



West Erregulla Pipeline Flora and Fauna survey

Australian Gas Infrastructure Group

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Template 2.8.1

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Abbreviations

Abbreviation	Description
BAM Act	State <i>Biosecurity and Agriculture Management Act 2007</i>
BC Act	State <i>Biodiversity Conservation Act 2016</i>
BoM	Bureau of Meteorology
CLUSTER	Hierarchical Clustering
DAWE	Department of Agriculture, Water and the Environment
DBCA	Department of Biodiversity, Conservation and Attraction
DPIRD	Department of Primary industries and Regional Development
DRF	Declared Rare Flora
ELA	Eco Logical Australia
EP Act	State <i>Environmental Protection Act 1986</i>
EPA	Environmental Protection Authority
EPBC Act	Commonwealth <i>Environment Protection and Biodiversity Conservation Act 1999</i>
ESA	Environmentally Sensitive Areas
ha	hectare
IBRA	Interim-Biogeographic Regionalisation for Australia
km	kilometre
m	metre
mm	millimetre
NVIS	National Vegetation Information System
P	Priority
PEC	Priority Ecological Communities
PMST	Protected Matters Search Tool
PRIMER	Plymouth Routines in Multivariate Ecological Research v6
SIMPER	Similarity Percentages
T	Threatened
TEC	Threatened Ecological Communities
VU	Vulnerable
WA	Western Australia
WAH	Western Australian Herbarium
WAM	Western Australian Museums
WAOL	Western Australian Organism List
WoNS	Weed of National Significance

Executive Summary

Eco Logical Australia was engaged by Australian Gas Infrastructure Group to undertake a Detailed and Targeted flora survey and vegetation condition assessment, a Basic fauna survey, Targeted Black Cockatoo habitat assessment and Targeted Malleefowl survey of the West Erregulla Pipeline Project. The survey area, 212.2 hectares in size, is located approximately 230 kilometres north-east of Perth, and 50 kilometres south-east of Dongara, Western Australia. The initial field survey was undertaken from 7th to 10th September 2020 by Dr Jeffrey Cargill (Senior Botanist), Daniel Brassington (Botanist), Briana Wingfield (Ecologist) and Jeni Morris (Ecologist). In order to capture Threatened and Priority flora known to commence flowering from October onwards, a follow up targeted survey was conducted in areas of suitable habitat identified during the first survey (8th to 9th October 2020).

A total of 170 taxa (168 native and two introduced) from 93 genera and 39 families were recorded across 26 quadrats established within the survey area (161 taxa) and from Targeted and opportunistic collections (nine taxa). Average species per quadrat was 38.04 species, ranging from a low of 19 species to a high of 57 species. The majority of taxa recorded were representative of the Proteaceae (30), Myrtaceae (23 taxa) and Fabaceae (18 taxa) families. *Banksia* and *Hakea* were the best represented genera throughout the survey area with 8 taxa recorded each.

No Threatened flora species listed under the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* or the State *Biodiversity Conservation Act 2016* were recorded from within the current survey area. One Threatened flora species, *Paracaleana dixonii* (Endangered under the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* and Vulnerable under the State *Biodiversity Conservation Act 2016*) was recorded within the survey area in 2011 from one location (24 plants) in a database search. Eight Priority flora species were recorded within the survey area; *Micromyrtus rogeri* (Priority 1), *Lasiopetalum ogilvieanum* (Priority 1), *Guichenotia alba* (Priority 3), *Mesomelaena stygia* subsp. *deflexa* (Priority 3), *Stylidium drummondianum* (Priority 3), *Banksia scabrella* (Priority 4), *Eucalyptus macrocarpa* subsp. *elachantha* (Priority 4), and *Stawellia dimorphantha* (Priority 4).

A total of six vegetation communities were delineated and mapped within the survey area, covering a total of 208.7 hectares (98.35% of the total area surveyed). No vegetation communities delineated within the current survey area were inferred to represent any potential conservation significant communities listed under the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999*, the State *Biodiversity Conservation Act 2016* or by the Department of Biodiversity, Conservation and Attractions. Vegetation communities recorded include:

- **AcEbHh:** *Allocasuarina campestris* tall sparse shrubland over *Eremaea beaufortioides*, *Calothamnus quadrifidus* subsp. *angustifolius*, *Isopogon tridens* mid sparse shrubland over *Hibbertia hypericoides*, *Melaleuca leuropoma* low open shrubland and *Ecdeiocolea monostachya* low open sedgeland.
- **EtAhHh:** *Eucalyptus todtiana* mid open woodland over *Allocasuarina humilis*, *Banksia scabrella* (P4), *Calothamnus sanguineus* mid open shrubland over *Hibbertia hypericoides*, *Melaleuca leuropoma* low open shrubland and *Caustis dioica* low open sedgeland.
- **BpDdHh:** *Banksia prionotes* mid open woodland over *Daviesia divaricata*, *Conospermum boreale*, *Allocasuarina humilis* mid open shrubland over *Hibbertia hypericoides* low open shrubland and *Ecdeiocolea monostachya*, *Mesomelaena pseudostygia* low open sedgeland.

- **AcAhGp:** *Allocasuarina campestris* tall sparse shrubland over *Allocasuarina humilis*, *Hakea auriculata*, *Petrophile shuttleworthiana* mid open shrubland over *Gastrolobium plicatum* low open shrubland and *Ecdeiocolea monostachya*, *Schoenus armeria* low open sedgeland.
- **AcDdMI:** *Allocasuarina campestris* tall isolated shrubs over *Daviesia divaricata*, *Conospermum boreale*, *Beaufortia elegans* mid open shrubland over *Melaleuca leuropoma*, *Hibbertia hypericoides* low open shrub over *Ecdeiocolea monostachya* low open sedgeland.
- **EtBaHh:** *Eucalyptus tottiana* mid open woodland over *Banksia attenuata*, *Calothamnus blepharospermus*, *Eremaea beaufortoides* mid open shrubland over *Hibbertia hypericoides*, *Melaleuca leuropoma* low open shrubland and *Ecdeiocolea monostachya* low open sedgeland.

Descriptions of vegetation communities resemble those described by a previous report (Woodman 2013) in a far larger mapped area adjacent to the current survey area. This report also did not infer the presence of any threatened or priority ecological communities.

Vegetation condition within the survey area was Excellent (208.7 hectares; 98.35%) or Cleared (3.5 hectares; 1.65%) based on the vegetation condition scale adapted by Keighery provided in the Environmental Protection Authority *Technical Guidance: Flora and Vegetation Surveys for Environmental Impact Assessment*. The primary disturbance within the survey area was a recent prescribed burn, which occurred in April 2019. Post fire regeneration was very good, with majority of species that were expected to occur being recorded. It is noted however, that structural elements of defined vegetation communities may slightly change over time as plant growth and development continue. This includes *Banksia* spp. and *Hakea* spp., Carnaby's Cockatoo (*Calyptorhynchus latirostris*) foraging species, which are predicted to increase in density, quality and structural complexity over time (currently provide low quality foraging habitat).

A total of 35 fauna species were recorded in the survey area, comprising 28 bird species, five mammal species and two reptile species. Introduced fauna species recorded included Cattle (*Bos taurus*), Domestic Dog (*Canis lupus familiaris*), Goat (*Capra hircus*) and European Rabbit (*Oryctolagus cuniculus*). No Threatened or Priority fauna species listed under the Federal *Environment Protections and Biodiversity Conservation Act 1999*, the State *Biodiversity Conservation Act 2016* or by the Department of Biodiversity, Conservation and Attractions were recorded from within the survey area.

Three fauna habitats were delineated and mapped within the survey area; **Fauna habitat 1:** *Allocasuarina campestris* tall sparse shrubland over shrubs and sedgeland on sandy plains, **Fauna habitat 2:** *Banksia* spp. and occasional *Eucalyptus tottiana* mid open woodland over shrubs and sedgeland on sandy plains, **Fauna habitat 3:** *Allocasuarina campestris* tall sparse shrubland over shrubs and sedgeland on stony rises. Fauna habitat 2 was the most commonly occurring fauna habitat, covering 95.2 hectares (44.86%) of the survey area.

No individuals of Carnaby's Cockatoo were recorded within the survey area. No potential or confirmed breeding or roosting trees were recorded as occurring within the survey area. Fauna habitat 2, totalling 95.2 ha (44.86% of the survey area), was assessed as providing 'Low' quality foraging habitat due to the presence of *Banksia* spp. and *Hakea* spp. (SEWPaC 2012; DotEE 2017). The recent fire has decreased the likelihood of the species utilising the survey area in the immediate future; however, *Banksia* spp. and *Hakea* spp. are predicted to increase in density quality and structural complexity over time. The remaining vegetated areas (113.6 ha, 53.53%) are considered as providing 'Negligible' quality foraging

habitat of Carnaby's Cockatoo. Cleared areas (3.4 ha, 1.6%) provide 'Nil' quality foraging habitat for black cockatoo species. No foraging evidence was observed within the survey area.

Whilst the Malleefowl (*Leipoa ocellata*) was targeted in the survey area, the habitat is not considered suitable for the species due to the lack of leaf litter and thicker vegetation. The recent fire has also decreased the likelihood of the species, as the effect of fire on Malleefowl is severe, with breeding in burnt areas usually reduced for at least 30 years (Benshemesh 2007).

For the purposes of the current flora, vegetation and fauna survey, adequate data has been collected to define and assess the presence, extent and significance of species and communities within the survey area. Based on the values identified, it is unlikely that proposed works would appreciably reduce the representativeness of individual taxa or vegetation associations within the local area or indeed across the broader landscape. It is recognised that the survey area far exceeds what would be impacted by any site works.

1. Introduction

1.1 Project background




Eco Logical Australia (ELA) was engaged by Australian Gas Infrastructure Group (AGIG) to undertake a Detailed and Targeted flora survey and vegetation condition assessment, a Basic fauna survey, Targeted Black Cockatoo habitat assessment and Targeted Malleefowl survey of the West Erregulla Pipeline Project.

A proposed pipeline and gas processing plant (the project) includes a survey area of 212.2 hectares (ha), approximately 230 kilometres (km) north-east of Perth, and 50 km south-east of Dongara, Western Australia (WA; **Figure 1**). The objectives of this survey were as follows:

- Undertake a desktop assessment to identify the potential occurrence of any Federal or State conservation listed flora, fauna or communities;
- Undertake a Detailed and Targeted flora and vegetation survey in accordance with the Environmental Protection Authority (EPA) *Technical Guidance: Flora and Vegetation Surveys for Environmental Impact Assessment* (EPA 2016), including:
 - Identification and mapping of vegetation communities, including identification of Threatened Ecological Communities (TECs) and Priority Ecological Communities (PECs);
 - Completion of a full species inventory (including weeds), and mapping of any Federal or State listed Threatened, Priority or other significant flora; and
- Assessment and mapping of vegetation structure cover and condition.
- Undertake a Basic fauna survey in accordance with the EPA *Technical Guidance: Terrestrial vertebrate fauna surveys for environmental impact assessment* (EPA 2020), including:
 - Broad level fauna habitat mapping;
 - Targeted fauna searches and mapping of any Federal or State listed Threatened, Priority and other conservation listed fauna species present and their habitat; and
 - Opportunistic observations of fauna species.
- Undertake a Targeted Black Cockatoo habitat assessment in accordance with the *Environmental Protection and Biodiversity Conservation (EPBC) Act referral guidelines for three threatened black cockatoo species* (DSEWPac 2012).
- Undertake a Targeted Malleefowl survey in accordance with the National Heritage Trust *National Manual for The Malleefowl Monitoring System* (National Heritage Trust 2007).
- Preparation of a standalone summary report detailing the findings of the desktop assessment and field survey; and
- Provision of data including relevant mapping at an appropriate scale and associated data files.

Figure 1: Survey area location



- Legend**
-  Survey Footprint
 -  Town
 -  Major Road

0 5 10
Kilometers
Scale: 1:350,000 (A4)
Datum/Projection:
GDA 1994 MGA Zone 50



2. Methodology

2.1 Desktop review

2.1.1 Database searches and literature review

The following Commonwealth and State databases were searched for information relating to conservation listed flora, fauna and ecological communities in order to compile and summarise existing data to inform the field survey. Searches of the Commonwealth EPBC Act Protected Matters Search Tool (PMST) and the State NatureMap (DBCA 2007-2021) online databases were undertaken using a polygon presented in **Table 1**. Applied buffers below are considered suitable based on flora and fauna assemblages expected to occur within the survey area. It should be noted that the buffers for the DBCA database searches are selected by DBCA on a case-by-case basis and are therefore not always consistent with other searches undertaken in the area.

Table 1: Database searches undertaken for the survey area

Database	Reference	Buffer (km)
Search area polygon coordinates:		
50J 319124 mE 6746717 mS (north-west corner);		
50J 336944 mE 6746281 mS (north-east corner);		
50J 336783 mE 6743316 mS (south-east corner); and		
50J 319659 mE 6744175 mS (south-west corner).		
EPBC Act Protected Matters Search Tool (PMST) for Threatened species and communities listed under the EPBC Act	DAWE 2020	10
DBCA and Western Australian Museum (WAM) NatureMap online database.	DBCA 2007-2020	0
Atlas of Living Australia database	ALA 2021	0
Birddata database	Birddata 2021	0
Birdlife Australia Black Cockatoo roosting database	Birdlife 2021	12
Index of Biodiversity Surveys for Assessments (IBSA)	DWER 2021	0
Search area: survey area shapefile		
DBCA Threatened and Priority flora database searches for Declared Rare Flora (DRF) listed under the latest WA Wildlife Conservation (Rare Flora) Notice and Priority Flora.	DBCA 2020a	10
DBCA Threatened and Priority fauna database searches for Scheduled fauna listed under the EPBC Act or latest WA Wildlife Conservation (Specially Protected Fauna) Notice and Priority Fauna.	DBCA 2020b	50
DBCA Threatened and Priority Ecological Communities' database search	DBCA 2020c	15

In addition, the following documents, provided by AGIG, were also reviewed:

- Review of key potential flora, vegetation and fauna values on the proposed pipeline for Strike Energy near Dongara - Mattiske Consulting Pty Ltd (2020);
- West Erregulla targeted threatened flora survey - Ecologia Environment (2018); and
- West Erregulla Project Flora and Vegetation Assessment – Woodman Environmental Consulting (2013).

2.1.2 Likelihood of occurrence assessment

A likelihood of occurrence assessment was undertaken to identify conservation listed flora and fauna species that possibly occur within the survey area, identified from a review of key datasets and literature, as specified above. Conservation codes, categories and criteria for flora and fauna protected under the EPBC Act and the State *Biodiversity Conservation Act 2016* (BC Act) are provided in **Appendix A** (DBCA 2019a). Criteria used for this assessment are presented in **Appendix B**.

2.2 Field survey

2.2.1 Survey team and timing

The initial field survey was conducted by Dr Jeffry Cargill (Senior Botanist), Daniel Brassington (Botanist), Briana Wingfield (Ecologist) and Jeni Morris (Ecologist) from 7th to 10th September 2020. In order to capture threatened and priority flora known to commence flowering from October onwards, a follow up targeted survey was conducted in areas of suitable habitat identified during the first survey. The second survey was conducted by Dr Jeffry Cargill (Senior Botanist) and Daniel Brassington (Botanist) from 8th to 9th October 2020. The survey team's relevant qualifications, experience and licences are provided in **Table 2**. There was no rainfall recorded during the field survey (BoM 2020).

Table 2: Survey team

Name	Qualification	Relevant experience	Licences
Dr. Jeffry Cargill	BSc. Hons. PhD Environmental Sciences	Jeff has more than 12 years' experience in botanical and ecological studies throughout Western Australia including baseline vegetation studies (Reconnaissance and Detailed surveys), Targeted threatened and priority flora surveys, fauna and black cockatoo surveys, MNES surveys, environmental risk assessments and rehabilitation and vegetation monitoring programs.	Flora scientific collection licence: FB62000138 Declared Rare Flora (DRF) permit: TFL 48-1920
Daniel Brassington	BSc. Hons. Environmental Science	Daniel has over 8 years' experience in botanical surveys and environmental services throughout Western Australia. This includes baseline vegetation studies (Reconnaissance and Detailed surveys), Threatened and Priority flora surveys, rehabilitation and vegetation monitoring, targeted species surveys, weed control, seed collection and processing, nursery operations and revegetation operations. Daniel has an extensive background in both mining and consulting, particularly in remote areas.	Flora scientific collection licence: SL012503 DRF permit: TFL 15-1920
Briana Wingfield	BSc. Conservation and Wildlife Biology and Environmental Science (Hons)	Briana has seven years' experience conducting fauna surveys across Western Australia, including Basic fauna surveys and Targeted black cockatoo habitat assessments.	N/A

Name	Qualification	Relevant experience	Licences
Jeni Morris	BSc. Conservation and Wildlife Biology	Jeni has over five years' experience conducting flora, vegetation and fauna surveys across a range of Western Australian bioregions, including the Mid West, Carnarvon and Gascoyne bioregions.	Flora scientific collection licence: FB62000070 DRF permit: TFL 13-1920

2.2.2 Flora and vegetation survey

A Detailed flora and vegetation survey was conducted in accordance with the EPA *Technical Guidance: Flora and Vegetation Surveys for Environmental Impact Assessment* (EPA 2016). The survey included:

- Mapping of vegetation types and completion of a species list; and
- Vegetation condition mapping using the scale outlined in EPA (2016), which is adapted from Keighery (1994).

Stainless steel fence droppers were used to permanently mark the north-west corner of each quadrat. Dominant vegetation communities were described, with respect to dominant species, structure and overall condition. The survey involved the use of 10 x 10 m quadrats as recommended for the Geraldton sandplain bioregion (EPA 2016). Photos were taken from the north-western corner of each quadrat. Where relevant, opportunistic sampling of species not recorded within the quadrats was undertaken to supplement the existing list of species recorded from within the survey area.

A total of 26 quadrats were established across the survey area (**Figure 2**). The following data was recorded within each quadrat:

- Vegetation structure and classes, cover of all species, dominant species list for each vegetation type (in accordance with the National Vegetation Information System (NVIS) Level V structure and floristics);
- Vegetation condition, in accordance with the scale outlined in EPA (2016) adapted from Keighery (1994);
- Full species list of both native and introduced species; and
- Relevant site data including coordinates, site photograph, soil, geology, drainage, slope etc. and any other relevant observational data.

2.2.3 Targeted searches

A targeted survey was undertaken within the survey area to identify and record and conservation significant flora or communities potentially occurring, including:

- Threatened flora or TECs listed under the EPBC Act;
- Threatened (Declared Rare) Flora listed under the latest WA Wildlife Conservation (Rare Flora) Notice under the BC Act;
- PECs endorsed by the Western Australian Minister for the Environment; or
- Priority (P) flora recognised by DBCA.

The survey methodology involved personnel walking meandering transects across the survey area, with transect spacing being determined by suitability of habitat for target species. Locations of survey transects is shown in **Figure 2**. Flora species able to be identified in the field were recorded, and voucher specimens of unfamiliar species were collected for later identification. All collections were assigned a

unique collecting number. For conservation significant identified in the field, the following was recorded:

- A colour photograph;
- GPS location;
- Population size estimate;
- Location of population boundaries;
- Associated habitat/landscape element;
- Time and date observed;
- Observer details; and
- A voucher specimen suitable for use as a reference specimen (if appropriate to do so for conservation significant flora).

Flora specimen identification was undertaken by ELA botanist Daniel Brassington, with assistance from Dr Jeffrey Cargill where required. The Western Australian Herbarium (WAH) was also utilised to confirm additional specimens. Species identification utilised taxonomic literature and keys and where required specimens were confirmed using the WAH reference collection. Suitable material that meets WAH specimen lodgement requirements, such as flowering material and range extensions, will be submitted along with Threatened and Priority Report forms to DBCA, as required by conditions of collection licences issued under the BC Act. Nomenclature used for the flora species within this report follows the WA Plant Census as available on FloraBase (DBCA and WAH 2020).

2.2.4 Data analysis

2.2.4.1 Flora species accumulation curve

A flora species accumulation curve was undertaken to indicate adequacy of the survey effort (Clarke and Gorley 2006). As the number of survey sites increases, and correspondingly the size of the area surveyed increases, there should be a diminishing number of new species recorded. At some point, the number of new species recorded becomes essentially asymptotic. The asymptotic value was determined using Michaelis-Menten modelling and provided an incidence-based coverage estimator of species richness. When the number of new species being recorded for survey effort expended approaches this asymptotic value, the survey effort can be considered adequate.

2.2.4.2 Vegetation communities

Plymouth Routines in Multivariate Ecological Research v6 (PRIMER) statistical analysis software was used to analyse species-by-site data and discriminate survey sites based on their species composition (Clarke and Gorley 2006). To down weight the relative contributions of quantitatively dominant species a 4th root transformation was applied to the species percentage cover dataset. Introduced species (weeds), specimens not identified to species level and singletons (species recorded at a single quadrat and not forming a dominant structural component) were excluded from the data set prior to analysis. In addition, annuals were also removed from the dataset prior to analysis due to the likelihood of substantial differences between years based on seasonality of local rainfall events. Computation of similarity matrices was based on the Bray-Curtis similarity measure. Data were analysed using a series of multivariate analysis routines including Similarity Profile (SIMPROF), Hierarchical Clustering (CLUSTER) and Similarity Percentages (SIMPER). Results were used to inform and support interpretation of aerial photography and delineation of individual plant communities.

2.2.5 Fauna survey

2.2.5.1 Basic fauna survey

The Basic fauna survey was conducted in accordance the EPA *Technical Guidance: Terrestrial vertebrate fauna surveys for environmental impact assessment* (EPA 2020). An assessment of fauna habitat in terms of its ability to support and sustain populations of fauna, along with an assessment of the likelihood of occurrence of conservation significant fauna species, was undertaken during the survey. The habitat characteristics and fauna database records used in assessing likelihood of occurrence for fauna included:

- Vegetation community, structure and condition;
- Soil and landform type;
- Extent and connectivity of bushland;
- Fauna species habitat preferences;
- Proximity of conservation significant fauna records; and
- Signs of species presence.

Opportunistic recordings of fauna species were made at all times during the field survey. These included visual sightings of active fauna such as reptiles and birds; records of bird calls; and signs of species presence such as tracks, diggings, burrows, scats and any other signs of fauna activity.

Nomenclature used for the vertebrate fauna species within this report follows the WAM Checklist of the Vertebrates of Western Australia (WAM 2020). Where common names were not stated for certain species, the following references were consulted:

- Amphibians and reptiles: Bush et al. (2010);
- Reptiles: Wilson and Swan (2013);
- Birds: Morcombe (2007); and
- Mammals: Menkhorst and Knight (2011).

2.2.5.2 Targeted Black Cockatoo habitat assessment

A black cockatoo habitat assessment was undertaken in accordance with the Department of Sustainability, Environment, Population and Communities (SEWPaC) *EPBC Act referral guidelines for three threatened black cockatoo species* (SEWPaC 2012). This involved assessing all significant tree species known to support potential suitable breeding, roosting and foraging habitat. Significant breeding trees are defined as trees of suitable species with a Diameter at Breast Height (DBH) greater than 500 millimetres (mm; > 300 mm for salmon gum and wandoo; SEWPaC 2012). Trees with a DBH greater than 500 mm (or >300 mm for Salmon Gum and Wandoo) are large enough to potentially contain hollows suitable for nesting black cockatoos or have the potential to develop suitable hollows over the next 50 years. Trees of this size may also be large enough to provide roosting habitat (i.e. trees which provide a roost or rest area for the birds). All potential breeding trees with a DBH of 500 mm or greater encountered within the Project Area were recorded.

Hollows were considered 'suitable' if the entrance was >100 mm in diameter, >300 mm deep and aligned near vertical. If it was not possible to determine if a hollow was suitable or not it was categorised as 'potentially suitable'. Hollows that did not meet any of the requirements were categorised as 'unsuitable'. Trees that met the required measurements were inspected with a camera-pole for

suitability of hollows for nesting and/or roosting and evidences of current or previous occupancy, including wear and chew marks around the entrance.

Vegetation present within the Project Area was assessed for its potential to provide foraging and roosting habitat for black cockatoos as per the SEWPaC guidelines (SEWPaC 2012), and the extent of potential suitable habitat within the Survey Area was mapped. Observations were also made of any black cockatoo foraging activity or feeding residue such as chewed Banksia, Jarrah and Marri nuts, and any black cockatoo individuals observed within the Survey Area.

The foraging value of vegetation to black cockatoos depends upon a number of factors including the foraging plant species present, the extent and density of those foraging species and the overall structure and condition of foraging species present. In addition, presence of weeds and/or disease or drought (i.e. plant deaths) was also considered as these can influence native vegetation recruitment and regrowth which may influence the viability of foraging species present in the short, medium or long term (Bamford 2020b, c). Foraging habitat quality can also be influenced by additional contextual information such as the availability, or lack of, foraging habitat nearby and presence/extent of breeding habitat.

Foraging habitat was assigned a quality rating based on three components (**Table 3**):

- Vegetation composition, condition and structure;
- Extent of weeds and/or tree deaths which has the potential to suppress regrowth or successful recruitment and therefore affect foraging habitat viability in the short, medium or long term; and
- Presence of black cockatoos.

As with vegetation condition, foraging quality is usually not uniform throughout an entire vegetation association and, as such, these variations have been accounted for within the assessment by using a habitat quality range (**Table 3**; i.e. low to moderate or moderate to high).

Table 3: Definition of black cockatoo foraging habitat quality*

Foraging habitat quality	Justification
High	<ul style="list-style-type: none"> • Presence of suitable foraging plant species[#], including non-native food sources, for black cockatoos at a high density (i.e. foliage cover of suitable species >60%) and presence of preferred food sources at several strata; • Low weed invasion and/or low tree deaths (indicating it is robust and unlikely to decline in the medium or long term) or • Lower quality foraging habitat based on vegetation characteristics, but with evidence of use (i.e. chewed nuts, cones, seeds or flowers).
Moderate to high	<ul style="list-style-type: none"> • Presence of suitable foraging plant species*, including non-native food sources, for black cockatoos at a high density (i.e. foliage cover of suitable species 40-60%) and presence of preferred food sources at several strata; • Foraging species with greater than 60% projected foliage cover but foraging habitat viability reduced due to high weed invasion and/or tree deaths indicating that the vegetation could potentially decline in the medium term due to suppressed regrowth or disease, or • Lower quality foraging habitat but with evidence of use (i.e. chewed nuts, cones, seeds or flowers).
Moderate	<ul style="list-style-type: none"> • Presence of suitable foraging plant species, including non-native food sources, for black cockatoos at a low to moderate density (i.e. projected foliage cover of suitable species 20-40%); and/or

Foraging habitat quality	Justification
	<ul style="list-style-type: none"> Foraging species with 40-60% projected foliage cover but foraging habitat viability reduced due to high weed invasion and/or tree deaths indicating that the vegetation could potentially decline in the medium term due to suppressed regrowth or disease; and/or Lower quality foraging habitat but with evidence of use (i.e. chewed nuts, cones, seeds or flowers).
Low to moderate	<ul style="list-style-type: none"> Suitable foraging species present but at a lower density (i.e. foliage cover of preferred species 10-20%); Foraging species with 20-40% projected foliage cover but foraging habitat viability reduced due to high weed invasion and/or some tree deaths indicating that the vegetation could potentially decline in the medium term due to suppressed regrowth or disease; and/or Lack of preferred foraging plant species but other suitable foraging species present at a low density.
Low	<ul style="list-style-type: none"> Suitable foraging species present at a low density (i.e. projected foliage cover of preferred foraging species less than 10%); and/or Scattered foraging species or paddocks with known food sources such as melons or weeds that represent a short-term food source.
Negligible	<ul style="list-style-type: none"> Presence of some scattered foraging species but with projected foliage cover of less than 2%.
Nil	<ul style="list-style-type: none"> No suitable foraging species present; Cleared areas.

*Methods for assigning quality to black cockatoo foraging habitat are based on ELAs internal scoring system and have been refined to include additional methodology developed by Bamford Consulting Ecologists (Bamford) in Bamford (2020a, 2020b).

Based on the list of suitable foraging plants collated from the following sources: Groom (2011), Johnstone et al. (2011), SEWPaC (2012), Heydenrych (2012) and Lee *et al.* (2013).

2.2.5.3 Targeted Malleefowl survey

A Targeted Malleefowl survey was conducted in accordance with the National Malleefowl Monitoring Manual (National Malleefowl Recovery Team 2020). A targeted survey for Malleefowl, including:

- Transect searches (i.e., spacing of approximately 20 m apart with four personnel) in suitable habitat for mound nests;
- Location and photograph of each nest mound, including the placement of two or three sticks in an 'X' formation in the centre of the mound to indicate mounds that have been inspected;
- Assessment of the activity status, being: active (containing eggs); recently active (showing signs of disturbance); or inactive (not showing any signs of disturbance).
- Nest mound profile, being: typical crater with raised rims (1); mound fully dug out (2); mound with litter (3); mound mounded up (no crater) (4); mound that has a sandy crater with peak in centre (5); and mound low and flat without pear or crater (6);
- Dimensions (total height and width) of each nest mound, where the nest mound has been excavated and the diameter across the rim/depth of excavation from the rim;
- Vegetation type in which each nest mound is identified;
- Any signs of physical disturbance, including whether or not the surface of the mound has recently been disturbed (scraped);
- If any eggshell is visible on the mound and how much (none, some or lots); and
- If animal prints or scats are present (including which species if possible).

