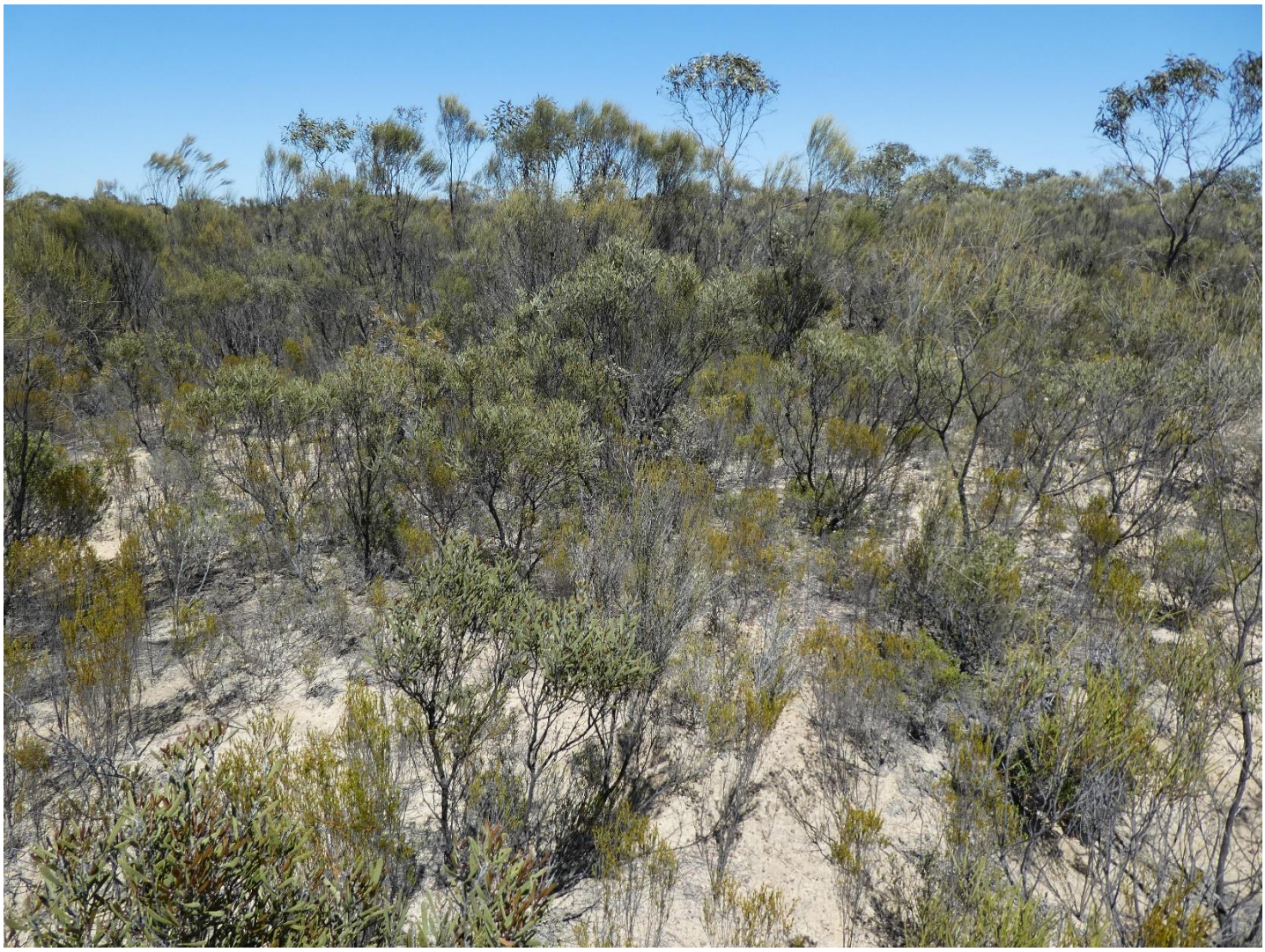

Covalent Lithium Pty Ltd

Flora survey Mt Holland

March 2020

Executive summary

Covalent Lithium (Covalent) engaged GHD to undertake a targeted flora survey near Mt Holland, Western Australia (WA), with a focus on occurrence of conservation significant species. Covalent are investigating potential locations for an airstrip that will provide access to the mine site, where exploration for Lithium is being undertaken.

Extensive survey work has been undertaken previously in the study area, the results of which, informed the field survey and provided GHD with known records of Priority and Threatened flora surrounding the survey area. Some of these flora include *Acacia undosa* (Priority 3), *Eutaxia lasiocalyx* (Priority 2), *Microcorys* sp. Mt Holland (Priority 1), *Microcorys* sp. Mt Holland broad-leaf (Priority 1) and *Banksia sphaerocarpa* var. *dolichostyla* A.S.George (Vulnerable), among others.

GHD surveyed two out of three potential airstrip locations (survey polygons). These were extensively ground-truthed on foot, and one polygon was traversed further northwards, outside the boundary, for the purpose of recording the extent of a population of Threatened *Banksia sphaerocarpa* var. *dolichostyla*. This report is subject to, and must be read in conjunction with, the limitations set out in 1.4 and the assumptions and qualifications contained throughout the Report.

GHD recorded a total of six (6) conservation significant flora taxa within the survey area. These flora, and the number of individuals recorded is listed below:

- *Banksia sphaerocarpa* var. *dolichostyla* A.S.George (Vulnerable, EPBC Act 1999) (172)
- *Microcorys* sp. Mt Holland (D. Angus DA 2397) (Priority 1, BC Act 2016) (13)
- *Eutaxia lasiocalyx* Chappill & C.F.Wilkins (Priority 2, BC Act 2016) (356)
- *Hakea pendens* R.M.Barker (Priority 3, BC Act 2016) (41)
- *Verticordia stenopetala* Diels (Priority 3, BC Act 2016) (141)
- *Verticordia gracilis* A.S.George (Priority 3, BC Act 2016) (203).

A likelihood of occurrence assessment post-field survey determined an additional six conservation significant flora have the potential to occur in the survey area, due to suitable habitat and/or presence of previously recorded individuals with the WA Herbarium and/or Mattiske. These flora included *Baeckea* sp. Forrestania (K.R Newbey 1105) (Priority 1, BC Act 2016), *Brachyloma stenolobum* (Priority 1), *Gyrostemon ditrigynus* (Priority 4), *Logania nanophylla* (Priority 2), *Orianthera exilis* (Priority 2) and *Teucrium* sp. dwarf (R. Davis 8813) (Priority 3).

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Appendices

1. Introduction

1.1 Project background

Covalent Lithium (Covalent) are undertaking exploration activities at Mount Holland, located approximately 462 kilometres (km) east of Perth and 122 km south of Southern Cross. Due to the anticipated mining for Lithium in the area, Covalent are investigating potential locations for an airstrip that will enable staff and related personnel access to site. GHD were engaged to undertake a targeted flora survey.

1.2 Purpose of this report

The purpose of the assessment was to identify key flora constraints within the survey area by undertaking targeted searches for conservation listed flora species. This report details the flora results, which will be used to identify and assess key constraints and inform the environmental assessment and approvals process and to support environmental approvals.

1.3 Survey area

The survey area is located near Mount Holland, in the Coolgardie bioregion of Western Australia (WA). The survey area contains three sites, each approximately 6.3 km, 10.6 km, and 10.8 km west of the existing Mount Holland mine. The sites are each 184 hectares, and cover mining tenements E77/2167, M77/522, and M77/523. The survey area boundary is shown in Figure 1, Appendix A. Two of the three sites were extensively surveyed, with the survey effort extending beyond the boundary of the most northern site to record the extent of significant flora adjacent to this area. Covalent directed GHD to focus on this approach, rather than complete the survey of the third site.

1.3.1 Study area

The study area includes the survey area and an additional 20 km radius buffer area. The study area defines the limits of the desktop assessment as described in section 2.1 and 3.

1.4 Scope of works

The following scope of works was completed to achieve the purpose of the assessment:

- A desktop assessment of the survey area prior to the field survey to identify biological features and constraints, which may be in, or near the survey area
- A review of relevant publically available or supplied by Covalent environmental reports
- A targeted flora survey of conservation significant flora and associated vegetation within the survey area
- A consolidated technical report (this report) drafted post-survey.

1.5 Relevant legislation, conservation codes and background information

In WA some ecological communities, flora and fauna are protected under both Federal and State Government legislation. In addition, regulatory authorities also provide a range of guidance and information on expected standards and protocols for environmental surveys.

An overview of key legislation and guidelines, conservation codes and background information relevant to this biological survey is provided in Appendix B.

1.6 Report limitations and assumptions

This report has been prepared by GHD for Covalent and may only be used and relied on by Covalent for the purpose agreed between GHD and Covalent as set out in section 1.2 of this report.

GHD otherwise disclaims responsibility to any person other than Covalent arising in connection with this report. GHD also excludes implied warranties and conditions, to the extent legally permissible.

The services undertaken by GHD in connection with preparing this report were limited to those specifically detailed in the report and are subject to the scope limitations set out in the report.

The opinions, conclusions and any recommendations in this report are based on conditions encountered and information reviewed at the date of preparation of the report. GHD has no responsibility or obligation to update this report to account for events or changes occurring subsequent to the date that the report was prepared.

The opinions, conclusions and any recommendations in this report are based on assumptions made by GHD described in this report. GHD disclaims liability arising from any of the assumptions being incorrect.

GHD has prepared this report on the basis of information provided by Covalent and others who provided information to GHD (including Government authorities), which GHD has not independently verified or checked beyond the agreed scope of work. GHD does not accept liability in connection with such unverified information, including errors and omissions in the report which were caused by or omissions in that information.

The opinions, conclusions and any recommendations in this report are based on information obtained from, and testing undertaken at or in connection with, specific sample points. Site conditions at other parts of the site may be different from the site conditions found at the specific sample points.

Site conditions may change after the date of the field survey. GHD does not accept responsibility arising from, or in connection with, any change to the site conditions. GHD is also not responsible for updating this report if the site conditions change.

This report has assessed the flora within two of the three pre-determined sites included within the survey area (Figure 1, Appendix A). Should the survey area change or be refined, further assessment may be required.

2. Methodology

2.1 Desktop Assessment

Prior to the field survey a desktop assessment was undertaken to collect relevant environmental and ecological information pertaining to the survey area, and wider study area, to assist survey design. This included a review of:

- The Department of Agriculture Water and Environment (DAWE 2020) Protected Matters Search Tool (PMST), to identify any flora or vegetation protected under the *Environmental Protection and Biodiversity Conservation Act 1999* (EPBC Act) potentially occurring within the study area (DotEE 2020a) (Appendix C)
- The Department of Biodiversity Conservation and Attractions (DBCA) Threatened Ecological Communities (TEC) and Priority Ecological Communities (PEC) database to establish records of conservation significant communities within the study area
- The DBCA Threatened and Priority Flora (TPFL) database and the WA Herbarium (WAHERB) for Threatened flora listed under the *Biodiversity Conservation Act 2016* (BC Act) and Priority flora regulated by DBCA, that occur within the study area
- The DBCA *NatureMap* database for flora species previously recorded within the study area and surrounds (DBCA 2020) (Appendix C)
- Existing datasets including pre-European vegetation mapping of the survey area (DPIRD-006), and aerial photography, information on vegetation units aerial photography, geology/soils, and hydrology information, to provide background information on the variability of the landscape, and associated/likely vegetation types, TECs or PECs
- Environmentally Sensitive Areas (ESAs) and DBCA-managed conservation estates and reserves located in the study area
- Existing flora and vegetation reports and/or data:
  - Flora and Vegetation of the Earl Grey, Irish Breakfast and Prince of Wales Prospects prepared for Kidman Resources Limited (Mattiske 2017)
  - Flora and Vegetation Assessment Earl Grey Lithium Project Prepared for Kidman Resources Limited (Mattiske 2018)
  - Memorandum: Earl Grey Lithium Project (Mattiske 2019)
  - Threatened and Priority Flora Booklet for Covalent Lithium Pty Ltd Earl Grey Lithium Project Mt Holland (Mattiske 2019)

The mapped environmental constraints within 20 km of the survey area is provided in Figure 2, Appendix A.

2.2 Field Survey

2.2.1 Targeted flora survey

GHD senior Botanist Joel Collins, botanist Sarah Flemington, and sub-consultant botanist from Ecoedge, Colin Spencer, undertook the targeted flora survey between 24 – 30 November 2019. The survey was undertaken to identify and record the presence of conservation significant flora, and describe the landforms where the species are present, to assist in assessing the likelihood of occurrence in the survey area for the other species identified at the initial desktop phase.

The survey methodology employed by GHD was undertaken with reference to the EPA Technical Guidance – *Flora and Vegetation Surveys for Environmental Impact Assessment* (EPA 2016).

Conservation significant flora

Prior to the field survey, information provided by Covalent (previous survey reports, refer section 2.1), and recordings of significant flora around the Mt Holland area by Covalent site environmental scientists) was used to review the likelihood of occurrence of several Threatened and Priority flora. This information also aided in the searches for more cryptic flora, some with inconspicuous discerning features to common taxa in the area, and taxa with little information available in other databases. The EPBC PMST, *NatureMap* and DBCA database results were utilised for flora that have the potential to occur, but have not already been recorded by other consultants in the area.

Targeted searches in the survey polygons provided, were made by walking transects spaced at approximately 50 m apart. The survey boundary changed during the survey as populations of Priority and Threatened flora were recorded, leading to survey effort extending out of the survey polygons, after discussion with the client. Transects were walked at 50 m apart approximately 1 km to the north, and south, outside of the northernmost survey polygon (Figure 1, Appendix A). The middle proposed survey polygon was not surveyed as agreed with Covalent during the survey.

Where Threatened or Priority flora were recorded, the attributes listed in Table 1 were captured.

Table 1 Data collected during the field survey

Aspect	Measurement
Collection attributes	Site code, personnel/recorder; date, photograph of population or individual.
Physical features	Landform and soil type.
Location	Coordinates recorded in GDA94 datum using Samsung tablet (ArcGis Collector) to accuracy approximately ± 5 m.
Disturbance	Level and nature of disturbances (e.g. weed presence, fire and time since last fire, impacts from grazing, exploration activities).
Flora	Associated species and vegetation type.

Flora identification and nomenclature

Species well known to the survey botanist(s) were identified in the field; all other species were collected and assigned a unique collection number to facilitate tracking. All specimens collected during the field assessment were dried and processed in accordance with the requirements of the WA Herbarium.

The conservation status of all recorded flora was compared against the current lists available on *FloraBase* (WA Herbarium 1998–2020) and the EPBC Act Threatened species database provided by DotEE (2020a). Nomenclature used in this report follows that used by the WA Herbarium as reported on *FloraBase* (WA Herbarium 1998–2020).

2.3 Limitations

2.3.1 Field survey limitations

The EPA (2016) Technical Guide states flora survey reports for environmental impact assessment in WA should contain a section describing the limitations of the survey methods used. The limitations and constraints associated with this field survey are discussed in Table 2.

Table 2 Field survey limitations

Aspect	Constraint	Comment
Sources of information and availability of contextual information	Nil	Adequate information is available for the survey area, this includes: • Broad scale (1:250,000) mapping by Beard (1979) and digitised by Shepherd *et al*. (2002) • Previous survey reports (Mattiske 2017; 2018; 2019).
Scope (what life forms were sampled etc)	Nil	Vascular flora were sampled during the survey. Non-vascular flora were not surveyed.
Proportion of flora collected and identified (based on sampling, timing and intensity) Proportion of fauna identified, recorded and/or collected	Nil	The vegetation survey was a single season survey and was undertaken in late spring (November 2019). Spring is considered the most optimal time to undertake vegetation surveys in the South-Western Interzone botanical province. Late spring is not optimal timing for a number of Threatened flora (orchids in particular) that may potentially occur in the survey area; however no Threatened orchids were expected to occur in the survey area. The targeted survey aimed to detect a number of Priority and Threatened flora previously recorded in the area from prior surveys. Several reference locations/populations were available for the botanists to assess, to aid in the detectability of these species prior to the survey.
Completeness and further work which might be needed (e.g. was the relevant area fully surveyed)	Nil	The survey area was accessible and was accessed by foot.
Timing/weather/season/cycle	Minor	The field survey was undertaken in late spring 2019. This timing of the flora and vegetation survey is considered the optimal season to complete flora and vegetation surveys in the South-Western Interzone botanical province. Rainfall in the 6 months preceding the survey was above the long-term average in the months October (17.3 mm - 21 mm) and significantly in June (38.3 mm - 79.4 mm) (BoM 2020). The weather conditions recorded during the survey were warm, with some cooler days and mostly dry, with one day experiencing some minimal rainfall. Observations in the field, of flowers and fruit remaining on plants suggests that the wetter months created better conditions, despite some months being drier than the long-term average.
Disturbances (e.g. fire, flood, accidental human intervention)	Nil	Little disturbances were present within the survey areas, a part from vehicle tracks around the perimeter of the survey areas. These disturbances did not impact the survey.
Resources	Nil	Adequate resources were employed during the field surveys. Twenty one person days were spent undertaking the surveys using experienced botanists/ecologists.
Access restrictions	Nil	Access was difficult in some areas, but there were no restricted areas. The survey areas were covered.
Experience levels	Nil	Joel Collins (senior botanist GHD) is Ecology Team Lead and has over 17 years experiences undertaking surveys in the Coolgardie and Avon Wheatbelt bioregions. Joel has previously

Aspect	Constraint	Comment
		undertaken flora surveys in the Mount Holland area while employed as a consultant and at Department of Parks and Wildlife. Sarah Flemington (botanist GHD) has 3.5 years experience working in the environmental sector, undertaking remote botanical surveys in WA. Colin Spencer (sub-consultant Ecoedge) has over 13 years experience in the environmental sector. He has excellent botanical and taxonomic knowledge, particularly with the flora of the South West and adjoining areas.

3. Desktop Assessment

3.1 Regional biogeography

The survey area occurs in the South-Western Interzone botanical province of WA (Beard 1990), and within the Coolgardie Bioregion (COO) and Southern Cross subregion (COO2) as described by the Interim Biogeographic Regionalisation of Australia (IBRA) (DotEE 2019).

The Southern Cross subregion comprises of subdued relief of gently undulating uplands dissected by broad valleys and bands of low greenstone hills. There are chains of saline playa-lakes. The area contains diverse Eucalyptus woodlands containing *Eucalyptus salmonophloia, E. salubris, E. transcontinentalis* and *E. longicornis*. Salt lake surfaces support dwarf shrublands of samphire, whilst granite outcrops support large populations of *Borya constricta, Acacia acuminata*, and *Eucalyptus loxophleba*. The upper landscape yields yellow sandplains and gravelly sandplains supporting mallees of *Eucalyptus leptopoda, E. platycorys and E. scyphocalyx*. Lateritic breakaways and sandplains support mallees and scrub-heaths of *Allocasuarina, Callitris, Melaleuca* and *Acacia* (Cowan, Graham & Mckenzie 2001). Scrubs are rich in endemic Acacias and Myrtaceae.

3.2 Soils geology and landforms

The northernmost survey area is within the AC1 soil-landscape unit. The southern survey area is located within the Ya28 soil-landscape unit. These are broadly described as:

- AC1: Gently sloping to gently undulating plateau areas, or uplands, on granites, gneisses, and allied rocks, with long gentle slopes and in some places abrupt erosional scarps
- Ya28: Sandy plains with some clay pans and small salt lakes, dunes, and lunettes.

