Lot 7546 - O'Neill Road Waste Facility Site

Mount Barker

Reconnaissance flora and vegetation and basic fauna survey report

Bio Diverse Solutions

Final v.1

21/12/2021

DOCUMENT CONTROL

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Client: Shire of Plantagenet

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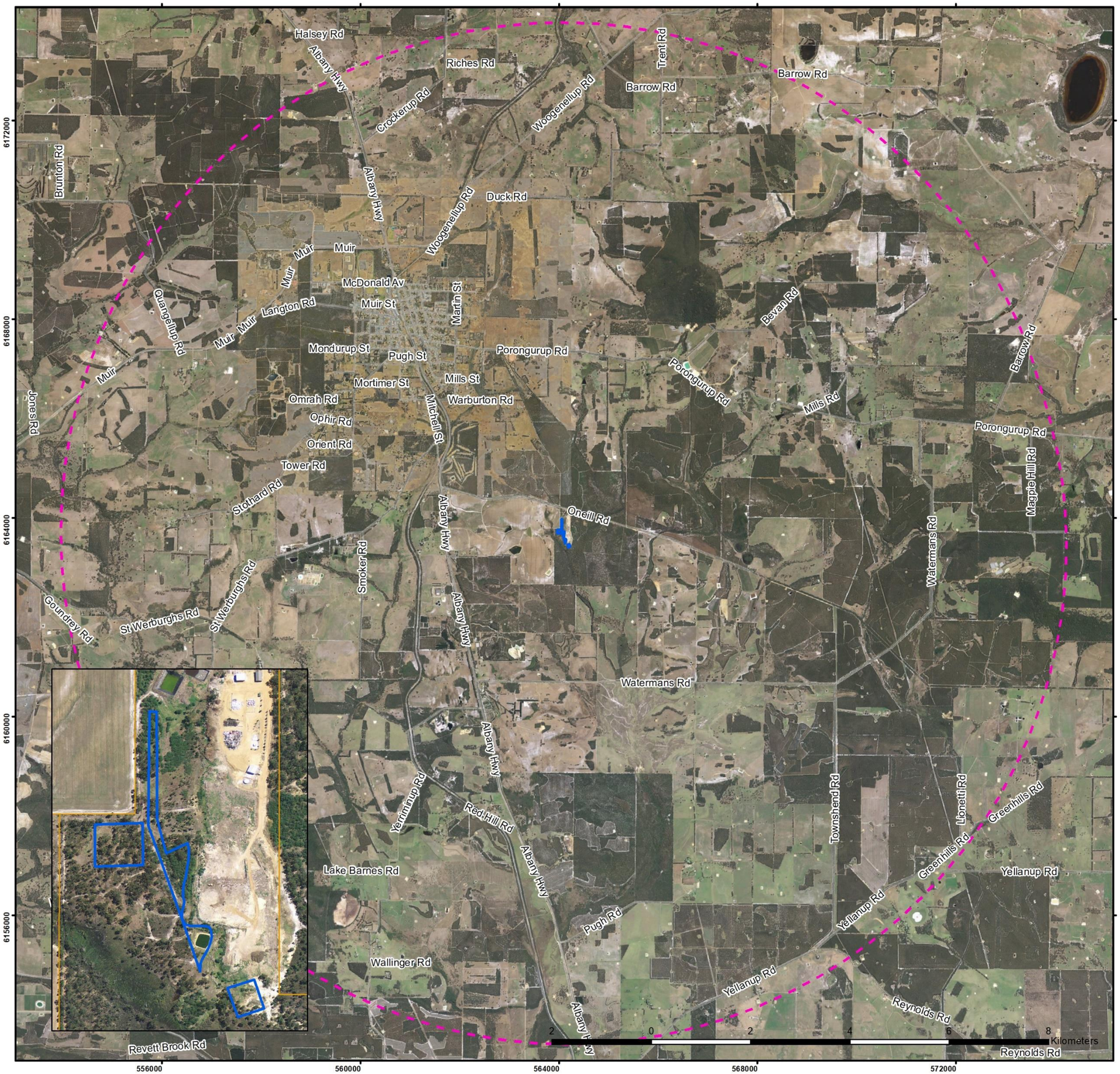
1. Introduction, scope and background information

The Shire of Plantagenet (SoP; "the client") commissioned Bio Diverse Solutions as Environmental Consultants to undertake a spring reconnaissance flora and vegetation survey and a basic (previously reconnaissance) fauna assessment of the proposed additional clearing within the O'Neill Road Waste Facility site, Mount Barker. The scope of works included:

- Complete a desktop assessment of publicly available databases pertaining to the site for threatened flora, vegetation and fauna;
- Undertake a reconnaissance spring flora and vegetation survey across the survey area including targeted threatened flora survey, field GPS vegetation and flora and mapping of boundaries of vegetation community types and threatened and priority flora (if present)
    - This shall include a likelihood of occurrence assessment for all conservation significant flora species identified in desktop searches.
- Undertake any identification of flora species, including herbarium identification as required;
- Identification and mapping of the vegetation condition within the survey area, including the location of any Weeds of National Significance or Declared Weeds, using the EPA (2016) condition scale;
- Undertake a reconnaissance fauna (including targeted threatened fauna) survey across the survey area, field GPS fauna habitat and threatened and priority fauna (if present):
    - A likelihood of occurrence assessment for all conservation significant fauna species (including black cockatoo) identified in desktop searches.
    - Identification of trees that may be of potential significance for threatened species, e.g. hollow-bearing trees
- Prepare IBSA data package as per EPA guidelines, and provide to client at completion of survey (as required to be submitted via the IBSA website by the client); and
- Preparation of reconnaissance flora, vegetation, and basic fauna survey report, which will be aligned with the appropriate government agency legislation and guidelines.

1.1. Site Location and Development Proposal

The "survey area" is defined as the approximately 1.68 ha area within Lot 7546 O'Neill Road, Mount Barker located approximately 7 km to the southeast of the Mount Barker Townsite. The study area consists of a 10 km radius around the survey area, which is used to determine the potential occurrence of threatened or priority listed species and ecological communities within the survey area based on their presence in this broader area. The survey area is located within the existing SoP waste receival site. The development proposed within the survey area is the expansion of existing waste receival facilities.



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BIO DIVERSE SOLUTIONS

Overview Map Scale 1:100,000

Legend

Survey Area

10km Study Area

Scale
1:75,000 @ A3
GDA MGA 94 Zone 50

Data Sources
Aerial Imagery: WA Now, Landgate Subscription Imagery
Cadastre, Relief Contours and Roads: Landgate 2017
IRIS Road Network: Main Roads Western Australia 2017
Overview Map: World Topographic map service, ESRI 2012

CLIENT
Shire of Plantagenet
Mount Barker Waste Facility
Lot 7546 O'Neill Road
Mount Barker, WA 6324

Figure 1: Survey Area Locality.

	QA Check	*Drawn by*
	KK	**BT**
STATUS	*FILE*	*DATE*
FINAL	**MB009**	**03/11/2021**

1.2. Geology and soils

Database searches shows the survey area lies within the Kent System (254Ke) and the Warren-Denmark Southland Zone (254). The Kent System is described as *"Undulating lateritic plain with lakes and poorly drained flats. Duplex sandy gravels, loamy gravels, grey deep sandy duplexes semi-wet soils and wet soils"* (DPIRD, 2021). The Warren-Denmark Southland Zone is described as "*Rises in a series of broad benches from the Southern Ocean north to the Blackwood Valley. Deeply weathered granite and gneiss overlain by Tertiary and Quaternary sediments in the south. Swampy in places."* (DPIRD, 2018). The soil type within the survey area is mapped as the Caldyanup Subsystem(254KeCA), which is described as "*Plains with drainage floors and low rises. Yellow solonetzic soils; Hakea scrub, Paperbark woodland. Humus podzols; Kangaroo Grass sedgelands. Reddish yellow earths; Hakea scrub"* (DPIRD, 2019).

1.3. Climate

The closest Bureau of Meteorology (BoM) site is Mount Barker (009581). The average annual temperature in Mount Barker ranges from 9.5 – 20.2°C. The average summer temperature ranges between 11.4-26.3°C, whilst average winter temperatures range between 6.1-15.4°C. The annual mean rainfall for Mount Barker is 726.0mm (BoM, 2021).

On average the months of May – September are the months with the highest rainfall (Figure 2). There was higher than average rainfall recorded in the months of February, March, April, May, July and September 2021, and higher than average rain recorded in November 2020 (Figure 2). Note there is no rainfall data currently available for this site for October and November 2021, therefore data from 2020 has been utilised below. The total rainfall in the year previous to the survey (October 2020 – September 2021) was 868.8 mm which is 142.8 mm above average and equates to 19.66% increase in average rainfall.

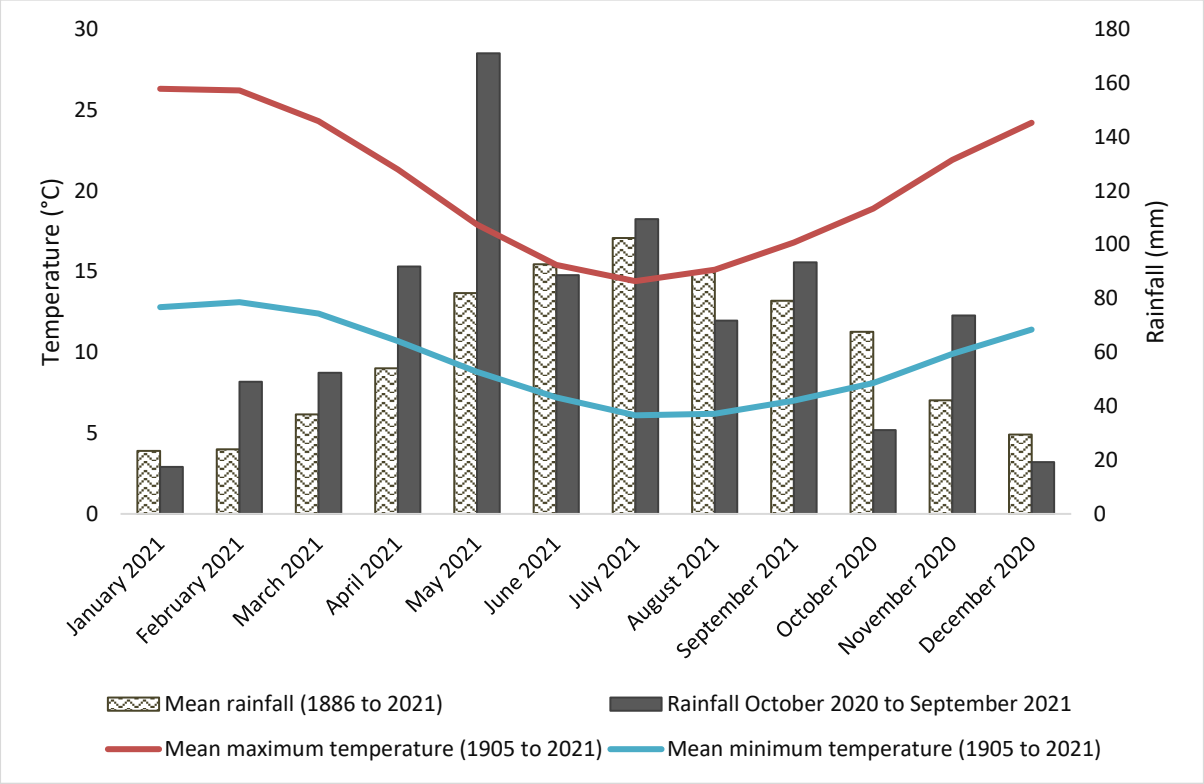


Figure 2: Temperature and Rainfall Data for Mount Barker BoM Weather Station No. 009581.

1.4. Habitat Connectivity

Habitat connectivity assessments rely on a bioregional and landscape-scale approach to evaluate habitat for fauna movement and ecological linkage across a region. Habitat connectivity is largely reliant on remnant vegetation and recognising it plays an important role in developing or maintaining corridors between protected areas to assist in achieving long-term biodiversity management outcomes (Wilkins *et al*. 2006). The survey area lies within the modified agricultural landscape of the SoP. Reserve 10003 (Nature Reserve) is located along the eastern boundary of Lot 7546, the Lot within which the survey area is

located. This reserve also extends to the north of O'Neill Road where it adjoins Reserve 16447. Another smaller reserve (Reserve 31092) is located to the east of the survey area (see Table 1 below for reserve details). There are also areas of remnant vegetation located within private property in the surrounding areas to the north, south, east and west of the survey area. These mosaics of remnant vegetation ultimately contribute to vegetated connections to other important reserves such as the Porongurup National Park, which is located approximately 10 km to the east.

Table 1: Reserve Details (GoWA, 2021).

Reserve Number	Responsible Agency	Current Purpose
10003	Department of Biodiversity, Conservation and Attractions	Conservation of Flora and Fauna
16447	Department of Planning, Lands and Heritage	Rifle Range
31092	Department of Planning, Lands and Heritage	Boy Scout Activities

1.5. Hydrology and Water

The survey area does not lie within any Public Drinking Water Source areas (DWER, 2020a), the nearest significant wetland, Lake Barnes is approximately 8km to the southwest (DBCA, 2017).

1.6. Environmentally Sensitive Areas

The survey area does not contain any Environmentally Sensitive Areas (ESA) (DWER, 2020b).

1.7. Remnant Vegetation

The survey area lies within the Southern Jarrah Forest (JAF02) IBRA subregion of the Jarrah Forest Bioregion. Hearn *et al* (2002) describes the Southern Jarrah Forest subregion as "*Duricrusted plateau of Yilgarn Craton characterised by Jarrah-Marri Forest on laterite gravels and, in the eastern part, by Wandoo - Marri woodlands on clayey soils. Eluvial and alluvial deposits support Agonis shrublands. In areas of Mesozoic sediments, Jarrah forests occur in a mosaic with a variety of species-rich shrublands.*"

The vegetation has been mapped on a broad scale by J.S. Beard (Shepherd *et al.* 2002) in the 1970's, where a system was devised for state-wide mapping and vegetation classification based on geographic, geological, soil, climate structure, life form and vegetation characteristics (Sandiford and Barrett, 2010). Vegetation units were regarded as associations and were grouped into Vegetation Systems representing a particular pattern of association distribution within a given area. A GIS search of J.S. Beards (Beard *et al.* 2013) vegetation classification places the survey area within one Vegetation Association (DPIRD, 2019b) Refer to Map 1 in Appendix A:

- **Vegetation Association Name:** Narrikup.
- **Vegetation Association Number:** 3
- **Vegetation Description:** Forest
- **Floristic Description:** Mainly jarrah and marri *Eucalyptus marginata, Corymbia calophylla*
- **Remnant Vegetation by Beard Association Rarity in LGA:** 36.37% remaining (GoWA, 2019).
- **Remnant Vegetation by Beard Association Rarity in IBRA Region:** 67.10% remaining (GoWA, 2019).

2. Methodology – Desktop Assessment

2.1. Flora and Vegetation

A desktop inventory of conservation significant flora species known to occur within 10 km of the survey area was undertaken using databases listed below. Although requested, the SoP did not supply DBCA datasets (WA Herbarium, TPFL and TEC/PEC), despite these being required to meet EPA Guidance (2016) for conducting a desktop assessment.

- Nature Map Database Search (combined data from DBCA, WA Museum and WA Herbarium; DBCA, 2007-; WAH 1998-) (DBCA 2021); and
- Protected matters search tool (DAWE, 2021).

The conservation significance of flora species has been assessed using data from the following sources:

- *Environment Protection and Biodiversity Conservation Act 1999* (*EPBC Act*). Administered by the Australian Government Department of Agriculture, Water and the Environment (DAWE);
- *Biodiversity Conservation Act 2016* (*BC Act*). Administered by the Western Australian Department of Biodiversity Conservation and Attractions (DBCA);
- DBCA priority and threatened ecological community list (DBCA, 2021). A non-legislative list maintained by DBCA for management purposes; and
- DBCA Priority Flora list. A non-legislative list maintained by DBCA for management purposes.

2.2. Fauna

A desktop inventory of conservation significant fauna species known to occur within 10 km of the survey area was undertaken using databases listed below. Although requested, the SoP did not supply DBCA databases, despite these being required to meet EPA Guidance (2016) for conducting a desktop assessment:

- Nature Map Database Search (combined data from DBCA, WA Museum and WA Herbarium); and
- Protected matters search tool (DAWE, 2020).

The conservation significance of fauna species has been assessed using data from the following sources:

- *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act). Administered by the Australian Government Department of Agriculture, Water and the Environment (DAWE);
- *Biodiversity Conservation Act 2016* (BC Act). Administered by the Western Australian Department of Biodiversity Conservation and Attractions (DBCA);

Desktop assessment for the Black Cockatoo habitat consisted of reviewing DBCA locational records and a range of publicly available datasets relevant to Black Cockatoo breeding, roosting and foraging areas. These included:

- Carnaby's Cockatoo Confirmed (DBCA_050) and Unconfirmed Roost Sites (DBCA_051; DBCA, 2018c).
- Carnaby's Cockatoo Confirmed (DBCA_52) and Unconfirmed Roost Sites Buffered 6km (DBCA-053; DBCA, 2018e).
- Carnaby's Cockatoo Confirmed Breeding Areas within the Swan Coastal Plain and Jarrah Forest IBRA Regions DBCA_054 (DBCA, 2018f).
- Carnaby's Cockatoo Unconfirmed Breeding Areas within the Swan Coastal Plain and Jarrah Forest IBRA Regions (DBCA-055; DBCA, 2018g).
- Black Cockatoo Breeding Sites - Buffered DBCA_063 (DBCA, 2019a).
- Black Cockatoo Roosting Sites – Buffered DBCA_064 (DBCA, 2019b).

3. Methodology - Field Survey

3.1. Flora and Vegetation

The aim of this survey was to provide context and gather knowledge of the survey area. This type of survey aims to verify the desktop information obtained, and to characterise the flora and vegetation units present within the survey area.

A Spring season reconnaissance level flora and vegetation survey was undertaken by Dr. Karlene Bain (Wildlife Ecologist) and Bianca Theyer (Conservation and Wildlife Biologist / Ecologist) on the 9th November 2021. The survey area was surveyed on foot using traverses and relevés. The intent of the traverses was to identify and map the different vegetation types, their condition category and to undertake more intensive targeted surveys within suitable habitat for conservation significant species. In addition, nine relevés were systematically surveyed within representative vegetation types to enable thorough recording of species occurrence and representative vegetation descriptions.

For species that were not flowering and where foliage or nuts / fruit couldn't be used for identification, potential habitat was used as an indication of the likelihood of species occurrence. All specimens were identified using high-quality macro and scaled photographs. Vegetation types were described based on structure, dominant taxa and cover characteristics as defined by relevé data and field observations, in accordance with both Muirs and NVIS Level 5 (sub-association) description methods.

Information collected within each relevé included:

- Location: coordinates of the relevé.
- Date and site code.
- Site description: landform, slope, soil colour and type and hydrology.
- Vegetation description: dominant and non-dominant species present within the different growth forms and percentage cover.
- Vegetation condition.

Following the field survey, the likelihood of occurrence and probability of detection for conservation significant flora species was assessed, based on the habitats identified within the survey, timing of the survey in relation to flowering periods, and survey effort. Assessments of detection probability and likelihood of occurrence for threatened ecological communities were based on key botanical, geological and locational diagnostic criteria as well as habitat requirements.

An assessment of potential survey limitations is outlined below in Table 2. No significant constraints were identified for this survey.

Table 2: Assessment of potential survey limitations.

Limitation	Constraint	Comment
Experience of personnel	Nil	Karlene Bain has 26 years field experience as a wildlife ecologist working with State Government, Natural Resource Management Groups, Not for Profit organisations and Private Industry. She has a Bachelor's Degree in Biological Science, and a Master's Degree and PhD in Zoology. Bianca Theyer has 5 years' experience in flora and vegetation assessment working with Bio Diverse Solutions' Botanists. She has experience in assisting with targeted and reconnaissance surveys within the Great Southern, South West and Esperance areas.
Survey timing	Nil	The survey was undertaken within the acceptable spring period, but did occur towards the end of the peak flowering period in this locale (9th of November 2021). The survey area is located directly adjacent to the existing operational waste receival site and is already highly disturbed, resulting in a large reduction in biodiversity. The survey timing of this survey is not considered a limitation to this survey. Eleven species of priority flora identified within the desktop survey are not recorded flowering in November. However, all of these species have been recorded as 'unlikely' to occur within the survey area.

Table 2 continued.

Limitation	Constraint	Comment
Access restrictions	Nil	No access restrictions were encountered during the survey.
Availability of contextual information	Minor	Publicly available desktop and background information was readily available to give a broad contextual understanding of the site. Although requested, DBCA database searches for the WA Herbarium, TPFL and threatened and priority ecological community (TEC/PEC) were not supplied by the Shire of Plantagenet. The desktop assessment therefore does not meet the EPA Guidance (2016).
Survey effort and extent	Nil	Nine relevé data sets collected to gain as complete a picture as possible of vegetation communities and flora species present at the site, which was an appropriate level of sampling for the site and at a reconnaissance level survey. The site is in a degraded to completely degraded condition and a high percentage (66%) of flora species identified were introduced species. The random traverse sufficiently covered the area, with traverse within 5-10m of each other. One orchid species was identified in the desktop assessment as 'possible' to occur, *Drakaea micrantha*. Following the CoA (2013) *Survey guidelines for Australia's Threatened Orchids,* it is recognised that due to the complex nature of Orchid phenology and physiology, more intensive survey transects and surveys in different time frames may be required. However, it was assessed that the species had a high likelihood of detection if it was present, due to the disturbed and low-competition nature of the site and the survey being conducted during the flowering period for the species. See Table A2, Appendix B.
Disturbances that may affect results	Nil	There are historical disturbances evident within the survey area in the form of an existing dam, access tracks and cleared areas likely associated with the historical development of the waste receival site. There is a very high level of weed invasion present within the site as well as rubbish, which has come into the survey area from the adjacent waste facility. As these are long-term disturbances, they will not have affected the results of this survey as the survey area has been altered due to their presence. In addition, the survey area appears to be long unburnt, and therefore no fire ephemeral species were captured during this survey. This is not considered to have had a significant impact on the survey as no fire ephemeral species were identified within the desktop assessment.
Identification issues	Nil	The survey was undertaken on 9th of November during the peak flowering period for many south coast flora species to maximise ease of identification. There was sufficient taxonomic material available for identification (such as nuts, fruit, leaf structure or flowers) for all of the 62 species detected within the survey area.

3.2. Basic Fauna Survey Methodology

Field survey work was carried out by Dr. Karlene Bain (Wildlife Ecologist) and Bianca Theyer (Conservation and Wildlife Biologist/Ecologist) on the 9th November 2021, in accordance with Guidance Statement 56: *Terrestrial Fauna Surveys* (EPA 2020).

Fauna surveys were was carried on foot using traverses and targeted survey techniques consistent with the following documents developed by the EPA and Department of Agriculture, Water and the Environment (DAWE) formerly the Department of Sustainability, Water, Population, and Communities (DSEWPaC) and Department of the Environment, Water, Heritage and the Arts (DEWHA):

- EPA (2020) Technical Guidance – Terrestrial vertebrate fauna surveys for environmental impact assessment;
- DEWHA (2010) Survey guidelines for Australia's threatened birds;
- DSEWPaC (2011) Survey guidelines for Australia's threatened mammals; and
- DSEWPaC (2012) Referral Guidelines for Three Threatened Black Cockatoo Species.

The vegetation units described in Section 5.2 broadly define habitat types across the survey area. The aim of the basic fauna survey was to assess and map the fauna habitat within the survey area, assess the likelihood of conservation fauna species utilising the general area and/or particular vegetation types, recording actual presence of conservation fauna taxa, and undertaking an opportunistic inventory of vertebrate species encountered whilst traversing the survey area on foot.

The conclusions presented are based upon field data collected over a limited period of time and are indicative of the environmental condition of the site at the time. Some fauna species are reported as potentially occurring within the subject site based on the presence of suitable habitat (quality and extent) within the subject site or immediately adjacent. With respect to opportunistic observations, the possibility exists that certain species may not have been detected during field investigations due to seasonal inactivity during the field survey, species present within micro habitats not surveyed, cryptic species able to avoid detection. and transient wide-ranging species not present during the survey period.

3.3. Targeted Black Cockatoo Habitat Assessment

The aim of the Black Cockatoo habitat assessment was to identify all trees that have a diameter, measured at 1.5 metres from the base of the tree, of 500 millimetres DBH or greater for Jarrah (*Eucalyptus marginata*) and Marri (*Corymbia calophylla*) and contain a hollow(s) of potential suitability for breeding by Carnaby's (*Calyptorhynchus latirostris*), Baudin's (*Calyptorhynchus baudinii*), and Forest Red-tailed Black Cockatoos (*Calyptorhynchus banksii naso*) referred to hereafter as significant trees. In addition, signs of feeding and roosting were also recorded.

All significant trees were GPS located, measured 1.5m above ground (DBH) using a diameter tape, photographed, and the presence or absence of potential breeding hollows determined. Where present, the entrance dimensions of the hollow entrance were recorded and hollows were assessed for signs of use by cockatoos, based on evidence such as scratching and chewing around the hollow entrance, and activity at the base of the tree, e.g., feathers, faecal material, feeding debris.

Long term studies on Carnaby's Black Cockatoos have shown that they utilise tree hollows ranging from 100mm – 650mm (average 260mm) in diameter (Saunders *et al.* 2014a, 2014b), whilst Forest Red-tailed Black Cockatoos utilise hollows with diameters ranging from 100mm x 120mm to 440mm x 1500mm (mean 280mm x 300mm; Johnstone and Storr, 1998; Johnstone *et al.* 2013). There is little published about dimensions of hollows utilised by Baudin's Black Cockatoo; however, it is expected they would be similar to those utilised by Carnaby's. In all instances, these species also require a hollow with significant depth. Based on the published information, hollows with an entrance diameter larger than 100mm x 100mm that occurred in branches or trunks with the capacity for deep hollows were recorded as potential cockatoo hollows. Smaller hollows with the potential to develop into suitable nesting hollows were also recorded.

The hollows were classified in accordance with their entry type:

- Chimney: the hollow entry faces upwards in the end of the main trunk or branch;
- Side: the hollow entry is into the side of the trunk or branch; or
- Elbow: the hollow entry is in the bend / elbow of the trunk and branch.

Foraging habitat was identified and mapped based on vegetation types described during the flora and vegetation survey (refer to Section 5.2). The *EPBC Guidelines for Black Cockatoos* (DSEWPaC, 2012) outline general criteria for identifying foraging habitat (Table 5) but do not provide detailed criteria for assessing quality. In this instance, the quantity of feeding evidence, overall health of trees (dead, presence of disease), presence of fruiting material, and diversity of known foraging species was taken into account when assessing the quality of foraging habitat. Vegetation types that do not contain known foraging species were not considered to contain foraging habitat.

Given the absence of criteria within the EPBC Guidelines (DSEWPaC, 2012) for assessing roosting habitat, the presence of cockatoo feathers and faecal material were used.

