Reconnaissance Flora and Vegetation Survey

Greenbushes Operations - Upcoming Clearing Approvals

Prepared for Talison Lithium Australia
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EXECUTIVE SUMMARY

Talison Lithium Australia (Talison) currently operates a lithium mine at Greenbushes, situated approximately 250 km south of Perth in south-west Western Australia. Onshore Environmental Consultants Pty Ltd (Onshore Environmental) was commissioned to undertake a reconnaissance flora and vegetation survey of eleven vegetation blocks identified within upcoming clearing approvals. The blocks covered a total of 47.75 hectares (ha), with four blocks situated east of Floyd's Waste Dump (12.50 ha), two blocks occurring along Maranup Ford Road to the south-west of the Mine Development Envelope (MDE) (4.34 ha), and five blocks situated adjacent to Austin's and South Hampton Dams inside the north-west sector of the MDE (30.57 ha); herein the eleven blocks are referred to as 'the study area'.

The majority of the study area was previously surveyed in 2018 as part of a two season detailed flora and vegetation survey (Onshore Environmental 2018). To ensure ecological survey data is maintained within a five year timeframe, Onshore Environmental completed a reconnaissance flora and vegetation survey of the eleven blocks identified within upcoming clearing approvals. The survey mapped current vegetation type and vegetation condition with targeted searches completed for conservation significant flora.

The reconnaissance flora and vegetation survey was completed between the 2nd and 5th of April 2024. A total number of 141 plant taxa (including varieties and subspecies) from 40 families and 96 genera were recorded from the study area, noting that total flora was under-represented owing to the poor seasonal conditions relating to survey timing and an extended dry period. None of the plant taxa recorded from the study area were listed as Threatened Flora under the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) or the Western Australian *Biodiversity Conservation Act 2016* (BC Act). One Priority 4 flora taxon listed by the Department of Biodiversity Conservation and Attractions (DBCA) was recorded from previously disturbed and rehabilitated ground in the north-west sector of the study area; *Acacia semitrullata*.

A total of ten vegetation types were mapped within the study area with all vegetation types having been recorded during previous surveys in the Greenbushes area. The dominant vegetation types comprised Forest of *Corymbia calophylla* (Marri) and *Eucalyptus marginata* subsp. *marginata* (Jarrah) on lateritic hillslopes. None of the vegetation types were aligned with Commonwealth or State listed Threatened Ecological Communities (TECs) or State listed Priority Ecological Communities (PECs).

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1.0 INTRODUCTION

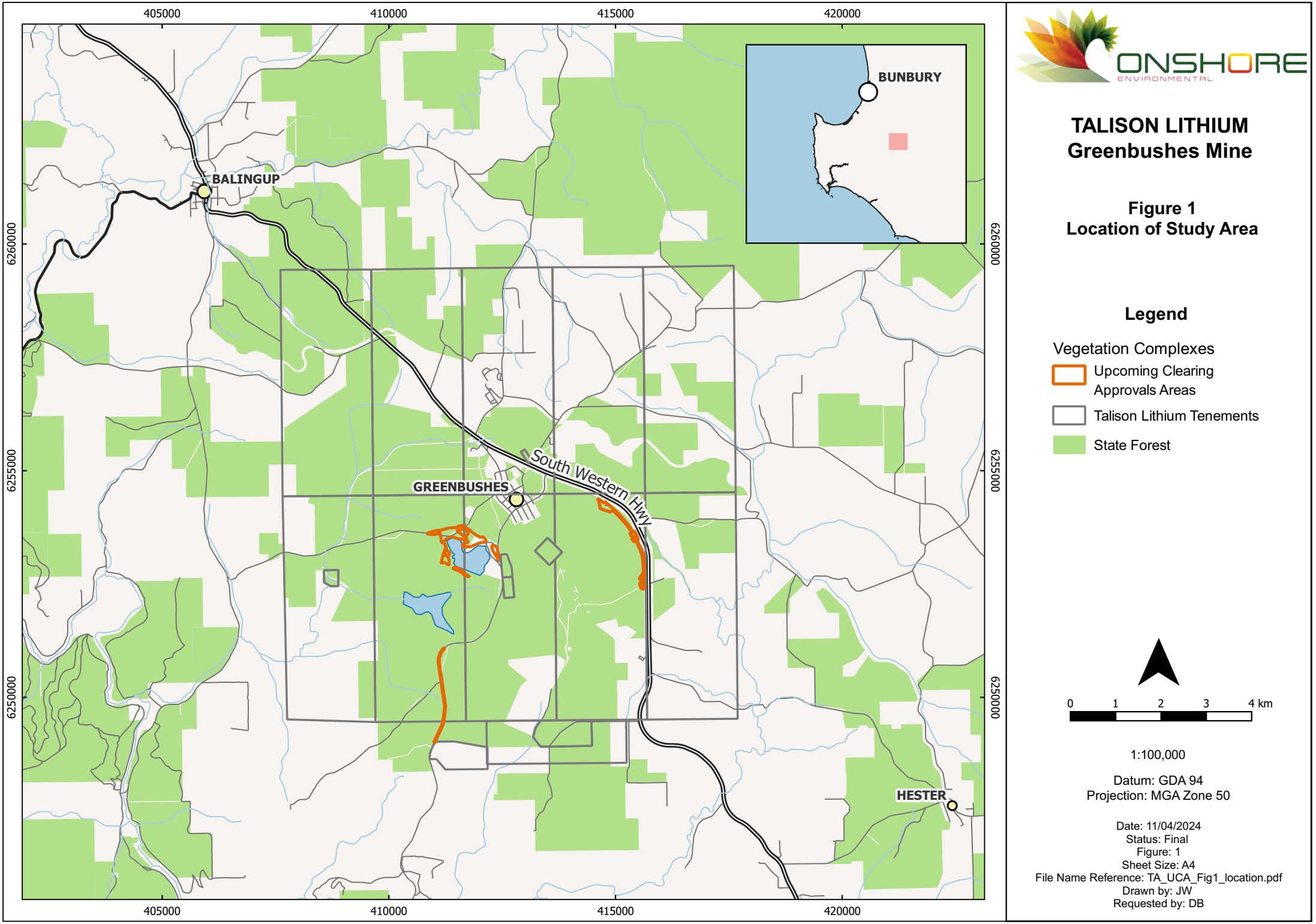
1.1 Preamble

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

Previous surveys of the Greenbushes Mine include a single season detailed flora and vegetation survey undertaken in October 2011 covering 10,059 hectares (ha) and ten mining leases (M01/2 to M01/11) (Onshore Environmental 2012). In 2018 a two season detailed flora and vegetation survey was completed over 802 ha (within the 2011 survey area) forming the MDE (Onshore Environmental 2018). The 2018 survey provided a more intensive survey of native vegetation within the area where Talison was proposing to continue to expand its operation at the Greenbushes Mine.

A meeting in March 2024 with the Department of Climate Change, Energy, the Environment and Water (DCCEEW) regarding Talison's upcoming clearing approvals emphasised the requirement for ecological survey data to be maintained within a five year timeframe. Longer term mine planning has identified the requirement for further clearing at eleven native vegetation blocks covering a total of 47.75 ha. This includes four areas located east of Floyd's Waste Dump (12.50 ha), two areas along Maranup Ford Road to the south-west of the MDE (4.34 ha), and five areas adjacent to Austin's and South Hampton Dams inside the north-west sector of the MDE (30.57 ha).

Onshore Environmental was commissioned by Talison to undertake a reconnaissance flora and vegetation survey of the study area in early April 2024 to ensure survey data remained current.



ONSHORE ENVIRONMENTAL

TALISON LITHIUM
Greenbushes Mine

Figure 1
Location of Study Area

Legend

Vegetation Complexes

- Upcoming Clearing Approvals Areas
- Talison Lithium Tenements
- State Forest

0 1 2 3 4 km

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Datum: GDA 94
Projection: MGA Zone 50

Date: 11/04/2024
Status: Final
Figure: 1
Sheet Size: A4
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1.2 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 nearby town of Bridgetown is 726.8 mm (approximately 10 km south-east of the study area) (Bureau of Meteorology [BOM] 2024), with most falls occurring during the winter months of June and July associated with cold fronts moving across the south-west of Western Australia.

The rainfall total at Bridgetown for the three and six month periods prior to the early April 2024 field survey were 5% and 48% of the long term average respectively (Figure 2). The below average rainfall and Autumn timing for the field survey resulted in very dry seasonal conditions and the absence of annual and ephemeral plant taxa.

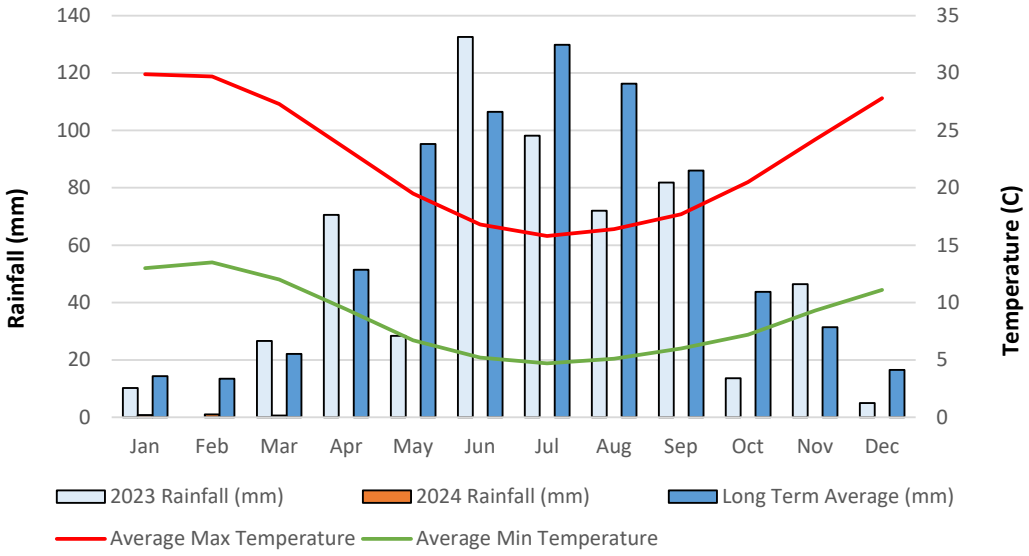

Figure 2 Rainfall (2023 and January-March 2024) and temperature data from the Bridgetown Weather Station (BOM 2024).