3.3 Land use

3.3.1 Conservation reserves and estates

There are no national parks or other conservation reserves within or immediately adjacent to the survey area. The nearest conservation reserve is the Jilbadji Nature Reserve, 4.63 km north of the survey area (Figure 2, Appendix A).

3.3.2 Environmentally Sensitive Areas

The survey area does not intersect any ESAs. The closest ESA (Jilbadaji Nature Reserve) is located 4.63 km north of the northernmost survey polygon (Figure 2, Appendix A).

3.3.3 Wetlands

The survey area does not intersect any wetlands or wetlands of significance. The study area contains a series of wetland systems and lakes (Figure 2, Appendix A).

3.4 Vegetation and flora

3.4.1 Broad vegetation associations

Broad scale (1:250,000) pre-European vegetation mapping of the survey area has been completed by Beard (1979) at an association level. The mapping indicates the survey area intersects two vegetation associations:

- Eucalypt shrubland; *Eucalyptus eremophila, E. redunca* and E. spp. (association 519) – occurs in the northernmost survey polygon

- Mosaic: Medium woodland; salmon gum & morrel / Shrublands; mallee scrub, redwood (association 941) – occurs in the southern survey polygon.

The pre-European mapping has been adapted and digitised by Shepherd *et al.* (2002). The extent of vegetation associations have been determined by the state-wide vegetation remaining extent calculations maintained by DBCA (latest update April 2019 – GoWA 2019). As shown in Table 3 the current remaining extents of vegetation associations 519 and 941 are greater than 98% of their pre-European extent at an IBRA sub-region level, and IBRA Bioregion level. Association 519 has 61.71% of pre-European vegetation remaining at the state-level, whilst Association 941 retains 50.48% state-wide.

Table 3 Extents of vegetation associations mapped within the survey area (GoWA 2019)

Vegetation Association	Scale	Pre-European extent (ha)	Current extent (ha)	Remaining extent (%)	Current extent remaining within all DBCA managed land (%)
519	State: WA	2,333,413.96	1,440,062.48	61.71	16.95
	IBRA Bioregion: Coolgardie	147,579.03	146,943.59	99.57	10.71
	Sub-region: Southern Cross	133,412.06	132,776.62	99.52	11.77
	LGA: Shire of Yilgarn	96,380.69	88,816.42	92.15	17.59
941	State: WA	34,247.70	17,289.95	50.48	15.12
	IBRA Bioregion: Coolgardie	10,822.28	10,800.61	99.80	-
	Sub-region: Southern Cross	10,822.28	10,800.61	99.80	-
	LGA: Shire of Yilgarn	6,094.92	6,074.92	99.67	-

3.4.1 Previous flora and vegetation surveys

Mattiske undertook detailed flora and vegetation surveys of the Mt Holland area in 2017, 2018 and 2019 on behalf of Kidman Resources Limited, of their then-owned Earl Grey Prospect, located south of Southern Cross, near Mt Holland (approximately 5 km east of the survey area). Other prospects included the Irish Breakfast and Prince of Whales, which are all located in the same general area. Mattiske undertook this work for the Earl Grey Lithium Project. The results of these surveys have been considered in the flora assessment of likelihood (Appendix D) and in the survey results discussion (GHD 2020).

3.4.2 Threatened and priority ecological communities

No TECs or PECs intersect the survey area. One PEC extends from the northern to the southern extent of the study area, and is located <1 km east of the northernmost survey polygon.

3.4.3 Conservation significant flora

The EPBC Act PMST, *NatureMap* and DBCA Threatened and Priority Flora databases identified the presence/potential presence of 33 conservation significant flora taxa within 20 km of the study area (Appendix C and Figure 2, Appendix A). The desktop searches returned:

- Seven Threatened flora taxa listed under the EPBC Act and/or BC Act
- Nine Priority 1 taxa
- Five Priority 2 taxa
- Nine Priority 3 taxa
- Three Priority 4 taxa.

Mattiske have identified an additional 41 conservation significant flora as occurring within the wider Mount Holland area. These have been included in the likelihood table (Appendix D).

4. Field survey results

4.1 Flora taxonomy and identification

GHD utilised the WA Herbarium for the identification of specimens, including utilising the identification services for potential conservation listed *Verticordia* sp. WA Herbarium identification Botanist Mike Hislop undertook the identifications. It was confirmed that the records contained *Verticordia stenopetala* (P3) and *V. gracilis* (P3). A specimen of potential *?Brachyloma stenolobum* was identified as an inland variant of *Conostephium drummondii* (not conservation significant).

4.2 Conservation significant flora

GHD recorded six conservation significant flora taxa within the survey area. A description of these taxa, their ecology, and the number of individuals recorded by GHD and Mattiske (if recorded) has been provided in this section.

The locations of the conservation significant flora recorded by GHD within the survey area are mapped in Figure 3 (Appendix A). Species location data and number of plants recorded are presented in Appendix D.

Banksia sphaerocarpa var. *dolichostyla*

Banksia sphaerocarpa var. *dolichostyla* (Ironcaps Banksia) (EPBC Listed Vulnerable and DBCA listed Threatened) (Plate 1) is a shrub growing to 4 m high and 4 m wide. It is a densely leaved plant and cones occur at the base of the stems. It flowers between March and May, producing dark golden flowers (WA Herbarium 1998-2020, Mattiske 2019b).

This species can resprout after fire as it contains a lignotuber, making it a fire tolerant species (DAWE 2020). It is a species associated with disturbance, having been observed to rapidly recruit and recover in areas of ongoing disturbance (Strategen 2019).

The species occurs on lateritic gravel, in low open-woodland and low shrubland. It has a preference for iron-capped hills and rises on ironstone, and often is found with other *Banksia* sp. (*Banksia laevigata* in Mt Holland), and *Allocasuarina* sp (DAWE 2020).

Mattiske (2017) recorded this species within mapped vegetation type, MW5 described as: *Eucalyptus burracoppinensis*, *Allocasuarina acutivalvis* subsp. *acutivalvis*, *Callitris canescens* low open mallee woodland over *Banksia purdieana*, *Beaufortia orbifolia, Allocasuarina spinosissima* mid open shrubland over *Gompholobium hendersonii*, *Goodenia pinifolia* low isolated shrubs on yellow-brown clay loam on flats.

GHD recorded a total of 172 individuals within the northernmost survey polygon, on white flat sandplains and undulating hills in heath with scattered *Eucalyptus burracoppinensis* open mallee with *Allocasuarina acutivalvis subsp. acutivalvis, Banksia purdieana*, *Beaufortia orbifolia,* and *Allocasuarina spinosissima*.

Plate 1 *Banksia sphaerocarpa* var. *dolichostyla*

Microcorys sp. Mt Holland (D. Angus DA 2397)

Microcorys sp. Mt Holland (DBCA listed Priority 1) is a tall, spindly shrub, with many individuals recorded growing from 1-1.5 m tall (Plate 2). Mattiske (2018) recorded this species within 13 vegetation communities (Strategen 2019). Three of these communities bared resemblance to the vegetation of the northernmost polygon where GHD recorded the species. These vegetation types were:

- S1: *Allocasuarina acutivalvis, Allocasuarina spinosissima* tall closed shrubland over *Hakea subsulcata*, *Melaleuca cordata*, *Micromyrtus erichsenii* mid sparse heathland on lateritic orange-red clay soils on flats and lower slopes
- S3: *Allocasuarina acutivalvis*, *Eucalyptus burracoppinensis* tall sparse shrubland over *Banksia purdieana*, *Hakea subsulcata*, *Melaleuca cordata* mid sparse shrubland over *Micromyrtus erichsenii*, *Persoonia helix* low isolated shrubs on gravelly yellow brown to orange brown clay to clayey sand soils on flats
- W5: *Eucalyptus rigidula, Eucalyptus burracoppinensis* low open mallee woodland over *Micromyrtus erichsenii*, *Persoonia helix, Hakea erecta* mid sparse heathland over *Hibbertia rostellata, Hibbertia stowardii* low isolated shrubs.

Mattiske (2017; 2018, 2019a; 2019b) have recorded a total of 8353 individuals across various mine prospects (Earl Grey, Irish Breakfast and Prince of Wales) as part of survey work undertaken for Covalent. GHD recorded 13 individuals within the northernmost survey polygon.

Plate 2 *Microcorys* sp. Mt Holland (D. Angus DA 2397)

Eutaxia lasiocalyx

Eutaxia lasiocalyx (DBCA listed Priority 2) is described as a spreading, densely branched shrub growing to 0.15 m tall and 0.6 m wide. It occurs on red, sandy loam in woodland or mallee on lateritic or quartzitic substrates (Mattiske 2019b) (Plate 3).

Mattiske have recorded 371 individuals of *E. lasiocalyx* within the Earl Grey, Irish Breakfast and Prince of Wales prospects. GHD recorded a total of 356 individuals within the southernmost survey polygon in brown sandy-loam soils and white sand within *Eucalyptus* woodland.

Plate 3 *Eutaxia lasiocalyx*

Hakea pendens

Hakea pendens (DBCA listed Priority 3) is described as a prickly, upright shrub growing to 2.5 m, with multi-stemmed branches and rough, grey bark. It occurs on ironstone ridges and

outcrops, and stony clay in mixed scrub and Eucalypt woodland (Mattiske 2019b). GHD (2020) recorded this species on white/brown sand. Mattiske (2018) recorded the species in six vegetation communities.

GHD recorded a total of 41 individuals within the survey area. Mattiske have recorded 252 individuals across their survey sites (Strategen 2019).

Plate 4 ***Hakea pendens***

Verticordia stenopetala

Verticordia stenopetala (DBCA listed Priority 3) is described as a small shrub growing 0.2-0.5 m tall. It occurs in white to grey sand, yellow sand over loam and gravel and is often in association with several *Verticordia* spp. and heath and open mallee shrubland (Mattiske 2019b). GHD recorded 141 individuals within the northernmost survey polygon.

Plate 5 ***Verticordia stenopetala***

Verticordia gracilis

Verticordia gracilis (DBCA listed Priority 3) is described as a spindly to bushy shrub growing 0.15-0.45 m tall and 0.2-0.6 m high. It occurs in yellow sand, usually with or over loam and gravel, in association with other Verticordias and heath and open mallee shrubland (Mattiske 2019b). GHD recorded 203 individuals within the northernmost survey polygon.

Plate 6 *Verticordia gracilis*

4.3 Likelihood of Occurrence assessment

A likelihood of occurrence assessment was conducted post-field survey for all conservation significant flora taxa identified in the desktop assessment (Appendix D). This assessment took into account previous records, habitat requirements, efficacy of the survey, intensity of the survey, flowering times and the cryptic nature of species. The assessment also utilised previous flora records from Mattiske (2017, 2018, 2019a).

The likelihood of occurrence assessment post-field survey concluded that in addition to the six known flora species, six conservation significant flora species are considered possible to occur within the survey area (Table 4).

Table 4 Taxa considered likely or possible to occur within the survey area

Taxa	Status	Likelihood of Occurrence
Baeckea sp. Forrestania (K.R. Newbey 1105)	Priority 1	Possible Suitable habitat exists in the survey area and has been previously recorded in close proximity to the survey area (1.5 km south of northernmost survey polygon).
Brachyloma stenolobum	Priority 1	Possible Suitable habitat exists in the survey area and close records exist in the study area (1.5 km west of the northernmost survey polygon).

Gyrostemon ditrigynus	Priority 4	Possible Some suitable habitat exists and the species has been previously recorded by Mattiske (2017). A fire dependant species.
Logania nanophylla	Priority 2	Possible The northernmost survey polygon contains suitable habitat, and it has been recorded in the study area (7.31 km northwest of the northernmost survey polygon (NatureMap 2020)).
Orianthera exilis	Priority 2	Possible Some suitable habitat exists in the southernmost survey polygon and has been recorded previously in the study area (4.9 km east of the southernmost survey polygon).
Teucrium sp. dwarf (R. Davis 8813	Priority 3	Possible Suitable habitat exists in the survey area and has been recorded in the study area previously by Mattiske (2018).

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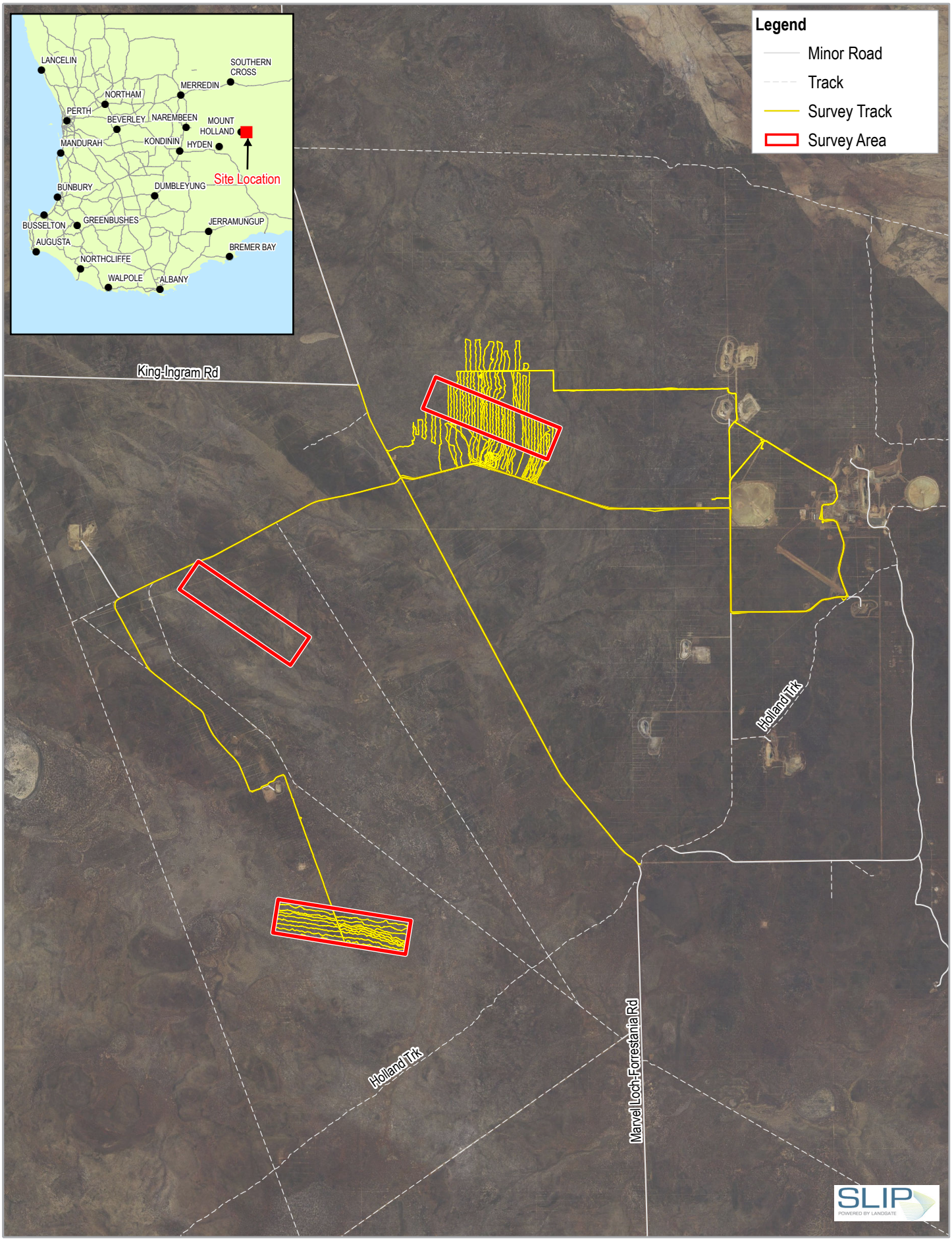
Appendix A - Figures



Paper Size ISO A4

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Kilometres

Map Projection: Transverse Mercator
Horizontal Datum: GDA 1994
Grid: GDA 1994 MGA Zone 50

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Covalent Lithium Pty Ltd
Flora Surveys Mt Holland

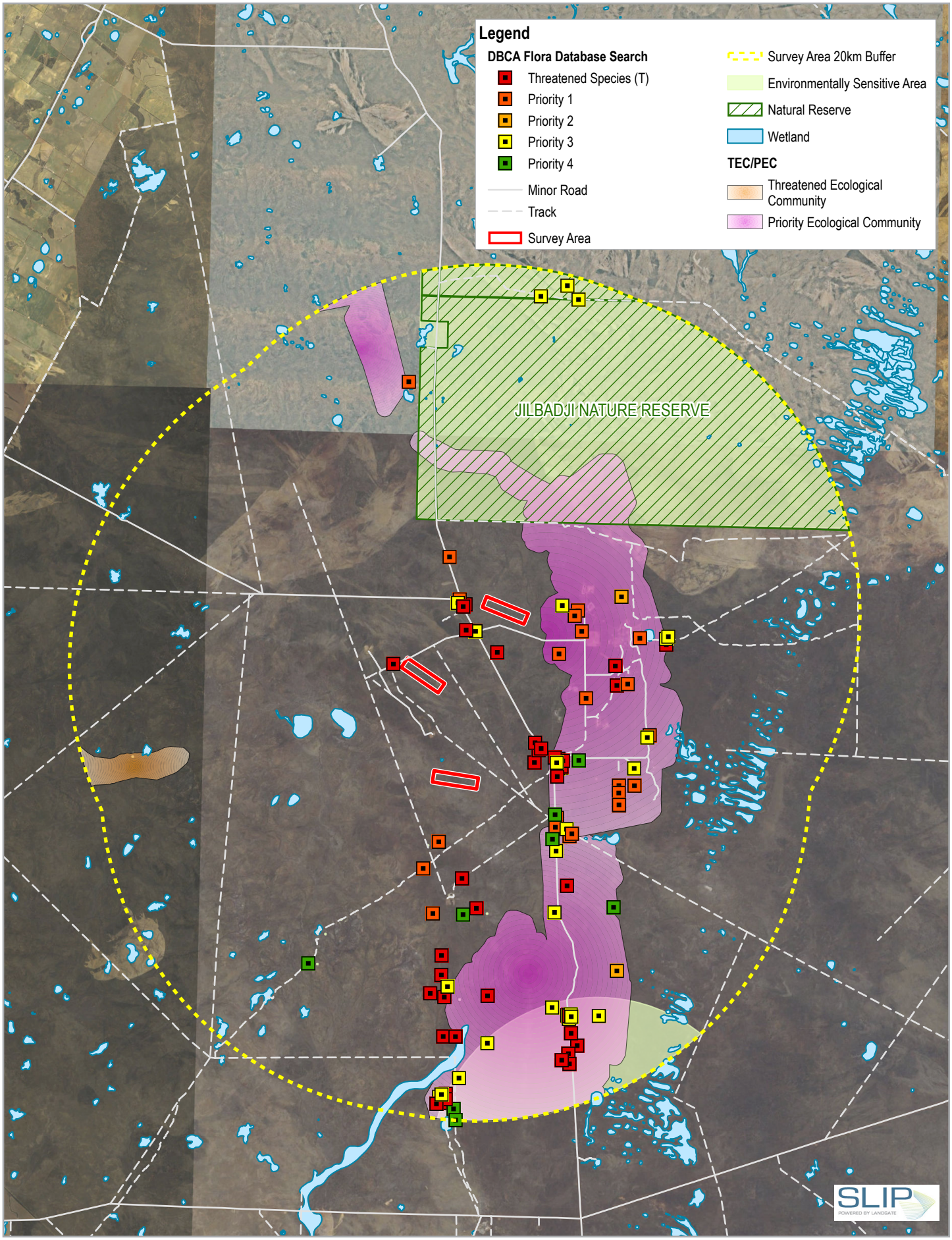
Project No. **12518797**
Revision No. **0**
Date **09/03/2020**