The results presented are based upon field data collected over a limited period of time and are indicative of the environmental condition of the survey area at the time. This was a ground-based survey and actual depth of hollows were not determined. Hollows were visually inspected from the ground and where necessary, binoculars were used to inspect the entrance. Survey limitations are outlined below, none are deemed to have significantly impacted the survey (Table 3).

Table 3: Fauna survey limitations and constraints.

Limitation	Constraint	Comment
Scope	Nil	The scope was a basic fauna survey to generally assess the presence / evidence of fauna species within the survey area, map the fauna habitat, undertake opportunistic inventory of species including priority conservation species. Additional targeted assessment of significant trees was undertaken to identify breeding, roosting or foraging habitat for Black Cockatoos.
Disturbances that may affect results	Nil	No recent disturbances which may affect results of the survey were identified, e.g., recent fire or grazing. Historical and ongoing disturbances from the existing operational activities at the waste facility site may impact the presence of fauna within the survey area. However, given these disturbances are long-term and continuous, they are unlikely to have resulted in a significant limitation on detection probability or species occurrence during the survey period (i.e. activities would result in some fauna moving away / not utilising the survey area at all times).
Intensity of survey	Nil	The basic fauna survey and targeted components of the survey were deemed appropriate given the scope was to identify the general presence of fauna species and fauna habitat in the survey area.
Sources of information (recent or historic) and availability of contextual information	Minor	Publicly available desktop and background information was readily available to give a broad contextual understanding of the site. Although requested DBCA database searches were not supplied by the Shire of Plantagenet. Given the survey area is highly disturbed, this is not considered a limiting factor for this survey.
Remoteness or access issues	Nil	No access restrictions were encountered.
Experience of personnel	Nil	Bianca Theyer has 5 years of fauna survey experience through her role at Bio Diverse Solutions and has been mentored by Dr Karlene Bain (Wildlife Ecologist) during this time. She has 6 years' experience assisting other Zoologists (Bush Heritage, Australian Wildlife Conservancy and DBCA) in a voluntary capacity with fauna monitoring surveys. Dr Karlene Bain has 26 years of fauna survey experience through roles in biodiversity survey, research and management working with State Government, State Natural Resource Management groups, Regional NRM groups, Research Institutions, and Private Industry.

4. Results – Desktop Assessment

4.1. Flora and Vegetation

The full species list compiled from all available data (Table A2 in Appendix B) is based on observations from a broader area than the survey area and is likely to include species that would not occur in the actual survey area due to a lack of suitable habitat. The data also includes very old records and in some cases the species in question may have become locally or regionally extinct. Conservation categories for Threatened and Priority flora and ecological communities are presented in Tables A5-A8 in Appendix C. NatureMap and Protected matters search tool database searches are provided in Appendix E.

As a result of the above-mentioned database searches 15 Threatened and 15 Priority species were identified within the study area (10km buffer). Of these, four were assessed to be "possible" to occur. Refer to Table A2 in Appendix B for likelihood of occurrence (LOO) analysis.

4.2. Threatened and Priority Ecological Communities

Database analysis relied entirely on the PMST (DAWE, 2021) which only identifies ecological communities with a threatened status. The PMST (DAWE, 2021) results indicate that one ecological community '*Proteaceae Dominated Kwongkan Shrublands of the Southeast Coastal Floristic Province of Western Australia* (Kwongkan)*'* may be present within the survey area, which is further described below.

Due to no desktop survey occurring within the study area for DBCA's TEC/PEC databases, all known TECs and PECs within the south coast region were considered during the survey thorough comparison of DBCA's priority ecological community listing (DBCA, 2021). One PEC was identified that bore similarities to the vegetation types identified within the survey area, 'Swamp Yate, *Eucalyptus occidentalis,* woodlands in seasonally inundated clay basins (South Coast)'. This is described in further detail below.

Proteaceae Dominated Kwongkan Shrublands of the Southeast Coastal Floristic Province of Western Australia (Kwongkan)

Kwongkan is listed as Priority 3 (P3) PEC within WA under the *Biodiversity Conservation Act 2016* (BC Act) and as an Endangered Threatened Ecological Community (TEC) under the *Environment Protection and Biodiversity Conservation Act* 1999 (EPBC Act). The survey area lies within the southeast botanical province of Western Australia (Hopper and Gioia, 2004), which is the geographical location of Kwongkan. It is defined and assessed in the conservation advice as generally Kwongkan shrubland, ranging from sparse to dense, thicket-forming, where Proteaceous species form a significant component (DoE, 2015b). It is confined to the southeast botanical province of Western Australia (Hopper and Gioia, 2004) and primarily occurs on sandplains and marine plains and lower to upper slopes and ridges, as well as uplands across this region. Multiple other ecological communities are listed under the *BC Act 2016* that also meet criteria of Kwongkan TEC and should be considered when assessing whether Kwongkan is present.

Kwongkan is recognised by the below key diagnostic features and minimum condition thresholds outlined in Approved Conservation Advice Guidelines (DoE, 2015):

1) Occurs within the South Coastal Floristic Province (Hopper and Gioia, 2004); relating to south west phytogeographic boundaries. Includes Island of the Recherche Archipelago.
2) a) Characterised by Proteaceae species having 30% or greater cover of Proteaceae species across all layers of where shrubs occur (crowns measured as if opaque). OR;
   b) Two or more diagnostic Proteaceae species are present that are likely to form a significant vegetative component when regenerated. The use of diagnostic species is for situations in which the cover or Proteaceae species is reduced due to recent disturbance (e.g., fire).

Condition thresholds for the ecological community are described in Table 4.

Table 4: Condition thresholds and minimum patch size analysis for Kwongkan PEC/TEC diagnostic criteria.

Condition category	Minimum patch size	Weeds	Dieback
High	1 ha	<30% perennial weed cover	No known Dieback infestation
Moderate	0.5 ha	<70% perennial weed cover	May be present or unknown

The approved conservation advice, available spatial mapping for the ecological community, and description above indicates that this TEC/PEC could possibly occur within the survey area.

'Swamp Yate, *Eucalyptus occidentalis*, woodlands in seasonally inundated clay basins (South Coast) (Yate Woodland)'

Yate Woodland is listed as a P3 PEC community, as outlined on DBCA's priority and threatened ecological community (DBCA, 2021). It is therefore not recognised federally as a TEC, or as a matter of national significance. No approved conservation advice guideline is present for Yate Woodlands. It is described as being poorly conserved in the region, and recognised through the presence of an intact understory and fringing vegetation.

Following the above description, mapped soil types and vegetation types, this PEC could possibly be within the survey area.

4.3. Fauna

As a result of the above-mentioned database searches, 26 Threatened and Priority fauna species were identified as potentially being present within the survey area (with a 10km buffer). Conservation categories for Threatened and Priority fauna are presented in Tables A5 and A6 in Appendix C. NatureMap and Protected matters search tool database searches are provided in Appendix E.

The full species list compiled from all available data (Table A4 Appendix B) is based on observations from a broader area than the survey area and is likely to include species that would not occur in the actual survey area due to a lack of suitable habitat. The data also includes very old records and in some cases the species in question may have become locally or regionally extinct.

4.4. Potential breeding, foraging and roosting habitat for black cockatoos

Carnaby's Cockatoo

Carnaby's Cockatoo have a wide-spread distribution across Western Australia which extends from Kalbarri and Geraldton in the northwest of the state, inland to Morawa, Dowerin and Merredin and to the east of Esperance (DSEWPaC, 2012). The survey and study area lie within the known breeding and foraging range of the Carnaby's Cockatoo (DSEWPaC, 2012).

Carnaby's Cockatoo breed within the inland parts of its distribution, in areas with 300-750mm annual average rainfall (DPaW, 2013). This breeding range has expanded in recent years to extend further south into Jarrah-Marri forests and the coastal tuart forests south of Perth (Johnstone and Storr 1998; Johnstone *et al.* 2011). There are no known confirmed breeding sites within a 10km range of the survey area, with the closest being approximately 27-28km north and northwest of the study area (DBCA, 2018a; 2019a). However, based on known breeding habitat preferences (Table 5), and information provided by the Shire of Plantagenet prior to the survey being undertaken it is expected the survey area will contain suitable breeding habitat for this species.

Publicly available DBCA database records indicate there are no confirmed or unconfirmed roosting areas within the 10km study or survey area (DBCA, 2018b-e). However, data from the Great Cocky Count (DBCA, 2019b) indicate that there are roosting sites within the study area, the closets being approximately 4.5km to the northwest of the survey area. Carnaby's Cockatoo roost in non-breeding areas near riparian environments or natural and artificial permanent water sources, within an area of high-quality foraging habitat. (DSEWPaC, 2012; Table 5). The lack of confirmed roosting sites within the survey and study area may be due to the criterion that roosting sites are located near an "important" water source, and high-quality feeding areas. It should be noted that there is no definition of what an important water source for black cockatoos is within the EPBC Guidelines (2020). Potential roosting habitat may be present within the survey area.

Carnaby's Cockatoo prefers Kwongkan heathland, shrublands and woodlands dominated by Proteaceous species as foraging habitat, but will feed on individual Eucalypts and small stands of Eucalypt woodland or forest (Table 5). The vegetation present within the survey area is considered likely to contain potential foraging habitat for this species.

Baudin's Cockatoo

Baudin's Black Cockatoo is most commonly found in forested areas, but is also found in the open agricultural areas within the southwest (DEC, 2008). The study and survey area falls within the known distribution area for Baudin's Cockatoo, which extends from Mundaring south to Kojonup and Albany, and inland to the Stirling Ranges (DEC, 2008; DSEWPaC, 2012). Based on modelled predicted breeding areas contained within the guidelines (DSEWPaC, 2012), the study and survey area do not fall within the breeding distribution. The breeding ecology of this species is not well known outside of the southwest forests where it is known to breed within the Jarrah, Marri and Karri Forest (Table 5) of the far southwest of WA.

Roosting habitat for this species is similar to that of Carnaby's Cockatoo and usually occurs in riparian systems or near permanent and important water sources, within areas with high-quality foraging habitat (DSEWPaC, 2012; DEC, 2008). Based on known roosting habitat preferences the survey area may have the potential to contain roosting habitat for this species.

Foraging habitat for this species includes Eucalypt woodlands and forest, and Proteaceous woodland and heath, where Cockatoo's feed mostly on marri seeds and Proteaceous species such as Banksia sp. and Hakea sp. (refer to Table 5 for more foraging species detail). The survey area may contain foraging habitat, but it is likely to be marginal due to the low diversity and availability of suitable foraging species.

Forest Red-tailed Black Cockatoo

Forest Red-tailed Black Cockatoo occur within the south-west humid and sub-humid zones of Western Australia, in the dense Jarrah, Karri and Marri forests that receive more than an average of 600mm annual rainfall (DEC, 2008). Their distribution extends from Perth, east to Wundowie and south through to Narrogin, Kojonup, Cranbrook and Albany (DSEWPaC, 2012). The survey and study area are located within the known distribution for this species (DSEWPaC, 2012). Forest Red-tailed Black Cockatoo are known to breed in Marri, Jarrah, Blackbutt, Bullich and Wandoo within the south-west humid and subhumid zones of Western Australia (DEC, 2008; DSEWPaC, 2012). Based on this information breeding habitat may be present within the survey area.

Roosting habitat is similar to the other two black cockatoo species whereby they use communal roosts in tall woodland and forested areas close to a water source and high-quality foraging habitat. Based on the known roosting habitat preferences (refer to Table 5) it is possible that suitable roosting habitat may be present within the survey area.

Table 5: Habitats used by Black Cockatoos (DSEWPaC 2012).

Habitat	Baudin's	Carnaby's	Forest Red-tailed
Breeding	Generally, in woodland or forest, but may also breed in former woodland or forest now present as isolated trees. Nest in hollows in live or dead trees of karri *Eucalyptus diversicolor*, marri *Corymbia calophylla*, wandoo *E. wandoo* and tuart *E. gomphocephala*.	Generally, in woodland or forest, but also breeds in former woodland or forest now present as isolated trees. Nest in hollows in live or dead trees of salmon gum *E. salmonophloia*, wandoo, tuart, jarrah *E. marginata*, flooded gum *E. rudis*, york gum *E. loxophleba* subsp. *loxophleba*, powder bark *E. accedens*, karri and marri.	Generally, in woodland or forest, but may also breed in former woodland or forest now present as isolated trees. Nest in hollows in live or dead trees of marri, karri, wandoo, bullich *E. megacarpa*, blackbutt *E. patens*, tuart and jarrah.
Roosting	Generally, in or near riparian environments or other permanent water sources. Jarrah, marri, flooded gum, blackbutt *E. patens*, tuart, and introduced eucalypts including blue gum *E. globulus*, and lemon scented gum *Corymbia citriodora*.	Generally, in or near riparian environments or natural and artificial permanent water sources. Flat-topped yate *E. occidentalis*, salmon gum, wandoo, marri, karri, blackbutt, tuart, introduced eucalypts (for example blue gum) and introduced pines.	Tall jarrah, marri, blackbutt, tuart and introduced eucalypt trees within or on the edges of forests.

Table 5 continued.

Habitat	Baudin's	Carnaby's	Forest Red-tailed
Foraging	Eucalypt woodlands and forest, and Proteaceous woodland and heath. During the breeding season feed primarily on native vegetation, particularly marri. Outside the breeding season, may feed in fruit orchards (mostly apple and pear, but also persimmon) and tips of *Pinus* spp.	Native shrubland, Kwongkan heathland and woodland dominated by Proteaceous plant species such as *Banksia* spp. (including *Dryandra* spp.), *Hakea* spp. and *Grevillea* spp. Forages in pine plantations (*Pinus* spp.), eucalypt woodland and forest that contains foraging species. Also, individual trees and small stands of these species.	Jarrah and marri woodlands and forest, and edges of karri forests including wandoo and blackbutt, within the range of the subspecies.
Foraging: common food items	Mostly marri (seeds, flowers, nectar and grubs) and proteaceous trees and shrubs. Also, other native seeds and introduced fruits; insects and insect larvae; pith of kangaroo paw *Anigozanthos flavidus*; juice of ripe persimmons; tips of *Pinus* spp. and seeds of apples and pears.	Seeds, flowers and nectar of native Proteaceous plant species (for example, *Banksia* spp., *Hakea* spp., *Dryandra* spp., and *Grevillea* spp.), eucalypts and Callistemon. Also seeds of introduced species including *Pinus* spp., *Erodium* spp., wild radish, canola, almonds and pecan nuts; insects and insect larvae; occasionally flesh and juice of apples and persimmons.	Mostly seeds of marri and jarrah, also *Eucalyptus caesia*, illyarrie, *E. erythrocorys* and some introduced eucalypts such as river red gum *E. camaldulensis* and flooded gum *E. grandis*, *Allocasuarina* cones, fruits of Snottygobble *Persoonia longifolia* and mountain marri *Corymbia haematoxylon*. On the Swan Coastal Plain, often feed on introduced cape lilac *Melia azedarach*.

5. Field Survey Results – Flora and Vegetation

5.1. Flora Diversity

During the survey 62 flora species, consisting of 23 families and 50 genera were found. The most commonly occurring families were Poaceae, Asteraceae and Fabaceae. The list includes 21 native species (refer to Table A10 Appendix D), and 41 introduced / alien species. The vegetation units identified across the survey area are described in Section 5.2. Refer to Figure 7 for vegetation mapping, and Appendix D for full species list.

5.2. Vegetation Units

Four vegetation types were identified during the survey period, vegetation descriptions can be found in the following sections, with relevé data presented in Appendix D. Refer to Figures 3 – 6 for photographs of vegetation units and Figure 7 or extent.

1. Vegetation type: Cleared / Disturbed

Vegetation Description (NVIS): U +/-*Eucalyptus occidentalis*\tree\7\bi; M^^ ^^*Chamaecytisus palmensis, Phytolacca octandra*, +/-*Acacia pycnantha*\shrub\^4,3\d; G^^ ^^*Raphanus raphanistrum, Fumaria capreolata, Ehrharta longiflora, Watsonia meriana*\^forb, grass\^2,1\d.

Vegetation Description (Muirs): *Eucalyptus occidentalis* Open Woodland, over **Chamaecytisus palmensis* and **Acacia pycnantha* thicket, over **Phytolacca octandra* Dwarf Scrub C, over **Ehrharta longiflora* and **Bromus diandrus* Dense Tall Grass, over **Lolium rigidum, *Cenchrus clandestinus* and **Lolium arundinaceum* Dense Low Grass, over **Raphanus raphanistrum, *Watsonia meriana* and **Fumaria capreolata* Dense Herbs.

Area:1.00 ha

Site description: Flat sites with dark brown sandy soils, with poor drainage. Located in drainage depressions and flat ground / plains.

Condition: Completely Degraded.

Represented in R1, R2, R5 and R7 (refer to Appendix D).

Figure 3: Cleared / Disturbed vegetation unit present within the survey area.

Figure 3 continued.

2. Vegetation type: *Corymbia calophylla and Eucalyptus marginata* [Corcal Eucmar] Woodland

Vegetation Description (NVIS): U ^^*Corymbia calophylla, Eucalyptus marginata*\tree\7\i; M^^ *Chamaecytisus palmensis*\shrub\4\d; G^^ ^^*Fumaria capreolata, Watsonia meriana, Ehrharta longiflora, Lolium arundinaceum*\^herb, grass\^2,1\d.

Vegetation Description (Muirs): *Corymbia calophylla* and *Eucalyptus marginata* Woodland, over **Chamaecytisus palmensis* Dense Thicket, over **Ehrharta longiflora* and **Lolium arundinaceum* Open Grass, over **Fumaria capreolata* and **Watsonia meriana* Open Herbs

Area: 0.046 ha.

Site description: Flat site in located adjacent to existing landfill area, with dark brown sandy soils that have poor drainage.

Condition: Degraded.

Represented in R3 (refer to Appendix D).

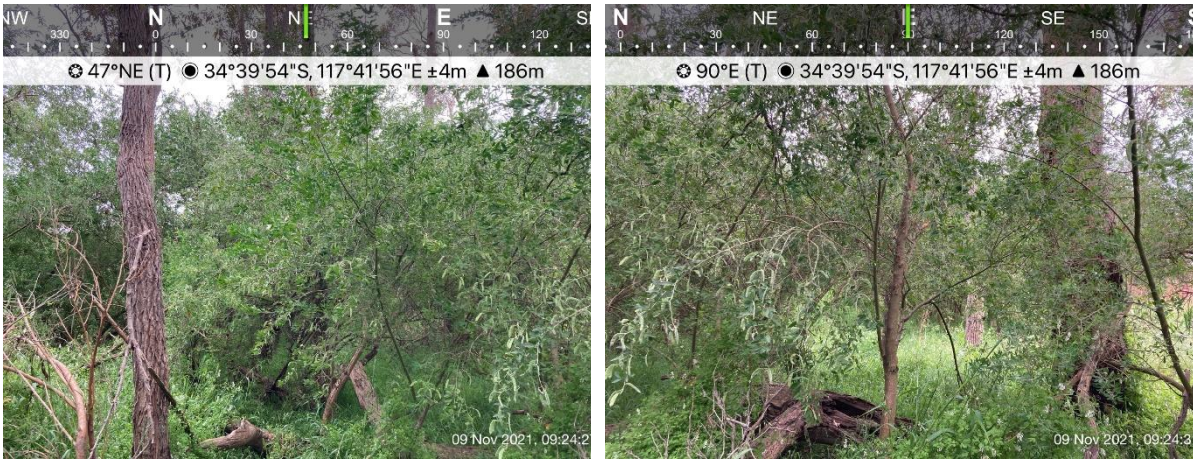


Figure 4: *Corymbia calophylla and Eucalyptus marginata* [Corcal Eucmar] Woodland vegetation unit present within the survey area.

***3.* Vegetation type: *Eucalyptus occidentalis* [Eucocc] Open Forest**

Vegetation Description (NVIS): U^^ ^*Eucalyptus occidentalis*, *+/-Corymbia calophylla*\tree\7\d; M ^^*Xanthorrhoea gracilis, Chamaecytisus palmensis, Paraserianthes lophantha*\shrub\3\i; G^^ ^*Watsonia meriana, Ehrharta longiflora, Briza maxima*\^forb, grass\1\d

Vegetation Description (Muirs): *Eucalyptus occidentalis* Dense Forest, over *Hakea prostrata, Agonis flexuosa, *Chamaecytisus palmensis* Scrub, over *Acacia extensa, *Paraserianthes lophantha* and **Watsonia meriana* Low Scrub A and B, over *Xanthorrhoea gracilis* and *Pimelea ciliata* open Dwarf Scrub C and D, over *Machaerina juncea, Cyathochaeta avenacea* and

Desmocladus asper Very Open Tall and Low Sedges, over **Sonchus oleraceus, *Arctotheca calendula* and **Hypochaeris radiata* Herbs, over **Ehrharta longiflora* and **Bromus diandrus* Tall Grass, over **Lolium rigidum, *Briza maxima* and **Briza minor* Low Grass.

Area: 0.609 ha.

Site description: Flat plains, with dark brown sandy soils and poor drainage.

Condition: Completely Degraded.

Represented in R4, R8 and R9 (refer to Appendix D).

Figure 5: *Eucalyptus occidentalis* [Eucocc] Open Forest vegetation unit present within the survey area.

4. Vegetation type: *Melaleuca cuticularis* [Melcut] Wetland

Vegetation Description (NVIS): U *Melaleuca cuticularis*\shrub\4\r; G^ ^*Watsonia meriana, +/-Bromus diandrus, Cyathochaeta avenacea*\^herb, grass, sedge\1\c

Vegetation Description (Muirs): *Melaleuca cuticularis* Open Low Scrub A, over *Cyathochaeta avenacea* Very Open Tall Sedges, over *Isolepis marginata* and **Cyperus tenellus* Very Open Low Sedges, over **Watsonia meriana, *Raphanus raphanistrum* and *Stylidium spathulatum* Herbs, over **Bromus diandrus* Very Open Tall Grass, over **Briza minor* and *Neurachne alopecuroidea* Very Open Low Grass.

Area: 0.028 ha.

Site description: Flat drainage depression with dark brown sandy soils with poor drainage.

Condition: Degraded.

Represented in R6 (refer to Appendix D).

Figure 6: *Melaleuca cuticularis* [Melcut] vegetation unit present within the survey area.

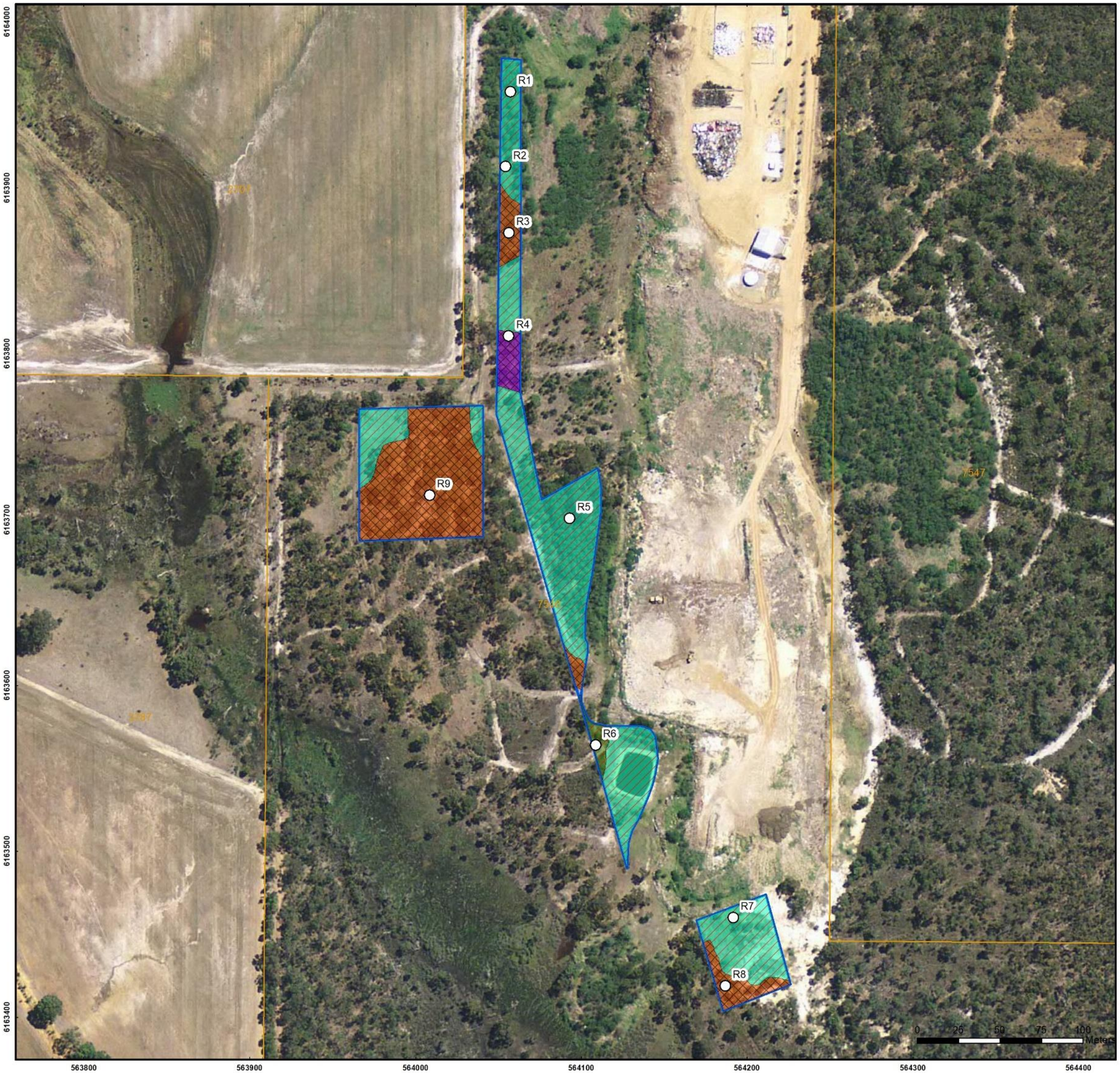
5.3. Vegetation Condition

The vegetation condition for the survey area (Table 6) has been mapped using the condition rating scale (adapted from Keighery 1994) outlined in *EPA Flora and Vegetation Survey Technical Guidance* (2016).

The vegetation ranged from Degraded to Completely Degraded condition throughout the survey area. These classification levels are related to degradation of structure and vegetation integrity by processes such as clearing, fire, weeds, Phytophthora Dieback and vehicle tracks. The 'Cleared / Disturbed' and 'Melcut Wetland' units are classified as being in Completely Degraded condition, the 'Corcal Eucmar Woodland' and 'Eucocc Open Forest' are classified as being in Degraded condition. See Table 6 below for condition rating and size of each vegetation unit.

Table 6: Vegetation condition rating.