2.3 Limitations

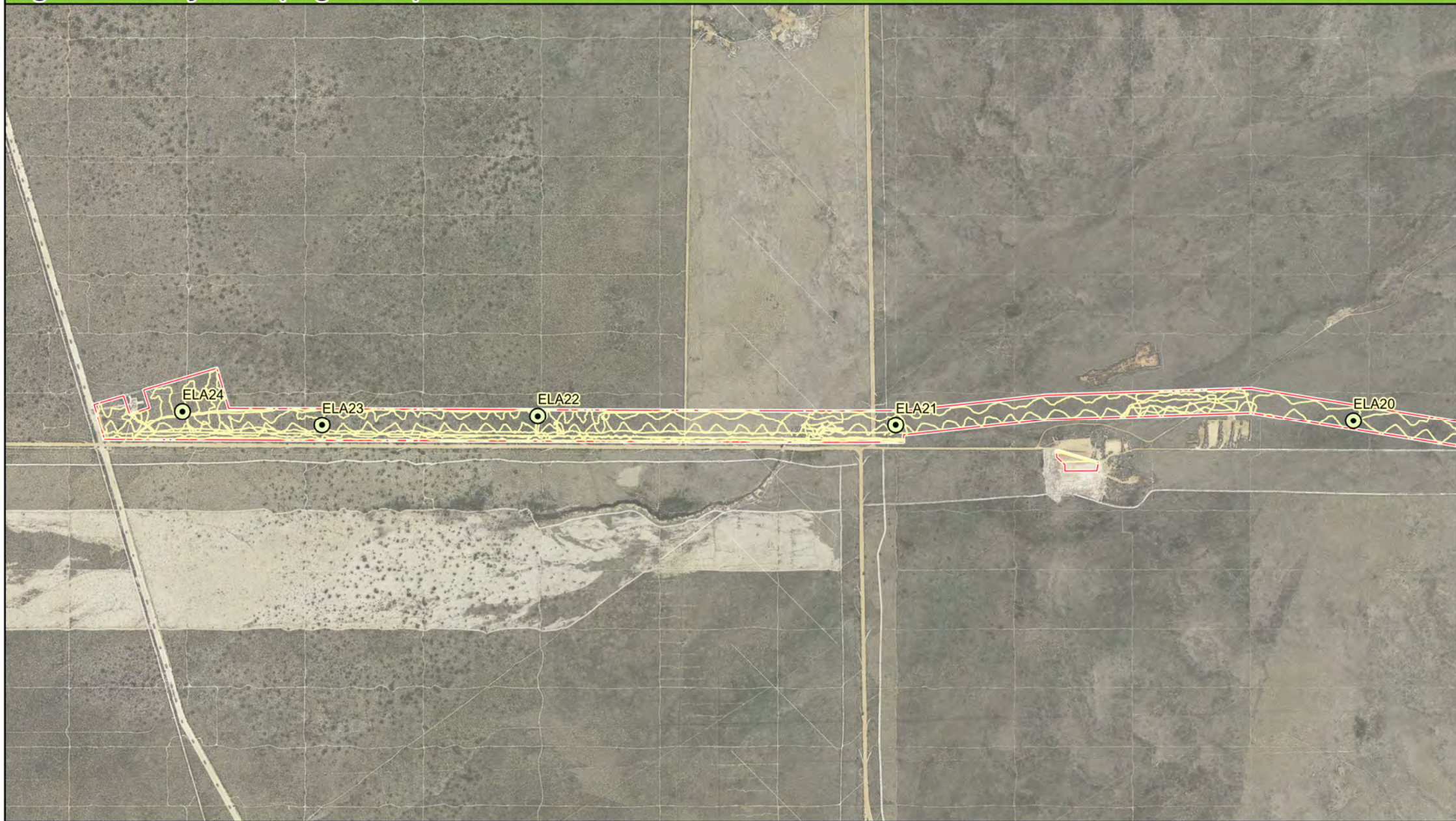
The EPA *Technical Guidance: Flora and Vegetation Surveys for Environmental Impact Assessment* (EPA 2016) and *Technical Guidance: Terrestrial vertebrate fauna surveys for environmental impact assessment* (EPA 2020) recommends including discussion of the limitations of the survey methods used. These limitations are summarised in **Table 4**.

Table 4: Survey limitations

Potential survey limitation	Impact on survey
Sources of information and availability of contextual information (i.e. pre-existing background versus new material).	Not a constraint. Previous reports for the region were provided where applicable. Broad-scale vegetation mapping at a scale of 1:1,000,000 was available. Land system mapping at a scale of 1:2,000,000 and soil and landform mapping was also available. Available information was sufficient to provide context at varying scales and therefore were not considered a limitation.
Scope (i.e. what life forms, etc., were sampled).	Not a constraint. The survey requirement of a Detailed and Targeted flora and vegetation survey and a Basic and Targeted fauna survey in accordance with relevant State and Federal legislation and EPA guidance documents was adequately met.
Proportion of flora collected and identified (based on sampling, timing and intensity).	Not a constraint. Adequacy of sampling effort was tested via a species accumulation curve; approximately 88.93% of the flora potentially present within the survey area were recorded, which is considered to be an acceptable level of sample effort to compile a comprehensive flora inventory and subsequently accurately delineate vegetation communities present within the survey area.
Completeness and further work which might be needed (i.e. was the relevant survey area fully surveyed).	Not a constraint. The survey area was fully covered to meet requirements outlined in the scope of works. Quadrat locations were pre-selected using high resolution aerial photography, and confirmed in the field, to ensure all apparent vegetation communities identified were sampled, with multiple replications where possible. Site selection and replication was considered adequate to accurately analyse and discriminate sites based on species composition and subsequently delineate vegetation community boundaries.
Mapping reliability.	Not a constraint. Coverage of the survey area was considered to be good. High quality aerial maps were used for both the survey and subsequent vegetation mapping. Due to the nature of vegetation in the survey area, mapping boundaries of individual communities were discrete, and thus are considered accurate.
Timing, weather, season, cycle.	Not a constraint. The survey was undertaken in the appropriate season as specified by the EPA <i>Technical Guidance: Flora and Vegetation Surveys for Environmental Impact Assessment</i> (2016), with rainfall in the three months prior to the survey matching the long-term average and allowing for the presence of some annual species.
Disturbances (fire, flood, accidental human intervention, etc.).	Potential constraint: A fire in April 2019 resulted in disturbance of majority of the survey area and is considered a potential constraint as it has the potential to prevent flora species being detected or identified. Post fire regeneration was very good, with majority of species that were expected to occur being recorded. It is noted however, that structural elements of defined vegetation communities may slightly change over time as plant growth and development continue. Minor disturbances included minimal presence of weeds and feral fauna (rabbit diggings, scats).
Intensity (in retrospect, was the intensity adequate).	Not a constraint. The survey effort was adequately met. The area was searched for conservation significant species by field staff undertaking transects across the survey area spaced adequately apart. This method provides an accurate assessment of habitat characteristics and likelihood of conservation significant species. The number of

Potential survey limitation	Impact on survey
Resources (i.e. were there adequate resources to complete the survey to the required standard).	<p>quadrats established was sufficient to determine the vegetation communities present and to identify any vegetation of conservation significance.</p> <p>Not a constraint. The number of personnel conducting this field survey in the given time was adequate to undertake the required level of survey. Additional resources, including equipment available, additional support and personnel were adequate.</p>
Access problems (i.e. ability to access survey area).	<p>Not a constraint. All relevant areas within the survey area were able to be accessed and surveyed.</p>
Experience levels (e.g. degree of expertise in plant identification to taxon level).	<p>Not a constraint. The personnel conducting this field survey were both suitably qualified to identify specimens, having previously undertaken flora and fauna surveys in the Geraldton sandplain bioregion of Western Australia.</p>

Figure 2: Survey effort (Page 1 of 3)



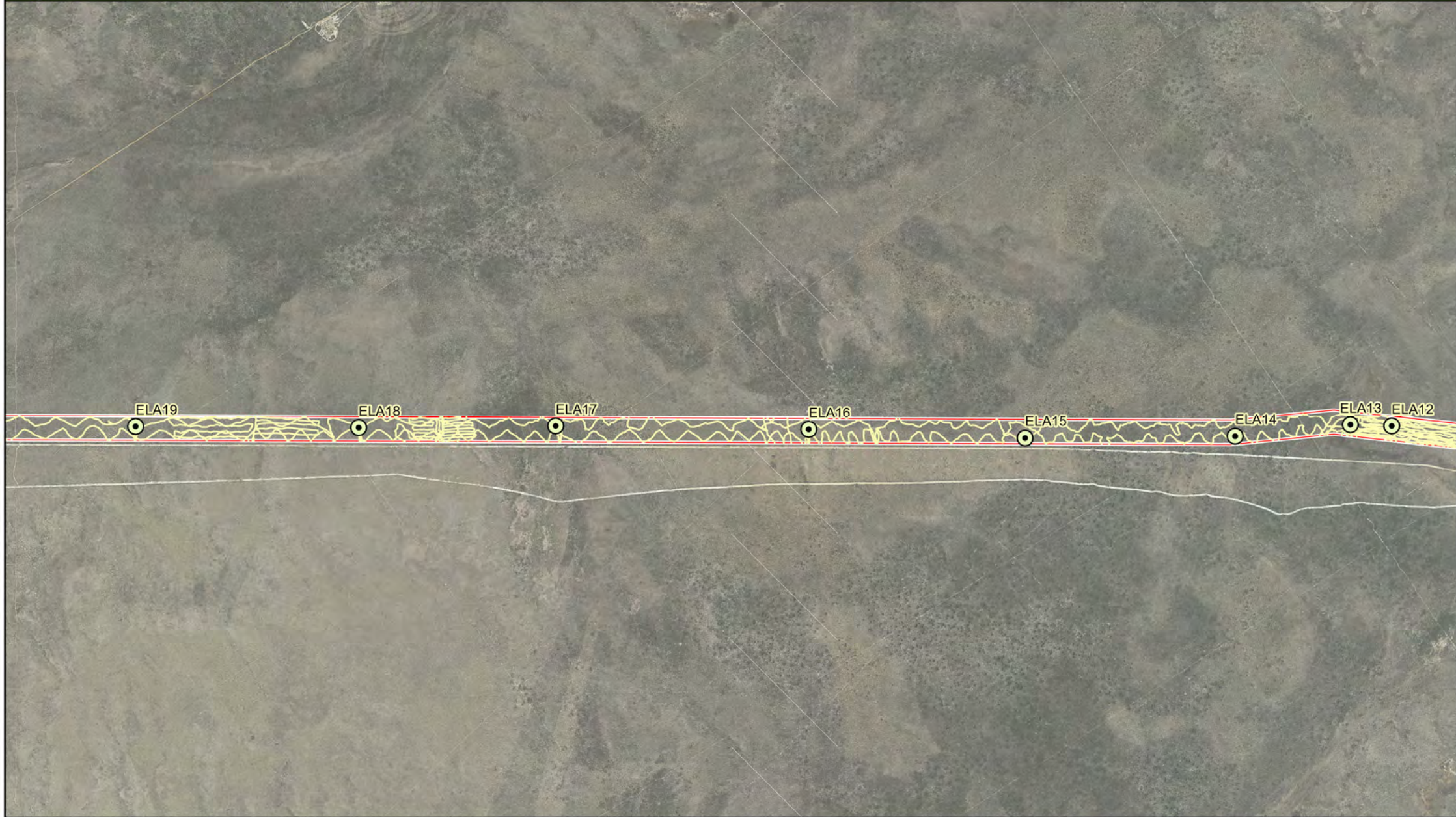
- Legend**
- Survey Footprint
 - Quadrat
 - Transect



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Metres

Scale: 1:20,000
Datum/Projection:
GDA 1994 MGA Zone 50





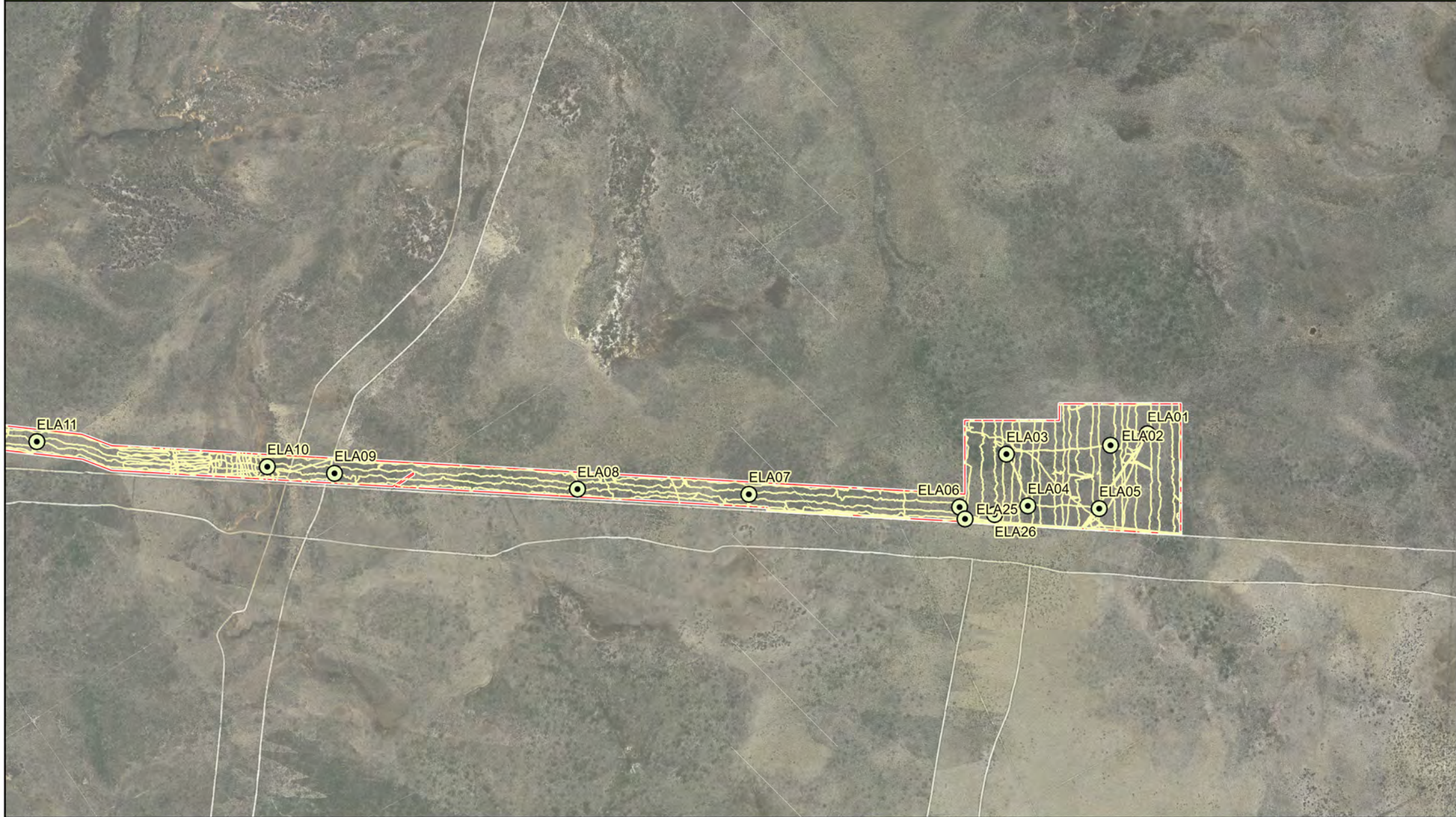
- Legend**
- Survey Footprint
 - Quadrat
 - Transect



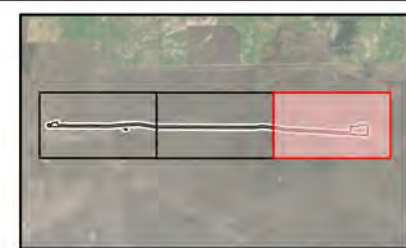
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- Legend**
- Survey Footprint
 - Quadrat
 - Transect



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Project: 20PER16294-GM Date: 15/10/2020

3. Results

3.1 Desktop review

3.1.1 Climate

The Swan Coastal Plain experiences a warm, Mediterranean climate with hot dry summers and mild wet winters (Mitchell et al. 2002). Based on climate data from the nearby Bureau of Meteorology (BoM) Dongara weather station (station number 8044; climate data 1844 – current; located approximately 50 km north-west of the survey area), the area receives an annual average rainfall of 454.4 mm, with most rainfall occurring during the winter months of June, July and August (BoM 2020; **Table 5**).

In the 12 months preceding the field survey, the area received a total of 164.3 mm which is below the long-term average of 454.4 mm (BoM 2020). The area received 75.5 mm of rainfall in August 2020, which is above the long-term average for the same period (66.3 mm; BOM 2020). As a result, survey conditions at this time were considered to be good, with the majority of individuals being recorded in various reproductive stages (e.g. flowering, seeding), allowing for the positive identification of individual species.

Table 5: Rainfall data recorded at the Dongara weather station (8044) 12 months prior to the field survey compared to the long-term average

Month	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Total
Total monthly rainfall 2019-20 (mm)	13.2	7.2	0.0	0.0	0.0	34	5.6	6.0	22.8	-	-	75.5	164.3
Average monthly rainfall 1896 - current	35.2	18.7	8.7	4.3	5.4	10.6	13.8	22.3	68.1	108.3	91.8	66.3	454.4

Source: BoM 2020. Note: June and July 2020 rainfall data is missing from Dongara weather station

3.1.2 Geology, landforms and soils

The survey area is situated within the Northern Sandplains Region (Irwin Botanical District) as described by Beard (1976; 1990). This region is characterised by extensive lateritic sandplains, locally dissected especially near the coast, and almost entirely underlain by sedimentary rocks of a mostly siliceous nature. The sedimentary rocks form a series of plateaux, including the Dandaragan Plateau, on which the survey area is located. While dissected by rivers and eroded by sea on the west, stretches of the plateau surface is still preserved, and forms extensive monotonous sandplains, with lateritic outcrops on ridges and breakaways also common. Four broad geology soil units have been mapped across the survey area, as described in **Table 6**.

Table 6: Broad geology soil units of the survey area

Unit	Type	Description	Extent (ha) within the survey area
Czl	Lateritic duricrust	Pisolitic, nodular or vuggy ferruginous laterite; some lateritic soils; ferricrete; magnesite; ferruginous and siliceous duricrusts and reworked products, calcrete, kaolinised rock, gossan; residual ferruginous saprolite	22.6
Czs	Sand - residual	Sand or gravel plains; quartz sand sheets commonly with ferruginous pisoliths or pebbles, minor clay; local calcrete, laterite, silcrete, silt, clay, alluvium, colluvium, aeolian sand	142.9
Jsya	Sandstone, siltstone, shale, conglomerate, coal	Variegated sandstone, feldspathic sandstone, siltstone, shale, conglomerate, coal	4.5
Qd	Sand - aeolian, sand - residual	Dunes, sandplain with dunes and swales; may include numerous interdune claypans; residual and aeolian sand with minor silt and clay; aeolian red quartz sand, clay and silt, in places gypsiferous; yellow hummocky sand	42.2

Sandy soils are found throughout the survey area. Two soil units have been mapped across the survey area, as described in **Table 7**.

Table 7: Soil units of the survey area

Unit	Description	Extent (ha) within the survey area	Proportion of extent within the survey area (%)
Wd9	Broad valleys and undulating interfluvial areas with some discontinuous breakaways and occasional mesas; lateritic materials mantle the area: chief soils are sandy acidic yellow mottled soils, (Dy5.81) containing much ironstone gravel in the A horizons, and (Dy5.84), both forming a complex pattern with each other and with lateritic sandy gravels (KS-Uc2.12). Associated are leached sands (Uc2.21) underlain by lateritic gravels and mottled clays that occur at a progressively greater depth down slope	191.0	90
Ca27	Sandy plains with occasional pockets of sand dunes, a few small swamps, and stream courses: chief soils are leached sands (Uc2.21), often with a sandy clay substrate between 3 and 6 ft in depth. Associated are (Dy5.61) and gravelly (Dy5.81) soils with (Uc1.22) soils on the dunes	21.2	10

3.1.3 Interim Biogeographic Regionalisation of Australia

The Interim Biogeographic Regionalisation for Australia (IBRA7) currently classifies 89 bioregions across Australia, based on a range of biotic and abiotic factors such as climate, vegetation, fauna, geology and landform (Thackway and Cresswell 1995; DAWE 2020b). These bioregions are currently further refined into 419 sub-regions representing more localised and homogenous geomorphological units in each bioregion (DAWE 2020b). IBRA divides Western Australia into 26 biogeographic regions and 53

subregions based on dominant landscape characteristics of climate, lithology, geology, landform and vegetation (DAWE 2020b).

The survey area is situated in the Geraldton sandplain bioregion (Lesueur sandplain subregion, GS3). The Geraldton sandplain bioregion comprises mainly proteaceous shrub-heaths on extensive, undulating and lateritic sandplain (Desmond and Chant 2001). More specifically, the Lesueur sandplain subregion comprises coastal Aeolian and limestones, Jurassic siltstones and sandstones of central Perth Basin. Alluvials are associated with drainage systems and there are extensive yellow sandplains in south-eastern parts. Shrub-heaths rich in endemics occur on a mosaic of lateritic mesas, sandplains, coastal sands and limestones, and heath on lateritised sandplains along the subregions north-eastern margins (Desmond and Chant 2001).

3.1.4 Land system mapping

Soil Landscape Mapping - Systems mapping prepared by the Department of Primary Industries and Regional Development (DPIRD), provides an inventory and condition survey of lands at a 1: 250 000 scale (version April 2018; DPIRD 2020). Two land systems are present within the survey area, as outlined in **Table 8** and **Figure 3**.

Table 8: Land systems of the survey area

Land system	Land system description	Total current extent mapped in Western Australia	Extent (ha) mapped within the survey area	Proportion of total current extent (%) within the survey area
Mount Adams System (224Ma)	Gently undulating sandplain with low gravel ridges and occasional laterite breakaways.	86,963	187.2	0.1
Correy System (221Cy)	Broad sandy alluvial fan of the lower Arrowsmith River. Pale deep sands predominate, with grey shallow sandy duplexes, moderately deep sandy gravels and yellow deep sands less common. Banksia woodlands and heathlands.	27,252	25.0	0.2

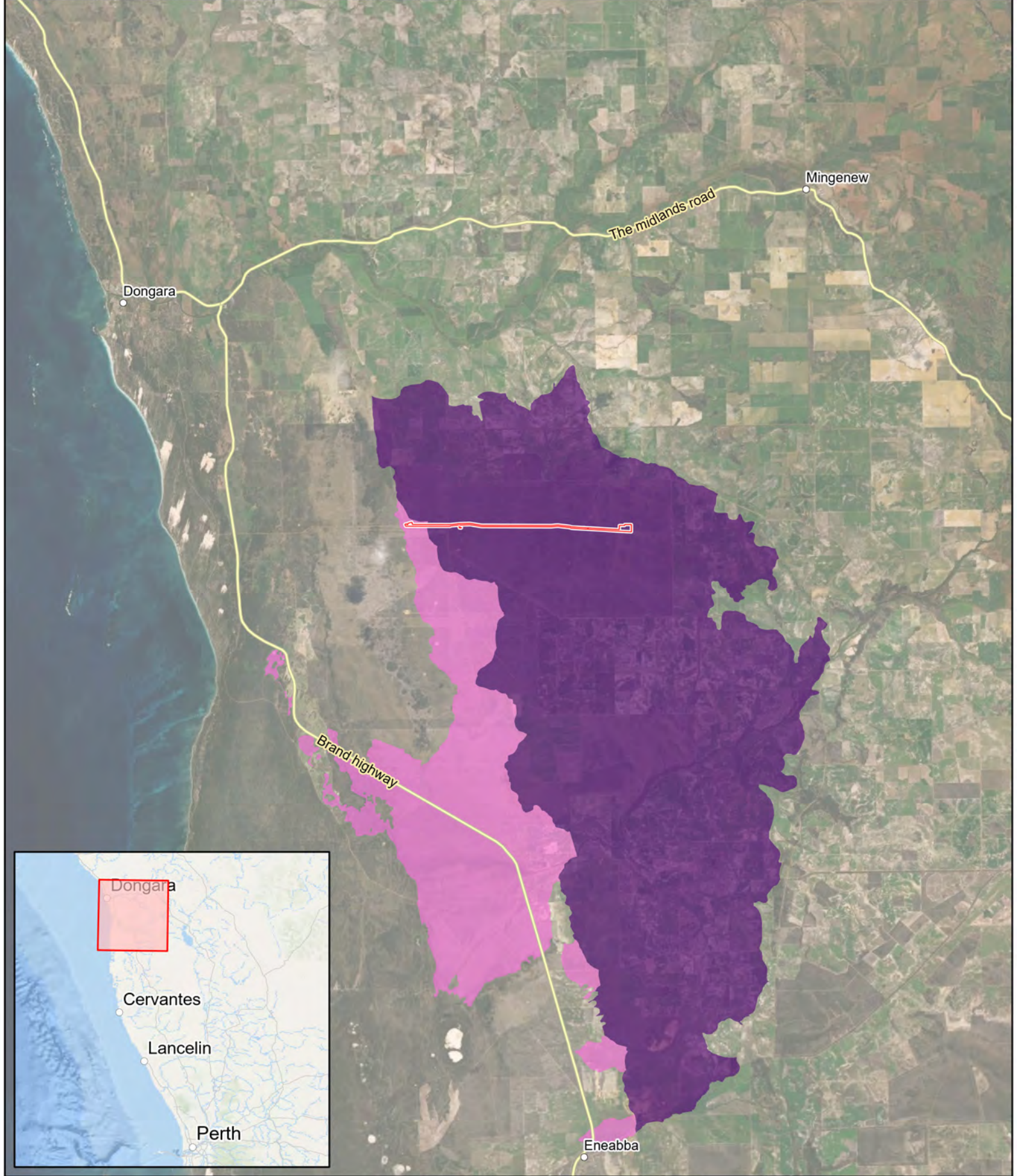
3.1.5 Broad-scale vegetation mapping

The vegetation of the survey area was defined and mapped by Beard (1976) and within the broader region by Beard (1990) in the Irwin Botanical District as coastal scrub heath on sandplains, with *Acacia* and *Allocasuarina* thickets further inland, and hard-setting loams with *Acacia* scrub and scattered *Eucalyptus loxophleba*. Three vegetation associations are present within the survey area, as outlined in **Table 9** and **Figure 4**.

Table 9: Beard (1976) vegetation associations of the survey area

Vegetation association	Description	Pre-European extent (ha) within the Lesueur sandplain subregion	Current extent (ha) within the Lesueur sandplain subregion	Proportion of pre-European extent remaining (%)	Extent (ha) mapped within the survey area	Proportion of current extent within the survey area (%)
49	Shrublands; mixed heath	33,139.33	13,618.88	41.10	12.1	0.1
378	Shrublands; scrub-heath with scattered <i>Banksia</i> spp., <i>Eucalyptus todtiana</i> and <i>Xylomelum angustifolium</i> on deep sandy flats in the Geraldton sandplains bioregion	90,922.87	60,668.26	66.72	46.2	0.1
379	Shrublands; scrub-heath on lateritic sandplain in the central Geraldton sandplains bioregion	370,029.76	111,632.48	30.17	153.9	0.1

Figure 3: Land system mapping of the survey area

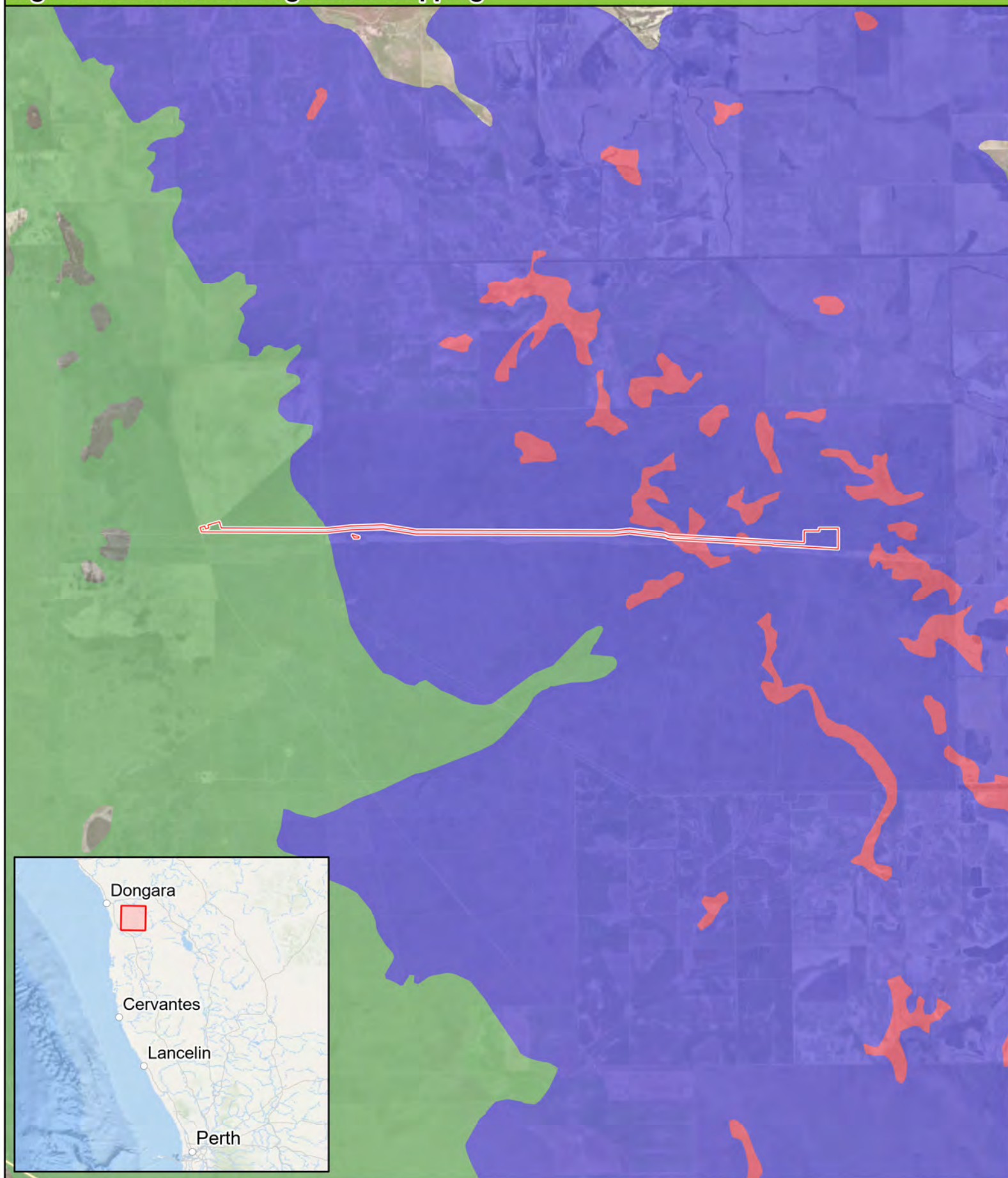


- Legend**
- Land system**
- Correy System (221Cy)
 - Mount Adams System (224Ma)

0 5 10
Kilometers
Scale: 1:350,000 (A4)
Datum/Projection:
GDA 1994 MGA Zone 50



Figure 4: Broad scale vegetation mapping



- Legend**
- Survey Footprint
 - Major Road

- Beard's (1975) vegetation associations**
- ERIDOON_378
 - TATHRA_379
 - TATHRA_49

0 5
Kilometers
Scale: 1:350,000 (A4)
Datum/Projection:
GDA 1994 MGA Zone 50

3.1.6 Previous surveys undertaken in the vicinity of the survey area

An overview of the prior studies in the vicinity of the survey area is provided in **Table 10**.

Table 10: Overview of previous studies undertaken in proximity to the survey area

Reference	Survey type and location	Conservation significant species of communities
Review of key potential flora, vegetation and fauna values on the proposed pipeline for Strike Energy near Dongara (Mattiske 2020)	Desktop assessment of the potential flora, vegetation and fauna values present (within the current survey area)	12 threatened and 18 priority flora species have the potential to occur. 4 threatened ecological communities (TECs) and 6 Priority ecological communities (PECs) have the potential to occur. 10 threatened fauna species have the potential to occur.
West Erregulla targeted threatened flora survey (ecologia 2018)	Targeted threatened flora survey (within the current survey area)	No individuals of the targeted threatened taxa <i>Thelymitra stellata</i> , <i>Paracaleana dixonii</i> and <i>Eucalyptus crispata</i> . No TECs and PECs were recorded. Threatened (Declared Rare Flora) flora: <i>Thelymitra stellata</i> , <i>Paracaleana dixonii</i> , <i>Eucalyptus crispata</i> . <i>T. stellata</i> records were associated with vegetation types 7a, 7b, 8, 11, 13a. <i>P. dixonii</i> records were associated with vegetation types 7a, 7b, 8, 10, 11, 12, 13a. <i>E. crispata</i> records were associated with vegetation type 8 and 10. Priority flora: 23 confirmed taxa No TECs and PECs were recorded.
West Erregulla Project Flora and Vegetation Assessment (Woodman 2013)	Detailed flora and vegetation survey (within the current survey area)	

No previous studies were found within a 100 km radius of the survey area (DWER 2021).