Survey Location and Effort

FIGURE 1

G:\61\12518797\GIS\Maps\Working\12518797\12518797.aprx
Print date: 09 Mar 2020 - 14:22

Data source: GHD: Survey Area - 20200122, Survey Tracks - 20200128; Landgate: Roads - 20190128, WANow: Landgate / SLIP. Created by: bmorgan



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Map Projection: Transverse Mercator
Horizontal Datum: GDA 1994
Grid: GDA 1994 MGA Zone 50

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Covalent Lithium Pty Ltd
Flora Surveys Mt Holland

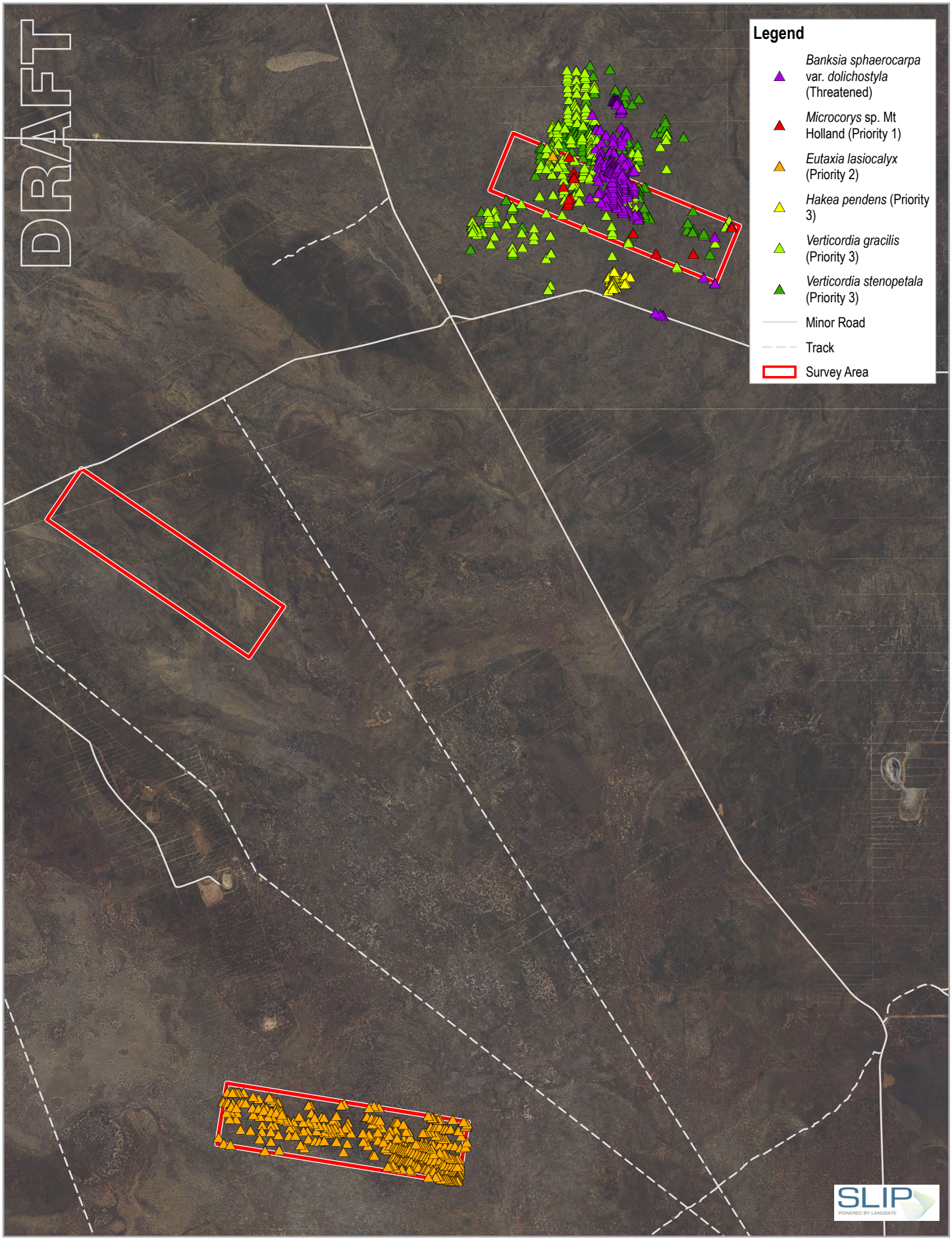
Project No. **12518797**
Revision No. **0**
Date **09/03/2020**

Environmental Constraints

FIGURE 2

G:\61\12518797\GIS\Maps\Working\12518797\12518797.aprx
Print date: 09 Mar 2020 - 14:24

Data source: GHD: Survey Area - 20200122; DWER: Environmentally Sensitive Areas - 20180223; DBCA: Flora Database Search - 20190329, Wetlands - 20170913, TEC/PEC - 20190410; Landgate: Reserves - 20200204, Roads - 20190128WANow: Landgate / SLIP. Created by: bmorgan



Paper Size ISO A4

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Kilometres

Map Projection: Transverse Mercator
Horizontal Datum: GDA 1994
Grid: GDA 1994 MGA Zone 50

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Covalent Lithium Pty Ltd
Flora Surveys Mt Holland

Conservation Significant Flora Records

Project No. **12518797**
Revision No. **0**
Date **09/03/2020**

FIGURE 3

G:\61\12518797\GIS\Maps\Working\12518797\12518797.aprx
Print date: 09 Mar 2020 - 14:25

Data source: GHD: Flora Observations, Flora Area, Survey Area - 20200122; Landgate: Roads - 20190128, WANow: Landgate / SLIP. Created by: bmorgan

Appendix B – Relevant legislation, background information and conservation codes

Relevant legislation

Federal *Environment Protection and Biodiversity Conservation Act 1999*

The *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) is the Federal Government's central piece of environmental legislation. It provides a legal framework to protect and manage nationally and internationally important flora, fauna, ecological communities and heritage places, which are defined in the EPBC Act as Matters of National Environmental Significance (MNES).

The biological aspects listed as MNES include:

- Nationally threatened flora and fauna species and ecological communities
- Migratory species

A person must not undertake an action that has, will have, or is likely to have a significant impact (direct or indirect) on MNES, without approval from the Federal Minister for the Environment.

The EPBC Act is administered by the Department of Agriculture, Water and the Environment (DAWE).

State *Environmental Protection Act 1986*

The *Environmental Protection Act 1986* (EP Act) is the primary legislative Act dealing with the protection of the environment in Western Australia. The Act allows the Environmental Protection Authority (EPA), to prevent, control and abate pollution and environmental harm, for the conservation, preservation, protection, enhancement and management of the environment and for matters incidental to or connected with the foregoing. Part IV of the EP Act is administered by the EPA and makes provisions for the EPA to undertake environmental impact assessment of significant proposals, strategic proposals and land use planning schemes.

The Department of Water and Environment Regulation (DWER) is responsible for administering the clearing provisions of the EP Act (Part V). Clearing of native vegetation in Western Australia requires a permit from the DWER, unless exemptions apply. Applications for clearing permits are assessed by the Department and decisions are made to grant or refuse the application in accordance with the Act. When making a decision the assessment considers clearing against the ten clearing principles as specified in Schedule 5 of the EP Act:

a) Native vegetation should not be cleared if it comprises a high level of biodiversity.

b) Native vegetation should not be cleared if it comprises the whole or a part of, or is necessary for the maintenance of a significance habitat for fauna indigenous to Western Australia.

c) Native vegetation should not be cleared if it includes, or is necessary, for the continued existence of rare flora.

d) Native vegetation should not be cleared if it comprises the whole or part of native vegetation in an area that has been extensively cleared.

e) Native vegetation should not be cleared if it is significant as a remnant of native vegetation in an area that has been extensively cleared.

f) Native vegetation should not be cleared if it is growing in, or in association with, an environment associated with a watercourse or wetland.

g) Native vegetation should not be cleared if the clearing of the vegetation is likely to have an impact on the environmental values of any adjacent or nearby conservation area.

h) Native vegetation should not be cleared if the clearing of the vegetation is likely to cause appreciable land degradation.

i) Native vegetation should not be cleared if the clearing of the vegetation is likely to cause deterioration in the quality of surface or underground water.

j) Native vegetation should not be cleared if clearing the vegetation is likely to cause, or exacerbate, the incidence of flooding.

Exemptions for clearing include clearing that is a requirement of a written law or authorised under certain statutory processes (listed in Schedule 6 of the EP Act) and exemptions for prescribed low impact day-to-day activities (prescribed in the Environmental Protection (Clearing of Native Vegetation) Regulations 2004); these exemptions do not apply in environmentally sensitive areas (ESAs).

State *Biodiversity and Conservation Act 2016*

The *Biodiversity Conservation Act 2016* (BC Act) provides for the conservation and protection of biodiversity and biodiversity components, as well as the promotion of the ecologically sustainable use of biodiversity components in Western Australia. The BC Act replaces both the repealed *Wildlife Conservation Act 1950* (WC Act) and the *Sandalwood Act 1929* (Sandalwood Act), as well as their associated regulations. To attain the objectives of the BC Act, principles of ecological sustainable development have been established:

- Decision-making processes should effectively integrate both long-term and short-term economic, environmental, social and equitable considerations
- If there are threats of serious or irreversible environmental damage, lack of full scientific certainty should not be used as a reason for postponing measures to prevent environmental degradation
- The present generation should ensure that the health, diversity and productivity of the environment is maintained or enhanced for the benefit of future generations
- The conservation of biodiversity and ecological integrity should be a fundamental consideration indecision-making
- Improved valuation, pricing and incentive mechanisms should be promoted.

The BC Act is administered by the Department of Biodiversity Conservation and Attractions (DBCA).

State *Biosecurity and Agriculture Management Act 2007*

The *Biosecurity and Agriculture Management Act 2007* (BAM Act) and associated regulations are administered by the Department of Primary Industries and Regional Development (DPIRD) and replace the repealed *Agriculture and Related Resources Protection Act 1976.* The main purposes of the BAM Act and its regulations are to:

- Prevent new animal and plant pests (vermin and weeds) and diseases from entering WA
- Manage the impact and spread of those pests already present in the state
- Safely manage the use of agricultural and veterinary chemicals
- Increased control over the sale of agricultural products that contain violative chemical residues.

The Western Australian Organism List (WAOL) provides the status of organisms which have been categorised under the BAM Act. A Declared Pest is a prohibited organism or an organism for which a declaration under Section 22(2) of the Act is in force. Declared Pests may be assigned a control category including: C1 (exclusion), C2 (eradication) and C3 (management). The category may apply to the whole of the State, LGAs, districts, individual properties or even paddocks, and all landholders are obliged to comply with the specific category of control. Categories of control are defined below.

DPIRD Categories for Declared Pests under the BAM Act

Control class code	Description
C1 (Exclusion)	Pests will be assigned to this category if they are not established in Western Australia and control measures are to be taken, including border checks, in order to prevent them entering and establishing in the State.
C2 (Eradication)	Pests will be assigned to this category if they are present in Western Australia in low enough numbers or in sufficiently limited areas that their eradication is still a possibility.
C3 (Management)	Pests will be assigned to this category if they are established in Western Australia but it is feasible, or desirable, to manage them in order to limit their damage. Control measures can prevent a C3 pest from increasing in population size or density or moving from an area in which it is established into an area which currently is free of that pest.

Background information

Environmentally Sensitive Areas

Environmentally Sensitive Areas (ESAs) are declared by the Minister for Environment under Section 51B of the EP Act. The Table below outlines the aspects of areas declared as ESA in the Environmental Protection (Environmentally Sensitive Areas) Notice 2005.

Aspects of ESAs

Aspects of Environmentally Sensitive Areas
A declared World Heritage property as defined in Section 13 of the EPBC Act.
An area that is included on the Register of the National Estate (RNE), because of its natural values, under the *Australian Heritage Commission Act 1975* of the Commonwealth (the RNE was closed in 2007 and is no longer a statutory list – all references to the RNE were removed from the EPBC Act on 19 February 2012).
A defined wetland and the area within 50 m of the wetland. Defined wetlands include Ramsar wetlands, conservation category wetlands and nationally important wetlands.
The area covered by vegetation within 50 m of rare flora, to the extent to which the vegetation is continuous with the vegetation in which the rare flora is located.
The area covered by a Threatened Ecological Community.
A Bush Forever Site listed in "Bush Forever" Volumes 1 and 2 (2000), published by the Western Australia Planning Commission, except to the extent to which the site is approved to be developed by the Western Australia Planning Commission.
The areas covered by the *Environmental Protection (Gnangara Mound Crown Land) Policy 1992*.
The areas covered by the *Environmental Protection (Western Swamp Tortoise Habitat) Policy 2002*.
The areas covered by the lakes to which the *Environmental Protection (Swan Coastal Plain Lakes) Policy 1992* (EPP Lakes) applies.
Protected wetlands as defined in the *Environmental Protection (South West Agricultural Zone Wetlands) Policy 1998*.

Reserves and conservation areas

Department of Biodiversity, Conservation and Attractions managed lands and waters

DBCA manages lands and waters throughout Western Australia to conserve ecosystems and species, and to provide for recreation and appreciation of the natural environment. DBCA managed lands and waters include national parks, conservation parks and reserves, marine parks and reserves, regional parks, nature reserves, State forest and timber reserves. DBCA managed conservation estate, is vested with the Conservation Commission of Western Australia. Access to, or through, some areas of DBCA managed lands may require a permit or could be restricted due to management activities. Proposed land use changes and development proposals that abut DBCA managed lands will generally be referred to DBCA throughout the assessment process.

Wetlands

Wetlands include not only lakes with open water, but areas of seasonally, intermittently or permanently waterlogged soil.

Ramsar Listed Wetlands

The Convention of Wetlands of International Importance was signed in 1971 at the Iranian town of Ramsar. The Convention has since been referred to as the Ramsar Convention. Ramsar Listed wetlands are “sites containing representative, rare or unique wetlands, or wetlands that are important for conserving biological diversity … because of their ecological, botanical, zoological, limnological or hydrological importance” (DEE 2019b). Once a Ramsar Listed Wetland is designated, the country agrees to manage its conservation and ensure its wise use. Under the Convention, wise use is broadly defined as “maintaining the ecological character of a wetland” (DEE 2019b).

Nationally important wetlands

Wetlands of national significance are listed under the Directory of Important Wetlands in Australia. Nationally important wetlands are wetlands which meet at least one of the following criteria (DEE 2019a):

- It is a good example of a wetland type occurring within a biogeographic region in Australia
- It is a wetland which plays an important ecological or hydrological role in the natural functioning of a major wetland system/complex
- It is a wetland which is important as the habitat for animal taxa at a vulnerable stage in their life cycles, or provides a refuge when adverse conditions such as drought prevail
- The wetland supports one percent or more of the national populations of any native plant or animal taxa
- The wetland supports native plant or animal taxa or communities which are considered endangered or vulnerable at the national level
- The wetland is of outstanding historical or cultural significance

Vegetation extent and status

The National Objectives and Targets for Biodiversity Conservation 2001–2005 (Commonwealth of Australia 2001) recognise that the retention of 30 percent or more of the pre-clearing extent of each ecological community is necessary if Australia’s biological diversity is to be protected. This is the threshold level below which species loss appears to accelerate exponentially and loss below this level should not be permitted. This level of recognition is in keeping with the targets recommended in the review of the National Strategy for the Conservation of Australia’s Biological Diversity (ANZECC 2000).

The extent of remnant native vegetation in WA has been assessed by Shepherd et al. (2002) and the GoWA (2018), based on broadscale vegetation association mapping by Beard (various publications). The GoWA produces Statewide Vegetation Statistics Reports that are used for a number of purposes including conservation planning, land use planning and when assessing development applications. The reports are updated at least every two years.

Vegetation condition

The vegetation condition can be assessed in accordance with the vegetation condition rating scale for the South West and Interzone Botanical Provinces (EPA 2016a). The scale recognises the intactness of vegetation and consists of six rating levels as outlined below.

Vegetation condition rating scale for the South West and Interzone Botanical Provinces

Condition	South West and Interzone Botanical Provinces description
Pristine	Pristine or nearly so, no obvious signs of damage caused by human activities since European settlement.
Excellent	Vegetation structure intact, disturbance affecting individual species and weeds are non-aggressive species. Damage to trees caused by fire, the presence of non-aggressive weeds and occasional vehicle tracks.
Very Good	Vegetation structure altered, obvious signs of disturbance. Disturbance to vegetation structure caused by repeated fires, the presence of some more aggressive weeds, dieback, logging and grazing.
Good	Vegetation structure significantly altered by very obvious signs of multiple disturbances. Retains basic vegetation structure or ability to regenerate it. Disturbance to vegetation structure caused by very frequent fires, the presence of very aggressive weeds, partial clearing, dieback and grazing.
Degraded	Basic vegetation structure severely impacted by disturbance. Scope for regeneration but not to a state approaching good condition without intensive management. Disturbance to vegetation structure caused by very frequent fires, the presence of very aggressive weeds at high density, partial clearing, dieback and grazing.
Completely Degraded	The structure of 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 or shrubs.

Conservation codes

Species of significant flora, fauna and communities are protected under both Federal and State Acts. The Federal EPBC Act provides a legal framework to protect and manage nationally important flora and communities. The State BC Act is the primary wildlife conservation legislation in Western Australia. Information on the conservation codes is summarised in the following sections.

Ecological communities

Conservation significant communities

Ecological communities are defined as naturally occurring biological assemblages that occur in a particular type of habitat (English and Blyth 1997). Federally listed Threatened Ecological Communities (TECs) are protected under the EPBC Act. The BC Act provides for the Minister to list an ecological community as a TEC (section 27), or as a collapsed ecological community (section 31) statutory listing of State TECs by the Minister. The legislation also describes statutory processes for preparing recovery plans for TECs, the registration of their critical habitat, and penalties for unauthorised modification of TECs.

Possible TECs that do not meet survey criteria are added to the DBCA Priority Ecological Community (PEC) List under Priorities 1, 2 and 3. These are ecological communities that are adequately known; are rare but not threatened, or meet criteria for Near Threatened. PECs that have been recently removed from the threatened list are placed in Priority 4. These ecological communities require regular monitoring. Conservation dependent ecological communities are placed in Priority 5. PECs are not listed under any formal Federal or State legislation, however, may be listed as TECs under the EPBC Act.

