hill crests and upper hill slopes OR Forest of *Corymbia calophylla* and *Eucalyptus marginata* subsp. *marginata* over Low Woodland A of *Banksia grandis* and *Persoonia longifolia* over Open Low Scrub A/B of *Pteridium esculentum* and *Macrozamia riedlei (Bossiaea linophylla)* over Dwarf Scrub D of *Bossiaea ornata* on hillslopes	
% Ground Cover	Rock	<2%
	Leaf Litter	30-70%
	Logs	2-10%
	Vegetation	30-70%
Rocks	Type	Areas of laterite gravels
	Size	1 cm
Soil	Type	Sandy-loam
	Colour	Brown
Habitat Features Occasional logs and dense leaf litter, larger trees with hollows	Slope	Low to moderate, occasionally steep leading down in to drainage systems and valleys
	Water	None
	Woody Debris	Minor
	Peeling Bark	Minor
	Rock Crevices	Absent
	Burrowing Suitability	Poor
	Tree Hollows (<10cm)	Common
	Tree Hollows (>10cm)	Occasional
Connectivity	Habitat is relatively continuous and well connected and provides linkage between to drainge system habitats. Connectivity broken by farmland, roads and powerlines in places.	
Condition	Condition	Very Good (Good)
	Disturbances	Fire, roads/access tracks, logging, firewood cutting, rubbish, weeds, feral animals.
	Fire Age	Moderate-Old, small areas recently burnt

Plates 1-2 Representative photos of hillslope habitat within the study area.

Table 7 Description of the Drainage Systems with Flooded Gum or Yarri-Marri Forest fauna habitat.

Name	Description	
Drainage system	Drainage Systems with Flooded Gum or Yarri-Marri Forest	
Area (ha)	159 ha	
Landform	Drainage flats and drainage lines	
Vegetation Description	Forest of *Eucalyptus rudis* subsp. *rudis* (*Corymbia calophylla, Eucalyptus patens)* over Low Woodland A of *Banksia littoralis, Callistachys lanceolata* and *Acacia saligna* (*Melaleuca rhaphiophylla*) over Low Scrub A of *Taxandria linearifolia* and *Pteridium escuulentum* on drainage lines OR Woodland (to Forest) of *Eucalyptus patens* and *Corymbia calophylla (Banksia seminuda, Banksia littoralis*) over Scrub of *Trymalium odoratissimum* subsp. *trifidum* and/or *Taxandria parviceps* over Low Scrub B of *Pteridium esculentum* and *Acacia pulchella* on drainage lines OR Low Woodland A of *Melaleuca preissiana* and *Banksia littoralis (Callistachys lanceolata, Corymbia calophylla*) over Thicket of *Taxandria linearifolia* and *Hakea prostrata* over Open Tall Sedges of *Leptocarpus depilatus* on brown sandy clay loam on drainage flats	
% Ground Cover	Rock	<2%
	Leaf Litter	30-70%
	Logs	2-10%
	Vegetation	30-70%
Rocks	Type	Laterite and granite
	Size	1-5 cm occasional boulders
Soil	Type	Sandy loam, silty loam and orange sands
	Colour	Brown/orange
Habitat Features Associated with and providing linkages between large water pools and dams thorughout the study area. Some areas of dense sedges and shrubs provide refuges, large trees occur along the edges of the drainge line and in places appear to have been protected from fire and logging.	Slope	Low
	Water	None
	Woody Debris	Minor
	Peeling Bark	Minor
	Rock Crevices	Occasional
	Burrowing Suitability	Poor
	Tree Hollows (<10cm)	Occasional
	Tree Hollows (>10cm)	Occasional
Condition	Condition	Good
	Disturbances	Altered drainage, mining exploration and rehabilitation, access tracks, logging, firewood cutting, rubbish, weeds, feral animals.
	Fire Age	Old

Plates 3-4 Representative photos of drainage line habitat within the study area.

4.5.2 Foraging Habitat Score (DAWE 2022)

Based on the foraging quality scoring tool (DAWE 2022, Appendix 2) a score of ten was given for the three species of black-cockatoo, as evidence of all three species utilising the study area was recorded (Table 8). The study area was considered to support high quality foraging habitat for all three species. Forest Red-tailed Black-cockatoos were resident within the study area and surrounds, with Baudin's and Carnaby's Black-cockatoos more seasonally mobile and likely to utilise the study area occasionally.

Factors that may affect the suitability of the study area for breeding including the proximity of water sources, availability of adequate foraging habitat in close proximity, and the presence of disease are discussed below. The availability and connectivity of nearby foraging habitat is important for successful breeding of black-cockatoos (Saunders 1977, 1986). Approximately 52% (49,135 ha) of the land area within a 12 km radius of the study area is native vegetation (DPIRD 2017) (Figure 12). The vast majority of this native vegetation is likely to comprise Jarrah - Marri forest and therefore represents suitable foraging habitat for black-cockatoos. The study area is situated immediately adjacent to significant continuous areas of suitable foraging habitat within state forest. Based on the proximity and connectivity of significant foraging resources, no points were deducted from the foraging score for connectivity.

Database searches indicate that there are five known black-cockatoo roost sites within close proximity to the study area (DBCA 2024) (Figure 12). Forest Red-tailed Black-cockatoos are likely to roost at ten locations within the study area as discussed above.

There is extensive habitat that is suitable for breeding for all three species and multiple known nesting hollows have been confirmed within the study area. Based on the above information, no points were deducted for proximity to roosting or breeding sites. While there was minor evidence of *Phytophthora* dieback within the study area, no severe dieback or Marri canker disease was observed during the field survey, and no points were deducted for impacts from significant plant disease.

Table 8 Scoring tool for determining quality of black cockatoo foraging habitat.

Score	Baudin's Black-cockatoo	Carnaby's Black-cockatoo	Forest Red-tailed 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	**10**	**10**	**10**

4.5.3 Offset Habitat Scoring

The foraging habitat scoring system for black-cockatoos developed by DCCEEW to calculate the value of an offset site (Appendix 3) was applied to each of the two fauna habitat types mapped within the study area (Table 9).

The site condition component of the foraging value score was based predominantly on projected foliage cover which was variable across the extent of each habitat type due to differences in vegetation type, logging history and soil/landform. Projected foliar cover was estimated at 40-50% for the 'Hillslopes with Jarrah-Marri Forest' habitat correlating with a moderate to high site condition score (score of 6), and >50% for the 'Drainage Systems with Flooded Gum or Yarri-Marri Forest' habitat correlating with a high site condition score (score of 7) (Table 9).

A site context score of three was given to all six fauna habitat types owing to the presence of foraging and breeding habitat within close proximity to the study area. The 12 km buffer for regional foraging habitat was based upon the maximum distance from a nest that breeding birds are likely to travel (DEC 2012). Approximately 52% (49,135 ha) of the land area within a 12 km radius of the study area is native vegetation (DPIRD 2017) (Figure 12). The vast majority of this likely comprised Jarrah - Marri forest of moderate to high foraging value. Therefore, a score of three (out of a possible score

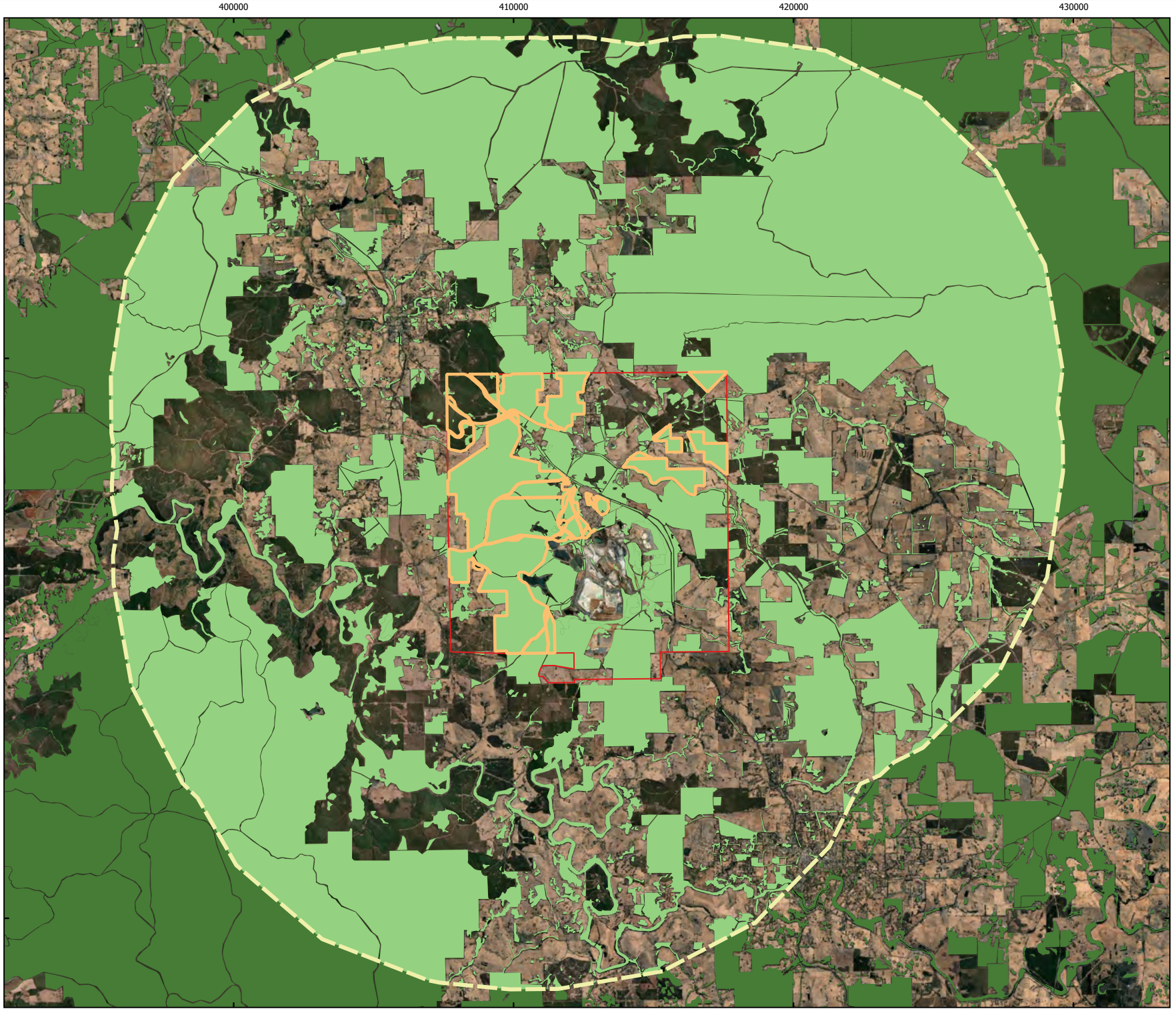
of three) was determined for all species across both habitat types for site context (Table 9).