1.3 Biogeographic Regions

The latest version of the Interim Biogeographic Regionalisation for Australia divides Australia into 89 bioregions based on climate, geology, landform, native vegetation and species information, and includes 419 sub-regions (Department of the Environment and Energy 2013). The bioregions and sub-regions are the reporting unit for assessing the status of native ecosystems and their level of protection in the National Reserve System. The study area is located within the Southern Jarrah Forest (JF2) sub-region within the Jarrah Forest bioregion but is close to the border of the Northern Jarrah Forest sub-region. The Southern Jarrah Forest sub-region is described as “Duricrusted plateau of Yilgarn Craton characterised by Jarrah-Marri forest on laterite gravels and, in the eastern part, by Marri-Wandoo woodlands on clayey soils. Eluvial and alluvial deposits support *Agonis* shrublands. In areas of

Mesozoic sediments, Jarrah forests occur in a mosaic with a variety of species-rich shrublands. The climate is Warm Mediterranean" (Hearn *et al*. 2002). The vegetation of the sub-region is described as "Jarrah-Marri forest in the west grading to Marri and Wandoo woodlands in the east. There are extensive areas of swamp vegetation in the south-east, dominated by Paperbarks and Swamp Yate. The understorey component of the forest and woodland reflects the more mesic nature of this area. Much 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).

1.4 Land Use

The major land uses in the Greenbushes region are state forest, residential, mining and agriculture. The study area intersects the Greenbushes State Forest with the majority excised for the current MDE. The two areas fringing Maranup Ford Road in the south-west sector of the study area occur outside of the MDE. Nearby towns include Bridgetown (10 km to the south-east) and Balingup (10 km to the north-west).

1.5 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 (1961). The study area intersects two subsystems, all of the Darling Plateau system within the Western Darling Range zone:

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

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

A variety of published studies that relate to flora and vegetation of the southern jarrah forest are listed below:

- Distribution and prehistory of karri, jarrah and marri (Churchill 1968);
- Structure and composition of the karri forest around Pemberton (McArthur and Clifton 1975);
- Vegetation mapping of the Manjimup-Pemberton area (Smith 1972);
- Vegetation mapping of the Swan area (Beard 1981, see Figure 3);
- Vegetation mapping of the Darling System (Heddle *et al.* 1980); and
- Vegetation mapping as part of the Regional Forest Agreement (Mattiske and Havel 1998, see Figure 4).

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) map the study area as being predominantly within the Dwellingup (D1) complex, as well as the Grimwade (GR) complex, the Goonaping (G) complex, and the Catterick (CC1) complex (Figure 4).

ONSHORE ENVIRONMENTAL

TALISON LITHIUM
Greenbushes Mine

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

Legend

Upcoming Clearing Areas

Bread Vegetation Associations

BRIDGETOWN_3

0 0.5 1 1.5 km

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Projection: MGA Zone 50

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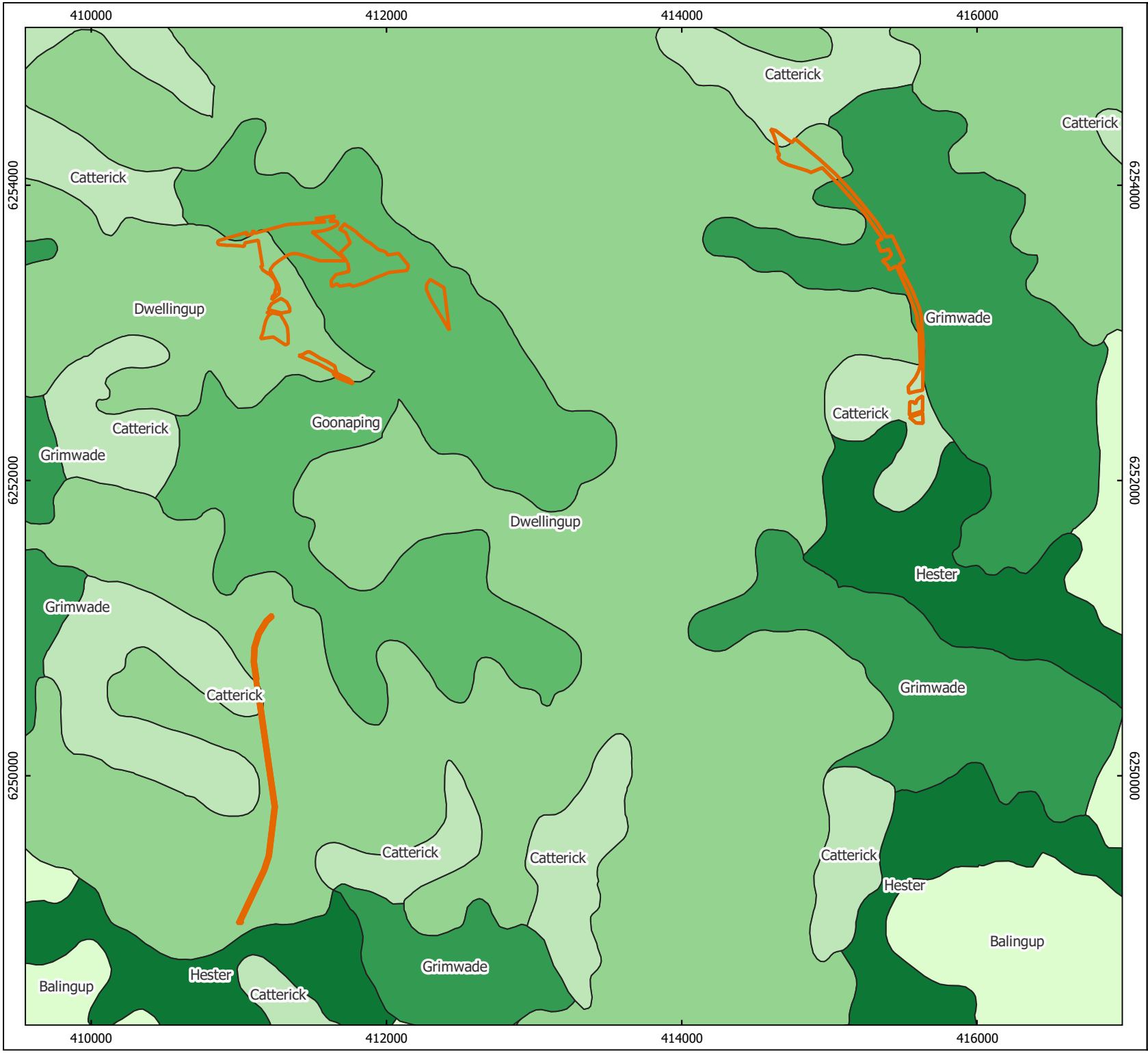

ONSHORE ENVIRONMENTAL

TALISON LITHIUM
Greenbushes Mine

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

Legend

- Upcoming Clearing Approvals Areas

Vegetation Complexes

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

0 0.5 1 1.5 km

1:35,000

Datum: GDA 94
Projection: MGA Zone 50

Date: 11/04/2024
Status: Final
Figure: 4
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2.0 METHODOLOGY

2.1 Legislation and Guidance Statements

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

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

2.2 Desktop Assessment

2.2.1 Literature Review

Regional scale reports relevant to the study area locality were reviewed, including:

- a summary of bioregional data (Hearn *et al*. 2002); and
- vegetation description and mapping by Beard (1981), and more recently by Heddle, Loneragan and Havel (1980), and by Mattiske and Havel (1998).

In addition, there was a review of all publicly available literature and internal reports commissioned and held by Talison. There were 17 flora and vegetation surveys previously completed between 1991 and 2023 in the vicinity of the study area. As part of the desktop review total flora lists for these surveys were reviewed to ensure nomenclature was accurate, consistent and current. The previous survey work is summarised in more detail in Section 3.1.

2.2.2 Database Searches

Desktop searches included databases relating to significant flora, TECs and PECs previously collected or described within, or in close proximity to, the study area. The search was extended beyond the study area to place flora values into a local and regional context. The following databases were searched:

- DBCA's Threatened and Priority flora database was searched to confirm the Naturemap results (30 km radial search) (DBCA 2022a);
- DBCA's TEC, PEC and Environmentally Sensitive Areas (ESAs) database was searched to identify significant communities (50 km radial search) (DBCA 2022b);
- Environmental Protection and Biodiversity Conservation (EPBC) Act Protected Matters Database (30 km radial search) (DCCEEW 2023); and
- Atlas of Living Australia (ALA) spatial database search of the study area boundary (ALA 2023).

2.2.3 Assessment of Conservation Significance

The conservation significance of flora 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).

Commonwealth Level:

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

State Level:

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

Local Level:

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

2.2.4 Assessment of Likelihood of Occurrence in the Study Area

A list of conservation significant flora species occurring within a 50 km radius of the study area was compiled during the literature review and database searches. The likelihood of each taxon occurring within the study area was assessed using a set of rankings and criteria (as described in Table 1). The criteria are based on presence of suitable landform (inferred from aerial imagery with contours overlayed, and from knowledge of the adjacent areas) and distance to known records.