Conservation codes and definitions for TECs listed under the EPBC Act and/ or BC Act

Categories	Definition
Federal Government Conservation Categories (EPBC Act)	
Critically Endangered (CR)	An ecological community if, at that time, is facing an extremely high risk of extinction in the wild in the immediate future, as determined in accordance with the prescribed criteria (as outlined in Environment Protection and Biodiversity Conservation Regulations 2000)
Endangered (EN)	An ecological community if, at that time: A) is not critically endangered; and B) is facing a very high risk of extinction in the wild in the near future, as determined in accordance with the prescribed criteria (as outlined in Environment Protection and Biodiversity Conservation Regulations 2000)
Vulnerable (VU)	An ecological community if, at that time: A) is not critically endangered or endangered; and B) is facing a high risk of extinction in the wild in the medium-term future, as determined in accordance with the prescribed criteria (as outlined in Environment Protection and Biodiversity Conservation Regulations 2000)
Western Australia Conservation Categories (BC Act)	
Threatened Ecological Communities	

Categories	Definition
Critically Endangered (CR)	An ecological community that has been adequately surveyed and found to have been subject to a major contraction in area and/or that was originally of limited distribution and is facing severe modification or destruction throughout its range in the immediate future, or is already severely degraded throughout its range but capable of being substantially restored or rehabilitated.
Endangered (EN)	An ecological community that has been adequately surveyed and found to have been subject to a major contraction in area and/or was originally of limited distribution and is in danger of significant modification throughout its range or severe modification or destruction over most of its range in the near future.
Vulnerable (VU)	An ecological community that has been adequately surveyed and is found to be declining and/or has declined in distribution and/or condition and whose ultimate security has not yet been assured and/or a community that is still widespread but is believed likely to move into a category of higher threat in the near future if threatening processes continue or begin operating throughout its range.
Collapsed ecological communities	
An ecological community is eligible for listing as a collapsed ecological community at a particular time if, at that time – (a) there is no reasonable doubt that the last occurrence of the ecological community has collapsed); or (b) the ecological community has been so extensively modified throughout its range that no occurrence of it is likely to recover – (i) its species composition or structure; or (ii) its species composition and structure. Section 33 of the BC Act provides for a collapsed ecological community to be regarded as a threatened ecological community if it is discovered in a state that no longer makes it eligible for listing as a collapsed ecological community.	

Conservation categories and definitions for PECS as listed by the DBCA

Category	Description
Priority 1	Poorly known ecological communities. Ecological communities that are known from very few occurrences with a very restricted distribution (generally ≤5 occurrences or a total area of ≤100 ha). Occurrences are believed to be under threat either due to limited extent, or being on lands under immediate threat (e.g. within agricultural or pastoral lands, urban areas, active mineral leases) or for which current threats exist. May include communities with occurrences on protected lands. Communities may be included if they are comparatively well-known from one or more localities but do not meet adequacy of survey requirements, and/or are not well defined, and appear to be under immediate threat from known threatening processes across their range.
Priority 2	Poorly known ecological communities. Communities that are known from few occurrences with a restricted distribution (generally ≤10 occurrences or a total area of ≤200 ha). At least some occurrences are not believed to be under immediate threat of destruction or degradation. Communities may be included if they are comparatively well known from one or more localities but do not meet adequacy of survey requirements, and/or are not well defined, and appear to be under threat from known threatening processes.

Category	Description
Priority 3	Poorly known ecological communities. (i) Communities that are known from several to many occurrences, a significant number or area of which are not under threat of habitat destruction or degradation or: (ii) communities known from a few widespread occurrences, which are either large or with significant remaining areas of habitat in which other occurrences may occur, much of it not under imminent threat, or; (iii) communities made up of large, and/or widespread occurrences, that may or may not be represented in the reserve system, but are under threat of modification across much of their range from processes such as grazing by domestic and/or feral stock, and inappropriate fire regimes. Communities may be included if they are comparatively well known from several localities but do not meet adequacy of survey requirements and/or are not well defined, and known threatening processes exist that could affect them.
Priority 4	Ecological communities that are adequately known, rare but not threatened or meet criteria for Near Threatened, or that have been recently removed from the threatened list. These communities require regular monitoring. (i) Rare. Ecological communities known from few occurrences that are considered to have been adequately surveyed, or for which sufficient knowledge is available, and that are considered not currently threatened or in need of special protection, but could be if present circumstances change. These communities are usually represented on conservation lands. (ii) Near Threatened. Ecological communities that are considered to have been adequately surveyed and that do not qualify for Conservation Dependent, but that are close to qualifying for Vulnerable. (iii) Ecological communities that have been removed from the list of threatened communities during the past five years.
Priority 5	Conservation Dependent ecological communities. Ecological communities that are not threatened but are subject to a specific conservation program, the cessation of which would result in the community becoming threatened within five years.

Other significant vegetation

Vegetation may be significant for a range of reasons other than a statutory listing. The EPA (2016b) states that significant vegetation may include vegetation that includes the following:

- Restricted distribution
- Degree of historical impact from threatening processes
- Local endemism in restricted habitats
- Novel combinations of taxa
- A role as a refuge
- A role as a key habitat for Threatened species or large population representing a significant proportion of the local to regional total population of a species
- Being representative of a vegetation unit in ‘pristine’ condition in a highly cleared landscape, recently discovered range extensions, or isolated outliers of the main range)
- Being poorly reserved.

This may apply at a number of levels, so the unit may be significant when considered at the fine-scale (intra-locality), intermediate-scale (locality or inter-locality) or broad-scale (local to region).

Flora and fauna

Conservation significant flora and fauna

Species of significant flora are protected under both Federal and State legislation. Any activities that are deemed to have a significant impact on species that are recognised by the EPBC Act, and/or the BC Act can warrant referral to the DEE and/or the EPA.

The Federal conservation level of flora and fauna species and their significance status is assessed under the EPBC Act. The significance levels for flora and fauna used in the EPBC Act align with the International Union for Conservation of Nature (IUCN) Red List criteria, which are internationally recognised as providing best practice for assigning the conservation status of species. The EPBC Act also protects land and migratory species that are listed under International Agreements. The list of migratory species established under section 209 of the EPBC Act comprises:

- Migratory species which are native to Australia and are included in the appendices to the Bonn Convention (Convention on the Conservation of Migratory Species of Wild Animals Appendices I and II)
- Migratory species included in annexes established under the Japan-Australia Migratory Bird Agreement (JAMBA) and the China–Australia Migratory Bird Agreement (CAMBA)
- Native, migratory species identified in a list established under, or an instrument made under, an international agreement approved by the Minister, such as the republic of Korea–Australia Migratory Bird Agreement (ROKAMBA)

The State conservation level of flora and fauna species and their significance status also follows the IUCN Red List criteria. Under the BC Act flora and fauna can be listed as Threatened, Extinct and as Specially Protected species.

Threatened species are those are species which have been adequately searched for and are deemed to be, in the wild, either rare, under identifiable threat of extinction, or otherwise in need of special protection, and have been gazetted as such. The assessment of the conservation status of Threatened species is based on their national extent and ranked according to their level of threat using IUCN Red List categories and criteria. Specially protected species meet 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 or Extinct species under the BC Act cannot also be listed as Specially Protected 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 flora or fauna.

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.

For the purposes of this assessment, all species listed under the EPBC Act, BC Act and DBCA Priority species are considered conservation significant.

Conservation categories and definitions for EPBC Act and BC Act listed flora and fauna species

Conservation category	Definition
Threatened species	
Critically Endangered (CR)	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.
Endangered (EN)	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
Vulnerable (VU)	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.

Conservation codes for DBCA listed Priority flora and fauna

Priority category	Definition
Priority 1	Poorly-known taxa 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 taxa 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 taxa 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

Priority category	Definition
	known threatening processes exist that could affect them. Such species are in need of further survey.
Priority 4	Rare, Near Threatened and other taxa in need of monitoring A. Rare: Taxa 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 taxa are usually represented on conservation lands. B. Near Threatened. Taxa that are considered to have been adequately surveyed and that do not qualify for Conservation Dependent, but that are close to qualifying for Vulnerable. C. Taxa that have been removed from the list of threatened taxa during the past five years for reasons other than taxonomy.

Other significant flora

Flora species, subspecies, varieties, hybrids and ecotypes may be significant for a range of reasons, other than a statutory listing. The EPA (2016b) states that significant flora may include taxa that have:

- A keystone role in a particular habitat for threatened or Priority flora or fauna species, or large populations representing a considerable proportion of the local or regional total population of a species
- Relictual status, being representation of taxonomic or physiognomic groups that no longer occur widely in the broader landscape
- Anomalous features that indicate a potential new discovery
- Being representative of the range of a species (particularly, at the extremes of range, recently discovered range extensions, or isolated outliers of the main range)
- The presence of restricted subspecies, varieties, or naturally occurring hybrids
- Local endemism (a restricted distribution) or association with a restricted habitat type (e.g. surface water or groundwater dependent ecosystems)
- Being poorly reserved

Introduced plants (weeds)

Declared Pests

Information on species considered to be Declared Pests is provided under *State Biosecurity and Agriculture Management Act 2007.*

Weeds of National Significance

The spread of weeds across a range of land uses or ecosystems is important in the context of socio-economic and environmental values. The assessment of Weeds of National Significance (WoNS) is based on four major criteria:

- Invasiveness
- Impacts
- Potential for spread
- Socio-economic and environmental values

Australian state and territory governments have identified thirty-two Weeds of National Significance (WoNS); a list of 20 WoNS was endorsed in 1999 and a further 12 were added in 2012.

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Appendix C – Desktop searches

EPBC Act PMST (20 km)

NatureMap Flora report (20 km)

Australian Government
Department of the Environment and Energy

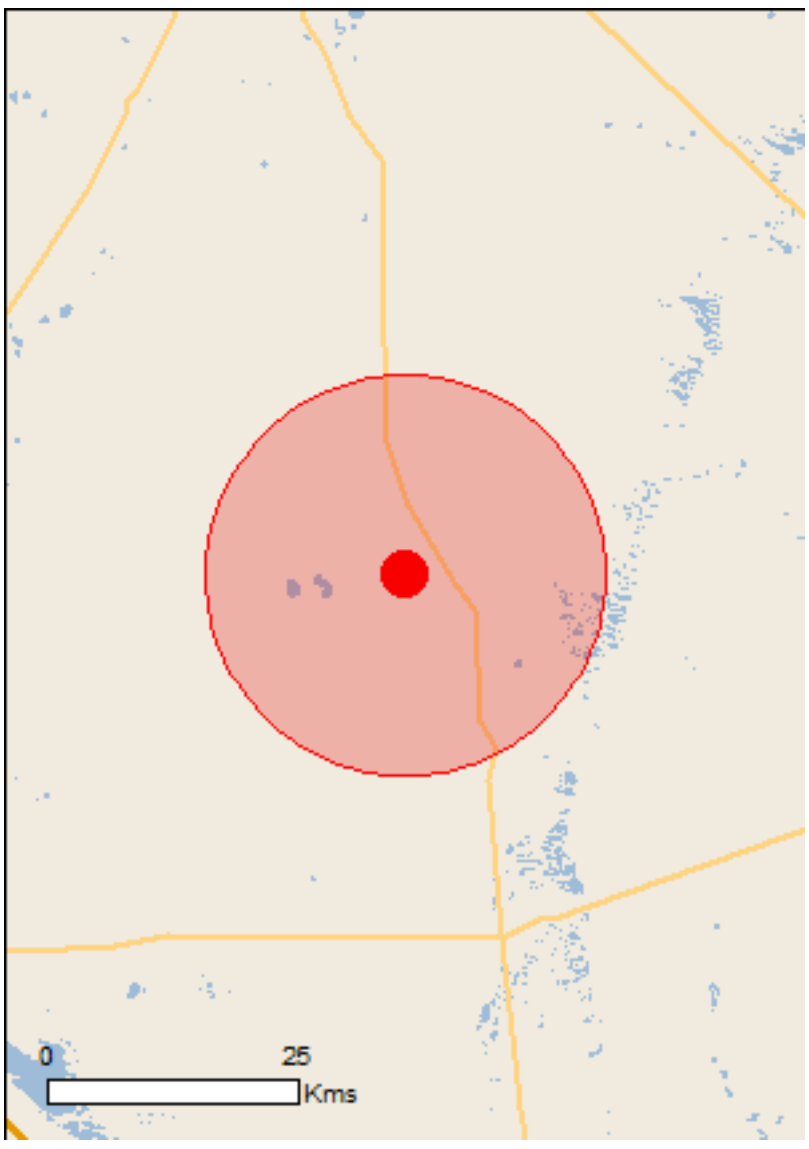
EPBC Act Protected Matters Report

This report provides general guidance on matters of national environmental significance and other matters protected by the EPBC Act in the area you have selected.

Information on the coverage of this report and qualifications on data supporting this report are contained in the caveat at the end of the report.

Information is available about Environment Assessments and the EPBC Act including significance guidelines, forms and application process details.

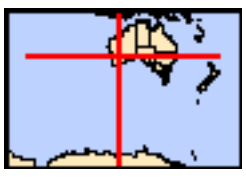
Report created: 17/01/20 14:15:47



This map may contain data which are ©Commonwealth of Australia (Geoscience Australia), ©PSMA 2010

Coordinates

Buffer: 20.0Km



Summary

Matters of National Environmental Significance

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

World Heritage Properties:	None
National Heritage Places:	None
Wetlands of International Importance:	None
Great Barrier Reef Marine Park:	None
Commonwealth Marine Area:	None
Listed Threatened Ecological Communities:	1
Listed Threatened Species:	11
Listed Migratory Species:	6

Other Matters Protected by the EPBC Act

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

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

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

Commonwealth Land:	None
Commonwealth Heritage Places:	None
Listed Marine Species:	11
Whales and Other Cetaceans:	None
Critical Habitats:	None
Commonwealth Reserves Terrestrial:	None
Australian Marine Parks:	None

Extra Information

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

State and Territory Reserves:	1
Regional Forest Agreements:	None
Invasive Species:	11
Nationally Important Wetlands:	None
Key Ecological Features (Marine)	None

Details

Matters of National Environmental Significance

Listed Threatened Ecological Communities [Resource Information]

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

Name	Status	Type of Presence
Eucalypt Woodlands of the Western Australian Wheatbelt	Critically Endangered	Community likely to occur within area

Listed Threatened Species [Resource Information]

Name	Status	Type of Presence
Birds		
Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	Species or species habitat may occur within area
Calyptorhynchus latirostris Carnaby's Cockatoo, Short-billed Black-Cockatoo [59523]	Endangered	Breeding likely to occur within area
Leipoa ocellata Malleefowl [934]	Vulnerable	Species or species habitat known to occur within area
Mammals		
Dasyurus geoffroii Chuditch, Western Quoll [330]	Vulnerable	Species or species habitat may occur within area
Phascogale calura Red-tailed Phascogale, Red-tailed Wambenger, Kenngoor [316]	Vulnerable	Species or species habitat likely to occur within area
Plants		
Acacia lanuginophylla Woolly Wattle [55575]	Endangered	Species or species habitat known to occur within area
Acacia lobulata Chiddarcooping Wattle [55567]	Endangered	Species or species habitat may occur within area
Banksia sphaerocarpa var. dolichostyla Ironcaps Banksia, Ironcap Banksia [10518]	Vulnerable	Species or species habitat known to occur within area
Eucalyptus steedmanii Steedmans Gum [15393]	Vulnerable	Species or species habitat known to occur within area
Paragoodia crenulata [86387]	Critically Endangered	Species or species habitat likely to occur within area

Name	Status	Type of Presence
[Roycea pycnophylloides](#) Saltmat [21161]	Endangered	Species or species habitat likely to occur within area

Listed Migratory Species [Resource Information]

* Species is listed under a different scientific name on the EPBC Act - Threatened Species list.

Name	Threatened	Type of Presence
Migratory Marine Birds		
[Apus pacificus](#) Fork-tailed Swift [678]		Species or species habitat likely to occur within area
Migratory Terrestrial Species		
[Motacilla cinerea](#) Grey Wagtail [642]		Species or species habitat may occur within area
Migratory Wetlands Species		
[Actitis hypoleucos](#) Common Sandpiper [59309]		Species or species habitat may occur within area
[Calidris acuminata](#) Sharp-tailed Sandpiper [874]		Species or species habitat may occur within area
[Calidris ferruginea](#) Curlew Sandpiper [856]	Critically Endangered	Species or species habitat may occur within area
[Calidris melanotos](#) Pectoral Sandpiper [858]		Species or species habitat may occur within area

Other Matters Protected by the EPBC Act

Listed Marine Species [Resource Information]

* Species is listed under a different scientific name on the EPBC Act - Threatened Species list.

Name	Threatened	Type of Presence
Birds		
[Actitis hypoleucos](#) Common Sandpiper [59309]		Species or species habitat may occur within area
[Apus pacificus](#) Fork-tailed Swift [678]		Species or species habitat likely to occur within area
[Ardea alba](#) Great Egret, White Egret [59541]		Species or species habitat likely to occur within area
[Ardea ibis](#) Cattle Egret [59542]		Species or species habitat may occur within area
[Calidris acuminata](#) Sharp-tailed Sandpiper [874]		Species or species habitat may occur within area
[Calidris ferruginea](#) Curlew Sandpiper [856]	Critically Endangered	Species or species habitat may occur within area

Name	Threatened	Type of Presence
Calidris melanotos		
Pectoral Sandpiper [858]		Species or species habitat may occur within area
Chrysococcyx osculans		
Black-eared Cuckoo [705]		Species or species habitat known to occur within area
Merops ornatus		
Rainbow Bee-eater [670]		Species or species habitat may occur within area
Motacilla cinerea		
Grey Wagtail [642]		Species or species habitat may occur within area
Thinornis rubricollis		
Hooded Plover [59510]		Species or species habitat may occur within area

Extra Information

State and Territory Reserves	[Resource Information]
Name	State
Jilbadji	WA

Invasive Species	[Resource Information]

Weeds reported here are the 20 species of national significance (WoNS), along with other introduced plants that are considered by the States and Territories to pose a particularly significant threat to biodiversity. The following feral animals are reported: Goat, Red Fox, Cat, Rabbit, Pig, Water Buffalo and Cane Toad. Maps from Landscape Health Project, National Land and Water Resouces Audit, 2001.

Name	Status	Type of Presence
Birds		
Columba livia		
Rock Pigeon, Rock Dove, Domestic Pigeon [803]		Species or species habitat likely to occur within area
Mammals		
Camelus dromedarius		
Dromedary, Camel [7]		Species or species habitat likely to occur within area
Canis lupus familiaris		
Domestic Dog [82654]		Species or species habitat likely to occur within area
Capra hircus		
Goat [2]		Species or species habitat likely to occur within area
Felis catus		
Cat, House Cat, Domestic Cat [19]		Species or species habitat likely to occur within area
Mus musculus		
House Mouse [120]		Species or species habitat likely to occur within area
Oryctolagus cuniculus		
Rabbit, European Rabbit [128]		Species or species habitat likely to occur within area
Sus scrofa		
Pig [6]		Species or species habitat likely to occur within area

Name	Status	Type of Presence
Vulpes vulpes Red Fox, Fox [18]		Species or species habitat likely to occur within area
Plants		
Carrichtera annua Ward's Weed [9511]		Species or species habitat likely to occur within area
Tamarix aphylla Athel Pine, Athel Tree, Tamarisk, Athel Tamarisk, Athel Tamarix, Desert Tamarisk, Flowering Cypress, Salt Cedar [16018]		Species or species habitat likely to occur within area

Caveat

The information presented in this report has been provided by a range of data sources as acknowledged at the end of the report.