Vegetation type	Condition rating	Area (ha)
Cleared / Disturbed	Completely Degraded	1.00
Corymbia calophylla and Eucalyptus marginata [Corcal Eucmar] Woodland	Degraded	0.046
Eucalyptus occidentalis [Eucocc] Open Forest	Degraded	0.609
Melaleuca cuticularis [Melcut] Wetland	Completely Degraded	0.028
	Total	**1.68 ha**



Albany Office:
29 Hercules Crescent
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Denmark Office:
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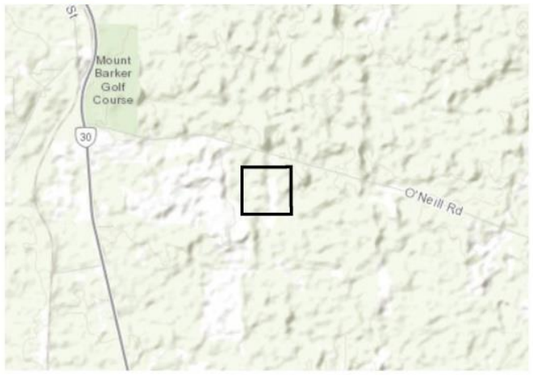
Denmark, WA 6333
(08) 9848 1309

Esperance Office:
2A/113 Dempster Street
Esperance, WA 6450
(08) 9072 1382

BIO DIVERSE SOLUTIONS



Overview Map Scale 1:100,000

Legend

- Survey Area
- Cadastre

Sample Sites

- Releve

Vegetation Units

- Cleared / Disturbed
- Corcal Eucmar Woodland
- Eucocc Open Forest
- Melcut wetland

2D Vegetation Condition

- Degraded
- Completely Degraded

Scale
1:2,250 @ A3
GDA MGA 94 Zone 50

Data Sources
Aerial Imagery: WA Now, Landgate Subscription Imagery
Cadastre, Relief Contours and Roads: Landgate 2017
IRIS Road Network: Main Roads Western Australia 2017
Overview Map: World Topographic map service, ESRI 2012

CLIENT
Shire of Plantagenet
Mount Barker Waste Facility
Lot 7546 O'Neill Road
Mount Barker, WA 6324

Figure 7: Vegetation Units & Condition.

	QA Check	*Drawn by*
	KK	**BT**
STATUS	*FILE*	*DATE*
FINAL	**MB009**	**07/12/2021**

5.4. Weeds and disturbance

Of the 62 flora species recorded within the survey area, 41 species are introduced. The full suite of weed species recorded is listed below in Table 7, with their corresponding ratings under the WA Weed Strategy (CALM, 1999) and the *BAM Act* (2007). The ratings given under the WA Weed Strategy relate to determining the significance of a weed, based on the criteria of invasiveness, impacts, potential for spread and socioeconomic and environmental values, and can be either 'High', 'Moderate', 'Mild', or 'Low' (CALM, 1999).

Bridal creeper (*Asparagus asparagoides*) is classed as a 'Declared Pest – s22(2) (Exempt)', whilst all others are classified as 'Permitted – s11', under the *Biosecurity and Agriculture Management Act 2007*. Under the Environmental Weeds Strategy for Western Australia (CALM, 1999) there are three species with a rating of 'High', 18 'Moderate', six 'Mild' eight 'Low' and six with no rating (Table 7).

It is strongly recommended that all machinery entering the survey area (if clearing is approved in the future) has rigorous and thorough biosecurity hygiene applied to limit the introduction of invasive species infestation and the potential to significant degrade the surrounding reserve in pristine to excellent condition.

Table 7: Weed species recorded from the survey area.

Family	Species	Vernacular	WA Weed Strategy rating (CALM 1999) / BAM Act (2007)
Asparagaceae	*Asparagus asparagoides*	Bridal Creeper	High / Declared Pest – s22(2) (Exempt)
Poaceae	*Bromus diandrus*	Great Brome	High / Permitted (s11)
Poaceae	*Lagurus ovatus*	Hare's Tail Grass	High / Permitted (s11)
Asteraceae	*Arctotheca calendula*	Capeweed	Moderate / Permitted – s11
Poaceae	*Briza maxima*	Blowfly Grass	Moderate / Permitted (s11)
Poaceae	*Briza minor*	Shivery Grass	Moderate / Permitted (s11)
Poaceae	*Cenchrus clandestinus*	Kikuyu	Moderate / Permitted (s11)
Fabaceae	*Chamaecytisus palmensis*	Tagasaste	Moderate / Permitted (s11)
Asteraceae	*Cirsium vulgare*	Bull Thistle	Moderate / Permitted (s11)
Cyperaceae	*Cyperus tenellus*	Tiny Flat Sedge	Moderate / Permitted (s11)
Orchidaceae	*Disa bracteata*	Bract Disa	Moderate / Permitted (s11)
Poaceae	*Ehrharta longiflora*	Annual Veldt Grass	Moderate / Permitted (s11)
Poaceae	*Lolium rigidum*	Wimmera Ryegrass	Moderate / Permitted (s11)
Poaceae	*Polypogon monspeliensis*	Annual Beard Grass	Moderate / Permitted (s11)
Asteraceae	*Pseudognaphalium luteoalbum*	Jersey Cudweed	Moderate / Permitted (s11)
Solanaceae	*Solanum nigrum*	Black Berry Nightshade	Moderate / Permitted (s11)
Asteraceae	*Sonchus asper*	Rough Sowthistle	Moderate / Permitted (s11)
Asteraceae	*Sonchus oleraceus*	Common Sowthistle	Moderate / Permitted (s11)
Fabaceae	*Trifolium campestre*	Hop Clover	Moderate / Permitted (s11)
Campanulaceae	*Wahlenbergia capensis*	Cape Bluebell	Moderate / Permitted (s11)
Iridaceae	*Watsonia meriana*	Bulbil Bugle-lily	Moderate / Permitted (s11)
Papaveraceae	*Fumaria capreolata*	White Fumitory	Mild / Permitted (s11)
Fabaceae	*Ornithopus compressus*	Yellow Serradella	Mild / Permitted (s11)
Phytolaccaceae	*Phytolacca octandra*	Red Inkweed	Mild / Permitted (s11)
Brassicaceae	*Raphanus raphanistrum*	Wild Radish	Mild / Permitted (s11)
Polygonaceae	*Rumex crispus*	Curled Dock	Mild / Permitted (s11)
Solanaceae	*Solanum laciniatum*	Kangaroo Apple	Mild / Permitted (s11)
Fabaceae	*Acacia pycnantha*	Golden Wattle	Low / Permitted (s11)
Poaceae	*Bromus hordeaceus*	Soft Brome	Low / Permitted (s11)

Table 7 continued.

Family	Species	Vernacular	WA Weed Strategy rating (CALM 1999) / BAM Act (2007)
Caryophyllaceae	*Cerastium glomeratum*	Chickweed	Low / Permitted (s11)
Asteraceae	*Cotula turbinata*	Funnel Weed	Low / Permitted (s11)
Poaceae	*Lolium arundinaceum*	Tall Fescue	Low / Permitted (s11)
Oxalidaceae	*Oxalis incarnata*	Pale Pink Sorrel	Low / Permitted (s11)
Oxalidaceae	*Oxalis purpurea*	Large Flower Wood Sorrel	Low / Permitted (s11)
Caryophyllaceae	*Silene gallica*	Small-flowered Catchfly	Low / Permitted (s11)
Iridaceae	*Romulea rosea*	Guildford Grass	TBA / Permitted (s11)
Asteraceae	*Cotula coronopifolia*	Waterbuttons	- / Permitted (s11)
Primulaceae	*Lysimachia arvensis*	Scarlet Pimpernel	- / Permitted (s11)
Fabaceae	*Paraserianthes lophantha*	Albizia	- / Permitted (s11)
Caryophyllaceae	*Petrorhagia dubia*	Hairypink	- / Permitted (s11)
Asteraceae	*Hypochaeris radicata*	Cats Ear	- / Permitted (s11)

5.5. Threatened Flora

Of the 30 Threatened and Priority flora species identified within the desktop assessment, none were identified during the field survey to be present. Of these 30 species, four have been assessed to be 'Possible' to occur due to suitable habitat. There was marginal suitable habitat for four species, that have ultimately been assessed as "unlikely" to occur due to the marginal habitat present. None of these species were identified on site, furthermore the genus of eight of these species was not identified within the survey area.

All flora species identified within the survey area bore no similarities to conservation listed species, identified within the desktop assessment and more broadly within the Jarrah Forest IBRA region. All identifications were undertaken using a range of assisting material, such as relevant keys and reference materials. Nomenclature used in the report is consistent with Florabase at time of reporting, as adopted by the WA Herbarium (WAH, 1998 -).

5.6. Threatened and Priority Ecological Communities

One threatened (TEC) and priority (PEC) ecological community was identified in the 10km desktop analysis, *'Proteaceae Dominated Kwongkan Shrublands of the Southeast Coastal Floristic Province of Western Australia (Kwongkan)*' (Section 5.2; Table A3 Appendix B). None of the vegetation units present within the survey area are consistent with this ecological community, with only two Proteaceous species were identified within the survey area.

The DBCA priority ecological community listing (DBCA, 2021) was thoroughly reviewed within the south coast region, due to DBCA's TEC/PEC database not been included in the desktop survey. A single PEC was identified that bore similarities to the vegetation types identified within the survey area, 'Swamp Yate, *Eucalyptus occidentalis,* woodlands in seasonally inundated clay basins (South Coast)'. This is described in further detail below.

'Swamp Yate, *Eucalyptus occidentalis*, woodlands in seasonally inundated clay basins (South Coast) (Yate Woodland)'

The vegetation type Eucocc (*Eucalyptus occidentalis* Open Forest) meets the description of Yate Woodland PEC, through being dominated by *E. occidentalis,* presence of trees forming a defining feature of the description of the vegetation unit (forest, woodland) and being present in a poor drainage area that may be seasonally inundated. However, as outlined in Section 4.2, intact understory or fringing vegetation is required to meet Yate Woodland PEC. Due to this vegetation being Completely Degraded, minimal native vegetation remains in the understory, as shown in the three relevés systematically sampled in the vegetation unit (Appendix D). It is likely that historically prior to disturbance, this vegetation community met the Yate Woodland but no longer does.

6. Fauna Survey Results

6.1. Basic Fauna Survey

A description of the four vegetation units identified during the survey is given in Section 5.2, which correlate with fauna habitat types (refer to Figure 7 above).

During the survey, fauna were observed either directly (sight, sound) or indirectly via signs of presence such as tracks, runnels, scats, diggings, bones, feeding remains or scratchings. During the survey, 22 species of fauna were recorded, of these 22 species, 17 were birds and five were mammals. Refer to full fauna species list in Table A11 in Appendix D.

No threatened or priority listed species were identified within the survey area during the survey period. There was evidence of brushtail possum (*Trichosurus vulpecula*) and mardo (*Antechinus flavipes*) observed within and directly adjacent to the survey area, with evidence of use of hollow bearing trees and habitat logs on the ground. In addition, there was a high level of western grey kangaroo (*Macropus fuliginosus*) activity observed through the presence of scats and tracks throughout the survey area. Notable non-native species observed were rabbit (*Oryctolagus cuniculus*) and fox (*Vulpes vulpes*).

Please see Figure 8 below for photographs of indicators of species presence observed during the survey period.

a) b) c)

d) e)

Figure 8: Photographs of evidence of fauna presence and habitat within the survey area.
a) Mardo scat; b) Brushtail possum scat; c) and d) brushtail possum tree scratchings; e) habitat log being utilised by mardo.

f)

g)

Figure 8 continued: f) western grey kangaroo tracks; g) fox track.

6.2. Targeted Black Cockatoo Assessment

6.2.1. Breeding habitat

A total of six significant trees were identified within and directly adjacent to the survey area, three of these were *Corymbia calophylla*, two were *Eucalyptus marginata* and one was *Eucalyptus occidentalis*. Of these six trees, Tree 1 and 4 were the only two trees recorded inside the survey area. Tree 1 had brushtail possum activity up the trunk, and showed some evidence of historical cockatoo or corella activity, consisting of old chew marks around the entrance of the main hollow. This may have been investigatory chewing. No recent evidence of cockatoo nesting or hollow occupation was observed. Tree 4 also had brushtail possum activity up the trunk, and contained a smaller sized hollow (6 x 8 cm) which is not currently considered suitable for black cockatoos. This tree is considered to have future suitable hollow forming potential for black cockatoos. Of the other remaining four trees, Tree 5 contained a potentially suitable black cockatoo hollow, and the remaining trees contained hollows that are too small and unlikely to develop into suitable hollows due to their location in small branches which limits their internal dimensions. None of the hollows that were considered suitable for cockatoos were occupied by cockatoos at the time of this survey. Please refer to Figure 9 for black cockatoo habitat identified, Table 8, for hollow assessment details and Figure 10 in for images of corresponding trees with hollows.

The vegetation in the 'Corcal and Eucmar Woodland' vegetation unit is considered Degraded, as it almost exclusively consists of an overstorey of Marri and Jarrah with no native mid or understorey present. All three species of black cockatoos are known to breed in hollows in both Marri and Jarrah within dense woodland and forest as well as isolated trees (DEC, 2008; DSEWPaC, 2012; DPaW, 2013). This vegetation unit contains a small number of suitable breeding hollows for all three black cockatoo species. However, for breeding habitat to be suitable, it needs to be proximate to high quality feeding resources and permanent water.

Of the trees surveyed, four (Tree1, 2, 4, 6) were assessed as being occupied by brushtail possum or a small arboreal mammal (mardo) due to the presence of chew marks, rubbing and general activity around and up to the hollow entrance or visual observation of scats on or nearby to trees containing hollows.

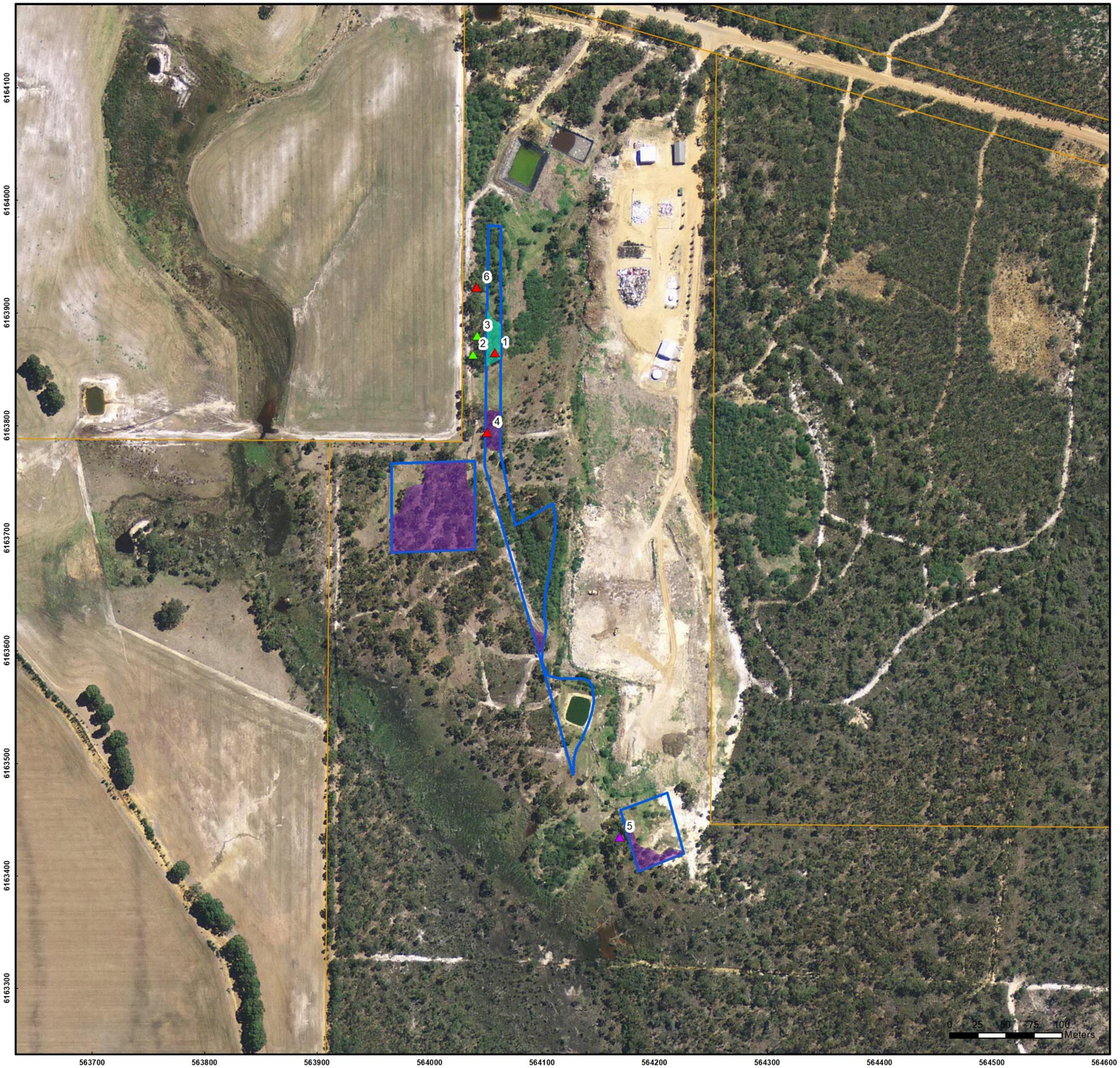
6.2.2. Foraging and roosting habitat

During this survey, no evidence of feeding events (chewed nuts) was observed within the survey area. The mature Marri and Jarrah trees within the 'Corcal Eucmar Woodland' vegetation unit provide a potential food source for the three species of black cockatoo, but this is considered low quality due to the degraded nature of the vegetation. No other vegetation within the survey area contains suitable foraging habitat for black cockatoos. The foraging habitat available for black cockatoos equates to approximately 0.049 ha which is 7.53% of the black cockatoo habitat identified within the survey area (see Table 8).

There was no evidence of black cockatoos roosting within the survey area, as assessed through the presence of accumulated feathers and faecal material. However, there is potential roosting habitat present within the 'Corcal Eucmar Woodland' and 'Eucocc Open Forest' vegetation units. The potential roosting habitat available for black cockatoos equates to approximately 0.606 ha which is 95.51% of the black cockatoo habitat identified within the survey area (see Table 8).

Table 8: Potential black cockatoo habitat present within the survey area.

Habitat Type	Description	Area(ha)	Percentage (%) of all mapped Cockatoo Habitat
Foraging and Roosting Habitat	Corcal Eucmar Woodland vegetation unit. Potential foraging and roosting habitat.	0.049	7.53
Roosting Habitat	Eucocc Open Forest (non-foraging species). Potential roosting habitat	0.606	92.51
	Totals	**0.655**	**100**



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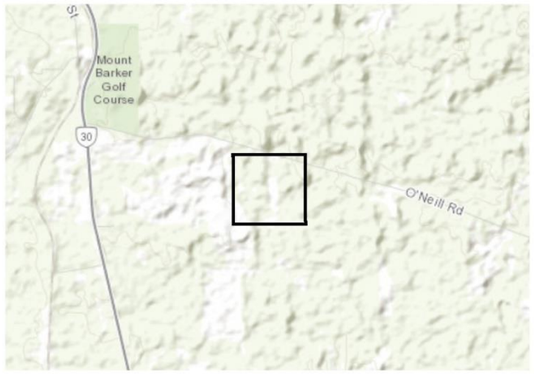

Overview Map Scale 1:100,000

Legend

- Survey Area
- Cadastre

Significant Trees with Hollows

- ▲ *Corymbia calophylla*
- ▲ *Eucalyptus marginata*
- ▲ *Eucalyptus occidentalis*

Black Cocaktoo Habitat

- Foraging and Roosting Habitat
- Roosting Habitat

Scale
1:3,299 @ A3
GDA MGA 94 Zone 50

Data Sources
Aerial Imagery: WA Now, Landgate Subscription Imagery
Cadastre, Relief Contours and Roads: Landgate 2017
IRIS Road Network: Main Roads Western Australia 2017
Overview Map: World Topographic map service, ESRI 2012

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Figure 9: Black Cockatoo Habitat.

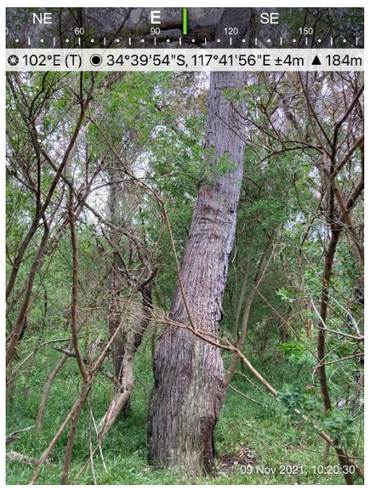
	QA Check	*Drawn by*
	KK	**BT**
STATUS **FINAL**	*FILE* **MB009**	*DATE* **03/12/2021**

Table 9: Significant trees (>500mm DBH) containing hollows or with hollow bearing potential identified.

Tree ID	Species	DBH (mm)	Crown Senescent	Hollows Present	Location	Size of Entrance	Type of Entrance	Height Above Ground	Rubbing or Chewing Around Entrance	Comments	Easting	Northing
1	*Corymbia calophylla*	581	No	Yes	Trunk	18 x 16	Chimney	12	Yes	Brushtail possum activity up trunk. Two additional hollows in trunk & branch. Potential Black Cockatoo & Corella hollow with past but no recent evidence of occupation.	-34.66517293	117.6991561
2	*Eucalyptus marginata*	482	No	Yes	Branch	4 x 5	Chimney	8	No	Possible small arboreal mammal hollow (likely *Antechinus flavipes*), brushtail possum activity up trunk. Not a suitable Black Cockatoo hollow.	-34.66518846	117.6989425
3	*Eucalyptus marginata*	507	Yes	Yes	Branch	3 x 4	Elbow	10	No	Not a suitable Black Cockatoo hollow. Tree has hollow base, long-term stability / viability questionable	-34.6650384	117.6989827
4	*Corymbia calophylla*	747	No	Yes	Branch	6 x 8	Chimney	12	No	Brushtail possum activity up trunk, with additional hollow forming in lower branch. Future potential Black Cockatoo hollow	-34.6658119	117.6990853
5	*Eucalyptus occidentalis*	599	Dead	Yes	Trunk	12 x 15	Side	10	No	Potentially suitable Black Cockatoo hollow, no recent or past evidence of use. Dead tree.	-34.66904883	117.7003989
6	*Corymbia calophylla*	1020	No	Yes	Branch	15 x 12	Elbow	9	Yes	Occupied by brushtail possum, heavy track leading up to hollow. Multiple hollows forming. Not suitable for Black Cockatoo due to limited internal dimensions	-34.66465142	117.6989721

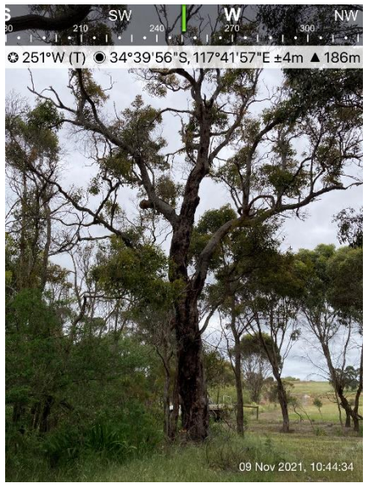
Tree ID: 1

Tree ID: 2



Tree ID: 3

Figure 10: Significant trees and hollow images identified during the survey period.



Tree ID: 4

Tree ID: 5

Tree ID: 6

Figure 10 continued.

7. Discussion

7.1. Vegetation, Threatened and Priority Flora and Ecological Communities

The scope for this survey was to provide the client with information on any threatened or priority flora species that are potentially present within the subject site, as well as threatened/priority ecological communities, and to provide an assessment on vegetation types and their general condition.

Four vegetation units were recorded during the survey, namely Cleared / Disturbed, *Corymbia calophylla* and *Eucalyptus marginata* [Corcal Eucmar] Woodland, *Eucalyptus occidentalis* [Eucocc] Open Forest and *Melaleuca cuticularis* [Melcut] Wetland. The vegetation was assessed as being in 'Degraded' and 'Completely Degraded' condition. Only Eucocc Open Forest vegetation unit bore met criteria for the PEC 'Swamp Yate (*Eucalyptus occidentalis*) woodland in seasonally inundated basins (South Coast)', but was deemed to be too Degraded to meet criteria, primarily through the loss of native understory.

A total of 62 flora species were recorded, comprising 21 native species and 41 introduced species, further confirming that the vegetation present within the survey area has been altered due to historical disturbances. No Threatened or Priority flora were identified during the survey period. Given the vegetation present within the survey area is comprised of a majority of invasive species, weed control within the area will be important so as not to further degrade the surrounding remnant vegetation.

7.2. Basic Fauna Survey and Significant Tree Survey

The aim of the basic fauna and targeted black cockatoo habitat survey was to assess and map the fauna habitat within the survey area, assess the likelihood of conservation significant fauna being present within the survey area and/or particular vegetation types, record actual presence of threatened and priority listed species, and undertake opportunistic inventory of vertebrate species encountered whilst traversing the survey area on foot.

During the survey, a relatively low level of fauna diversity was detected with just 22 species identified during the survey period. This is reflective of the poor quality of the habitat available within the survey area. No Threatened or Priority fauna species were identified during the survey period.

The black cockatoo habitat assessment found two trees within the survey area that contained hollows, one of which was potentially suitable for use by cockatoos and had investigative chewing around the hollow entrance that was suggestive of historical cockatoo or corella activity. This hollow was occupied by a brushtail possum at the time of the survey. The second tree contained a hollow that was not suitable for use by cockatoos. There were an additional four significant trees containing hollows immediately adjacent to the survey area, one of these contained a hollow that is suitable for use by cockatoos for breeding. Given there was no evidence of black cockatoo presence (feathers, chewed nuts etc) it is unlikely these species are utilising the survey area for breeding, foraging or roosting. The lack of high-quality foraging habitat present within the survey area is likely to be a significant contributing factor in limiting the suitability of potential breeding hollows.

Overall, the area proposed to be cleared as part of the waste receival site expansion will result in a loss of 0.655 ha of roosting and foraging habitat. The *EPBC Act 1999* referral guidelines for the three threatened black cockatoo species stipulates that a proposal should be referred for assessment if more than 1ha of high-quality habitat is to be removed. Given the habitat present is less than 1 ha and is not of high-quality it is unlikely this proposal will need to be referred under the *EPBC Act 1999*.