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

Rank	Criteria
Recorded	The species has been recorded in the study area.
Likely to occur	The species has previously been recorded from a landform/habitat which is present within the study area, and there are previous records within a 10 km radius of the study area.
Possible to occur	The species has previously been recorded from a landform/habitat which is present within the study area, and there are previous records within a 30 km radius of the study area.
Unlikely to occur	The landform/habitat from which the species has previously been recorded is absent within the study area.

2.3 Survey Methodology

2.3.1 Timing and Personnel

The reconnaissance flora and vegetation survey was completed by Principal Ecologist Jesscia Waters and Ecologist Thomas Mott between the 2nd and 5th of April 2024.

2.3.2 Sampling of the Study Area

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

Targeted searches for flora species of conservation significance were completed within the study area. Ground truthing provided an opportunity to record opportunistic locations for conservation significant flora, and undertake closer examination of specific landforms where conservation significant flora may be expected to occur.

2.3.3 Vegetation Type Mapping

The classification of vegetation types within the study area follow the height, life form and density classes of Muir (1977) (see Appendix 3). This is largely a structural classification suitable for broader scale mapping, but takes all ecologically significant strata into account. Vegetation type mapping utilised high-resolution aerial photography at a scale of 1:4,000, with definition of vegetation polygons based on contrasting shading patterns. Vegetation mapping had previously been completed across much of the study area, with new vegetation types described where appropriate. Ground-truthing of the study area was completed during the field survey with vegetation descriptions made within selected vegetation polygons to confirm dominant structural layers and associated plant taxa. Relevé points were overlaid on aerial photography and previous mapping, and associated flora and vegetation data was used to update vegetation type descriptions for individual polygons defined.

2.3.4 Targeted Surveys for Conservation Significant Species

Ground truthing conducted across the study area provided an opportunity to record opportunistic locations for conservation significant flora and undertake closer examination of specific landforms where conservation significant flora would be expected to occur. Targeted searches for species of conservation significance were completed in areas where it was anticipated that significant flora might occur based on habitat preferences (according to the database searches) and from previous knowledge of the local flora and vegetation. These habitats were intensively covered during the field survey due to their increased likelihood to support several conservation significant species.

2.3.3 Vouchering

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

2.3.4 Field Survey Constraints

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

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

Constraint	Relevance
Availability of contextual information at a regional and local scale	NOT A LIMITATION There has been 17 previous flora and vegetation surveys completed within state forest adjacent to the study area, providing a comprehensive local database.
Proportion of flora recorded and/or collected, any identification issues	LIMITATION The reconnaissance flora survey was completed during Autumn 2024 under very dry seasonal conditions. The recommended survey timing by the EPA (2016a) is during peak flowering periods in Spring (September to November). Annual and ephemeral flora species such as orchids would not have been present or identifiable during the current survey timing.
Survey timing, rainfall, season of survey	LIMITATION The field survey was completed in early April 2024 and outside the recommended primary survey period (Spring). Total rainfall during the period before the survey was significantly below average. Seasonal conditions were considered to be poor.
Disturbance that may have affected the results of the survey such as fire, flood or clearing	NOT A LIMITATION There were no disturbances recorded within the study area that influenced survey outcomes. There was evidence of historical alluvial mining disturbance within the central sector the study area, resulting in a mixture of open mine voids, large mullock dumps and native rehabilitation. The study area was also dissected by formed bitumen roads, with internal access tracks including walking trails. The area had also been logged for native timber and impacted by firewood cutting.

Constraint	Relevance
Was the appropriate area fully surveyed (effort and extent)	NOT A LIMITATION The entire study area was ground truthed with grid-like coverage on foot. There was additional coverage around habitats where target species were most likely to occur, based on desktop searches. This represented an appropriate effort for a reconnaissance level survey.
Access restrictions within the survey area	NOT A LIMITATION The study area was accessed from major arterial routes using a 4WD vehicle and internally on foot. There were no restrictions.
Competency/experience of the team carrying out the survey, including experience in the bioregion surveyed	NOT A LIMITATION The Principal Ecologist working on the survey (Jessica Waters) has over ten years' experience working locally and has completed numerous surveys around Greenbushes since 2012.

3.0 RESULTS

3.1 Desktop Review

3.1.1 Previous Flora Surveys

The results from previous flora and vegetation surveys completed within close proximity to the study area are presented in Table 3 and summarised below. The 17 surveys have recorded one Threatened Flora taxon and five Priority flora taxa within a 20 km radius of the study area:

- *Caladenia harringtoniae* (Threatened, Vulnerable);
- *Eucalyptus relicta* (Priority 2);
- *Dillwynia* sp. Capel (P.A. Jurjevich 1771) (Priority 3);
- *Melaleuca viminalis* (Priority 2)[1];
- *Tetratheca parvifolia* (Priority 3); and
- *Acacia semitrullata* (Priority 4).

Two species have been identified as occurring outside of their known distribution (i.e. range extensions):

- **Cyperus involucratus* (80 km southeast of nearest known population); and
- *Hybanthus epacroides* (180 km west of nearest known population).

Vegetation types recorded during the previous surveys are not aligned with any Commonwealth or State listed TECs or DBCA listed PECs, and are regarded as well represented and adequately reserved.

The previous surveys have typically recorded a high representation of introduced species within the total flora reflecting historical mining activities, heavy logging and related disturbance of the state forest precinct around Greenbushes.

[1] Likely introduced through revegetation around the Greenbushes Swimming Pool.

Table 3 Results from flora and vegetation surveys previously completed within, or in close proximity to, the study area.

Survey	Consultant	Year	Field Survey Date	Flora Statistics	Significant Flora	Introduced (Weed) Taxa
A Flora and Vegetation Survey of Part of the Greenbushes Leases	Trudgen and Morgan	1991	13-14 April 1991	91 plant taxa 35 families 65 genera	None	9 introduced taxa including one Declared Plant listed under the BAM Act; **Rubus anglocandicans* (Blackberry)
Flora and Vegetation Survey Greenbushes Mine Site: Vegetation surrounding south east corner of the TSF	Onshore Environmental Consultants	2006	13th April 2006	135 plant taxa 37 families 97 genera	None	27 introduced taxa including one Declared Plant listed under the BAM Act; **Rubus anglocandicans* (Blackberry)
Bridgetown RWSS Pipelines Millstream Dam to Greenbushes Link Biological Survey	AECOM Australia Pty Ltd	2010	Spring 2009	86 plant taxa 37 families 70 genera	None	29 introduced taxa including three Declared Plant listed under the BAM Act; **Rubus ulmifolius* (Blackberry), **Asparagus asparadoidies* (Bridal Creeper), **Echium plantagineum* (Paterson's Curse)
Flora and Vegetation Survey Greenbushes Mining Leases	Onshore Environmental Consultants	2012	13-21 October 2011	368 plant taxa 73 families 208 genera	*Caladenia harringtoniae* (T); *Tetratheca parvifolia* (P3)	86 introduced taxa including three Declared Plants listed under the BAM Act; **Asparagus asparagoides* (Bridal Creeper), **Galium aparine* (Goosegrass), **Rubus ulmifolius* (Blackberry)
Greenbushes Mining Operations Detailed Flora and Vegetation Survey	Onshore Environmental Consultants	2018	27 February - 2 March and 26 September, 4, 16-18 October 2018	365 plant taxa 63 families 200 genera	*Acacia semitrullata* (P4), **Cyperus involucratus* (range extension)	66 introduced taxa, including three Declared Plants listed under the BAM Act; **Asparagus asparagoides* (Bridal Creeper), **Rubus anglocandicans* (Blackberry) and **Rumex acetosella* (Sorrell)

Survey	Consultant	Year	Field Survey Date	Flora Statistics	Significant Flora	Introduced (Weed) Taxa
Greenbushes Infrastructure Corridors Detailed Flora and Vegetation Survey	Onshore Environmental Consultants	2019a	30 July - 6 August and 26-27, 29-30 September, 3-4 and 18 October 2018	280 plant taxa 60 families 157 genera	*Acacia semitrullata* (P4), *Melaleuca viminalis* (P2), *Hybanthus epacroides* (range extension)	45 introduced taxa, including two Declared Plants listed under the BAM Act; **Asparagus asparagoides* (Bridal Creeper) and **Rubus anglocandicans* (Blackberry)
Targeted Flora Survey Greenbushes Lithium Mine	Onshore Environmental Consultants	2019b	19-20 September and 10 October 2019	Not assessed	*Acacia semitrullata* (P4)	Not assessed
Targeted Survey for *Eucalyptus relicta* Greenbushes Lithium Operations	Onshore Environmental Consultants	2020	20-24 July and 5-15 August 2020	Not assessed	*Eucalyptus relicta* (P2)	Not assessed
Detailed Flora and Vegetation Survey Greenbushes Mine Expansion Area 2 and Area 4	Onshore Environmental Consultants	2021	26 -31 October 2021	272 plant taxa, 60 families and 162 genera	None	49 introduced taxa
Greenbushes Proposed Village - Reconnaissance Flora and Vegetation Survey	Onshore Environmental Consultants	2022a	20 September 2022	Not recorded	None	One Declared Plant listed under the BAM Act; **Rubus ulmifolius* (Blackberry)
Greenbushes Mine Access Road - Reconnaissance Flora and Vegetation Survey	Onshore Environmental Consultants	2022b	19-20 September 2022	Not recorded	None	Three plant taxa were listed as Declared Plants under the BAM Act; **Rubus ulmifolius* (Blackberry), **Asparagus asparagoides* (Bridal Creeper) and **Zantedeschia aethiopica* (Arum Lilly)
Greenbushes Rehabilitation Materials Stockpiles - Reconnaissance Flora and Vegetation Survey	Onshore Environmental Consultants	2022c	21 September 2022	Not recorded	None	One Declared Plant listed under the BAM Act; **Rubus ulmifolius* (Blackberry)