This report is designed to assist in identifying the locations of places which may be relevant in determining obligations under the Environment Protection and Biodiversity Conservation Act 1999. It holds mapped locations of World and National Heritage properties, Wetlands of International and National Importance, Commonwealth and State/Territory reserves, listed threatened, migratory and marine species and listed threatened ecological communities. Mapping of Commonwealth land is not complete at this stage. Maps have been collated from a range of sources at various resolutions.

Not all species listed under the EPBC Act have been mapped (see below) and therefore a report is a general guide only. Where available data supports mapping, the type of presence that can be determined from the data is indicated in general terms. People using this information in making a referral may need to consider the qualifications below and may need to seek and consider other information sources.

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

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

Where very little information is available for species or large number of maps are required in a short time-frame, maps are derived either from 0.04 or 0.02 decimal degree cells; by an automated process using polygon capture techniques (static two kilometre grid cells, alpha-hull and convex hull); or captured manually or by using topographic features (national park boundaries, islands, etc). In the early stages of the distribution mapping process (1999-early 2000s) distributions were defined by degree blocks, 100K or 250K map sheets to rapidly create distribution maps. More reliable distribution mapping methods are used to update these distributions as time permits.

Only selected species covered by the following provisions of the EPBC Act have been mapped:

- migratory and
- marine

The following species and ecological communities have not been mapped and do not appear in reports produced from this database:

- threatened species listed as extinct or considered as vagrants
- some species and ecological communities that have only recently been listed
- some terrestrial species that overfly the Commonwealth marine area
- migratory species that are very widespread, vagrant, or only occur in small numbers

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

- non-threatened seabirds which have only been mapped for recorded breeding sites
- seals which have only been mapped for breeding sites near the Australian continent

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

Coordinates

-32.14119 119.66856

Acknowledgements

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

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

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

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

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NatureMap
Mapping Western Australia's biodiversity

Mt Holland 20 km

Created By Guest user on 22/11/2019

Current Names Only	Yes
Core Datasets Only	Yes
Method	'By Circle'
Centre	119° 39' 45" E,32° 07' 44" S
Buffer	20km
Group By	Kingdom

Kingdom	Species	Records
Animalia	165	2348
Plantae	477	1537
TOTAL	**642**	**3885**

	Name ID	Species Name	Naturalised	Conservation Code	[1]Endemic To Query Area
Animalia					
1.	24559	*Acanthagenys rufogularis (Spiny-cheeked Honeyeater)*			
2.	24260	*Acanthiza apicalis (Broad-tailed Thornbill, Inland Thornbill)*			
3.	24265	*Acanthiza uropygialis (Chestnut-rumped Thornbill)*			
4.	25535	*Accipiter cirrocephalus (Collared Sparrowhawk)*			
5.	25544	*Aegotheles cristatus (Australian Owlet-nightjar)*			
6.	33902	*Aganippe castellum (Tree-stem Trapdoor Spider)*		P4	
7.	24312	*Anas gracilis (Grey Teal)*			
8.	44629	*Anilios australis*			
9.	44631	*Anilios bituberculatus*			
10.	24561	*Anthochaera carunculata (Red Wattlebird)*			
11.	25670	*Anthus australis (Australian Pipit)*			
12.	24285	*Aquila audax (Wedge-tailed Eagle)*			
13.	25566	*Artamus cinereus (Black-faced Woodswallow)*			
14.	24353	*Artamus cyanopterus (Dusky Woodswallow)*			
15.	47713	*Austronomus australis (White-striped Free-tailed Bat)*			
16.	25715	*Cacatua roseicapilla (Galah)*			
17.	25598	*Cacomantis flabelliformis (Fan-tailed Cuckoo)*			
18.	42307	*Cacomantis pallidus (Pallid Cuckoo)*			
19.	24086	*Cercartetus concinnus (Western Pygmy-possum, Mundarda)*			
20.	24186	*Chalinolobus gouldii (Gould's Wattled Bat)*			
21.	24187	*Chalinolobus morio (Chocolate Wattled Bat)*			
22.	24321	*Chenonetta jubata (Australian Wood Duck, Wood Duck)*			
23.	47909	*Cheramoeca leucosterna (White-backed Swallow)*			
24.	24431	*Chrysococcyx basalis (Horsfield's Bronze Cuckoo)*			
25.	24434	*Chrysococcyx osculans (Black-eared Cuckoo)*			
26.	47910	*Cinclosoma clarum (Western Chestnut Quail-thrush, Copperback Quail-thrush)*			
27.	24289	*Circus assimilis (Spotted Harrier)*			
28.	47915	*Climacteris rufus (Black-tailed Treecreeper)*			
29.	25675	*Colluricincla harmonica (Grey Shrike-thrush)*			
30.	25568	*Coracina novaehollandiae (Black-faced Cuckoo-shrike)*			
31.	25592	*Corvus coronoides (Australian Raven)*			
32.	24671	*Coturnix pectoralis (Stubble Quail)*			
33.	25595	*Cracticus tibicen (Australian Magpie)*			
34.	25596	*Cracticus torquatus (Grey Butcherbird)*			
35.	25456	*Crenadactylus ocellatus (Clawless Gecko)*			
36.	24918	*Crenadactylus ocellatus subsp. ocellatus (Clawless Gecko)*			
37.	25401	*Crinia pseudinsignifera (Bleating Froglet)*			
38.	30893	*Cryptoblepharus buchananii*			
39.	24871	*Ctenophorus cristatus (Bicycle Dragon)*			
40.	25460	*Ctenophorus maculatus (Spotted Military Dragon)*			
41.	24883	*Ctenophorus ornatus (Ornate Crevice-Dragon)*			
42.	24888	*Ctenophorus salinarum (Salt Pan Dragon)*			
43.	25026	*Ctenotus atlas*			
44.	25047	*Ctenotus impar*			

	Name ID	Species Name	Naturalised	Conservation Code	[1]Endemic To Query Area
45.	25054	*Ctenotus mimetes*			
46.	25074	*Ctenotus schomburgkii*			
47.	25465	*Ctenotus uber (Spotted Ctenotus)*			
48.	24322	*Cygnus atratus (Black Swan)*			
49.	25673	*Daphoenositta chrysoptera (Varied Sittella)*			
50.	24092	*Dasyurus geoffroii (Chuditch, Western Quoll)*		T	
51.	24995	*Delma australis*			
52.	25766	*Delma fraseri (Fraser's Legless Lizard)*			
53.	25607	*Dicaeum hirundinaceum (Mistletoebird)*			
54.	41403	*Diplodactylus calcicolus (South Coast Gecko)*			
55.	25469	*Diplodactylus granariensis*			
56.	24929	*Diplodactylus granariensis subsp. granariensis*			
57.	24470	*Dromaius novaehollandiae (Emu)*			
58.	24650	*Drymodes brunneopygia (Southern Scrub-robin)*			
59.	25104	*Egernia richardi*			
60.	24651	*Eopsaltria australis subsp. griseogularis (Western Yellow Robin)*			
61.	24368	*Eurostopodus argus (Spotted Nightjar)*			
62.	25621	*Falco berigora (Brown Falcon)*			
63.	25622	*Falco cenchroides (Australian Kestrel, Nankeen Kestrel)*			
64.	25623	*Falco longipennis (Australian Hobby)*			
65.	25624	*Falco peregrinus (Peregrine Falcon)*		S	
66.	24041	*Felis catus (Cat)*	Y		
67.	42314	*Gavicalis virescens (Singing Honeyeater)*			
68.	24959	*Gehyra variegata*			
69.	25530	*Gerygone fusca (Western Gerygone)*			
70.	47962	*Glyciphila melanops (Tawny-crowned Honeyeater)*			
71.	24295	*Haliastur sphenurus (Whistling Kite)*			
72.	25474	*Hemiergis initialis*			
73.	42408	*Hesperoedura reticulata*			
74.	47965	*Hieraaetus morphnoides (Little Eagle)*			
75.	24491	*Hirundo neoxena (Welcome Swallow)*			
76.	24277	*Hylacola cauta (Shy Groundwren, Shy Heathwren)*			
77.	34001	*Hylacola cauta subsp. whitlocki (Shy Groundwren)*			
78.	24367	*Lalage tricolor (White-winged Triller)*			
79.	24557	*Leipoa ocellata (Malleefowl)*		T	
80.	25131	*Lerista distinguenda*			
81.	24573	*Lichenostomus cratitius (Purple-gaped Honeyeater)*			
82.	25659	*Lichenostomus leucotis (White-eared Honeyeater)*			
83.	25661	*Lichmera indistincta (Brown Honeyeater)*			
84.	41413	*Liopholis multiscutata (Bull Skink)*			
85.	30935	*Lucasium maini*			
86.	24132	*Macropus fuliginosus (Western Grey Kangaroo)*			
87.	24551	*Malurus pulcherrimus (Blue-breasted Fairy-wren)*			
88.	24583	*Manorina flavigula (Yellow-throated Miner)*			
89.	47997	*Melanodryas cucullata (Hooded Robin)*			
90.	25663	*Melithreptus brevirostris (Brown-headed Honeyeater)*			
91.	25184	*Menetia greyii*			
92.	24598	*Merops ornatus (Rainbow Bee-eater)*			
93.	25693	*Microeca fascinans (Jacky Winter)*			
94.	24904	*Moloch horridus (Thorny Devil)*			
95.	25494	*Morelia spilota (Carpet Python)*			
96.	25240	*Morelia spilota subsp. imbricata (Carpet Python)*			
97.	25190	*Morethia butleri*			
98.	25192	*Morethia obscura*			
99.	24223	*Mus musculus (House Mouse)*	Y		
100.	25610	*Myiagra inquieta (Restless Flycatcher)*			
101.	25421	*Neobatrachus albipes (White-footed Trilling Frog)*			
102.	25425	*Neobatrachus kunapalari (Kunapalari Frog)*			
103.	25426	*Neobatrachus pelobatoides (Humming Frog)*			
104.	25427	*Neobatrachus sutor (Shoemaker Frog)*			
105.	24738	*Neophema elegans (Elegant Parrot)*			
106.	24970	*Nephrurus stellatus*			
107.	24096	*Ningaui yvonneae (Southern Ningaui)*			
108.	48016	*Ninox boobook (Boobook Owl)*			
109.	24229	*Notomys mitchellii (Mitchell's Hopping-mouse)*			
110.	24407	*Ocyphaps lophotes (Crested Pigeon)*			
111.	24618	*Oreoica gutturalis (Crested Bellbird)*			
112.	24085	*Oryctolagus cuniculus (Rabbit)*	Y		
113.	24619	*Pachycephala inornata (Gilbert's Whistler)*			
114.	48046	*Pachycephala occidentalis (Western Golden Whistler, Western Whistler)*			

	Name ID	Species Name	Naturalised	Conservation Code	[1]Endemic To Query Area
115.	25680	*Pachycephala rufiventris (Rufous Whistler)*			
116.	25253	*Parasuta gouldii*			
117.	25681	*Pardalotus punctatus (Spotted Pardalote)*			
118.	25682	*Pardalotus striatus (Striated Pardalote)*			
119.	25246	*Paroplocephalus atriceps (Lake Cronin Snake)*		P3	
120.	48055	*Parvipsitta porphyrocephala (Purple-crowned Lorikeet)*			Y
121.	48061	*Petrochelidon nigricans (Tree Martin)*			
122.	24659	*Petroica goodenovii (Red-capped Robin)*			
123.	24409	*Phaps chalcoptera (Common Bronzewing)*			
124.	25587	*Phaps elegans (Brush Bronzewing)*			
125.	48071	*Phylidonyris niger (White-cheeked Honeyeater)*			
126.	24596	*Phylidonyris novaehollandiae (New Holland Honeyeater)*			
127.	25720	*Platycercus icterotis (Western Rosella)*			
128.	25721	*Platycercus zonarius (Australian Ringneck, Ring-necked Parrot)*			
129.	25703	*Podargus strigoides (Tawny Frogmouth)*			
130.	25510	*Pogona minor (Dwarf Bearded Dragon)*			
131.	24907	*Pogona minor subsp. minor (Dwarf Bearded Dragon)*			
132.	25722	*Polytelis anthopeplus (Regent Parrot)*			
133.	24683	*Pomatostomus superciliosus (White-browed Babbler)*			
134.	24230	*Pseudomys albocinereus (Ash-grey Mouse)*			
135.	25511	*Pseudonaja affinis (Dugite)*			
136.	25434	*Pseudophryne occidentalis (Western Toadlet)*			
137.	48087	*Ptilotula ornata (Yellow-plumed Honeyeater)*			
138.	42344	*Purnella albifrons (White-fronted Honeyeater)*			
139.	25008	*Pygopus lepidopodus (Common Scaly Foot)*			
140.	24278	*Pyrrholaemus brunneus (Redthroat)*			
141.	48096	*Rhipidura albiscapa (Grey Fantail)*			
142.	25614	*Rhipidura leucophrys (Willie Wagtail)*			
143.	24199	*Scotorepens balstoni (Inland Broad-nosed Bat)*			
144.	25534	*Sericornis frontalis (White-browed Scrubwren)*			
145.	30948	*Smicrornis brevirostris (Weebill)*			
146.	24109	*Sminthopsis dolichura (Little long-tailed Dunnart)*			
147.	24111	*Sminthopsis gilberti (Gilbert's Dunnart)*			
148.	24112	*Sminthopsis granulipes (White-tailed Dunnart)*			
149.	24117	*Sminthopsis ooldea (Ooldea Dunnart)*			
150.	25597	*Strepera versicolor (Grey Currawong)*			
151.	25518	*Strophurus spinigerus*			
152.	24943	*Strophurus spinigerus subsp. inornatus*			
153.	24207	*Tachyglossus aculeatus (Short-beaked Echidna)*			
154.	25203	*Tiliqua occipitalis (Western Bluetongue)*			
155.	25519	*Tiliqua rugosa*			
156.	25549	*Todiramphus sanctus (Sacred Kingfisher)*			
157.	48147	*Turnix varius (Painted Button-quail)*			
158.	24851	*Turnix velox (Little Button-quail)*			
159.	24983	*Underwoodisaurus milii (Barking Gecko)*			
160.		*Urodacus novaehollandiae*			
161.	25218	*Varanus gouldii (Bungarra or Sand Monitor)*			
162.	25225	*Varanus rosenbergi (Heath Monitor)*			
163.	24202	*Vespadelus baverstocki (Inland Forest Bat)*			
164.	24206	*Vespadelus regulus (Southern Forest Bat)*			
165.	24040	*Vulpes vulpes (Red Fox)*	Y		
Plantae					
166.	3200	*Acacia acuminata (Jam, Mangard)*			
167.	3201	*Acacia acutata*			
168.	14052	*Acacia asepala*		P2	
169.	15467	*Acacia assimilis subsp. assimilis*			
170.	3236	*Acacia beauverdiana (Pukkati)*			
171.	3240	*Acacia binata*			
172.	3251	*Acacia camptoclada*			
173.	14057	*Acacia castanostegia*			
174.	12253	*Acacia consobrina*			
175.	3269	*Acacia coolgardiensis (Spinifex Wattle)*			
176.	20435	*Acacia daphnifolia*			
177.	16169	*Acacia deficiens*			
178.	3292	*Acacia densiflora*			
179.	3324	*Acacia erinacea*			
180.	16123	*Acacia evenulosa*			
181.	16128	*Acacia hadrophylla*			
182.	3366	*Acacia hemiteles*			
183.	3369	*Acacia heteroneura*			

	Name ID	Species Name	Naturalised	Conservation Code	[1]Endemic To Query Area
184.	15284	*Acacia heteroneura var. heteroneura*			
185.	15285	*Acacia heteroneura var. jutsonii*			
186.	15604	*Acacia hystrix subsp. hystrix*			
187.	3389	*Acacia intricata*			
188.	3393	*Acacia jennerae*			
189.	12261	*Acacia lanuginophylla*		T	
190.	3440	*Acacia merrallii*			
191.	3451	*Acacia multispicata*			
192.	16133	*Acacia mutabilis subsp. angustifolia*			
193.	16134	*Acacia mutabilis subsp. mutabilis*			
194.	15479	*Acacia nigripilosa subsp. nigripilosa*			
195.	16136	*Acacia nivea*			
196.	3478	*Acacia pachypoda*			
197.	3494	*Acacia poliochroa*			
198.	3495	*Acacia prainii (Prain's Wattle)*			
199.	16147	*Acacia rostellata*			
200.	11838	*Acacia sclerophylla var. sclerophylla*			
201.		*Acacia sp.*			
202.	49008	*Acacia sp. Mt Holland (B. Ellery BE 1147)*		P1	Y
203.	3552	*Acacia spinosissima*			
204.	23525	*Acacia steedmanii subsp. steedmanii*			
205.	13506	*Acacia sulcata var. platyphylla*			
206.	14149	*Acacia tetraptera*			
207.	14152	*Acacia undosa*		P3	
208.	3590	*Acacia unifissilis*			
209.	46473	*Acacia verriculum*			
210.	3596	*Acacia viscifolia*			
211.	15292	*Acacia yorkrakinensis subsp. acrita*			
212.	31602	*Acrotriche lancifolia*			
213.	7817	*Actinobole uliginosum (Flannel Cudweed)*			
214.	6204	*Actinotus humilis*			
215.	1770	*Adenanthos argyreus (Little Woollybush)*			
216.	1720	*Allocasuarina acutivalvis*			
217.	13904	*Allocasuarina acutivalvis subsp. acutivalvis*			
218.	1721	*Allocasuarina campestris*			
219.	1722	*Allocasuarina corniculata*			
220.	1730	*Allocasuarina helmsii*			
221.	12655	*Allocasuarina spinosissima*			
222.	6565	*Alyxia buxifolia (Dysentery Bush)*			
223.	7831	*Angianthus micropodioides*		P3	
224.	1265	*Arthropodium curvipes*			
225.	7846	*Asteridea athrixioides*			
226.	6336	*Astroloma serratifolium (Kondrung)*			
227.	20726	*Astus subroseus*			
228.	2479	*Atriplex stipitata (Mallee Saltbush)*			
229.	17231	*Austrostipa acrociliata*			
230.	17237	*Austrostipa elegantissima*			
231.	17241	*Austrostipa hemipogon*			
232.	17251	*Austrostipa scabra*			
233.	36283	*Austrostipa sp. Carlingup Road (S. Kern & R. Jasper LCH 18459)*		P1	
234.	17255	*Austrostipa trichophylla*			
235.	5344	*Baeckea elderiana*			
236.	5349	*Baeckea grandibracteata*			
237.	31155	*Baeckea sp. Blue Haze Mine (P. Armstrong 06/910)*		P1	
238.	20632	*Baeckea sp. Forrestania (K.R. Newbey 1105)*		P1	
239.	45193	*Banksia densa var. Wheatbelt (M. Pieroni s.n. PERTH 04083407)*			
240.	32542	*Banksia erythrocephala var. erythrocephala*			
241.	1824	*Banksia laevigata (Tennis Ball Banksia)*			
242.	11777	*Banksia laevigata subsp. fuscolutea*			
243.	32136	*Banksia purdieana*			
244.	11582	*Banksia sphaerocarpa var. dolichostyla (Ironcap Banksia)*		T	
245.	32014	*Banksia viscida*		P3	
246.	5389	*Beaufortia orbifolia (Ravensthorpe Bottlebrush)*			
247.	4591	*Bertya dimerostigma*			
248.	34261	*Beyeria minor*			
249.	34276	*Beyeria sulcata var. brevipes*			
250.	34297	*Beyeria sulcata var. gracilis*			
251.	34257	*Beyeria sulcata var. sulcata*			
252.	4425	*Boronia inornata (Desert Boronia)*			
253.	15965	*Boronia inornata subsp. inornata*			