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9. Appendices

Appendix A – Maps

Appendix B – Conservation Significant Values Likelihood of Occurrence Analysis

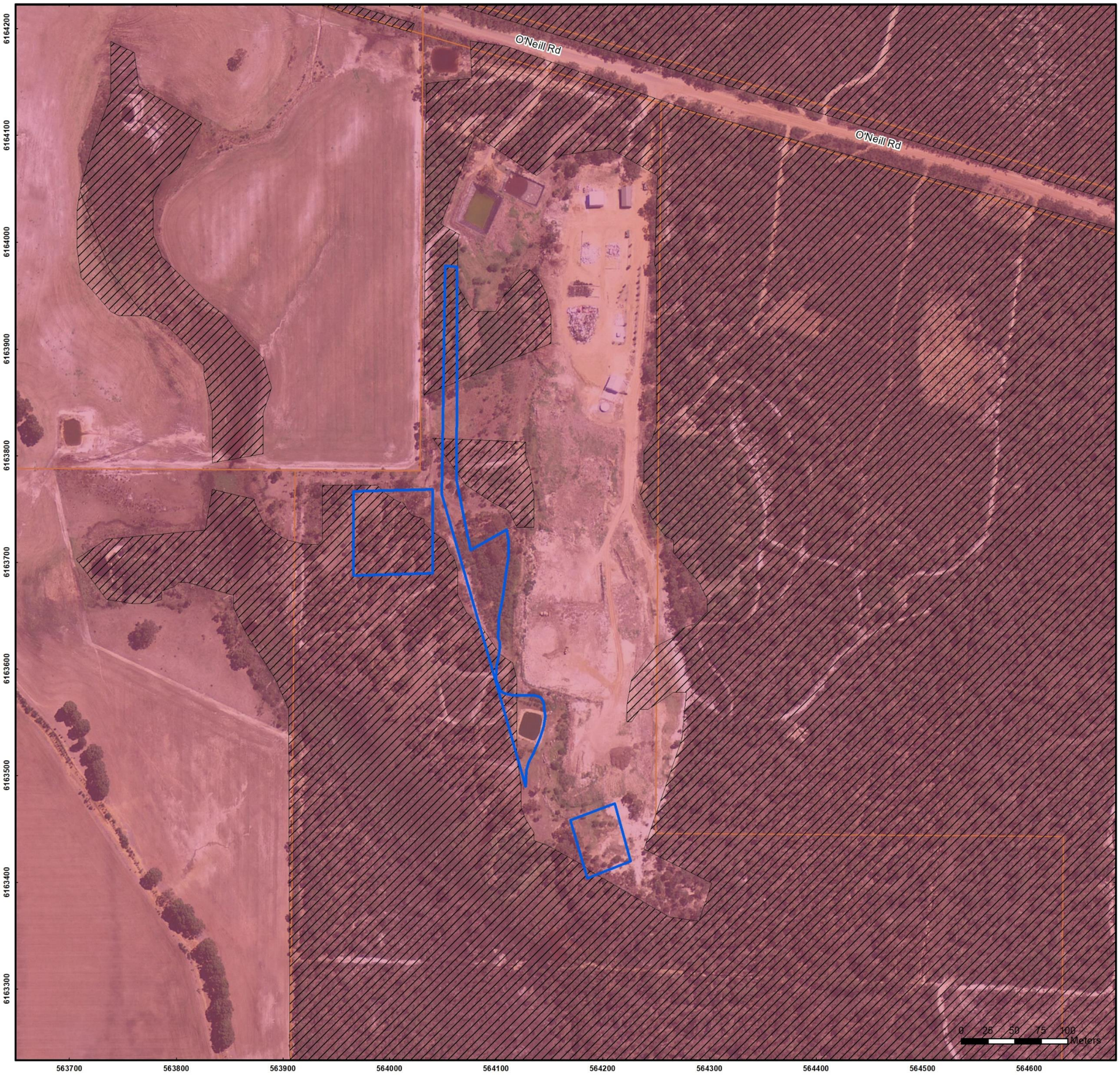
Appendix C – Conservation Status Definitions and Condition Scale

Appendix D –Species Lists and Relevé Data

Appendix E - NatureMap and EPBC Act PMST reports

Appendix A

Maps



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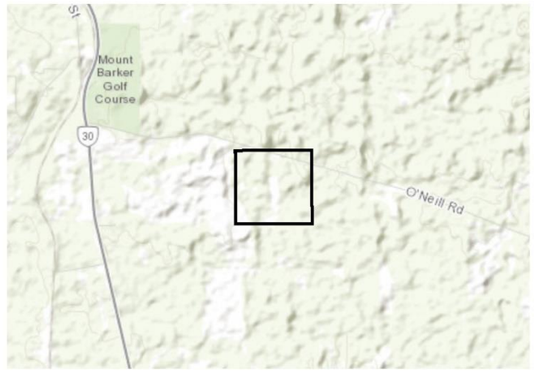

Overview Map Scale 1:100,000

Legend

- Survey Area
- Cadastre
- Native Vegetation Extent (DPIRD_005)

Pre European Vegetation (DPIRD_006)

- NARRIKUP_3

Scale
1:3,500 @ A3
GDA MGA 94 Zone 50

Data Sources
Aerial Imagery: WA Now, Landgate Subscription Imagery
Cadastre, Relief Contours and Roads: Landgate 2017
IRIS Road Network: Main Roads Western Australia 2017
Overview Map: World Topographic map service, ESRI 2012

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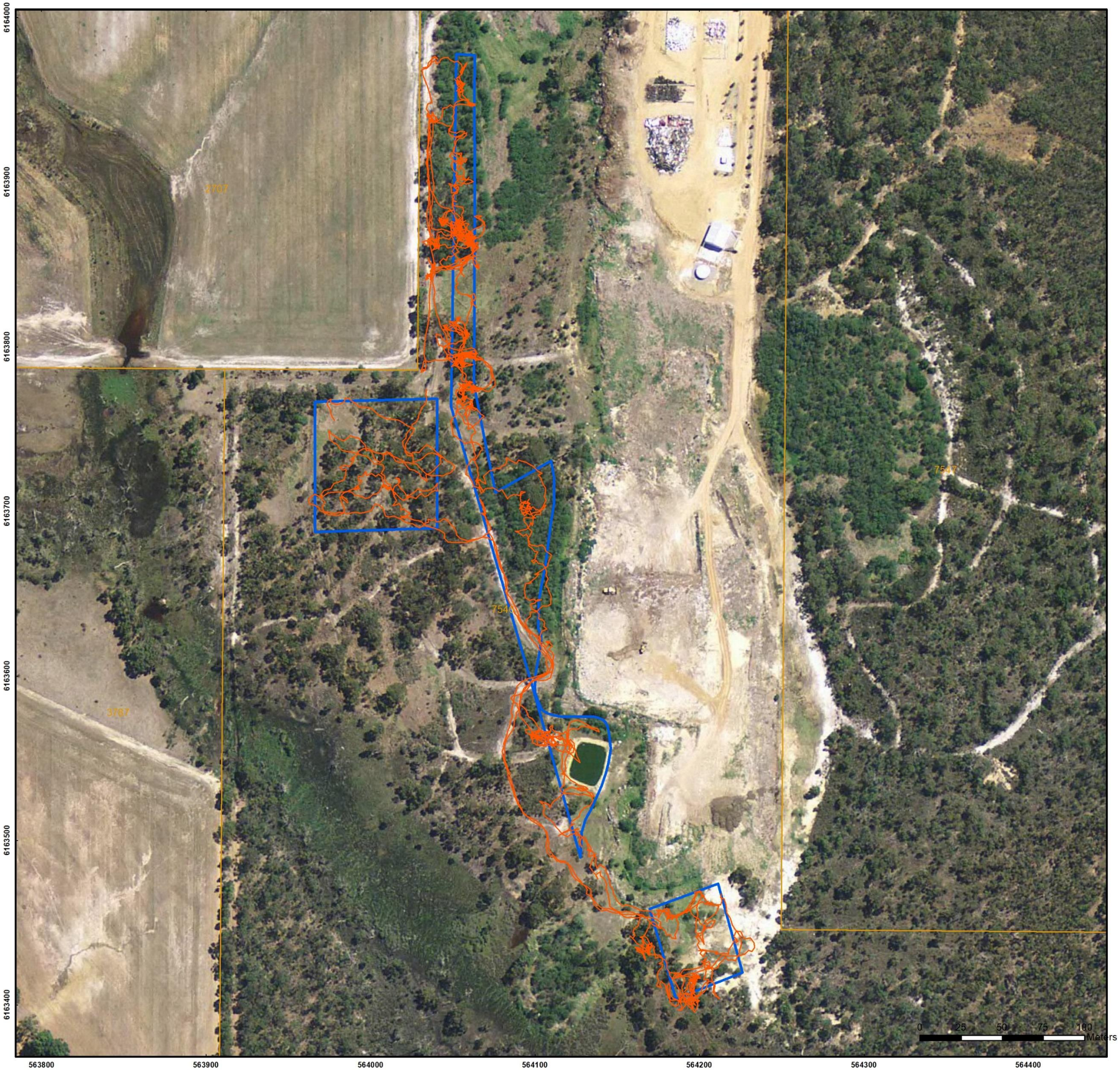
Map 1: Desktop Vegetation Data

	QA Check	*Drawn by*
	KK	**BT**
STATUS	*FILE*	*DATE*
FINAL	**MB009**	**03/11/2021**



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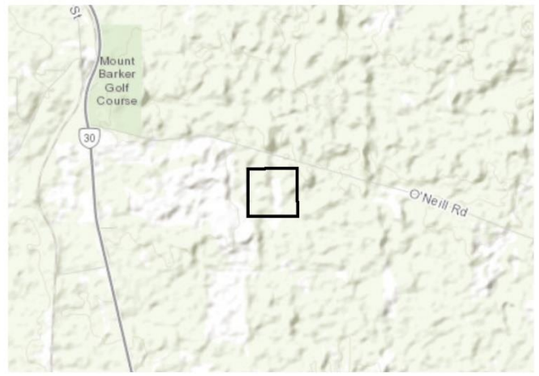

Overview Map Scale 1:100,000

Legend

- Survey Area
- Cadastre
- Survey Effort

Scale
1:2,250 @ A3
GDA MGA 94 Zone 50

Data Sources
Aerial Imagery: WA Now, Landgate Subscription Imagery
Cadastre, Relief Contours and Roads: Landgate 2017
IRIS Road Network: Main Roads Western Australia 2017
Overview Map: World Topographic map service, ESRI 2012

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Map 2: Survey Effort

	QA Check	*Drawn by*
	KK	**BT**
STATUS	*FILE*	*DATE*
FINAL	**MB009**	**03/12/2021**

Appendix B

Conservation Significant Values Likelihood of Occurrence Analysis

Table A1: Criteria for assessing the likelihood of occurrence of conservation significant flora within a 10km radius of the survey area.

Likelihood	Criteria
Present	Species is recorded within the survey area.
Likely	Species has been previously recorded in close proximity and suitable habitat occurs within the survey area.
Possible	Species previously recorded within 10 km and suitable habitat occurs in the survey area.
Unlikely	The species has been recorded locally through database searches. However, suitable habitat for the species does not occur at the survey area or suitable habitat may occur but the species has a highly restricted distribution, is very rare and only known from a limited number of populations. Species is unlikely to occur due to the site lacking critical habitat, only containing marginally suitable habitat, and/or the survey area is considerably degraded. The species has not been recorded in the survey area despite adequate survey effort.
Highly Unlikely	The survey area is outside the species' natural distribution.

Table A2: Potential conservation significant flora located within 10km of the survey area and likelihood of occurrence (LOO) analysis (post survey).
NB - Species are sorted by likelihood of occurrence.

Family	Species	Vernacular	Status (WA)	NatureMap	PMST	Description- Species	Description - Habitat	Peak Flowering period	LOO	Survey in Flowering Period	Habitat Present	Likelihood of Detection if Present	Species Present	Comments
Proteaceae	*Synaphea preissii*		P3	X		Erect, low shrub, 0.15-0.4 m high. Fl. yellow,	Sand, gravelly loam	Jul-Nov or Feb-Mar	Possible	Y	Y	High	No	Genus not present within the survey area.
Proteaceae	*Lambertia* subsp. *orbifolia Flora Base*	Round leaf Honeysuckle	T - En		X	Very open spindly, non-lignotuberous shrub to 3.5 m high. Bark smooth, grey-brown. Flower red-orange	Shallow grey or light brown sand, grey sandy loams over laterite, gravel. Gently undulating plains, low slopes, low ridges, along roadsides	May or Aug or Nov to Dec or Jan to Feb	Possible	Y	Y	High	No	Genus not present within the survey area.
Orchidaceae	*Drakaea micrantha*	Dwarf Hammer Orchid	T - Vu		X	Tuberous, perennial, herb, 0.15-0.3 m high. Flowers red and yellow.	White grey sand	Sept to Oct. Nov in southern part of range,	Possible	Y	Y	High	No	Species still flowering in southern parts of its range at the time of survey. Genus not present within the survey area.
Cyperaceae	*Schoenus* sp. Mt Barker (G.J. Keighery 9679)		P1	X		Mat forming perennial, grass-like or herb (sedge), clumps to 30 cm diameter.	Sandy clay, loam.		Possible	N/A	Y	High	No	Potential habitat in north-eastern section of survey area. Genus not present within the survey area. Degraded quality.
Thymelaeaceae	*Pimelea rosea* subsp. *annelsii*	Rose Banjine	P3	X		Shrub, 0.3-0.8 m high. Fl. Pink.	Sandy soils with gravel, laterite. Upper slopes. Mostly distributed around Mt Barker to Hay River/Narrikup. Marri and Jarrah Woodlands.	Sep to Nov	Unlikely	Y	Y	High	No	Marginal habitat. Genus not present within the survey area
Fabaceae	*Gastrolobium ferrugineum*		P2	X		Small tree, to 3 m high. Fl. yellow-red.	Sand, brown-red sandy gravel, laterite. Plains.	Aug-Sept	Unlikely	N	Y	High	No	Species can be identified without flowers. Genus not present within the survey area. Habitat marginal.
Proteaceae	*Banksia porrecta*		P4	X		Prostrate, sprawling, mat-forming, lignotuberous shrub, 0.2-0.35 m high, 0.6-4 m wide. Fl. white-cream,	White/grey sand, sandy loam.	Jul to Aug	Unlikely	N	Y	High	No	Species can be identified without flowers. Marginal habitat only
Orchidaceae	*Caladenia christineae*	Christine's Spider Orchid	T - Vu	X	X	Tuberous, perennial, herb, 0.25-0.4 m high. Fl. white-cream-yellow,	Sand, clayey loam, laterite. Margins of winter-wet flats, swamps, & freshwater lakes.	Sep to Nov.	Unlikely	Y	Y	High	No	Marginal habitat present. No Caladenias present within the survey area
Orchidaceae	*Caladenia harringtoniae*	Harringtons Spider Orchid	T - Vu		X	Tuberous, perennial, herb, 0.2-0.4 m high. Fl. pink,	Sandy loam. Winter-wet flats, margins of lakes, creek lines, granite outcrops.	Oct to Nov.	Unlikely	Y	Y	High	No	Marginal habitat present. No Caladenias present within the survey area
Proteaceae	*Banksia seneciifolia*		P4	X		Columnar, non-lignotuberous shrub, 0.6-1 m high. Fl. cream-yellow-brown	Sandy loam, sand. Rocky hillslopes.	Jun or Aug	Unlikely	N	Y	High	No	Marginal, borderline unsuitable habitat present.
Proteaceae	*Banksia brownii*	Feather Leaved Banksia	T - En	X	X	Bushy, non-lignotuberous shrub or tree (small), 1-6 m high. Fl. cream & brown/orange-red	Sand over laterite, gravel, loam over granite. In gullies.	Mar-Jul	Unlikely	N	Y	High	No	Species can be identified without flowers.
Proteaceae	*Isopogon uncinatus*	Albany Cone Bush	T - En		X	Tufted spreading or prostrate, non-lignotuberous shrub, 0.05-0.4 m high. Fl. yellow/cream,	Loam or sand on granite, peaty sand. Swampy depressions, hillslopes.	Oct to Nov.	Unlikely	Y	N	High	No	Genus not present within the survey area.
Restionaceae	*Chordifex abortivus*	Manypeaks Rush	T - En		X	Rhizomatous, erect perennial, herb, to 0.5 m high. Fl. brown,	Sand. Low rises and undulating areas.	Sep-Oct	Unlikely	N	Y	High	No	Detection of genus possible without flowers. Distribution restricted to east

Table A2 continued

Family	*Species*	Vernacular	Status (WA)	NatureMap	PMST	Description- Species	Description - Habitat	Peak Flowering period	LOO	Survey in Flowering Period	Habitat Present	Likelihood of Detection if Present	Species Present	Comments
Menyanthaceae	*Ornduffia marchantii*		P4	X		Strongly distylous, smooth heat shaped leaves.	Endemic to Porongurup's Range.		Unlikely	N	N	High	No	Endemic to Porongurup's.
Fabaceae	*Acacia heteroclita* subsp. *valida*		P2	X		Erect, spreading shrub or tree, 1-4 m high, phyllodes 4-9 mm wide. Fl yellow.	Shallow soils over granite, rocky granite slopes and outcrops. Endemic to Porongurup's	Sept to Nov	Unlikely	Y	N	High	No	The only Acacia within the survey area was an introduced species. Endemic to Porongurup's. Lack of suitable habitat, no granite present
Fabaceae	*Acacia drummondii* subsp. *elegans* Porongurup variant (R.J. Cumming 938)		P4	X		Shrub, 0.6-4 m high. Flower yellow.	Gullies, granite outcrops. Distribution almost entirely restricted to granite outcrops in Porongurup's	Aug or Oct	Unlikely	N	N	High	No	Species can be identified without flowers. The only Acacia within the survey area was an introduced species. endemic to Porongurup's. Lack of suitable habitat, no granite present.
Myrtaceae	*Darwinia leiostyla*	Mountain Bell	P4	X		Erect shrub, 0.3-1.5 m high. Fl. red & pink & white.	Sandy clay, black peaty sand, yellow sand, quartzite, sandstone. Rocky sites, streamlines, slopes of gullies and ranges. Endemic Stirling Ranges.	Jan or May or Jul or Sep to Oct or Dec	Unlikely	Y	N	High	No	Endemic to Stirling Ranges. Lack of suitable habitat
Orchidaceae	*Caladenia startiorum*		P2	X		Tuberous, perennial, herb, 0.2-0.6 m high. Flowers pink and white.	Clay loam. Winter wet swamps	Sept to Oct	Unlikely	N	N	High	No	
Proteaceae	*Banksia sphaerocarpa* var. *latifolia*	Fox Banksia	P2	X		Small rounded shrub to 50 cm in height.	In granitic clay-loam in low, open forest of Eucalyptus marginata and E. calophylla, usually on mid to upper slopes in landscape	Mar to Jul	Unlikely	N	N	High	No	Species can be identified without flowers.
Proteaceae	*Banksia verticillata*	Albany Banksia	T	X		Non-lignotuberous shrub or tree (rarely). 1.3-6 m high. Flowers yellow to orange.	Sandy loam. On or beside granite outcrops	Jan to Apr	Unlikely	N	N	High	No	Species can be identified without flowers.
Proteaceae	*Banksia pseudoplumosa*	False Plumed Banksia	T - En		X	Non-lignotuberous shrub to 1.8 m high.	Gravelly soils	Nov to Dec	Unlikely	Y	N	High	No	
Proteaceae	*Adenanthos pungens* subsp. *pungens*	Spiky Adenanthos	T - Vu		X	Erect shrub, 0.5-3 m high. Flowers pink/red.	White/grey or pink sands, rocky soils, gypsum. Sand dunes and hillsides.	Aug to Nov	Unlikely	Y	N	High	No	
Proteaceae	*Banksia goodii*	Goods Banksia	T - Vu		X	Lignotuberous, prostrate shrub, ca 0.2 m high. Fl. orange-brown-red	Shallow white to grey sand over laterite, in low open forest or low woodland of Jarrah and Sheoak.	May, Nov	Unlikely	Y	N	High	No	Species can be identified without flowers.
Ericaceae	*Sphenotoma drummondii*	Mountain Paper Heath	T - En		X	Tufted shrub, 0.15-0.5 m high. Fl. white,	Stony or shallow soils over granite or quartzite. Steep rocky slopes, crevices of rocks. Mostly restricted to Stirling Ranges	Sep to Dec.	Unlikely	Y	N	High	No	Mostly recorded in Stirling's. Lack of suitable habitat, no mountains
Stylidiaceae	*Stylidium corymbosum* var. *proliferum*		P2	X		Rosetted perennial, herb, 0.07-0.3 m high. Fl. white,	Sandy soils. Granite rocks. Porongurup's endemic	Oct to Nov	Unlikely	Y	N	High	No	Porongurup's endemic. Lack of suitable habitat
Pittosporaceae	*Marianthus granulatus*		P4	X		Twining shrub or climber, 1-5 m high. Flowers blue.	Loam over granite. Creek beds. Porongurup's endemic.	Jul or Oct to Dec	Unlikely	Y	N	High	No	Porongurup's endemic. Lack of suitable habitat

Table A2 continued

Family	*Species*	Vernacular	Status (WA)	NatureMap	PMST	Description- Species	Description - Habitat	Peak Flowering period	LOO	Survey in Flowering Period	Habitat Present	Likelihood of Detection if Present	Species Present	Comments
Myrtaceae	*Verticordia endlicheriana* var. *angustifolia*		P3	X		Erect shrub, 0.3-0.5 m high. Fl. Yellow	Sandy clay. Granite outcrops	Oct-Nov	Unlikely	Y	N	High	No	Lack of suitable habitat with granite
Myrtaceae	*Verticordia apecta*	Hay River Feather flower	T - Cr		X	Slender, erect shrub, 0.2-0.45 m high. Fl. white-pink,	Sandy clay with loam & broken granite. Slopes. Restricted along Hay River / Mt Lyndsey National Park	Nov.	Unlikely	Y	N	High	No	Restricted along Hay River / Mt Lyndsey National Park.
Haemodoraceae	*Conostylis misera*	Grass Conostylis	T - En	X	X	Rhizomatous, tufted perennial, grass-like or herb, 0.05-0.18 m high. Fl. yellow,	White, grey or yellow sand. Consolidated dunes; Spearwood, Phase 2+3, Brown siliceous soils and Yellowish-brown sands, co-dominant; Quindalup South Qr Phase, Undulating dunes. Shallow calcareous sands over limestone with much rock outcrop.	Oct to Nov.	Unlikely	Y	N	High	No	
Orchidaceae	*Diuris micrantha*	Dwarf Bee Orchid	T - Vu		X	Tuberous, perennial, herb, 0.3-0.6 m high. Flowers yellow and brown.	Brown loamy clay. Winter wet swamps in shallow water.	Sept to Oct	Highly unlikely	N	N	High	No	Distribution in Bunbury area

Table A3: Conservation Code definitions for Threatened and Priority Ecological Communities located within 10km of the survey area.

Community Name	Status	Description	Survey Outcome
Proteaceae Dominated Kwongkan Shrublands of the Southeast Coastal Floristic Province of Western Australia	Priority 3 (WA) EN (EPBC Act)	Consists of predominantly obligate seeding proteaceous shrubland and heath (Kwongkan) and mallee heath on sandplain, duplex sand/clay and gravels overlying Eocene sediments, quartzite, schist, Yilgarn and Albany Fraser granite and greenstone ranges. Its flora is characterised by high species diversity and a high degree of endemism, particularly in the Stirling Range, Fitzgerald River National Park, Ravensthorpe Range and Russell Ranges. Due to the high levels of endemism, there are few species that exist across the entire range of the dense, obligate seeding Proteaceae dominated shrublands and Kwongkan of the Esperance Sandplains, however particular species have been identified as common dominant species in each of its ecodistricts (DBCA, 2017a).	Not present in the survey area
Swamp Yate (*Eucalyptus occidentalis*) woodland in seasonally inundated basins (South Coast)	Priority 3 (WA)	Yate woodlands with intact understorey and fringing vegetation are poorly conserved in the region.	Present, but degraded to point no likely meets criteria – Vegetation Type Eucocc (*Eucalyptus occidentalis* Open Forest) meets basic description of the PEC, but Completely Degraded, resulting in degradation and loss of key characteristics. No longer meets criteria, but likely historically present.

Table A4: Potential conservation significant fauna located within 10km of the survey area and likelihood of occurrence (LOO) analysis (post survey).

Note: Species are presented based on likelihood of occurrence. Habitat information taken from publicly available resources such as: DSEWPaC (2011) Survey guidelines for Australia's threatened mammals; DEWHA (2010) Survey guidelines for Australia's threatened birds; SPRAT profiles and species-specific recovery plans.