3.1.7 Areas of conservation significance

Environmentally Sensitive Areas (ESAs) are defined in the Environmental Protection (Environmentally Sensitive Areas) Notice 2005 under section 51B of the State *Environmental Protection Act 1986* (EP Act). ESAs include areas declared as World Heritage, included on the Register of the National Estate, defined wetlands, and vegetation containing rare (Threatened) flora and TECs.

PECs are biological flora or fauna communities that are recognised to be of significance, but do not meet the criteria for a TEC. There are five categories of PECs, none of which are currently protected under legislation.

There are no TECs listed at Commonwealth level. There are two TECs listed at State level that occur 10 km to the east of the survey area (DBCA 2020c) (see Appendix A for conservation codes):

- Mound Springs (Three Springs area) (EN); and
- Ferricrete floristic community (Rocky Springs Type) (VU).

There are no PECs listed with the potential to occur within or near the survey area. No World Heritage Areas, National Heritage or Ramsar wetlands are located within or in close proximity to the survey area. The Yardanogo Nature Reserve (R36203) and Beekeepers Nature Reserve (R24496) are located to the west of the survey area.

3.1.8 Flora and fauna species of conservation significance

An initial 61 conservation listed flora species and 46 conservation listed fauna species were identified as possibly occurring within the survey area, based on the database searches (Section 2.1.1) and using criteria outlined in **Appendix B (Figure 5 to Figure 7)**.

Conservation significant flora species identified from database searches undertaken included 14 Threatened species and 47 Priority species. The flora likelihood of occurrence assessment is presented in **Appendix C**.

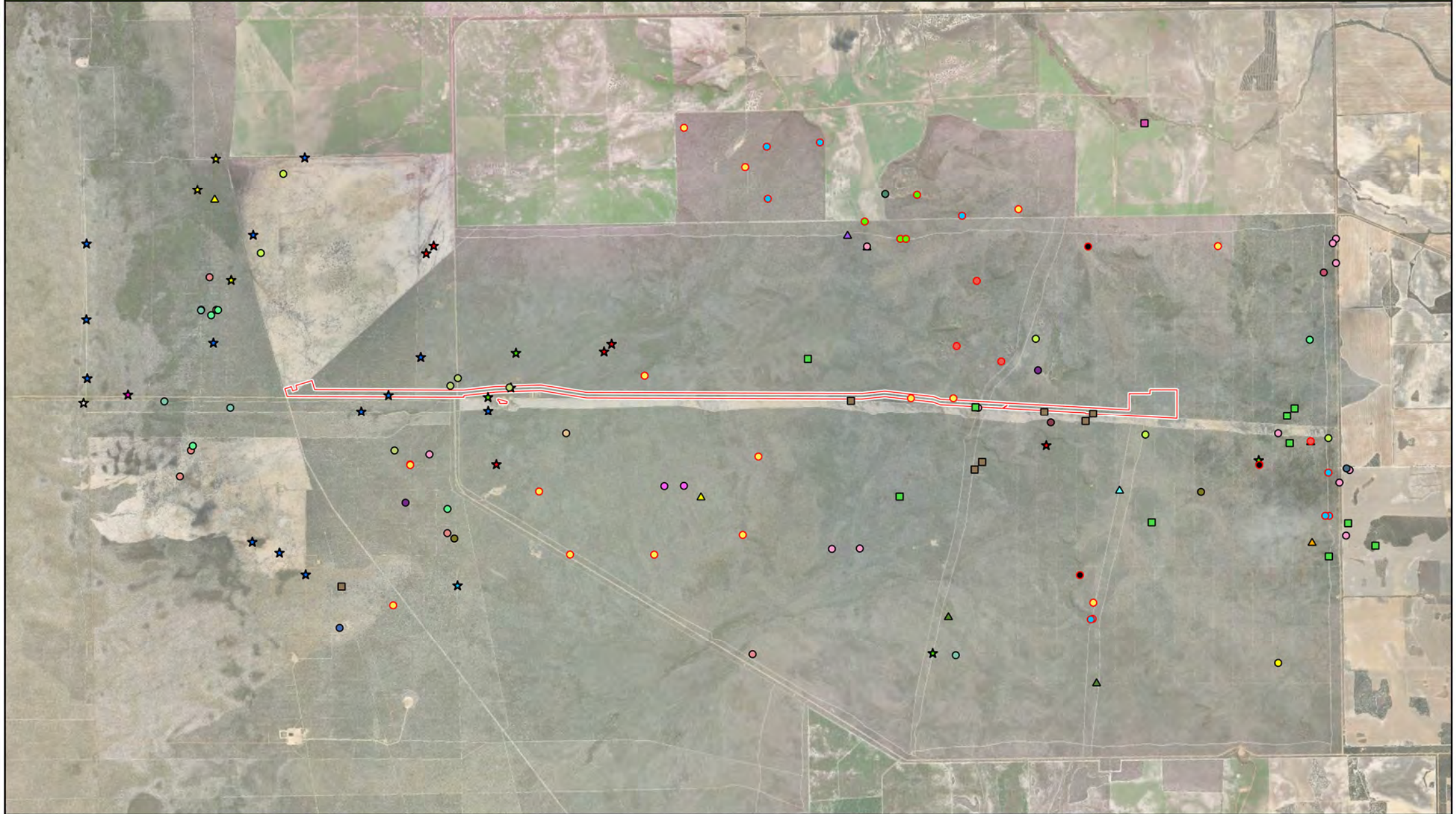
Database searches identified one Threatened flora species, *Paracaleana dixonii* (Endangered under the EPBC Act and Vulnerable under the BC Act) recorded within the survey area in 2011. This record included 24 plants recorded approximately 5 km west from the eastern end of the survey area.

Conservation significant fauna species identified from database searches undertaken included five species listed as Endangered under the EPBC Act, four species listed as Vulnerable under the EPBC Act, 23 species listed as Migratory under the EPBC Act/BC Act, one species listed as Vulnerable under the BC Act, one species listed as Migratory under the BC Act, one species listed as 'other specially protected fauna' under the BC Act, one species listed as 'species of special conservation interest (conservation dependent fauna)', two species listed as P1 by DBCA, one species listed as P2 by DBCA, four species listed as P3 by DBCA and three species listed as P4 by DBCA.

Aquatic and marine species were not considered in the likelihood of occurrence assessment as the survey area does not contain core habitat that these species solely rely on for survival. The fauna likelihood of occurrence assessment is presented in **Appendix D**.

One confirmed white-tailed Black Cockatoo record occurs within 12 km of the survey area; 10 km north (IRWMILR001; Birdlife 2021).

Figure 5: Conservation significant flora species previously found within 5km of the survey area



Legend

Survey Footprint

Conservation significant species DBCA (2020a)

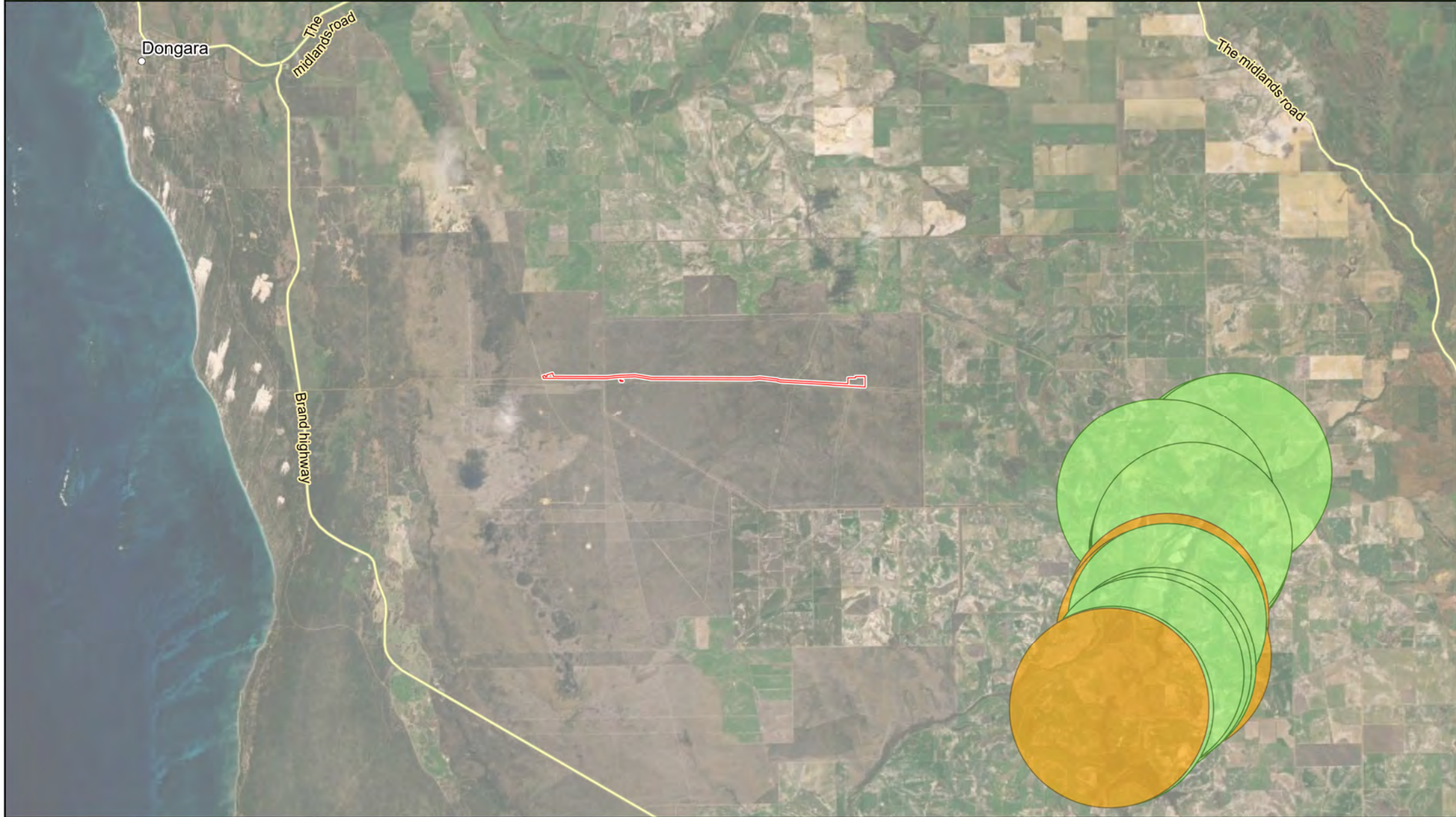
<ul style="list-style-type: none"> ● <i>Daviesia speciosa</i> (T) ● <i>Eucalyptus crispata</i> (T) ● <i>Eucalyptus leprophloia</i> (T) ● <i>Paracaleana dixonii</i> (T) ● <i>Thelymitra stellata</i> (T) ■ <i>Lasiopetalum ogilvieanum</i> (P1) ■ <i>Malleostemon decipiens</i> (P1) 	<ul style="list-style-type: none"> ■ <i>Micromyrtus rogeri</i> (P1) ▲ <i>Comesperma griffinii</i> (P2) ▲ <i>Eucalyptus abdita</i> (P2) ▲ <i>Schoenus badius</i> (P2) ▲ <i>Stylidium pseudocaeplitosum</i> (P2) ▲ <i>Synaphea sparsiflora</i> (P2) ● <i>Acacia lanceolata</i> (P3) ● <i>Allocasuarina grevilleoides</i> (P3) ● <i>Beyeria gardneri</i> (P3) ● <i>Banksia fraseri</i> var. <i>crebra</i> (P3) 	<ul style="list-style-type: none"> ● <i>Comesperma rhadinocarpum</i> (P3) ● <i>Eucalyptus macrocarpa</i> x <i>pyriformis</i> (P3) ● <i>Guichenotia alba</i> (P3) ● <i>Hemianthra</i> sp. <i>Eneabba</i> (H. Demaiz 3687) (P3) ● <i>Hypocalymma gardneri</i> (P3) ● <i>Mesomelaena stygia</i> subsp. <i>deflexa</i> (P3) ● <i>Persoonia filiformis</i> (P3) ● <i>Persoonia rudis</i> (P3) ● <i>Stylidium drummondianum</i> (P3) ● <i>Stylidium tortricarpum</i> (P3) 	<ul style="list-style-type: none"> ● <i>Synaphea oulopha</i> (P3) ● <i>Verticordia luteola</i> var. <i>luteola</i> (P3) ★ <i>Banksia elegans</i> (P4) ★ <i>Banksia scabrella</i> (P4) ★ <i>Calytrix chrysantha</i> (P4) ★ <i>Eucalyptus macrocarpa</i> subsp. <i>elachantha</i> (P4) ★ <i>Schoenus griffinianus</i> (P4) ★ <i>Stawellia dimorphantha</i> (P4) ★ <i>Thysanotus glaucus</i> (P4)
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Kilometers
Scale: 1:90,000
Datum/Projection: GDA 1994 MGA Zone 50

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Figure 6: Conservation significant vegetation communities previously found within 20km of the survey area



Legend

- Survey Footprint
- Conservation significant vegetation communities (DBCA 2020b)
 - Assemblages of organic mound springs of the Three Springs area (EN)
 - Ferricrete floristic community (Rocky Springs type) (VU)

0 2.5 5 10
Kilometers
Scale: 1:250,000
Datum/Projection:
GDA 1994 MGA Zone 50

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Figure 7: Conservation significant fauna species previously found within 20km of the survey area



Legend

Survey Footprint

Conservation significant fauna species (DBCAs 2020c)

- Carnaby's cockatoo (*Calyptorhynchus latirostris*, EN)
- White-tailed black cockatoo (*Calyptorhynchus* sp. 'white-tailed black cockatoo', EN)
- Malleefowl (*Leipoa ocellata*, VU)
- Black-striped snake (*Neelaps calonotos*, P3)
- Western brush wallaby (*Phasmodes jeeba*, P4)

0 2.5 5
Kilometers
Scale: 1:200,000
Datum/Projection:
GDA 1994 MGA Zone 50

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3.2 Flora and vegetation survey

3.2.1 Flora overview

A total of 170 taxa (168 native and two introduced) from 93 genera and 39 families were recorded across 26 quadrats established within the survey area (161 taxa) and from targeted and opportunistic collections (nine taxa). A flora species list is provided in **Appendix E**. Average species per quadrat was 38.04 species, ranging from a low of 19 species at ELA12 to a high of 57 species at ELA02. The majority of taxa recorded were representative of the Proteaceae (30), Myrtaceae (23 taxa) and Fabaceae (18 taxa) families. *Banksia* and *Hakea* were the best represented genera throughout the survey area with 8 taxa recorded each. A flora species matrix (per quadrat) is provided in **Appendix F**.

3.2.2 Accumulated species – site surveyed (species-area curve)

A species accumulation curve (**Figure 8**) was used to evaluate the adequacy of sampling (Clarke and Gorley 2006). Only species data recorded from defined quadrats were used, no opportunistic flora collections were included. The asymptotic value was determined using Michaelis Menten modelling. Using this analysis, the incidence-based coverage estimator of species richness was calculated to be 181.05. Based on this value, and the total of 161 species recorded within quadrats, approximately 88.9% of the flora species potentially present within the survey area were recorded. This result, in addition to opportunistic collections, indicates that the majority of flora potentially present within the survey area were recorded.

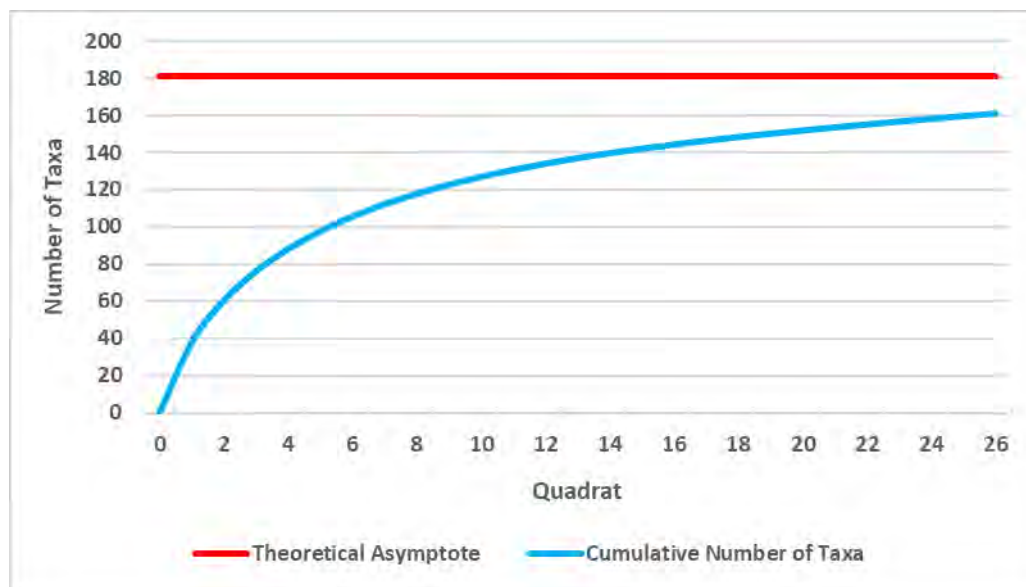


Figure 8: Average randomised species accumulation curve

Note: Only species recorded from quadrats were used to calculate the species accumulation curve and theoretical maximum number of species (asymptotic value).

3.2.3 Conservation significant flora

No Threatened flora species listed under the EPBC Act or the BC Act were recorded within the survey area from the current field survey. Conservation significant flora species listed by DBCA included; *Micromyrtus rogeri* (P1), *Lasiopetalum ogilvieanum* (P1), *Guichenotia alba* (P3), *Mesomelaena stygia* subsp. *deflexa* (P3), *Stylidium drummondianum* (P3), *Banksia scabrella* (P4), *Eucalyptus macrocarpa* subsp. *elachantha* (P4), and *Stawellia dimorphantha* (P4). Locations of these species are presented in

Figure 9 and **Appendix H**. Individual records and abundance of each species within the vegetation communities are presented in **Table 11**.

Table 11: Priority flora records and abundance within each vegetation community

Species and vegetation community	Records	Abundance
<i>Banksia scabrella</i>	485	10776
AcAhGp	6	43
AcDdMI	2	16
AcEbHh	97	900
BpDdHh	23	256
EtAhHh	357	9561
<i>Echium plantagineum</i>	1	2
EtBaHh	1	2
<i>Eucalyptus macrocarpa</i> subsp. <i>elachantha</i>	1	10
AcEbHh	1	10
<i>Guichenotia alba</i>	63	607
AcDdMI	1	1
AcEbHh	55	577
Cleared	3	17
EtBaHh	4	12
<i>Lasiopetalum ogilvieanum</i>	21	100
AcDdMI	1	12
AcEbHh	5	37
EtAhHh	15	51
<i>Mesomelaena stygia</i> subsp. <i>deflexa</i>	55	4648
AcEbHh	11	443
EtAhHh	44	4205
<i>Micromyrtus rogeri</i>	18	939
AcAhGp	16	829
EtAhHh	2	110
<i>Stawellia dimorphantha</i>	45	298
AcDdMI	40	275
AcEbHh	1	5
EtBaHh	4	18
<i>Stylidium drummondianum</i>	10	54
AcAhGp	3	18
AcEbHh	2	5
EtAhHh	5	31
Grand Total	699	17434

3.2.3.1 *Micromyrtus rogeri*

Micromyrtus rogeri was recorded from 18-point locations within the survey area, totalling 939 individuals. Of the 18-point locations occurring within the survey area, the majority (16) were located within the laterite rises of AcAhGp vegetation community. *Micromyrtus rogeri* was recorded from several populations towards the eastern end of the survey area.

Locations of *Micromyrtus rogeri* are presented in **Plate 1**, **Figure 9** and **Appendix H**.



Plate 1: *Micromyrtus rogeri* © Eco Logical Australia

3.2.3.2 *Lasiopetalum ogilvieanum*

Lasiopetalum ogilvieanum was recorded from 21-point locations within the survey area, totalling 100 individuals. Of the 21-point locations occurring within the survey area, the majority (15) were located within the sandy plains of EtAhHh vegetation community. *Lasiopetalum ogilvieanum* was recorded from several populations towards the eastern end of the survey area.

Locations of *Lasiopetalum ogilvieanum* are presented in **Plate 2, Figure 9** and in **Appendix H**.



Plate 2: *Lasiopetalum ogilvieanum* © Eco Logical Australia

3.2.3.3 *Guichenotia alba*

Guichenotia alba was recorded from 63-point locations within the survey area, totalling 607 individuals. Of the 63-point locations occurring within the survey area, the majority (55) were located within the sandy plains of AcEbHh vegetation community. *Guichenotia alba* was recorded from two populations towards the western end of the survey area.

Locations of *Guichenotia alba* are presented in **Plate 3, Figure 9** and in **Appendix H**.



Plate 3: *Guichenotia alba* © Eco Logical Australia

3.2.3.4 *Mesomelaena stygia* subsp. *deflexa*

Mesomelaena stygia subsp. *deflexa* was recorded from 55-point locations within the survey area, totalling 4,648 individuals. Of the 55-point locations occurring within the survey area, the majority (44) were located within the sandy plains of EtAhHh vegetation community. *Mesomelaena stygia* subsp. *deflexa* was recorded from several populations towards the eastern end of the survey area.

Locations of *Mesomelaena stygia* subsp. *deflexa* are presented in **Plate 4, Figure 9** and in **Appendix H**.



Plate 4: *Mesomelaena stygia* subsp. *deflexa* © Eco Logical Australia

3.2.3.5 *Stylidium drummondianum*

Stylidium drummondianum was recorded from 10-point locations within the survey area, totalling 54 individuals. Of the 10-point locations occurring within the survey area, five were located within EtAhHh vegetation community, three within AcAhGp and two within AcEbHh. *Stylidium drummondianum* was recorded from several populations towards the eastern end of the survey area.

Locations of *Stylidium drummondianum* are presented in **Plate 5, Figure 9** and in **Appendix H**.



Plate 5: *Stylidium drummondianum* © Eco Logical Australia

3.2.3.6 *Banksia scabrella*

Banksia scabrella was recorded from 485-point locations within the survey area, totalling 10,776 individuals. Of the 485-point locations occurring within the survey area, the majority (357) were located within EtAhHh vegetation community, 97 within AcEbHh, 23 within BpDdHh, six within AcAhGp and two within AcDdMl. *Banksia scabrella* was a dominant structural component of EtAhHh vegetation community and was recorded from several populations across the survey area.

Locations of *Banksia scabrella* are presented in **Plate 6, Figure 9** and in **Appendix H**.



Plate 6: *Banksia scabrella* © Eco Logical Australia

3.2.3.7 *Eucalyptus macrocarpa* subsp. *elachantha*

Eucalyptus macrocarpa subsp. *elachantha* was recorded from one-point location towards the middle of the survey area, totalling ten individuals. This location was located within the sandy plains of AcEbHh vegetation community.

Locations of *Eucalyptus macrocarpa* subsp. *elachantha* are presented in **Plate 7, Figure 9** and in **Appendix H**.



Plate 7: *Eucalyptus macrocarpa* subsp. *elachantha* © Eco Logical Australia

3.2.3.8 *Stawellia dimorphantha*

Stawellia dimorphantha was recorded from 45-point locations within the survey area, totalling 298 individuals. Of the 45-point locations occurring within the survey area, the majority (40) were located within AcDdMI vegetation community. *Stawellia dimorphantha* was recorded from one population towards the western end of the survey area.

Locations of *Stawellia dimorphantha* are presented in **Plate 8, Figure 9** and in **Appendix H**.



Plate 8: *Stawellia dimorphantha* © Eco Logical Australia

Of the 61 flora species identified from the desktop assessment as possibly occurring within the survey area, the eight species above were found to occur in the survey area. 11 species were considered as likely to occur, and 25 considered as having the potential to occur, based on the species habitat preferences and proximity of records to the survey area. The remaining 17 species were considered

unlikely to occur. The flora likelihood of occurrence assessment is presented in **Appendix C**. A flora likelihood of occurrence assessment was also undertaken by Matiske (2020), which has been considered for this report.

3.2.4 Introduced flora

Two introduced (weed) flora species was recorded as occurring within the survey area, *Hypochaeris glabra* and *Echium plantagineum*. *E. plantagineum* is listed as a Declared Pest under the State *Biosecurity and Agriculture Management Act 2007* (BAM Act) and on the Western Australian Organism List (WAOL) database as s22. *H. glabra* is not listed as a Weed of National Significance (WoNS) or Declared Pest under the BAM Act and is listed on the WAOL database as s11 (permitted). *E. plantagineum* was recorded once opportunistically, whilst *H. glabra* was recorded in five quadrats (ELA01, ELA08, ELA14, ELA21, ELA24) at a low density (0.01% cover) and is associated with AcEbHh, EtAhHh and EtBaHh vegetation communities.

3.2.5 Vegetation communities

A total of six vegetation communities were delineated and mapped within the survey area (**Table 12, Figure 10, Appendix G**). The most widespread vegetation community was AcEbHh, which occurred across 34.02% (72.2 ha) of the survey area. Descriptions of vegetation communities resemble those described by Woodman (2013) in a far larger mapped area adjacent to the current survey area. This report also did not infer the presence of any threatened or priority ecological communities.

No vegetation communities delineated within the current survey area were inferred to represent any or potential conservation significant communities listed under the EPBC Act, the BC Act or by DBCA. This is supported by Woodman (2013) which also found no conservation significant communities.

Similarity Profile Analysis (SIMPROF) separated the 26 quadrats into six statistically dissimilar groupings (Global R= 6.02; Significance level of sample statistic; $p = 0.01$; **Appendix I**).

Table 12: Vegetation communities recorded within the survey area



Image	Vegetation community	Woodman (2013) corresponding vegetation type	Vegetation description	Quadrats	Extent within the survey area (ha)	Proportion of the survey area (%)
	AcEbHh	10 and 12	<i>Allocasuarina campestris</i> tall sparse shrubland over <i>Eremaea beaufortioides</i> , <i>Calothamnus quadrifidus</i> subsp. <i>angustifolius</i> , <i>Isopogon tridens</i> mid sparse shrubland over <i>Hibbertia hypericoides</i> , <i>Melaleuca leuropoma</i> low open shrubland and <i>Ecdeiocolea monostachya</i> low open sedgeland.	ELA01, ELA02, ELA05, ELA09, ELA20 and ELA21	72.2	34.02
	EtAhHh	13a	<i>Eucalyptus todtiana</i> mid open woodland over <i>Allocasuarina humilis</i> , <i>Banksia scabrella</i> (P4), <i>Calothamnus sanguineus</i> mid open shrubland over <i>Hibbertia hypericoides</i> , <i>Melaleuca leuropoma</i> low open shrubland and <i>Caustis dioica</i> low open sedgeland.	ELA03, ELA04, ELA07, ELA08, ELA14 and ELA17	55	25.92





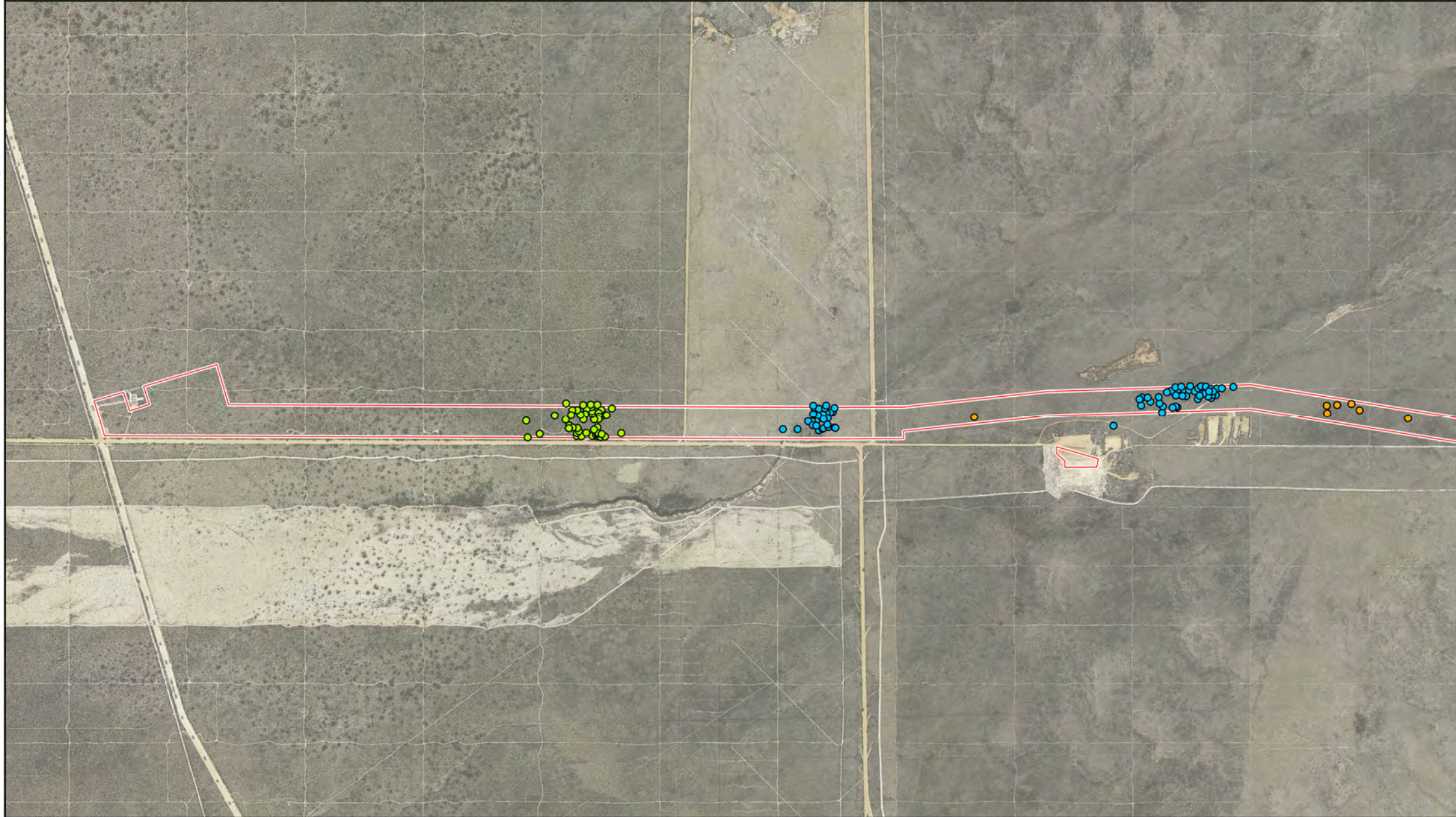
Image	Vegetation community	Woodman (2013) corresponding vegetation type	Vegetation description	Quadrats	Extent within the survey area (ha)	Proportion of the survey area (%)
	BpDdHh	13b	<i>Banksia prionotes</i> mid open woodland over <i>Daviesia divaricata</i> , <i>Conospermum boreale</i> , <i>Allocasuarina humilis</i> mid open shrubland over <i>Hibbertia hypericoides</i> low open shrubland and <i>Ecdeiocolea monostachya</i> , <i>Mesomelaena pseudostygia</i> low open sedgeland.	ELA06, ELA11, ELA25 and ELA26	12	5.66
	AcAhGp	9	<i>Allocasuarina campestris</i> tall sparse shrubland over <i>Allocasuarina humilis</i> , <i>Hakea auriculata</i> , <i>Petrophile shuttleworthiana</i> mid open shrubland over <i>Gastrolobium plicatum</i> low open shrubland and <i>Ecdeiocolea monostachya</i> , <i>Schoenus armeria</i> low open sedgeland.	ELA10, ELA12 and ELA13	5.5	2.59
	AcDdMI	12	<i>Allocasuarina campestris</i> tall isolated shrubs over <i>Daviesia divaricata</i> , <i>Conospermum boreale</i> , <i>Beaufortia elegans</i> mid open shrubland over <i>Melaleuca leuropoma</i> , <i>Hibbertia hypericoides</i> low open shrub over <i>Ecdeiocolea monostachya</i> low open sedgeland.	ELA15, ELA16, ELA18 and ELA19	35.9	16.92

Image	Vegetation community	Woodman (2013) corresponding vegetation type	Vegetation description	Quadrats	Extent within the survey area (ha)	Proportion of the survey area (%)
	EtBaHh	10, 13b	<p><i>Eucalyptus todtiana</i> mid open woodland over <i>Banksia attenuata</i>, <i>Calothamnus blepharospermus</i>, <i>Eremaea beaufortoides</i> mid open shrubland over <i>Hibbertia hypericoides</i>, <i>Melaleuca leuropoma</i> low open shrubland and <i>Ecdeiocolea monostachya</i> low open sedgeland.</p>	ELA22, ELA23 and ELA24	28.1	13.24
TOTAL					212.2	100

3.2.6 Vegetation condition

Vegetation condition within the survey area was Excellent (208.7 ha; 98.35%) or Cleared (3.5 ha; 1.65%), based on the Keighery (1994) vegetation scale provided in the EPA *Technical Guidance: Flora and Vegetation Surveys for Environmental Impact Assessment* (2016).