	Name ID	Species Name	Naturalised	Conservation Code	[1]Endemic To Query Area
254.	15966	*Boronia inornata subsp. leptophylla*			
255.	4445	*Boronia ternata*			
256.	12005	*Boronia ternata var. foliosa*			
257.	17968	*Boronia ternata var. promiscua*			
258.	11201	*Boronia ternata var. ternata*			
259.	1267	*Borya constricta*			
260.	44681	*Brachyloma stenolobum*		P1	
261.	7882	*Brachyscome perpusilla*			
262.	15334	*Caladenia brevisura*			
263.	15344	*Caladenia dimidia*			
264.	15370	*Caladenia microchila*			
265.	15374	*Caladenia pachychila*			
266.	18594	*Caladenia sp. Muddarning Hill (S.D. Hopper 4013)*			
267.	15050	*Calamphoreus inflatus*		P4	
268.	2846	*Calandrinia calyptrata (Pink Purslane)*			
269.	2853	*Calandrinia eremaea (Twining Purslane)*			
270.	96	*Callitris preissii (Rottnest Island Pine, Maro)*			
271.	5408	*Calothamnus gilesii*			
272.	35736	*Calothamnus quadrifidus subsp. seminudus*			
273.	7903	*Calotis hispidula (Bindy Eye)*			
274.	5466	*Calytrix merrelliana*			
275.	5476	*Calytrix sapphirina*			
276.	11351	*Cassytha aurea var. hirta*			
277.	2953	*Cassytha melantha (Large Dodder-laurel)*			
278.	2955	*Cassytha nodiflora*			
279.	7924	*Ceratogyne obionoides (Wingwort)*			
280.	5491	*Chamelaucium ciliatum*			
281.	15130	*Chamelaucium pauciflorum subsp. pauciflorum*			
282.	5499	*Chamelaucium virgatum*			
283.	12818	*Cheilanthes sieberi subsp. sieberi*			
284.	6215	*Chlaenosciadium gardneri*			
285.	13110	*Chorizema circinale*		P3	
286.	2778	*Codonocarpus cotinifolius (Native Poplar, Kundurangu)*			
287.	4553	*Comesperma drummondii (Drummond's Milkwort)*			
288.	4566	*Comesperma volubile (Love Creeper)*			
289.	40923	*Commersonia craurophylla (Brittle Leaved Rulingia)*			
290.	8824	*Conospermum croniniae*			
291.	16846	*Conospermum sigmoideum*		P2	
292.	1422	*Conostylis argentea*			
293.	1424	*Conostylis bealiana*			
294.	7418	*Coopernookia polygalacea*			
295.	7419	*Coopernookia strophiolata*			
296.	20270	*Crassula colligata subsp. lamprosperma*			
297.	3139	*Crassula exserta*			
298.	15545	*Cryptandra apetala var. anomala*			
299.	16188	*Cryptandra minutifolia subsp. brevistyla*			
300.	16187	*Cryptandra minutifolia subsp. minutifolia*			
301.	9076	*Cryptandra myriantha*			
302.	16194	*Cryptandra recurva*			
303.	16195	*Cryptandra wilsonii*			
304.	17417	*Cullen discolor*			
305.	42066	*Cyathostemon heterantherus*			
306.	7458	*Dampiera obliqua*			
307.	7460	*Dampiera orchardii*		P2	
308.	37041	*Dampiera sp. Forrestania (F. Lullfitz L 4034)*			
309.	35618	*Darwinia sp. Karonie (K. Newbey 8503)*			
310.	35638	*Darwinia sp. Lake Cobham (K. Newbey 3262)*			
311.	6218	*Daucus glochidiatus (Australian Carrot)*			
312.	8977	*Daviesia aphylla*			
313.	16576	*Daviesia argillacea*			
314.	16577	*Daviesia articulata*			
315.	3813	*Daviesia grahamii*			
316.	12816	*Daviesia newbeyi*		P3	
317.	3829	*Daviesia pachyloma*			
318.	3830	*Daviesia pachyphylla (Ouch Bush)*			
319.	16587	*Daviesia rubiginosa*			
320.	16591	*Daviesia scoparia*			
321.	11636	*Dianella revoluta var. divaricata*			
322.	12860	*Dicrastylis capitellata*		P1	
323.	3862	*Dillwynia acerosa*			

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324.	3864	*Dillwynia divaricata*			
325.	3866	*Dillwynia uncinata (Silky Parrot Pea)*			
326.	4755	*Dodonaea bursariifolia*			
327.	12034	*Dodonaea microzyga var. acrolobata*			
328.	4780	*Dodonaea stenozyga*			
329.	3088	*Drosera andersoniana (Sturdy Sundew)*			
330.	13224	*Drosera browniana*			
331.	29207	*Drosera rupicola*			
332.	49090	*Drosera sp. Branched styles (S.C. Coffey 193)*			
333.	4459	*Drummondita hassellii*			
334.	7184	*Eremophila biserrata*		P4	
335.	14895	*Eremophila decipiens subsp. decipiens*			
336.	7195	*Eremophila dempsteri*			
337.	16809	*Eremophila densifolia subsp. capitata*			
338.	16807	*Eremophila densifolia subsp. pubiflora*			
339.	7198	*Eremophila deserti*			
340.	7200	*Eremophila drummondii*			
341.	7226	*Eremophila ionantha (Violet-flowered Eremophila)*			
342.	17170	*Eremophila labrosa*			
343.	10780	*Eremophila psilocalyx*			
344.	7260	*Eremophila racemosa (Showy Eremophila)*		P4	
345.	15172	*Eremophila rugosa*			
346.		*Eremophila sp.*			
347.	7279	*Eremophila verticillata (Whorled Eremophila)*		T	
348.	3869	*Erichsenia uncinata*			
349.	20718	*Ericksonella saccharata*			
350.	45244	*Ericomyrtus serpyllifolia*			
351.	19650	*Eucalyptus alipes*			
352.	12896	*Eucalyptus arachnaea (Black-stemmed Mallee)*			
353.	5572	*Eucalyptus burracoppinensis (Burracoppin Mallee)*			
354.	5579	*Eucalyptus calycogona (Gooseberry Mallee)*			
355.	19508	*Eucalyptus calycogona subsp. calycogona*			
356.	12904	*Eucalyptus capillosa*			
357.	11978	*Eucalyptus celastroides subsp. virella*			
358.	5595	*Eucalyptus comitae-vallis (Comet Vale Mallee)*			
359.	5596	*Eucalyptus concinna (Victoria Desert Mallee)*			
360.	5611	*Eucalyptus cylindriflora (White Mallee)*			
361.	5612	*Eucalyptus cylindrocarpa (Woodline Mallee)*			
362.	12869	*Eucalyptus densa subsp. densa*			
363.	12868	*Eucalyptus densa subsp. improcera (Dwarf Blue Mallee)*			
364.	34811	*Eucalyptus distuberosa subsp. distuberosa*			
365.	5637	*Eucalyptus eremophila (Tall Sand Mallee)*			
366.	13515	*Eucalyptus exigua*		P3	
367.	12377	*Eucalyptus extensa*			
368.	5648	*Eucalyptus flocktoniae (Merrit, Merid)*			
369.	18521	*Eucalyptus flocktoniae subsp. flocktoniae*			
370.	19320	*Eucalyptus flocktoniae subsp. hebes*			
371.	13523	*Eucalyptus georgei subsp. fulgida*		P4	
372.	5662	*Eucalyptus gracilis (Yorrell)*			
373.	5673	*Eucalyptus horistes*			
374.	15743	*Eucalyptus incerata (Mount Day Mallee)*			
375.	12901	*Eucalyptus livida (Mallee Wandoo)*			
376.	5701	*Eucalyptus longicornis (Red Morrel, Moril)*			
377.	5717	*Eucalyptus myriadena*			
378.	13514	*Eucalyptus myriadena subsp. parviflora*		P1	
379.	18490	*Eucalyptus neutra*			
380.	20091	*Eucalyptus oleosa subsp. oleosa*			
381.	13524	*Eucalyptus olivina*			
382.	12893	*Eucalyptus phaenophylla*			
383.	5745	*Eucalyptus pileata (Capped Mallee)*			
384.	5747	*Eucalyptus platycorys (Boorabbin Mallee)*			
385.	13520	*Eucalyptus polita*			
386.	19064	*Eucalyptus prolixa*			
387.	12380	*Eucalyptus ravida (Silver-topped Gimlet)*			
388.	33540	*Eucalyptus retusa*		P1	
389.	5761	*Eucalyptus rigidula (Stiff-leaved Mallee)*			
390.	5766	*Eucalyptus salmonophloia (Salmon Gum, Wurak)*			
391.	5767	*Eucalyptus salubris (Gimlet)*			
392.	5777	*Eucalyptus steedmanii (Steedman's Gum)*		T	
393.	12883	*Eucalyptus subangusta subsp. subangusta*			

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394.	13027	*Eucalyptus tenera*			
395.	13521	*Eucalyptus tenuis*			
396.	5793	*Eucalyptus transcontinentalis (Redwood, Pungul)*			
397.	18293	*Eucalyptus urna*			
398.	34775	*Eucalyptus vittata*			
399.	5802	*Eucalyptus yilgarnensis (Yorrell)*			
400.	16722	*Euryomyrtus maidenii*			
401.	20741	*Eutaxia lasiocalyx*		P2	
402.	20208	*Eutaxia neurocalyx*			
403.	36540	*Eutaxia sp. North Ironcap (P. Armstrong PA 06/898)*		P1	Y
404.	10977	*Exocarpos aphyllus (Leafless Ballart)*			
405.	49062	*Exocarpos sp. Ardath (J. Buegge D 62)*			
406.	10765	*Exocarpos sparteus (Broom Ballart, Djuk)*			
407.	3900	*Gastrolobium floribundum (Wodjil Poison)*			
408.	3924	*Gastrolobium spinosum (Prickly Poison)*			
409.	33620	*Glischrocaryon angustifolium*			
410.	6144	*Glischrocaryon flavescens*			
411.	7061	*Glossostigma drummondii (Mudmat)*			
412.	10777	*Gompholobium gompholobioides*			
413.	10969	*Gompholobium hendersonii*			
414.	3952	*Gompholobium obcordatum*			
415.	7504	*Goodenia dyeri*			
416.	7534	*Goodenia pinifolia (Pine-leaved Goodenia)*			
417.	19051	*Goodenia scapigera subsp. scapigera*			
418.	7562	*Goodenia viscida (Viscid Goodenia)*			
419.	14427	*Granitites intangendus*			
420.	1949	*Grevillea acuaria*			
421.	15763	*Grevillea biformis subsp. biformis*			
422.	13453	*Grevillea didymobotrya subsp. didymobotrya*			
423.	2002	*Grevillea eryngioides (Curly Grevillea)*			
424.	8832	*Grevillea excelsior (Flame Grevillea)*			
425.	19314	*Grevillea hookeriana subsp. apiciloba*			
426.	2018	*Grevillea huegelii*			
427.	2033	*Grevillea lissopleura*		P1	
428.	12223	*Grevillea marriottii*		P1	Y
429.	45334	*Grevillea neodissecta*		P4	
430.	2053	*Grevillea oligantha*			
431.	2055	*Grevillea oncogyne*			
432.	13419	*Grevillea pilosa subsp. pilosa*			
433.	14416	*Grevillea pilosa subsp. redacta*		P3	
434.	2077	*Grevillea pterosperma*			
435.	15766	*Grevillea shuttleworthiana subsp. obovata*			
436.	2805	*Gunniopsis intermedia (Yellow Salt Star)*			
437.	2781	*Gyrostemon ditrigynus*		P4	
438.	2783	*Gyrostemon racemiger*			
439.	2157	*Hakea erecta*			
440.	2181	*Hakea meisneriana*			
441.	2184	*Hakea multilineata (Grass Leaf Hakea)*			
442.	12232	*Hakea pendens*		P3	
443.	2211	*Hakea subsulcata*			
444.	6688	*Halgania erecta*			
445.	6692	*Halgania lavandulacea (Blue Bush)*			
446.	6175	*Haloragis hamata*			
447.	6182	*Haloragodendron glandulosum (Glandular Raspwort)*			
448.	8024	*Helichrysum leucopsideum*			
449.	6849	*Hemigenia diplanthera*			
450.	38325	*Hemigenia loganiacea*			
451.	6875	*Hemigenia westringioides (Open Hemigenia)*			
452.	6776	*Hemiphora elderi (Red Velvet)*			
453.	41045	*Hemiphora lanata*			
454.	5122	*Hibbertia eatoniae*			
455.	5124	*Hibbertia exasperata*			
456.	5131	*Hibbertia gracilipes*			
457.	20417	*Hibbertia oligantha*			
458.	20349	*Hibbertia psilocarpa*			
459.	5165	*Hibbertia rostellata*			
460.	5166	*Hibbertia rupicola*			
461.	5813	*Homalocalyx pulcherrimus*			
462.	12742	*Hyalosperma demissum*			
463.	5221	*Hybanthus floribundus*			

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464.	12007	*Hybanthus floribundus subsp. floribundus*			
465.	8086	*Hypochaeris glabra (Smooth Catsear)*	Y		
466.	7	*Isoetes australis*			
467.	9	*Isoetes caroli*			
468.	8087	*Isoetopsis graminifolia (Cushion Grass)*			
469.	14440	*Isopogon gardneri*			
470.	2236	*Isopogon scabriusculus*			
471.	16812	*Isopogon scabriusculus subsp. pubifloris*			
472.	40918	*Labichea rossii*		P1	Y
473.	31775	*Lasiopetalum ferraricollinum*			
474.	4950	*Lawrencia berthae*			
475.	31772	*Lepidosperma amantiferrum*		P1	
476.	31760	*Lepidosperma diurnum*			
477.	32657	*Lepidosperma fimbriatum*			
478.	41647	*Lepidosperma sanguinolentum*			
479.		*Lepidosperma sp.*			
480.	33279	*Lepidosperma sp. Bandalup Scabrid (N. Evelegh 10798)*			
481.	4056	*Leptosema daviesioides*			
482.	5847	*Leptospermum erubescens (Roadside Teatree)*			
483.	5855	*Leptospermum roei*			
484.	6383	*Leucopogon cuneifolius*			
485.	6401	*Leucopogon hamulosus*			
486.	41770	*Leucopogon sp. Boorabbin (K.R. Newbey 8374)*			
487.	20763	*Leucopogon sp. Coolgardie (M. Hislop & F. Hort MH 3197)*			
488.	41768	*Leucopogon sp. Forrestania (G.F. Craig 2386)*			
489.	19205	*Leucopogon sp. Wheatbelt (S. Murray 257)*			
490.	19517	*Leucopogon sp. outer wheatbelt (M. Hislop 30)*			
491.	16727	*Logania nanophylla*		P2	
492.	34736	*Lysinema pentapetalum*			
493.	2544	*Maireana georgei (Satiny Bluebush)*			
494.	2550	*Maireana marginata*			
495.	15063	*Melaleuca acuminata subsp. acuminata*			
496.	5870	*Melaleuca adnata*			
497.	19380	*Melaleuca calyptroides*			
498.	17982	*Melaleuca carrii*			
499.	5890	*Melaleuca cliffortioides*			
500.	19289	*Melaleuca condylosa*			
501.	5896	*Melaleuca cordata*			
502.	5898	*Melaleuca cucullata*			
503.	5903	*Melaleuca depauperata*			
504.	5908	*Melaleuca eleuterostachya*			
505.	5909	*Melaleuca elliptica (Granite Bottlebrush, Ngow)*			
506.	19486	*Melaleuca hamata*			
507.	19081	*Melaleuca johnsonii*			
508.	5922	*Melaleuca lanceolata (Rottnest Teatree, Moonah)*			
509.	5925	*Melaleuca lateriflora (Gorada)*			
510.	5927	*Melaleuca laxiflora*			
511.	15663	*Melaleuca pauperiflora subsp. fastigiata*			
512.	15664	*Melaleuca pauperiflora subsp. pauperiflora*			
513.	17144	*Melaleuca phoidophylla*			
514.	5956	*Melaleuca pungens*			
515.	5960	*Melaleuca rigidifolia*			
516.	18276	*Melaleuca sapientes*			
517.	20290	*Melaleuca scalena*			
518.	5966	*Melaleuca sheathiana (Boree, Buri)*			
519.	18165	*Melaleuca societatis*			
520.	5967	*Melaleuca sparsiflora*			
521.	5979	*Melaleuca teuthidoides*			
522.	18232	*Melaleuca tuberculata var. tuberculata*			
523.	18395	*Melaleuca villosisepala*			
524.	2814	*Mesembryanthemum nodiflorum (Slender Iceplant)*	Y		
525.	6891	*Microcorys ericifolia*			
526.	6899	*Microcorys obovata*			
527.	18316	*Microcorys sp. Forrestania (V. English 2004)*		P4	
528.	48563	*Microcorys sp. Mt Holland (D. Angus DA 2397)*		P1	Y
529.	18046	*Microcybe multiflora subsp. multiflora*			
530.	9187	*Micromyrtus erichsenii*			
531.	5999	*Micromyrtus obovata*			
532.	14344	*Millotia tenuifolia var. tenuifolia (Soft Millotia)*			
533.	16645	*Muehlenbeckia diclina subsp. diclina*			