Class	Family	Scientific Name	Vernacular	Status (WA) / EPBC Act	Habitat Description	Likelihood of Occurrence	Habitat Present	Likelihood of Detection if Present	Species Present	Comment
Aves	Apodidae	*Apus pacificus*	Fork-tailed Swift	MI / MI	Dry or open habitats, including riparian woodland and tea-tree swamps, low scrub, heathland or saltmarsh. Almost exclusively aerial, flying from less than 1 m to at least 300m above ground over inland plains but sometimes above foothills or in coastal areas.	Possible	Yes	High	No	
Aves	Psittacidae	*Cacatua pastinator* subsp. *pastinator*	Muir's Corella	CD / -	Large live or dead eucalypts, particularly Marri (*Corymbia calophylla)* and Jarrah (*Eucalyptus marginata)*, Flooded Gum (*Eucalyptus rudis)*, Yate (*Eucalyptus cornuta*) and Paperbark (*Melaleuca preissiana)* in forested areas or as lone trees in paddocks and along roadsides in the region from Boyup Brook, McAlinden and Qualeup, south to Lake Muir and the lower Perup River, and east to Frankland and Rocky Gully. Nests in the hollows of mature live Eucalypts (often lone trees in paddocks or along roadsides)	Possible	Yes	High	No	Three hollows were potentially suitable for nesting for Corellas. However, there was no evidence of feeding, roosting or nesting activity for this species within the survey area and no birds seen or heard during the survey
Aves	Cacatuidae	*Calyptorhynchus banksii* subsp. *naso*	Forest Red-tailed Black Cockatoo	VU / VU	Foraging habitat includes vegetation containing Proteaceous heath/woodland, Eucalypt woodlands or forest (particularly Marri and Jarrah forest) and Pinus spp. Breeding habitat includes large, mature trees containing suitable sized hollows, proximate to high quality feeding habitat.	Possible	Yes	High	No	Three hollows were potentially suitable for nesting for Cockatoos. However, there was limited foraging habitat, no evidence of feeding, roosting or nesting activity for this species within the survey area and no birds seen or heard during the survey
Aves	Cacatuidae	*Calyptorhynchus baudinii*	Baudin's Cockatoo, White-tailed Long-billed Black Cockatoo	EN / EN	Hollows of large, mature trees. Foraging habitat includes vegetation containing Proteaceous heath/woodland, Eucalypt woodlands or forest (particularly Marri and Jarrah forest) and Pinus spp.	Possible	Yes	High	No	Three hollows were potentially suitable for nesting for Cockatoos. However, there was limited foraging habitat, no evidence of feeding, roosting or nesting activity for this species within the survey area and no birds seen or heard during the survey
Aves	Cacatuidae	*Calyptorhynchus latirostris*	Carnaby's Cockatoo, White-tailed Short-billed Black Cockatoo	EN / EN	Eucalypt woodlands, especially those that contain Salmon Gum and Wandoo, and in shrubland or Kwongkan heathland dominated by Hakea, Dryandra, Banksia and Grevillea species. It also occurs in remnant patches of native vegetation on land otherwise cleared for agriculture. It also forages in forests containing Marri, Jarrah or Karri	Possible	Yes	High	No	Three hollows were potentially suitable for nesting for Cockatoos. However, there was limited foraging habitat, no evidence of feeding, roosting or nesting activity for this species within the survey area and no birds seen or heard during the survey
Aves	Cacatuidae	*Calyptorhynchus* sp.	White-tailed Black Cockatoo	EN / EN	As above for *Calyptorhynchus baudinii* and *Calyptorhynchus latirostris.*	Possible	Yes		No	As above
Aves	Scolopacidae	*Actitis hypoleucos*	Common Sandpiper	MI / MI	Almost entirely coastal, coastal wetlands and some inland wetlands, with varying levels of salinity, and is mostly found around muddy margins or rocky shores and rarely on mudflats	Unlikely	No	High	No	
Aves	Ardeidae	*Botaurus poiciloptilus*	Australasian Bittern	EN / EN	Wetlands, permanent and seasonal freshwater habitats, particularly those dominated by sedges, rushes and reeds (e.g. Phragmites, Cyperus, Eleocharis, Juncus, Typha, Baumea, Bolboschoenus sp.) or cutting grass (Gahnia) growing over a muddy or peaty substrate	Unlikely	No	High	No	
Aves	Scolopacidae	*Calidris acuminata*	Sharp-tailed Sandpiper	MI / MI	Muddy edges of shallow fresh or brackish wetlands, with inundated or emergent sedges, grass, saltmarsh or other low vegetation.	Unlikely	No	High	No	

Table A4 continued

Class	Family	*Scientific Name*	Vernacular	Status (WA) / EPBC Act	Habitat Description	Likelihood of Occurrence	Habitat Present	Likelihood of Detection if Present	Species Present	Comment
Aves	Scolopacidae	*Calidris ferruginea*	Curlew Sandpiper	CR / CR & MI	Intertidal mudflats in sheltered coastal areas, non-tidal swamps, lakes and lagoons near the coast, and occasionally around ephemeral and permanent lakes and dams with bare edges of mud or sand	Unlikely	No		No	
Aves	Scolopacidae	*Calidris melanotos*	Pectoral Sandpiper	MI / MI	Shallow fresh to saline wetlands.	Unlikely	No	High	No	
Aves	Dasyornithidae	*Dasyornis longirostris*	Western Bristlebird	EN / EN	Preferred habitat includes floristically diverse low dense coastal heathland.	Unlikely	No	High	No	
Mammal	Dasyuridae	*Dasyurus geoffroii*	Chuditch, Western Quoll	VU / VU	Woodland or forest. Logs must have a diameter > 30 cm and a hollow with 7–20 cm diameter and 1 m length (Dunlop and Morris 2012). Burrows are constructed beneath habitat features such as stumps, logs, trees or rock outcrops.	Unlikely	No	Moderate	No	A den log containing a small hollow was detected within the survey area. It appeared to be occupied by *Antechinus flavipes*. The hollow entrance was too small for *D. geoffroii*
Aves	Falconidae	*Falco hypoleucos*	Grey Falcon	VU / -	Usually in lightly timbered country, especially stony plains and lightly timbered acacia shrublands.	Unlikely	No	High	No	
Mammal	Muridae	*Hydromys chrysogaster*	Water-rat, Rakali	P4 / -	Permanent fresh or brackish water, subalpine streams and other inland waterways to lakes, swamps, and farm dams	Unlikely	No	High	No	
Mammal	Peramelidae	*Isoodon fusciventer*	Quenda, southwestern brown bandicoot	P4 / -	Scrubby, often swampy, vegetation with dense cover up to 1 m high, often feeding in adjacent forest and woodland that is burnt on a regular basis. Forest, woodlands, heath and coastal scrub, usually on sandy combination soils.	Unlikely	No	High	No	
Aves	Megapodiidae	*Leipoa ocellata*	Malleefowl	VU / VU	Arid and semi-arid areas dominated by mallee eucalypts on sandy soils. They are known to also occur in Mulga (*Acacia aneura*), Broombush (*Melaleuca uncinata*), Scrub Pine (*Callitris verrucosa*), Eucalyptus woodlands and coastal heathlands. Malleefowl require abundant leaf litter and a sandy substrate for the successful construction of nest mounds.	Unlikely	No	High	No	
Mammal	Thylacomydidae	*Macrotis lagotis*	Bilby	VU / VU	Known distribution in WA includes the Gibson Desert, Little Sandy Desert, Great Sandy Desert and parts of the Pilbara and Southern Kimberley. Habitat includes open tussock grassland on uplands and hills, *Acacia aneura* (Mulga) woodland/shrubland growing on ridges and rises, and hummock grassland in plains and alluvial areas.	Unlikely	No	High	No	
Aves	Motacillidae	*Motacilla cinerea*	Grey Wagtail	MI / MI	Species has a strong association with water (wetlands, water courses banks of lakes and marshes, artificial wetlands).	Unlikely	No	High	No	
Mammal	Myrmecobiidae	*Myrmecobius fasciatus*	Numbat	EN / EN	Current known distribution is a small area of WA's Jarrah forest and Wheatbelt, notably at Dryandra Woodland and the Upper Warren area. Habitat is generally woodland dominated by Eucalyptus species, with abundant hollow logs and branches for shelter and termites for food.	Unlikely	No	High	No	
Fish	Percichthyidae	*Nannatherina balstoni*	Balston's Pygmy Perch	VU / VU	Acidic, tannin-stained freshwater pools, streams and lakes in peat flats within 30 km of the coast of south-west Western Australia. The species prefers shallow water, and is commonly associated with tall sedge thickets and inundated riparian vegetation (Allen et al. 2002; Morgan et al. 1998).	Unlikely	No	High	No	
Aves	Scolopacidae	*Numenius madagascariensis*	Eastern Curlew	CR / CR & MI	Intertidal mudflats and sandflats, often with beds of seagrass, on sheltered coasts, especially estuaries, mangrove swamps, bays, harbours and lagoons.	Unlikely	No	High	No	
Aves	Accipitridae	*Pandion haliaetus*	Osprey	MI / MI	Littoral and coastal habitats and terrestrial wetlands and offshore islands. Requires extensive areas of open fresh, brackish or saline water for foraging	Unlikely	No	High	No	

Table A4 continued

Class	Family	*Scientific Name*	Vernacular	Status (WA) / EPBC Act	Habitat Description	Likelihood of Occurrence	Habitat Present	Likelihood of Detection if Present	Species Present	Comment
Mammal	Dasyuridae	*Parantechinus apicalis*	Dibbler	EN / EN	Old-growth Mallee heath. Prefer vegetation with a dense canopy greater than 1 m high which has been unburnt for at least 10 years or more.	Unlikely	No	Moderate	No	
Mammal	Dasyuridae	*Phascogale tapoatafa* subsp. *wambenger*	South-western Brush-tailed Phascogale, Wambenger	CD / -	Sclerophyll forests and open woodlands that contain hollow-bearing trees.	Unlikely	Y	Moderate	No	Three hollows were potentially suitable for this species. However, there was limited connectivity of woodland vegetation and the quality of woodland within the survey area was low.
Mammal	Pseudocheiridae	*Pseudocheirus occidentalis*	Western Ringtail Possum, ngwayir	CR / CR	Suitable habitat in the southern forests includes Jarrah, Marri or Karri dominated forests. South coast habitat includes coastal heath, Jarrah/Marri woodland and forest, Peppermint Tree woodland, Myrtaceous heaths and shrublands, Bullich dominated riparian zones and Karri forest (DPaW 2014)	Unlikely	No	High	No	Three hollows were potentially suitable for this species. However, there was limited connectivity of woodland vegetation and the quality of woodland within the survey area was low. There were no dreys or faecal material for this species detected.
Aves	Scolopacidae	*Tringa nebularia*	Common Greenshank, greenshank	MI / MI	Typical habitat is often found to be sheltered coasts with reefs and rock platforms or with intertidal mudflats.	Unlikely	No	High	No	
Invertebrate	Triozidae	*Trioza barrettae*	Banksia brownii plant louse	EN / -	*Trioza barrettae* is associated with its host plant *B. brownii*, which is associated with a range of habitats including thickets and mallee-heath and mallee heath shrublands and woodlands. The associated habitat is rich in Proteaceous and Myrtaceous species	Unlikely	No	High	No	Host species not present within the survey area

Appendix C

Conservation Status Definitions and Condition Scale

Table A5: Conservation code definitions for flora and fauna as listed as threatened or specially protected.

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

Threat Category	Definition
Threatened - Critically endangered species (CR)	Facing an extremely high risk of extinction in the wild in the immediate future
Threatened - Endangered species (EN)	Facing a very high risk of extinction in the wild in the near future
Threatened - Vulnerable species (VU)	Facing a high risk of extinction in the wild in the medium-term future
Threatened - Extinct (EX)	There is no reasonable doubt that the last member of the species has died
Threatened – Extinct in the wild (EW)	Species is known only to survive in cultivation, in captivity or as a naturalised population well outside its past range; and it has not been recorded in its known habitat or expected habitat, at appropriate seasons, anywhere in its past range, despite surveys over a time frame appropriate to its life cycle and form
Specially protected species - Migratory species (MI)	Fauna that periodically or occasionally visit Australia or an external Territory or the exclusive economic zone; or the species is subject of an international agreement that relates to the protection of migratory species and that binds the Commonwealth; Includes birds that are subject to an agreement between the government of Australia and the governments of Japan (JAMBA), China (CAMBA) and The Republic of Korea (ROKAMBA), and fauna subject to the Convention on the Conservation of Migratory Species of Wild Animals (Bonn Convention), an environmental treaty under the United Nations Environment Program. Migratory species listed under the BC Act are a subset of the migratory animals that are known to visit Western Australia, protected under the international agreements or treaties, excluding species that are listed as Threatened species.
Specially protected species – Conservation Dependent (CD)	Fauna of special conservation need being species dependent on ongoing conservation intervention to prevent it becoming eligible for listing as threatened,
Specially protected species – Other specially protected species (OS)	Fauna otherwise in need of special protection to ensure their conservation

Table A6: Conservation code definitions for flora and fauna as listed as Priority.

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.

Threat Category	Definition
Priority 1: Poorly-known species	Species that are known from one or a few locations (generally five or less) which are potentially at risk. All occurrences are either: very small; or on lands not managed for conservation, e.g. agricultural or pastoral lands, urban areas, road and rail reserves, gravel reserves and active mineral leases; or otherwise under threat of habitat destruction or degradation.
Priority 2: Poorly-known species	Species that are known from one or a few locations (generally five or less), some of which are on lands managed primarily for nature conservation, e.g. national parks, conservation parks, nature reserves and other lands with secure tenure being managed for conservation.
Priority 3: Poorly-known species	Species that are known from several locations, and the species does not appear to be under imminent threat, or from few but widespread locations with either large population size or significant remaining areas of apparently suitable habitat, much of it not under imminent threat.
Priority 4: Rare, Near Threatened and other species in need of monitoring	(a) Rare. Species that are considered to have been adequately surveyed, or for which sufficient knowledge is available, and that are considered not currently threatened or in need of special protection but could be if present circumstances change. These species are usually represented on conservation lands. (b) Near Threatened. Species that are considered to have been adequately surveyed and that are close to qualifying for vulnerable but are not listed as Conservation Dependent. (c) Species that have been removed from the list of threatened species during the past five years for reasons other than taxonomy.

Table A7: Conservation code definitions for ecological communities listed as threatened (TEC).

Threat Category	Definition
Presumed Totally Destroyed (PD)	An ecological community that has been adequately searched for but for which no representative occurrences have been located. The community has been found to be totally destroyed or so extensively modified throughout its range that no occurrence of it is likely to recover its species composition and/or structure in the foreseeable future.
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.

Table A8: Conservation code definitions for ecological communities listed as priority (PEC).

Possible threatened ecological communities that do not meet survey criteria or that are not adequately defined are added to the Priority Ecological Community List under priorities 1, 2 and 3.

Threat Category	Definition
Priority One (P1)	Ecological communities that are known from very few occurrences with a very restricted distribution (generally ≤5 occurrences or a total area of ≤100ha), and appear to be under immediate threat.
Priority Two (P2)	Communities that are known from few occurrences with a restricted distribution (generally ≤10 occurrences or a total area of ≤200ha). At least some occurrences are not believed to be under immediate threat (within approximately 10 years) of destruction or degradation.
Priority Three (P3)	(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 (within approximately 10 years), 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, inappropriate fire regimes, clearing, hydrological change etc.
Priority Four (P4)	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.
Priority Five (P5)	Conservation Dependent 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.

Table A9: Condition Rating Scale (adapted from Keighery 1994) outlined in EPA (2016a).

Vegetation Condition Rating	Description
Pristine	Pristine or nearly so, no obvious signs of disturbance or damage caused by human activities since European settlement.
Excellent	Vegetation structure intact, disturbance affecting individual species and weeds are non-aggressive species. Damage to trees caused by fire, the presence of non-aggressive weeds and occasional vehicle tracks.
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 the vegetation is no longer intact and the area is completely or almost completely without native species. These areas are often described as 'parkland cleared' with the flora comprising weed or crop species with isolated native trees and shrubs.

Appendix D

Species Lists and Relevé Data

Table A10: Flora Species List recorded within survey area.

Family	Scientific Name	Vernacular	Conservation Code
Native Species			
Asparagaceae	*Sowerbaea laxiflora*	Purple Tassels	
Asteraceae	*Craspedia variabilis*	Common Billy Buttons	
Cyperaceae	*Cyathochaeta avenacea*		
Cyperaceae	*Isolepis marginata*	Coarse Club-rush	
Cyperaceae	*Machaerina juncea*	Twig Rush	
Fabaceae	*Acacia extensa*	Wiry Wattle	
Iridaceae	*Patersonia occidentalis*	Purple Flag	
Juncaginaceae	*Triglochin striata*	Arrow Grass	
Myrtaceae	*Corymbia calophylla*	Marri	
Myrtaceae	*Eucalyptus marginata*	Jarrah	
Myrtaceae	*Eucalyptus occidentalis*	Flat-topped Yate	
Myrtaceae	*Melaleuca cuticularis*	Saltwater Paperbark	
Poaceae	*Neurachne alopecuroidea*	Foxtail Mulga Grass	
Proteaceae	*Hakea laurina*	Pincushion Hakea	
Proteaceae	*Hakea prostrata*	Harsh Hakea	
Restionaceae	*Desmocladus asper*		
Stylidiaceae	*Stylidium crassifolium*	Thick-leaved Triggerplant	
Stylidiaceae	*Stylidium spathulatum*	Creamy Triggerplant	
Thymelaeaceae	*Pimelea ciliata*	White Banjine	
Xanthorrhoeaceae	*Xanthorrhoea gracilis*	Graceful Grass Tree	
Xanthorrhoeaceae	*Xanthorrhoea preissii*	Grass Tree	
Introduced / Alien Weed Species			
Asparagaceae	*Asparagus asparagoides*	Bridal Creeper	
Asteraceae	*Arctotheca calendula*	Capeweed	
Asteraceae	*Cirsium vulgare*	Bull Thistle	
Asteraceae	*Cotula coronopifolia*	Waterbuttons	
Asteraceae	*Cotula turbinata*	Funnel Weed	
Asteraceae	*Hypochaeris radicata*	Cats Ear	
Asteraceae	*Pseudognaphalium luteoalbum*	Jersey Cudweed	
Asteraceae	*Sonchus asper*	Rough Sowthistle	
Asteraceae	*Sonchus oleraceus*	Common Sowthistle	
Brassicaceae	*Raphanus raphanistrum*	Wild Radish	
Campanulaceae	*Wahlenbergia capensis*	Cape Bluebell	
Caryophyllaceae	*Cerastium glomeratum*	Chickweed	
Caryophyllaceae	*Petrorhagia dubia*	Hairypink	
Caryophyllaceae	*Silene gallica*	Small-flowered Catchfly	
Cyperaceae	*Cyperus tenellus*	Tiny Flatsedge	
Fabaceae	*Acacia pycnantha*	Golden Wattle	
Fabaceae	*Chamaecytisus palmensis*	Tagasaste	
Fabaceae	*Ornithopus compressus*	Yellow Serradella	

Table A10 continued.

Family	*Scientific Name*	Vernacular	Conservation Code
Introduced / Alien Weed Species			
Fabaceae	*Paraserianthes lophantha*	Albizia	
Fabaceae	*Trifolium campestre*	Hop Clover	
Funariaceae	*Fumaria capreolata*	White Fumitory	
Iridaceae	*Romulea rosea*	Guildford Grass	
Iridaceae	*Watsonia meriana*	Bulbil Bugle-lily	
Orchidaceae	*Disa bracteata*	Bract Disa	
Oxalidaceae	*Oxalis incarnata*	Pale Pink Sorrel	
Oxalidaceae	*Oxalis purpurea*	Largeflower Wood Sorrel	
Phytolaccaceae	*Phytolacca octandra*	Red Inkweed	
Poaceae	*Briza maxima*	Blowfly Grass	
Poaceae	*Briza minor*	Shivery Grass	
Poaceae	*Bromus diandrus*	Great Brome	
Poaceae	*Bromus hordeaceus*	Soft Brome	
Poaceae	*Cenchrus clandestinus*	Kikuyu	
Poaceae	*Ehrharta longiflora*	Annual Veldt Grass	
Poaceae	*Lagurus ovatus*	Hare's Tail Grass	
Poaceae	*Lolium arundinaceum*	Tall Fescue	
Poaceae	*Lolium rigidum*	Wimmera Ryegrass	
Poaceae	*Polypogon monspeliensis*	Annual Beardgrass	
Polygonaceae	*Rumex crispus*	Curled Dock	
Primulaceae	*Lysimachia arvensis*	Scarlet Pimpernel	
Solanaceae	*Solanum laciniatum*	Kangaroo Apple	
Solanaceae	*Solanum nigrum*	Black Berry Nightshade	

Relevé	R1	**Veg Code**	Cleared / Disturbed	**Date Surveyed**	9/11/2021
GPS (Lat, Long)	-34.66433001, 117.6991368				
Landform and Slope	Plain, Flat				
Soils	Sand, Dark Brown				
Hydrology	Poor drainage				
Vegetation description	**Vegetation Description (NVIS)**: U +/-*Eucalyptus occidentalis*\tree\7\bi; M^^ ^^*Chamaecytisus palmensis, Phytolacca octandra*, +/-*Acacia pycnantha*\shrub\^4,3\d; G^^ ^^*Raphanus raphanistrum, Fumaria capreolata, Ehrharta longiflora, Watsonia meriana*\^forb, grass\^2,1\d. **Vegetation Description (Muirs)**: *Eucalyptus occidentalis* Open Woodland, over **Chamaecytisus palmensis* and **Acacia pycnantha* thicket, over **Phytolacca octandra* Dwarf Scrub C, over **Ehrharta longiflora* and **Bromus diandrus* Dense Tall Grass, over **Lolium rigidum, *Cenchrus clandestinus* and **Lolium arundinaceum* Dense Low Grass, over **Raphanus raphanistrum, *Watsonia meriana* and **Fumaria capreolata* Dense Herbs.				
Condition	Completely Degraded				
Comments	-				

Life Form	**Dominant Species**	**Other Species**	**Cover (%)**
Trees >30m			
Trees 10-30m			
Shrub >2m	**Chamaecytisus palmensis*	**Solanum laciniatum*	>70%
Shrub 1-2m			
Shrub 0.5-1m	**Phytolacca octandra*		
Shrub <0.5m			
Sedge			10-30%
Herb	**Raphanus raphanistrum, *Fumaria capreolata*	**Arctotheca calendula, *Ornithopus compressus, *Hypochaeris radicata*	30-70%
Grass	**Ehrharta longiflora, *Lolium rigidum, *Bromus diandrus*		>70%

Relevé	R2	**Veg Code**	Cleared / Disturbed	**Date Surveyed**	9/11/2021
GPS (Lat, Long)	-34.66473728, 117.6991078				
Landform and Slope	Plain, Flat				
Soils	Sand, Dark Brown				
Hydrology	Poor drainage				
Vegetation description	**Vegetation Description (NVIS):** U +/-*Eucalyptus occidentalis*\tree\7\bi; M^^ ^^*Chamaecytisus palmensis, Phytolacca octandra*, +/-*Acacia pycnantha*\shrub\^4,3\d; G^^ ^^*Raphanus raphanistrum, Fumaria capreolata, Ehrharta longiflora, Watsonia meriana*\^forb, grass\^2,1\d. **Vegetation Description (Muirs):** *Eucalyptus occidentalis* Open Woodland, over **Chamaecytisus palmensis* and **Acacia pycnantha* thicket, over **Phytolacca octandra* Dwarf Scrub C, over **Ehrharta longiflora* and **Bromus diandrus* Dense Tall Grass, over **Lolium rigidum, *Cenchrus clandestinus* and **Lolium arundinaceum* Dense Low Grass, over **Raphanus raphanistrum, *Watsonia meriana* and **Fumaria capreolata* Dense Herbs.				
Condition	Completely Degraded				
Comments	-				

Life Form	**Dominant Species**	**Other Species**	**Cover (%)**
Trees >30m			
Trees 10-30m			
Shrub >2m			
Shrub 1-2m			
Shrub 0.5-1m	**Phytolacca octandra*		2-10%
Shrub <0.5m			
Sedge			
Herb	**Raphanus raphanistrum,* **Watsonia meriana,*	**Rumex crispus, *Trifolium campestre*	>70%
Grass	**Ehrharta longiflora*	**Lolium arundinaceum, *Cenchrus clandestinus*	30-70%

Relevé	R3	**Veg Code**	Corcal Eucmar Woodland	**Date Surveyed**	9/11/2021
GPS (Lat, Long)	-34.6650967, 117.6991321				
Landform and Slope	Plain, Flat				
Soils	Sand, Dark Brown				
Hydrology	Poor drainage				
Vegetation description	**Vegetation Description (NVIS):** U ^^*Corymbia calophylla, Eucalyptus marginata*\tree\7\i; M^^ *Chamaecytisus palmensis*\shrub\4\d; G^^ ^^*Fumaria capreolata, Watsonia meriana, Ehrharta longiflora, Lolium arundinaceum*\^herb, grass\^2,1\d. **Vegetation Description (Muirs):** *Corymbia calophylla* and *Eucalyptus marginata* Woodland, over **Chamaecytisus palmensis* Dense Thicket, over **Ehrharta longiflora* and **Lolium arundinaceum* Open Grass, over **Fumaria capreolata* and **Watsonia meriana* Open Herbs				
Condition	Degraded				
Comments	-				

Life Form	**Dominant Species**	**Other Species**	**Cover (%)**
Trees >30m			
Trees 10-30m	*Corymbia calophylla, Eucalyptus marginata*		10-30%
Shrub >2m	**Chamaecytisus palmensis*		>70%
Shrub 1-2m			
Shrub 0.5-1m			
Shrub <0.5m			
Sedge			
Herb	**Fumaria capreolata, *Watsonia meriana*	**Hypochaeris radicata, *Cirsium vulgare, *Pseudognaphalium luteoalbum, *Petrorhagia dubia, *Cotula turbinata, *Ornithopus compressus*	>70%
Grass	**Ehrharta longiflora, *Lolium arundinaceum*	**Briza maxima, *Briza minor, *Ornithopus compressus*	10-30%

Relevé	R4	**Veg Code**	Eucocc Open Forest	**Date Surveyed**	9/11/2021
GPS (Lat, Long)	-34.66565828, 117.6991354				
Landform and Slope	Plain, Flat				
Soils	Sand, Dark Brown				
Hydrology	Poor drainage				
Vegetation description	**Vegetation Description (NVIS):** U^^ ^*Eucalyptus occidentalis*, +/-*Corymbia calophylla*\tree\7\d; M ^^*Xanthorrhoea gracilis, Chamaecytisus palmensis, Paraserianthes lophantha*\shrub\3\i; G^^ ^*Watsonia meriana, Ehrharta longiflora, Briza maxima*\^forb, grass\1\d **Vegetation Description (Muirs):** *Eucalyptus occidentalis* Dense Forest, over *Hakea prostrata, Agonis flexuosa, *Chamaecytisus palmensis* Scrub, over *Acacia extensa, *Paraserianthes lophantha* and **Watsonia meriana* Low Scrub A and B, over *Xanthorrhoea gracilis* and *Pimelea ciliata* open Dwarf Scrub C and D, over *Machaerina juncea, Cyathochaeta avenacea* and *Desmocladus asper* Very Open Tall and Low Sedges, over **Sonchus oleraceus, *Arctotheca calendula* and **Hypochaeris radiata* Herbs, over **Ehrharta longiflora* and **Bromus diandrus* Tall Grass, over **Lolium rigidum, *Briza maxima* and **Briza minor* Low Grass.				
Condition	Degraded				
Comments	-				

Life Form	**Dominant Species**	**Other Species**	**Cover (%)**
Trees >30m			
Trees 10-30m	*Eucalyptus occidentalis*	*Corymbia calophylla*	>70%
Shrub >2m	*Hakea prostrata*		<5%
Shrub 1-2m	*Acacia extensa, *Paraserianthes lophantha*	**Solanum nigrum*	<5%
Shrub 0.5-1m			
Shrub <0.5m			
Sedge	*Machaerina juncea*		<5%
Herb	**Watsonia meriana*	**Fumaria capreolata, *Trifolium campestre, *Sonchus oleraceus, *Disa bracteata, *Briza minor, *Arctotheca calendula, *Pseudognaphalium luteoalbum, *Hypochaeris radicata*	>70%
Grass	**Ehrharta longiflora, *Lolium rigidum, Desmocladus asper*	**Briza maxima*	10-30%

Relevé	R5	**Veg Code**	Cleared / Disturbed	**Date Surveyed**	9/11/2021
GPS (WGS 84)	-34.6666465, 117.6995449				
Landform and Slope	Plain, Flat				
Soils	Sand, Dark Brown				
Hydrology	Poor drainage				
Vegetation description	**Vegetation Description (NVIS):** U^^ ^*Eucalyptus occidentalis*, +/-*Corymbia calophylla*\tree\7\d; M ^^*Xanthorrhoea gracilis, Chamaecytisus palmensis, Paraserianthes lophantha*\shrub\3\i; G^^ ^*Watsonia meriana, Ehrharta longiflora, Briza maxima*\^forb, grass\1\d **Vegetation Description (Muirs):** *Eucalyptus occidentalis* Dense Forest, over *Hakea prostrata, Agonis flexuosa, *Chamaecytisus palmensis* Scrub, over *Acacia extensa, *Paraserianthes lophantha* and **Watsonia meriana* Low Scrub A and B, over *Xanthorrhoea gracilis* and *Pimelea ciliata* open Dwarf Scrub C and D, over *Machaerina juncea, Cyathochaeta avenacea* and *Desmocladus asper* Very Open Tall and Low Sedges, over **Sonchus oleraceus, *Arctotheca calendula* and **Hypochaeris radiata* Herbs, over **Ehrharta longiflora* and **Bromus diandrus* Tall Grass, over **Lolium rigidum, *Briza maxima* and **Briza minor* Low Grass.				
Condition	Completely Degraded				
Comments	-				