The primary disturbance within the survey area was a recent prescribed burn, which occurred in April 2019. Post fire regeneration was very good, with majority of species that were expected to occur being recorded. It is noted however, that structural elements of defined vegetation communities may slightly change over time as plant growth and development continue. Minor disturbances included minimal presence of weeds and feral fauna (rabbit diggings, scats). Vegetation condition within the survey area is presented in **Figure 11**.



Legend

Survey Footprint


Species

- *Guichenotia alba* (P3)
- *Banksia scabrella* (P4)
- *Stawellia dimorphantha* (P4)

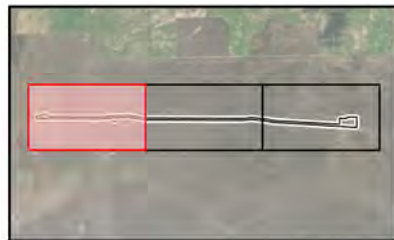
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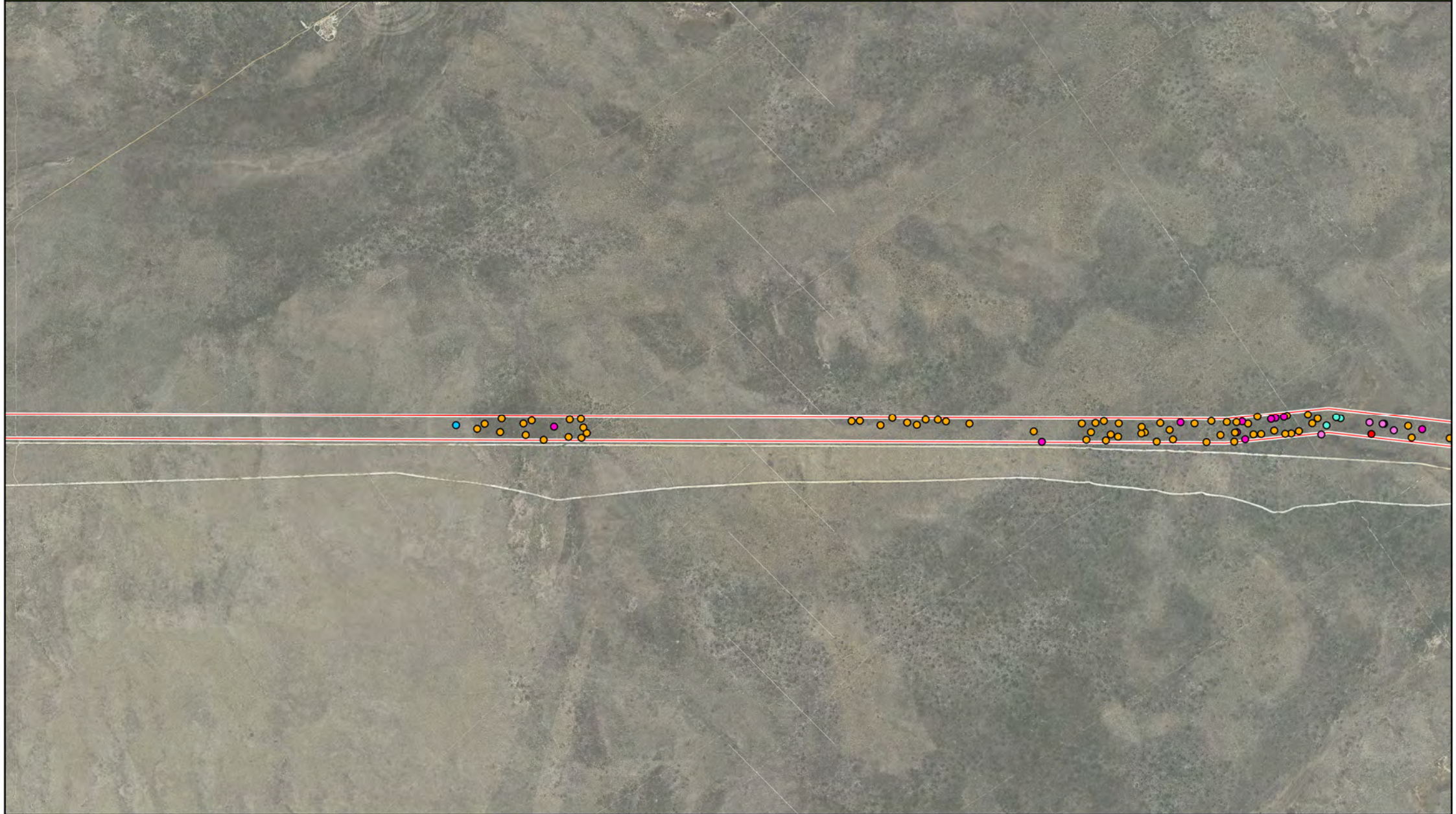
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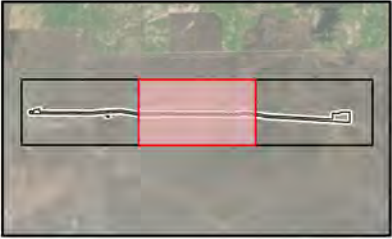


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Survey Footprint

Species

- *Lasiopetalum ogilvieanum* (P1)
- *Micromyrtus rogeri* (P1)
- *Guichenotia alba* (P3)
- *Stylidium drummondianum* (P3)
- *Banksia scabrella* (P4)
- *Eucalyptus macrocarpa* subsp. *elachantha* (P4)



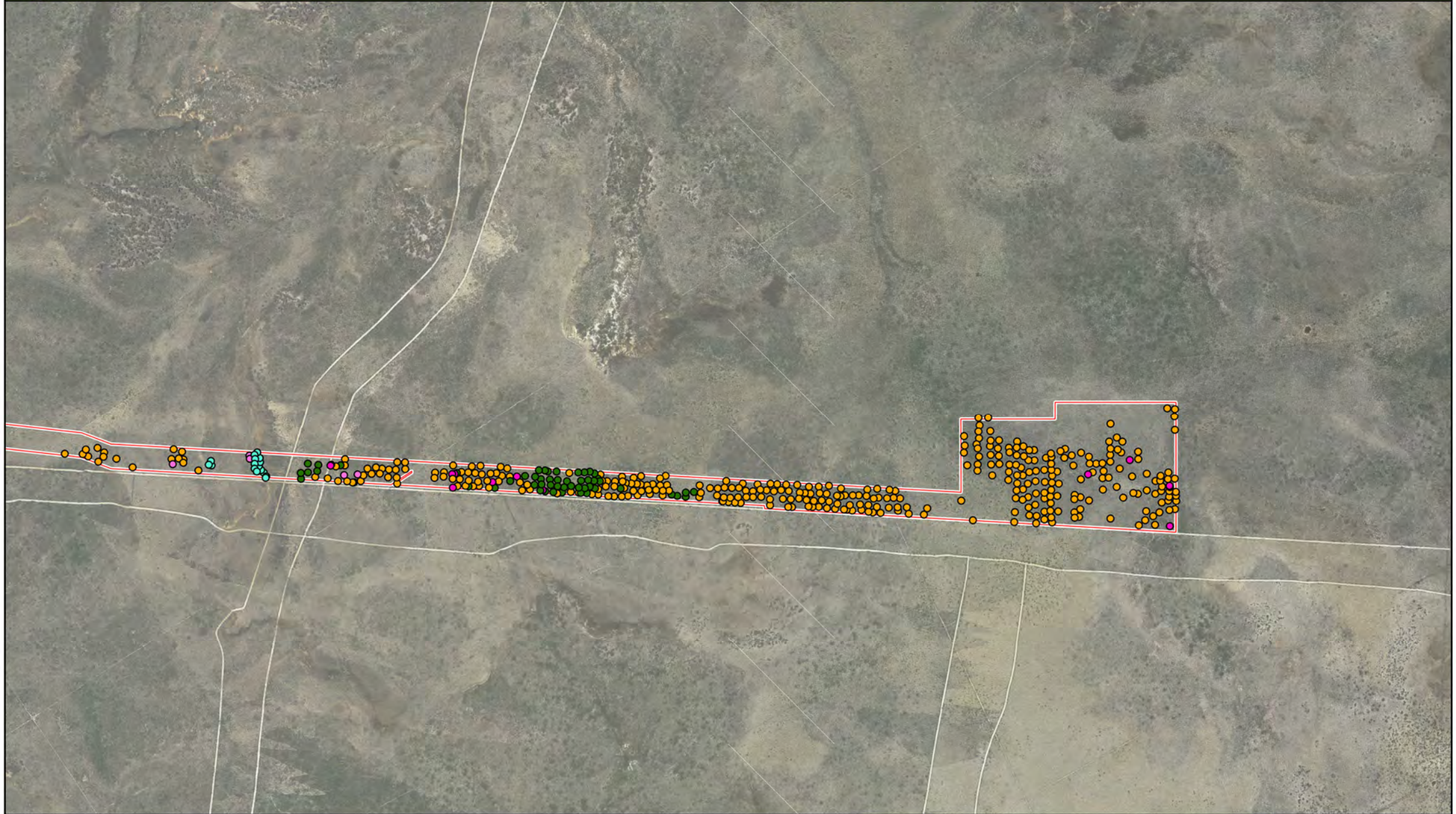
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Survey Footprint

Species

- *Mesomelaena stygia* subsp. *deflexa* (P3)
- *Lasiopetalum ogilvieanum* (P1)
- *Micromyrtus rogeri* (P1)
- *Stylidium drummondianum* (P3)
- *Banksia scabrella* (P4)



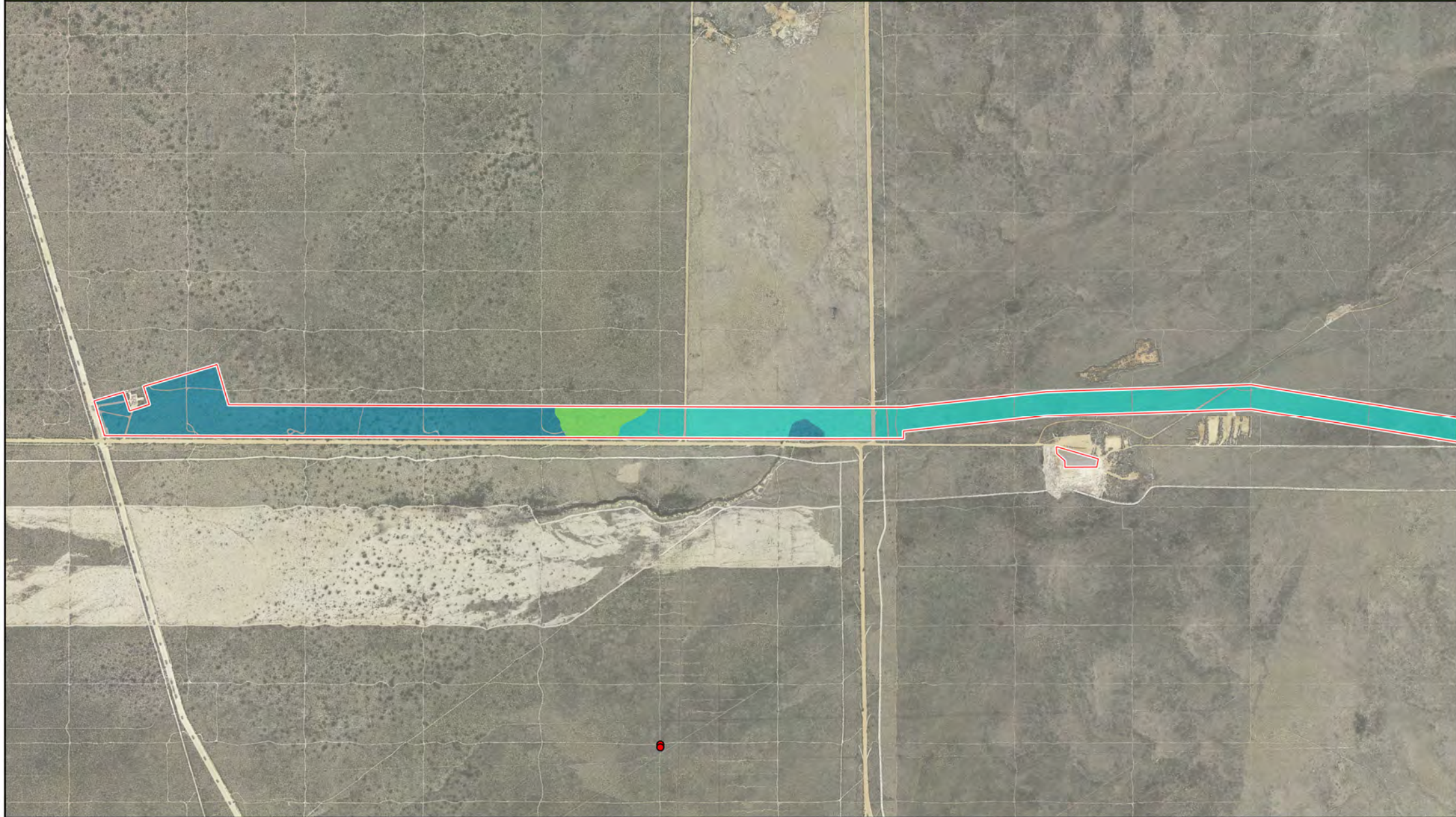
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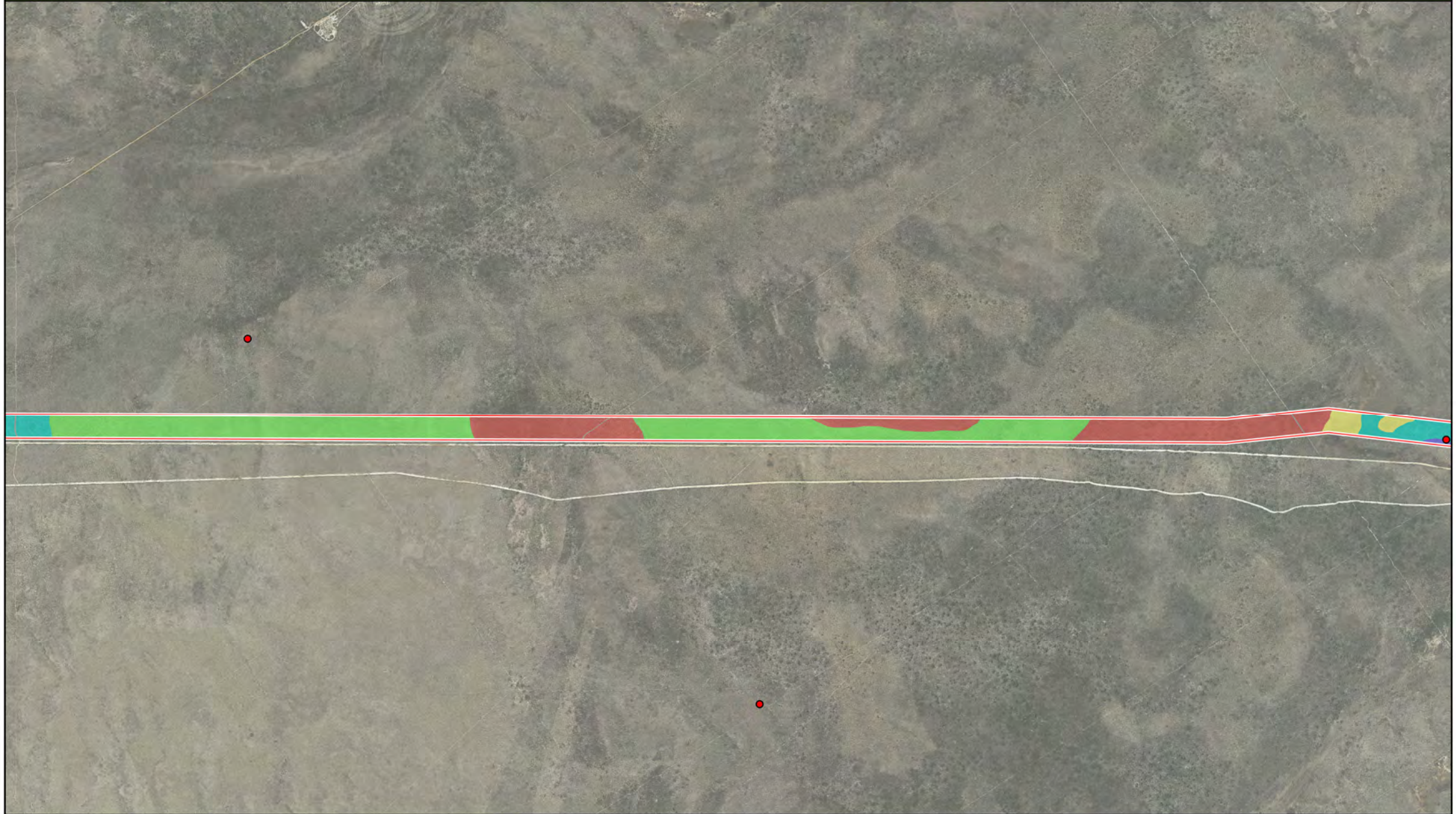
Legend

Survey Footprint	Vegetation communities
<i>Paracalaena dixonii</i> (T)	AcDdMI
	AcEbHh
	EtBaHh
	Cleared



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Scale: 1:20,000
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Project: 20PER16294-GM Date: 23/12/2020



Legend

Survey Footprint	Vegetation communities
<i>Paracalaena dixonii</i> (T)	AcAhGp
	AcDdMI
	AcEbHh
	BpDdHh
	EtAhHh
	Cleared

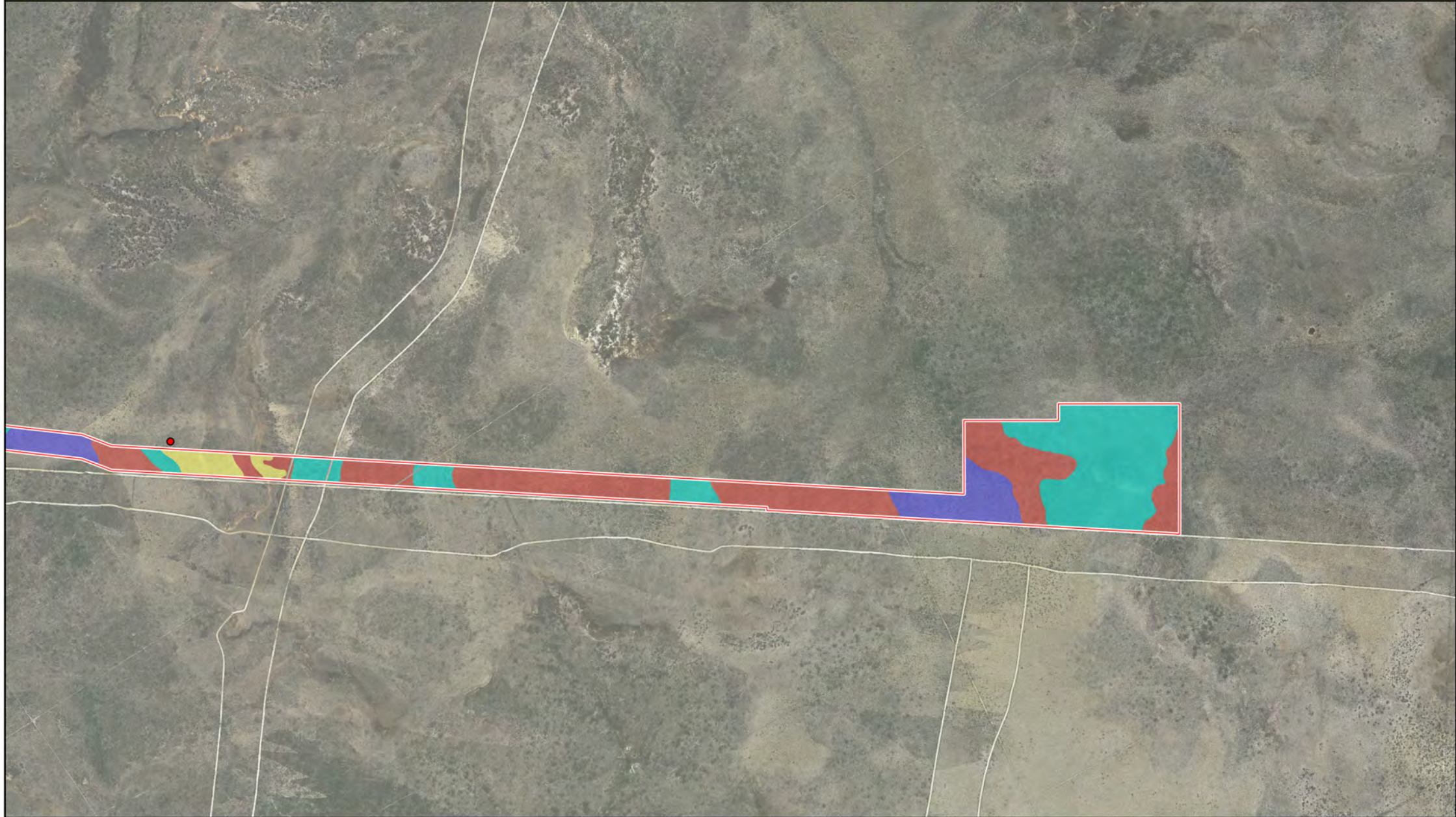


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Legend

Survey Footprint	Vegetation communities
<i>Paracalaena dixonii</i> (T)	AcAhGp
	AcEbHh
	BpDdHh
	EtAhHh
	Cleared

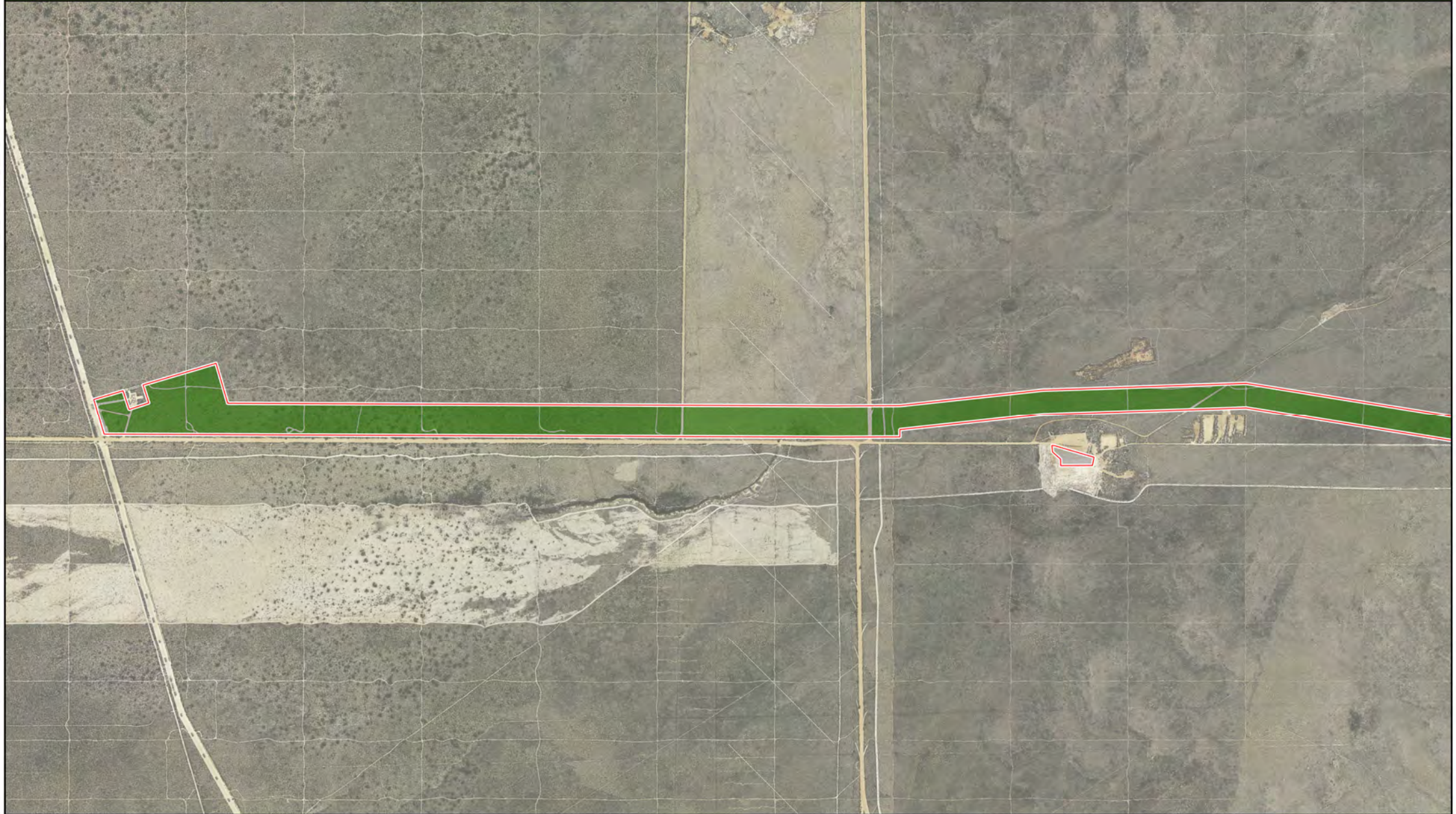


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Project: 20PER16294-GM Date: 23/12/2020




Legend

 Survey Footprint	Vegetation condition
	 Excellent
	 Cleared

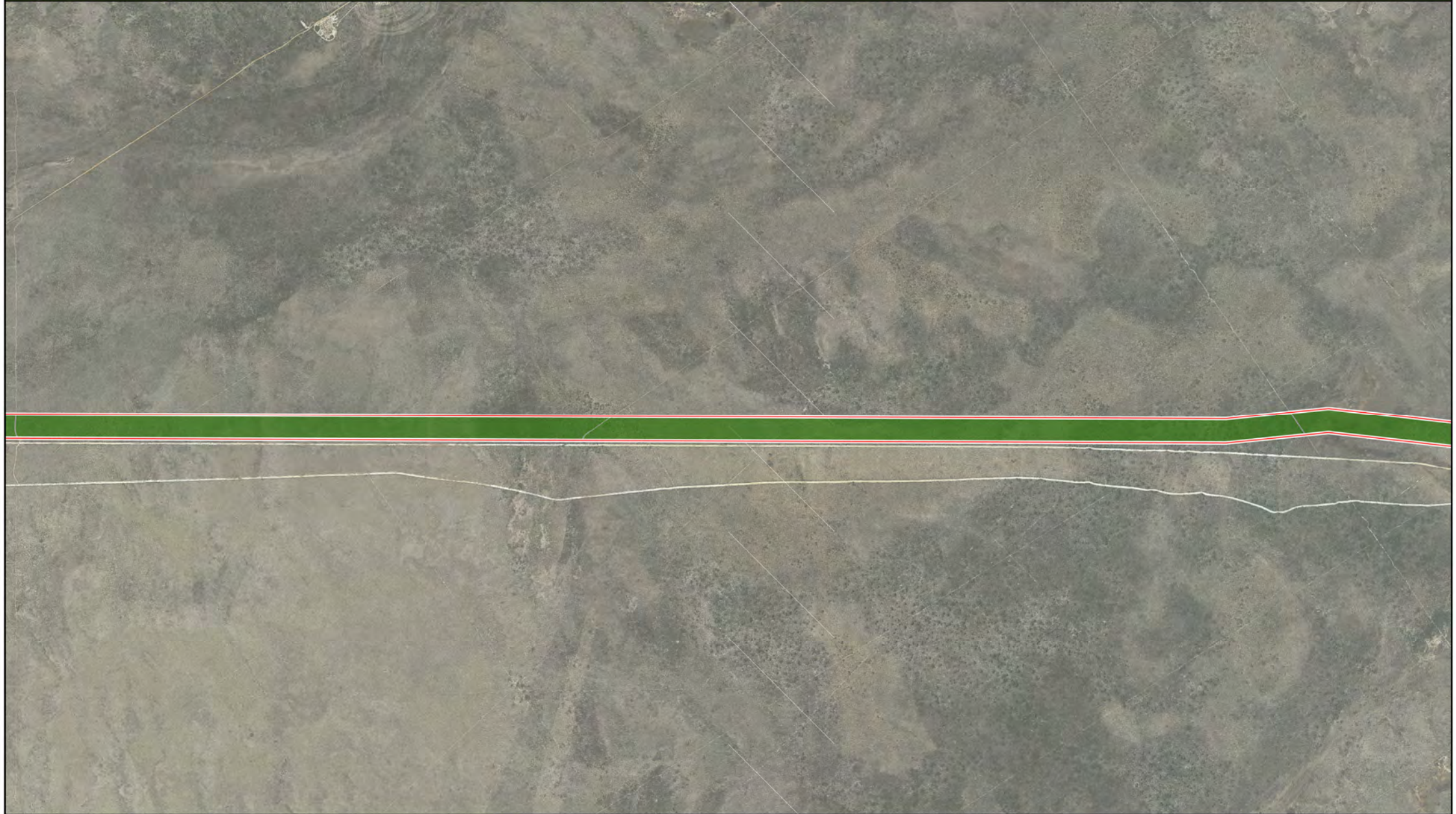


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Project: 20PER16294-GM Date: 15/10/2020



Legend

 Survey Footprint	Vegetation condition
	 Excellent
	 Cleared



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Metres

Scale: 1:20,000
Datum/Projection:
GDA 1994 MGA Zone 50




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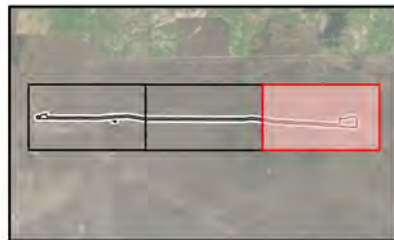

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Project: 20PER16294-GM Date: 15/10/2020




Legend

 Survey Footprint	Vegetation condition
	 Excellent
	 Cleared



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Scale: 1:20,000
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GDA 1994 MGA Zone 50

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Project: 20PER16294-GM Date: 15/10/2020

3.3 Fauna survey

3.3.1 Fauna habitat

Three fauna habitats were delineated and mapped within the survey area (**Table 13; Figure 12**), covering a total of 212.2 ha (98.40% of the survey area). Photos of the fauna habitats are provided in **Appendix J**.