Survey	Consultant	Year	Field Survey Date	Flora Statistics	Significant Flora	Introduced (Weed) Taxa
Detailed Flora and Vegetation Survey - New Water Storages	Onshore Environmental Consultants	2023a	1-5 October 2022	236 plant taxa, 55 families and 142 genera	None One species of interest: *Gonocarpus* sp. indet	Four plant taxa listed as Declared Plants under the BAM Act; **Rubus anglocandicans* (Blackberry), **Asparagus asparagoides* (Bridal Creeper), **Zantedeschia aethiopica* (Arum Lilly) and **Galium aparine* (Cleavers)
Detailed Flora and Vegetation Survey - Floyd's Waste Rock Landform Extension	Onshore Environmental Consultants	2023b	26-30 September 2022	132 plant taxa, 45 families and 102 genera	None	14 introduced species (none listed as Declared Plants under the BAM Act
Additional Areas at Water Storages Reconnaissance Flora and Vegetation Survey	Onshore Environmental Consultants	2023c	7-8 and 15-16 December 2022	Not recorded	*Acacia semitrullata* (P4)	Not recorded
Targeted Flora Survey New Zealand Gully	Onshore Environmental Consultants	2023d	5-9 September 2023	Not recorded	*Caladenia validinervia* (P1), *Dillwynia* sp. Capel (P.A. Jurjevich 1771) (P3).	Not recorded
Detailed Flora and Vegetation Survey Additional Areas North	Onshore Environmental Consultants	2024	15-23 November 2023	330 plant taxa	Species of interest: *Lepidosperma* sp. ONS6731	75 introduced plant species (three species listed as Declared Pests under the Biosecurity and Agriculture Management Act 2007 (BAM Act): *Gomphocarpus fruticosus* (Narrowleaf Cottonbush), *Rubus anglocandicans* (Blackberry) and *Asparagus asparagoides* (Bridal Creeper).

3.1.2 Threatened Flora listed under the EPBC Act

A search of the EPBC Protected Matters database was undertaken for a 10 km radius around the study area (DCCEEW 2023). The search identified three records of Threatened flora potentially occurring within the buffer of the study area: *Caladenia hoffmanii* (Endangered), *Caladenia harringtoniae* and *Diuris micrantha* (Vulnerable) (Table 4).

3.1.3 Threatened Flora listed under the BC Act

A total of three Threatened Flora taxa were identified from the DBCA rare flora database search (DBCA 2022a) as occurring within a 40 km radius of the study area: *Caladenia harringtoniae, Caladenia christineae* and *Diuris drummondii* (Table 4).

3.1.4 Priority Flora recognised by the DBCA

A total of 24 Priority flora taxa were identified as potentially occurring within a 40 km radius of the study area (DBCA 2022a) (Table 4).

3.1.5 Likelihood of Occurrence

The combined database searches resulted in a list of 27 species of conservation significance with the potential to occur within the study area (Table 4). Eight of the 26 taxa were considered 'likely' to occur within the study area (as per criteria set out in Table 1) based on occurrence of habitat and proximity of previous records (Table 4). One taxon was considered 'possible' to occur within the study area, and the remaining 18 taxa were determined as 'unlikely' to occur within the study area.

3.1.6 TECs listed under State and Federal Legislation

A search of the EPBC Protected Matters database (DCCEEW 2023) confirmed there were no Commonwealth listed TECs previously recorded within a 30 km radius of the study area.

A search of the DBCA ecological community database (DBCA 2022b) confirmed there were no state listed TEC records within a 50 km radius of the study area.

3.1.7 PECs recognised by DBCA

A search of DBCA's ecological community database (DBCA 2022b) confirmed that there were no PECs occurring within a 50 km radius of the study area.

3.1.8 Environmentally Sensitive Areas

There was one Environmentally Sensitive Area (ESA) identified approximately 0.6 km north-west from the intersection of Huitson Road and Maranup Ford Road. The ESA incorporates the winter-wet dampland supporting the Threatened orchid species *Caladenia harringtoniae*. While this landform was evident within the study area, targeted searches did not record any evidence of *Caladenia harringtoniae*.

Table 4 Significant flora potentially occurring within a 40 km radius of the study area (from database searches), and the likelihood of these taxa occurring within the study area.

Taxon	Code	Habitat Preference	Likelihood
Acacia parkerae	3	Loam soils.	Unlikely
Acacia semitrullata	4	Grey sand.	Likely
Acacia tayloriana	4	Grey or yellow/orange sandy soils, lateritic gravel, clay loam.	Unlikely
Andersonia barbata	2	White sand. Swampy areas.	Unlikely
Aponogeton hexatepalus	4	Freshwater: ponds, rivers, claypans.	Unlikely
Caladenia christineae	T (V)	Winter- wet flats (on the margins as well as in standing water) in heath and tall scrub.	Unlikely
Caladenia harringtoniae	T (V)	Swamps and flats which are inundated for several months of the year; creek lines.	Likely
Caladenia uliginosa subsp. *patulens*	1	Clay loam and gravel. Well drained soils amongst dense shrubs.	Unlikely
Caladenia validivervia	1	Jarrah-Marri woodland	Likely
Carex tereticaulis	3	Black peaty sand.	Unlikely
Chorizema carinatum	3	Sand, sandy clay.	Unlikely
Dampiera heteroptera	3	Sandy soils. Swampy areas.	Possible
Dillwynia sp. Capel (P.A. Jurjevich 1771)	3	Littered grey loamy sand, rocky soils. Valleys, rangelands.	Likely
Diuris drummondii	T (V)	Low-lying depressions in peaty and sandy clay swamps.	Unlikely
Eucalyptus relicta	2	Grey clay-loam. Undulating upper slopes, along creeklines.	Likely
Gastrolobium formosum	3	Clay loam. Along river banks or in swamps.	Unlikely
Grevillea bronwenae	3	Grey sand over laterite, lateritic loam. Hillslopes.	Unlikely
Grevillea ripicola	4	Sandy clay, clay or gravelly loam. Swampy flats, granite outcrops, drainages.	Likely
Melaleuca viminalis	2	Drainage lines and flats.	Likely
Pultenaea skinneri	4	Sandy or clayey soils. Winter-wet depressions.	Unlikely
Scaevola ballajupensis	1	Brown sandy gravel, laterite, granite. Outcrops.	Unlikely
Synaphea otiostigma	3	Clayey laterite, gravelly loam, sand.	Unlikely
Netrostylis sp. Blackwood River (A.R. Annels 3043)	3	Loam soil.	Unlikely
Netrostylis sp. Nannup (P.A. Jurjevich 1133)	1	Laterite.	Unlikely
Tetratheca parvifolia	3	Loam soils.	Likely
Thysanotus formosus	1	Clayey sand, sandy loam. In situations often inundated in winter.	Unlikely
Thysanotus gageoides	3	Sand, clay, granite, sandstone, laterite.	Unlikely

3.2 Flora Species

A total number of 141 plant taxa (including varieties and subspecies) from 40 families and 96 genera were recorded from the study area (Table 5, Appendix 4). Species representation was greatest among the Fabaceae, Myrtaceae, Proteaceae, Poaceae, Cyperaceae, Asparagaceae, Asteraceae, Ericaceae and Dilleniaceae families. The most speciose genera was *Acacia* (14 taxa), followed by *Eucalyptus* (five taxa), *Hakea, Hibbertia, Lomandra, Melaleuca* and *Styphelia* (4 taxa each), *Banksia, Bossiaea* and *Lepidosperma* (three taxa each).

Table 5 Statistics for total flora recorded from the study area.

Overview	No. Taxa
Families	40
Genera	96
Taxa (species, subspecies, varieties)	141
Native Taxa	117
Introduced Taxa	24
Threatened Flora	0
Priority Flora	1
Range Extensions	0
Species of Interest	0
Speciose Families	**No. Taxa**
Fabaceae	30
Myrtaceae	19
Proteaceae	11
Cyperaceae	10
Poaceae	8
Asparagaceae	6
Ericaceae	6
Asteraceae	5
Dilleniaceae	4
Restionaceae	4
Goodeniaceae	3
Haemodoraceae	3
Orchidaceae	2
Speciose Genera	**No. Taxa**
Acacia	14
Eucalyptus	5
Hakea	4
Hibbertia	4
Lomandra	4
Melaleuca	4
Styphelia	4
Banksia	3
Bossiaea	3
Lepidosperma	3
Billardiera	2
Corymbia	2
Dampiera	2
Leucopogon	2
Taxandria	2