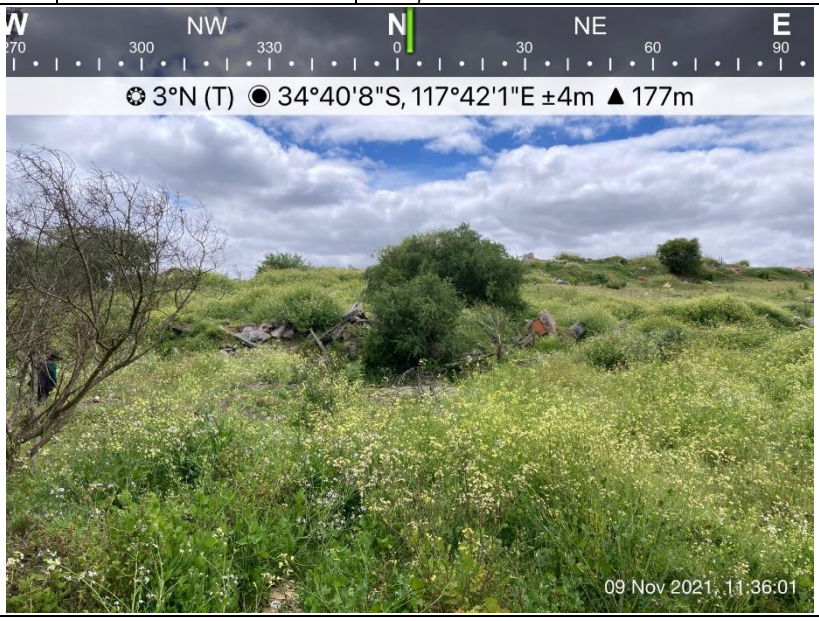
Life Form	**Dominant Species**	**Other Species**	**Cover (%)**
Trees >30m			
Trees 10-30m		*Eucalyptus occidentalis*	<5%
Shrub >2m	**Chamaecytisus palmensis*		>70%
Shrub 1-2m			
Shrub 0.5-1m			
Shrub <0.5m			
Sedge			
Herb	**Fumaria capreolata*	**Silene gallica*	30-70%
Grass	**Ehrharta longiflora*	**Briza maxima*	30-70%

Relevé	R6	**Veg Code**	Melcut wetland	**Date Surveyed**	9/11/2021
GPS (WGS 84)	-34.66787863, 117.6997262				
Landform and Slope	Drainage Depression, Moderate to Flat Slope				
Soils	Sand, Dark Brown				
Hydrology	Poor drainage				
Vegetation description	**Vegetation Description (NVIS):** U *Melaleuca cuticularis*\shrub\4\r; G^ ^*Watsonia meriana, +/- Bromus diandrus, Cyathochaeta avenacea*\^herb, grass, sedge\1\c **Vegetation Description (Muirs):** *Melaleuca cuticularis* Open Low Scrub A, over *Cyathochaeta avenacea* Very Open Tall Sedges, over *Isolepis marginata* and **Cyperus tenellus* Very Open Low Sedges, over **Watsonia meriana, *Raphanus raphanistrum* and *Stylidium spathulatum* Herbs, over **Bromus diandrus* Very Open Tall Grass, over **Briza minor* and *Neurachne alopecuroidea* Very Open Low Grass.				
Condition	Completely Degraded				
Comments	-				

Life Form	**Dominant Species**	**Other Species**	**Cover (%)**
Trees >30m			
Trees 10-30m			
Shrub >2m			
Shrub 1-2m	*Melaleuca cuticularis*		2-10%
Shrub 0.5-1m			
Shrub <0.5m			
Sedge	*Cyathochaeta avenacea*	*Isolepis marginata, *Cyperus tenellus*	2-10%
Herb	**Watsonia meriana*	**Raphanus raphanistrum, Stylidium spathulatum, Patersonia occidentalis, *Hypochaeris radicata, *Cotula coronopifolia*	30-70%
Grass	**Bromus diandrus, *Briza minor, Neurachne alopecuroidea*		<5%

Relevé	R7	**Veg Code**	Cleared / Disturbed	**Date Surveyed**	9/11/2021
GPS (WGS 84)	-34.66881183, 117.7006406				
Landform and Slope	Drainage Depression, Moderate to Flat Slope				
Soils	Sand, Dark Brown				
Hydrology	Poor drainage				
Vegetation description	**Vegetation Description (NVIS):** U +/-*Eucalyptus occidentalis*\tree\7\bi; M^^ ^^*Chamaecytisus palmensis, Phytolacca octandra*, +/-*Acacia pycnantha*\shrub\^4,3\d; G^^ ^^*Raphanus raphanistrum, Fumaria capreolata, Ehrharta longiflora, Watsonia meriana*\^forb, grass\^2,1\d. **Vegetation Description (Muirs):** *Eucalyptus occidentalis* Open Woodland, over **Chamaecytisus palmensis* and **Acacia pycnantha* thicket, over **Phytolacca octandra* Dwarf Scrub C, over **Ehrharta longiflora* and **Bromus diandrus* Dense Tall Grass, over **Lolium rigidum, *Cenchrus clandestinus* and **Lolium arundinaceum* Dense Low Grass, over **Raphanus raphanistrum, *Watsonia meriana* and **Fumaria capreolata* Dense Herbs.				
Condition	Completely Degraded				
Comments	-				

Life Form	**Dominant Species**	**Other Species**	**Cover (%)**
Trees >30m			
Trees 10-30m			
Shrub >2m	**Acacia pycnantha*	**Solanum nigrum*	<5%
Shrub 1-2m			
Shrub 0.5-1m			
Shrub <0.5m			
Sedge	**Cyperus tenellus*	*Juncus pallidus, Isolepis marginata*	>70%
Herb	**Raphanus raphanistrum, *Silene gallica, *Oxalis purpurea*	**Sonchus oleraceus, *Wahlenbergia capensis, *Cotula coronopifolia, *Cerastium glomeratum*	>70%
Grass	**Ehrharta longiflora, *Cenchrus clandestinus*	**Bromus diandrus, *Lagurus ovatus, *Polypogon monspeliensis*	2-10%



Relevé	R8	**Veg Code**	Eucocc Open Forest	**Date Surveyed**	9/11/2021
GPS (WGS 84)	-34.66918281, 117.7005909				
Landform and Slope	Plain, Flat				
Soils	Sand, Dark Brown				
Hydrology	Poor drainage				
Vegetation description	**Vegetation Description (NVIS):** U^^ ^*Eucalyptus occidentalis*, +/-*Corymbiacalophylla*\tree\7\d; M ^^*Xanthorrhoea gracilis, Chamaecytisus palmensis, Paraserianthes lophantha*\shrub\3\i; G^^ ^*Watsonia meriana, Ehrharta longiflora, Briza maxima*\^forb, grass\1\d **Vegetation Description (Muirs):** *Eucalyptus occidentalis* Dense Forest, over *Hakea prostrata, Agonis flexuosa, *Chamaecytisus palmensis* Scrub, over *Acacia extensa, *Paraserianthes lophantha* and **Watsonia meriana* Low Scrub A and B, over *Xanthorrhoea gracilis* and *Pimelea ciliata* open Dwarf Scrub C and D, over *Machaerina juncea, Cyathochaeta avenacea* and *Desmocladus asper* Very Open Tall and Low Sedges, over **Sonchus oleraceus, *Arctotheca calendula* and **Hypochaeris radiata* Herbs, over **Ehrharta longiflora* and **Bromus diandrus* Tall Grass, over **Lolium rigidum, *Briza maxima* and **Briza minor* Low Grass.				
Condition	Degraded				
Comments	-				

Life Form	**Dominant Species**	**Other Species**	**Cover (%)**
Trees >30m			
Trees 10-30m	*Eucalyptus occidentalis*		30-70%
Shrub >2m	*Agonis flexuosa*	*Melaleuca cuticularis*	2-10%
Shrub 1-2m	**Watsonia meriana*	*Hakea laurina*	2-10%
Shrub 0.5-1m	*Xanthorrhoea gracilis*		<5%
Shrub <0.5m	*Pimelea ciliata*		<5%
Sedge	*Cyathochaeta avenacea, Desmocladus asper*		>70%
Herb	*Stylidium crassifolium, Stylidium spathulatum, Sowerbaea laxiflora*	**Asparagus asparagoides, *Lysimachia arvensis*	2-10%
Grass	**Bromus diandrus, *Briza maxima*	**Briza minor, *Polypogon monspeliensis, Triglochin striata*	30-70%

Relevé	R9	**Veg Code**	Eucocc Open Forest	**Date Surveyed**	9/11/2021
GPS (WGS 84)	-34.66652607, 117.698622				
Landform and Slope	Plain, Flat				
Soils	Sand, Dark Brown				
Hydrology	Poor drainage				
Vegetation description	**Vegetation Description (NVIS):** U^^ ^*Eucalyptus occidentalis*, +/-*Corymbia calophylla*\tree\7\d; M ^^*Xanthorrhoea gracilis, Chamaecytisus palmensis, Paraserianthes lophantha*\shrub\3\i; G^^ ^*Watsonia meriana, Ehrharta longiflora, Briza maxima*\^forb, grass\1\d **Vegetation Description (Muirs):** *Eucalyptus occidentalis* Dense Forest, over *Hakea prostrata, Agonis flexuosa, *Chamaecytisus palmensis* Scrub, over *Acacia extensa, *Paraserianthes lophantha* and **Watsonia meriana* Low Scrub A and B, over *Xanthorrhoea gracilis* and *Pimelea ciliata* open Dwarf Scrub C and D, over *Machaerina juncea, Cyathochaeta avenacea* and *Desmocladus asper* Very Open Tall and Low Sedges, over **Sonchus oleraceus, *Arctotheca calendula* and **Hypochaeris radiata* Herbs, over **Ehrharta longiflora* and **Bromus diandrus* Tall Grass, over **Lolium rigidum, *Briza maxima* and **Briza minor* Low Grass.				
Condition	Degraded				
Comments	-				

Life Form	**Dominant Species**	**Other Species**	**Cover (%)**
Trees >30m			
Trees 10-30m	*Eucalyptus occidentalis*		30-70%
Shrub >2m	**Chamaecytisus palmensis*		2-10%
Shrub 1-2m	**Watsonia meriana, Xanthorrhoea gracilis*	*Xanthorrhoea preissii*	30-70%
Shrub 0.5-1m			
Shrub <0.5m			
Sedge	*Desmocladus asper, Machaerina juncea, *Cyperus tenellus*	**Bromus hordeaceus*	10-30%
Herb	**Petrorhagia dubia*	*Craspedia variabilis, *Raphanus raphanistrum, *Sonchus oleraceus, *Cotula turbinata, *Disa bracteata, *Silene gallica, *Romulea rosea, *Arctotheca calendula, *Oxalis incarnata, *Hypochaeris radicata*	30-70%
Grass	**Ehrharta longiflora, *Bromus diandrus, *Briza minor, *Briza maxima*		>70%

Table A11: Fauna species recorded within survey area.

Class	Family	Scientific Name	Vernacular	Conservation Status
Aves	Meliphagidae	*Acanthorhynchus superciliosus*	Western Spinebill	
Aves	Meliphagidae	*Anthochaera carunculata*	Red Wattlebird	
Aves	Psittaculidae	*Barnardius zonarius*	Australian Ringneck Parrot	
Aves	Cuculidae	*Cacomantis flabelliformis*	Fan-tailed Cuckoo	
Aves	Campephagidae	*Coracina novaehollandiae*	Black-faced Cuckoo-shrike	
Aves	Corvidae	*Corvus coronoides*	Australian Raven	
Aves	Artamidae	*Cracticus tibicen*	Australian Magpie	
Aves	Halcyonidae	*Dacelo novaeguineae*	Kookaburra	
Aves	Petroicidae	*Eopsaltria georgiana*	White-breasted Robin	
Aves	Acanthizidae	*Gerygone fusca*	Western Gerygone	
Aves	Acanthizidae	*Gerygone fusca*	Western Gerygone	
Aves	Pachycephalidae	*Pachycephala pectoralis fuliginosa*	Golden Whistler	
Aves	Columbidae	*Phaps chalcoptera*	Common Bronzewing	
Aves	Meliphagidae	*Phylidonyris novaehollandiae*	New Holland Honeyeater	
Aves	Psittacidae	*Platycercus icterotis*	Western Rosella	
Aves	Dicruridae	*Rhipidura albiscapa*	Grey Fantail	
Aves	Zosteropidae	*Zosterops lateralis*	Silvereye	
Mammal	Dasyuridae	*Antechinus flavipes*	Mardo	
Mammal	Macropodidae	*Macropus fuliginosus*	Western Grey Kangaroo	
Mammal	Leporidae	*Oryctolagus cuniculus*	Rabbit	
Mammal	Phalangeridae	*Trichosurus vulpecula*	Brushtail Possum	
Mammal	Canidae	*Vulpes Phalangolidae*	Red Fox	

Appendix E

NatureMap and EPBC Act PMST reports

NatureMap
Mapping Western Australia's biodiversity

NatureMap Species Report

Created By Guest user on 19/08/2021

Current Names Only	Yes
Core Datasets Only	Yes
Method	'By Circle'
Centre	117° 41' 58" E,34° 39' 52" S
Buffer	10km
Group By	Kingdom

Kingdom	Species	Records
Animalia	169	2943
Bacteria	1	1
Fungi	21	29
Plantae	721	1555
TOTAL	**912**	**4528**

	Name ID	Species Name	Naturalised	Conservation Code	[1]Endemic To Query Area
Animalia					
1.	24260	*Acanthiza apicalis (Broad-tailed Thornbill, Inland Thornbill)*			
2.	24261	*Acanthiza chrysorrhoa (Yellow-rumped Thornbill)*			
3.	24262	*Acanthiza inornata (Western Thornbill)*			
4.	24560	*Acanthorhynchus superciliosus (Western Spinebill)*			
5.	25535	*Accipiter cirrocephalus (Collared Sparrowhawk)*			
6.	25536	*Accipiter fasciatus (Brown Goshawk)*			
7.	25544	*Aegotheles cristatus (Australian Owlet-nightjar)*			
8.		*Akamptogonus novarae*			
9.		*Allothereua maculata*			
10.		*Ambicodamus marae*			
11.		*Aname mainae*			
12.	24310	*Anas castanea (Chestnut Teal)*			
13.	24312	*Anas gracilis (Grey Teal)*			
14.	24315	*Anas rhynchotis (Australasian Shoveler)*			
15.	24316	*Anas superciliosa (Pacific Black Duck)*			
16.	24561	*Anthochaera carunculata (Red Wattlebird)*			
17.	24562	*Anthochaera lunulata (Western Little Wattlebird)*			
18.	24990	*Aprasia pulchella (Granite Worm-lizard)*			
19.	24285	*Aquila audax (Wedge-tailed Eagle)*			
20.		*Arachnura higginsi*			
21.		*Araneus cyphoxis*			
22.		*Araneus eburneiventris*			
23.		*Araneus senicaudatus*			
24.	24341	*Ardea pacifica (White-necked Heron)*			
25.		*Argiope trifasciata*			
26.		*Arkys walckenaeri*			
27.	25566	*Artamus cinereus (Black-faced Woodswallow)*			
28.	24353	*Artamus cyanopterus (Dusky Woodswallow)*			
29.		*Artoria cingulipes*			
30.		*Artoriopsis expolita*			
31.		*Austracantha minax*			
32.		*Backobourkia brounii*			
33.		*Baiami volucripes*			
34.		*Barnardius zonarius*			
35.	24319	*Biziura lobata (Musk Duck)*			
36.	24724	*Cacatua pastinator subsp. pastinator (Muir's Corella, Muir's Corella (Western Corella SW WA))*		S	
37.	25598	*Cacomantis flabelliformis (Fan-tailed Cuckoo)*			
38.	42307	*Cacomantis pallidus (Pallid Cuckoo)*			
39.	25717	*Calyptorhynchus banksii (Red-tailed Black-Cockatoo)*			
40.	24731	*Calyptorhynchus banksii subsp. naso (Forest Red-tailed Black Cockatoo)*		T	
41.	24733	*Calyptorhynchus baudinii (Baudin's Cockatoo, White-tailed Long-billed Black Cockatoo)*		T	

	Name ID	Species Name	Naturalised	Conservation Code	[1]Endemic To Query Area
42.	24734	*Calyptorhynchus latirostris (Carnaby's Cockatoo, White-tailed Short-billed Black Cockatoo)*		T	
43.	48400	*Calyptorhynchus sp. (white-tailed black cockatoo)*		T	
44.	24187	*Chalinolobus morio (Chocolate Wattled Bat)*			
45.	24321	*Chenonetta jubata (Australian Wood Duck, Wood Duck)*			
46.	24980	*Christinus marmoratus (Marbled Gecko)*			
47.	24288	*Circus approximans (Swamp Harrier)*			
48.	25675	*Colluricincla harmonica (Grey Shrike-thrush)*			
49.	25568	*Coracina novaehollandiae (Black-faced Cuckoo-shrike)*			
50.	25592	*Corvus coronoides (Australian Raven)*			
51.	24671	*Coturnix pectoralis (Stubble Quail)*			
52.	25701	*Coturnix ypsilophora (Brown Quail)*			
53.	25595	*Cracticus tibicen (Australian Magpie)*			
54.	25596	*Cracticus torquatus (Grey Butcherbird)*			
55.	25398	*Crinia georgiana (Quacking Frog)*			
56.	25399	*Crinia glauerti (Clicking Frog)*			
57.	25401	*Crinia pseudinsignifera (Bleating Froglet)*			
58.	24322	*Cygnus atratus (Black Swan)*			
59.	30901	*Dacelo novaeguineae (Laughing Kookaburra)*	Y		
60.	25673	*Daphoenositta chrysoptera (Varied Sittella)*			
61.	24470	*Dromaius novaehollandiae (Emu)*			
62.		*Egretta novaehollandiae*			
63.		*Elanus axillaris*			
64.	24290	*Elanus caeruleus subsp. axillaris (Australian Black-shouldered Kite)*			
65.	47937	*Elseyornis melanops (Black-fronted Dotterel)*			
66.	24652	*Eopsaltria georgiana (White-breasted Robin)*			
67.	24567	*Epthianura albifrons (White-fronted Chat)*			
68.		*Eriophora biapicata*			
69.	25621	*Falco berigora (Brown Falcon)*			
70.	25622	*Falco cenchroides (Australian Kestrel, Nankeen Kestrel)*			
71.	25727	*Fulica atra (Eurasian Coot)*			
72.	34028	*Galaxias occidentalis (Western Minnow)*			
73.	25530	*Gerygone fusca (Western Gerygone)*			
74.	47962	*Glyciphila melanops (Tawny-crowned Honeyeater)*			
75.	24443	*Grallina cyanoleuca (Magpie-lark)*			
76.	24295	*Haliastur sphenurus (Whistling Kite)*			
77.	25117	*Hemiergis peronii subsp. peronii*			
78.	47965	*Hieraaetus morphnoides (Little Eagle)*			
79.	25734	*Himantopus himantopus (Black-winged Stilt)*			
80.	24491	*Hirundo neoxena (Welcome Swallow)*			
81.	24215	*Hydromys chrysogaster (Water-rat, Rakali)*		P4	
82.	48588	*Isoodon fusciventer (Quenda, southwestern brown bandicoot)*		P4	
83.		*Isopeda leishmanni*			
84.		*Lampona cylindrata*			
85.		*Latrodectus hasseltii*			
86.	24557	*Leipoa ocellata (Malleefowl)*		T	
87.	25661	*Lichmera indistincta (Brown Honeyeater)*			
88.	25378	*Litoria adelaidensis (Slender Tree Frog)*			
89.	25388	*Litoria moorei (Motorbike Frog)*			
90.	24132	*Macropus fuliginosus (Western Grey Kangaroo)*			
91.	24168	*Macrotis lagotis (Bilby, Dalgyte, Ninu)*		T	
92.	24326	*Malacorhynchus membranaceus (Pink-eared Duck)*			
93.	25650	*Malurus elegans (Red-winged Fairy-wren)*			
94.	24551	*Malurus pulcherrimus (Blue-breasted Fairy-wren)*			
95.	25654	*Malurus splendens (Splendid Fairy-wren)*			
96.	24583	*Manorina flavigula (Yellow-throated Miner)*			
97.		*Maratus karrie*			
98.		*Maratus pavonis*			
99.	25758	*Megalurus gramineus (Little Grassbird)*			
100.	25663	*Melithreptus brevirostris (Brown-headed Honeyeater)*			
101.	24587	*Melithreptus chloropsis (Western White-naped Honeyeater)*			
102.	25184	*Menetia greyii*			
103.	24598	*Merops ornatus (Rainbow Bee-eater)*			
104.		*Microcarbo melanoleucos*			
105.	25693	*Microeca fascinans (Jacky Winter)*			
106.		*Missulena granulosa*			
107.		*Missulena hoggi*			
108.		*Myandra bicincta*			
109.	25610	*Myiagra inquieta (Restless Flycatcher)*			
110.	24146	*Myrmecobius fasciatus (Numbat, Walpurti)*		T	

	Name ID	Species Name	Naturalised	Conservation Code	[1]Endemic To Query Area
111.	24738	*Neophema elegans (Elegant Parrot)*			
112.	25252	*Notechis scutatus (Tiger Snake)*			
113.		*Nunciella aspera*			
114.	24195	*Nyctophilus gouldi (Gould's Long-eared Bat)*			
115.	24407	*Ocyphaps lophotes (Crested Pigeon)*			
116.		*Oecobius navus*			
117.		*Ostearius melanopygius*			
118.		*Ozarchaea harveyi*			
119.	25680	*Pachycephala rufiventris (Rufous Whistler)*			
120.		*Paraplectanoides crassipes*			
121.	25681	*Pardalotus punctatus (Spotted Pardalote)*			
122.	25682	*Pardalotus striatus (Striated Pardalote)*			
123.	48061	*Petrochelidon nigricans (Tree Martin)*			
124.	48066	*Petroica boodang (Scarlet Robin)*			
125.	25699	*Phalacrocorax varius (Pied Cormorant)*			
126.	24409	*Phaps chalcoptera (Common Bronzewing)*			
127.	25587	*Phaps elegans (Brush Bronzewing)*			
128.	48070	*Phascogale tapoatafa subsp. wambenger (South-western Brush-tailed Phascogale, Wambenger)*		S	
129.		*Phryganoporus nigrinus*			
130.	24596	*Phylidonyris novaehollandiae (New Holland Honeyeater)*			
131.	24841	*Platalea flavipes (Yellow-billed Spoonbill)*			
132.	25720	*Platycercus icterotis (Western Rosella)*			
133.	25721	*Platycercus zonarius (Australian Ringneck, Ring-necked Parrot)*			
134.	24681	*Poliocephalus poliocephalus (Hoary-headed Grebe)*			
135.	25722	*Polytelis anthopeplus (Regent Parrot)*			
136.	24771	*Porzana tabuensis (Spotless Crake)*			
137.		*Protogarypinus giganteus*			
138.	24166	*Pseudocheirus occidentalis (Western Ringtail Possum, ngwayir)*		T	
139.	42416	*Pseudonaja mengdeni (Western Brown Snake)*			
140.	25433	*Pseudophryne guentheri (Crawling Toadlet)*			
141.		*Purpureicephalus spurius*			
142.	25008	*Pygopus lepidopodus (Common Scaly Foot)*			
143.	24776	*Recurvirostra novaehollandiae (Red-necked Avocet)*			
144.	48096	*Rhipidura albiscapa (Grey Fantail)*			
145.	25614	*Rhipidura leucophrys (Willie Wagtail)*			
146.	25534	*Sericornis frontalis (White-browed Scrubwren)*			
147.		*Servaea incana*			
148.		*Servaea melaina*			
149.	30948	*Smicrornis brevirostris (Weebill)*			
150.		*Sminthopsis murina*			
151.		*Spinicrus porongorupensis*			
152.	24645	*Stagonopleura oculata (Red-eared Firetail)*			
153.	25655	*Stipiturus malachurus (Southern Emu-wren)*			
154.		*Storosa tetrica*			
155.	25597	*Strepera versicolor (Grey Currawong)*			
156.	25590	*Streptopelia senegalensis (Laughing Turtle-Dove)*	Y		
157.	25705	*Tachybaptus novaehollandiae (Australasian Grebe, Black-throated Grebe)*			
158.	24331	*Tadorna tadornoides (Australian Shelduck, Mountain Duck)*			
159.	24167	*Tarsipes rostratus (Honey Possum, Noolbenger)*			
160.	24845	*Threskiornis spinicollis (Straw-necked Ibis)*			
161.	25203	*Tiliqua occipitalis (Western Bluetongue)*			
162.	25549	*Todiramphus sanctus (Sacred Kingfisher)*			
163.	24158	*Trichosurus vulpecula subsp. vulpecula (Common Brushtail Possum)*			
164.	24808	*Tringa nebularia (Common Greenshank, greenshank)*		IA	
165.		*Urodacus novaehollandiae*			
166.		*Venatrix pullastra*			
167.		*Venonia micarioides*			
168.	24206	*Vespadelus regulus (Southern Forest Bat)*			
169.	25765	*Zosterops lateralis (Grey-breasted White-eye, Silvereye)*			

Bacteria

170.		*Anabaena circinalis*			

Fungi

171.	42107	*Austroparmelina elixiana*			
172.	41242	*Buellia homophylia*			
173.	27625	*Caloplaca cinnabarina*			
174.	27663	*Cladia aggregata*			
175.	28208	*Cladonia cervicornis subsp. verticillata*			
176.	27683	*Cladonia imbricata*			

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177.	27692	*Cladonia rigida*			
178.	38802	*Laccocephalum tumulosum*			
179.	31280	*Lichenomphalia chromacea*			
180.	27892	*Pannoparmelia wilsonii*			
181.		*Panus fasciatus*			
182.		*Phellinus rimosus*			
183.		*Phytophthora cinnamomi*			
184.		*Placoasterella baileyi*			
185.	48835	*Pycnoporus coccineus*			
186.	28223	*Ramalina celastri subsp. ovalis*			
187.	28070	*Thysanothecium hookeri*			
188.	45845	*Tilletia viennotii*			
189.	45896	*Ustilago bromivora*			
190.	28144	*Xanthoparmelia isidiigera*			
191.	29964	*Xanthoparmelia sargentii*		P1	
Plantae					
192.	15466	*Acacia applanata*			
193.	3235	*Acacia baxteri (Baxter's Wattle)*			
194.	3239	*Acacia biflora*			
195.	3247	*Acacia browniana*			
196.	11731	*Acacia browniana var. browniana*			
197.	11449	*Acacia browniana var. endlicheri*			
198.	3257	*Acacia chrysocephala*			
199.	3277	*Acacia crispula*			
200.	11192	*Acacia drummondii subsp. elegans*			
201.	14854	*Acacia drummondii subsp. elegans Porongurup variant (R.J. Cumming 938)*		P4	
202.	3331	*Acacia extensa (Wiry Wattle)*			
203.	15475	*Acacia heteroclita subsp. heteroclita*			
204.	14117	*Acacia heteroclita subsp. valida*		P2	
205.	3383	*Acacia incurva*			
206.	3413	*Acacia leioderma*			
207.	3428	*Acacia luteola*			
208.	3436	*Acacia maxwellii*			
209.	10955	*Acacia melanoxylon*	Y		
210.	3453	*Acacia myrtifolia*			
211.	3454	*Acacia nervosa (Rib Wattle)*			
212.	3482	*Acacia paradoxa (Kangaroo Thorn)*	Y		
213.	15482	*Acacia pulchella var. goadbyi*			
214.	15483	*Acacia pulchella var. pulchella*			
215.	3504	*Acacia pycnantha (Golden Wattle)*	Y		
216.	30034	*Acacia saligna subsp. pruinescens*			
217.	30036	*Acacia saligna subsp. stolonifera*			
218.	13506	*Acacia sulcata var. platyphylla*			
219.	13504	*Acacia sulcata var. sulcata*			
220.	3582	*Acacia triptycha*			
221.	5315	*Actinodium cunninghamii (Albany Daisy)*			
222.	35620	*Actinodium sp. Fitzgerald River (H.A. Froebe & R. Classen 810)*			
223.	6203	*Actinotus glomeratus*			
224.	1769	*Adenanthos apiculatus*			
225.	1773	*Adenanthos cuneatus (Coastal Jugflower)*			
226.	1791	*Adenanthos obovatus (Basket Flower)*			
227.	11700	*Agapanthus praecox subsp. praecox (Agapanthus)*	Y		
228.	19789	*Agonis theiformis*			
229.	179	*Agrostis gigantea (Redtop Bent)*	Y		
230.	182	*Agrostis stolonifera (Creeping Bent)*	Y		
231.	23474	*Agrostocrinum hirsutum*			
232.	1378	*Allium triquetrum (Three-cornered Garlic)*	Y		
233.	1379	*Allium vineale (Crow Garlic)*	Y		
234.	1732	*Allocasuarina humilis (Dwarf Sheoak)*			
235.	13908	*Allocasuarina lehmanniana subsp. lehmanniana*			
236.	1734	*Allocasuarina microstachya*			
237.	194	*Amphipogon amphipogonoides*			
238.	197	*Amphipogon debilis*			
239.	20184	*Amphipogon laguroides subsp. laguroides*			
240.	2380	*Amyema miquelii (Stalked Mistletoe)*			
241.	1058	*Anarthria gracilis*			
242.	1062	*Anarthria prolifera*			
243.	1063	*Anarthria scabra*			
244.	6306	*Andersonia caerulea (Foxtails)*			
245.	6317	*Andersonia micrantha*			