Table 13: Fauna habitats recorded within the survey area

Fauna habitat	Fauna habitat description	Extent within the survey area (ha)	Proportion of the survey area (%)
Fauna habitat 1	<i>Allocasuarina campestris</i> tall sparse shrubland over shrubs and sedgeland on sandy plains	72.2	34.02
Fauna habitat 2	<i>Banksia</i> spp. and occasional <i>Eucalyptus tottiana</i> mid open woodland over shrubs and sedgeland on sandy plains	95.2	44.86
Fauna habitat 3	<i>Allocasuarina campestris</i> tall sparse shrubland over shrubs and sedgeland on stony rises	41.4	19.51
Cleared	-	3.4	1.60
TOTAL		212.2	100

There are no significant habitat features present within any of the three fauna habitats. As outlined in Section 3.2.6, a recent prescribed burn occurred in April 2019 across the survey area.

3.3.2 Fauna overview

A total of 35 fauna species (31 native and four introduced) were recorded within the survey area. This number comprised 28 bird species, five mammal species and two reptile species. Bird species were predominantly observed where a definitive canopy was present and vegetation cover was thickest. Evidence of mammal species (scats, tracks) was observed across the survey area, with no specific habitat preferences observed. The Spotted Military Dragon (*Ctenophorus maculatus* subsp. *maculatus*) were observed throughout the survey area.

Evidence of introduced fauna species (mainly scats and tracks) within the survey area included Cattle (*Bos taurus*), Domestic Dog (*Canis lupus familiaris*), Goat (*Capra hircus*) and European Rabbit (*Oryctolagus cuniculus*). A fauna species list is provided in **Appendix J**.

3.3.3 Conservation significant fauna

No direct (observations) or indirect (scats, tracks, diggings) evidence of conservation significant fauna species were recorded within the survey area from the current field survey. No evidence of the targeted species, Carnaby's Cockatoo (*Calyptorhynchus latirostris*) and Malleefowl (*Leipoa ocellata*), were recorded within the survey area.

Of the 46 fauna species identified from the desktop assessment as possibly occurring within the survey area, four species were considered having the potential to occur, based on the species habitat preferences and proximity of records to the survey area; Carnaby's Cockatoo (*Calyptorhynchus latirostris*; listed as EN under the EPBC Act and BC Act), Fork-tailed Swift (*Apus pacificus*; listed as MI under the EPBC Act and BC Act), Grey Falcon (*Falco hypoleucos*; listed as VU under the BC Act) and

Peregrine Falcon (*Falco peregrinus*; listed as OS under the BC Act). The remaining 42 species were considered unlikely to occur (Appendix D). The survey area is in the non-breeding range of the Carnaby's Cockatoo, however the survey area potentially provides low quality foraging habitat (discussed further in Section 4.3).

3.3.4 Black cockatoo habitat assessment

No individuals of Carnaby's Cockatoo were recorded within the survey area. No potential or confirmed breeding or roosting trees were recorded as occurring within the survey area.

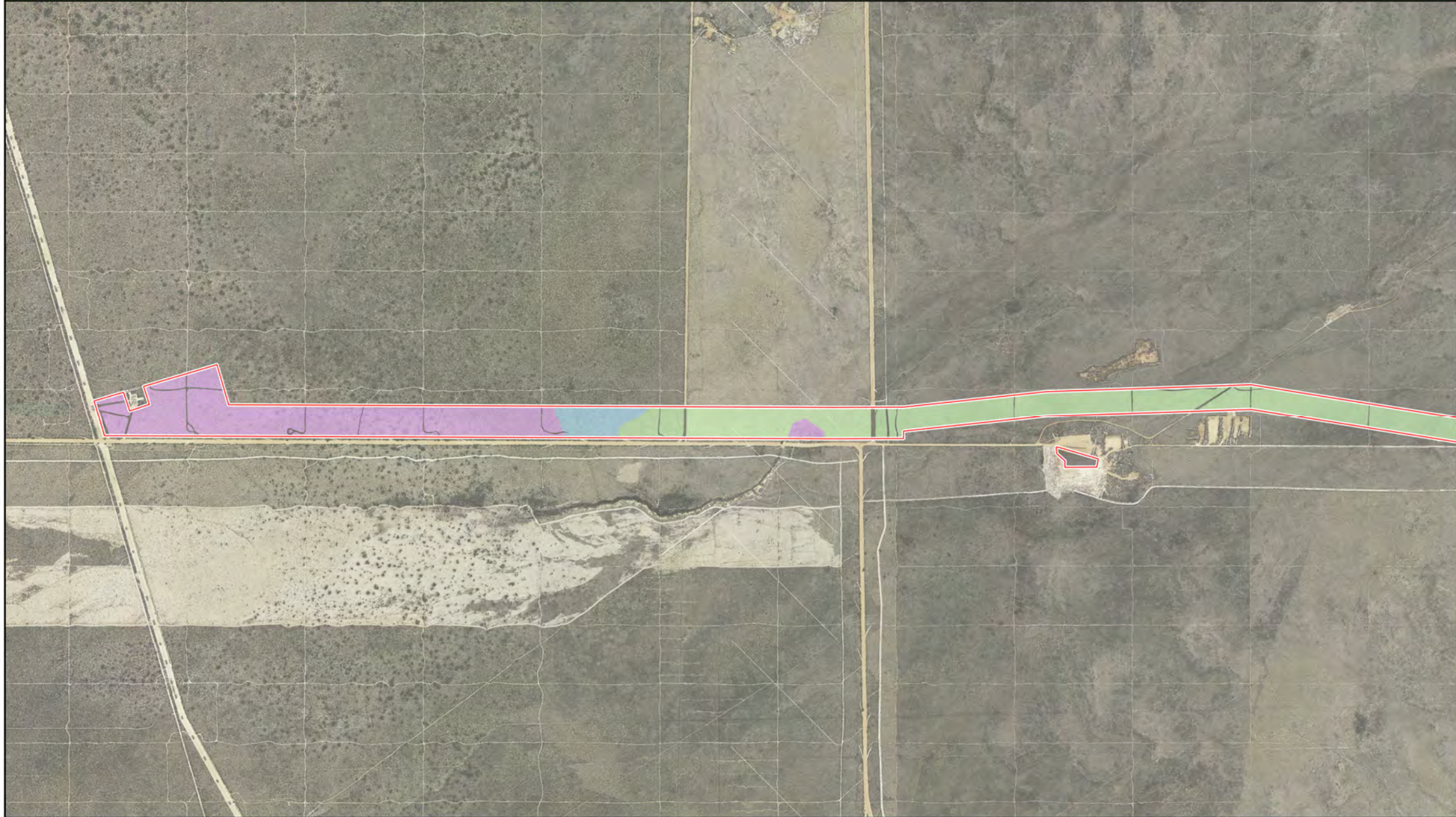
A total of 95.2 ha (44.86% of the survey area) is considered as providing 'Low' quality foraging habitat for Carnaby's Cockatoo; namely Fauna habitat 2: *Banksia* spp. and occasional *Eucalyptus todtiana* mid open woodland over shrubs and sedgeland on sandy plains (refer to **Table 3** above for definitions of black cockatoo foraging habitat quality; Figure 13). This habitat provides suitable foraging species (*Banksia* spp. and *Hakea* spp.) at a low density (<10%) across Fauna habitat 2. This was determined by field observations and utilising the Detailed flora and vegetation survey results.

The remaining vegetated areas (113.6 ha, 53.53%) are considered as providing 'Negligible' quality foraging habitat of Carnaby's Cockatoo; namely Fauna habitat 1: *Allocasuarina campestris* tall sparse shrubland over shrubs and sedgeland on sandy plains, and Fauna habitat 3: *Allocasuarina campestris* tall sparse shrubland over shrubs and sedgeland on stony rises. These habitat types provide some scattered foraging species but at very low density (<2%). Cleared areas (3.4 ha, 1.6%) provide 'Nil' quality foraging habitat for black cockatoo species. No foraging evidence was observed within the survey area.

3.3.5 Malleefowl survey

No individuals of Malleefowl or their mounds were recorded within the survey area. This species was considered to be unlikely to occur (see Appendix D) as the habitat within the survey area is not suitable for the species due to the lack of leaf litter and thicker vegetation. The survey area has also been recently burnt.

Figure 12: Fauna habitat recorded within the survey area (Page 1 of 3)



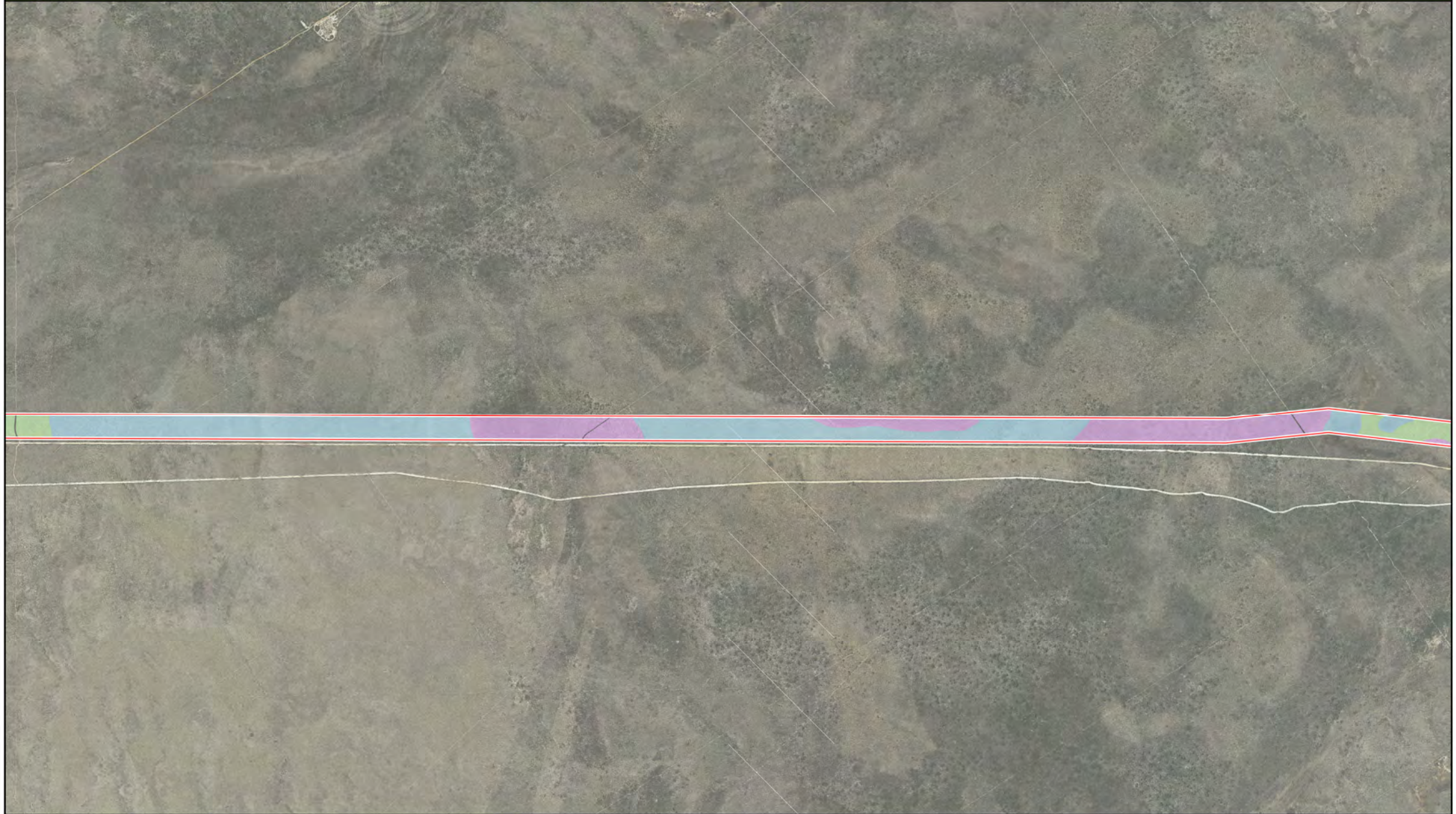
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- Survey Footprint
- Fauna Habitat**
 - Fauna Habitat 1: *Allocasuarina campestris* tall sparse shrubland over shrubs and sedgeland on sandy plains
 - Fauna Habitat 2: *Banksia* spp. and occasional *Eucalyptus tottiana* mid open woodland over shrubs and sedgeland on sand plains
 - Fauna Habitat 3: *Allocasuarina campestris* tall sparse shrubland over shrubs and sedgeland on stony rises
 - Cleared

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Scale: 1:20,000
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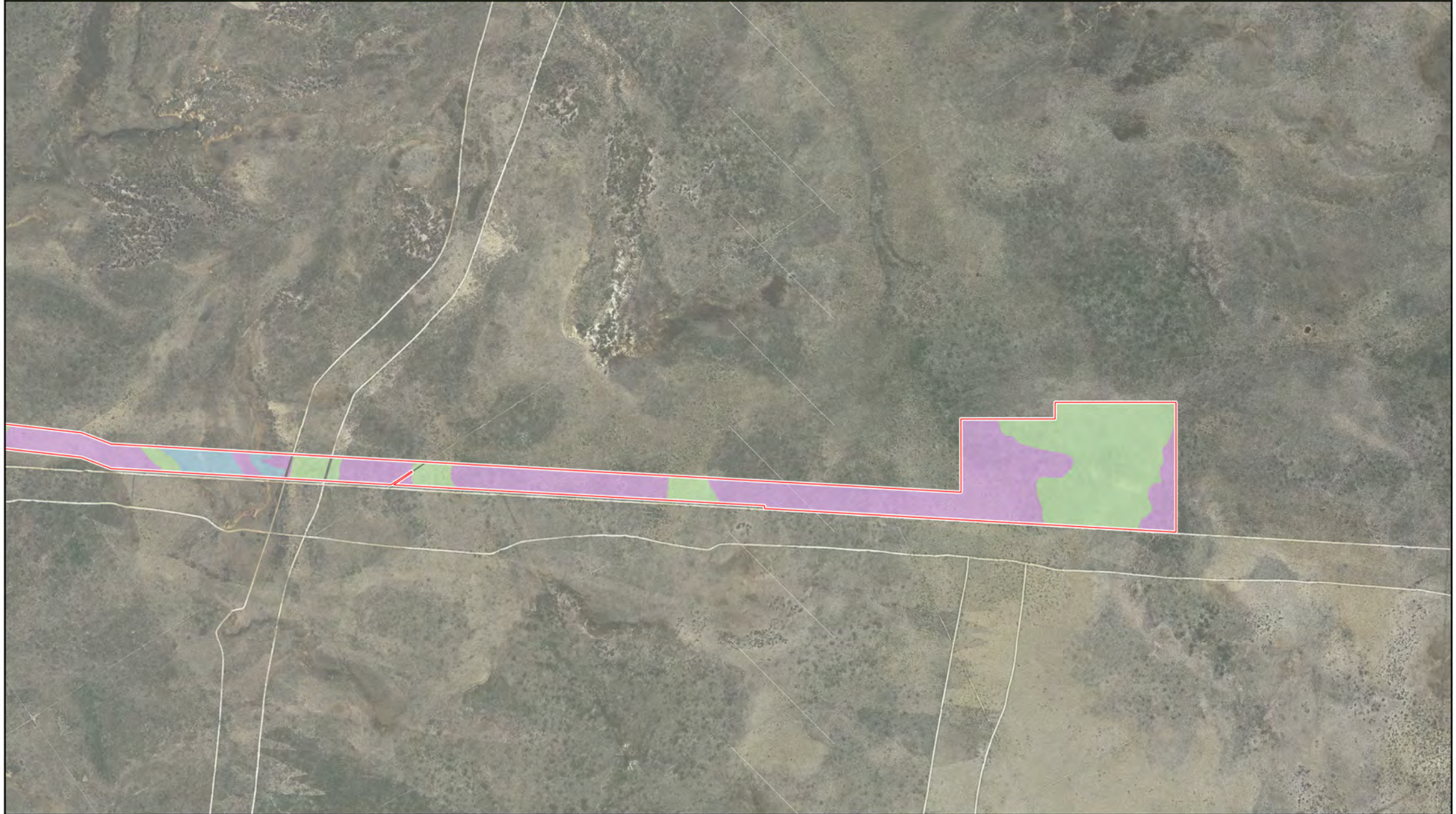


Legend

- Survey Footprint
- Fauna Habitat**
 - Fauna Habitat 1: *Allocasuarina campestris* tall sparse shrubland over shrubs and sedgeland on sandy plains
 - Fauna Habitat 2: *Banksia* spp. and occasional *Eucalyptus tottiana* mid open woodland over shrubs and sedgeland on sand plains
 - Fauna Habitat 3: *Allocasuarina campestris* tall sparse shrubland over shrubs and sedgeland on stony rises
 - Cleared

0 125 250 500
Metres
Scale: 1:20,000
Datum/Projection: GDA 1994 MGA Zone 50

Project: 20PER16294-GM Date: 15/10/2020



Legend

- Survey Footprint
- Fauna Habitat**
 - Fauna Habitat 1: *Allocasuarina campestris* tall sparse shrubland over shrubs and sedgeland on sandy plains
 - Fauna Habitat 2: *Banksia* spp. and occasional *Eucalyptus todtiana* mid open woodland over shrubs and sedgeland on sand plains
 - Fauna Habitat 3: *Allocasuarina campestris* tall sparse shrubland over shrubs and sedgeland on stony rises
 - Cleared

0 125 250 500
Metres
Scale: 1:20,000
Datum/Projection: GDA 1994 MGA Zone 50

Project: 20PER16294-GM Date: 15/10/2020

Figure 13: Carnaby's Cockatoo foraging habitat recorded in the survey area



Legend

 Survey Footprint	CBC Foraging Quality
	 Negligible
	 Low
	 Cleared


Scale: 1:20,000
Datum/Projection: GDA 1994 MGA Zone 50



Project: 20PER16294-GM Date: 16/11/2021



Figure 13: Carnaby's Cockatoo foraging habitat recorded in the survey area



Legend

 Survey Footprint	CBC Foraging Quality
 Negligible	
 Low	
 Cleared	



0 125 250 500
Metres

Scale: 1:20,000
Datum/Projection:
GDA 1994 MGA Zone 50

 N


A TETRA TECH COMPANY

Project: 20PER16294-GM Date: 16/11/2021

Figure 13: Carnaby's Cockatoo foraging habitat recorded in the survey area



Legend

Survey Footprint	CBC Foraging Quality
	Negligible
	Low
	Cleared



0 125 250 500
Metres
Scale: 1:20,000
Datum/Projection:
GDA 1994 MGA Zone 50

N

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4. Discussion and recommendations

4.1 Flora

A total of 167 taxa (165 native and one introduced) from 90 genera and 37 families were recorded within the survey area. Of these, 161 taxa were recorded from quadrats and five taxa were recorded from targeted and opportunistic collections. Average species richness per quadrat was 38.04 species, ranging from a low of 19 species at ELA12 to a high of 57 species at ELA02. Woodman (2013) recorded a range of species richness from 3 species to 47 species, demonstrating that the post fire regeneration for the current survey was very good. A species accumulation curve determined that approximately 88.93% of the flora species potentially present within the survey area were recorded, resulting in sufficient data to define and assess the presence, extent and significance of vegetation types within the survey area.

One Threatened flora species, *Paracaleana dixonii* (Endangered under the EPBC Act and Vulnerable under the BC Act) was recorded within the survey area from a database search and Woodman (2013). Eight flora species listed as Priority by DBCA were recorded within the survey area from the current field survey, including; *Micromyrtus rogeri* (P1), *Lasiopetalum ogilvieanum* (P1), *Guichenotia alba* (P3), *Mesomelaena stygia* subsp. *deflexa* (P3), *Stylidium drummondianum* (P3), *Banksia scabrella* (P4), *Eucalyptus macrocarpa* subsp. *elachantha* (P4), and *Stawellia dimorphantha* (P4).

Paracaleana dixonii is listed as Endangered under the EPBC Act and Vulnerable under the BC Act. Endangered species are taxa considered to be facing a very high risk of extinction in the wild. Vulnerable species are species considered to be facing a high risk of extinction in the wild in the medium-term future (Appendix A). *Paracaleana dixonii* is a tuberous, perennial herb of 0.09-0.2 m in the Orchidaceae family (DBCA and WAH 2020). It has yellow-brown flowers from October to December or January (DBCA and WAH 2020). This species is known from 74 records across a range of 190 km, from Dongara to Dandaragan (DBCA 2007-2020). It has previously been recorded from grey sand over granite (DBCA and WAH 2020).

A database search indicates that *Paracaleana dixonii* was recorded from one location (24 plants) in the current survey area in 2011. The species was recorded in the AcEbHh vegetation community, which is described as *Allocasuarina campestris* tall sparse shrubland over *Eremaea beaufortioides*, *Calothamnus quadrifidus* subsp. *angustifolius*, *Isopogon tridens* mid sparse shrubland over *Hibbertia hypericoides*, *Melaleuca leuropoma* low open shrubland and *Ecdeiocolea monostachya* low open sedgeland. *Paracaleana dixonii* was also recorded in Woodman (2013) from 174 locations, totalling 263 individuals. This species was recorded in vegetation type 7a, 7b, 8, 10, 11, 12 and 13a, which correspond to the AcEbHh, EtAhHh, AcDdMI and EtBaHh vegetation communities. Species such as *Paracaleana dixonii* are cryptic in nature and therefore although not recorded during the current survey, it's occurrence at this location cannot be completely discounted. In addition, it is recognised that factors such as the recent prescribed burn throughout the survey area may also influence this species emergence currently and in the future.

Micromyrtus rogeri is listed as P1 by DBCA. Priority 1 species are poorly known species that are known from one or a few locations (generally five or less) which are potentially at risk (Appendix A). *Micromyrtus rogeri* is a shrub of 0.2-0.4 m in the Myrtaceae family (DBCA and WAH 2020). It has white flowers from July to October (DBCA and WAH 2020). This species is currently known from 17 DBCA

records across a range of 175 km, from Dongara to Dandaragan (DBCA 2007-2020). It has previously been recorded from yellow-brown sandy soils, gravel, laterite, breakaways (DBCA and WAH 2020).

Within the survey area, *Micromyrtus rogeri* was recorded from 18-point locations, totalling 939 individuals. The species was recorded in the AcAhGp vegetation community, which is described as *Allocasuarina campestris* tall sparse shrubland over *Allocasuarina humilis*, *Hakea auriculata*, *Petrophile shuttleworthiana* mid open shrubland over *Gastrolobium plicatum* low open shrubland and *Ecdeiocolea monostachya*, *Schoenus armeria* low open sedgeland. *Micromyrtus rogeri* was also recorded in Woodman (2013) from 504 locations, totalling 17,174 individuals.

Lasiopetalum ogilvieanum is listed as P1 by DBCA. *Lasiopetalum ogilvieanum* is a shrub 0.45-1.5 m in the Malvaceae family (DBCA and WAH 2020). It has pink-white flowers from July to October (DBCA and WAH 2020). This species is currently known from 21 DBCA records across a range of 85 km, north and south of Dongara (DBCA 2007-2020). It has previously been recorded from white/grey or yellow sand, stony loam on undulating plains, lateritic rises (DBCA and WAH 2020).

Within the survey area, *Lasiopetalum ogilvieanum* was recorded from 21-point locations, totalling 100 individuals. The species was recorded in the EtAhHh vegetation community, which is described as *Eucalyptus todtiana* mid open woodland over *Allocasuarina humilis*, *Banksia scabrella* (P4), *Calothamnus sanguineus* mid open shrubland over *Hibbertia hypericoides*, *Melaleuca leuropoma* low open shrubland and *Caustis dioica* low open sedgeland. *Lasiopetalum ogilvieanum* was also recorded in Woodman (2013) from 26 locations, totalling 113 individuals.

Guichenotia alba is listed as P3 by DBCA. Priority 3 species are poorly-known 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 (Appendix A). *Guichenotia alba* is a slender, few-branched shrub 0.1-0.45 m in the Malvaceae family (DBCA and WAH 2020). It has white flowers from July to August (DBCA and WAH 2020). This species is currently known from 38 DBCA records across a range of 170 km from Dongara south (DBCA 2007-2020). It has previously been recorded from sandy and gravelly soils on low-lying flats (DBCA and WAH 2020).

Within the survey area, *Guichenotia alba* was recorded from 63-point locations, totalling 607 individuals. The species was recorded in the AcEbHh vegetation community, which is described as *Allocasuarina campestris* tall sparse shrubland over *Eremaea beaufortoides*, *Calothamnus quadrifidus* subsp. *angustifolius*, *Isopogon tridens* mid sparse shrubland over *Hibbertia hypericoides*, *Melaleuca leuropoma* low open shrubland and *Ecdeiocolea monostachya* low open sedgeland. *Guichenotia alba* was not recorded in Woodman (2013).

Mesomelaena stygia* subsp. *deflexa is listed as P3 by DBCA. *Mesomelaena stygia* subsp. *deflexa* is a tufted perennial grass-like or herb (sedge) 0.1-0.5 m in the Cyperaceae family (DBCA and WAH 2020). It has brown-black flowers March to October (DBCA and WAH 2020). This species is currently known from 29 DBCA records across a range of 70 km from Dongara south (DBCA 2007-2020). It has previously been recorded from white, grey or lateritic sand, clay, gravel (DBCA and WAH 2020).

Within the survey area, *Mesomelaena stygia* subsp. *deflexa* was recorded from 55-point locations, totalling 4,648 individuals. The species was recorded in the EtAhHh vegetation community, which is

described as *Eucalyptus todtiana* mid open woodland over *Allocasuarina humilis*, *Banksia scabrella* (P4), *Calothamnus sanguineus* mid open shrubland over *Hibbertia hypericoides*, *Melaleuca leuropoma* low open shrubland and *Caustis dioica* low open sedgeland. *Mesomelaena stygia* subsp. *deflexa* was also recorded in Woodman (2013) from 514 locations, totalling 21,527 individuals.

Stylidium drummondianum is listed as P3 by DBCA. *Stylidium drummondianum* is a rosetted perennial herb 0.05-0.22 m in the Stylidiaceae family (DBCA and WAH 2020). It has pink flowers August to October (DBCA and WAH 2020). This species is currently known from 40 DBCA records across a range of 175 km from Geraldton to Dongara (DBCA 2007-2020). It has previously been recorded from sand or clayey sand over laterite on upper hillslopes, breakaways in low heath, mallee shrubland (DBCA and WAH 2020).

Withing the survey area, *Stylidium drummondianum* was recorded from 10-point locations, totalling 54 individuals. The species was recorded in the EtAhHh, AcAhGp and AcEbHh vegetation communities. *Stylidium drummondianum* was also recorded in Woodman (2013) from 433 locations, totalling 9,294 individuals.

Banksia scabrella is listed as P4 by DBCA. Priority 4 species are described as Rare, Near Threatened and other species in need of monitoring (Appendix A). *Banksia scabrella* is a much branched, lignotuberous shrub 0.6-2 m in the Proteaceae family (DBCA and WAH 2020). It has yellow and cream flowers from September to December or January (DBCA and WAH 2020). This species is known from 53 DBCA records across a range of 110 km from Geraldton to Dongara (DBCA 2007-2020). It has previously been recorded from white, grey or yellow sand, sometimes with lateritic gravel, on sandplains and lateritic ridges (DBCA and WAH 2020).

Withing the survey area, *Banksia scabrella* was recorded from 485-point locations, totalling 10,776 individuals. The species was recorded in the EtAhHh vegetation community, which is described as *Eucalyptus todtiana* mid open woodland over *Allocasuarina humilis*, *Banksia scabrella* (P4), *Calothamnus sanguineus* mid open shrubland over *Hibbertia hypericoides*, *Melaleuca leuropoma* low open shrubland and *Caustis dioica* low open sedgeland. *Banksia scabrella* was also recorded in Woodman (2013) from 463 locations, totalling 7,668 individuals.

Eucalyptus macrocarpa* subsp. *elachantha is listed as P4 by DBCA. *Eucalyptus macrocarpa* subsp. *elachantha* is a spreading or sprawling mallee 0.8-4 m in the Myrtaceae family (DBCA and WAH 2020). It has smooth bark, grey over salmon pink, and red-pink flowers from August to September or November to December (DBCA and WAH 2020). This species is known from 73 DBCA records across a range of 230 km south of Geraldton to south of Dongara (DBCA 2007-2020). It has previously been recorded from white or grey sand over laterite on hillslopes, ridges and sandplains (DBCA and WAH 2020).

Within the survey area, *Eucalyptus macrocarpa* subsp. *elachantha* was recorded from one-point location, totalling ten individuals. The species was recorded in the AcEbHh vegetation community, which is described as *Allocasuarina campestris* tall sparse shrubland over *Eremaea beaufortioides*, *Calothamnus quadrifidus* subsp. *angustifolius*, *Isopogon tridens* mid sparse shrubland over *Hibbertia hypericoides*, *Melaleuca leuropoma* low open shrubland and *Ecdeiocolea monostachya* low open sedgeland. *Eucalyptus macrocarpa* subsp. *elachantha* was also recorded in Woodman (2013) from 121 locations, totalling 1,310 individuals.