3.3 Significant Flora

3.3.1 Threatened Flora listed under the EPBC Act and BC Act

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

3.3.2 Priority Flora

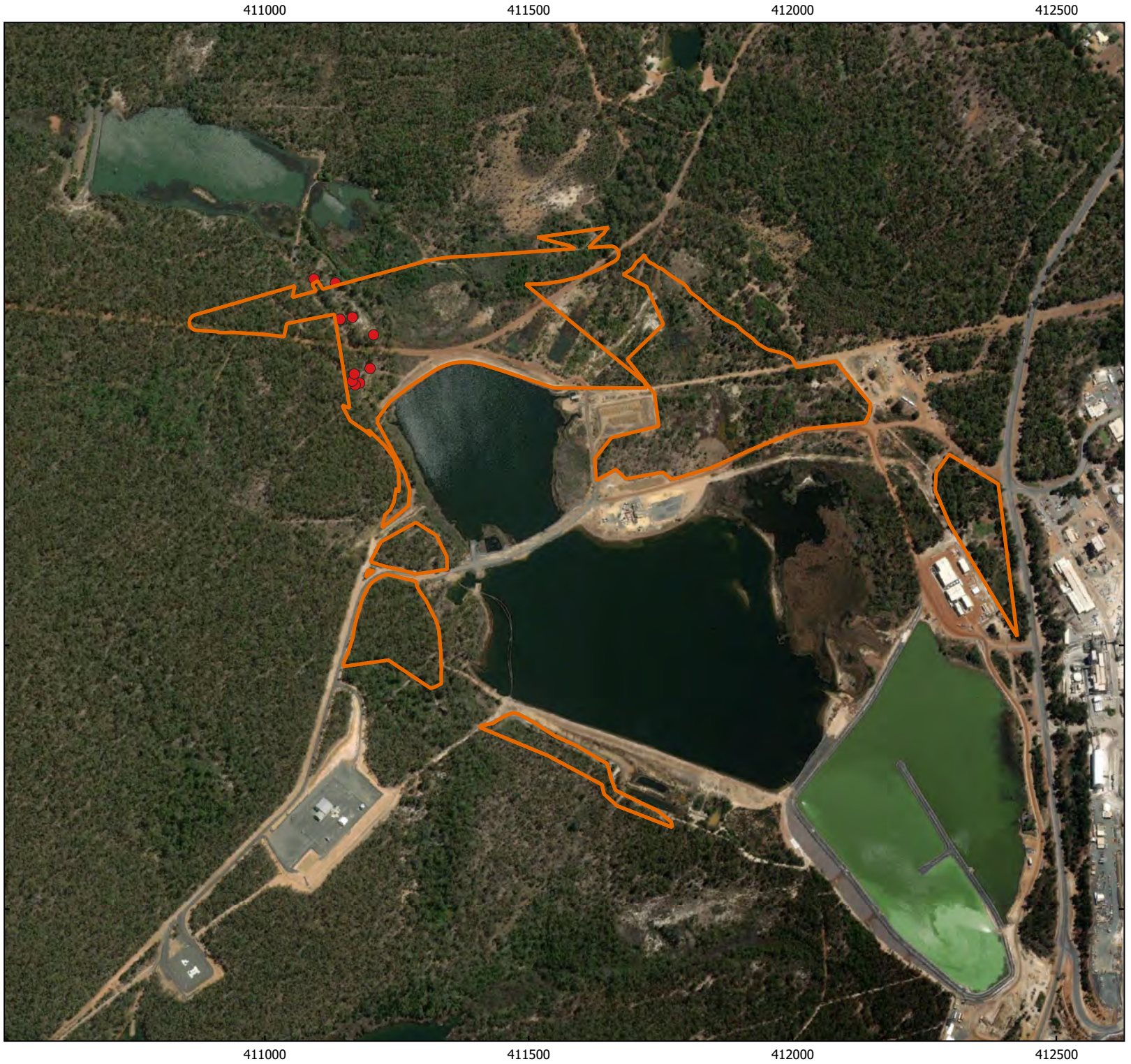
One plant taxon recorded from the study area was listed as a Priority flora species by the DBCA: *Acacia semitrullata* (Priority 4, Plate 1). It is known to occur from white/grey sands on sandplains or swampy areas, from the Jarrah Forest, Swan Coastal Plan and Warren bioregions (WAH 2022). It has been widely recorded between Pinjarra in the north, Cape Leeuwin in the south, and Collie and Nannup in the east, with one outlying record from Walpole on the south coast (Atlas of Living Australia 2022).

A total of 25 plants were recorded from the study area occurring within rehabilitated areas adjacent to Spring Gully Road (Figure 5). Several dead plants were noted within the population likely due to poor seasonal conditions. Location of plants within the study area is provided in Appendix 5.

3.3.3 Species of Interest

None of the flora recorded from the study area represented potentially new taxa or species occurring outside of the known distribution, i.e. range extensions.

Plate 1 ***Acacia semitrullata*** **(Priority 4).**



ONSHORE ENVIRONMENTAL

TALISON LITHIUM
Greenbushes Mine

Figure 5
Significant flora recorded within the study area

Legend

Upcoming Clearing Approvals Areas

Significant Flora

- Acacia semitrullata (Priority 4)

0 100 200 300 m

1:10,000

Datum: GDA 94
Projection: MGA Zone 50

Date: 11/04/2024
Status: Final
Figure: 5
Sheet Size: A4
File Name Reference: TA_UCA_Flora_Fig5_sig_flora.pdf
Drawn by: JW
Requested by: DB

3.4 Vegetation Types

A total of ten vegetation types were described and mapped within the study area (Figure 6, Table 6). Areas of rehabilitation, cleared areas and roads were also mapped. Vegetation types were broadly associated with four broad landforms including lateritic hill slopes, lower drainage flats, minor drainage lines and wetlands.

The dominant vegetation types recorded within the study area were Jarrah-Marri Forest on lateritic hill slopes (HS Bo and HS Bg) and historical rehabilitation areas, each covering >10% of the study area (Table 6). Large parts of the study area had also previously been cleared for roads or other infrastructure (Table 6).

None of the vegetation types were aligned with Commonwealth or State listed TECs or DBCA listed PECs from the South West Region.

Table 6 Vegetation types represented within the study area.

Code	Description	Condition	Area (ha)
FL To	Dense Tall Sedges of **Typha orientalis* on brown light clay	Degraded	0.62 (1.3%)
HS Xp	Forest of *Corymbia calophylla* and *Eucalyptus marginata* subsp. *marginata* over Scrub of *Xanthorrhoea preissii (Bossiaea linophylla)* over Dwarf Scrub C of *Xanthorrhoea gracilis* and *Lysiandra calycina* on brown sandy loam on hillslopes	Good	4.22 (8.8%)
WE Tl	Dense Tall Sedges of *Machaerina rubiginosa, Machaerina juncea* with Low Open Scrub A of *Taxandria linearifolia*, *Taxandria parviceps* and *Astartea scoparia* on brown sandy clay on wetlands	Degraded	3.00 (6.3%)
DF EpMpHp	Forest of *Eucalyptus patens* and *Corymbia calophylla* (*Eucalyptus marginata* subsp. *marginata* and **Pinus radiata*) over Scrub of *Taxandria linearifolia, Bossiaea linophylla* and *Hakea prostrata* over Open Dwarf Scrub D of *Hypocalymma angustifolium* over Very Open Low Sedges of *Cyathochaeta avenacea, Lepidosperma leptostachyum* and *Netrostylis* sp. Jarrah Forest (R. Davis 7391) on brown sandy clay loam on drainage flats	Degraded	2.23 (4.7%)
HS Bg	Forest of *Corymbia calophylla* and *Eucalyptus marginata* subsp. *marginata* over Low Woodland A of *Banksia grandis, Persoonia longifolia, Corymbia calophylla* and *Eucalyptus marginata* subsp. *marginata* over Open Low Scrub A of *Bossiaea linophylla, Pteridium esculentum* and/or *Macrozamia riedlei* over Low Heath D of *Bossiaea ornata* and/or *Leucopogon capitellatus* on brown sandy loam on upper hillslopes	Good	6.94 (14.5%)
HS Bo	Forest of *Eucalyptus marginata* subsp. *marginata* and *Corymbia calophylla* over Low Heath D of *Bossiaea ornata, Leucopogon capitellatus* and *Banksia dallaneyi* subsp. *sylvestris* over Very Open Low Sedges of *Lepidosperma leptostachyum* and *Netrostylis* sp. Jarrah Forest on grey/brown loamy sand on lateritic hill crests and upper hill slopes	Good	9.21 (19.3%)
HS Pd TpBl	Heath A of *Podocarpus drouynianus* (*Pultenaea ochreata*) with Woodland (to Forest) of *Eucalyptus marginata* subsp. *marginata* and *Corymbia calophylla* over Scrub of *Taxandria parviceps* (*Bossiaea linophylla*) over Dwarf Scrub C/D of *Dasypogon bromeliifolius, Adenanthos obovatus* and *Styphelia erubescens* on grey sand on lower hillslopes	Good	0.19 (0.4%)

Code	Description	Condition	Area (ha)
DF TlHp	Thicket of *Taxandria linearifolia* and *Hakea prostrata* with Low Woodland A of *Melaleuca preissiana* and *Banksia littoralis* (*Callistachys lanceolata, Corymbia callophylla*) over Open Tall Sedges of *Leptocarpus depilatus* on brown sandy clay loam on drainage flats	Good	3.71 (7.8%)
DL EpCc Tp	Woodland (to Forest) of *Eucalyptus patens* and *Corymbia calophylla* (*Callistachys lanceolata, Banksia seminuda* or *Banksia littoralis*) over Thicket of *Taxandria parviceps*, *Bossiaea linophylla, Acacia extensa* and *Pteridium esculentum* over Open Dwarf Scrub D of *Dasypogon bromeliifolius* and *Conospermum capitatum* on grey sand on drainage lines	Good	0.24 (0.5%)
FL LrBr	Dense Tall Sedges of *Leptocarpus depilatus* and *Machaerina rubiginosa* with Thicket of *Astartea scoparia* and *Taxandria linearifolia* and Open Low Woodland A of *Eucalyptus rudis* subsp. *rudis* and *Corymbia calophylla* on orange sand or brown light clay on minor drainage lines	Good	0.19 (0.4%)
Rehab	Rehabilitation	Degraded	6.47 (13.6%)
Cleared	Cleared Areas	Cleared	3.62 (7.6%)
Road	Roads and associated cleared areas	Cleared	7.10 (14.9%)

3.5 Vegetation Condition

Vegetation condition within the majority of the study area was rated as *good* (51%) or *degraded* (26%), with a smaller proportion already cleared of native vegetation (21%) (Table 7). No part of the study area supported vegetation condition rated as *pristine, excellent* or *very good.* The northern sector of the study area adjacent to South Hampton Dam was heavily disturbed by historical and current mining operations, with the condition of remnant native vegetation in the north and west reduced by edge effects from these disturbances (Figure 7). Additional disturbances included existing formed roads, powerline corridors and forestry tracks, cleared farmland, hardwood logging and historical tin mining.

Table 7 Area of vegetation condition classes within the study area.