In order for an offset site to be considered suitable the presence of black-cockatoos within the area must be confirmed. The scoring tool requires that the species is seen or reported regularly (intervals of every few days or weeks for at least several months of the year) and/or there is abundant foraging evidence, e.g. chewed nuts that can be identified as belonging to the species. Based on the current survey effort and knowledge of the study area the regular presence of Baudin's Black-cockatoo was not confirmed within the study area. Foraging evidence and sightings of the Forest Red-tailed Black-cockatoo and Carnaby's Black-cockatoo were made during the field survey, and these species are therefore confirmed as regularly being present within the area.

Table 9 Foraging values of vegetation in the survey area for Baudin's, Carnaby's and Forest Red-tailed Black-cockatoos, based upon vegetation characteristics, context and species density.

SITE CONDITION					
Indicator	Score	Foraging Value	Reasoning	Hillslopes with Jarrah-Marri Forest (ha)	Drainage Systems with Flooded Gum or Yarri-Marri Forest (ha)
Vegetation condition & structure. Habitat features.	7	Very High	Marri-Jarrah forest/woodland with >50% projected foliage cover. Low percentage (<5%) of tree deaths.		159
	6	High	Marri-Jarrah-Karri, other eucalypt woodlands with >40% projected foliage cover. Low percentage (<10%) of tree deaths.	642	
	5	Moderate to High	Marri-Jarrah-Karri Forest, other eucalypt woodlands, or Allocasuarina woodlands, with 30-40% projected foliage cover		
	4	Moderate	Marri-Jarrah Forest or woodlands with 20-30% projected foliage cover; or Marri-Jarrah Forest with 40-60% projected foliage cover but vegetation condition reduced due to tree deaths (up to 30-40%).		
	3	Low to Moderate	Pine plantation aged 10-30 years.		
	2	Low	Has been cleared within the past decade. Banksia woodland (native regeneration) with <10% projected foliage cover. Scattered food plants.		
	1	Negligible to Low	Scattered specimens of known food plants but projected foliage cover of these is <2%. May include paddocks or urban areas with scattered foraging trees.		
	0	None	No Proteaceae, eucalypts or other potential sources of food. May include bare ground or developed sites devoid of vegetation.		
			Sub-Total	6	7
SITE CONTEXT					
Proximity of the site in relation to other habitat	3	<12km of other foraging resources with site condition of at least 3, or 6km of known breeding habitat		642	159
	2	<15km of other foraging resources with site condition of at least 4, or 12 km of known breeding habitat			
	1	15-20km of other foraging resources with site condition of at least 5, or <15km of known breeding habitat			
	0	>20km from other foraging resources, or >15km of known breeding habitat			
			Sub-Total	3	3
			FINAL TOTAL	**9**	**10**

	Indicator	Species Stocking Rate	Carnaby's	Baudin's	FRTBC
Confirm presence/ absence of species	Yes	Species is seen or reported regularly and/or there is abundant foraging evidence, e.g. chewed nuts can be identified as this species. Regularly is when the species is seen at intervals of every few days or weeks for at least several months of the year.	X		X
	No	Species is recorded or reported very infrequently and there is little or no foraging evidence.		X	



ONSHORE ENVIRONMENTAL

TALISON LITHIUM BLACK-COCKATOO SURVEY

Figure 12
Foraging habitat within 12km of the study area

Legend

- Talison Mining Tenements
- Study area
- 12km study area buffer
- Native Vegetation Extent (DPIRD 2017)

0 2 4 6 km

1:180,000

Document Control	
Date:	30 January 2025
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Figure:	12
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File Reference:	TA_TBC_Fig11_foraging_value

Datum: GDA 2020
Projection: MGA Zone 50

5.0 DISCUSSION

The study area supports significant breeding habitat for black-cockatoos (Figures 13 and 14). Evidence of all three species of black-cockatoo was recorded from the study area during the survey. Forest Red-tailed Black-cockatoos were common within the study area and the areas surveyed were confirmed to support a significant breeding population. The dominance of sightings of Forest Red-tailed Black-cockatoos confirmed interpretation from previous surveys and from the consolidated database identifying this species as resident in the Greenbushes area. However, there was a relative absence of sightings and observations for the two white-tailed species (*Zanda* spp.) within the area surveyed. Additionally, there was no evidence of breeding for the two white-tailed species recorded despite the survey occurring during breeding season for both Baudin's and Carnaby's Black-cockatoo, and a significant number of known nesting hollows being recorded. Nevertheless, chewed hollows recorded during the survey may be utilised by either *Zanda* species. The Bridgetown area (approximately 10 km south of the study area) is documented as a breeding area for Baudin's Black-cockatoos (Johnstone and Kirkby 2008).

The survey identified two areas that were likely to be of significance for the local Forest Red-tailed Black-cockatoo population:

- High density of chewed hollows and breeding activity in the state forest block north of Mount Jones Dam; and
- Roosting and crèche area associated within the Greenbushes Pool extending north to town.

Drainage habitats and associated water are also likely to be significant, representing potential roosting habitats and higher quality foraging habitats for black-cockatoos. The hillslope habitat type supporting *Allocasuarina fraseriana* and *Banksia grandis* as a component of the overstory also represents higher quality foraging habitat within the area.

A total of 68 known nesting hollows were recorded within the 3,319 ha area surveyed, equivalent to 0.02 known nesting hollows per ha (two hollows per 100 ha). However, in the densest breeding areas, known nesting hollow density was significantly higher (31 hollows within 713 ha, equivalent to four hollows per 100 ha) in the state forest area north of Mount Jones Dam. Bamford (2023) recorded a similar density of known nesting hollows with five hollows within 243 ha surveyed by belt transects in the Collie area (predominantly Baudin's Black-cockatoos) (equivalent to two hollows per 100 ha). The variability in density suggest there is likely to be several factors driving the density of breeding hollows within the study area. Potential factors influencing the availability of hollows and breeding success for black-cockatoos include:

- Proximity (and quality) of nearby foraging habitats;
- Proximity (and quality) of nearby water sources;
- Proximity to roost sites;

- Social factors, i.e. whether breeding is occurring in the area and return of birds to natal areas;
- Disturbance history, particularly logging and fire; and
- Presence of hollow competitive species and predatory species.

There is extensive foraging habitat in close proximity to breeding hollows identified within the study area (Figure 15). Approximately 50% of the surrounding land area is native vegetation which appears sufficient to support the significant local breeding population. However, clearing associated within the ongoing expansion of the Greenbushes operations is likely to impact on the availability of foraging habitat within the area to some extent. Rehabilitation and revegetation in areas within 12km of the breeding locations identified within the study area would aid in directly offsetting impacts from loss of foraging habitat through clearing.

Proximity to water sources was identified as a key driver of breeding hollows for Forest Red-tailed Black-cockatoos in the northern Jarrah Forest (Craig *et. al.* 2023). Numerous water sources occur within the study area and surrounds. The locations of known nesting hollows were clustered in close proximity to water sources (Figure 16). A total of 48 of the 68 known nesting hollows identified (70%) were situated within 1 km of a water source.

Disturbance history was identified during the survey as a factor possibly contributing to the variable availability of hollows across the study area. The relative dominance of Jarrah and Marri within hillslope habitat across the study area was variable and is linked to historical logging in the area. Large hollows and known nesting hollows were predominantly identified in Marri which forms large hollow more readily than Jarrah.

Logging history data available from DBCA has been mapped across Talison's mining leases, identifying areas logged by year and by the type of silvicultural operation. Areas within state forest located east and north of the mine were primarily subject to harvesting operations between 1920 and the 1970s. Whereas state forests to the west of the mine (comprising a large proportion of the area surveyed) has been partially harvested[2] for Jarrah during the 1980s. The study area has been subject to logging from the 1920s through to 2007 and predominantly includes areas partially harvested for Jarrah (Figure 17). A large percentage of known nesting hollows occur in areas that were partially harvested for Jarrah. Large Marri trees were retained within these blocks providing the suitable hollows recorded during the survey. The consolidated database

[2] 'Partial harvesting of Jarrah' refers to selective removal of Jarrah logs that provided the highest recovery of timber, with other tree species such as Marri not harvested. Blocks that were 'harvested' removed all larger Jarrah and Marri trees.

shows fewer hollows occurring within harvested areas occurring cross Talison's previously surveyed potential impact areas.

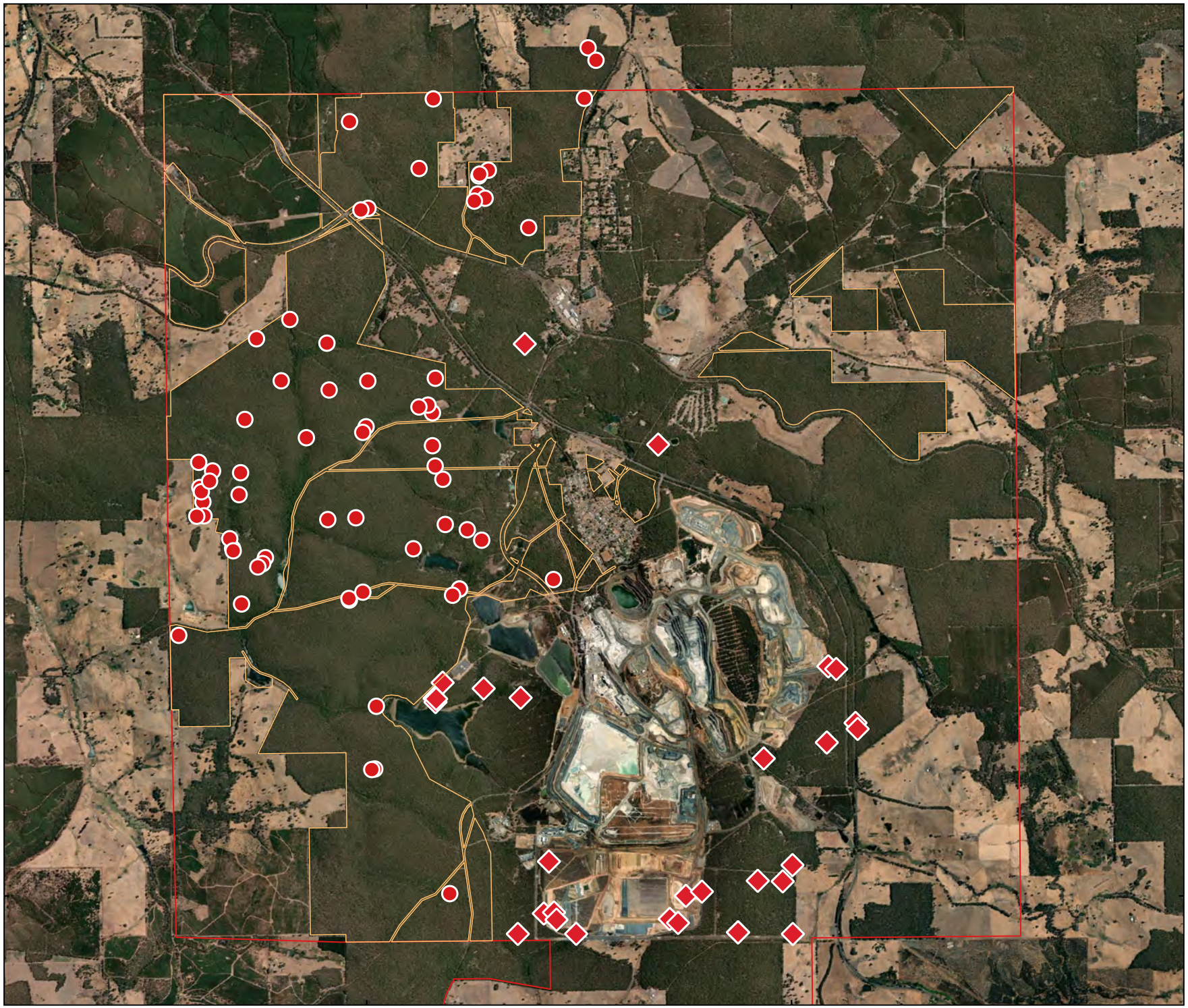
Fire age of the vegetation may also impact the availability of hollows with fire contributing to both the establishment and loss of hollows. The area containing the highest density of hollows has remained unburnt for over 20 years with the most recent fires occurring in 2000 and 2003. Fire frequency and timing may also influence the formation and loss of hollows.