Stawellia dimorphantha is listed as P4 by DBCA. *Stawellia dimorphantha* is a stilt-rooted perennial herb 0.05-0.2 m in the Hemerocallidaceae family (DBCA and WAH 2020). It has purple/cream flowers from June to November (DBCA and WAH 2020). This species is known from 67 DBCA records across a range of 90 km north and south of Dongara (DBCA 2007-2020). It has previously been recorded from white, grey and yellow sand (DBCA and WAH 2020).

Within the survey area, *Stawellia dimorphantha* was recorded from 45-point locations, totalling 298 individuals. The species was recorded in the AcDdMI vegetation community, which is described as *Allocasuarina campestris* tall isolated shrubs over *Daviesia divaricata*, *Conospermum boreale*, *Beaufortia elegans* mid open shrubland over *Melaleuca leuropoma*, *Hibbertia hypericoides* low open shrub over *Ecdeiocolea monostachya* low open sedgeland. *Stawellia dimorphantha* was not recorded in Woodman (2013).

A further 53 species were identified from the likelihood of occurrence assessment as possibly occurring within the survey area. Of these, 11 species were considered as likely to occur, and 25 considered as having the potential to occur, based on the species habitat preferences and proximity of records to the survey area. The remaining 17 species are considered unlikely to occur (Appendix C).

One introduced (weed) flora species was recorded as occurring within the survey area, *Hypochaeris glabra*. This species is not listed as a Weed of National Significance (WoNS) or Declared Pest under the State BAM Act, and is listed on the Western Australian Organism List (WAOL) database as s11 (permitted). This species was recorded at a low density (0.01%) within the AcEbHh, EtAhHh and EtBaHh vegetation communities from within quadrats ELA01, ELA08, ELA14, ELA21, ELA24. It is likely this weed is being spread within the survey area via the movement of cattle and other introduced fauna species.

4.2 Vegetation

A total of six vegetation communities were delineated and mapped across the survey area. The most widespread vegetation community was AcEbHh, which occurred across 34.02% (72.2 ha) of the survey area. The least common vegetation community was AcAhGp, which occurred across 2.59% (5.5 ha) of the survey area. Vegetation communities within the survey area are not inferred to represent any known TECs or PECs listed under the EPBC Act, BC Act or by DBCA. This is supported by Woodman (2013) which also found no conservation significant communities across a larger area.

At a regional scale, the percentage impact to Beard (1976) vegetation associations (49, 378 and 379) and land systems (Mount Adams and Correy) as a result of the project is low (DPIRD 2020). Each of these land systems is well represented across the broader landscape, with the survey area representing a small percentage of the current extent of each (0.2% and 0.1% respectively). At a local scale, impacts to individual communities as a result of the project is also low. Of particular note is vegetation community EtAhHh which comprises *Banksia scabrella* as the main component. This community is similar to Woodman (2013) mapped VT 13a, of which 1,740.14 ha was mapped. Therefore, it is unlikely that the proposed pipeline would appreciably reduce the representativeness of either vegetation associations in the local area or indeed at a regional scale.

Vegetation within the survey area was classed as being in Excellent condition (208.7 ha; 98.35%), with a total of 3.5 ha (1.65% of the survey area) classed as Cleared. Minor disturbances included minimal presence of weeds and feral fauna (rabbit diggings, scats).

The recent fire has altered the structural elements of vegetation communities present within the survey area. A strong post-fire recovery was observed, with the majority of flora species expected to occur being present. However, their relative dominance and strata position is slightly different to what would otherwise be expected in an unburnt or indeed longer time since fire environment. In addition, flora species with more rapid post-fire recovery strategies were naturally more dominant than those which take longer to re-establish. For example, species such as *Grevillea biformis* subsp. *biformis* and *Conostylis* spp. were present during the current survey, however in other previous surveys, these were not considered dominant components of the vegetation. Therefore, other vegetation community mapping work undertaken in the general vicinity of the survey area (Woodman 2013) shows similarities but does not reflect these descriptions entirely.

4.3 Fauna

A total of 35 fauna species (31 native and four introduced) were recorded within the survey area. This number comprised 28 bird species, five mammal species and two reptile species. Of these, four mammal species are introduced; Cattle (*Bos taurus*), domestic Dog (*Canis lupus familiaris*), Goat (*Capra hircus*) and European Rabbit (*Oryctolagus cuniculus*).

A total of four fauna habitats were identified within the survey area. The most commonly occurring fauna habitat was Fauna habitat 2: *Banksia* spp. and occasional *Eucalyptus todtiana* mid open woodland over shrubs and sedgeland on sandy plains (89.5 ha; 44.15% of the survey area). Fauna habitat 3: *Allocasuarina campestris* tall sparse shrubland over shrubs and sedgeland on stony rises (40.8 ha; 20.13% of the survey area) was found to be the least common fauna habitat type occurring within the survey area.

No direct (observations) or indirect (scats, tracks, diggings) evidence of conservation significant fauna species were recorded within the survey area. Of the 46 fauna species identified from the desktop assessment as possibly occurring within the survey area, four species were considered having the potential to occur; Carnaby's Cockatoo (*Calyptorhynchus latirostris*; listed as EN under the EPBC Act and BC Act), Fork-tailed Swift (*Apus pacificus*; listed as MI under the EPBC Act and BC Act), Grey Falcon (*Falco hypoleucos*; listed as VU under the BC Act) and Peregrine Falcon (*Falco peregrinus*; listed as OS under the BC Act). Each of these species has a diverse and wide range of habitats, including those which occur within the survey area. The remaining 42 species were considered unlikely to occur (Appendix D).

The Fork-tailed Swift (*Apus pacificus*), Grey Falcon (*Falco hypoleucos*) and Peregrine Falcon (*Falco peregrinus*) have a diverse and wide range of habitats, including those which occur within the survey area (e.g. grassland). However, these species are not considered likely to occur within the survey area due to lack of access to appropriate nesting habitat, water and preferred prey species.

No individuals of Carnaby's Cockatoo were recorded within the survey area. No potential or confirmed breeding or roosting trees were recorded as occurring within the survey area. The survey area is in the non-breeding range of the Carnaby's Cockatoo (*Calyptorhynchus latirostris*), however Fauna habitat 2, totalling 95.2 ha (44.86% of the survey area), was assessed as providing 'Low' quality foraging habitat due to the presence of *Banksia* spp. and *Hakea* spp. (Table 3; SEWPac 2012; DotEE 2017). The recent fire has decreased the likelihood of the species utilising the survey area in the immediate future; however, *Banksia* spp. and *Hakea* spp. are predicted to increase in density quality and structural complexity over time. The remaining vegetated areas (113.6 ha, 53.53%) are considered as providing

'Negligible' quality foraging habitat of Carnaby's Cockatoo. Cleared areas (3.4 ha, 1.6%) provide 'Nil' quality foraging habitat for black cockatoo species. No foraging evidence was observed within the survey area.

Whilst the Malleefowl (*Leipoa ocellata*) was targeted in the survey area (Section 2.2.5), the habitat is not considered suitable for the species due to the lack of leaf litter and thicker vegetation. The recent fire has also decreased the likelihood of the species, as the effect of fire on Malleefowl is severe, with breeding in burnt areas usually reduced for at least 30 years (Benshemesh 2007).

The survey area broadly comprised a mixture of *Allocasuarina* shrubland, and *Banksia* or *Eucalyptus todtiana* woodland. Habitat within the survey area is unlikely to support conservation significant fauna species, except potentially low-quality foraging habitat for the Carnaby's Cockatoo (*Calyptorhynchus latirostris*). Based on results of the fauna survey and fauna values identified within the survey area, it is unlikely that the proposed pipeline would appreciably reduce or impact the representativeness of individual species or supporting habitat within the local area or across the broader landscape.

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Appendix A Framework for conservation significant flora and fauna ranking

CATEGORIES OF THREATENED SPECIES UNDER THE ENVIRONMENT PROTECTION AND BIODIVERSITY CONSERVATION ACT 1999 (EPBC ACT)

Threatened fauna and flora may be listed in any one of the following categories as defined in Section 179 of the EPBC Act. Species listed as 'conservation dependent' and 'extinct' are not Matters of National Environmental Significance and therefore do not trigger the EPBC Act.

Category	Definition
Extinct (EX)	There is no reasonable doubt that the last member of the species has died.
Extinct in the Wild (EW)	Taxa known to survive only in captivity or as a naturalised population well outside its past range; or taxa has not been recorded in its known and/or expected habitat at appropriate seasons, anywhere in its past range, despite exhaustive surveys over a time frame appropriate to its life cycle and form.
Critically Endangered (CE)	Taxa considered to be facing an extremely high risk of extinction in the wild.
Endangered (EN)	Taxa considered to be facing a very high risk of extinction in the wild.
Vulnerable (VU)	Taxa considered to be facing a high risk of extinction in the wild.
Near Threatened (NT)	Taxa has been evaluated against the criteria but does not qualify for Critically Endangered, Endangered or Vulnerable now, but is close to qualifying for or is likely to qualify for a threatened category in the near future.
Least Concern (LC)	Taxa has been evaluated against the criteria and does not qualify for Critically Endangered, Endangered, Vulnerable or Near Threatened. Widespread and abundant taxa are included in this category.
Data Deficient (DD)	There is inadequate information to make a direct, or indirect, assessment of taxa's risk extinction based on its distribution and/or population status.
Not Evaluated (NE)	Taxa has not yet been evaluated against the criteria.
Migratory (MI)	Not an IUCN category. Species are defined as migratory if they are listed in an international agreement approved by the Commonwealth Environment Minister, including: <ul style="list-style-type: none"> • the Bonn Convention (Convention on the Conservation of Migratory Species of Wild Animal) for which Australia is a range state; • the agreement between the Government of Australian and the Government of the People's Republic of China for the Protection of Migratory Birds and their environment (CAMBA); • the agreement between the Government of Japan and the Government of Australia for the Protection of Migratory Birds and Birds in Danger of Extinction and their Environment (JAMBA); or • the agreement between Australia and the Republic of Korea to develop a bilateral migratory bird agreement similar to the JAMBA and CAMBA in respect to migratory bird conservation and provides a basis for collaboration on the protection of migratory shorebirds and their habitat (ROKAMBA).

CONSERVATION CODES FOR WESTERN AUSTRALIA FLORA AND FAUNA

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

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.

Threatened species (T)

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

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

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

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

Category	Code	Description
Critically Endangered species	CR	Threatened species considered to be “facing an extremely high risk of extinction in the wild in the immediate future, as determined in accordance with criteria set out in the ministerial guidelines”. Listed as critically endangered under section 19(1)(a) of the BC Act in accordance with the criteria set out in section 20 and the ministerial guidelines. Published under schedule 1 of the Wildlife Conservation (Specially Protected Fauna) Notice 2018 for critically endangered fauna or the Wildlife Conservation (Rare Flora) Notice 2018 for critically endangered flora.
Endangered species	EN	Threatened species considered to be “facing a very high risk of extinction in the wild in the near future, as determined in accordance with criteria set out in the ministerial guidelines”. Listed as endangered under section 19(1)(b) of the BC Act in accordance with the criteria set out in section 21 and the ministerial guidelines. Published under schedule 2 of the Wildlife Conservation (Specially Protected Fauna) Notice 2018 for endangered fauna or the Wildlife Conservation (Rare Flora) Notice 2018 for endangered flora.

Category	Code	Description
Vulnerable species	VU	Threatened species considered to be “facing a high risk of extinction in the wild in the medium-term future, as determined in accordance with criteria set out in the ministerial guidelines”. Listed as vulnerable under section 19(1)(c) of the BC Act in accordance with the criteria set out in section 22 and the ministerial guidelines. Published under schedule 3 of the Wildlife Conservation (Specially Protected Fauna) Notice 2018 for vulnerable fauna or the Wildlife Conservation (Rare Flora) Notice 2018 for vulnerable flora.

Extinct species

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

Category	Code	Description
Extinct species	EX	Species which have been adequately searched for and there is no reasonable doubt that the last individual has died. Published as Specially Protected under the Wildlife Conservation Act 1950, in Schedule 4 of the Wildlife Conservation (Specially Protected Fauna) Notice for Presumed Extinct Fauna and Wildlife Conservation (Rare Flora) Notice for Presumed Extinct Flora.
Extinct in the wild species	EW	Species that “is known only to survive in cultivation, in captivity or as a naturalised population well outside its past range; and it has not been recorded in its known habitat or expected habitat, at appropriate seasons, anywhere in its past range, despite surveys over a time frame appropriate to its life cycle and form”, and listing is otherwise in accordance with the ministerial guidelines (section 25 of the BC Act). Currently there are no threatened fauna or threatened flora species listed as extinct in the wild. If listing of a species as extinct in the wild occurs, then a schedule will be added to the applicable notice.

Specially protected species

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

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

Categories are detailed below.

Category	Code	Description
Migratory species	MI	<p>Fauna that periodically or occasionally visit Australia or an external Territory or the exclusive economic zone; or the species is subject of an international agreement that relates to the protection of migratory species and that binds the Commonwealth; and listing is otherwise in accordance with the ministerial guidelines (section 15 of the BC Act).</p> <p>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.</p> <p>Published as migratory birds protected under an international agreement under schedule 5 of the Wildlife Conservation (Specially Protected Fauna) Notice 2018.</p>
Species of special conservation interest (conservation dependent fauna)	CD	<p>Fauna of special conservation need being species dependent on ongoing conservation intervention to prevent it becoming eligible for listing as threatened, and listing is otherwise in accordance with the ministerial guidelines (section 14 of the BC Act).</p> <p>Published as conservation dependent fauna under schedule 6 of the Wildlife Conservation (Specially Protected Fauna) Notice 2018.</p>
Other specially protected species	OS	<p>Fauna otherwise in need of special protection to ensure their conservation, and listing is otherwise in accordance with the ministerial guidelines (section 18 of the BC Act).</p> <p>Published as other specially protected fauna under schedule 7 of the Wildlife Conservation (Specially Protected Fauna) Notice 2018.</p>

Priority species (P)

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

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

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

Category	Code	Definition
Priority 1	P1	<p><i>Poorly-known species</i></p> <p>Species that are known from one or a few locations (generally five or less) which are potentially at risk. All occurrences are either: very small; or on lands not managed for conservation, e.g. agricultural or pastoral lands, urban areas, road and rail reserves, gravel reserves and active mineral leases; or otherwise under threat of habitat destruction or degradation. Species may be included if they are comparatively well known from one or more locations but do not meet adequacy of survey requirements and appear to be under immediate threat from known threatening processes. Such species are in urgent need of further survey.</p>
Priority 2	P2	<p><i>Poorly-known species</i></p> <p>Species that are known from one or a few locations (generally five or less), some of which are on lands managed primarily for nature conservation, e.g. national parks, conservation parks, nature reserves and other lands with secure tenure being managed for conservation. Species may be included if they are comparatively well known from one or more locations but do not meet adequacy of survey requirements and appear to be under threat from known threatening processes. Such species are in urgent need of further survey.</p>
Priority 3	P3	<p><i>Poorly-known species</i></p> <p>Species that are known from several locations, and the species does not appear to be under imminent threat, or from few but widespread locations with either large population size or significant remaining areas of apparently suitable habitat, much of it not under imminent threat. Species may be included if they are comparatively well known from several locations but do not meet adequacy of survey requirements and known threatening processes exist that could affect them. Such species are in need of further survey.</p>
Priority 4	P4	<p><i>Rare, Near Threatened and other species in need of monitoring</i></p> <p>(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.</p> <p>(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.</p> <p>(c) Species that have been removed from the list of threatened species during the past five years for reasons other than taxonomy.</p>

Appendix B Likelihood of occurrence assessment criteria

Likelihood rating	Criteria
Recorded	The species has previously been recorded within survey area from DBCA database search results and/or from previous surveys of the survey area, and/or the species has been confirmed through a current vouchered specimen at WA Herbarium.
Likely	<p>The species has not previously been recorded from within the survey area. However, (to qualify requires one or more criteria to be met):</p> <ul style="list-style-type: none"> the species has been recorded in close proximity to the survey area, and occurs in similar habitat to that which occurs within the survey area core habitat and suitable landforms for the species occurs within the survey area either year-round or seasonally. In relation to fauna species, this could be that a host plant is seasonally present on site, or habitat features such as caves are present that may be used during particular times during its life cycle e.g. for breeding. In relation to both flora and fauna species, it may be there are seasonal wetlands present there is a medium to high probability that a species uses the survey area.
Potential	<p>The species has not previously been recorded from within the survey area. However, (one or more criteria requires to be met):</p> <ul style="list-style-type: none"> targeted surveys may locate the species based on records occurring in proximity to the survey area and suitable habitat occurring in the survey area the survey area has been assessed as having potentially suitable habitat through habitat modelling the species is known to be cryptic and may not have been detected despite extensive surveys the species is highly mobile and has an extensive foraging range so may not have been detected during previous surveys <p>The species has been recorded in the survey area by a previous consultant survey or there is historic evidence of species occurrence within the survey area. However, (one or more criteria requires to be met):</p> <ul style="list-style-type: none"> doubt remains over taxonomic identification, or the majority of habitat does not appear suitable (although presence cannot be ruled out due to factors such as species ecology or distribution) coordinates are doubtful.
Unlikely	<p>The species has been recorded locally through DBCA database searches. However, it has not been recorded within the survey area and</p> <ul style="list-style-type: none"> it is unlikely to occur due to the site lacking critical habitat, having at best marginally suitable habitat, and/or being severely degraded it is unlikely to occur due to few historic record/s and no other current collections in the local area. <p>The species has been recorded within the bioregion based on literature review but has not been recorded locally or within the survey area through DBCA database searches.</p> <p>The species has not been recorded in the survey area despite adequate survey efforts, such as a standardised methodology or targeted searching within potentially suitable habitat.</p>

Likelihood rating	Criteria
Does not occur (one or more criteria requires to be met).	<p>The species is not known to occur within the IBRA bioregion based on current literature and distribution.</p> <p>The conspicuous species has not been recorded in the survey area despite adequate survey efforts at an appropriate time of year to detect the species within potentially suitable habitat.</p> <p>The survey area lacks important habitat for a species that has highly selective habitat requirements.</p> <p>The species has been historically recorded within survey area or locally; however, it is considered locally extinct due to significant habitat changes such as land clearing and/or introduced predators.</p>

Appendix C Flora likelihood of occurrence assessment

Species	Conservation status		Habitat ¹	Source ²	Likelihood of occurrence	Justification for likelihood
	EPBC Act	BC Act / DBCA listing				
<i>Chorizema humile</i>	EN	CR	Sprawling, prostrate or decumbent shrub. Fl. yellow & red/brown, Jul to Sep. Sandy clay or loam. Plains.	DAWE 2020a	Potential	Some suitable habitat within the survey area.
<i>Eucalyptus impensa</i>	EN	CR	Straggly mallee, to 1.5 m high, bark smooth. Fl. pink, Jun to Jul. Yellow sand. Lateritic hills.	DAWE 2020a	Unlikely	Some suitable habitat within the survey area, however conspicuous species would have been observed if present.
<i>Eucalyptus balanites</i>	x EN	CR	Mallee to 5 m high, bark rough, flaky. Fl. white, Oct to Dec or Jan to Feb. Sandy soils with lateritic gravel.	Mattiske 2020	Unlikely	Some suitable habitat within the survey area, however conspicuous species would have been observed if present.
<i>Hemiandra gardneri</i>	EN	CR	Prostrate, pungent shrub, 0.1-0.2 m high, to 1 m wide. Fl. red/pink-red, Aug to Oct. Grey or yellow sand, clayey sand. Sandplains.	DAWE 2020a	Potential	Some suitable habitat within the survey area.
<i>Daviesia speciosa</i>	EN	EN	Many-stemmed shrub, 0.3-0.8 m high. Fl. red, Apr to May. Gravelly lateritic soils. Undulating plains, rises.	DAWE 2020a; DBCA 2020a	Unlikely	Appears to be locally restricted, but abundant when it occurs. Conspicuous species would have been observed if present.
<i>Eucalyptus leprophloia</i>	EN	EN	Mallee, 2-5(-8) m high, bark rough loose & flaky to 1 m. Fl. cream-white, Aug to Oct. White or grey sand over laterite. Valley slopes.	DBCA 2007-2020; DAWE 2020a; DBCA 2020a	Unlikely	A few records surrounding the survey area (DBCA 2020a). Also recorded from Woodman (2013). Suitable habitat within the survey area, however conspicuous species would have been observed if present.
<i>Leucopogon obtectus</i>	EN	EN	Erect shrub, 0.5-1.7 m high, cream-yellow, August to October, Grey sand.	DAWE 2020a	Potential	Suitable habitat within the survey area.
<i>Thelymitra stellata</i>	EN	EN	Tuberous, perennial, herb, 0.15-0.25 m high. Fl. yellow & brown, Oct to Nov. Sand, gravel, lateritic loam.	DAWE 2020a; DBCA 2020a	Potential	A few records surrounding the survey area (DBCA 2020a). Also recorded from Woodman (2013). Suitable habitat within the survey area.

Species	Conservation status		Habitat ¹	Source ²	Likelihood of occurrence	Justification for likelihood
	EPBC Act	BC Act / DBCA listing				
<i>Conostylis dielsii</i> subsp. <i>teres</i>	EN	VU	Shortly rhizomatous, tufted perennial, grass-like or herb, 0.13-0.33 m high, leaves terete. Fl. cream-yellow, Jul to Aug. White, grey or yellow sand, gravel. Low open woodland.	DAWE 2020a	Unlikely	No suitable habitat within the survey area.
<i>Conostylis micrantha</i>	EN	VU	Rhizomatous, tufted perennial, grass-like or herb, 0.13-0.24 m high. Fl. yellow-cream/red, Jul to Aug. White or grey sand. Sandplains.	DAWE 2020a	Potential	Some suitable habitat within the survey area.
<i>Hakea megalosperma</i>	EN	VU	Spreading, lignotuberous shrub, 1-2 m high. Fl. white-cream/pink, May to Jun. Grey sand, loam. Lateritic hills & rocks.	DAWE 2020a	Unlikely	Marginal habitat within the survey area. Conspicuous species would have been observed if present
<i>Paracaleana dixonii</i>	EN	VU	Tuberous, perennial, herb, 0.09-0.2 m high. Fl. yellow-brown, Oct to Dec or Jan. Grey sand over granite.	DBCA 2007-2020; DAWE 2020a; DBCA 2020a	Likely	One record from within the survey area from 2011 and multiple records surrounding the survey area (DBCA 2020a). Also recorded from Woodman (2013). Suitable habitat within the survey area.
<i>Wurmbea tubulosa</i>	EN	VU	Cormous, perennial, herb, 0.01-0.03 m high, dioecious or sometimes andromonoecious. Fl. white-pink, Jun to Aug. Clay, loam. River banks, seasonally-wet places.	DAWE 2020a	Unlikely	No suitable habitat within the survey area.
<i>Eucalyptus crispata</i>	VU	EN	Mallee, 3-7 m high, bark rough on the trunk, in partly decorticated curls. Fl. yellow-cream, Mar to Jun. Sand, loam with lateritic gravel. Lateritic breakaways.	DAWE 2020a; DBCA 2020a	unlikely	One record 1.5 km to the east of the survey area (DBCA 2020a). Also recorded from Woodman (2013). Suitable habitat within the survey area. Conspicuous species would have been observed if present
<i>Drosera pedicellaris</i>	-	P1	Fibrous-rooted perennial, herb, to 0.15 m high. Fl. white, Oct to Nov. Deep beige sand.	DBCA 2020a	Unlikely	One record 11 km south-west of the survey area, towards the coast (DBCA 2020a). No suitable habitat within the survey area.
<i>Lasiopetalum ogilvieanum</i>	-	P1	Shrub, 0.45-1.5 m high. Fl. pink-white, Jul to Oct. White/grey or yellow sand, stony loam. Undulating plains, lateritic rises.	DBCA 2007-2020; DBCA 2020a	Recorded	Species was recorded within the survey area.

Species	Conservation status		Habitat ¹	Source ²	Likelihood of occurrence	Justification for likelihood
	EPBC Act	BC Act / DBCA listing				
<i>Malleostemon decipiens</i>	-	P1	Grows on sandy soils.	DBCA 2020a	Potential	One record 4.5 km north of the survey area (DBCA 2020a). Also recorded from Woodman (2013). Some suitable habitat within the survey area.
<i>Micromyrtus rogeri</i>	-	P1	Shrub, 0.2-0.4 m high. Fl. white, Jul to Oct. Yellow-brown sandy soils, gravel, laterite. Breakaways.	DBCA 2007-2020; DBCA 2020a	Recorded	Species was recorded within the survey area
<i>Stylidium carnosum</i> subsp. Narrow leaves (J.A. Wege 490)	-	P1	Cormaceous perennial, herb (with basal leaf rosette), to 1 m high. Fl. white, Oct to Nov. Lateritic soils.	DBCA 2020a	Unlikely	One records 9.5 km south of the survey area (DBCA 2020a). No suitable habitat within the survey area.
<i>Verticordia dasystylis</i> subsp. <i>oestopoa</i>	-	P1	Spreading shrub, 0.1-0.4 m high. Fl. cream-yellow, Oct. Gritty soils over granite. Outcrops.	DBCA 2020a	Unlikely	One record 11 km south-east of the survey area on outcrops (DBCA 2020a). No suitable habitat within the survey area.
<i>Acacia vittata</i>	-	P2	Dense, rounded shrub, 1-4 m high. Fl. yellow, Aug. Grey sand, sandy clay. Margins of seasonal lakes.	DBCA 2020a	Unlikely	One record 8 km south of the survey area in 2006 (DBCA 2020a). No seasonal lakes in the survey area.
<i>Calectasia palustris</i>	-	P2	Stilt-rooted herb (undershrub), stems to 0.7 m high. Fl. blue, Jul to Oct. White or grey sand. Seasonally inundated swamplands.	DBCA 2020a	Unlikely	One record 8 km south of the survey area in 2007 (DBCA 2020a). No inundated swamplands in the survey area.
<i>Comesperma griffinii</i>	-	P2	Annual or perennial, herb, to 0.15 m high. Fl. white, Oct. Yellow or grey sand. Plains.	DBCA 2020a	Potential	Multiple records surrounding the survey area (DBCA 2020a). Some suitable habitat within the survey area.
<i>Eucalyptus abdita</i>	-	P2	Mallee or shrub, 2-3 m high, bark smooth, grey. Laterite, sandy clay with gravel over laterite. Slopes, breakaways.	DBCA 2020a	Potential	Records to the east of the survey area (DBCA 2020a). Also recorded from Woodman (2013). Suitable habitat within the survey area.

Species	Conservation status		Habitat ¹	Source ²	Likelihood of occurrence	Justification for likelihood
	EPBC Act	BC Act / DBCA listing				
<i>Homalocalyx chapmanii</i>	-	P2	Shrub, 0.2-0.5 m high. Fl. red-pink-purple, Sep to Oct. Yellow or grey/brown sand. Undulating plains, weathered granite.	DBCA 2020a	Unlikely	One record 6.5 km south-east of the survey area, between the two watercourses of Arrowsmith River (DBCA 2020a).
<i>Schoenus badius</i>	-	P2	Slender annual, grass-like or herb (sedge), 0.05-0.12 m high. Fl. brown-green, Sep to Oct. Grey sand. Moist areas.	DBCA 2020a	Unlikely	Multiple records surrounding the survey area but in moist areas (DBCA 2020a). Also recorded from Woodman (2013). No suitable habitat within the survey area.
<i>Synaphea sparsiflora</i>	-	P2	Shrub, to 0.6 m high, to 1 m wide. Fl. yellow, Aug to Sep. Sandy loam over laterite.	DBCA 2020a	Potential	Two records 7 km east of the survey area (DBCA 2020a). Some suitable habitat within the survey area.
<i>Stylidium pseudocaespitosum</i>	-	P2	Rosetted perennial, herb, 0.1-0.3 m high, leaves tufted, linear, 2-7 cm long, 0.5-2 mm wide, apex subacute, margin entire, scabrous. Scape glabrous. Inflorescence racemose. Fl. yellow, Sep to Nov. White, grey or yellow sand over laterite. Breakaways and hillslopes.	DBCA 2007-2020; DBCA 2020a	Potential	One record 1.5 km south of the survey area, on top of a lateritic breakaway (DBCA 2020a). Also recorded from Woodman (2013). Some suitable habitat within the survey area.
<i>Stylidium</i> sp. Three Springs (J.A. Wege & C. Wilkins JAW 600)	-	P2		DBCA 2020a	Unlikely	One record 12 km south of the survey area, in breakaway country (DBCA 2020a). No suitable habitat within the survey area.
<i>Acacia lanceolata</i>	-	P3	Open, pungent shrub, 0.3-1.2(-1.5) m high. Fl. yellow. Lateritic hills & breakaways.	DBCA 2020a	Unlikely	One record 3.6 km north of the survey area, on top of a lateritic breakaway (DBCA 2020a). No suitable habitat within the survey area.
<i>Allocasuarina grevilleoides</i>	-	P3	Dioecious, lignotuberous shrub, 0.15-0.4 m high. Sand over laterite, gravel.	DBCA 2020a	Potential	One record 5 km south-east of the survey area (DBCA 2020a). Also recorded from Woodman (2013). Suitable habitat within the survey area.
<i>Austrostipa</i> sp. Cairn Hill (A.S. George 11249)	-	P3	Perennial grass to 50 cm with pubescent leaves. Simple slope, grey light clay soil with <2% of limestone coarse fragments up to 20 mm.	DBCA 2020a	Unlikely	No suitable habitat within the survey area.