	Name ID	Species Name	Naturalised	Conservation Code	[1]Endemic To Query Area
534.	492	*Neurachne alopecuroidea (Foxtail Mulga Grass)*			
535.	8140	*Olearia muelleri (Goldfields Daisy)*			
536.	8146	*Olearia ramosissima (Much-branched Daisy Bush)*			
537.	46219	*Orianthera exilis*		P2	
538.	46313	*Orianthera flaviflora*			
539.	46220	*Orianthera judithiana*			
540.	12646	*Ozothamnus occidentalis*			
541.	40424	*Pentameris airoides subsp. airoides*	Y		
542.	2255	*Persoonia angustiflora*			
543.	2259	*Persoonia coriacea (Leathery-leaf Persoonia)*			
544.	15136	*Persoonia cymbifolia*		P3	
545.	15628	*Persoonia helix*			
546.	15630	*Persoonia inconspicua*			
547.	2274	*Persoonia saundersiana*			
548.	2308	*Petrophile seminuda*			
549.	12237	*Petrophile stricta*			
550.	4500	*Phebalium filifolium (Slender Phebalium)*			
551.	16556	*Phebalium megaphyllum*			
552.	4504	*Phebalium tuberculosum*			
553.	18509	*Philotheca rhomboidea*			
554.	4142	*Phyllota luehmannii*			
555.	5229	*Pimelea aeruginosa*			
556.	5231	*Pimelea angustifolia (Narrow-leaved Pimelea)*			
557.	5240	*Pimelea cracens*			
558.	6812	*Pityrodia lepidota*			
559.	7299	*Plantago debilis*			
560.	6257	*Platysace maxwellii (Karno)*			
561.	4725	*Psammomoya choretroides*			
562.		*Pterostylis aff. nana*			
563.	12216	*Pterostylis roensis*			
564.	1696	*Pterostylis sargentii (Frog Greenhood)*			
565.		*Pterostylis sp.*			
566.	18657	*Pterostylis sp. inland (A.C. Beauglehole 11880)*			
567.	2718	*Ptilotus drummondii (Narrowleaf Mulla Mulla)*			
568.	2732	*Ptilotus holosericeus*			
569.	4163	*Pultenaea arida*			
570.	20783	*Pultenaea daena*		P3	
571.	28286	*Pultenaea heterochila*			
572.	4182	*Pultenaea rotundifolia*			
573.	4964	*Radyera farragei (Knobby Hibiscus)*			
574.	6014	*Regelia inops*			
575.	11254	*Rhagodia preissii subsp. preissii*			
576.	13294	*Rhodanthe laevis*			
577.	13252	*Rhodanthe pygmaea*			
578.	6018	*Rinzia carnosa (Fleshy-leaved Rinzia)*			
579.	6028	*Rinzia sessilis (Sessile-leaved Rinzia)*			
580.	48266	*Rinzia torquata (Necklace Rinzia)*		P3	
581.	48267	*Rinzia triplex (Triad Rinzia)*		P3	
582.	11151	*Rostraria pumila*	Y		
583.	40425	*Rytidosperma caespitosum*			
584.	2356	*Santalum acuminatum (Quandong, Warnga)*			
585.	2358	*Santalum murrayanum (Bitter Quandong, Kulya)*			
586.	7601	*Scaevola bursariifolia*			
587.	7607	*Scaevola cuneiformis (Wedge-leaved Scaevola)*			
588.	7644	*Scaevola spinescens (Currant Bush, Maroon)*			
589.	2609	*Sclerolaena diacantha (Grey Copperburr)*			
590.	8207	*Senecio glossanthus (Slender Groundsel)*			
591.	8217	*Senecio quadridentatus*			
592.	17645	*Senna artemisioides*			
593.	12276	*Senna artemisioides subsp. filifolia*			
594.	17558	*Senna artemisioides subsp. x artemisioides*			
595.	18446	*Senna stowardii*			
596.	46814	*Seringia adenogyna (Skinny-leaved fire-bush)*		P3	
597.	7034	*Solanum simile (Oondoroo)*			
598.	4734	*Stackhousia muricata*			
599.	2917	*Stellaria filiformis (Thread Spurry)*			
600.	31712	*Stenanthemum bremerense*		P4	
601.	16200	*Stenanthemum stipulosum*			
602.	7714	*Stylidium dielsianum (Tangle Triggerplant)*			
603.	7751	*Stylidium limbatum (Fringed-leaved Triggerplant)*			

	Name ID	Species Name	Naturalised	Conservation Code	[1]Endemic To Query Area
604.	18061	*Stylidium sejunctum*		P3	
605.	20773	*Stylidium validum*		P1	
606.	4221	*Swainsona colutoides (Bladder Vetch)*			
607.	16761	*Synaphea interioris*			
608.	31716	*Tecticornia syncarpa*			
609.	31717	*Tecticornia undulata*			
610.	4248	*Templetonia aculeata*			
611.	4249	*Templetonia battii*			
612.	4530	*Tetratheca efoliata*			
613.	1701	*Thelymitra antennifera (Vanilla Orchid)*			
614.	20732	*Thelymitra petrophila*			
615.	5082	*Thomasia gardneri (Mt. Holland Thomasia)*		X	Y
616.	5099	*Thomasia sarotes*			
617.	6050	*Thryptomene australis (Hook-leaf Thryptomene)*			
618.	6053	*Thryptomene cuspidata*			
619.	6058	*Thryptomene kochii*			
620.	1338	*Thysanotus manglesianus (Fringed Lily)*			
621.	1343	*Thysanotus patersonii*			
622.	19054	*Trachymene anisocarpa var. anisocarpa*			
623.	6268	*Trachymene cyanopetala*			
624.	33221	*Triglochin longicarpa*			
625.	16986	*Trymalium myrtillus subsp. myrtillus*			
626.	8255	*Ursinia anthemoides (Ursinia)*	Y		
627.	12388	*Verticordia acerosa var. preissii*			
628.	12411	*Verticordia densiflora var. cespitosa*			
629.	12427	*Verticordia gracilis*		P3	
630.	12432	*Verticordia inclusa*			
631.	36801	*Verticordia mitchelliana subsp. implexior*			
632.	12449	*Verticordia plumosa var. brachyphylla*			
633.	12451	*Verticordia plumosa var. incrassata*			
634.	6121	*Verticordia stenopetala*		P3	
635.	12052	*Vulpia myuros forma megalura*	Y		
636.	33101	*Vulpia myuros forma myuros*	Y		
637.	7386	*Wahlenbergia gracilenta (Annual Bluebell)*			
638.	13331	*Waitzia acuminata var. acuminata*			
639.	6938	*Westringia cephalantha*			
640.	34602	*Westringia cephalantha var. cephalantha*			
641.	9247	*Westringia rigida (Stiff Westringia)*			
642.	6659	*Wilsonia humilis (Silky Wilsonia)*			

Conservation Codes
T - Rare or likely to become extinct
X - Presumed extinct
IA - Protected under international agreement
S - Other specially protected fauna
1 - Priority 1
2 - Priority 2
3 - Priority 3
4 - Priority 4
5 - Priority 5

[1] For NatureMap's purposes, species flagged as endemic are those whose records are wholely contained within the search area. Note that only those records complying with the search criterion are included in the calculation. For example, if you limit records to those from a specific datasource, only records from that datasource are used to determine if a species is restricted to the query area.

Appendix D – Flora survey results

Flora likelihood of occurrence assessment

Conservation listed flora raw data

Flora likelihood of occurrence assessment guidelines

Likelihood of occurrence	Guideline
Known	Species recorded within survey area from field survey results.
Likely	Species previously recorded within 20 km and large areas of suitable habitat occur in the survey area.
Possible	Species previously recorded within 20 km and areas of suitable habitat occur/may occur in the survey area.
Unlikely	Species previously recorded within 20 km, but suitable habitat does not occur in the survey area.
Highly unlikely	Species not previously recorded within 20 km, suitable habitat does not occur in the survey area and/or the survey area is outside the natural distribution of the species.
Other considerations	Intensity of survey, availability of access, growth form type, recorded flowering times, cryptic nature of species

Source information – desktop searches

PMST – DotEE Protected Matters Search Tool (PMST) to identify flora listed under the EPBC Act potentially occurring within the study area

DBCA – records of threatened flora from TPFL and WAHERB database searches within the study area

NM – DBCA *NatureMap* (accessed November 2019)

Flora likelihood of occurrence assessment of conservation significant flora identified in the desktop assessment as potentially occurring within the study area

Taxa	Status		Source				Description and habitat requirements	Nearest WA Herbarium Record	Likelihood of occurrence within the survey area
	EPBC Act	BC Act/ DBCA	PMST	NM	DBCA	Mattiske 2019b			
Angianthus micropodioides		P3				X	A white woolly erect annual growing up to 15 cm high with clustered flower heads. Prefers saline sandy soils against river edges, saline depressions and claypans.	-	Highly unlikely, no suitable habitat exists in the survey area
Acacia asepala	-	P2				X	Much-branched shrub growing 0.5-1.5 m high. Prefers red-brown sandy loam on undulating plains along drainage lines.	-	Highly unlikely no suitable habitat exists in the survey area
Acacia lanuginophylla	EN	T	X			X	Dense to open and domed erect or spreading shrub growing 0.1 – 1.2 m high. Prefers slightly sand over clay along drainage channels in low open scrub.	-	Highly unlikely no suitable habitat exists in the survey area
Acacia lobulata	EN	T	X				Erect open and spindly shrub growing 1-2 m high. Prefers gritty loam or sand on low granitic breakaways.	-	Highly unlikely no suitable habitat exists in the survey area
Acacia sp. Forrestania (D. Angus DA 3001)	-	P1			X	X	Low spinescent shrub growing to 0.2 m high and 0.2 m wide. Recorded on lateritic orange-red clay soils on flats and lower slopes.	7.3 km southeast of the northernmost survey polygon	Unlikely, has been recorded prior in the study area but no suitable habitat exists in the survey area.
Acacia sp. Mt Holland (B. Ellery BE 1147)	-	P1			X	X	Tall dense shrub growing 1 m tall and 0.8 m wide. Branchlets and pods densely wooly. Recorded on clay with large white quartz rocks.	2.9 km southeast of the northernmost survey polygon	Unlikely, has been recorded prior in the study area by Mattiske (2019a) but no suitable habitat exists in the survey area.
Acacia undosa	-	P3			X	X	Dense domed shrub growing 0.3 – 1.5 m tall. Pods are strongly undulate. Grows in clayey sand or loam in open shrub mallee.	2.3 km east of the	Unlikely, no suitable habitat is present in the survey area, but

Taxa	Status		Source				Description and habitat requirements	Nearest WA Herbarium Record	Likelihood of occurrence within the survey area
	EPBC Act	BC Act/ DBCA	PMST	NM	DBCA	Mattiske 2019b			
								northernmost survey polygon	has been recorded in the study area.
Austrostipa sp. Carlingup Road (S. Kern & R. Jasper LCH 18459)	-	P1				X	Bunch grass measuring 0.4 m high and located on gentle inclined crest of basalt and minor quartz with red-brown shallow sandy clay loam soil in mallee or eucalypt woodland (Botanica Consulting 2017; Mattiske 2018)	-	Unlikely, some suitable habitat exists (southern polygon) and little records exist in the area for this species.
Baeckea sp. Forrestania (K.R. Newbey 1105)	-	P1			X		Shrub to 0.6 m high. Occurs on sand and plains and brown sandy-loam on hills (WA Herbarium 1998- 2020).	1.5 km south of northernmost survey polygon	Possible, suitable habitat exists in the survey area and has been previously recorded in close proximity to the survey area.
Baeckea sp. Blue Haze Mine (P. Armstrong 06/910)		P1				X	Large flowered shrub growing to 1.2 m tall. Occurs on yellow-orange lateritic sandy clay loam on undulating plains with open mallee, low to tall shrub heath (Mattiske 2018).	-	Unlikely, no suitable habitat exists in the survey area.
Banksia sphaerocarpa var. dolichostyla	VU		X		X	X	Tall shrub growing to 2-3 m tall. Occurs on lateritic gravel, and grey sand in low open woodland and low shrubland.	1.0 km west of the northernmost survey polygon	Known.
Banksia viscida	-	P3		X			Densely branched shrub growing to 0.4 – 1 m high. Occurs on gravelly soils and lateritic rises.	-	Unlikely, no suitable habitat exists in the survey area.
Brachyloma nguba		P1				X	Erect compact to spreading mid-dense shrub growing 0.8 m tall. Occurs on white to brown sandy clay, shallow sandy loam in open mallee woodland, mallee scrub and flat plains.	-	Unlikely, suitable habitat exists in the survey area but no records have been

Taxa	Status		Source				Description and habitat requirements	Nearest WA Herbarium Record	Likelihood of occurrence within the survey area
	EPBC Act	BC Act/ DBCA	PMST	NM	DBCA	Mattiske 2019b			
									previously made in the study area.
Brachyloma stenolobum	-	P1			X	X	Shrub to 1.5 m high and 1.2 m wide, single-stemmed at ground level from a fire-sensitive rootstock. Occurs in mixed heath and *Eucalyptus eremophila* over Melaleuca on yellow sandplain.	1.5 km west of the northernmost survey polygon	Possible, suitable habitat exists in the survey area and close records exist in the study area.
Boronia revoluta	EN	T				X	Erect much-branched shrub growing 0.4-0.8 m high. Occurs on stony sandy loam or sand and ironstone on plains, hillsides and summits. Recorded in populations of *Banksia sphaerocarpa* var *dolichostyla.*	-	Unlikely no suitable habitat exists in the survey area.
Calamphoreus inflatus	-	P4			X	X	Erect shrub 0.5 – 3 m tall, occurs in light brown clay loam often with a stony surface, in Eucalyptus woodland (Gimlet and *E. longicornis*). Occurs in open areas and on disturbed soils.	4.8 km east of the southernmost survey polygon	Unlikely, no suitable habitat exists in the survey area.
Conospermum sigmoideum	-	P2				X	Erect shrub growing to 0.2 – 0.5 m tall. Occurs on yellow sand.	-	Unlikely, no suitable habitat exists in the survey area.
Chorizema circinale	-	P3			X	X	Small shrub growing to 0.3 m, from a woody rootstock. Occurs on deep yellow sands in flat landscape.	1.6 km southwest of the northernmost survey polygon	Unlikely, no suitable habitat exists in the survey area.
Dampiera orchardii		P2				X	Erect, branched perennial herb growing to 0.2-0.4 m tall. Occurs on grey-white sand and grey-brown clayey sand in saline influenced areas.	-	Unlikely, no seasonally wet or saline areas occur in the survey area.
Daviesia implexa		P3				X	Spreading or sprawling shrub growing to 0.4 – 1 m high. Recorded in yellow-orange and red sand and laterite.	-	Unlikely, no suitable habitat exists in the survey area.

Taxa	Status		Source				Description and habitat requirements	Nearest WA Herbarium Record	Likelihood of occurrence within the survey area
	EPBC Act	BC Act/ DBCA	PMST	NM	DBCA	Mattiske 2019b			
Daviesia sarissa subsp. *redacta*	-	P2			X	X	Spreading or sprawling glaucous shrub growing to 0.6 m high. Occurs in yellow sandplains.	100 km north of survey area	Highly unlikely, survey area outside of species range.
Daviesia newbeyi	-	P3				X	Multi-branched broom-like shrub growing to 1.5 m tall (occasionally 0.2 – 0.5 m tall). Has been recorded on orange yellow and red stony sand over granite, on exposed well drained slope in open heath.	-	Unlikely, no suitable habitat exists in the survey area.
Dicrastylis capitellata	-	P1				X	Erect or spreading shrub 0.2 to 0.35 m tall, up to 0.4 m wide. Prefers low-lying ground in open mallee woodlands, on white sandy clay close to salt lakes.	-	Unlikely, no suitable habitat exists in the survey area and no records have been made in the study area.
Eremophila biserrata	-	P4			X	X	Prostrate shrub to 3 m wide. Occurs on sandy or sandy clay soils, alluvial flats, salt flats and lakes.	21.1 km south of southernmost survey polygon	Unlikely, no suitable habitat exists in the survey area and no records within study area.
Eremophila caerulea subsp. merrallii		P4				X	Spreading or sprawling shrub growing up to 0.35 m tall and 0.8 m wide. Occurs on red-brown sand, clay or loam on undulating plains.	-	Unlikely, no suitable habitat exists in the survey area
Eremophila racemosa		P4				X	Erect shrub, 0.5 – 1.7 m high. Occurs on sandy or stony loam, clay loam and undulating plains.	-	Unlikely, no suitable habitat exists in the survey area
Eremophila verticillata	EN	T			X	X	Shrub growing from 0.2 – 1 m tall. Occurs on red/brown clay loam, white sand over limestone, and adjacent salt lakes.	8.6 km east of the northernmost survey polygon	Unlikely, no suitable habitat exists in the survey area.

Taxa	Status		Source				Description and habitat requirements	Nearest WA Herbarium Record	Likelihood of occurrence within the survey area
	EPBC Act	BC Act/ DBCA	PMST	NM	DBCA	Mattiske 2019b			
Eucalyptus exigua		P3				X	Smooth-barked mallee growing 2-5 m tall. Occurs on sandy loam , white sand and sandplains.	-	Unlikely, suitable habitat does exist in the survey area but no records have been made in the study area.
Eucalyptus georgei subsp. *fulgida*		P4				X	Smooth-barked tree growing from 4 – 20 m high. Occurs on brown sandy loam, clayey sand on slight depressions.	-	Unlikely, no records have been made within the study area and suitable habitat is low.
Eucalyptus myriadena subsp. *parviflora*		P1				X	Tall tree or mallee up to 12 m high with smooth bark grey-olive and silvery in strips. Occurs on orange lateritic gravel on summits and gentle upland slopes.	-	Unlikely, no suitable habitat exists in the survey area and no records have been made in the study area
Eucalyptus steedmanii	VU	T	X			X	Smooth barked tree growing 2-8 , up to 12 m tall. Occurs on gravelly loam over ironstone, sand, on low hills and undulating plains.	-	Unlikely, no suitable habitat exists in the survey area.
Eutaxia acanthoclada	-	P3				X	Compact, mat forming prostrate shrub growing to 0.3 m tall. Occurs on light brown sandy clay, shallow sandy loam, red clay over BIF and gravel. Gently undulating plains.	-	Unlikely, no suitable habitat exists in the survey area and no records have been made in the study area.
Eutaxia hirsuta	-	P2				X	Erect sparsely branched shrub growing up to 0.45 m tall. Occurs on sandy gravelly sand plains in low open heath.	-	Highly unlikely, only known from Muntadgin, north of Hyden.

Taxa	Status		Source				Description and habitat requirements	Nearest WA Herbarium Record	Likelihood of occurrence within the survey area
	EPBC Act	BC Act/ DBCA	PMST	NM	DBCA	Mattiske 2019b			
Eutaxia lasiocalyx	-	P2			X	X	Spreading densely branched shrub growing from 0.15 m high and 0.6 m wide. Occurs on red sandy loam , in woodland or mallee, on lateritic or quarzitic substrates	5.7 km east of the northernmost survey polygon	Recorded.
Eutaxia nanophylla		P3				X	Spreading or rounded sparsely branched shrub growing 0.15 to 0.35 m tall. Occurs in woodland, shrubland or rarely open herbland on sand over clay, stony, clay loam or red clay.	-	Highly unlikely, known from Riverina Station to the northern Stirling Ranges, and nearest collection from Duranillin.
Eutaxia rubricarina		P3				X	Spreading or prostrate, erect shrub growing from 0.2 – 0.5 m high, and 0.5 m wide. Occurs in gravelly sand, grey to pinkish-white sandy clay, red loam on flats, slopes, valley floors and road verges.	-	Highly unlikely, very limited records of this species have been made, and no suitable habitat exists in the survey area.
Eutaxia sp. North Ironcap (P. Armstrong PA 06/898)	-	P1			X		Erect spindly shrub, broom-like, growing to 0.2 m tall and 0.2 m wide. Recorded in shrub mallee over *Melaleuca brophyi* on undulating plain of red sandy clay loam.	7.8 km south of the southernmost survey polygon	Unlikely, no suitable habitat occurs in the survey area.
Gastrolobium tenue		P1				X	Low bushy shrub growing up to 0.6 m high. Occurs on yellow sand or sandy clay on undulating dunes and stony outcrops.	-	Highly unlikely, no suitable habitat occurs in the survey area and no records are from within the study area.
Grevillea lissopleura	-	P1			X		Erect shrub growing to 1.2 m high and 0.5 – 0.7 m wide. Occurs in open shrubland on well-drained rocky, stony red-brown soils.	13.8 km northwest of northernmost survey polygon	Unlikely, no suitable Has been recorded by Mattiske (2018) in the study area.