During the assessment of the study area a number of disturbance factors with the potential to impact black-cockatoos were identified. These included the presence of bees in tree hollows, drought impacting on vegetation health, vehicle strike and feral pigs.

Bees were observed occupying two suitable hollows and six potentially suitable hollows within the study area. Four of these hollows were within 1 km of the Greenbushes Pool. A bird killed by vehicle strike was recorded in the vicinity of Spring Gully Road during the survey and birds were commonly recorded along this road. Vegetation adjoining Spring Gully Road is situated between the Mount Jones breeding area and the roost site at the Greenbushes Pool as well as supporting a number of chewed hollows. Feathers from a second dead bird were observed in the north of the study area with the cause of death unable to be determined. This death was unlikely to be due to vehicle strike it was not in close proximity to major roads.

The results of the survey indicate that the area surveyed likely supports a significant breeding population of Forest Red-tailed Black-cockatoos. Approximately 20% of the observations during the survey were groups of three birds, most likely comprising breeding pairs accompanied by a juvenile likely to have fledged from the local area. Management actions that could be investigated to assist in mitigating Talison's impacts on the local population include:

- Monitoring numbers of juveniles to establish trends and monitor levels of breeding success;
- Monitoring the Forest Red-tailed Black-cockatoo population size of through roosting counts;
- Monitoring selected known nesting hollows during breeding season;
- Installation of black-cockatoo warning signage on Spring Gully Road;
- Control of feral bees in the Greenbushes Pool area;
- Revegetation projects within a 12 km radius of known breeding areas;
- Advocating/liaising with DBCA for exclusion of fire during breeding season in identified breeding areas surrounding known hollows; and
- Collaring trees with known nesting hollows and monitoring to determine effectiveness in improving fledging success.



TALISON LITHIUM BLACK-COCKATOO SURVEY

Figure 13
Location of habitat trees with known nesting hollows within Talison leases

Legend

- Talison Mining Tenements

Habitat Trees - Consolidated data from SNA

- Known nesting hollows

Habitat Trees - Talison Mining leases survey (Onshore Env 2025)

- Known nesting hollows

0 1 2 km

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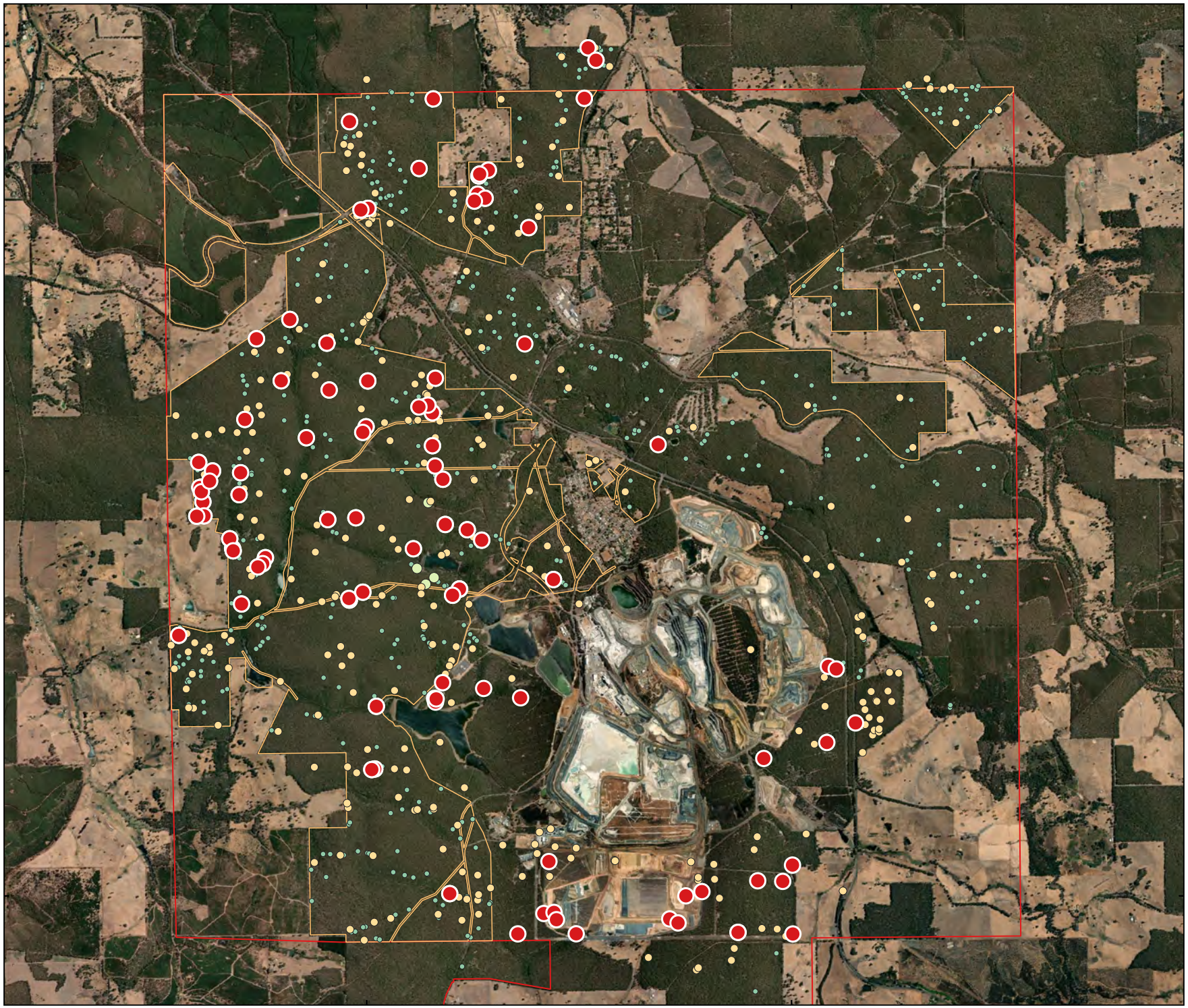
Document Control	
Date:	7th February 2025
Status:	Final
Figure:	13
Sheet Size:	A4
File Reference:	TA_TBC_FigX_ali_hollows

Datum: GDA 2020
Projection: MGA Zone 50



TALISON LITHIUM BLACK-COCKATOO SURVEY

Figure 14
Location of habitat trees within Talison leases

Legend

- Talison Mining Tenements

Habitat Trees

- Chewed
- Suitable
- Artificial hollow
- Potentially suitable

0 1 2 km

1:60,000

Document Control	
Date:	7th February 2025
Status:	Final
Figure:	14
Sheet Size:	A4
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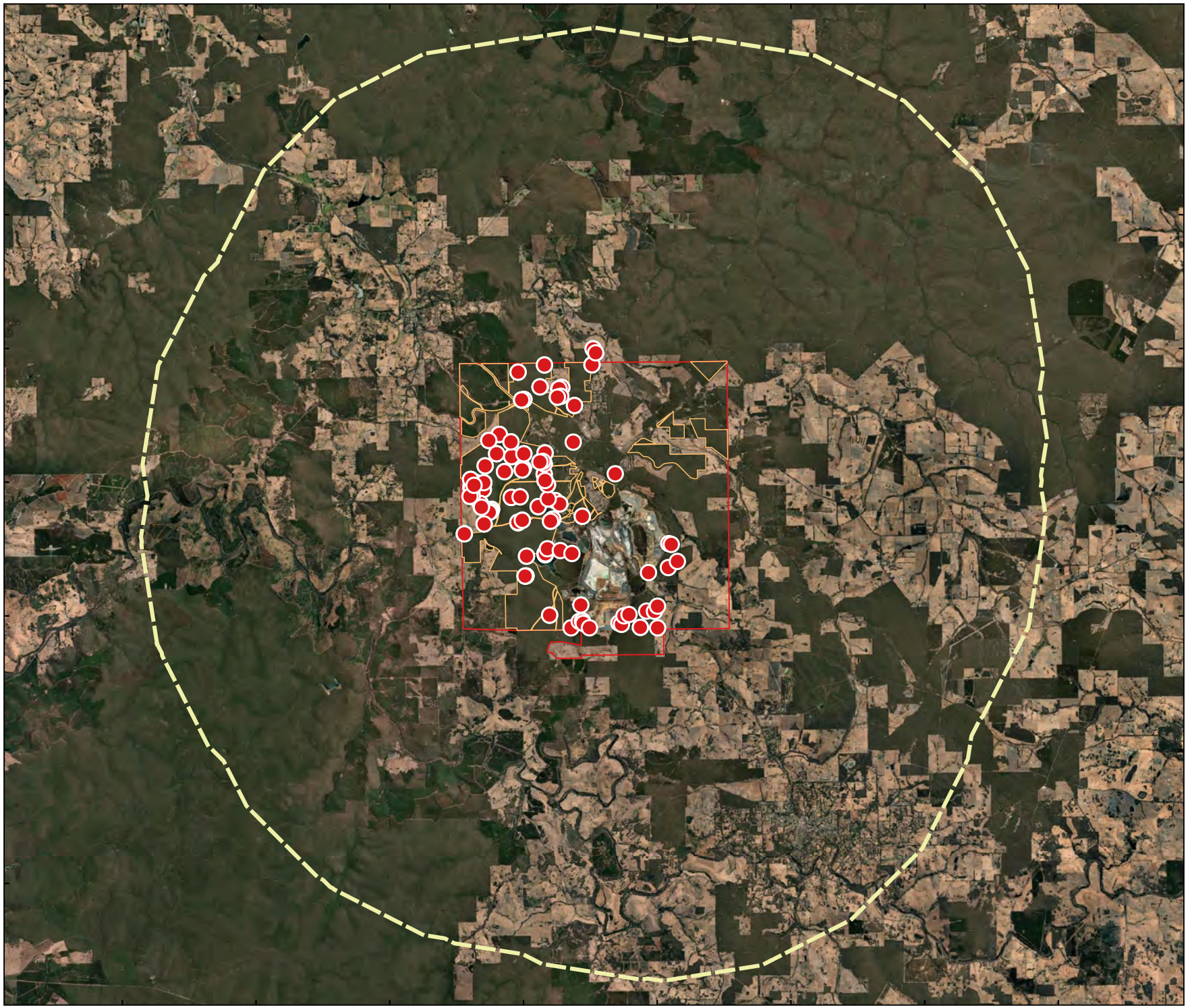