Vegetation Condition	Area (ha)	% of Study Area
Good	24.58	51.47
Degraded	12.45	26.07
Cleared	10.72	22.46

ONSHORE ENVIRONMENTAL

TALISON LITHIUM
Greenbushes Mine

Figure 6a
Vegetation types recorded within the study area

Legend

- Upcoming Clearing Approvals Areas

Vegetation Mapping

- WE Tl
- DF EpMpHp
- DF TlHp
- FL To
- HS Bg
- HS Bo
- HS Pd TpBl
- HS Xp
- Rehab
- Road
- Cleared

0 100 200 300 m

1:10,000

Datum: GDA 94
Projection: MGA Zone 50

Date: 11/04/2024
Status: Final
Figure: 6a
Sheet Size: A4
File Name Reference: TA_UCA_Flora_Fig6_veg_types.pdf
Drawn by: JW
Requested by: DB

ONSHORE ENVIRONMENTAL

TALISON LITHIUM
Greenbushes Mine

Figure 6b
Vegetation types recorded within the study area

Legend

- Upcoming Approval Areas

Vegetation Types

- HS Bo
- Road

0 100 200 300 m

1:6,000

Datum: GDA 94
Projection: MGA Zone 50

Date: 11/04/2024
Status: Final
Figure: 6b
Sheet Size: A4
File Name Reference: TA_UCA_Flora_Fig6_vegtypes.pdf
Drawn by: JW
Requested by: DB

ONSHORE ENVIRONMENTAL

TALISON LITHIUM
Greenbushes Mine

Figure 6c
Vegetation types recorded within the study area

Legend

- Upcoming Approval Areas

Vegetation Types

- HS Bg
- HS Bo
- Road

0 100 200 300 m

1:6,000

Datum: GDA 94
Projection: MGA Zone 50

Date: 11/04/2024
Status: Final
Figure: 6c
Sheet Size: A4
File Name Reference: TA_UCA_Flora_Fig6_vegtypes.pdf
Drawn by: JW
Requested by: DB

ONSHORE ENVIRONMENTAL

TALISON LITHIUM
Greenbushes Mine

Figure 6d
Vegetation types recorded within the study area

Legend

- Upcoming Approval Areas

Vegetation Types

- DF EpMpHp
- FL LrBr
- HS Bg
- HS Bo
- HS Xp
- Road

0 100 200 300 m

1:6,000

Datum: GDA 94
Projection: MGA Zone 50

Date: 11/04/2024
Status: Final
Figure: 6d
Sheet Size: A4
File Name Reference: TA_UCA_Flora_Fig6_vegtypes.pdf
Drawn by: JW
Requested by: DB

ONSHORE ENVIRONMENTAL

TALISON LITHIUM
Greenbushes Mine

Figure 6e
Vegetation types recorded within the study area

Legend

- Upcoming Approval Areas

Vegetation Types

- DF EpMpHp
- HS Bo
- HS Xp
- Road

0 100 200 300 m

1:6,000

Datum: GDA 94
Projection: MGA Zone 50

Date: 11/04/2024
Status: Final
Figure: 6e
Sheet Size: A4
File Name Reference: TA_UCA_Flora_Fig6_vegtypes.pdf
Drawn by: JW
Requested by: DB

ONSHORE ENVIRONMENTAL

TALISON LITHIUM
Greenbushes Mine

Figure 7a
Vegetation condition recorded within the study area

Legend

- Upcoming Clearing Approvals Areas

Vegetation Mapping

- Cleared
- Degraded
- Good

0 100 200 300 m

1:10,000

Datum: GDA 94
Projection: MGA Zone 50

Date: 11/04/2024
Status: Final
Figure: 7a
Sheet Size: A4
File Name Ref : TA_UCA_Flora_Fig7_vegcondition.pdf
Drawn by: JW
Requested by: DB

ONSHORE ENVIRONMENTAL

TALISON LITHIUM
Greenbushes Mine

Figure 7b
Vegetation condition recorded within the study area

Legend

Upcoming Clearing Approvals Areas

Vegetation Mapping

- Cleared
- Degraded
- Good

0 100 200 300 m

1:6,000

Datum: GDA 94
Projection: MGA Zone 50

Date: 11/04/2024
Status: Final
Figure: 7
Sheet Size: A4
File Name Ref : TA_UCA_Flora_Fig7_vegcondition.pdf
Drawn by: JW
Requested by: DB

ONSHORE ENVIRONMENTAL

TALISON LITHIUM
Greenbushes Mine

Figure 7c
Vegetation condition recorded within the study area

Legend

- Upcoming Clearing Approvals Areas

Vegetation Mapping

- Cleared
- Degraded
- Good

0 100 200 300 m

1:6,000

Datum: GDA 94
Projection: MGA Zone 50

Date: 11/04/2024
Status: Final
Figure: 7c
Sheet Size: A4
File Name Ref : TA_UCA_Flora_Fig7_vegcondition.pdf
Drawn by: JW
Requested by: DB

ONSHORE ENVIRONMENTAL

TALISON LITHIUM
Greenbushes Mine

Figure 7d
Vegetation condition recorded within the study area

Legend

- Upcoming Clearing Approvals Areas

Vegetation Mapping

- Cleared
- Degraded
- Good

0 100 200 300 m

1:6,300

Datum: GDA 94
Projection: MGA Zone 50

Date: 11/04/2024
Status: Final
Figure: 7d
Sheet Size: A4
File Name Ref : TA_UCA_Flora_Fig7_vegcondition.pdf
Drawn by: JW
Requested by: DB

ONSHORE ENVIRONMENTAL

TALISON LITHIUM
Greenbushes Mine

Figure 7e
Vegetation condition recorded within the study area

Legend

- Upcoming Clearing Approvals Areas

Vegetation Mapping

- Cleared
- Degraded
- Good

0 100 200 300 m

1:6,300

Datum: GDA 94
Projection: MGA Zone 50

Date: 11/04/2024
Status: Final
Figure: 7e
Sheet Size: A4
File Name Ref : TA_UCA_Flora_Fig7_vegcondition.pdf
Drawn by: JW
Requested by: DB

3.6 Representation and Reservation of Vegetation

3.6.1 Beard (1981) Vegetation Associations

Regional vegetation mapping completed by Beard (1981) was utilised to assess representation of vegetation within the study area. A single Beard vegetation association was represented within the study area; 3 Medium forest; jarrah-marri (Table 8, Figure 3). In terms of representation, the Western Australian Government is committed to the National Objectives Targets for Biodiversity Conservation which includes a target that prevents clearance of ecological communities with an extent below 30% of that present at pre-European settlement (Department of Natural Resources and Environment 2002, EPA 2000). When considering representation at the State level, Beard vegetation association 3 currently has 67.76% of the pre-European extent remaining (Table 8, Government of Western Australia 2018). The study area is located within the Jarrah Forest Bioregion, specifically within the Southern Jarrah Forest Subregion (as discussed in Section 1.3). When considering the representation of vegetation association 3 at the IBRA regional and sub-regional levels, 67.10% and 59.40% of the pre-European extent remains respectively (Table 8). The study area falls entirely within the Shire of Bridgetown-Greenbushes. At this local level 56.35% of the pre-European extent remains for vegetation association 3 (Table 8). Vegetation within the study area is therefore determined to be well represented at all levels (state-wide, bioregional [IBRA region and IBRA sub-region] and local government authority).

In terms of reservation, there is a benchmark for a minimum of 15% of each Beard (1981) vegetation association to be protected in Class I-IV reserves (Commonwealth of Australia 1997). The proportion of the current extent of vegetation association 3 occurring within Class I-IV reserves at a state-wide, bioregional and local government authority level ranges between 23.44% and 31.13%, noting that larger proportions (ranging from 78.50% to 86.77%) occur within DBCA managed lands (Table 8). Hence the reservation status is determined to be above the minimum benchmark confirming adequate reservation for vegetation association 3.

3.6.2 Mattiske and Havel (1998) Vegetation Complexes

The pre-1750 distribution of vegetation complexes of the South West Forest Region of Western Australia has been mapped at 1:50,000 scale by Mattiske and Havel (1998) as part of the biodiversity assessment for the comprehensive regional assessment for the South West Forest Region. Interrogation of this database confirmed that four vegetation complexes intersected the study area (Figure 4):

- Dwellingup (D1) - Open Forest of *Eucalyptus marginata* subsp. *marginata*-*Corymbia calophylla* on lateritic uplands in mainly humid and subhumid zones
- Grimwade (GR) - 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 (G) - 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); and

- Catterick (CC1) - 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.

The four vegetation complexes currently have between 50.3% and 86.7% of the pre-European extent remaining within the South West Forest Region (Table 8). Hence, they are determined to be well represented.

The current extent within Class I-IV conservation reserves is less than the 15% benchmark for three of the four vegetation complexes (Table 8), however the current extent represented within DBCA managed lands ranges between 43.3% and 82.1% (Table 8). On this basis vegetation within the study area is determined to be well reserved in terms of occurrence within DBCA managed lands but would benefit from increased formal reservation within Class I-IV reserves.

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

Vegetation System / Association	Pre-European Extent (ha)	Current Extent (ha)	% Pre-European Extent Remaining	Current Extent in Class I-IV Reserves (ha)	% Current Extent in Class I-IV Reserves	Current Extent DBCA Managed Lands (ha)	% Current Extent DBCA Managed Lands
State-wide							
3 Medium forest; jarrah-marri	2,661,404.62	1,803,437.48	67.76	485,223.00	26.91	1,469,765.60	81.50
Beard Vegetation System							
3 Bridgetown	700,920.83	455,092.38	64.93	131,748.88	28.95	377,759.27	83.01
IBRA Region							
3 Jarrah Forest	2,390,591.54	1,604,101.56	67.10	385,183.08	24.01	1,299,263.74	81.00
IBRA Sub-Region							
3 Southern Jarrah Forest	1,482,491.85	880,655.65	59.40	274,167.05	31.13	691,319.44	78.50
Local Government Authority							
Shire of Bridgetown-Greenbushes	121,152.70	68,275.41	56.35	16,006.81	23.44	59,243.12	86.77
Mattiske & Havel Complexes							
Dwellingup, D1	208,490.90	180,683.44	86.66	17,839.29	8.33	171,201.17	82.11
Catterick, CC1	27,385.55	16,745.40	61.15	1,901.24	6.85	15,211.05	55.54
Goonaping, G	27,467.04	21,836.72	79.50	13,905.39	50.63	19,349.22	70.45
Grimwade, GR	22,046.59	11,092.40	50.31	1,307.17	5.93	9,556.60	43.35

3.7 Conservation Significance of Vegetation

3.7.1 National Significance

None of the vegetation types recorded from the study area supported Threatened Flora listed under the EPBC Act or were aligned with any Commonwealth listed TECs. Therefore, vegetation within the study area was not considered to be of national significance.