Taxa	Status		Source				Description and habitat requirements	Nearest WA Herbarium Record	Likelihood of occurrence within the survey area
	EPBC Act	BC Act/ DBCA	PMST	NM	DBCA	Mattiske 2019b			
Grevillea marriottii	-	P1			X		Erect, much-branched to open shrub growing 0.8 - 1.2 m high and 1 m wide. Occurs in yellow or white sand over laterite on rises or on lateritic cappings in shrubland.	3.52 km south of the southernmost polygon	Unlikely, habitat combination does not occur in the survey area.
Grevillea neodissecta		P4				X	Low, rounded prickly shrub growing to 0.3 – 1 m tall. Occurring on sand over laterite, and clay loam	-	Unlikely, no records have been made within the study area, however, some suitable habitat exists.
Grevillea pilosa subsp. *redacta*		P3				X	Spreading to prostrate, non-lignotuberous shrub growing 0.4 – 1.2 m over sand and laterite and gravelly rises on brown loam in dense shrubland.	-	Unlikely, no records exist within the study area and no suitable habitat exists in the survey area.
Gyrostemon ditrigynus	-	P4			X	X	Shrub growing 0.4 to 1.5 m high. Occurs on white, yellow and lateritic sand, sandy clay, loam on plains low ironstone ridges.	6.1 km east of the southernmost survey polygon	Possible, some suitable habitat exists and the species has been previously recorded by Mattiske (2017).
Hakea pendens	-	P3			X	X	A prickly upright shrub growing to 2.5 m, multi-stemmed with rough grey bark. Occurs on variable soils (orange-brown ironstone, grey sand, brown sandy loam), but with lateritic influence.	8.5 km east of the northernmost survey polygon	Known.
Hemigenia sp. Newdegate	-	P1				X	Compact spindly, erect to spreading shrub growing 0.2-0.45 m high to 0.5 m wide. Occurs on clay loam and disturbed sites	-	Unlikely, this species has not been recorded within the study area and no suitable habitat exists in the survey area.

Taxa	Status		Source				Description and habitat requirements	Nearest WA Herbarium Record	Likelihood of occurrence within the survey area
	EPBC Act	BC Act/ DBCA	PMST	NM	DBCA	Mattiske 2019b			
Isopogon robustus	CR	T				X	Shrub growing to 1.5 m and 2 m wide. Occurs on an eroding laterite shelf, with skeletal grey sandy-loam soil.	-	Highly unlikely, known only from a single population in the Parker Range, 50 km SE of Southern Cross.
Labichea rossii	-	P1			X	X	Sub-shrub recorded growing 0.4 m high, stems sparingly branched and semi-erect. Recorded on small ironstone ridge dominated by *Allocasuarina* - Proteaceae and Myrtaceae with some Eucalpyts. Grows out of cracks in large outcrops od banded ironstone, often in shade of larger shrubs.	10.28 km south east of the northernmost polygon	Highly unlikely, no suitable habitat exists in the survey area
Lepidosperma amantiferrum	-	P1				X	Tufted rhizomatous herb (sedge) growing 0.15 – 0.42 m high. Occurs on yellow sandy loam with banded ironstone gravel and rocks over gentle lower slopes.	-	Highly unlikely, species has not been recorded within the study area and does not contain suitable habitat in the survey area.
Logania nanophylla	-	P2		X			Low spreading shrub growing 0.1 – 0.25 m high and 0.5 m wide. Occurs on white sand, pebbly calcareous sandy clay and sand dunes. Has been recorded approximately 7.31 km northwest of the northernmost survey polygon (NatureMap 2020)	-	Possible, the northernmost survey polygon contains suitable habitat, and it has been recorded in the study area.
Melaleuca ochroma		P3				X	Shrub growing 0.7 to 2.5 m tall. Bark is hard and fibrous. Occurs within Melaleuca shrubland, containing emergent mallee eucalypts and Wandoo, *Grevillea huegelii*	-	Unlikely, moderately suitable habitat in the southernmost survey polygon, however no

Taxa	Status		Source				Description and habitat requirements	Nearest WA Herbarium Record	Likelihood of occurrence within the survey area
	EPBC Act	BC Act/ DBCA	PMST	NM	DBCA	Mattiske 2019b			
							over brown clay, whitish sandy-clay, brown clay loam and sandy loam.		records have been made in the study area.
Microcorys sp. Mt Holland broad-leaf (G. Barrett s.n. PERTH 04104927)		P1				X	Shrub to 1 m, occurs with *Melaleuca cordata*, *Eucalyptus burracoppinensis, Banksia purdieana*, and *Gastrolobium spinosum* over reddish yellow clayey sand over laterite. Has been recorded in disturbed areas, from fire and mine development.	-	Unlikely, no suitable habitat was located in the survey area, despite records made by Mattiske 2018; 2019a)
Microcorys sp. Mt Holland (D. Angus DA 2397)	-	P1			X	X	Perennial shrub growing 1.5 m tall and 1.2 m wide. Plant multi-stemmed at ground level from fire-tolerant rootstock. Occurs in disturbed areas on brown sandy loam, grey-brown sandy clay, orange clay and ironstone.	1.61 km south of the northernmost survey polygon.	Known.
Microcorys sp. Forrestania (V. English 2004)		P4				X	Low growing shrub to 0.3 m tall. Occurs on red-brown or yellow shallow sandy clay loam soils on quartz and banded ironstone.	-	Unlikely, limited suitable habitat is available for this species. It has not been recorded within the study area.
Mirbelia densiflora	-	P3				X	Shrub up to 1 m high. Occurs on stony loam, loamy sand, small ridges, breakaways and undulating plains.	-	Unlikely, limited suitable habitat is available for this species. It has not been recorded within the study area.
Mirbelia taxifolia	-	P1				X	Shrub growing from 0.6 to 0.9 m high on red and yellow sand.	-	Unlikely, no suitable habitat is present in the survey area and it has not been

Taxa	Status		Source				Description and habitat requirements	Nearest WA Herbarium Record	Likelihood of occurrence within the survey area
	EPBC Act	BC Act/ DBCA	PMST	NM	DBCA	Mattiske 2019b			
									recorded within the study area.
Myriophyllum petraeum		P4				X	Aquatic annual herb with stems growing between 0.15 – 0.3 m long. Confined to ephemeral rock pools on granite outcrops.	-	Highly unlikely. No suitable habitat is present in the survey area and it has not been recorded within the study area.
Olearia laciniifolia	-	P2			X	X	Erect, few-stemmed shrub growing 0.6 to 1.2 m high. Occurs on white sand around playa lakes.	28.5 km southeast of the southernmost survey polygon.	Highly unlikely, it has not been recorded within the study area and suitable habitat does not exist in the survey area.
Orianthera exilis	-	P2			X	X	Tufted, woody sedge-like sub-shrub branching from the ground. Occurs on brown loam over laterite, pale yellow sandy loam.	4.9 km east of the southernmost survey polygon.	Possible, some suitable habitat exists in the southernmost survey polygon and has been recorded previously in the study area.
Paragoodia crenulata	CR	T	X			X	Annual prostrate herb growing to 0.1 m high. Occurs on lateritic, gravelly loam on low rise slopes.	-	Highly unlikely, no suitable habitat exists in study area and has not been previously recorded.
Persoonia cymbifolia	-	P3				X	Erect, spreading shrub growing 0.2 – 0.6 m tall. Occurs on sandy soils on flats or in rock crevices.	-	Unlikely, suitable habitat exists in survey area, but no records have been made previously in the study area.

Taxa	Status		Source				Description and habitat requirements	Nearest WA Herbarium Record	Likelihood of occurrence within the survey area
	EPBC Act	BC Act/ DBCA	PMST	NM	DBCA	Mattiske 2019b			
Pultenaea daena	-	P3		X			Dense, prostrate, domed shrub growing up to 0.07 m high. Occurs on white to yellow sand or sandy loam, sandy or loamy clay, gravel, limestone, dolomite and laterite on gently undulating plains adjacent to salt lakes or in disturbed areas. Has been previously recorded approximately 15 km south of the southernmost survey polygon (NatureMap 2020)	-	Unlikely, no salt lakes occur in the survey area.
Rinzia medifila		P1				X	Shrub up to 1 m tall, branchlets flowering 1 flower, and rarely 2 pairs. Occurs in yellow-red sandy soils, occasionally laterite or greenstone, in Eucalyptus woodlands, often with Melaleuca. Known only from Parker Range, south-east of Southern Cross.	-	Highly unlikely, species range is not within the study area, and no suitable habitat exists in the survey area.
Rinzia torquata		P3				X	Shrub growing from 0.5 – 1.7 m tall and 0.5 m wide. Commonly occurs in yellow sand or laterite, sometimes with clay, and with mallees, Acacia, Allocasuarina and Melaleuca, near creeks or exposed small rises. Range extends from near Merredin east to Parker Range and south-east near Hatter Hill.	-	Unlikely, there is no suitable habitat available in the survey area.
Rinzia triplex	-	P3		X			Perennial shrub growing to 1 m high and 0.6 m wide. Occurs on flat and undulating plains of yellow sandy clay loam with lateritic gravel.This species has been recorded within approximately 5 km of the survey area (NatureMap 2020).	-	Unlikely, no suitable habitat exists in the survey area.

Taxa	Status		Source				Description and habitat requirements	Nearest WA Herbarium Record	Likelihood of occurrence within the survey area
	EPBC Act	BC Act/ DBCA	PMST	NM	DBCA	Mattiske 2019b			
Roycea pycnophylloides	EN	T	X				Perennial herb growing to 0.05 m high, forming dense silvery mats at 1 m wide. Occurs on sandy soils with saline flats.	-	Highly unlikely, no suitable habitat exists in the survey area
Seringia adenogyna		P3				X	Shrub single or multi-stemmed, and spreading and reaching 0.3 – 0.7 m tall. Occurs in areas containing mallee trees with tall shrubland, or in mallee heath, on gravelly, yellow-brown or red-brown sand or grey, sandy clay or loam. Sometimes in damp, low lying areas.	-	Unlikely, no suitable habitat exists in the survey area and no records exist in the study area.
Stenanthemum bremerense	-	P4				X	Erect or low spreading shrub recorded between 0.2 and 1.4 m high Occurs on orange-brown sandy loam, orange-red gravelly loam, red loam with laterite and ironstone, or top or side of outcrops and breakaways.	-	Highly unlikely, no suitable habitat exists in the survey area and no records exist in the study area.
Stylidium sejunctum	-	P3			X	X	Caespitose perennial herb growing from 0.25 to 0.45 m tall. Occurs on clayey sand, loam or laterite, on outcrops, upper slopes and breakaways in mallee and Allocasuarina shrubland.	9 km east of the southernmost survey polygon	Unlikely, no suitable habitat exists in the survey area.
Stylidium thylax	-	P2				X	Creeping perennial herb growing from 0.04 to 0.08 m tall. Occurs in yellow-brown pebbly sand, on gentle slopes and plains in heath and mallee shrubland.	-	Unlikely, some suitable habitat exists in the survey area but no records exist in the study area.
Stylidium validum	-	P1				X	Caespitose perennial herb growing to from 0.06 to 0.3 m tall. Found between Norseman and Forrestiana – Southern Cross Road, in upland, ironstone and greenstone habitats bearing low sclerophyll woodland.	-	Highly unlikely, no suitable habitat exists in survey area and no records are from within the study area.

Taxa	Status		Source				Description and habitat requirements	Nearest WA Herbarium Record	Likelihood of occurrence within the survey area
	EPBC Act	BC Act/ DBCA	PMST	NM	DBCA	Mattiske 2019b			
Teucrium sp. dwarf (R. Davis 8813)	-	P3			X	X	Compact dwarf shrub growing to 0.1 m high and 0.1 m wide. Occurs on hills and road verges.	26.5 km south of southernmost survey polgyon	Possible, suitable habitat exists in the survey area and has been recorded in the study area previously by Mattiske (2018).
Verticordia gracilis		P3				X	Spindly to bushy shrub growing 0.15-0.45 m tall and 0.2-0.6 m high. Grows in yellow sand, usually with or over loam and gravel, in association with other Verticordias in heath and open mallee shrubland.	-	Known.
Verticordia stenopetala	-	P3			X	X	A small shrub growing 0.2-0.5 m tall. Occurs in white to grey sand, yellow sand over loam and gravel, often in association with several Verticordia spp. in heath and open mallee shrubland.	8.8 km southeast of southernmost survey polygon	Known.

Flora raw data

Taxon	Number of Individuals	Lat	Lon
Banksia sphaerocarpa var. dolichostyla		-32.08574428	119.694095
Banksia sphaerocarpa var. dolichostyla	1	-32.09391737	119.7089931
Banksia sphaerocarpa var. dolichostyla	5	-32.08722362	119.6998364
Banksia sphaerocarpa var. dolichostyla	7	-32.08738698	119.6998223
Banksia sphaerocarpa var. dolichostyla	4	-32.08762622	119.6998095
Banksia sphaerocarpa var. dolichostyla	8	-32.087747	119.6998638
Banksia sphaerocarpa var. dolichostyla	2	-32.08739817	119.6992812
Banksia sphaerocarpa var. dolichostyla	1	-32.08726737	119.6994088
Banksia sphaerocarpa var. dolichostyla	4	-32.08521762	119.6991791
Banksia sphaerocarpa var. dolichostyla	2	-32.08505495	119.6991487
Banksia sphaerocarpa var. dolichostyla	1	-32.08490907	119.6991783
Banksia sphaerocarpa var. dolichostyla	1	-32.08447032	119.6991992
Banksia sphaerocarpa var. dolichostyla	2	-32.08397247	119.6985195
Banksia sphaerocarpa var. dolichostyla	1	-32.08414652	119.6984469
Banksia sphaerocarpa var. dolichostyla	3	-32.08473665	119.698388
Banksia sphaerocarpa var. dolichostyla	1	-32.08486183	119.6985712
Banksia sphaerocarpa var. dolichostyla	5	-32.08506305	119.6985126
Banksia sphaerocarpa var. dolichostyla	2	-32.08516395	119.6985287
Banksia sphaerocarpa var. dolichostyla	1	-32.08533388	119.6985397
Banksia sphaerocarpa var. dolichostyla	2	-32.08559438	119.6985326
Banksia sphaerocarpa var. dolichostyla	1	-32.08671008	119.6985284
Banksia sphaerocarpa var. dolichostyla	3	-32.0871597	119.6980397
Banksia sphaerocarpa var. dolichostyla	6	-32.08696298	119.6981338
Banksia sphaerocarpa var. dolichostyla	2	-32.08698657	119.697966
Banksia sphaerocarpa var. dolichostyla	3	-32.08680167	119.697979

Banksia sphaerocarpa var. dolichostyla	2	-32.08663363	119.697943
Banksia sphaerocarpa var. dolichostyla	1	-32.08574638	119.6979496
Banksia sphaerocarpa var. dolichostyla	2	-32.0855841	119.6978797
Banksia sphaerocarpa var. dolichostyla	2	-32.08529758	119.6979539
Banksia sphaerocarpa var. dolichostyla	3	-32.0850565	119.6979977
Banksia sphaerocarpa var. dolichostyla	2	-32.08483585	119.6979323
Banksia sphaerocarpa var. dolichostyla	1	-32.08476612	119.6979543
Banksia sphaerocarpa var. dolichostyla	1	-32.08465787	119.6979745
Banksia sphaerocarpa var. dolichostyla	1	-32.08445332	119.6979268
Banksia sphaerocarpa var. dolichostyla	1	-32.08427567	119.6978826
Banksia sphaerocarpa var. dolichostyla	1	-32.08419447	119.6979568
Banksia sphaerocarpa var. dolichostyla	1	-32.0837991	119.6978627
Banksia sphaerocarpa var. dolichostyla	2	-32.083623	119.6974666
Banksia sphaerocarpa var. dolichostyla	2	-32.0836733	119.6972872
Banksia sphaerocarpa var. dolichostyla	4	-32.08389333	119.6972552
Banksia sphaerocarpa var. dolichostyla	1	-32.08446058	119.6972662
Banksia sphaerocarpa var. dolichostyla	1	-32.08491608	119.697225
Banksia sphaerocarpa var. dolichostyla	1	-32.08501657	119.6972991
Banksia sphaerocarpa var. dolichostyla	2	-32.08544802	119.6972722
Banksia sphaerocarpa var. dolichostyla	1	-32.08550618	119.6973319
Banksia sphaerocarpa var. dolichostyla	3	-32.0856808	119.6973655
Banksia sphaerocarpa var. dolichostyla	1	-32.08582913	119.6972836
Banksia sphaerocarpa var. dolichostyla	2	-32.08597515	119.6972984
Banksia sphaerocarpa var. dolichostyla	2	-32.08652948	119.6973069
Banksia sphaerocarpa var. dolichostyla	2	-32.08666115	119.697303
Banksia sphaerocarpa var. dolichostyla	2	-32.08639285	119.6967247
Banksia sphaerocarpa var. dolichostyla	3	-32.08626702	119.6967295
Banksia sphaerocarpa var. dolichostyla	3	-32.08616802	119.6966975

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Banksia sphaerocarpa var. dolichostyla	2	-32.08594613	119.6967228
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Banksia sphaerocarpa var. dolichostyla	2	-32.08569373	119.6966977
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Banksia sphaerocarpa var. dolichostyla	3	-32.08406705	119.6966362
Banksia sphaerocarpa var. dolichostyla	2	-32.08360287	119.6965727
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Banksia sphaerocarpa var. dolichostyla	2	-32.08330682	119.6958379
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Banksia sphaerocarpa var. dolichostyla	1	-32.08517262	119.6960135
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Banksia sphaerocarpa var. dolichostyla	5	-32.083082	119.6964545
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Eutaxia lasiocalyx	4	-32.1798415	119.6705343
Eutaxia lasiocalyx	1	-32.17968748	119.6716094
Eutaxia lasiocalyx	50	-32.17966548	119.6719438
Eutaxia lasiocalyx	50	-32.17975717	119.6720737
Eutaxia lasiocalyx	6	-32.17980207	119.6728869
Eutaxia lasiocalyx	100	-32.18022005	119.6740569
Eutaxia lasiocalyx	50	-32.18025902	119.6742691
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Eutaxia lasiocalyx	20	-32.18114582	119.6780504
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Eutaxia lasiocalyx	5	-32.1815943	119.6796294
Eutaxia lasiocalyx	50	-32.18173207	119.6799739
Eutaxia lasiocalyx	100	-32.18187957	119.6802079
Eutaxia lasiocalyx	50	-32.18216405	119.680492
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Eutaxia lasiocalyx	100	-32.18204773	119.6816407
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Microcorys sp. Mt Holland	2	-32.086491	119.6914914
Microcorys sp. Mt Holland	12	-32.08630735	119.69158
Microcorys sp. Mt Holland	1	-32.0858008	119.6918353
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12518797-55323/https://projectsportal.ghd.com/sites/pp18_02/florasurveysmthollan/ProjectDocs/12518797_Targeted flora survey report.docx

Document Status

Revision	Author	Reviewer		Approved for Issue		
		Name	Signature	Name	Signature	Date
0	Sarah Flemington	D. Farrar		D. Farrar		20/02/2020

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