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246.	6320	*Andersonia simplex (Spiked Andersonia)*			
247.	6321	*Andersonia sprengelioides*			
248.	11931	*Anigozanthos bicolor subsp. decrescens*			
249.	1408	*Anigozanthos gabrielae (Dwarf Kangaroo Paw)*			
250.	1413	*Anigozanthos preissii (Albany Catspaw)*			
251.	202	*Anthoxanthum odoratum (Sweet Vernal Grass)*	Y		
252.	3689	*Aotus intermedia*			
253.	18127	*Aotus sp. Scott River (K.F. Kenneally 2371)*			
254.	1117	*Aphelia cyperoides*			
255.	12040	*Apium prostratum subsp. prostratum var. prostratum (Sea Celery)*			
256.	20127	*Astartea glomerulosa (Early Astartea)*			
257.	45213	*Astartea pulchella*			
258.	20131	*Astartea sp. southern ranges (T.E.H. Aplin 2108)*			
259.		*Asterella drummondii*			
260.	7850	*Asteridea nivea*			
261.	4401	*Asterolasia squamuligera*			
262.	6323	*Astroloma ciliatum (Candle Cranberry)*			
263.	6325	*Astroloma drummondii*			
264.	6334	*Astroloma pallidum (Kick Bush)*			
265.	2471	*Atriplex prostrata (Hastate Orache)*	Y		
266.	17233	*Austrostipa campylachne*			
267.	17253	*Austrostipa semibarbata*			
268.	17255	*Austrostipa trichophylla*			
269.	233	*Avena barbata (Bearded Oat)*	Y		
270.	32684	*Banksia arctotidis*			
271.	32682	*Banksia armata var. armata*			
272.	32683	*Banksia armata var. ignicida*			
273.	1806	*Banksia brownii (Feather-leaved Banksia)*		T	
274.	32580	*Banksia dallanneyi subsp. dallanneyi var. dallanneyi*			
275.	32616	*Banksia dallanneyi subsp. sylvestris*			
276.	32558	*Banksia drummondii subsp. drummondii*			
277.	32525	*Banksia formosa (Showy Dryandra)*			
278.	11532	*Banksia gardneri var. gardneri*			
279.	1819	*Banksia grandis (Bull Banksia, Pulgarla)*			
280.	1822	*Banksia ilicifolia (Holly-leaved Banksia)*			
281.	1830	*Banksia littoralis (Swamp Banksia, Pungura)*			
282.	32202	*Banksia nivea (Honeypot Dryandra, Pudjarn)*			
283.	1837	*Banksia occidentalis (Red Swamp Banksia)*			
284.	32158	*Banksia porrecta*		P4	
285.	32085	*Banksia seneciifolia*		P4	
286.	33539	*Banksia sphaerocarpa var. latifolia*		P2	
287.	1854	*Banksia verticillata (Albany Banksia)*		T	
288.	32315	*Barbula calycina*			
289.	32323	*Bartramia pseudostricta*			
290.	739	*Baumea acuta (Pale Twig-rush)*			
291.	743	*Baumea juncea (Bare Twigrush)*			
292.	5392	*Beaufortia sparsa (Swamp Bottlebrush)*			
293.	3154	*Billardiera coriacea*			
294.	3157	*Billardiera floribunda (White-flowered Billardiera)*			
295.	25798	*Billardiera fusiformis (Australian Bluebell)*			
296.	3159	*Billardiera laxiflora*			
297.	3165	*Billardiera variifolia*			
298.	25779	*Billardiera venusta*			
299.	6674	*Borago officinalis (Borage)*	Y		
300.	4413	*Boronia crenulata (Aniseed Boronia)*			
301.	11503	*Boronia crenulata subsp. crenulata var. crenulata*			
302.	4423	*Boronia heterophylla (Kalgan Boronia)*			
303.	4441	*Boronia spathulata (Boronia)*			
304.	4443	*Boronia subsessilis*			
305.	1272	*Borya scirpoidea*			
306.	1273	*Borya sphaerocephala (Pincushions)*			
307.	3713	*Bossiaea linophylla*			
308.	3714	*Bossiaea ornata (Broad Leaved Brown Pea)*			
309.	14291	*Bossiaea praetermissa*			
310.	46733	*Brachyloma baxteri*			
311.	2996	*Brassica nigra (Black Mustard)*	Y		
312.	245	*Briza minor (Shivery Grass)*	Y		
313.	250	*Bromus hordeaceus (Soft Brome)*	Y		
314.	252	*Bromus madritensis (Madrid Brome)*	Y		
315.	12770	*Burchardia congesta*			

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316.	1385	*Burchardia multiflora (Dwarf Burchardia)*			
317.	1276	*Caesia micrantha (Pale Grass Lily)*			
318.	1277	*Caesia occidentalis*			
319.	15335	*Caladenia brownii*			
320.	1580	*Caladenia cairnsiana (Zebra Orchid)*			
321.	13617	*Caladenia christineae*		T	
322.	11165	*Caladenia falcata*			
323.	1590	*Caladenia ferruginea (Rusty Spider Orchid)*			
324.	15348	*Caladenia flava subsp. flava*			
325.	15350	*Caladenia flava subsp. sylvestris*			
326.	15353	*Caladenia heberleana*			
327.	15354	*Caladenia hirta subsp. hirta*			
328.	1601	*Caladenia lobata (Butterfly Orchid)*			
329.	15363	*Caladenia longicauda subsp. eminens*			
330.	15365	*Caladenia longicauda subsp. longicauda*			
331.	15367	*Caladenia longicauda subsp. redacta*			
332.	1603	*Caladenia longiclavata (Clubbed Spider Orchid)*			
333.	1604	*Caladenia macrostylis (Leaping Spider Orchid)*			
334.	1605	*Caladenia marginata (White Fairy Orchid)*			
335.	15372	*Caladenia nana subsp. unita*			
336.	1609	*Caladenia pectinata (King Spider Orchid)*			
337.	18026	*Caladenia pendens subsp. pendens*			
338.	1610	*Caladenia plicata (Crab-lipped Spider Orchid)*			
339.	15376	*Caladenia polychroma*			
340.	15377	*Caladenia reptans subsp. reptans*			
341.	15381	*Caladenia startiorum*		P2	
342.	44899	*Caladenia straminichila*			
343.	45758	*Calectasia demarzii (Demarz's Tinsel Lily)*			
344.	10861	*Callistachys lanceolata (Wonnich)*			
345.	5394	*Callistemon glaucus*			
346.	33160	*Calochilus uliginosus*			
347.	35816	*Calothamnus quadrifidus subsp. quadrifidus*			
348.	5430	*Calothamnus schaueri*			
349.	16493	*Calycopeplus oligandrus*			
350.	5440	*Calytrix asperula (Brush Starflower)*			
351.	5458	*Calytrix flavescens (Summer Starflower)*			
352.	48451	*Calytrix hirta*			
353.	5465	*Calytrix leschenaultii*			
354.	5482	*Calytrix tenuiramea*			
355.	32334	*Campylopus australis*			
356.	32461	*Campylopus bicolor var. bicolor*			
357.	32338	*Campylopus introflexus*	Y		
358.	7909	*Carduus pycnocephalus (Slender Thistle)*	Y		
359.	7910	*Carduus tenuiflorus (Slender Thistle, Winged Slender Thistle, Sheep Thistle)*	Y		
360.	2952	*Cassytha glabella (Tangled Dodder Laurel)*			
361.	11501	*Cassytha glabella forma casuarinae*			
362.	11242	*Cassytha racemosa forma pilosa*			
363.	6539	*Centaurium erythraea (Common Centaury)*	Y		
364.	6542	*Centaurium tenuiflorum*	Y		
365.	35322	*Centranthus ruber subsp. ruber*	Y		
366.	1121	*Centrolepis aristata (Pointed Centrolepis)*			
367.	3148	*Cephalotus follicularis (Albany Pitcher Plant)*			
368.	18156	*Chamaecytisus palmensis (Tagasaste)*	Y		
369.	11299	*Chamaescilla corymbosa var. corymbosa*			
370.	1217	*Chamaexeros serra (Little Fringe-leaf)*			
371.		*Chiloscyphus semiteres var. semiteres*			
372.	3751	*Chorizema aciculare (Needle-leaved Chorizema)*			
373.	13112	*Chorizema aciculare subsp. aciculare*			
374.	3752	*Chorizema cytisoides*			
375.	3754	*Chorizema diversifolium*			
376.	3757	*Chorizema glycinifolium*			
377.	12765	*Chorizema nanum*			
378.	14586	*Chorizema spathulatum*			
379.	7937	*Cirsium vulgare (Spear Thistle, Scotch Thistle)*	Y		
380.	2929	*Clematis pubescens (Common Clematis)*			
381.	4550	*Comesperma calymega (Blue-spike Milkwort)*			
382.	4551	*Comesperma ciliatum*			
383.	4557	*Comesperma nudiusculum*			
384.	4564	*Comesperma virgatum (Milkwort)*			
385.	40920	*Commersonia grandiflora*			

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386.	40925	*Commersonia parviflora (Small Flowered Rulingia)*			
387.	16855	*Conospermum caeruleum subsp. oblanceolatum*			
388.	16852	*Conospermum capitatum subsp. velutinum*			
389.	1418	*Conostylis aculeata (Prickly Conostylis)*			
390.	1441	*Conostylis misera (Grass Conostylis)*		T	
391.	1454	*Conostylis setigera (Bristly Cottonhead)*			
392.	11597	*Conostylis setigera subsp. setigera*			
393.	48259	*Cortaderia selloana subsp. selloana*	Y		
394.	17104	*Corymbia calophylla (Marri)*			
395.	7945	*Cotula coronopifolia (Waterbuttons)*	Y		
396.	7947	*Cotula turbinata (Funnel Weed)*	Y		
397.	1627	*Cryptostylis ovata (Slipper Orchid)*			
398.	15114	*Cyanicula gemmata*			
399.	15404	*Cyanicula sericea*			
400.	768	*Cyathochaeta avenacea*			
401.	285	*Cynosurus echinatus (Rough Dogstail)*	Y		
402.	815	*Cyperus tenellus (Tiny Flatsedge)*	Y		
403.	10964	*Cyrtostylis robusta*			
404.	287	*Dactylis glomerata (Cocksfoot)*	Y		
405.	7420	*Dampiera alata (Winged-stem Dampiera)*			
406.	7454	*Dampiera linearis (Common Dampiera)*			
407.	7462	*Dampiera pedunculata*			
408.	5508	*Darwinia citriodora (Lemon-scented Darwinia)*			
409.	19923	*Darwinia leiostyla*		P4	
410.	5519	*Darwinia oederoides*			
411.	5533	*Darwinia vestita (Pom-pom Darwinia)*			
412.	1218	*Dasypogon bromeliifolius (Pineapple Bush)*			
413.	6964	*Datura stramonium (Common Thornapple)*	Y		
414.	3791	*Daviesia alternifolia*			
415.	3799	*Daviesia cordata (Bookleaf)*			
416.	3811	*Daviesia flexuosa*			
417.	3812	*Daviesia gracilis*			
418.	12326	*Daviesia hakeoides subsp. subnuda*			
419.	3815	*Daviesia horrida (Prickly Bitter-pea)*			
420.	15505	*Daviesia incrassata subsp. incrassata*			
421.	3835	*Daviesia preissii*			
422.	17691	*Desmocladus fasciculatus*			
423.	16595	*Desmocladus flexuosus*			
424.	299	*Deyeuxia quadriseta (Reed Bentgrass)*			
425.	7487	*Diaspasis filifolia (Thread-leaved Diaspasis)*			
426.	6616	*Dichondra repens (Kidney Weed)*			
427.	32345	*Didymodon australasiae*			
428.	32346	*Didymodon torquatus*			
429.	15118	*Dierama pulcherrimum*	Y		Y
430.	19649	*Disa bracteata*	Y		
431.	7961	*Dittrichia graveolens (Stinkwort)*	Y		
432.	7962	*Dittrichia viscosa*	Y		
433.	42231	*Diuris decrementa*			
434.	1635	*Diuris longifolia (Common Donkey Orchid)*			
435.	15436	*Diuris porrifolia*			
436.	1638	*Diuris setacea (Bristly Donkey Orchid)*			
437.	4757	*Dodonaea ceratocarpa*			
438.	1640	*Drakaea glyptodon (King-in-his-carriage)*			
439.	11156	*Drakaea livida*			
440.	48751	*Drosera drummondii*			
441.	13218	*Drosera erythrogyne*			
442.	3097	*Drosera gigantea (Giant Sundew)*			
443.	3098	*Drosera glanduligera (Pimpernel Sundew)*			
444.	3102	*Drosera huegelii (Bold Sundew)*			
445.	19256	*Drosera intricata*			
446.	3106	*Drosera macrantha (Bridal Rainbow)*			
447.	3109	*Drosera menziesii (Pink Rainbow)*			
448.	3118	*Drosera pallida (Pale Rainbow)*			
449.	3122	*Drosera platypoda (Fan-leaved Sundew)*			
450.	3123	*Drosera platystigma (Black-eyed Sundew)*			
451.	3124	*Drosera pulchella (Pretty Sundew)*			
452.	3126	*Drosera pygmaea*			
453.	3130	*Drosera scorpioides (Shaggy Sundew)*			
454.	49090	*Drosera sp. Branched styles (S.C. Coffey 193)*			
455.	8914	*Drosera sulphurea (Sulphur-flowered Sundew)*			

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456.	33500	*Dysphania ambrosioides (Mexican Tea)*	Y		
457.	33480	*Dysphania pumilio (Clammy Goosefoot)*			
458.	16093	*Echinochloa esculenta*	Y		
459.	332	*Echinochloa frumentacea (Siberian Millet)*	Y		
460.	1643	*Elythranthera brunonis (Purple Enamel Orchid)*			
461.	1644	*Elythranthera emarginata (Pink Enamel Orchid)*			
462.	32353	*Entosthodon apophysatus*			
463.	32356	*Entosthodon subnudus*			
464.	1646	*Eriochilus dilatatus (White Bunny Orchid)*			
465.	15412	*Eriochilus dilatatus subsp. multiflorus*			
466.	5570	*Eucalyptus buprestium (Apple Mallee)*			
467.	5605	*Eucalyptus cornuta (Yate, Yeid)*			
468.	5615	*Eucalyptus decipiens (Limestone Marlock, Moit)*			
469.	5627	*Eucalyptus doratoxylon (Spearwood Mallee, Keidjngund)*			
470.	5675	*Eucalyptus incrassata (Lerp Mallee)*			
471.	13547	*Eucalyptus marginata subsp. marginata (Jarrah)*			
472.	5735	*Eucalyptus pachyloma (Kalgan Plains Mallee)*			
473.	5796	*Eucalyptus uncinata (Hook-leaved Mallee)*			
474.	20214	*Eutaxia myrtifolia*			
475.	3880	*Eutaxia virgata*			
476.	834	*Evandra aristata*			
477.	10765	*Exocarpos sparteus (Broom Ballart, Djuk)*			
478.	430	*Festuca arundinacea (Tall Fescue)*	Y		
479.	1944	*Franklandia fucifolia (Lanoline Bush)*			
480.	31532	*Fumaria muralis subsp. muralis*	Y		
481.		*Fumaria sp.*			
482.	32370	*Funaria hygrometrica*			
483.	7324	*Galium tricornutum (Threehorn Bedstraw)*	Y		
484.	3896	*Gastrolobium crassifolium (Thickleaf Poison)*			
485.	19190	*Gastrolobium cuneatum*			
486.	19752	*Gastrolobium ferrugineum*		P2	
487.	20511	*Gastrolobium minus*			
488.	20512	*Gastrolobium praemorsum*			
489.	16348	*Gastrolobium pusillum*			
490.	19733	*Gastrolobium retusum*			
491.	20500	*Gastrolobium sericeum*			
492.	3932	*Gastrolobium velutinum (Stirling Range Poison)*			
493.	32374	*Gemmabryum cheelii*			
494.	32380	*Gemmabryum pachythecum*			
495.	3936	*Genista linifolia (Flaxleaf Broom)*	Y		
496.	4341	*Geranium solanderi (Native Geranium)*			
497.	1524	*Gladiolus undulatus (Wild Gladiolus)*	Y		
498.	33620	*Glischrocaryon angustifolium*			
499.	6143	*Glischrocaryon aureum (Common Popflower)*			
500.	3948	*Gompholobium capitatum*			
501.	10909	*Gompholobium confertum*			
502.	3950	*Gompholobium knightianum*			
503.	3951	*Gompholobium marginatum*			
504.	3953	*Gompholobium ovatum*			
505.	3954	*Gompholobium polymorphum*			
506.	3955	*Gompholobium preissii*			
507.	11083	*Gompholobium scabrum*			
508.	6160	*Gonocarpus paniculatus*			
509.	7517	*Goodenia incana (Hoary Goodenia)*			
510.	7537	*Goodenia pterigosperma*			
511.	19283	*Goodenia pulchella subsp. Mt Barker (K.F. Kenneally 1166)*			
512.	19285	*Goodenia pulchella subsp. Wheatbelt (L.W. Sage & F. Hort 795)*			
513.	14282	*Gratiola pubescens*			
514.	1987	*Grevillea depauperata*			
515.	2005	*Grevillea fasciculata*			
516.	15991	*Grevillea pulchella subsp. pulchella*			
517.	2080	*Grevillea quercifolia (Oak-leaf Grevillea)*			
518.	2112	*Grevillea trifida*			
519.	32473	*Grimmia pulvinata var. africana*			
520.	48613	*Gypsophila vaccaria*	Y		
521.	1474	*Haemodorum sparsiflorum*			
522.	2137	*Hakea ceratophylla (Horned Leaf Hakea)*			
523.	2145	*Hakea corymbosa (Cauliflower Hakea)*			
524.	2159	*Hakea falcata*			
525.	2160	*Hakea ferruginea*			

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526.	2162	*Hakea florida*			
527.	2174	*Hakea linearis*			
528.	2197	*Hakea prostrata (Harsh Hakea)*			
529.	2212	*Hakea sulcata (Furrowed Hakea)*			
530.	2214	*Hakea trifurcata (Two-leaf Hakea)*			
531.	2215	*Hakea undulata (Wavy-leaved Hakea)*			
532.	2216	*Hakea varia (Variable-leaved Hakea)*			
533.	3961	*Hardenbergia comptoniana (Native Wisteria)*			
534.	32392	*Hedwigidium integrifolium*			
535.	8084	*Helminthotheca echioides (Ox-tongue, Prickly Ox-tongue)*	Y		
536.	6839	*Hemiandra pungens (Snakebush)*			
537.	6855	*Hemigenia humilis*			
538.	6865	*Hemigenia podalyrina*			
539.	5109	*Hibbertia amplexicaulis*			
540.	5114	*Hibbertia commutata*			
541.	5118	*Hibbertia cunninghamii*			
542.	5119	*Hibbertia depressa*			
543.	5131	*Hibbertia gracilipes*			
544.	5135	*Hibbertia hypericoides (Yellow Buttercups)*			
545.	5144	*Hibbertia microphylla*			
546.	5159	*Hibbertia pulchra*			
547.	20033	*Hibbertia pulchra var. acutibractea*			
548.	5172	*Hibbertia stellaris (Orange Stars)*			
549.	444	*Holcus lanatus (Yorkshire Fog)*	Y		
550.	8476	*Hordeum hystrix (Mediterranean Region Barley Grass)*	Y		
551.	449	*Hordeum leporinum (Barley Grass)*	Y		
552.	451	*Hordeum vulgare (Barley)*	Y		
553.	3964	*Hovea chorizemifolia (Holly-leaved Hovea)*			
554.	3965	*Hovea elliptica (Tree Hovea)*			
555.	16759	*Hyalosperma simplex subsp. simplex*			
556.	6226	*Hydrocotyle callicarpa (Small Pennywort)*			
557.	5817	*Hypocalymma angustifolium (White Myrtle, Kudjid)*			
558.	5827	*Hypocalymma strictum*			
559.	9352	*Hypochaeris radicata (Flat Weed, Cats-ear)*	Y		
560.	1070	*Hypolaena exsulca*			
561.	1071	*Hypolaena fastigiata*			
562.	912	*Isolepis cyperoides*			
563.	916	*Isolepis inundata (Swamp Club Rush)*			
564.	10831	*Isolepis prolifera (Budding Club-rush)*	Y		
565.	2222	*Isopogon attenuatus*			
566.	2224	*Isopogon baxteri (Stirling Range Coneflower)*			
567.	2230	*Isopogon formosus (Rose Coneflower)*			
568.	16880	*Isopogon formosus subsp. formosus*			
569.	2233	*Isopogon longifolius*			
570.	2238	*Isopogon teretifolius (Nodding Coneflower)*			
571.	3992	*Isotropis cuneifolia (Granny Bonnets)*			
572.	1533	*Ixia paniculata*	Y		
573.	4017	*Jacksonia horrida*			
574.	4028	*Jacksonia spinosa*			
575.	1295	*Johnsonia acaulis*			
576.	1297	*Johnsonia lupulina (Hooded Lily)*			
577.	1178	*Juncus bufonius (Toad Rush)*	Y		
578.	8329	*Juncus gregiflorus*			
579.	14630	*Juncus imbricatus*	Y		
580.	1188	*Juncus pallidus (Pale Rush)*			
581.	1190	*Juncus planifolius (Broadleaf Rush)*			
582.	1195	*Juncus subsecundus (Finger Rush)*			
583.	4037	*Kennedia coccinea (Coral Vine)*			
584.	4041	*Kennedia microphylla*			
585.	4044	*Kennedia prostrata (Scarlet Runner)*			
586.	11898	*Kickxia elatine subsp. elatine*	Y		
587.	17506	*Kunzea ericifolia subsp. ericifolia*			
588.	15498	*Kunzea glabrescens (Spearwood)*			
589.	5841	*Kunzea recurva*			
590.	5844	*Kunzea sulphurea*			
591.	467	*Lagurus ovatus (Hare's Tail Grass)*	Y		
592.	14878	*Lambertia echinata subsp. citrina*			
593.	17757	*Latrobea sp. South Coast (A.M. Ashby 1949)*			
594.	1308	*Laxmannia sessiliflora (Nodding Lily)*			
595.	11464	*Laxmannia sessiliflora subsp. australis*			

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596.	7572	*Lechenaultia expansa*			
597.	7575	*Lechenaultia formosa (Red Leschenaultia)*			
598.	3018	*Lepidium africanum (Rubble Peppercress)*	Y		
599.	931	*Lepidosperma drummondii*			
600.	932	*Lepidosperma effusum (Spreading Sword-sedge)*			
601.	936	*Lepidosperma leptostachyum*			
602.	937	*Lepidosperma longitudinale (Pithy Sword-sedge)*			
603.	940	*Lepidosperma pubisquameum*			
604.		*Lepidosperma sp.*			
605.	945	*Lepidosperma squamatum*			
606.	946	*Lepidosperma striatum*			
607.	1653	*Leporella fimbriata (Hare Orchid)*			
608.	1077	*Leptocarpus canus (Hoary Twine-rush)*			
609.	1078	*Leptocarpus coangustatus*			
610.	46380	*Leptocarpus kraussii*			
611.	19833	*Leptocarpus laxus*			
612.	1082	*Leptocarpus tenax (Slender Twine Rush)*			
613.	2345	*Leptomeria ericoides*			
614.	2347	*Leptomeria lehmannii*			
615.	2353	*Leptomeria scrobiculata*			
616.	2355	*Leptomeria squarrulosa*			
617.	5847	*Leptospermum erubescens (Roadside Teatree)*			
618.	1084	*Lepyrodia drummondiana*			
619.	1087	*Lepyrodia hermaphrodita*			
620.		*Lethocolea pansa*			
621.	6360	*Leucopogon australis (Spiked Beard-heath)*			
622.	6382	*Leucopogon cucullatus*			
623.	6387	*Leucopogon distans*			
624.	6396	*Leucopogon glabellus*			
625.	33380	*Leucopogon interstans*			
626.	40941	*Leucopogon obovatus subsp. revolutus*			
627.	6423	*Leucopogon oppositifolius*			
628.	6425	*Leucopogon oxycedrus*			
629.	6428	*Leucopogon pendulus*			
630.	6436	*Leucopogon propinquus*			
631.	6441	*Leucopogon reflexus (Heart-leaf Beard-heath)*			
632.	10755	*Leucopogon rubricaulis*			
633.	34718	*Leucopogon sp. Southern Forests (B.G. Hammersley 1000)*			
634.	6449	*Leucopogon tamariscinus*			
635.	6454	*Leucopogon verticillatus (Tassel Flower)*			
636.	7676	*Levenhookia pusilla (Midget Stylewort)*			
637.	7677	*Levenhookia stipitata (Common Stylewort)*			
638.	59	*Lindsaea linearis (Screw Fern)*			
639.	9289	*Lobelia anceps (Angled Lobelia)*			
640.	7406	*Lobelia rhombifolia (Tufted Lobelia)*			
641.	6504	*Logania buxifolia*			
642.		*Lolium sp.*			
643.	1223	*Lomandra caespitosa (Tufted Mat Rush)*			
644.	1229	*Lomandra integra*			
645.	1234	*Lomandra nigricans*			
646.	1240	*Lomandra purpurea (Purple Mat Rush)*			
647.	4059	*Lotus angustissimus (Narrowleaf Trefoil)*	Y		
648.	8564	*Lotus subbiflorus*	Y		
649.	1097	*Lyginia barbata*			
650.	1656	*Lyperanthus serratus (Rattle Beak Orchid)*			
651.	6456	*Lysinema ciliatum (Curry Flower)*			
652.	34736	*Lysinema pentapetalum*			
653.	5281	*Lythrum hyssopifolia (Lesser Loosestrife)*	Y		
654.	17633	*Marianthus erubescens*			
655.	17638	*Marianthus granulatus*		P4	
656.	17630	*Marianthus tenuis*			
657.	5878	*Melaleuca blaeriifolia*			
658.	12386	*Melaleuca camptoclada*			
659.	5900	*Melaleuca cuticularis (Saltwater Paperbark)*			
660.	5902	*Melaleuca densa*			
661.	5926	*Melaleuca lateritia (Robin Redbreast Bush)*			
662.	5946	*Melaleuca pauciflora*			
663.	5952	*Melaleuca preissiana (Moonah)*			
664.	5956	*Melaleuca pungens*			
665.	5959	*Melaleuca rhaphiophylla (Swamp Paperbark)*			