3.7.2 State Significance

None of the vegetation types recorded from the study area supported Threatened Flora listed under the Western Australian BC Act or were aligned with any state listed TEC or PEC.

One Priority flora taxa, as listed by the DBCA, was recorded from localised areas within the study area: *Acacia semitrullata* (Priority 4). This population are determined to be of state significance, noting that it occurs with an area of native rehabilitation.

3.7.3 Local Significance

Vegetation within the study area did not support plant taxa considered to represent potential new species or significant range extensions outside of their known distribution, and hence was not determined to be of local conservation significance.

4.0 SUMMARY

A reconnaissance flora and vegetation survey of eleven vegetation blocks covering 47 ha identified within upcoming clearing approvals at the Greenbushes Mine was completed in early April 2024. The survey aimed to update existing flora and vegetation data recorded from previous surveys conducted in 2012 and 2018 ahead of upcoming clearing approval programs proposed by Talison.

A total number of 141 plant taxa (including varieties and subspecies) from 40 families and 96 genera were recorded from the study area, noting that total flora was under-represented owing to the poor seasonal conditions relating to survey timing and an extended dry period.

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

One plant taxon recorded during the field survey was listed as Priority flora by the DBCA: *Acacia semitrullata* (Priority 4). *Acacia semitrullata* is a low sprawling shrub and was recorded as 25 plants within native rehabilitation situated adjacent to Spring Gully Road.

There were ten vegetation types mapped within the study area. None of the vegetation types were aligned with any Commonwealth or State listed TECs or DBCA listed PECs, and vegetation was determined to be well represented and well reserved at the state-wide, IBRA regional and sub-regional, and local government authority levels according to broadscale mapping by Beard (1981).

5.0 STUDY TEAM

The reconnaissance flora and vegetation survey was planned, co-ordinated and executed by the following personnel:

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APPENDIX 1

Conservation Codes

Conservation codes for Western Australian Flora and Fauna

GOVERNMENT OF WESTERN AUSTRALIA

Department of **Biodiversity, Conservation and Attractions**

CONSERVATION CODES

For Western Australian Flora and Fauna

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

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

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

T **Threatened species**

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

Threatened fauna is that subset of 'Specially Protected Fauna' listed under schedules 1 to 3 of the *Wildlife Conservation (Specially Protected Fauna) Notice 2018* for Threatened Fauna.

Threatened flora is that subset of 'Rare Flora' listed under schedules 1 to 3 of the *Wildlife Conservation (Rare Flora) Notice 2018* for Threatened Flora.

The assessment of the conservation status of these species is based on their national extent and ranked according to their level of threat using IUCN Red List categories and criteria as detailed below.

CR **Critically endangered species**

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

Listed as critically endangered under section 19(1)(a) of the BC Act in accordance with the criteria set out in section 20 and the ministerial guidelines. Published under schedule 1 of the *Wildlife Conservation (Specially Protected Fauna) Notice 2018* for critically endangered fauna or the *Wildlife Conservation (Rare Flora) Notice 2018* for critically endangered flora.

EN **Endangered species**

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

Listed as endangered under section 19(1)(b) of the BC Act in accordance with the criteria set out in section 21 and the ministerial guidelines. Published under schedule 2 of the *Wildlife Conservation (Specially Protected Fauna) Notice 2018* for endangered fauna or the *Wildlife Conservation (Rare Flora) Notice 2018* for endangered flora.

VU **Vulnerable species**

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

Listed as vulnerable under section 19(1)(c) of the BC Act in accordance with the criteria set out in section 22 and the ministerial guidelines. Published under schedule 3 of the *Wildlife Conservation (Specially Protected Fauna) Notice 2018* for vulnerable fauna or the *Wildlife Conservation (Rare Flora) Notice 2018* for vulnerable flora.

Conservation codes for Western Australian flora and fauna

Extinct species

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

EX Extinct species

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

Published as presumed extinct under schedule 4 of the *Wildlife Conservation (Specially Protected Fauna) Notice 2018* for extinct fauna or the *Wildlife Conservation (Rare Flora) Notice 2018* for extinct flora.

EW Extinct in the wild species

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

Currently there are no threatened fauna or threatened flora species listed as extinct in the wild. If listing of a species as extinct in the wild occurs, then a schedule will be added to the applicable notice.

Specially protected species

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

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

MI Migratory species

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

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

Published as migratory birds protected under an international agreement under schedule 5 of the *Wildlife Conservation (Specially Protected Fauna) Notice 2018*.

CD Species of special conservation interest (conservation dependent fauna)

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

Published as conservation dependent fauna under schedule 6 of the *Wildlife Conservation (Specially Protected Fauna) Notice 2018*.

OS Other specially protected species

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

Published as other specially protected fauna under schedule 7 of the *Wildlife Conservation (Specially Protected Fauna) Notice 2018*.

Conservation codes for Western Australian flora and fauna

P **Priority species**

Possibly threatened species that do not meet survey criteria, or are otherwise data deficient, are added to the Priority Fauna or Priority Flora Lists under Priorities 1, 2 or 3. These three categories are ranked in order of priority for survey and evaluation of conservation status so that consideration can be given to their declaration as threatened fauna or flora.

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

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

1 **Priority 1: Poorly-known species**

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.

2 **Priority 2: Poorly-known species**

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.

3 **Priority 3: Poorly-known species**

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.

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

(a) Rare. Species that are considered to have been adequately surveyed, or for which sufficient knowledge is available, and that are considered not currently threatened or in need of special protection but could be if present circumstances change. These species are usually represented on conservation lands.
(b) Near Threatened. Species that are considered to have been adequately surveyed and that are close to qualifying for vulnerable but are not listed as Conservation Dependent.
(c) Species that have been removed from the list of threatened species during the past five years for reasons other than taxonomy.

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

Last updated 3 January 2019

Conservation categories for flora described under the EPBC Act

Category	Description
Extinct (Ex)	A species is extinct if there is no reasonable doubt that the last member of the species has died.
Extinct in the Wild (EW)	A species is categorised as extinct in the wild if it is only known to survive in cultivations, in captivity, or as a naturalised population well outside its past range; or if it has not been recorded in its known/expected habitat, at appropriate seasons, anywhere in its past range, despite exhaustive surveys over a time frame appropriate to its life cycle and form.
Critically Endangered (CE)	The species is facing an extremely high risk of extinction in the wild and in the immediate future.
Endangered (EN)	The species is likely to become extinct unless the circumstances and factors threatening its abundance, survival, or evolutionary development cease to operate; or its numbers have been reduced to such a critical level, or its habitats have been so drastically reduced, that it is in immediate danger of extinction.
Vulnerable (VU)	Within the next 25 years, the species is likely to become endangered unless the circumstances and factors threatening its abundance, survival or evolutionary development cease to operate.
Conservation Dependent (CD)	The species is the focus of a specific conservation program, the cessation of which would result in the species becoming vulnerable, endangered or critically endangered within a period of 5 years.

Conservation categories for species described under the IUCN

Category	Description
Extinct (Ex)	A taxon is Extinct when there is no reasonable doubt that the last individual has died. A taxon is presumed Extinct when exhaustive surveys in known and/or expected habitat, at appropriate times (diurnal, seasonal, annual), throughout its historic range have failed to record an individual. Surveys should be over a time frame appropriate to the taxon's life cycle and life form.
Extinct in the Wild (EW)	A taxon is Extinct in the Wild when it is known only to survive in cultivation, in captivity or as a naturalized population (or populations) well outside the past range. A taxon is presumed Extinct in the Wild when exhaustive surveys in known and/or expected habitat, at appropriate times (diurnal, seasonal, annual), throughout its historic range have failed to record an individual. Surveys should be over a time frame appropriate to the taxon's life cycle and life form.
Critically Endangered (CE)	A taxon is Critically Endangered when the best available evidence indicates that it meets any of the criteria A to E for Critically Endangered, and it is therefore considered to be facing an extremely high risk of extinction in the wild.
Endangered (EN)	A taxon is Endangered when the best available evidence indicates that it meets any of the criteria A to E for Endangered, and it is therefore considered to be facing a very high risk of extinction in the wild.
Vulnerable (VU)	A taxon is Vulnerable when the best available evidence indicates that it meets any of the criteria A to E for Vulnerable, and it is therefore considered to be facing a high risk of extinction in the wild.
Near Threatened (NT)	A taxon is Near Threatened when it has been evaluated against the criteria but does not qualify for Critically Endangered, Endangered or Vulnerable now, but is close to qualifying for or is likely to qualify for a threatened category in the near future.
Data Deficient (DD)	A taxon is Data Deficient when there is inadequate information to make a direct, or indirect, assessment of its risk of extinction based on its distribution and/or population status. A taxon in this category may be well studied, and its biology well known, but appropriate data on abundance and/or distribution are lacking. Data Deficient is therefore not a category of threat. Listing of taxa in this category indicates that more information is required and acknowledges the possibility that future research will show that threatened classification is appropriate. It is important to make positive use of whatever data are available. In many cases great care should be exercised in choosing between DD and a threatened status. If the range of a taxon is suspected to be relatively circumscribed, and a considerable period of time has elapsed since the last record of the taxon, threatened status may well be justified.