TALISON LITHIUM BLACK-COCKATOO SURVEY

Figure 15
Foraging habitat supporting nesting at Greenbushes

Legend

- Talison Mining Tenements

Habitat Trees

- Chewed
- 12km buffer - Nesting hollows

0 1 2 km

1:190,608

Document Control	
Date:	7th February 2025
Status:	Final
Figure:	15
Sheet Size:	A4
File Reference:	TA_TBC_FigX_ali_hollows

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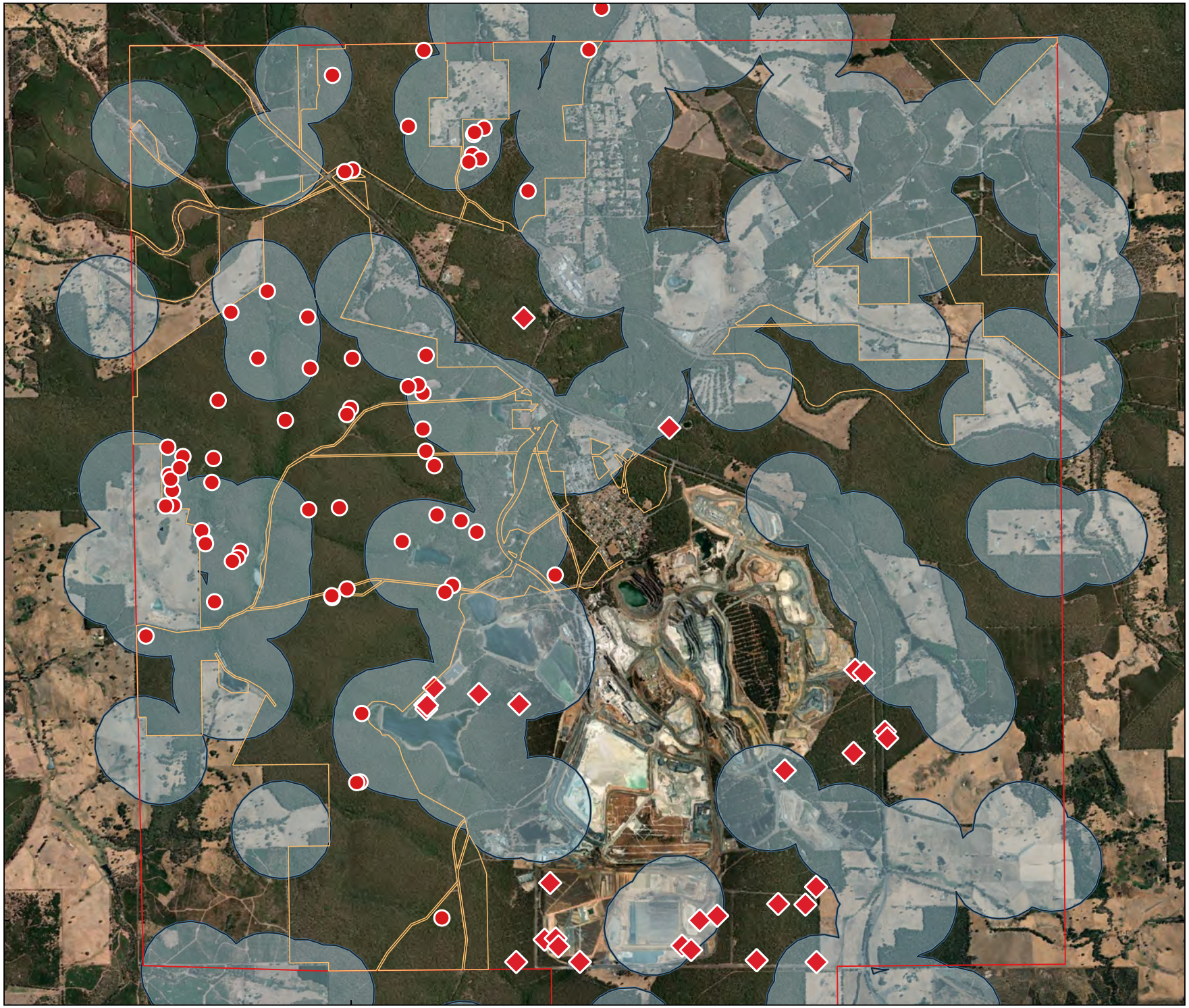

TALISON LITHIUM BLACK-COCKATOO SURVEY

Figure 16
Location of breeding hollows and water sources within the Greenbushes tenements

Legend

- Talison Mining Tenements
- Study area
- Water sources 1km buffer

Habitat Trees (current survey)

- Known nesting hollows

Habitat Trees (consolidated database)

- Known nesting hollows

0 1 2 km

1:55,000

Document Control	
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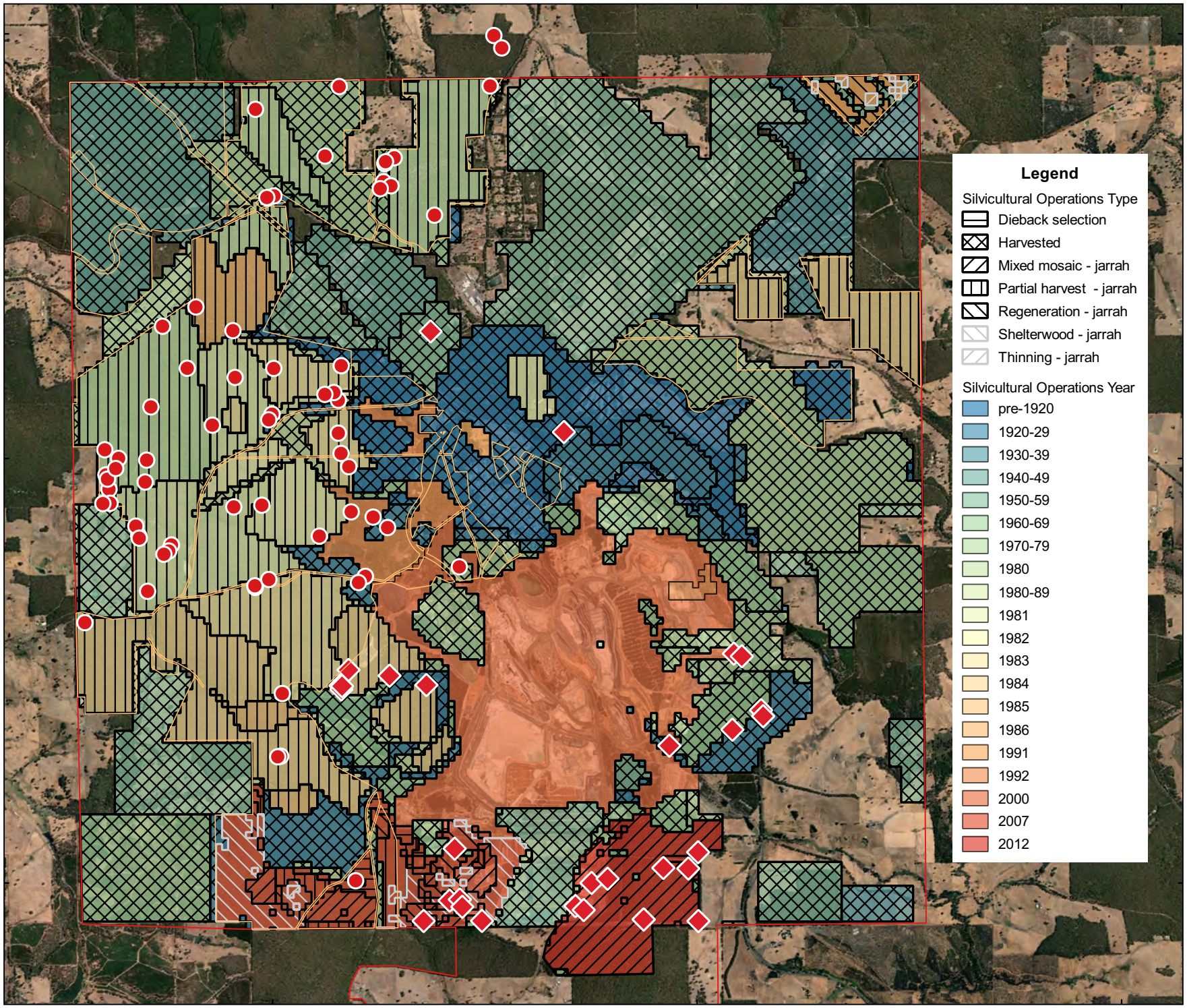
Figure:	16
Sheet Size:	A4
File Reference:	TA_TBC_Fig13_watersources

Datum: GDA 2020
Projection: MGA Zone 50



ONSHORE ENVIRONMENTAL

TALISON LITHIUM BLACK-COCKATOO SURVEY

Figure 17
Locations of known nesting hollows and records of silvicultural operations within Talison leases

Legend

- Talison Mining Tenements
- Study area

Habitat Trees - Consolidated data

- Known

Habitat Trees - Current survey

- Chewed

0 1 2 km

1:60,000

Document Control	
Date:	30 January 2025
Status:	Final
Figure:	17
Sheet Size:	A4
File Reference:	TA_TBC_Fig14_logging

Datum: GDA 2020
Projection: MGA Zone 50

6.0 SUMMARY

The targeted black-cockatoo survey of previously unsurveyed state forest within Talison's Greenbushes tenements was completed in November 2024. The study area supports approximately 3,000 ha of native vegetation which was ground truthed by walking transects in a north-south direction at 250 m intervals. A motion sensor camera and passive acoustic recorder were installed for 16 nights to trial monitoring of a known breeding hollow identified during the survey.

The Forest Red-tailed Black-cockatoo was common throughout the study area during the field survey with 73 direct observations (222 birds), 44 identifications through calls, and 246 occurrences of foraging evidence. Foraging evidence from Baudin's Black-cockatoo was observed at one location. Thirteen Carnaby's Black-cockatoos were observed from two observations within the study area and calls were also heard on four occasions from the same area. Foraging evidence from this species was identified at nine locations within the study area. Based on the survey results, Forest Red-tailed Black-cockatoos are resident within the study area and both Baudin's and Carnaby's Black-cockatoo are more seasonally mobile and likely to utilise the vegetation within the study area occasionally throughout the year.

The study area supports significant areas of breeding habitat suitable for all three species of black-cockatoo. Tree hollow assessments focused on identifying larger mature and senescent trees to assess nesting suitability for black-cockatoos. A total of sixty-eight known nesting trees were observed within the study area. These hollows showed signs of use by black-cockatoos in the form of chew marks or scratch marks. A total of 215 trees were identified as *suitable* for nesting by black-cockatoos. These hollows were considered of a size, orientation and depth to be suitable for use by black-cockatoos as breeding hollows. The majority of *suitable and known* nesting trees were Marri, with lower numbers of Jarrah and dead trees (unknown species). An additional 385 trees were identified as being *potentially suitable* for nesting by black-cockatoos.