Species	Conservation status		Habitat ¹	Source ²	Likelihood of occurrence	Justification for likelihood
	EPBC Act	BC Act / DBCA listing				
<i>Baeckea</i> sp. Walkaway (A.S. George 11249)	-	P3	Dense, multi-stemmed shrub, 0.5-2 m high. Fl. white, Dec or Jan. Yellow/brown or white sand. Undulating plains, hillslopes.	DBCA 2020a	Potential	Three records from 6 km north-west of the survey area (DBCA 2020a). Some suitable habitat within the survey area.
<i>Banksia fraseri</i> var. <i>crebra</i>	-	P3	Shrub, 0.3-4 m high, cream, pale-golden yellow & brown, July to August, Sand, gravelly clay loam, lateritic soil. Sandplains, shallow valleys, slopes.	DBCA 2007-2020; DBCA 2020a	Potential	Multiple records to the south of the survey area (DBCA 2020a). Some suitable habitat within the survey area.
<i>Beyeria gardneri</i>	-	P3	Shrub, 0.25-0.5 m high. Fl. yellow, Aug to Sep. Yellow sand.	DBCA 2007-2020; DBCA 2020a	Potential	Multiple records to the south of the survey area (DBCA 2020a). Some suitable habitat within the survey area.
<i>Comesperma rhadinocarpum</i>	-	P3	Perennial, herb. Fl. blue, Oct to Nov. Sandy soils.	DBCA 2007-2020; DBCA 2020a	Potential	One record less than 1 km south of the survey area (DBCA 2020a). Some suitable habitat within the survey area.
<i>Eucalyptus macrocarpa pyriformis</i>	x -	P3	Erect, open mallee tree, 1.2-6 m high. Fl. red, Apr or Aug to Oct. Sand, lateritic sandy soils. Hills, rocky ironstone ridges, sandplains.	DBCA 2007-2020	Unlikely	Recorded from Woodman (2013). Suitable habitat within the survey area., however conspicuous species would have been observed if present
<i>Guichenotia alba</i>	-	P3	Slender, lax, few-branched shrub, 0.1-0.45 m high. Fl. white, Jul to Aug. Sandy & gravelly soils. Low-lying flats, depressions.	DBCA 2007-2020; DBCA 2020a	Recorded	Species was recorded within the survey area
<i>Hemiandra</i> sp. Eneabba (H. Demarz 3687)	-	P3	Straggly, erect shrub, 0.5-0.9 m high, to 0.4 m wide. Fl. blue/violet, Feb. Sand. Disturbed sites.	DBCA 2020a	Potential	Multiple records surrounding the survey area (DBCA 2020a). Also recorded from Woodman (2013). Some suitable habitat within the survey area.
<i>Hensmania stoniella</i>	-	P3	Tufted, stilt-rooted perennial, herb, 0.1-0.2 m high. Fl. yellow-cream-white, Sep to Nov. White, grey or lateritic sand, often winter-wet.	DBCA 2020a	Unlikely	One record 6.5 km south-east of the survey area (DBCA 2020a). No suitable habitat within the survey area.

Species	Conservation status		Habitat ¹	Source ²	Likelihood of occurrence	Justification for likelihood
	EPBC Act	BC Act / DBCA listing				
<i>Hypocalymma gardneri</i>	-	P3	Shrub, to 0.3 m high. Fl. yellow, Aug to Sep. Grey-brown sand, laterite. Sandplains, upper slopes, heathland.	DBCA 2020a	Unlikely	One record 4.5 km south of the survey area (DBCA 2020a). No suitable habitat within the survey area.
<i>Melaleuca sclerophylla</i>	-	P3	Erect-spreading to prostrate shrub, 0.15-0.9 m high. Fl. purple-pink, Jun to Sep. Gravelly sand, clayey sand. Granite outcrops, rises.	DBCA 2020a	Unlikely	One record 8 km south-east of the survey area (DBCA 2020a). No suitable habitat within the survey area.
<i>Mesomelaena stygia</i> subsp. <i>deflexa</i>	-	P3	Tufted perennial, grass-like or herb (sedge), 0.1-0.5 m high. Fl. brown-black, Mar to Oct. White, grey or lateritic sand, clay, gravel.	DBCA 2007-2020; DBCA 2020a	Recorded	Species was recorded within the survey area
<i>Persoonia chapmaniana</i>	-	P3	Erect, spreading shrub, 1-2 m high. Fl. yellow, Sep to Nov. White sandy clay, yellow sand. Vicinity of salt lakes.	DBCA 2020a	Unlikely	One record 8 km south of the survey area in coastal areas (DBCA 2020a). No suitable habitat within the survey area.
<i>Persoonia filiformis</i>	-	P3	Erect, spreading, lignotuberous shrub, 0.07-0.4 m high. Fl. yellow, Nov to Dec. Yellow or white sand over laterite.	DBCA 2007-2020; DBCA 2020a	Potential	Multiple records to the west of the survey area (DBCA 2020a). Also recorded from Woodman (2013). Suitable habitat within the survey area.
<i>Persoonia rudis</i>	-	P3	Erect, often spreading shrub, 0.2-1 m high. Fl. yellow, Sep to Dec or Jan. White, grey or yellow sand, often over laterite.	DBCA 2020a	Potential	Multiple records to the west of the survey area (DBCA 2020a). Also recorded from Woodman (2013). Some suitable habitat within the survey area.
<i>Stylidium drummondianum</i>	-	P3	Rosetted perennial, herb, 0.05-0.22 m high, Leaves narrowly oblanceolate, 0.5-3 cm long, 0.8-2 mm wide, apex mucronate, margin hyaline and serrulate, glabrous. Scape hoary. Inflorescence paniculate. Fl. pink, Aug to Oct. Sand or clayey sand over laterite. Upper hillslopes, breakaways. Low heath, mallee shrubland.	DBCA 2007-2020; DBCA 2020a	Recorded	Species was recorded within the survey area
<i>Stylidium torticarpum</i>	-	P3	Caespitose perennial, herb, 0.12-0.27 m high, Leaves tufted, broadly linear, (2-) 5-13 cm long, 0.6-1.5 mm wide, apex mucronate, margin hyaline and serrulate, glabrous.	DBCA 2020a	Unlikely	Two records to the east of the survey area (DBCA 2020a). Also recorded from Woodman

Species	Conservation status		Habitat ¹	Source ²	Likelihood of occurrence	Justification for likelihood
	EPBC Act	BC Act / DBCA listing				
			Scape glandular throughout. Inflorescence paniculate. Capsule twisted. Fl. pink, Sep to Nov. Sandy clay and clay loam over laterite. Adjacent to creeklines, depressions, and beneath breakaways. Heath or mallee shrubland.			(2013). Nosuitable habitat within the survey area.
<i>Synaphea oulopha</i>	-	P3	Compact shrub, ca 0.2 m high. Fl. yellow, Jul to Oct. Grey sand, gravelly loam, clay. Lateritic breakaways & rises.	DBCA 2020a	Potential	One record 4 km north-east of the survey (DBCA 2020a). Also recorded from Woodman (2013). Some suitable habitat within the survey area.
<i>Thryptomene nitida</i>	-	P3	Spreading shrub to 0.8 m tall, 1-1.5 m wide; flowers pale pink/mauve.	DBCA 2020s	Unlikely	Several records 7.5 km north of the survey area along creeklines (DBCA 2020a). No suitable habitat within the survey area.
<i>Thysanotus vernalis</i>	-	P3	Perennial, herb (with tuberous roots), to 0.3 m high. Fl. purple, Sep to Oct. Sandy loam.	DBCA 2020a	Potential	One record 7.5 km east of the survey area (DBCA 2020a). Some suitable habitat within the survey area.
<i>Verticordia densiflora</i> var. <i>roseostella</i>	-	P3	Open shrub, 0.4-1.3 m high. Fl. pink-white, Sep to Dec. Sandy gravelly soils.	DBCA 2020a	Unlikely	One record 9 km east of the survey area on gravelly soils (DBCA 2020a). No suitable habitat within the survey area.
<i>Verticordia luteola</i> var. <i>luteola</i>	-	P3	Slender shrub, 0.5-1.4 m high. Fl. white-yellow, Nov to Dec. Grey sand over gravel. Flats.	DBCA 2020a	Potential	Multiple records surrounding the survey area (DBCA 2020a). Also recorded from Woodman (2013). Some suitable habitat within the survey area.
<i>Banksia elegans</i>	-	P4	Shrub (with fire-tolerant rootstock, often suckering), 1-4 m high. Fl. yellow/green-yellow, Oct to Nov. Yellow, white or red sand. Sandplains, low consolidated dunes.	DBCA 2020a	Potential	Multiple records to the west of the survey area (DBCA 2020a). Suitable habitat within the survey area.
<i>Banksia scabrella</i>	-	P4	Much-branched, lignotuberous shrub, 0.6-2 m high. Fl. yellow & cream & purple, Sep to Dec or Jan. White, grey or yellow sand, sometimes with lateritic gravel. Sandplains, lateritic ridges.	DBCA 2007-2020	Recorded	Species was recorded within the survey area

Species	Conservation status		Habitat ¹	Source ²	Likelihood of occurrence	Justification for likelihood
	EPBC Act	BC Act / DBCA listing				
<i>Calytrix chrysantha</i>	-	P4	Shrub, 0.3-1.3 m high. Fl. yellow, Dec or Jan to Feb. White, grey or yellow/brown sand. Flats.	DBCA 2020a	Potential	One record 3.5 km south of the survey area (DBCA 2020a). Also recorded from Woodman (2013). Some suitable habitat within the survey area.
<i>Eucalyptus macrocarpa</i> subsp. <i>elachantha</i>	-	P4	(Spreading or sprawling mallee), 0.8-4 m high, bark smooth, grey over salmon pink. Fl. red-pink, Aug to Sep or Nov to Dec. White or grey sand over laterite. Hillslopes, ridges, sandplains.	DBCA 2007-2020; DBCA 2020a	Recorded	Species was recorded within the survey area
<i>Eucalyptus zopherophloia</i>	-	P4	Spreading mallee, 2.5-4(-6) m high, bark rough, fibrous. Fl. cream-white, Oct to Dec or Jan. Grey/white sand with limestone rubble. Coastal areas.	DBCA 2020a	Unlikely	One record 5.5 km west of the survey area in coastal areas (DBCA 2020a). No suitable habitat within the survey area.
<i>Pityrodia viscida</i>	-	P4	Viscid shrub, 0.3-0.6(-1) m high. Fl. white, Sep to Dec or Jan to Feb. Lateritic sand.	DBCA 2020a	Potential	One record 7.5 km north of the survey area in coastal areas (DBCA 2020a). Some suitable habitat within the survey area.
<i>Schoenus griffinianus</i>	-	P4	Small, tufted perennial, grass-like or herb (sedge), to 0.1 m high. Fl. Sep to Oct. White sand.	DBCA 2020a	Unlikely	One record 5 km south of the survey area (DBCA 2020a). No suitable habitat within the survey area.
<i>Stawellia dimorphantha</i>	-	P4	Stilt-rooted perennial, herb, 0.05-0.2 m high. Fl. purple/cream, Jun to Nov. White, grey, yellow sand.	DBCA 2007-2020; DBCA 2020a	Recorded	Species was recorded within the survey area

¹DBCA (2007-2020), DAWE 2020c²DBCA (2020a); NatureMap (DBCA 2007-2020); PMST (DAWE 2020a)

Appendix D Fauna likelihood of occurrence assessment

Species	Common name	Conservation status		Habitat ¹	Source ²	Likelihood of occurrence	Justification
		EPBC Act	BC Act / DBCA listing				
<i>Calidris ferruginea</i>	Curlew Sandpiper	CR, MI	MI	Curlew Sandpipers mainly occur on intertidal mudflats in sheltered coastal areas, such as estuaries, bays, inlets and lagoons, and also around non-tidal swamps, lakes and lagoons near the coast, and ponds in saltworks and sewage farms. They are also recorded inland, though less often, including around ephemeral and permanent lakes, dams, waterholes and bore drains, usually with bare edges of mud or sand.	DAWE 2020a; DBCA 2020b	Unlikely	No suitable habitat for this species within the survey area.
<i>Numenius madagascariensis</i>	Eastern Curlew	CR, MI	MI	Within Australia, the Eastern Curlew has a primarily coastal distribution. During the non-breeding season in Australia, the eastern curlew is most commonly associated with sheltered coasts, especially estuaries, bays, harbours, inlets and coastal lagoons, with large intertidal mudflats or sandflats, often with beds of seagrass (Zosteraceae). Occasionally, the species occurs on ocean beaches (often near estuaries), and coral reefs, rock platforms, or rocky islets. The birds are often recorded among saltmarsh and on mudflats fringed by mangroves, and sometimes within the mangroves.	DAWE 2020a	Unlikely	No suitable habitat for this species within the survey area.
<i>Calyptorhynchus latirostris</i>	Carnaby's Cockatoo	EN	EN	Carnaby's Cockatoo is endemic to, and widespread in, the south-west of Western Australia. It occurs from the wheatbelt, in areas that receive between 300 and 750 mm of rainfall annually, across to wetter regions in the extreme south-west, including the Swan Coastal Plain and the southern coast. Its range extends from Cape Arid in the south-east to Kalbarri in the north, and inland to Hatter Hill, Gibb Rock, Narembeen, Noongar, Wongan Hills, Nugadong, near Perenjori, Wilroy and Nabawa.	DAWE 2020a; DBCA 2020b	Potential	The survey area occurs within the modelled non-breeding range (SEWPac 2012). This species may utilise the survey area for foraging habitat.

Species	Common name	Conservation status		Habitat ¹	Source ²	Likelihood of occurrence	Justification
		EPBC Act	BC Act / DBCA listing				
<i>Rostratula australis</i>	Australian Painted Snipe	EN	EN	The Australian Painted Snipe generally inhabits shallow terrestrial freshwater (occasionally brackish) wetlands, including temporary and permanent lakes, swamps and claypans. They also use inundated or waterlogged grassland or saltmarsh, dams, rice crops, sewage farms and bore drains. Typical sites include those with rank emergent tussocks of grass, sedges, rushes or reeds, or samphire; often with scattered clumps of lignum <i>Muehlenbeckia</i> or canegrass or sometimes tea-tree (<i>Melaleuca</i>).	DAWE 2020a	Unlikely	No suitable habitat for this species within the survey area.
<i>Parantechinus apicalis</i>	Dibbler	EN	EN	The Dibbler is currently restricted to the Western Australian coastline near Jurien on three small offshore islands (Boullanger, Whitlock and Escape Islands), and a small number of widely scattered mainland sites. Dibblers seem to prefer vegetation with a dense canopy greater than 1 m high which has been unburnt for at least 10 years or more. In some locations, the presence of Proteaceous and Myrtaceous flowering shrubs may also be important.	DAWE 2020a	Unlikely	No suitable habitat for this species within the survey area.
<i>Egernia stokesii badia</i>	Western Spiny-tailed Skink	EN	VU	The Western Spiny-tailed Skink is known to occur in a broad semi-arid area in south-west WA, between Shark Bay and Minnivale and east to Cue (DEC 2012). Most records of the brown form Western Spiny-tailed Skink are in York Gum (<i>Eucalyptus loxophleba</i>) woodland.	DAWE 2020a; DBCA 2020b	Unlikely	The survey area occurs within the 'species or species habitat may occur' distribution (DAWE 2020c). No suitable habitat (i.e., <i>Eucalyptus loxophleba</i>) for this species was found within the survey area. The closest records are from >40 km east of the survey area.

Species	Common name	Conservation status		Habitat ¹	Source ²	Likelihood of occurrence	Justification
		EPBC Act	BC Act / DBCA listing				
<i>Idiosoma nigrum</i>	Shield-backed trapdoor spider	EN	VU	The Shield-backed trapdoor spider is endemic to semi-arid south-west Western Australia (WA). It occurs in a number of severely fragmented populations in the central and northern Wheatbelt and more arid areas in the Midwest.	DBCA 2020b	Unlikely	The survey area occurs just outside the 'species or species habitat may occur' distribution (DAWE 2020c). One previous record 45 km south of the survey area (From 1987).
<i>Calidris canutus</i>	Red Knot	EN, MI	MI	In Australasia the Red Knot mainly inhabit intertidal mudflats, sandflats and sandy beaches of sheltered coasts, in estuaries, bays, inlets, lagoons and harbours; sometimes on sandy ocean beaches or shallow pools on exposed wave-cut rock platforms or coral reefs. They are occasionally seen on terrestrial saline wetlands near the coast, such as lakes, lagoons, pools and pans, and recorded on sewage ponds and saltworks, but rarely use freshwater swamps.	DAWE 2020a	Unlikely	No suitable habitat for this species within the survey area.
<i>Anous tenuirostris melanops</i>	Australian Lesser Noddy	VU	EN	The Australian Lesser Noddy is a marine bird known from tropical and subtropical waters.	DBCA 2020b	Unlikely	No suitable habitat for this species within the survey area.
<i>Dasyurus geoffroii</i>	Chuditch, western quoll	VU	VU	The Chuditch previously occurred throughout arid and semi arid Australia, but is now restricted to south-west Western Australia. During the day it mostly rests in hollow logs or earth burrows. It primarily forages on the ground at night, although can be active during the day during the breeding season or during bad weather. It may eat any animal smaller than a rabbit and they can climb trees when hunting or escaping predators.	DAWE 2020a; DBCA 2020b	Unlikely	No suitable habitat for this species within the survey area.

Species	Common name	Conservation status		Habitat ¹	Source ²	Likelihood of occurrence	Justification
		EPBC Act	BC Act / DBCA listing				
<i>Leipoa ocellata</i>	Malleefowl	VU	VU	The Malleefowl is found in semi-arid to arid shrublands and low woodlands, especially those dominated by mallee and/or acacias. A sandy substrate and abundance of leaf litter are required for breeding (Benshemesh 2007).	DAWE 2020a; DBCA 2020b	Unlikely	Whilst the survey area occurs in the 'species or species habitat likely to occur' distribution (DAWE 2020c) and DBCA (2020b) records surround the survey area (closest 17 km south-west by the coast), habitat within the survey area is not suitable for this species. The survey area has also been recently burnt.
<i>Sternula nereis nereis</i>	Australian Fairy Tern	VU	VU	The Fairy Tern (Australian) nests on sheltered sandy beaches, spits and banks above the high tide line and below vegetation.	DAWE 2020a	Unlikely	No suitable habitat for this species within the survey area.
<i>Limosa lapponica</i>	Bar-tailed Godwit	MI	VU	The Bar-tailed Godwit is found mainly in coastal habitats such as large intertidal sandflats, banks, mudflats, estuaries, inlets, harbours, coastal lagoons and bays. It is found often around beds of seagrass and, sometimes, in nearby saltmarsh. It has been sighted in coastal sewage farms and saltworks, saltlakes and brackish wetlands near coasts, sandy ocean beaches, rock platforms, and coral reef-flats.	DBCA 2020b	Unlikely	No suitable habitat for this species within the survey area.
<i>Actitis hypoleucos</i>	Common Sandpiper	MI	MI	The species utilises a wide range of 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. Generally the species forages in shallow water and on bare soft mud at the edges of wetlands; often where obstacles project from substrate, e.g. rocks or mangrove roots.	DAWE 2020a; DBCA 2020b	Unlikely	No suitable habitat for this species within the survey area.

Species	Common name	Conservation status		Habitat ¹	Source ²	Likelihood of occurrence	Justification
		EPBC Act	BC Act / DBCA listing				
<i>Apus pacificus</i>	Fork-tailed Swift	MI	MI	In Australia, they mostly occur over inland plains but sometimes above foothills or in coastal areas. They often occur over cliffs and beaches and also over islands and sometimes well out to sea. They also occur over settled areas, including towns, urban areas and cities. They mostly occur over dry or open habitats, including riparian woodland and tea-tree swamps, low scrub, heathland or saltmarsh. They are also found at treeless grassland and sandplains covered with spinifex, open farmland and inland and coastal sand-dunes. The sometimes occur above rainforests, wet sclerophyll forest or open forest or plantations of pines.	DAWE 2020a; DBCA 2020b	Potential	This species has a wide range and utilises a variety of habitat types. Potentially suitable habitat occurs within the survey area.
<i>Ardenna pacifica</i>	Wedge-tailed Shearwater	MI	MI	The Wedge-tailed Shearwater is a pelagic, marine bird known from tropical and subtropical waters.	DBCA 2020b	Unlikely	No suitable habitat for this species within the survey area.
<i>Arenaria interpres</i>	Ruddy Turnstone	MI	MI	In Australasia, the Ruddy Turnstone is mainly found on coastal regions with exposed rock coast lines or coral reefs. It also lives near platforms and shelves, often with shallow tidal pools and rocky, shingle or gravel beaches. It can, however, be found on sand, coral or shell beaches, shoals, cays and dry ridges of sand or coral.	DBCA 2020b	Unlikely	No suitable habitat for this species within the survey area.
<i>Calidris acuminata</i>	Sharp-tailed Sandpiper	MI	MI	They forage at the edge of the water of wetlands or intertidal mudflats, either on bare wet mud or sand, or in shallow water. Roosting occurs at the edges of wetlands, on wet open mud or sand, in shallow water, or in short sparse vegetation, such as grass or saltmarsh.	DAWE 2020a; DBCA 2020b	Unlikely	No suitable habitat for this species within the survey area.
<i>Calidris melanotos</i>	Pectoral Sandpiper	MI	MI	In Australasia, the Pectoral Sandpiper prefers shallow fresh to saline wetlands. The species is found at coastal lagoons, estuaries, bays, swamps, lakes, inundated grasslands, saltmarshes, river pools, creeks, floodplains and artificial wetlands.	DAWE 2020a	Unlikely	No suitable habitat for this species within the survey area.

Species	Common name	Conservation status		Habitat ¹	Source ²	Likelihood of occurrence	Justification
		EPBC Act	BC Act / DBCA listing				
<i>Calidris ruficollis</i>	Red-necked Stint	MI	MI	In Australasia, the Red-necked Stint is mostly found in coastal areas, including in sheltered inlets, bays, lagoons and estuaries with intertidal mudflats, often near spits, islets and banks and, sometimes, on protected sandy or coralline shores. Occasionally they have been recorded on exposed or ocean beaches, and sometimes on stony or rocky shores, reefs or shoals.	DBCA 2020b	Unlikely	No suitable habitat for this species within the survey area.
<i>Hydroprogne caspia</i>	Caspian Tern	MI	MI	The Caspian Tern is mostly found in sheltered coastal embayments (harbours, lagoons, inlets, bays, estuaries and river deltas) and those with sandy or muddy margins are preferred. They also occur on near-coastal or inland terrestrial wetlands that are either fresh or saline, especially lakes (including ephemeral lakes), waterholes, reservoirs, rivers and creeks. They also use artificial wetlands, including reservoirs, sewage ponds and saltworks.	DBCA 2020b	Unlikely	No suitable habitat for this species within the survey area.
<i>Motacilla cinerea</i>	Grey Wagtail	MI	MI	This species inhabits fast-flowing mountain streams and rivers with riffles and exposed rocks or shoals, often in forested areas. It is also found in more lowland watercourses, even canals, where there are artificial waterfalls, weirs, millraces or lock gates.	DAWE 2020a	Unlikely	No suitable habitat for this species within the survey area.
<i>Pandion haliaetus</i>	Osprey	MI	MI	Ospreys are found on the coast and in terrestrial wetlands of tropical and temperate Australia and off-shore islands, occasionally ranging inland along rivers, though mainly in the north of the country.	DAWE 2020a	Unlikely	No suitable habitat for this species within the survey area.
<i>Plegadis falcinellus</i>	Glossy Ibis	MI	MI	The Glossy Ibis' preferred habitat for foraging and breeding are fresh water marshes at the edges of lakes and rivers, lagoons, flood-plains, wet meadows, swamps, reservoirs, sewage ponds, rice-fields and cultivated areas under irrigation. The species is occasionally found in coastal locations such as estuaries, deltas, saltmarshes and coastal lagoons.	DBCA 2020b	Unlikely	No suitable habitat for this species within the survey area.

Species	Common name	Conservation status		Habitat ¹	Source ²	Likelihood of occurrence	Justification
		EPBC Act	BC Act / DBCA listing				
<i>Pluvialis squatarola</i>	Grey Plover	MI	MI	Grey Plovers occur almost entirely in coastal areas, where they usually inhabit sheltered embayments, estuaries and lagoons with mudflats and sandflats, and occasionally on rocky coasts with wave-cut platforms or reef-flats, or on reefs within muddy lagoons.	DBCA 2020b	Unlikely	No suitable habitat for this species within the survey area.
<i>Sterna dougallii</i>	Roseate Tern	MI	MI	The Roseate Tern occurs in coastal and marine areas in subtropical and tropical seas. The species inhabits rocky and sandy beaches, coral reefs, sand cays and offshore islands. Birds rarely occur in inshore waters or near the mainland, usually venturing into these areas only accidentally, when nesting islands are nearby.	DBCA 2020b	Unlikely	No suitable habitat for this species within the survey area.
<i>Thalasseus bergii</i>	Crested Tern	MI	MI	Coastal bays and inlets, lakes and large rivers.	DBCA 2020b	Unlikely	No suitable habitat for this species within the survey area.
<i>Tringa brevipes</i>	Grey-tailed Tattler	MI	MI	The Grey-tailed tattler is often found on sheltered coasts with reefs and rock platforms or with intertidal mudflats. It can also be found at intertidal rocky, coral or stony reefs as well as platforms and islets that are exposed at low tide. It has been found around shores of rock, shingle, gravel or shells and also on intertidal mudflats in embayments, estuaries and coastal lagoons, especially fringed with mangroves.	DBCA 2020b	Unlikely	No suitable habitat for this species within the survey area.
<i>Tringa glareola</i>	Wood Sandpiper	MI	MI	The Wood Sandpiper uses well-vegetated, shallow, freshwater wetlands, such as swamps, billabongs, lakes, pools and waterholes. They are typically associated with emergent, aquatic plants or grass, and dominated by taller fringing vegetation, such as dense stands of rushes or reeds, shrubs, or dead or live trees, especially <i>Melaleuca</i> and River Red Gums <i>Eucalyptus camaldulensis</i> and often with fallen timber.	DBCA 2020b	Unlikely	No suitable habitat for this species within the survey area.

Species	Common name	Conservation status		Habitat ¹	Source ²	Likelihood of occurrence	Justification
		EPBC Act	BC Act / DBCA listing				
<i>Tringa nebularia</i>	Common Greenshank	MI	MI	The Common Greenshank is found in a wide variety of inland wetlands and sheltered coastal habitats of varying salinity. It occurs in sheltered coastal habitats, typically with large mudflats and saltmarsh, mangroves or seagrass. Habitats include embayments, harbours, river estuaries, deltas and lagoons and are recorded less often in round tidal pools, rock-flats and rock platforms.	DBCA 2020b	Unlikely	No suitable habitat for this species within the survey area.
<i>Tringa stagnatilis</i>	Marsh Sandpiper, little greenshank	MI	MI	The Marsh Sandpiper lives in permanent or ephemeral wetlands of varying salinity, including swamps, lagoons, billabongs, salt pans, saltmarshes, estuaries, pools on inundated floodplains, and intertidal mudflats and also regularly at sewage farms and saltworks. They are recorded less often at reservoirs, waterholes, soaks, bore-drain swamps and flooded inland lakes. In north Australia they prefer intertidal mudflats.	DBCA 2020b	Unlikely	No suitable habitat for this species within the survey area.
<i>Xenus cinereus</i>	Terek Sandpiper	MI	MI	Preferring to roost in or among mangroves. The Terek Sandpiper mostly forages in the open, on soft wet intertidal mudflats or in sheltered estuaries, embayments, harbours or lagoons. The species has also been recorded on islets, mudbanks, sandbanks and spits, and near mangroves and occasionally in samphire.	DBCA 2020b	Unlikely	No suitable habitat for this species within the survey area.
<i>Falco hypoleucos</i>	Grey Falcon	-	VU	The species frequents timbered lowland plains, particularly acacia shrublands that are crossed by tree-lined water courses. The species has been observed hunting in treeless areas and frequents tussock grassland and open woodland, especially in winter.	DAWE 2020a	Potential	This species has a wide range and utilises a variety of habitat types. Potentially suitable habitat occurs within the survey area.
<i>Pandion cristatus</i>	Eastern Osprey	-	MI	Ospreys are found on the coast and in terrestrial wetlands of tropical and temperate Australia and off-shore islands, occasionally ranging inland along rivers, though mainly in the north of the country.	DBCA 2020b	Unlikely	No suitable habitat for this species within the survey area.

Species	Common name	Conservation status		Habitat ¹	Source ²	Likelihood of occurrence	Justification
		EPBC Act	BC Act / DBCA listing				
<i>Falco peregrinus</i>	Peregrine Falcon	-	OS	The Peregrine Falcon is found in most habitats, from rainforests to the arid zone, and at most altitudes, from the coast to alpine areas. It requires abundant prey and secure nest sites, and prefers coastal and inland cliffs or open woodlands near water, and may even be found nesting on high city buildings.	DBCA 2020b	Potential	This species has a wide range and utilises a variety of habitat types. Potentially suitable habitat occurs within the survey area.
<i>Phascogale tapoatafa wambenger</i>	South-western Brush-tailed Phascogale, wambenger	-	CD	The Brush-tailed Phascogale has a widespread but fragmented distribution throughout all states of Australia.	DBCA 2020b	Unlikely	No suitable habitat for this species within the survey area.
<i>Aspidites ramsayi</i> (southwest subpop.)	Woma	-	P1	Woma pythons are found in the arid regions of central Australia and in the south-west of Western Australia, near Shark Bay. By day, they shelter in hollow logs and burrows.	DBCA 2020b	Unlikely	No suitable habitat for this species within the survey area.
<i>Idiosoma kwongan</i>	Kwongan heath shield-backed trapdoor spider	-	P1	No habitat information available for this species.	DBCA 2020b	Unable to determine	Records are from the 1980's, 45 km south of the survey area.
<i>Hemisaga vepreculae</i>	Thorny bush katydid (Moora)	-	P2	No habitat information available for this species.	DBCA 2020b	Unable to determine	Record is from the 1980's, 38 km south of the survey area.
<i>Neelaps calonotos</i>	Black-striped snake	-	P3	The Black-striped snake is found in Banksia woodlands and sandy areas.	DBCA 2020b	Unlikely	No suitable habitat for this species within the survey area.
<i>Hylaeus globuliferus</i>	Woolybush bee	-	P3	No habitat information available for this species.	DBCA 2020b	Unable to determine	Records are from 28 km south of the survey area.

Species	Common name	Conservation status		Habitat ¹	Source ²	Likelihood of occurrence	Justification
		EPBC Act	BC Act / DBCA listing				
<i>Idiosoma arenaceum</i>	Geraldton Sandplain shield-backed trapdoor spider	-	P3	No habitat information available for this species.	DBCA 2020b	Unable to determine	Records are from the 1950's, 35 km north-east of the survey area.
<i>Phasmodes jeeba</i>	Springtime corroboree stick katydid (Eneabba)	-	P3	No habitat information available for this species.	DBCA 2020b	Unable to determine	Record is from the 1980's.
<i>Notamacropus irma</i>	Western Brush Wallaby	-	P4	The Western Brush Wallaby's optimum habitat is open forest or woodland, particularly favouring open, seasonally wet flats with low grasses and open scrubby thickets. It is also found in some areas of mallee and heathland, and is uncommon in karri forest	DBCA 2020b	Unlikely	No suitable habitat for this species within the survey area.
<i>Oxyura australis</i>	Blue-billed Duck	-	P4	The Blue-billed Duck is endemic to Australia, being found in the temperate wetlands of the south-east and south-west parts of the continent.	DBCA 2020b	Unlikely	No suitable habitat for this species within the survey area.
<i>Synemon gratiosa</i>	Graceful sunmoth	-	P4	The sunmoth is only known from two general vegetation types; open areas of herbland, heathland and shrubland on secondary Quindalup dunes containing <i>Lomandra maritima</i> and banksia woodland with <i>L. hermaphrodita</i> .	DBCA 2020b	Unlikely	All records are from 50 km south-west near Leeman. No suitable habitat (i.e., <i>Lomandra maritima</i> or <i>L. hermaphrodita</i>) for this species was found within the survey area.