APPENDIX 2

Vegetation condition scale
(as developed by Keighery 1994)

Condition	Code	Description
Pristine	1	Pristine or nearly so, no obvious signs of disturbance or damage caused by human activities since European settlement.
Excellent	2	Vegetation structure intact, disturbance affecting individual species and weeds are non-aggressive species. Damage to trees caused by fire, the presence of non-aggressive weeds and occasional vehicle tracks.
Very Good	3	Vegetation structure altered, obvious signs of disturbance. Disturbance to vegetation structure caused by repeated fires, the presence of some more aggressive weeds, dieback, logging and grazing.
Good	4	Vegetation structure significantly altered by very obvious signs of multiple disturbances. Retains basic vegetation structure or ability to regenerate it. Disturbance to vegetation structure caused by very frequent fires, the presence of very aggressive weeds, partial clearing, dieback and grazing.
Degraded	5	Basic vegetation structure severely impacted by disturbance. Scope for regeneration but not to a state approaching good condition without intensive management. Disturbance to vegetation structure caused by very frequent fires, the presence of very aggressive weeds at high density, partial clearing, dieback and grazing.
Completely Degraded	6	The structure of the vegetation is no longer intact and the area is completely or almost completely without native species. These areas are often described as ‘parkland cleared’ with the flora comprising weed or crop species with isolated native trees and shrubs.

APPENDIX 3

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

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

APPENDIX 4

Total flora list from the study area

* Denotes introduced flora species

Family	Genus	Species	Rank	Infra Name
Apiaceae	*Foeniculum	vulgare		
Asparagaceae	*Asparagus	asparagoides		
Asparagaceae	Lomandra	caespitosa		
Asparagaceae	Lomandra	hermaphrodita		
Asparagaceae	Lomandra	sericea		
Asparagaceae	Lomandra	sonderi		
Asparagaceae	Thysanotus	patersonii		
Asteraceae	*Cirsium	vulgare		
Asteraceae	*Conyza	bonariensis		
Asteraceae	*Hypochaeris	glabra		
Asteraceae	Senecio	quadridentatus		
Asteraceae	*Sonchus	oleraceus		
Campanulaceae	Lobelia	anceps		
Cyperaceae	Baumea	rubiginosa		
Cyperaceae	Cyathochaeta	avenacea		
Cyperaceae	Lepidosperma	leptostachyum		
Cyperaceae	Lepidosperma	pubisquameum		
Cyperaceae	Lepidosperma	tetraquetrum		
Cyperaceae	Machaerina	juncea		
Cyperaceae	Machaerina	rubiginosa		
Cyperaceae	Mesomelaena	tetragona		
Cyperaceae	Morelotia	octandra		
Cyperaceae	Netrostylis		sp.	Jarrah Forest (R. Davis 7391)
Dasypogonaceae	Dasypogon	bromeliifolius		
Dennstaedtiaceae	Pteridium	esculentum		
Dilleniaceae	Hibbertia	amplexicaulis		
Dilleniaceae	Hibbertia	commutata		
Dilleniaceae	Hibbertia	diamesogenos		
Dilleniaceae	Hibbertia	hypericoides		
Elaeocarpaceae	Tetratheca	hirsuta	subsp.	viminea
Ericaceae	Leucopogon	capitellatus		
Ericaceae	Leucopogon	verticillatus		
Ericaceae	Styphelia	erectifolia		
Ericaceae	Styphelia	erubescens		
Ericaceae	Styphelia	pallida		
Ericaceae	Styphelia	propinqua		
Fabaceae	Acacia	alata	subsp.	alata
Fabaceae	Acacia	celastrifolia		
Fabaceae	*Acacia	decurrens		
Fabaceae	Acacia	dentifera		
Fabaceae	Acacia	drummondii	subsp.	candolleana
Fabaceae	Acacia	extensa		
Fabaceae	Acacia	latericola		
Fabaceae	Acacia	myrtifolia		
Fabaceae	Acacia	obovata		
Fabaceae	Acacia	pulchella		
Fabaceae	*Acacia	pycnantha		
Fabaceae	Acacia	saligna		
Fabaceae	^Acacia	semitrullata		
Fabaceae	Acacia	urophylla		
Fabaceae	Bossiaea	aquifolium		
Fabaceae	Bossiaea	linophylla		
Fabaceae	Bossiaea	ornata		
Fabaceae	Callistachys	lanceolata		

Family	Genus	Species	Rank	Infra Name
Fabaceae	*Chamaecytisus	palmensis		
Fabaceae	Daviesia	physodes		
Fabaceae	Eutaxia	virgata		
Fabaceae	Gastrolobium	bilobum		
Fabaceae	Gompholobium	tomentosum		
Fabaceae	Hardenbergia	comptoniana		
Fabaceae	Hovea	chorizemifolia		
Fabaceae	Isotropis	cuneifolia		
Fabaceae	Jacksonia	furcellata		
Fabaceae	Labichea	punctata		
Fabaceae	Mirbelia	dilatata		
Fabaceae	Pultenaea	ochreata		
Goodeniaceae	Dampiera	alata		
Goodeniaceae	Dampiera	linearis		
Goodeniaceae	Lechenaultia	biloba		
Haemodoraceae	Anigozanthos	flavidus		
Haemodoraceae	Conostylis	aculeata	subsp.	aculeata
Haemodoraceae	Haemodorum	spicatum		
Hypericaceae	*Hypericum	perforatum		
Iridaceae	Patersonia	occidentalis	subsp.	occidentalis
Juncaceae	Juncus	pallidus		
Lamiaceae	*Lavandula	stoechas		
Lauraceae	Cassytha	racemosa	forma	racemosa
Lindsaeaceae	Lindsaea	linearis		
Malvaceae	Thomasia	grandiflora		
Myrtaceae	Astartea	scoparia		
Myrtaceae	Babingtonia	camphorosmae		
Myrtaceae	Corymbia	calophylla		
Myrtaceae	*Corymbia	maculata		
Myrtaceae	Eucalyptus	marginata	subsp.	marginata
Myrtaceae	Eucalyptus	patens		
Myrtaceae	*Eucalyptus	resinifera		
Myrtaceae	Eucalyptus	rudis	subsp.	rudis
Myrtaceae	Eucalyptus	wandoo		
Myrtaceae	*Gaudium	laevigatum		
Myrtaceae	Hypocalymma	angustifolium		
Myrtaceae	Kunzea	glabrescens		
Myrtaceae	Melaleuca	incana	subsp.	incana
Myrtaceae	Melaleuca	preissiana		
Myrtaceae	Melaleuca	rhaphiophylla		
Myrtaceae	Melaleuca	viminea		
Myrtaceae	Pericalymma	ellipticum	var.	ellipticum
Myrtaceae	Taxandria	linearifolia		
Myrtaceae	Taxandria	parviceps		
Orchidaceae	Cryptostylis	ovata		
Orchidaceae	Eriochilus	dilatatus		
Phyllanthaceae	Lysiandra	calycina		
Pinaceae	*Pinus	radiata		
Pittosporaceae	Billardiera	heterophylla		
Pittosporaceae	Billardiera	variifolia		
Poaceae	*Aira	caryophyllea		
Poaceae	Austrostipa	campylachne		
Poaceae	*Avena	barbata		
Poaceae	*Briza	maxima		

Family	Genus	Species	Rank	Infra Name
Poaceae	*Cortaderia	selloana		
Poaceae	Neurachne	alopecuroidea		
Poaceae	Tetrarrhena	laevis		
Poaceae	*Vulpia	bromoides		
Podocarpaceae	Podocarpus	drouynianus		
Primulaceae	*Lysimachia	arvensis		
Proteaceae	Adenanthos	obovatus		
Proteaceae	Banksia	dallanneyi	subsp.	sylvestris
Proteaceae	Banksia	grandis		
Proteaceae	Banksia	littoralis		
Proteaceae	Conospermum	capitatum	subsp.	glabratum
Proteaceae	Grevillea	trifida		
Proteaceae	Hakea	amplexicaulis		
Proteaceae	Hakea	lissocarpha		
Proteaceae	Hakea	prostrata		
Proteaceae	Hakea	undulata		
Proteaceae	Persoonia	longifolia		
Ranunculaceae	Clematis	pubescens		
Restionaceae	Desmocladus	fasciculatus		
Restionaceae	Hypolaena	exsulca		
Restionaceae	Leptocarpus	depilatus		
Restionaceae	Loxocarya	cinerea		
Rhamnaceae	Trymalium	odoratissimum	subsp.	odoratissimum
Rosaceae	*Acaena	echinata		
Rosaceae	*Rubus	anglocandicans		
Rubiaceae	Opercularia	apiciflora		
Rutaceae	Philotheca	spicata		
Solanaceae	*Solanum	nigrum		
Thymelaeaceae	Pimelea	suaveolans		
Typhaceae	Typha	domingensis		
Xanthorrhoeaceae	Xanthorrhoea	gracilis		
Xanthorrhoeaceae	Xanthorrhoea	preissii		
Zamiaceae	Macrozamia	riedlei		

APPENDIX 5

Priority flora locations within the study area

Species	Height (m)	No. Plants	Easting	Northing
Acacia semitrullata	0.5	7	411093	6253694
Acacia semitrullata	0.5	2	411180	6253497
Acacia semitrullata	0.5	1	411171	6253494
Acacia semitrullata	0.5	1	411166	6253501
Acacia semitrullata	0.5	1	411169	6253514
Acacia semitrullata	0.2	2	411199	6253525
Acacia semitrullata	0.4	2	411143	6253618
Acacia semitrullata	0.5	5	411134	6253687
Acacia semitrullata	0.4	3	411206	6253589
Acacia semitrullata	0.4	1	411166	6253622