The database searches identified five roosting sites within the study area. The survey identified a total of ten potential night roosting locations for Forest Red-tailed Black-cockatoos within the study area. These locations showed evidence of night roosting in the form of droppings, feathers or birds present in the late evening. Due to time constraints there were no night roosting surveys carried out during the current assessment.

The black-cockatoo field survey determined that the availability of hollows in state forest within the Greenbushes mining leases is impacted primarily by logging history, fire history and proximity to water. The highest density of known nesting hollows was located within areas partially harvested for Jarrah in the 1980s, unburnt for >20 years and within 1 km of water sources.

7.0 STUDY TEAM

The targeted black-cockatoo survey was planned, co-ordinated and executed by the following personnel:

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Dr Jerome Bull	PhD	Principal Botanist
Mr Thomas Mott	BSc	Ecologist

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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.

APPENDIX 2

Foraging Habitat Quality Score (DAWE 2022)

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

Offset Habitat Scoring System (DCCEEW 2020)

Habitat Scoring System for WA black cockatoo foraging habitat

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

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

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

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

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

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

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

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

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

Final Totals				

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

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

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

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

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

APPENDIX 4

Details of tree hollows recorded within the study area

Tree Species	DBH	Category	Easting	Northing
Unknown		Artificial hollow	410591	6253852
Unknown		Artificial hollow	410722	6254626
Unknown		Artificial hollow	410694	6253666
Unknown		Artificial hollow	410792	6253743
Eucalyptus marginata	55	Chewed	412605	6259979
Corymbia calophylla	80	Chewed	412698	6259833
Eucalyptus marginata	75	Chewed	411091	6253609
Dead	90	Chewed	411091	6253609
Corymbia calophylla	120	Chewed	410924	6254369
Corymbia calophylla	870	Chewed	410616	6258559
Corymbia calophylla	100	Chewed	411305	6258257
Corymbia calophylla	75	Chewed	411319	6258471
Corymbia calophylla	100	Chewed	411329	6258493
Eucalyptus marginata	850	Chewed	410783	6259378
Corymbia calophylla	120	Chewed	411183	6254307
Corymbia calophylla	90	Chewed	411353	6254184
Corymbia calophylla	80	Chewed	412198	6253721
Corymbia calophylla	80	Chewed	411010	6253536
Corymbia calophylla	80	Chewed	411431	6258539
Corymbia calophylla	120	Chewed	409935	6258067
Corymbia calophylla	175	Chewed	408807	6253978
Corymbia calophylla	70	Chewed	409289	6255390
Corymbia calophylla	80	Chewed	408775	6253908
Corymbia calophylla	85	Chewed	411393	6258209
Corymbia calophylla	90	Chewed	408718	6253870
Corymbia calophylla	110	Chewed	408497	6254720
Corymbia calophylla	95	Chewed	408421	6254086
Eucalyptus marginata	110	Chewed	409557	6255952
Eucalyptus marginata	120	Chewed	409541	6254427
Eucalyptus marginata	65	Chewed	409872	6254448
Eucalyptus marginata	135	Chewed	410549	6254083
Dead	60	Chewed	412561	6259385
Dead	130	Chewed	409095	6256782
Corymbia calophylla	70	Chewed	409531	6256503
Corymbia calophylla	130	Chewed	408702	6256555
Corymbia calophylla	90	Chewed	408565	6255605
Corymbia calophylla	50	Chewed	410773	6255296
Corymbia calophylla	100	Chewed	409992	6255519
Corymbia calophylla	80	Chewed	408387	6254201
Corymbia calophylla	120	Chewed	410015	6258090
Corymbia calophylla (dead)	120	Chewed	408993	6256060
Yarri		Chewed	410773	6255683
Corymbia calophylla	68	Chewed	407787	6253064
Corymbia calophylla	110	Chewed	408526	6253433
Corymbia calophylla	110	Chewed	410113	6252229
Corymbia calophylla	120	Chewed	409953	6255453
Corymbia calophylla	90	Chewed	408035	6254804
Corymbia calophylla	90	Chewed	410896	6254901
Corymbia calophylla	100	Chewed	408071	6254635
Corymbia calophylla	70	Chewed	408084	6254470

Tree Species	DBH	Category	Easting	Northing
Corymbia calophylla	120	Chewed	410807	6256090
Corymbia calophylla	90	Chewed	408053	6254754
Corymbia calophylla	120	Chewed	408185	6254999
Corymbia calophylla	120	Chewed	408022	6255100
Corymbia calophylla	120	Chewed	410720	6255774
Corymbia calophylla	100	Chewed	408428	6254059
Eucalyptus marginata	100	Chewed	411906	6257863
Eucalyptus marginata	80	Chewed	410012	6256058
Eucalyptus marginata (dead)	120	Chewed	410614	6255752
Unknown		Chewed	409931	6258071
Corymbia calophylla	180	Chewed	410094	6251491
Corymbia calophylla	110	Chewed	410059	6251484
Corymbia calophylla	110	Chewed (Active)	411267	6258175
Corymbia calophylla	190	Chewed (Active)	410977	6250024
Corymbia calophylla	100	Chewed (Active)	409797	6259110
Corymbia calophylla	105	Chewed (Active)	409795	6253479
Corymbia calophylla	110	Chewed (Active)	409790	6253498
Corymbia calophylla	150	Chewed (Active)	408515	6254978
Corymbia calophylla	100	Chewed (Active)	407999	6254466
Corymbia calophylla	170	Chewed (Active)	409954	6253572
Corymbia calophylla	70	Chewed (Active)	408150	6254879
Corymbia calophylla	70	Chewed (Active)	410805	6255057
Corymbia calophylla		Potentially suitable	412757	6259950
Dead		Potentially suitable	412503	6259719
Eucalyptus marginata		Potentially suitable	412874	6259961
Eucalyptus marginata		Potentially suitable	412575	6259733
Eucalyptus marginata		Potentially suitable	412597	6259963
Eucalyptus marginata		Potentially suitable	412501	6259946
Corymbia calophylla		Potentially suitable	412792	6259771
Corymbia calophylla		Potentially suitable	412733	6259982
Corymbia calophylla		Potentially suitable	412497	6259630
Corymbia calophylla		Potentially suitable	412292	6259903
Corymbia calophylla		Potentially suitable	412315	6259897
Corymbia calophylla		Potentially suitable	412250	6259901
Corymbia calophylla		Potentially suitable	412253	6259901
Corymbia calophylla		Potentially suitable	412334	6259776
Corymbia calophylla	200	Potentially suitable	410281	6259467
Corymbia calophylla	80	Potentially suitable	410295	6259456
Corymbia calophylla	200	Potentially suitable	407922	6255148
Eucalyptus marginata	110	Potentially suitable	417126	6259517
Eucalyptus marginata	130	Potentially suitable	417198	6259531
Eucalyptus marginata	160	Potentially suitable	416330	6259524
Corymbia calophylla	150	Potentially suitable	416388	6259509
Corymbia calophylla	170	Potentially suitable	416640	6259539
Corymbia calophylla	200	Potentially suitable	416978	6257432
Corymbia calophylla	200	Potentially suitable	417163	6257286
Corymbia calophylla		Potentially suitable	411115	6254318
Corymbia calophylla		Potentially suitable	411116	6254027
Eucalyptus marginata	170	Potentially suitable	411187	6249527
Corymbia calophylla	150	Potentially suitable	411178	6249989

Tree Species	DBH	Category	Easting	Northing
Corymbia calophylla		Potentially suitable	411246	6250900
Corymbia calophylla	100	Potentially suitable	411402	6255755
Corymbia calophylla	120	Potentially suitable	410062	6256441
Eucalyptus marginata	100	Potentially suitable	411365	6255909
Eucalyptus marginata	80	Potentially suitable	411571	6255719
Unknown	100	Potentially suitable	410229	6258217
Corymbia calophylla	150	Potentially suitable	410531	6259353
Corymbia calophylla	70	Potentially suitable	410770	6259296
Corymbia calophylla	80	Potentially suitable	410798	6259402
Corymbia calophylla	90	Potentially suitable	410076	6259267
Corymbia calophylla	60	Potentially suitable	410866	6258055
Corymbia calophylla	60	Potentially suitable	410589	6258517
Corymbia calophylla	90	Potentially suitable	410533	6259435
Corymbia calophylla	75	Potentially suitable	410412	6254983
Corymbia calophylla	65	Potentially suitable	410507	6255566
Eucalyptus marginata (dead)	40	Potentially suitable	411040	6258179
Eucalyptus marginata	95	Potentially suitable	410012	6259397
Eucalyptus marginata	120	Potentially suitable	410914	6253646
Eucalyptus marginata	90	Potentially suitable	410524	6253900
Eucalyptus marginata (dead)	90	Potentially suitable	410840	6253693
Eucalyptus patens (dead)	140	Potentially suitable	408401	6253124
Dead		Potentially suitable	411671	6254142
Dead		Potentially suitable	411519	6254236
Eucalyptus marginata		Potentially suitable	411200	6254245
Eucalyptus marginata		Potentially suitable	411306	6254217
Eucalyptus marginata	80	Potentially suitable	409863	6258054
Corymbia calophylla		Potentially suitable	411233	6255252
Corymbia calophylla		Potentially suitable	411574	6254192
Corymbia calophylla		Potentially suitable	411500	6255052
Corymbia calophylla		Potentially suitable	411192	6254228
Corymbia calophylla		Potentially suitable	411374	6254193
Corymbia calophylla		Potentially suitable	411308	6254112
Corymbia calophylla		Potentially suitable	411226	6254118
Corymbia calophylla	70	Potentially suitable	412308	6253685
Corymbia calophylla	100	Potentially suitable	412341	6253656
Corymbia calophylla	100	Potentially suitable	412282	6253937
Corymbia calophylla		Potentially suitable	412236	6253947
Corymbia calophylla	87	Potentially suitable	407799	6253157
Eucalyptus marginata		Potentially suitable	408364	6252698
Eucalyptus marginata		Potentially suitable	408357	6252431
Corymbia calophylla	140	Potentially suitable	410162	6258210
Corymbia calophylla	150	Potentially suitable	410104	6258143
Corymbia calophylla	160	Potentially suitable	410099	6258267
Corymbia calophylla	200	Potentially suitable	410276	6258748
Corymbia calophylla	150	Potentially suitable	410393	6258542
Corymbia calophylla	150	Potentially suitable	411033	6258122
Corymbia calophylla	150	Potentially suitable	410595	6255594
Corymbia calophylla	110	Potentially suitable	410281	6258130
Unknown	120	Potentially suitable	410421	6258050
Unknown		Potentially suitable	410112	6256401