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666.	5980	*Melaleuca thymoides*			
667.	5987	*Melaleuca viminea (Mohan)*			
668.	13280	*Melaleuca viminea subsp. viminea*			
669.	6883	*Mentha pulegium (Pennyroyal)*	Y		
670.	953	*Mesomelaena graciliceps*			
671.	956	*Mesomelaena stygia*			
672.	11473	*Mesomelaena stygia subsp. stygia*			
673.	957	*Mesomelaena tetragona (Semaphore Sedge)*			
674.	15419	*Microtis media subsp. media*			
675.	1660	*Microtis orbicularis (Dark Mignonette Orchid)*			
676.	8105	*Millotia myosotidifolia*			
677.	14344	*Millotia tenuifolia var. tenuifolia (Soft Millotia)*			
678.	37440	*Monopsis debilis var. depressa*	Y		
679.	44496	*Narcissus tazetta subsp. italicus*	Y		
680.	17965	*Nerine bowdenii*	Y		Y
681.	492	*Neurachne alopecuroidea (Foxtail Mulga Grass)*			
682.	6139	*Oenothera glazioviana (Evening Primrose)*	Y		
683.	2365	*Olax benthamiana*			
684.	2366	*Olax phyllanthi*			
685.	8131	*Olearia ciliata (Fringed Daisy Bush)*			
686.	8143	*Olearia paucidentata (Autumn Scrub Daisy)*			
687.	18254	*Opercularia apiciflora*			
688.	7348	*Opercularia hispidula (Hispid Stinkweed)*			
689.	46255	*Orianthera campanulata*			
690.	46315	*Orianthera serpyllifolia subsp. serpyllifolia*			
691.	36202	*Ornduffia marchantii*		P4	
692.	4353	*Oxalis hirta (Hairy Wood Sorrel)*	Y		
693.	4357	*Oxalis polyphylla*	Y		Y
694.	4358	*Oxalis purpurea (Largeflower Wood Sorrel)*	Y		
695.	7089	*Parentucellia latifolia (Common Bartsia)*	Y		
696.	1550	*Patersonia occidentalis (Purple Flag, Koma)*			
697.	30472	*Patersonia occidentalis var. occidentalis*			
698.	1551	*Patersonia pygmaea (Pygmy Patersonia)*			
699.	1553	*Patersonia umbrosa (Yellow Flags)*			
700.	14432	*Patersonia umbrosa var. umbrosa*			
701.	43765	*Pauridia glabella var. glabella*			
702.	43762	*Pauridia occidentalis var. quadriloba*			
703.	16477	*Pericalymma ellipticum var. ellipticum*			
704.	15501	*Pericalymma spongiocaule*			
705.	14934	*Persicaria orientalis*	Y		
706.	2262	*Persoonia elliptica (Spreading Snottygobble)*			
707.	2267	*Persoonia longifolia (Snottygobble)*			
708.	2277	*Persoonia striata*			
709.	2293	*Petrophile diversifolia*			
710.	2302	*Petrophile media*			
711.	2306	*Petrophile rigida*			
712.	2309	*Petrophile serruriae*			
713.	19825	*Petrorhagia dubia*	Y		
714.	548	*Phalaris aquatica (Phalaris)*	Y		
715.	18532	*Philotheca nodiflora subsp. lasiocalyx*			
716.	1173	*Philydrella pygmaea (Butterfly Flowers)*			
717.	16825	*Phyllangium divergens*			
718.	16177	*Phyllangium paradoxum*			
719.	4675	*Phyllanthus calycinus (False Boronia)*			
720.	2793	*Phytolacca octandra (Red Ink Plant)*	Y		
721.	5231	*Pimelea angustifolia (Narrow-leaved Pimelea)*			
722.	5232	*Pimelea argentea (Silvery Leaved Pimelea)*			
723.	11928	*Pimelea ciliata subsp. ciliata*			
724.	5243	*Pimelea ferruginea*			
725.	11533	*Pimelea imbricata var. imbricata*			
726.	11472	*Pimelea lehmanniana subsp. lehmanniana*			
727.	11182	*Pimelea lehmanniana subsp. nervosa*			
728.	5255	*Pimelea longiflora*			
729.	5261	*Pimelea rosea (Rose Banjine)*			
730.	18115	*Pimelea rosea subsp. annelsii*		P3	
731.	12041	*Pimelea suaveolens subsp. suaveolens*			
732.	5269	*Pimelea sylvestris*			
733.	5270	*Pimelea tinctoria*			
734.	18352	*Pithocarpa pulchella var. melanostigma*			
735.	17615	*Plantago coronopus subsp. coronopus*	Y		

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736.	7303	*Plantago lanceolata (Ribwort Plantain)*	Y		
737.	6258	*Platysace pendula*			
738.	4524	*Platytheca galioides*			
739.	32478	*Pleuridium nervosum var. nervosum*			
740.	578	*Poa porphyroclados*			
741.	86	*Podocarpus drouynianus (Wild Plum, Kula)*			
742.	8177	*Podolepis lessonii*			
743.	2416	*Polygonum arenastrum (Sand Wireweed)*	Y		
744.	582	*Polypogon monspeliensis (Annual Beardgrass)*	Y		
745.	4690	*Poranthera huegelii*			
746.	4691	*Poranthera microphylla (Small Poranthera)*			
747.	110	*Potamogeton drummondii*			
748.	15424	*Praecoxanthus aphyllus*			
749.	1676	*Prasophyllum hians (Yawning Leek Orchid)*			
750.	44084	*Prasophyllum sp. early (G. Brockman GBB 1626)*			
751.	1683	*Prasophyllum triangulare (Dark Leek Orchid)*			
752.	36137	*Pseudocrossidium crinitum*			
753.	4155	*Psoralea pinnata (African Scurfpea)*	Y		
754.	1686	*Pterostylis barbata (Bird Orchid)*			
755.	44725	*Pterostylis microphylla*			
756.	1693	*Pterostylis recurva (Jug Orchid)*			
757.		*Pterostylis sp.*			
758.	4164	*Pultenaea aspalathoides*			
759.	4171	*Pultenaea empetrifolia*			
760.	4181	*Pultenaea reticulata*			
761.	23459	*Pultenaea sp. southern (L.A. Orthia 39)*			
762.	32480	*Racopilum cuspidigerum var. convolutaceum*			
763.	2932	*Ranunculus colonorum (Common Buttercup)*			
764.	18544	*Rhadinothamnus rudis subsp. rudis*			
765.	13300	*Rhodanthe citrina*			
766.	13234	*Rhodanthe manglesii*			
767.	6027	*Rinzia schollerifolia (Cranberry Rinzia)*			
768.	14924	*Romulea rosea var. communis*	Y		
769.	32429	*Rosulabryum torquescens*			
770.	2429	*Rumex acetosella (Sorrel)*	Y		
771.	2430	*Rumex brownii (Swamp Dock)*	Y		
772.	40425	*Rytidosperma caespitosum*			
773.	40427	*Rytidosperma setaceum*			
774.	20063	*Salix babylonica*	Y		
775.	30434	*Salsola australis*			
776.	6483	*Samolus junceus*			
777.	2356	*Santalum acuminatum (Quandong, Warnga)*			
778.	7598	*Scaevola auriculata*			
779.	7602	*Scaevola calliptera*			
780.	7613	*Scaevola glandulifera (Viscid Hand-flower)*			
781.	7646	*Scaevola striata (Royal Robe)*			
782.	13175	*Scaevola striata var. striata*			
783.	24	*Schizaea fistulosa (Narrow Comb Fern)*			
784.	6263	*Schoenolaena juncea*			
785.	970	*Schoenus acuminatus*			
786.	983	*Schoenus cruentus*			
787.	985	*Schoenus discifer*			
788.	986	*Schoenus efoliatus*			
789.	1005	*Schoenus obtusifolius*			
790.	16270	*Schoenus sp. Mt Barker (G.J. Keighery 9679)*		P1	
791.	1016	*Schoenus subbarbatus (Bearded Bog-rush)*			
792.	1017	*Schoenus subbulbosus*			
793.	1020	*Schoenus sublateralis*			
794.	1021	*Schoenus sublaxus*			
795.	1023	*Schoenus tenellus*			
796.	32433	*Sematophyllum homomallum*			
797.	20719	*Senecio glomeratus subsp. glomeratus*			
798.	19453	*Setaria parviflora*	Y		
799.	8224	*Siloxerus filifolius*			
800.	7017	*Solanum laciniatum (Kangaroo Apple)*	Y		
801.	8230	*Sonchus asper (Rough Sowthistle)*	Y		
802.	9367	*Sonchus hydrophilus (Native Sowthistle)*			
803.	4200	*Sphaerolobium alatum*			
804.	17551	*Sphaerolobium drummondii*			
805.	20302	*Sphaerolobium hygrophilum*			

	Name ID	Species Name	Naturalised	Conservation Code	[1]Endemic To Query Area
806.	4207	*Sphaerolobium medium*			
807.	4211	*Sphaerolobium vimineum (Leafless Globe Pea)*			
808.	31931	*Sphenotoma capitata*			
809.	31952	*Sphenotoma gracilis (Swamp Paper-heath)*			
810.	8710	*Sporobolus africanus (Parramatta Grass)*	Y		
811.	9070	*Stackhousia pubescens (Downy Stackhousia)*			
812.	2918	*Stellaria media (Chickweed)*	Y		
813.	2316	*Stirlingia latifolia (Blueboy)*			
814.	2318	*Stirlingia tenuifolia*			
815.	39881	*Stylidium acuminatum subsp. meridionale*			
816.	7678	*Stylidium adnatum (Common Beaked Triggerplant)*			
817.	30278	*Stylidium androsaceum*			
818.	7687	*Stylidium assimile (Bronze-leaved Triggerplant)*			
819.	7695	*Stylidium caespitosum (Fly-away Triggerplant)*			
820.	7696	*Stylidium calcaratum (Book Triggerplant)*			
821.	7699	*Stylidium carnosum (Fleshy-leaved Triggerplant)*			
822.	11186	*Stylidium corymbosum var. proliferum*		P2	
823.	7708	*Stylidium crassifolium (Thick-leaved Triggerplant)*			
824.	40944	*Stylidium decipiens*			
825.	31355	*Stylidium diademum*			
826.	7718	*Stylidium diversifolium (Touch-me-not)*			
827.	7734	*Stylidium guttatum (Dotted Triggerplant)*			
828.	7735	*Stylidium hirsutum (Hairy Triggerplant)*			
829.	7738	*Stylidium imbricatum (Tile Leaved Triggerplant)*			
830.	7742	*Stylidium inundatum (Hundreds and Thousands)*			
831.	7745	*Stylidium junceum (Reed Triggerplant)*			
832.	7782	*Stylidium pulchellum (Thumbelina Triggerplant)*			
833.	7784	*Stylidium pygmaeum (Pygmy Triggerplant)*			
834.	7785	*Stylidium repens (Matted Triggerplant)*			
835.	7796	*Stylidium scandens (Climbing Triggerplant)*			
836.	7798	*Stylidium schoenoides (Cow Kicks)*			
837.	7799	*Stylidium spathulatum (Creamy Triggerplant)*			
838.	7800	*Stylidium spinulosum (Topsy-turvy Triggerplant)*			
839.	11223	*Stylidium spinulosum subsp. spinulosum*			
840.	7802	*Stylidium squamosotuberosum (Fleshy-rhizomed Trigger Plant)*			
841.	45593	*Stylidium tenue subsp. tenue (Little Fountain Triggerplant)*			
842.	2323	*Synaphea gracillima*			
843.	12911	*Synaphea obtusata*			
844.	2324	*Synaphea petiolaris (Synaphea)*			
845.	16864	*Synaphea petiolaris subsp. petiolaris*			
846.	2326	*Synaphea polymorpha (Albany Synaphea, Pinda)*			
847.	2327	*Synaphea preissii*		P3	
848.	32437	*Syntrichia antarctica*			
849.	20115	*Taxandria juniperina*			
850.	20135	*Taxandria linearifolia*			
851.	20133	*Taxandria parviceps*			
852.	1036	*Tetraria octandra*			
853.	35579	*Tetraria sp. Jarrah Forest (R. Davis 7391)*			
854.	4526	*Tetratheca affinis*			
855.	4546	*Tetratheca virgata*			
856.	1701	*Thelymitra antennifera (Vanilla Orchid)*			
857.	10856	*Thelymitra benthamiana (Leopard Orchid)*			
858.	1704	*Thelymitra cornicina (Lilac Sun Orchid)*			
859.	1705	*Thelymitra crinita (Blue Lady Orchid)*			
860.	1706	*Thelymitra cucullata (Swamp Sun Orchid)*			
861.	1707	*Thelymitra flexuosa (Twisted Sun Orchid)*			
862.	11143	*Thelymitra graminea*			
863.	11053	*Thelymitra macrophylla*			
864.	20730	*Thelymitra paludosa*			
865.	1716	*Thelymitra tigrina (Tiger Orchid)*			
866.	20731	*Thelymitra vulgaris*			
867.	673	*Themeda triandra*			
868.	5080	*Thomasia foliosa*			
869.	5092	*Thomasia pauciflora (Few Flowered Thomasia)*			
870.	5094	*Thomasia purpurea*			
871.	32486	*Thuidium sparsum var. hastatum*			
872.	1343	*Thysanotus patersonii*			
873.	1351	*Thysanotus sparteus*			
874.	1354	*Thysanotus tenellus*			
875.	1357	*Thysanotus thyrsoideus*			

	Name ID	Species Name	Naturalised	Conservation Code	[1]Endemic To Query Area
876.	32445	*Tortula muralis*			
877.	4547	*Tremandra diffusa*			
878.	4548	*Tremandra stelligera*			
879.	17684	*Tremulina tremula*			
880.	11112	*Tribolium uniolae*	Y		
881.	1481	*Tribonanthes australis (Southern Tiurndin)*			
882.	1483	*Tribonanthes longipetala (Branching Tiurndin)*			
883.	1361	*Tricoryne elatior (Yellow Autumn Lily)*			
884.	1362	*Tricoryne humilis*			
885.	43207	*Tricostularia exsul*			
886.	1038	*Tricostularia neesii*			
887.	4293	*Trifolium cernuum (Drooping Flower Clover)*	Y		
888.	4295	*Trifolium dubium (Suckling Clover)*	Y		
889.	17788	*Trifolium pratense var. sativum*	Y		
890.	4313	*Trifolium subterraneum (Subterranean Clover)*	Y		
891.	32451	*Triquetrella papillata*			
892.	13479	*Trymalium ledifolium var. rosmarinifolium*			
893.	33438	*Trymalium odoratissimum subsp. trifidum*			
894.	7148	*Utricularia multifida*			
895.	7150	*Utricularia simplex (Bluecoats)*			
896.	7665	*Velleia trinervis*			
897.	8257	*Vellereophyton dealbatum (White Cudweed)*	Y		
898.	7105	*Verbascum creticum*	Y		
899.	7112	*Veronica plebeia (Creeping Speedwell)*			
900.	12420	*Verticordia endlicheriana var. angustifolia*		P3	
901.	15619	*Verticordia endlicheriana var. endlicheriana*			
902.	6084	*Verticordia habrantha (Hidden Featherflower)*			
903.	6107	*Verticordia pennigera*			
904.	12449	*Verticordia plumosa var. brachyphylla*			
905.	11474	*Vicia sativa subsp. nigra*	Y		
906.	12052	*Vulpia myuros forma megalura*	Y		
907.	32455	*Weissia controversa*			
908.	20737	*X Cyanthera glossodioides*			
909.	6284	*Xanthosia candida*			
910.	6289	*Xanthosia huegelii*			
911.	6292	*Xanthosia rotundifolia (Southern Cross)*			
912.	19330	*Xanthosia tasmanica*			

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.

Australian Government

Department of Agriculture, Water and the Environment

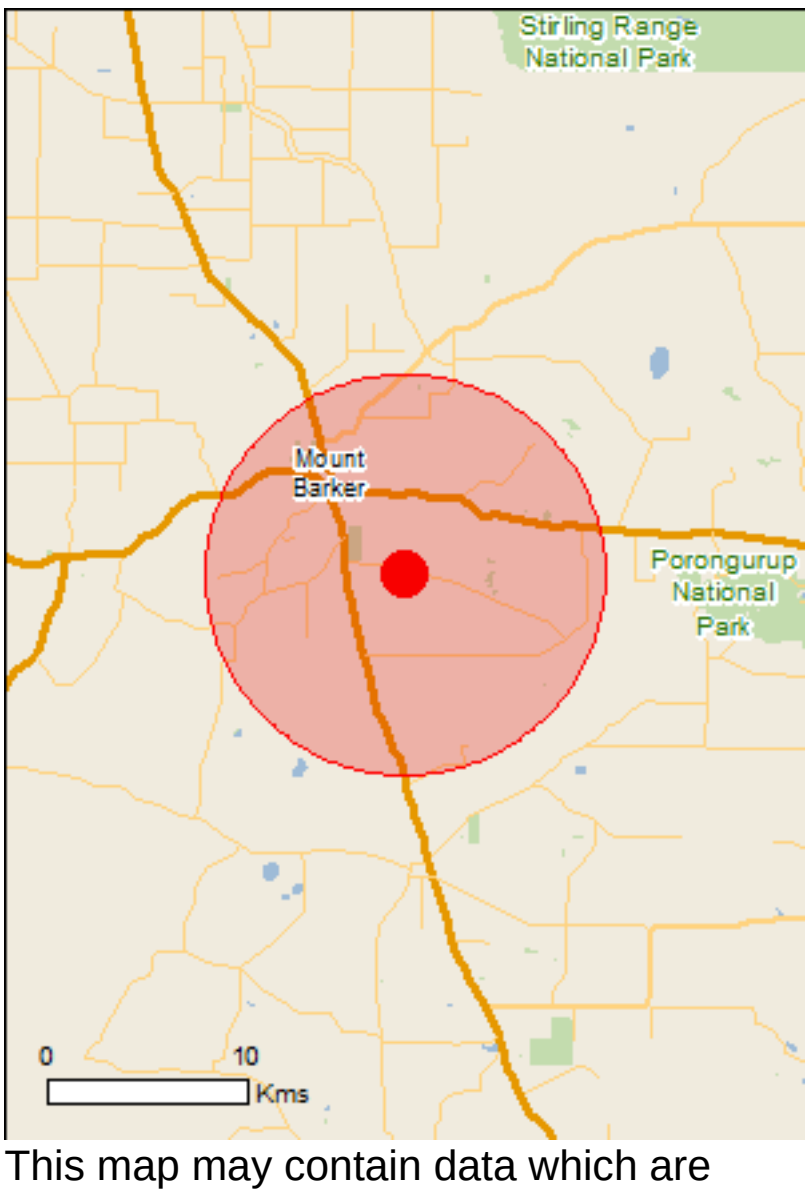
EPBC Act Protected Matters Report

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

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.

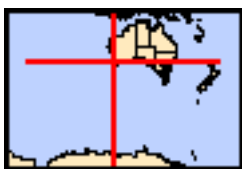
Information is available about Environment Assessments and the EPBC Act including significance guidelines, forms and application process details.

Report created: 19/08/21 17:48:22



Coordinates

Buffer: 10.0Km



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:	28
Listed Migratory Species:	9

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:	1
Commonwealth Heritage Places:	None
Listed Marine Species:	13
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:	2
Regional Forest Agreements:	1
Invasive Species:	22
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
Proteaceae Dominated Kwongkan Shrublands of the Southeast Coastal Floristic Province of Western Australia	Endangered	Community may occur within area

Listed Threatened Species		[Resource Information]
Name	Status	Type of Presence
Birds		
Botaurus poiciloptilus Australasian Bittern [1001]	Endangered	Species or species habitat likely to occur within area
Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	Species or species habitat may occur within area
Calyptorhynchus banksii naso Forest Red-tailed Black-Cockatoo, Karrak [67034]	Vulnerable	Species or species habitat known to occur within area
Calyptorhynchus baudinii Baudin's Cockatoo, Long-billed Black-Cockatoo [769]	Endangered	Species or species habitat known to occur within area
Calyptorhynchus latirostris Carnaby's Cockatoo, Short-billed Black-Cockatoo [59523]	Endangered	Species or species habitat known to occur within area
Dasyornis longirostris Western Bristlebird [515]	Endangered	Species or species habitat may occur within area
Falco hypoleucos Grey Falcon [929]	Vulnerable	Species or species habitat likely to occur within area
Leipoa ocellata Malleefowl [934]	Vulnerable	Species or species habitat likely to occur within area
Numenius madagascariensis Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat may occur within area
Fish		
Nannatherina balstoni Balston's Pygmy Perch [66698]	Vulnerable	Species or species habitat may occur within area
Insects		

Name	Status	Type of Presence
[Trioza barrettae](#) Banksia brownii plant louse [87805]	Endangered	Species or species habitat may occur within area
Mammals		
[Dasyurus geoffroii](#) Chuditch, Western Quoll [330]	Vulnerable	Species or species habitat likely to occur within area
[Parantechinus apicalis](#) Dibbler [313]	Endangered	Species or species habitat likely to occur within area
[Pseudocheirus occidentalis](#) Western Ringtail Possum, Ngwayir, Womp, Woder, Ngoor, Ngoolangit [25911]	Critically Endangered	Species or species habitat may occur within area
Plants		
[Adenanthos pungens subsp. pungens](#) Spiky Adenanthos [19429]	Vulnerable	Species or species habitat may occur within area
[Banksia brownii](#) Brown's Banksia, Feather-leaved Banksia [8277]	Endangered	Species or species habitat known to occur within area
[Banksia goodii](#) Good's Banksia [16727]	Vulnerable	Species or species habitat may occur within area
[Banksia pseudoplumosa](#) False Plumed-Banksia [82760]	Endangered	Species or species habitat may occur within area
[Caladenia christineae](#) Christine's Spider Orchid [56716]	Vulnerable	Species or species habitat known to occur within area
[Caladenia harringtoniae](#) Harrington's Spider-orchid, Pink Spider-orchid [56786]	Vulnerable	Species or species habitat likely to occur within area
[Chordifex abortivus](#) Manypeaks Rush [64868]	Endangered	Species or species habitat may occur within area
[Conostylis misera](#) Grass Conostylis [21320]	Endangered	Species or species habitat known to occur within area
[Diuris micrantha](#) Dwarf Bee-orchid [55082]	Vulnerable	Species or species habitat may occur within area
[Drakaea micrantha](#) Dwarf Hammer-orchid [56755]	Vulnerable	Species or species habitat may occur within area
[Isopogon uncinatus](#) Albany Cone Bush, Hook-leaf Isopogon [20871]	Endangered	Species or species habitat may occur within area
[Lambertia orbifolia](#) Roundleaf Honeysuckle [15725]	Endangered	Species or species habitat likely to occur within area
[Sphenotoma drummondii](#) Mountain Paper-heath [21160]	Endangered	Species or species habitat may occur within area
[Verticordia apecta](#) Hay River Featherflower, Scruffy Verticordia [65545]	Critically Endangered	Species or species habitat may occur within

Name	Status	Type of Presence
		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 likely to occur within area
Calidris acuminata		
Sharp-tailed Sandpiper [874]		Species or species habitat likely to 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 likely to occur within area
Numenius madagascariensis		
Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat may occur within area
Pandion haliaetus		
Osprey [952]		Species or species habitat may occur within area
Tringa nebularia		
Common Greenshank, Greenshank [832]		Species or species habitat likely to occur within area

Other Matters Protected by the EPBC Act

Commonwealth Land [Resource Information]

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

Name
Commonwealth Land -

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 likely to occur within area
Apus pacificus		
Fork-tailed Swift [678]		Species or species habitat likely to occur within area
Ardea ibis		
Cattle Egret [59542]		Species or species

Name	Threatened	Type of Presence
		habitat may occur within area
Calidris acuminata Sharp-tailed Sandpiper [874]		Species or species habitat likely to 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 likely to occur within area
Chrysococcyx osculans Black-eared Cuckoo [705]		Species or species habitat likely to occur within area
Haliaeetus leucogaster White-bellied Sea-Eagle [943]		Species or species habitat likely 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
Numenius madagascariensis Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat may occur within area
Pandion haliaetus Osprey [952]		Species or species habitat may occur within area
Tringa nebularia Common Greenshank, Greenshank [832]		Species or species habitat likely to occur within area

Extra Information

State and Territory Reserves [Resource Information]

Name	State
Lake Barnes Road	WA
Unnamed WA10003	WA

Regional Forest Agreements [Resource Information]

Note that all areas with completed RFAs have been included.

Name	State
South West WA RFA	Western Australia

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		

Name	Status	Type of Presence
Anas platyrhynchos Mallard [974]		Species or species habitat likely to occur within area
Columba livia Rock Pigeon, Rock Dove, Domestic Pigeon [803]		Species or species habitat likely to occur within area
Streptopelia senegalensis Laughing Turtle-dove, Laughing Dove [781]		Species or species habitat likely to occur within area
Sturnus vulgaris Common Starling [389]		Species or species habitat likely to occur within area
Mammals		
Canis lupus familiaris Domestic Dog [82654]		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
Feral deer Feral deer species in Australia [85733]		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
Rattus rattus Black Rat, Ship Rat [84]		Species or species habitat likely to occur within area
Sus scrofa Pig [6]		Species or species habitat likely to occur within area
Vulpes vulpes Red Fox, Fox [18]		Species or species habitat likely to occur within area
Plants		
Asparagus asparagoides Bridal Creeper, Bridal Veil Creeper, Smilax, Florist's Smilax, Smilax Asparagus [22473]		Species or species habitat likely to occur within area
Chrysanthemoides monilifera subsp. monilifera Boneseed [16905]		Species or species habitat likely to occur within area
Genista linifolia Flax-leaved Broom, Mediterranean Broom, Flax Broom [2800]		Species or species habitat likely to occur within area
Genista sp. X Genista monspessulana Broom [67538]		Species or species habitat may occur within area
Lantana camara Lantana, Common Lantana, Kamara Lantana, Large-leaf Lantana, Pink Flowered Lantana, Red Flowered Lantana, Red-Flowered Sage, White Sage, Wild Sage [10892]		Species or species habitat likely to occur within area
Lycium ferocissimum African Boxthorn, Boxthorn [19235]		Species or species

Name	Status	Type of Presence
		habitat likely to occur within area
Pinus radiata Radiata Pine Monterey Pine, Insignis Pine, Wilding Pine [20780]		Species or species habitat may occur within area
Rubus fruticosus aggregate Blackberry, European Blackberry [68406]		Species or species habitat likely to occur within area
Salix spp. except S.babylonica, S.x calodendron & S.x reichardtii Willows except Weeping Willow, Pussy Willow and Sterile Pussy Willow [68497]		Species or species habitat likely to occur within area
Ulex europaeus Gorse, Furze [7693]		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

-34.66456 117.69984

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

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

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