Tree Species	DBH	Category	Easting	Northing
Eucalyptus marginata	100	Potentially suitable	410110	6256391
Corymbia calophylla	110	Potentially suitable	417415	6259275
Corymbia calophylla	180	Potentially suitable	417411	6259264
Corymbia calophylla	180	Potentially suitable	416753	6259267
Eucalyptus marginata	180	Potentially suitable	417201	6259051
Eucalyptus marginata	80	Potentially suitable	414318	6256116
Eucalyptus marginata	100	Potentially suitable	414347	6256141
Corymbia calophylla	170	Potentially suitable	414661	6256042
Eucalyptus marginata	300	Potentially suitable	415192	6255777
Eucalyptus marginata	150	Potentially suitable	415275	6255769
Corymbia calophylla	220	Potentially suitable	415276	6255715
Corymbia calophylla	120	Potentially suitable	415505	6255858
Corymbia calophylla	200	Potentially suitable	416366	6255237
Corymbia calophylla	120	Potentially suitable	416537	6255562
Eucalyptus marginata	150	Potentially suitable	416408	6255836
Corymbia calophylla		Potentially suitable	416610	6259490
Corymbia calophylla	200	Potentially suitable	415595	6257598
Corymbia calophylla	190	Potentially suitable	415587	6257367
Dead	150	Potentially suitable	416760	6257427
Corymbia calophylla	200	Potentially suitable	416575	6257423
Corymbia calophylla	130	Potentially suitable	416311	6257339
Corymbia calophylla	150	Potentially suitable	409896	6250523
Eucalyptus marginata (dead)	170	Potentially suitable	410008	6250502
Eucalyptus marginata	130	Potentially suitable	410028	6250496
Corymbia calophylla	140	Potentially suitable	410361	6250524
Eucalyptus marginata	170	Potentially suitable	410714	6250253
Eucalyptus marginata	190	Potentially suitable	410707	6250260
Corymbia calophylla	250	Potentially suitable	410548	6250214
Corymbia calophylla	250	Potentially suitable	410446	6250242
Corymbia calophylla	200	Potentially suitable	410312	6250276
Corymbia calophylla	160	Potentially suitable	411012	6250781
Eucalyptus marginata	200	Potentially suitable	415236	6256005
Eucalyptus marginata	150	Potentially suitable	415055	6256121
Unknown (dead)		Potentially suitable	413104	6254885
Corymbia calophylla		Potentially suitable	413093	6254576
Corymbia calophylla		Potentially suitable	412688	6254855
Corymbia calophylla	160	Potentially suitable	410807	6249945
Corymbia calophylla	200	Potentially suitable	410896	6249889
Corymbia calophylla	180	Potentially suitable	410848	6249739
Corymbia calophylla	180	Potentially suitable	410855	6249759
Eucalyptus marginata	110	Potentially suitable	408397	6254258
Eucalyptus marginata	80	Potentially suitable	408389	6254097
Corymbia calophylla		Potentially suitable	408747	6256053
Corymbia calophylla	70	Potentially suitable	410308	6255009
Corymbia calophylla	90	Potentially suitable	408031	6254806
Corymbia calophylla	120	Potentially suitable	411755	6257993
Corymbia calophylla	150	Potentially suitable	409687	6257930
Corymbia calophylla	140	Potentially suitable	410805	6254946
Corymbia calophylla	120	Potentially suitable	411521	6258040
Corymbia calophylla	120	Potentially suitable	410601	6255064

Tree Species	DBH	Category	Easting	Northing
Corymbia calophylla	180	Potentially suitable	410857	6254917
Corymbia calophylla	130	Potentially suitable	410466	6255096
Unknown		Potentially suitable	410770	6255990
Eucalyptus marginata	50	Potentially suitable	410089	6252349
Eucalyptus marginata	100	Potentially suitable	410628	6255776
Corymbia calophylla		Potentially suitable	411401	6257802
Eucalyptus marginata	80	Potentially suitable	410178	6253118
Corymbia calophylla	80	Potentially suitable	409998	6257348
Eucalyptus marginata	130	Potentially suitable	410784	6256043
Eucalyptus marginata	80	Potentially suitable	410621	6255770
Eucalyptus marginata?	80	Potentially suitable	409756	6257417
Corymbia calophylla	60	Potentially suitable	409796	6259044
Corymbia calophylla	70	Potentially suitable	409973	6258471
Corymbia calophylla	70	Potentially suitable	409850	6258936
Corymbia calophylla	110	Potentially suitable	410119	6258401
Corymbia calophylla	110	Potentially suitable	409801	6259114
Corymbia calophylla	120	Potentially suitable	409756	6258938
Corymbia calophylla	130	Potentially suitable	411405	6258381
Corymbia calophylla	60	Potentially suitable	409956	6258012
Corymbia calophylla	60	Potentially suitable	409769	6258542
Corymbia calophylla	80	Potentially suitable	409988	6259071
Corymbia calophylla	170	Potentially suitable	408529	6254917
Corymbia calophylla	105	Potentially suitable	409285	6255349
Corymbia calophylla	105	Potentially suitable	408533	6255055
Corymbia calophylla	120	Potentially suitable	409520	6257664
Corymbia calophylla	130	Potentially suitable	408435	6255056
Corymbia calophylla	130	Potentially suitable	408501	6255148
Corymbia calophylla	150	Potentially suitable	408462	6254930
Corymbia calophylla	50	Potentially suitable	409242	6257608
Corymbia calophylla	60	Potentially suitable	409599	6253429
Corymbia calophylla	75	Potentially suitable	408712	6254198
Corymbia calophylla	75	Potentially suitable	408499	6253972
Corymbia calophylla	80	Potentially suitable	409292	6255577
Corymbia calophylla	85	Potentially suitable	409297	6255642
Corymbia calophylla	90	Potentially suitable	408749	6254223
Corymbia calophylla	90	Potentially suitable	408699	6253774
Corymbia calophylla	95	Potentially suitable	408547	6254183
Corymbia calophylla	75	Potentially suitable	411754	6258288
Eucalyptus marginata (dead)	650	Potentially suitable	409747	6258922
Eucalyptus marginata	70	Potentially suitable	410035	6258537
Eucalyptus marginata	100	Potentially suitable	411799	6259148
Eucalyptus marginata	100	Potentially suitable	409599	6254282
Eucalyptus marginata (dead)	100	Potentially suitable	409366	6255278
Eucalyptus marginata (dead)	100	Potentially suitable	409750	6253677
Eucalyptus marginata	110	Potentially suitable	409194	6257490
Eucalyptus marginata	120	Potentially suitable	410304	6255841
Eucalyptus marginata	120	Potentially suitable	409510	6255429
Eucalyptus marginata (dead)	120	Potentially suitable	409581	6257277
Eucalyptus marginata (dead)	135	Potentially suitable	408501	6254852
Eucalyptus marginata	150	Potentially suitable	409572	6255364

Tree Species	DBH	Category	Easting	Northing
Eucalyptus marginata (dead)	150	Potentially suitable	409557	6257050
Eucalyptus marginata	58	Potentially suitable	409526	6255168
Eucalyptus marginata	65	Potentially suitable	409492	6252565
Eucalyptus marginata (dead)	65	Potentially suitable	409421	6257305
Eucalyptus marginata (dead)	70	Potentially suitable	410911	6252984
Eucalyptus marginata	75	Potentially suitable	411143	6253185
Eucalyptus marginata	75	Potentially suitable	409578	6253276
Eucalyptus marginata	80	Potentially suitable	409644	6254266
Eucalyptus marginata	85	Potentially suitable	409672	6252454
Eucalyptus marginata	90	Potentially suitable	409517	6257464
Eucalyptus marginata	90	Potentially suitable	409185	6257191
Eucalyptus marginata	90	Potentially suitable	409488	6254515
Eucalyptus marginata	90	Potentially suitable	410607	6255292
Eucalyptus marginata (dead)	90	Potentially suitable	409856	6254497
Eucalyptus marginata (dead)	65	Potentially suitable	409997	6256092
Eucalyptus marginata	140	Potentially suitable	411084	6252928
Eucalyptus marginata	90	Potentially suitable	410348	6255817
Eucalyptus marginata	90	Potentially suitable	411860	6258869
Eucalyptus marginata	110	Potentially suitable	409443	6256255
Dead		Potentially suitable	412168	6258485
Dead		Potentially suitable	412345	6259247
Dead		Potentially suitable	412272	6259088
Dead		Potentially suitable	412242	6258878
Dead		Potentially suitable	409712	6256650
Dead		Potentially suitable	409373	6256473
Dead		Potentially suitable	409028	6255594
Dead	130	Potentially suitable	410658	6253051
Dead		Potentially suitable	410380	6252690
Dead		Potentially suitable	409113	6253854
Dead		Potentially suitable	409117	6254556
Eucalyptus marginata		Potentially suitable	412290	6259356
Eucalyptus marginata		Potentially suitable	412237	6259075
Eucalyptus marginata		Potentially suitable	409277	6256710
Eucalyptus marginata		Potentially suitable	409285	6256713
Eucalyptus marginata		Potentially suitable	408530	6256368
Eucalyptus marginata		Potentially suitable	408564	6255909
Eucalyptus marginata		Potentially suitable	410658	6253225
Eucalyptus marginata		Potentially suitable	410733	6252981
Eucalyptus marginata		Potentially suitable	410734	6252975
Eucalyptus marginata	150	Potentially suitable	410753	6252926
Eucalyptus marginata		Potentially suitable	410292	6252798
Eucalyptus marginata		Potentially suitable	410327	6252960
Eucalyptus marginata	150	Potentially suitable	410360	6253013
Eucalyptus marginata	110	Potentially suitable	410328	6253505
Eucalyptus marginata		Potentially suitable	408645	6254978
Eucalyptus marginata		Potentially suitable	409030	6254765
Corymbia calophylla		Potentially suitable	412231	6258574
Corymbia calophylla		Potentially suitable	412199	6258572
Corymbia calophylla		Potentially suitable	412232	6258639
Corymbia calophylla		Potentially suitable	412549	6259361

Tree Species	DBH	Category	Easting	Northing
Corymbia calophylla		Potentially suitable	409558	6256572
Corymbia calophylla		Potentially suitable	409610	6256487
Corymbia calophylla		Potentially suitable	409756	6256557
Corymbia calophylla		Potentially suitable	409831	6256719
Corymbia calophylla		Potentially suitable	409041	6256564
Corymbia calophylla		Potentially suitable	409082	6256516
Corymbia calophylla		Potentially suitable	409067	6256145
Corymbia calophylla		Potentially suitable	409027	6255889
Corymbia calophylla		Potentially suitable	408710	6256363
Corymbia calophylla		Potentially suitable	408530	6256374
Corymbia calophylla		Potentially suitable	408538	6256120
Corymbia calophylla		Potentially suitable	408548	6256062
Corymbia calophylla		Potentially suitable	408591	6256006
Corymbia calophylla	100	Potentially suitable	408539	6254947
Corymbia calophylla		Potentially suitable	410785	6255376
Corymbia calophylla		Potentially suitable	410838	6255121
Corymbia calophylla		Potentially suitable	411064	6254972
Corymbia calophylla		Potentially suitable	410672	6253134
Corymbia calophylla		Potentially suitable	410672	6253023
Corymbia calophylla	70	Potentially suitable	410678	6252388
Corymbia calophylla	90	Potentially suitable	410307	6253505
Corymbia calophylla	80	Potentially suitable	408644	6254953
Corymbia calophylla		Potentially suitable	408768	6255129
Corymbia calophylla		Potentially suitable	409060	6254992
Corymbia calophylla (dead)		Potentially suitable	408609	6255686
Corymbia calophylla		Potentially suitable	408196	6252752
Corymbia calophylla		Potentially suitable	407883	6252516
Corymbia calophylla		Potentially suitable	407896	6252543
Corymbia calophylla		Potentially suitable	407843	6252723
Corymbia calophylla		Potentially suitable	407902	6252796
Corymbia calophylla		Potentially suitable	408063	6252864
Corymbia calophylla		Potentially suitable	407751	6252741
Corymbia calophylla		Potentially suitable	407711	6252659
Corymbia calophylla		Potentially suitable	407781	6252687
Corymbia calophylla		Potentially suitable	407798	6253081
Corymbia calophylla		Potentially suitable	409390	6252117
Corymbia calophylla		Potentially suitable	409458	6252094
Corymbia calophylla (dead)		Potentially suitable	408062	6252770
Corymbia calophylla (dead)		Potentially suitable	408086	6252155
Corymbia calophylla (dead)		Potentially suitable	408255	6252581
Eucalyptus marginata		Potentially suitable	407905	6252253
Eucalyptus marginata		Potentially suitable	407911	6252518
Eucalyptus marginata		Potentially suitable	407951	6252641
Eucalyptus marginata		Potentially suitable	408048	6252643
Eucalyptus marginata		Potentially suitable	408079	6252281
Eucalyptus marginata		Potentially suitable	408133	6252922
Eucalyptus marginata		Potentially suitable	407790	6252819
Eucalyptus marginata		Potentially suitable	409294	6252135
Eucalyptus marginata		Potentially suitable	408880	6251946
Eucalyptus marginata (dead)		Potentially suitable	408366	6252969

Tree Species	DBH	Category	Easting	Northing
Eucalyptus marginata (dead)		Potentially suitable	408301	6252406
Eucalyptus marginata (dead)		Potentially suitable	408048	6252582
Eucalyptus marginata (dead)		Potentially suitable	409721	6251794
Corymbia calophylla	100	Potentially suitable	410297	6258239
Corymbia calophylla	120	Potentially suitable	410309	6258660
Corymbia calophylla	150	Potentially suitable	410260	6258239
Corymbia calophylla	150	Potentially suitable	410169	6258316
Corymbia calophylla	150	Potentially suitable	410072	6258646
Corymbia calophylla	100	Potentially suitable	410396	6258279
Corymbia calophylla	120	Potentially suitable	410452	6258405
Corymbia calophylla	150	Potentially suitable	410124	6258401
Corymbia calophylla	110	Potentially suitable	408502	6253575
Corymbia calophylla	80	Potentially suitable	410059	6258525
Corymbia calophylla	120	Potentially suitable	408513	6253283
Corymbia calophylla	100	Potentially suitable	407990	6254662
Corymbia calophylla	180	Potentially suitable	410850	6255091
Corymbia calophylla	140	Potentially suitable	408009	6255007
Eucalyptus marginata	150	Potentially suitable	410274	6258605
Unknown	80	Potentially suitable	410063	6258383
Corymbia calophylla	110	Potentially suitable	410458	6258074
Unknown		Potentially suitable	410092	6259098
Eucalyptus marginata	150	Potentially suitable	410611	6255874
Eucalyptus marginata	100	Potentially suitable	409987	6255546
Unknown		Potentially suitable	408409	6253441
Eucalyptus marginata	130	Potentially suitable	410457	6255918
Eucalyptus marginata	150	Potentially suitable	408715	6253186
Eucalyptus marginata	110	Potentially suitable	408773	6253268
Eucalyptus marginata	140	Potentially suitable	408767	6253273
Corymbia calophylla	100	Potentially suitable	408773	6253168
Eucalyptus marginata	100	Potentially suitable	408795	6253167
Eucalyptus marginata	140	Potentially suitable	408770	6253145
Eucalyptus marginata	130	Potentially suitable	408839	6253031
Eucalyptus marginata	130	Potentially suitable	408773	6252986
Eucalyptus marginata	120	Potentially suitable	408746	6252942
Eucalyptus marginata	120	Potentially suitable	408698	6252909
Eucalyptus marginata	160	Potentially suitable	408698	6252905
Eucalyptus marginata	140	Potentially suitable	415142	6257177
Corymbia calophylla	180	Potentially suitable	415491	6256951
Eucalyptus marginata	200	Potentially suitable	415505	6256958
Corymbia calophylla	200	Potentially suitable	415601	6256845
Corymbia calophylla	140	Potentially suitable	415685	6256858
Corymbia calophylla	200	Potentially suitable	415518	6257161
Eucalyptus marginata	110	Potentially suitable	415551	6257376
Corymbia calophylla	180	Potentially suitable	416618	6257360
Eucalyptus marginata	120	Potentially suitable	416497	6257279
Corymbia calophylla	180	Potentially suitable	416511	6257300
Corymbia calophylla	130	Potentially suitable	416447	6257279
Corymbia calophylla	150	Potentially suitable	416269	6257303
Corymbia calophylla	200	Potentially suitable	416673	6257144
Eucalyptus marginata	160	Potentially suitable	416732	6257231

Tree Species	DBH	Category	Easting	Northing
Eucalyptus marginata	130	Potentially suitable	416791	6256955
Eucalyptus marginata	140	Potentially suitable	416458	6256921
Eucalyptus marginata	200	Potentially suitable	416531	6256785
Corymbia calophylla	200	Potentially suitable	410496	6249837
Corymbia calophylla	200	Potentially suitable	410281	6250972
Eucalyptus marginata	140	Potentially suitable	410417	6251015
Corymbia calophylla	140	Potentially suitable	410748	6250982
Eucalyptus marginata	100	Potentially suitable	410473	6251245
Corymbia calophylla	110	Potentially suitable	410874	6251257
Eucalyptus marginata	170	Potentially suitable	410615	6251103
Eucalyptus marginata	130	Potentially suitable	410118	6251749
Eucalyptus marginata	170	Potentially suitable	410182	6251522
Corymbia calophylla	150	Potentially suitable	410127	6251504
Eucalyptus marginata	200	Potentially suitable	417272	6256605
Eucalyptus marginata	140	Potentially suitable	417220	6256548
Corymbia calophylla	200	Potentially suitable	417128	6256500
Corymbia calophylla	200	Potentially suitable	417027	6256320
Eucalyptus marginata	170	Potentially suitable	417571	6256654
Eucalyptus marginata	300	Potentially suitable	417472	6256672
Eucalyptus marginata	140	Potentially suitable	417088	6256801
Eucalyptus marginata	180	Potentially suitable	411316	6249615
Eucalyptus marginata	200	Potentially suitable	411329	6249932
Eucalyptus marginata	180	Potentially suitable	411335	6249949
Eucalyptus marginata	190	Potentially suitable	411315	6249952
Jarrah		Potentially suitable	411453	6249919
Jarrah		Potentially suitable	411442	6249902
Eucalyptus marginata	140	Potentially suitable	417179	6259489
Eucalyptus marginata	140	Potentially suitable	416741	6259209
Eucalyptus marginata	200	Potentially suitable	416675	6259199
Corymbia calophylla	140	Potentially suitable	416587	6259248
Corymbia calophylla	200	Potentially suitable	416761	6259102
Eucalyptus marginata	150	Potentially suitable	417176	6259049
Corymbia calophylla	120	Potentially suitable	416349	6259398
Eucalyptus marginata		Potentially suitable	416312	6259446
Eucalyptus marginata	150	Potentially suitable	416933	6259473
Corymbia calophylla	160	Potentially suitable	417050	6259428
Eucalyptus marginata	140	Potentially suitable	417059	6259369
Eucalyptus marginata	250	Potentially suitable	409790	6250838
Eucalyptus marginata	200	Potentially suitable	409802	6250861
Eucalyptus marginata	100	Potentially suitable	409986	6249633
Corymbia calophylla		Potentially suitable	411283	6250565
Eucalyptus marginata	180	Potentially suitable	409522	6250219
Dead		Potentially suitable	409346	6250306
Eucalyptus marginata	170	Potentially suitable	409570	6250489
Dead		Potentially suitable	409486	6250490
Eucalyptus marginata		Potentially suitable	409353	6249937
Eucalyptus marginata (dead)		Potentially suitable	410339	6249776
Eucalyptus marginata	200	Potentially suitable	409730	6250477
Eucalyptus marginata	100	Potentially suitable	409957	6249628
Eucalyptus marginata	160	Potentially suitable	409819	6249571

Tree Species	DBH	Category	Easting	Northing
Eucalyptus marginata	170	Potentially suitable	409864	6249577
Eucalyptus marginata	150	Potentially suitable	410109	6249497
Eucalyptus marginata	200	Potentially suitable	410152	6249484
Eucalyptus marginata	170	Potentially suitable	417339	6259231
Eucalyptus marginata	140	Potentially suitable	416994	6259252
Eucalyptus marginata	180	Potentially suitable	417075	6259163
Eucalyptus marginata	160	Potentially suitable	416755	6259478
Dead	80	Suitable	412707	6259862
Corymbia calophylla	120	Suitable	412858	6259760
Corymbia calophylla (dead)	130	Suitable	409999	6259606
Corymbia calophylla	75	Suitable	412688	6259980
Corymbia calophylla	120	Suitable	412293	6259873
Corymbia calophylla	80	Suitable	410274	6257913
Eucalyptus marginata	200	Suitable	416379	6259545
Eucalyptus marginata	100	Suitable	416594	6259615
Eucalyptus marginata	145	Suitable	416876	6259517
Corymbia calophylla	60	Suitable	410941	6254035
Dead	100	Suitable	410879	6254007
Corymbia calophylla	130	Suitable	411917	6253844
Corymbia calophylla	90	Suitable	412126	6254116
Eucalyptus marginata	150	Suitable	410752	6254643
Corymbia calophylla	180	Suitable	411126	6250279
Corymbia calophylla	140	Suitable	411178	6249958
Corymbia calophylla	120	Suitable	411564	6255716
Corymbia calophylla	120	Suitable	411571	6255728
Corymbia calophylla	150	Suitable	411302	6257938
Corymbia calophylla	80	Suitable	410994	6257964
Corymbia calophylla	80	Suitable	411427	6255648
Eucalyptus marginata	111	Suitable	411915	6254762
Corymbia calophylla	150	Suitable	410854	6255685
Corymbia calophylla	110	Suitable	410033	6258152
Corymbia calophylla	120	Suitable	410098	6258269
Corymbia calophylla	100	Suitable	411244	6258174
Corymbia calophylla	170	Suitable	409264	6254937
Corymbia calophylla	100	Suitable	410601	6255597
Corymbia calophylla	110	Suitable	410209	6255567
Corymbia calophylla (dead)	130	Suitable	411016	6258269
Corymbia calophylla (dead)	150	Suitable	410274	6255355
Corymbia calophylla	60	Suitable	410490	6255596
Eucalyptus marginata (dead)	135	Suitable	410770	6259335
Eucalyptus marginata	130	Suitable	412355	6254080
Euc rides	100	Suitable	409898	6256521
Eucalyptus marginata	120	Suitable	411257	6254907
Eucalyptus marginata	130	Suitable	411266	6254892
Eucalyptus marginata	110	Suitable	410061	6257966
Corymbia calophylla		Suitable	410001	6256798
Corymbia calophylla	120	Suitable	410768	6255634
Corymbia calophylla	110	Suitable	411254	6254220
Corymbia calophylla	135	Suitable	410642	6253631
Corymbia calophylla	100	Suitable	410077	6258022

Tree Species	DBH	Category	Easting	Northing
Corymbia calophylla	140	Suitable	412095	6253757
Corymbia calophylla	110	Suitable	410030	6256828
Corymbia calophylla	140	Suitable	411364	6255306
Corymbia calophylla	74	Suitable	408372	6252680
Corymbia calophylla	150	Suitable	410765	6255639
Corymbia calophylla	150	Suitable	410182	6256299
Unknown		Suitable	411315	6255368
Corymbia calophylla	150	Suitable	417433	6259247
Eucalyptus marginata	180	Suitable	416933	6259097
Corymbia calophylla	150	Suitable	415187	6255772
Corymbia calophylla	200	Suitable	416428	6255276
Eucalyptus marginata	200	Suitable	416631	6259499
Eucalyptus marginata	150	Suitable	410074	6250471
Corymbia calophylla	140	Suitable	410898	6250548
Eucalyptus marginata	140	Suitable	410564	6251006
Corymbia calophylla	140	Suitable	410596	6251014
Eucalyptus marginata	140	Suitable	411150	6251271
Eucalyptus marginata	150	Suitable	409383	6251513
Corymbia calophylla	150	Suitable	416274	6255861
Corymbia calophylla	200	Suitable	411084	6249982
Corymbia calophylla	79	Suitable	413042	6254754
Jarrah	120	Suitable	412696	6255123
Corymbia calophylla	132	Suitable	412613	6255087
Corymbia calophylla	200	Suitable	411120	6249711
Corymbia calophylla	190	Suitable	410840	6249780
Corymbia calophylla	120	Suitable	412041	6258094
Corymbia calophylla	120	Suitable	412026	6258110
Corymbia calophylla	80	Suitable	410709	6255888
Corymbia calophylla	80	Suitable	412385	6258103
Corymbia calophylla	120	Suitable	411785	6257796
Corymbia calophylla	150	Suitable	410645	6256128
Corymbia calophylla	120	Suitable	411466	6257858
Corymbia calophylla	100	Suitable	410760	6256016
Corymbia calophylla	120	Suitable	408087	6254956
Corymbia calophylla	70	Suitable	407754	6255651
Corymbia calophylla	150	Suitable	412019	6257993
Corymbia calophylla	120	Suitable	410501	6254663
Corymbia calophylla	60	Suitable	411581	6259374
Eucalyptus marginata	140	Suitable	409936	6255729
Dead	70	Suitable	412309	6259123
Corymbia calophylla	120	Suitable	408752	6256070
Corymbia calophylla	120	Suitable	408756	6254220
Corymbia calophylla	180	Suitable	408296	6255482
Eucalyptus marginata	100	Suitable	410693	6255909
Eucalyptus marginata	150	Suitable	409394	6256129
Eucalyptus marginata	150	Suitable	410327	6252415
Eucalyptus marginata	110	Suitable	410109	6252257
Corymbia calophylla	150	Suitable	410653	6255814
Corymbia calophylla	60	Suitable	409934	6258596
Corymbia calophylla	70	Suitable	409945	6258721

Tree Species	DBH	Category	Easting	Northing
Corymbia calophylla	950	Suitable	409911	6258960
Corymbia calophylla	100	Suitable	409809	6258822
Corymbia calophylla	110	Suitable	409776	6258736
Corymbia calophylla	120	Suitable	409729	6258843
Corymbia calophylla	100	Suitable	408680	6254422
Corymbia calophylla	110	Suitable	409642	6253544
Corymbia calophylla	145	Suitable	411809	6258606
Corymbia calophylla	170	Suitable	408512	6254457
Corymbia calophylla	65	Suitable	409222	6253474
Corymbia calophylla	80	Suitable	409473	6253461
Corymbia calophylla	90	Suitable	411793	6258668
Dead	0	Suitable	409414	6254362
Eucalyptus marginata (dead)	650	Suitable	409760	6258533
Eucalyptus marginata	100	Suitable	408620	6253844
Eucalyptus marginata	110	Suitable	410788	6253410
Eucalyptus marginata	115	Suitable	408643	6253762
Eucalyptus marginata	120	Suitable	409693	6252933
Eucalyptus marginata	120	Suitable	409708	6252706
Eucalyptus marginata	165	Suitable	408714	6253443
Eucalyptus marginata	170	Suitable	410999	6252766
Eucalyptus marginata	210	Suitable	411052	6252931
Eucalyptus marginata	75	Suitable	410972	6252705
Eucalyptus marginata	80	Suitable	409395	6254044
Eucalyptus marginata (dead)	80	Suitable	409750	6254209
Eucalyptus marginata	85	Suitable	410577	6254080
Eucalyptus marginata	90	Suitable	409541	6252834
Eucalyptus marginata (dead)	90	Suitable	409627	6253518
Eucalyptus marginata	95	Suitable	409433	6257010
Eucalyptus marginata	75	Suitable	409482	6257434
Dead	60	Suitable	409567	6256504
Dead	100	Suitable	409062	6256116
Dead	100	Suitable	409111	6253727
Dead	100	Suitable	408585	6255231
Eucalyptus marginata	150	Suitable	409205	6256666
Eucalyptus marginata	110	Suitable	409064	6256136
Eucalyptus marginata	110	Suitable	410776	6252957
Eucalyptus marginata	100	Suitable	410023	6257910
Eucalyptus marginata	130	Suitable	409064	6254988
Corymbia calophylla	70	Suitable	412260	6259433
Corymbia calophylla	120	Suitable	412185	6258814
Corymbia calophylla	90	Suitable	409574	6256582
Corymbia calophylla	140	Suitable	409596	6256504
Corymbia calophylla	140	Suitable	409959	6256749
Corymbia calophylla	140	Suitable	408984	6256420
Corymbia calophylla	90	Suitable	408978	6256015
Corymbia calophylla	140	Suitable	408761	6255658
Corymbia calophylla	80	Suitable	408732	6255765
Corymbia calophylla	130	Suitable	408678	6256399
Corymbia calophylla	100	Suitable	408589	6255730
Corymbia calophylla	100	Suitable	408474	6255450

Tree Species	DBH	Category	Easting	Northing
Corymbia calophylla	90	Suitable	408556	6254789
Corymbia calophylla	140	Suitable	408735	6254732
Corymbia calophylla	100	Suitable	410844	6255622
Corymbia calophylla	80	Suitable	410859	6255585
Corymbia calophylla	100	Suitable	410807	6255392
Corymbia calophylla	130	Suitable	410640	6253552
Corymbia calophylla	110	Suitable	410676	6253172
Corymbia calophylla	90	Suitable	409881	6257999
Corymbia calophylla	110	Suitable	408678	6254418
Corymbia calophylla	110	Suitable	412257	6258469
Corymbia calophylla (dead)	130	Suitable	408655	6255452
Corymbia calophylla	60	Suitable	407735	6252670
Corymbia calophylla	102	Suitable	407961	6252207
Corymbia calophylla	78	Suitable	408148	6252862
Corymbia calophylla	108	Suitable	408145	6252926
Corymbia calophylla	78	Suitable	408403	6253004
Corymbia calophylla	80	Suitable	408250	6252006
Corymbia calophylla	132	Suitable	407903	6252212
Corymbia calophylla	87	Suitable	407875	6252433
Corymbia calophylla	80	Suitable	408086	6252879
Corymbia calophylla	78	Suitable	407697	6252948
Corymbia calophylla	84	Suitable	407884	6253084
Corymbia calophylla	114	Suitable	408957	6251933
Corymbia calophylla (dead)	65	Suitable	407898	6252869
Corymbia calophylla (dead)	72	Suitable	409427	6252126
Eucalyptus marginata	95	Suitable	407947	6252608
Eucalyptus marginata	64	Suitable	407975	6252977
Eucalyptus marginata	68	Suitable	408325	6253063
Corymbia calophylla	120	Suitable	410677	6255093
Corymbia calophylla	180	Suitable	408155	6254933
Corymbia calophylla	80	Suitable	410713	6255891
Corymbia calophylla	100	Suitable	410180	6253533
Corymbia calophylla	170	Suitable	407977	6255412
Corymbia calophylla (dead)	100	Suitable	410370	6254076
Eucalyptus marginata	150	Suitable	410625	6255699
Eucalyptus marginata	100	Suitable	409815	6252826
Eucalyptus marginata	150	Suitable	409917	6253531
Corymbia calophylla	100	Suitable	408135	6255430
Eucalyptus marginata	120	Suitable	408041	6254872
Eucalyptus marginata	200	Suitable	410567	6256022
Eucalyptus marginata	180	Suitable	410744	6255995
Eucalyptus marginata	110	Suitable	410111	6253429
Eucalyptus marginata	150	Suitable	410743	6255998
Eucalyptus marginata	150	Suitable	410306	6254194
Eucalyptus marginata	80	Suitable	410173	6254327
Eucalyptus marginata	120	Suitable	409841	6252391
Corymbia calophylla	140	Suitable	416472	6256927
Eucalyptus marginata	160	Suitable	410789	6251019
Eucalyptus marginata	170	Suitable	410785	6251041
Corymbia calophylla	140	Suitable	409781	6251036

Tree Species	DBH	Category	Easting	Northing
Corymbia calophylla	180	Suitable	410373	6251158
Eucalyptus marginata	170	Suitable	408983	6252522
Corymbia calophylla	170	Suitable	410009	6251721
Eucalyptus marginata	100	Suitable	410445	6251731
Eucalyptus marginata	170	Suitable	410469	6251479
Eucalyptus marginata	200	Suitable	410326	6251493
Eucalyptus marginata	150	Suitable	410061	6251449
Eucalyptus marginata	130	Suitable	409881	6251446
Eucalyptus marginata	200	Suitable	409774	6251516
Eucalyptus marginata	150	Suitable	417421	6256662
Corymbia calophylla	200	Suitable	411316	6249781
Corymbia calophylla	160	Suitable	411305	6249948
Corymbia calophylla	71	Suitable	411316	6250012
Corymbia calophylla	95	Suitable	411306	6250242
Corymbia calophylla	180	Suitable	416788	6259490
Corymbia calophylla	160	Suitable	409768	6251089
Eucalyptus marginata	140	Suitable	409384	6250390
Eucalyptus marginata	180	Suitable	409688	6250476
Eucalyptus marginata	200	Suitable	410088	6249688
Eucalyptus marginata	190	Suitable	409803	6249604
Eucalyptus marginata	180	Suitable	409970	6249476
Corymbia calophylla	150	Suitable	410282	6249733