¹DAWE 2020c (unless otherwise referenced)²DBCA (2020b); PMST (DAWE 2020a)

Appendix E Flora species list

Family	Species	DBCA listing	Method
Amaranthaceae	<i>Gompholobium tomentosum</i>		Quadrat
Amaranthaceae	<i>Ptilotus manglesii</i>		Quadrat
Anarthriaceae	<i>Lyginia imberbis</i>		Quadrat
Araliaceae	<i>Trachymene pilosa</i>		Quadrat
Asparagaceae	<i>Acanthocarpus</i> sp. Ajana (C.A. Gardner 8596)		Quadrat
Asparagaceae	<i>Lomandra hastilis</i>		Quadrat
Asteraceae	* <i>Hypochaeris glabra</i>		Quadrat
Asteraceae	<i>Podotheca angustifolia</i>		Quadrat
Asteraceae	<i>Pterochaeta paniculata</i>		Quadrat
Asteraceae	<i>Waitzia acuminata</i> var. <i>acuminata</i>		Quadrat
Asteraceae	<i>Waitzia suaveolens</i> var. <i>suaveolens</i>		Quadrat
Boraginaceae	* <i>Echium plantagineum</i>		Opportunistic
Boryaceae	<i>Borya sphaerocephala</i>		Quadrat
Casuarinaceae	<i>Allocasuarina campestris</i>		Quadrat
Casuarinaceae	<i>Allocasuarina humilis</i>		Quadrat
Casuarinaceae	<i>Allocasuarina microstachya</i>		Quadrat
Celastraceae	<i>Stackhousia monogyna</i>		Quadrat
Celastraceae	<i>Tripterococcus brunonis</i>		Quadrat
Colchicaceae	<i>Burchardia congesta</i>		Quadrat
Cyperaceae	<i>Caustis dioica</i>		Quadrat
Cyperaceae	<i>Chaetospora curvifolia</i>		Quadrat
Cyperaceae	<i>Mesomelaena pseudostygia</i>		Quadrat
Cyperaceae	<i>Mesomelaena stygia</i> subsp. <i>deflexa</i>	P3	Quadrat
Cyperaceae	<i>Schoenus armeria</i>		Quadrat
Cyperaceae	<i>Schoenus clandestinus</i>		Quadrat
Cyperaceae	<i>Schoenus nanus</i>		Quadrat
Cyperaceae	<i>Schoenus pleiostemoneus</i>		Quadrat
Cyperaceae	<i>Schoenus</i> sp.		Quadrat
Dilleniaceae	<i>Hibbertia hypericoides</i>		Quadrat
Dilleniaceae	<i>Hibbertia spicata</i>		Quadrat
Dilleniaceae	<i>Hibbertia subvaginata</i>		Quadrat
Droseraceae	<i>Drosera erythrorhiza</i>		Quadrat
Droseraceae	<i>Drosera macrantha</i>		Quadrat

Family	Species	DBCAs listing	Method
Droseraceae	<i>Drosera menziesii</i>		Quadrat
Droseraceae	<i>Drosera porrecta</i>		Quadrat
Ecdeiocoleaceae	<i>Ecdeiocolea monostachya</i>		Quadrat
Ericaceae	<i>Styphelia hamulosa</i>		Quadrat
Ericaceae	<i>Styphelia microdonta</i>		Quadrat
Euphorbiaceae	<i>Beyeria gardneri</i>		Quadrat
Euphorbiaceae	<i>Monotaxis bracteata</i>		Quadrat
Fabaceae	<i>Acacia blakelyi</i>		Quadrat
Fabaceae	<i>Acacia dilatata</i>		Quadrat
Fabaceae	<i>Acacia pulchella</i>		Quadrat
Fabaceae	<i>Acacia</i> sp.		Quadrat
Fabaceae	<i>Acacia stenoptera</i>		Quadrat
Fabaceae	<i>Acacia tetragonaphylla</i>		Quadrat
Fabaceae	<i>Chorizema aciculare</i> subsp. <i>laxum</i>		Quadrat
Fabaceae	<i>Daviesia divaricata</i>		Quadrat
Fabaceae	<i>Daviesia incrassata</i> subsp. <i>teres</i>		Quadrat
Fabaceae	<i>Daviesia pedunculata</i>		Quadrat
Fabaceae	<i>Gastrolobium calycinum</i>		Quadrat
Fabaceae	<i>Gastrolobium plicatum</i>		Quadrat
Fabaceae	<i>Gastrolobium spinosum</i>		Quadrat
Fabaceae	<i>Isotropis cuneifolia</i>		Quadrat
Fabaceae	<i>Isotropis drummondii</i>		Quadrat
Fabaceae	<i>Jacksonia angulata</i>		Quadrat
Fabaceae	<i>Jacksonia hakeoides</i>		Quadrat
Fabaceae	<i>Mirbelia trichocalyx</i>		Quadrat
Goodeniaceae	<i>Dampiera alata</i>		Quadrat
Goodeniaceae	<i>Dampiera altissima</i>		Quadrat
Goodeniaceae	<i>Lechenaultia biloba</i>		Quadrat
Goodeniaceae	<i>Lechenaultia hirsuta</i>		Opportunistic
Goodeniaceae	<i>Lechenaultia linarioides</i>		Quadrat
Goodeniaceae	<i>Scaevola canescens</i>		Quadrat
Goodeniaceae	<i>Scaevola glandulifera</i>		Quadrat
Gyrostemonaceae	<i>Gyrostemon racemiger</i>		Quadrat
Gyrostemonaceae	<i>Tersonia cyathiflora</i>		Quadrat
Haemodoraceae	<i>Anigozanthos humilis</i> subsp. <i>humilis</i>		Quadrat
Haemodoraceae	<i>Conostylis aculeata</i>		Quadrat

Family	Species	DBCA listing	Method
Haemodoraceae	<i>Conostylis candicans</i>		Quadrat
Haemodoraceae	<i>Conostylis canteriata</i>		Quadrat
Haemodoraceae	<i>Conostylis dielsii</i> subsp. <i>dielsii</i>		Opportunistic
Haemodoraceae	<i>Conostylis</i> sp.		Quadrat
Haloragaceae	<i>Glischrocaryon angustifolium</i>		Opportunistic
Hemerocallidaceae	<i>Dianella revoluta</i>		Quadrat
Hemerocallidaceae	<i>Johnsonia pubescens</i> subsp. <i>pubescens</i>		Quadrat
Hemerocallidaceae	<i>Stawellia dimorphantha</i>	P4	Targeted search
Iridaceae	<i>Patersonia occidentalis</i>		Quadrat
Lamiaceae	<i>Hemiandra rubriflora</i>		Quadrat
Lamiaceae	<i>Quoya verbascina</i>		Quadrat
Loranthaceae	<i>Nuytsia floribunda</i>		Quadrat
Malvaceae	<i>Guichenotia alba</i>	P3	Targeted search
Malvaceae	<i>Guichenotia sarotes</i>		Quadrat
Malvaceae	<i>Lasiopetalum drummondii</i>		Quadrat
Malvaceae	<i>Lasiopetalum ogilvieanum</i>	P1	Quadrat
Montiaceae	<i>Calandrinia corrigioloides</i>		Quadrat
Myrtaceae	<i>Babingtonia camphorosmae</i>		Quadrat
Myrtaceae	<i>Beaufortia elegans</i>		Quadrat
Myrtaceae	<i>Calothamnus blepharospermus</i>		Quadrat
Myrtaceae	<i>Calothamnus quadrifidus</i> subsp. <i>angustifolius</i>		Quadrat
Myrtaceae	<i>Calothamnus sanguineus</i>		Quadrat
Myrtaceae	<i>Calytrix depressa</i>		Quadrat
Myrtaceae	<i>Calytrix</i> sp.		Quadrat
Myrtaceae	<i>Darwinia speciosa</i>		Quadrat
Myrtaceae	<i>Eremaea beaufortioides</i>		Quadrat
Myrtaceae	<i>Eremaea</i> sp.		Quadrat
Myrtaceae	<i>Eremaea violacea</i>		Quadrat
Myrtaceae	<i>Eucalyptus macrocarpa</i> subsp. <i>elachantha</i>	P4	Targeted search
Myrtaceae	<i>Eucalyptus todtiana</i>		Quadrat
Myrtaceae	<i>Hypocalymma hirsutum</i>		Quadrat
Myrtaceae	<i>Hypocalymma</i> sp.		Quadrat
Myrtaceae	<i>Leptospermum oligandrum</i>		Quadrat
Myrtaceae	<i>Leptospermum spinescens</i>		Quadrat
Myrtaceae	<i>Melaleuca aspalathoides</i>		Quadrat
Myrtaceae	<i>Melaleuca</i> sp.		Quadrat

Family	Species	DBCA listing	Method
Myrtaceae	<i>Melaleuca leuropoma</i>		Quadrat
Myrtaceae	<i>Micromyrtus rogeri</i>	P1	Targeted search
Myrtaceae	<i>Scholtzia laxiflora</i>		Quadrat
Myrtaceae	<i>Verticordia grandis</i>		Quadrat
Orchidaceae	<i>Caladenia brunonis</i>		Quadrat
Orchidaceae	<i>Caladenia flava</i>		Quadrat
Orchidaceae	<i>Cyanicula gemmata</i>		Quadrat
Orchidaceae	<i>Diuris</i> sp.		Opportunistic
Orchidaceae	<i>Leporella fimbriata</i>		Quadrat
Orchidaceae	<i>Thelymitra campanulata</i>		Quadrat
Orchidaceae	<i>Thysanotus dichotomus</i>		Quadrat
Orchidaceae	<i>Thysanotus multiflorus</i>		Quadrat
Orchidaceae	<i>Thysanotus patersonii</i>		Quadrat
Orchidaceae	<i>Thysanotus</i> sp.		Quadrat
Poaceae	<i>Austrostipa macalpinei</i>		Quadrat
Poaceae	<i>Neurachne alopecuroidea</i>		Quadrat
Proteaceae	<i>Banksia attenuata</i>		Quadrat
Proteaceae	<i>Banksia carlinoides</i>		Quadrat
Proteaceae	<i>Banksia dallanneyi</i> subsp. <i>media</i>		Quadrat
Proteaceae	<i>Banksia fraseri</i> var. <i>fraseri</i>		Quadrat
Proteaceae	<i>Banksia prionotes</i>		Quadrat
Proteaceae	<i>Banksia scabrella</i>	P4	Quadrat
Proteaceae	<i>Banksia sessilis</i>		Quadrat
Proteaceae	<i>Banksia shuttleworthiana</i>		Quadrat
Proteaceae	<i>Conospermum boreale</i>		Quadrat
Proteaceae	<i>Conospermum stoechadis</i>		Quadrat
Proteaceae	<i>Grevillea biformis</i>		Quadrat
Proteaceae	<i>Grevillea leucopteris</i>		Quadrat
Proteaceae	<i>Grevillea shuttleworthiana</i> subsp. <i>canarina</i>		Quadrat
Proteaceae	<i>Grevillea synapheae</i>		Quadrat
Proteaceae	<i>Hakea auriculata</i>		Quadrat
Proteaceae	<i>Hakea candolleana</i>		Quadrat
Proteaceae	<i>Hakea incrassata</i>		Quadrat
Proteaceae	<i>Hakea lissocarpha</i>		Quadrat
Proteaceae	<i>Hakea</i> sp. 1		Quadrat
Proteaceae	<i>Hakea</i> sp. 2		Quadrat

Family	Species	DBCA listing	Method
Proteaceae	<i>Hakea stenocarpa</i>		Quadrat
Proteaceae	<i>Hakea trifurcata</i>		Quadrat
Proteaceae	<i>Isopogon divergens</i>		Quadrat
Proteaceae	<i>Isopogon tridens</i>		Quadrat
Proteaceae	<i>Lambertia multiflora</i> var. <i>multiflora</i>		Quadrat
Proteaceae	<i>Persoonia acicularis</i>		Quadrat
Proteaceae	<i>Petrophile brevifolia</i>		Quadrat
Proteaceae	<i>Petrophile macrostachya</i>		Quadrat
Proteaceae	<i>Petrophile shuttleworthiana</i>		Quadrat
Proteaceae	<i>Proteaceae</i> sp.		Quadrat
Restionaceae	<i>Alexgeorgea nitens</i>		Quadrat
Restionaceae	<i>Desmocladius asper</i>		Quadrat
Restionaceae	<i>Desmocladius semiplanus</i>		Quadrat
Restionaceae	<i>Lepidobolus preissianus</i>		Quadrat
Rhamnaceae	<i>Stenanthemum notiale</i> subsp. <i>notiale</i>		Quadrat
Rubiaceae	<i>Opercularia vaginata</i>		Quadrat
Rutaceae	<i>Boronia coerulea</i> subsp. <i>spinescens</i>		Quadrat
Rutaceae	<i>Boronia cymosa</i>		Quadrat
Rutaceae	<i>Boronia ramosa</i> subsp. <i>anethifolia</i>		Quadrat
Rutaceae	<i>Diplolaena ferruginea</i>		Quadrat
Sapindaceae	<i>Diplopeltis huegelii</i> subsp. <i>lehmanii</i>		Quadrat
Stylidiaceae	<i>Levenhookia pusilla</i>		Quadrat
Stylidiaceae	<i>Stylidium crossocephalum</i>		Quadrat
Stylidiaceae	<i>Stylidium drummondianum</i>	P3	Quadrat
Stylidiaceae	<i>Stylidium rigidulum</i>		Quadrat
Thymelaeaceae	<i>Pimelea angustifolia</i>		Quadrat
Thymelaeaceae	<i>Pimelea microcephala</i>		Quadrat
Thymelaeaceae	<i>Pimelea sulphurea</i>		Quadrat
Xanthorrhoeaceae	<i>Chamaescilla corymbosa</i>		Quadrat

Appendix F Flora species matrix

Family	Species	ELA01	ELA02	ELA03	ELA04	ELA05	ELA06	ELA07	ELA08	ELA09	ELA10	ELA11	ELA12	ELA13	ELA14	ELA15	ELA16	ELA17	ELA18	ELA19	ELA20	ELA21	ELA22	ELA23	ELA24	ELA25	ELA26
Amaranthaceae	<i>Gompholobium tomentosum</i>	X	X	X	X										X	X											
Amaranthaceae	<i>Ptilotus manglesii</i>	X	X	X	X							X				X			X								
Anarthriaceae	<i>Lyginia imberbis</i>						X																X	X	X	X	X
Araliaceae	<i>Trachymene pilosa</i>				X				X						X	X		X									
Asparagaceae	<i>Acanthocarpus</i> sp. Ajana (C.A. Gardner 8596)										X			X										X	X		
Asparagaceae	<i>Lomandra hastilis</i>			X					X						X												
Asteraceae	* <i>Hypochaeris glabra</i>	X							X						X							X			X		
Asteraceae	<i>Podotheca angustifolia</i>	X	X			X		X	X			X			X	X		X	X			X		X			
Asteraceae	<i>Pterochaeta paniculata</i>	X	X			X			X		X		X	X								X					
Asteraceae	<i>Waitzia acuminata</i> var. <i>acuminata</i>				X						X																
Asteraceae	<i>Waitzia suaveolens</i> var. <i>suaveolens</i>	X	X		X	X		X				X			X		X		X							X	X
Boryaceae	<i>Borya sphaerocephala</i>	X	X				X																X				
Casuarinaceae	<i>Allocasuarina campestris</i>	X	X			X							X	X			X				X	X					
Casuarinaceae	<i>Allocasuarina humilis</i>			X	X			X	X	X	X	X	X	X				X		X						X	X
Casuarinaceae	<i>Allocasuarina microstachya</i>	X	X			X													X		X	X					
Celastraceae	<i>Stackhousia monogyna</i>	X	X	X	X	X						X							X								
Celastraceae	<i>Tripterococcus brunonis</i>	X	X		X	X		X	X	X		X							X	X	X	X	X			X	X
Colchicaceae	<i>Burchardia congesta</i>	X	X	X		X	X	X	X	X	X	X	X	X		X	X	X		X	X	X	X			X	X
Cyperaceae	<i>Caustis dioica</i>		X	X	X			X	X	X									X	X	X	X				X	
Cyperaceae	<i>Chaetospora curvifolia</i>		X	X	X										X							X					
Cyperaceae	<i>Mesomelaena pseudostygia</i>	X	X	X	X	X	X		X			X			X	X	X	X	X	X	X	X	X	X	X	X	X
Cyperaceae	<i>Mesomelaena stygia</i> var. <i>deflexa</i> (P3)								X																		

Family	Species	ELA01	ELA02	ELA03	ELA04	ELA05	ELA06	ELA07	ELA08	ELA09	ELA10	ELA11	ELA12	ELA13	ELA14	ELA15	ELA16	ELA17	ELA18	ELA19	ELA20	ELA21	ELA22	ELA23	ELA24	ELA25	ELA26	
Cyperaceae	<i>Schoenus armeria</i>										X		X	X														
Cyperaceae	<i>Schoenus clandestinus</i>	X	X	X	X	X	X	X	X	X		X				X	X		X	X	X	X	X	X	X	X	X	X
Cyperaceae	<i>Schoenus nanus</i>	X					X												X									
Cyperaceae	<i>Schoenus pleiostemoneus</i>																											X
Cyperaceae	<i>Schoenus sp.</i>							X																				
Dilleniaceae	<i>Hibbertia hypericoides</i>	X	X	X	X	X	X	X	X	X	X	X		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Dilleniaceae	<i>Hibbertia spicata</i>			X	X	X		X	X	X							X	X		X	X	X				X	X	
Dilleniaceae	<i>Hibbertia subvaginata</i>			X				X						X														
Droseraceae	<i>Drosera erythrorhiza</i>	X				X											X		X		X	X		X				
Droseraceae	<i>Drosera macrantha</i>					X	X	X																				
Droseraceae	<i>Drosera menziesii</i>	X	X	X	X		X			X		X	X	X		X	X		X	X		X	X		X	X	X	X
Droseraceae	<i>Drosera porrecta</i>	X	X	X	X	X	X	X	X	X					X	X	X	X	X	X	X	X	X	X	X	X	X	X
Ecdeiocoleaceae	<i>Ecdeiocolea monostachya</i>	X	X			X	X			X	X	X	X	X		X	X		X	X	X	X	X	X	X	X	X	X
Ericaceae	<i>Styphelia hamulosa</i>									X																		
Ericaceae	<i>Styphelia microdonta</i>		X				X					X							X		X							X
Euphorbiaceae	<i>Beyeria gardneri</i>		X																									
Euphorbiaceae	<i>Monotaxis bracteata</i>		X				X															X		X	X	X		
Fabaceae	<i>Acacia blakelyi</i>			X	X				X						X	X												
Fabaceae	<i>Acacia dilatata</i>	X				X						X									X	X						
Fabaceae	<i>Acacia pulchella</i>			X	X			X						X				X										
Fabaceae	<i>Acacia sp.</i>								X																			
Fabaceae	<i>Acacia stenoptera</i>			X																								
Fabaceae	<i>Acacia tetragonaphylla</i>																			X			X	X	X			
Fabaceae	<i>Chorizema aciculare</i> subsp. <i>laxum</i>	X	X																									
Fabaceae	<i>Daviesia divaricata</i>	X			X		X		X	X		X				X	X		X	X			X	X	X	X	X	X
Fabaceae	<i>Daviesia incrassata</i> subsp. <i>teres</i>												X															
Fabaceae	<i>Daviesia pedunculata</i>							X								X	X	X	X	X	X	X		X				

Family	Species	ELA01	ELA02	ELA03	ELA04	ELA05	ELA06	ELA07	ELA08	ELA09	ELA10	ELA11	ELA12	ELA13	ELA14	ELA15	ELA16	ELA17	ELA18	ELA19	ELA20	ELA21	ELA22	ELA23	ELA24	ELA25	ELA26
Fabaceae	<i>Gastrolobium calycinum</i>		X		X	X	X			X	X									X		X				X	X
Fabaceae	<i>Gastrolobium plicatum</i>	X											X	X													
Fabaceae	<i>Gastrolobium spinosum</i>									X	X		X	X													
Fabaceae	<i>Isotropis cuneifolia</i>	X	X	X	X	X		X	X	X		X			X	X		X				X			X		X
Fabaceae	<i>Isotropis drummondii</i>													X													
Fabaceae	<i>Jacksonia angulata</i>	X	X																								
Fabaceae	<i>Jacksonia hakeoides</i>														X	X		X					X	X			
Fabaceae	<i>Mirbelia trichocalyx</i>				X			X																			
Goodeniaceae	<i>Dampiera alata</i>	X	X			X				X	X																
Goodeniaceae	<i>Dampiera altissima</i>	X	X		X	X	X		X							X	X		X	X	X	X	X		X	X	X
Goodeniaceae	<i>Lechenaultia biloba</i>	X																									
Goodeniaceae	<i>Lechenaultia linarioides</i>									X																	
Goodeniaceae	<i>Scaevola canescens</i>							X	X	X		X				X		X	X	X	X	X	X	X	X	X	X
Goodeniaceae	<i>Scaevola glandulifera</i>										X		X	X													
Gyrostemonaceae	<i>Gyrostemon racemiger</i>											X										X					
Gyrostemonaceae	<i>Tersonia cyathiflora</i>				2		2		2							2	2	2	2	2				2	2		
Haemodoraceae	<i>Anigozanthos humilis</i> subsp. <i>humilis</i>	X	X	X	X		X	X	X						X		X	X			X	X				X	X
Haemodoraceae	<i>Conostylis aculeata</i>								X																		
Haemodoraceae	<i>Conostylis candicans</i>																	X									
Haemodoraceae	<i>Conostylis canteriata</i>			X	X			X							X		X				X	X					X
Haemodoraceae	<i>Conostylis</i> sp.																										X
Hemerocallidaceae	<i>Dianella revoluta</i>																										X
Hemerocallidaceae	<i>Johnsonia pubescens</i> subsp. <i>pubescens</i>			X				X													X						
Iridaceae	<i>Patersonia occidentalis</i>															X											
Lamiaceae	<i>Hemiandra rubriflora</i>			X	X													X									

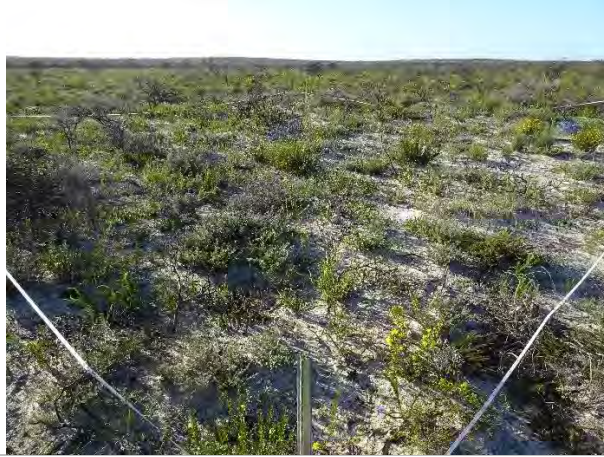

Family	Species	ELA01	ELA02	ELA03	ELA04	ELA05	ELA06	ELA07	ELA08	ELA09	ELA10	ELA11	ELA12	ELA13	ELA14	ELA15	ELA16	ELA17	ELA18	ELA19	ELA20	ELA21	ELA22	ELA23	ELA24	ELA25	ELA26
Lamiaceae	<i>Quoya verbascina</i>			X											X										X	X	
Loranthaceae	<i>Nuytsia floribunda</i>								X																		
Malvaceae	<i>Guichenotia sarotes</i>										X																
Malvaceae	<i>Lasiopetalum drummondii</i>		X					X		X					X					X	X				X		
Malvaceae	<i>Lasiopetalum ogilvieanum</i> (P1)																	X									
Montiaceae	<i>Calandrinia corrigioloides</i>														X			X			X		X	X	X		
Myrtaceae	<i>Babingtonia camphorosmae</i>	X				X						X							X	X							
Myrtaceae	<i>Beaufortia elegans</i>			X	X			X	X						X		X	X	X	X	X	X				X	X
Myrtaceae	<i>Calothamnus blepharospermus</i>																						X	X	X		
Myrtaceae	<i>Calothamnus quadrifidus</i> subsp. <i>angustifolius</i>	X	X	X	X	X	X	X	X	X			X		X			X			X	X			X	X	
Myrtaceae	<i>Calothamnus sanguineus</i>			X	X				X		X				X	X	X		X						X		
Myrtaceae	<i>Calytrix depressa</i>				X																						
Myrtaceae	<i>Calytrix</i> sp.						X	X				X									X		X	X	X	X	X
Myrtaceae	<i>Darwinia speciosa</i>		X	X		X	X									X										X	
Myrtaceae	<i>Eremaea beaufortioides</i>	X	X	X		X		X		X					X		X	X			X	X	X	X	X	X	X
Myrtaceae	<i>Eremaea</i> sp.	X	X	X		X				X									X								
Myrtaceae	<i>Eremaea violacea</i>																				X						X
Myrtaceae	<i>Eucalyptus todtiana</i>			X	X				X	X					X	X		X					X	X	X		
Myrtaceae	<i>Hypocalymma hirsutum</i>	X	X				X			X									X							X	
Myrtaceae	<i>Hypocalymma</i> sp.		X																								
Myrtaceae	<i>Leptospermum oligandrum</i>			X															X	X	X		X		X	X	X
Myrtaceae	<i>Leptospermum spinescens</i>									X						X				X	X					X	
Myrtaceae	<i>Melaleuca aspalathoides</i>	X	X			X					X			X			X				X	X					
Myrtaceae	<i>Melaleuca</i> sp.														X												
Myrtaceae	<i>Melaleuca leuropoma</i>	X	X	X	X	X		X	X	X		X			X	X	X	X	X	X	X		X	X	X	X	X

Family	Species	ELA01	ELA02	ELA03	ELA04	ELA05	ELA06	ELA07	ELA08	ELA09	ELA10	ELA11	ELA12	ELA13	ELA14	ELA15	ELA16	ELA17	ELA18	ELA19	ELA20	ELA21	ELA22	ELA23	ELA24	ELA25	ELA26	
Myrtaceae	<i>Scholtzia laxiflora</i>						X																X	X	X			
Myrtaceae	<i>Verticordia grandis</i>		X						X						X	X	X						X	X	X	X		
Orchidaceae	<i>Caladenia brunonis</i>												X															
Orchidaceae	<i>Caladenia flava</i>						X								X									X	X			
Orchidaceae	<i>Cyanicula gemmata</i>												X	X														
Orchidaceae	<i>Leporella fimbriata</i>				X	X		X	X														X					
Orchidaceae	<i>Thelymitra campanulata</i>																				X							
Orchidaceae	<i>Thysanotus dichotomus</i>																		X	X								
Orchidaceae	<i>Thysanotus multiflorus</i>																				X							
Orchidaceae	<i>Thysanotus patersonii</i>						X		X									X						X		X		
Orchidaceae	<i>Thysanotus</i> sp.																					X						
Poaceae	<i>Austrostipa macalpinei</i>														X	X		X										
Poaceae	<i>Neurachne alopecuroidea</i>	X	X	X	X	X	X	X	X	X	X	X	X	X		X	X	X	X		X	X			X	X	X	
Proteaceae	<i>Banksia attenuata</i>																						X	X	X			
Proteaceae	<i>Banksia carlinoides</i>	X	X					X		X												X						
Proteaceae	<i>Banksia dallanneyi</i> subsp. <i>media</i>			X	X				X									X					X	X	X			
Proteaceae	<i>Banksia fraseri</i> var. <i>fraseri</i>					X				X	X			X					X									
Proteaceae	<i>Banksia prionotes</i>						X																			X	X	
Proteaceae	<i>Banksia scabrella</i> (P4)		X	X	X			X	X	X					X													
Proteaceae	<i>Banksia sessilis</i>				X				X						X													
Proteaceae	<i>Banksia shuttleworthiana</i>		X	X	X	X	X	X				X						X	X	X	X	X	X			X	X	
Proteaceae	<i>Conospermum boreale</i>		X		X	X	X	X	X			X				X	X	X	X	X	X			X	X	X	X	X
Proteaceae	<i>Conospermum stoechadis</i>			X	X										X													
Proteaceae	<i>Grevillea biformis</i>		X																									
Proteaceae	<i>Grevillea leucopteris</i>																										X	
Proteaceae	<i>Grevillea shuttleworthiana</i> subsp. <i>canarina</i>																			X								

Family	Species	ELA01	ELA02	ELA03	ELA04	ELA05	ELA06	ELA07	ELA08	ELA09	ELA10	ELA11	ELA12	ELA13	ELA14	ELA15	ELA16	ELA17	ELA18	ELA19	ELA20	ELA21	ELA22	ELA23	ELA24	ELA25	ELA26
Proteaceae	<i>Grevillea synapheae</i>		X																								
Proteaceae	<i>Hakea auriculata</i>					X					X		X	X					X		X	X					
Proteaceae	<i>Hakea candolleana</i>																				X	X		X			
Proteaceae	<i>Hakea incrassata</i>			X	X				X						X												
Proteaceae	<i>Hakea lissocarpha</i>	X				X				X	X		X														
Proteaceae	<i>Hakea sp. 1</i>	X	X			X				X									X								
Proteaceae	<i>Hakea sp. 2</i>		X													X	X	X	X								
Proteaceae	<i>Hakea stenocarpa</i>					X				X																	
Proteaceae	<i>Hakea trifurcata</i>			X	X			X	X										X		X				X	X	X
Proteaceae	<i>Isopogon divergens</i>																					X					
Proteaceae	<i>Isopogon tridens</i>	X	X	X	X	X		X	X	X		X			X				X								
Proteaceae	<i>Lambertia multiflora</i> var. <i>multiflora</i>				X		X	X	X	X																	
Proteaceae	<i>Persoonia acicularis</i>																		X								
Proteaceae	<i>Petrophile brevifolia</i>	2	X	X						X						X											
Proteaceae	<i>Petrophile macrostachya</i>																		X	X	X				X	X	
Proteaceae	<i>Petrophile shuttleworthiana</i>									X	X		X	X													
Proteaceae	<i>Proteaceae</i> sp.																										X
Restionaceae	<i>Alexgeorgea nitens</i>			X								X			X												
Restionaceae	<i>Desmocladus asper</i>		X		X				X							X											
Restionaceae	<i>Desmocladus semiplanus</i>	X				X	X	X				X				X	X		X	X	X	X		X	X		X
Restionaceae	<i>Lepidobolus preissianus</i>		X																								
Rhamnaceae	<i>Stenanthemum notiale</i> subsp. <i>notiale</i>						X	X								X	X	X							X	X	
Rubiaceae	<i>Opercularia vaginata</i>	X	X	X	X	X		X	X	X		X	X		X	X	X	X	X	X	X	X		X		X	X
Rutaceae	<i>Boronia coerulescens</i> subsp. <i>spinescens</i>																X		X					X	X		
Rutaceae	<i>Boronia cymosa</i>	X	X			X				X	X			X		X	X	X	X	X	X	X					
Rutaceae	<i>Boronia ramosa</i> subsp. <i>anethifolia</i>														X			X						X			

Family	Species	ELA01	ELA02	ELA03	ELA04	ELA05	ELA06	ELA07	ELA08	ELA09	ELA10	ELA11	ELA12	ELA13	ELA14	ELA15	ELA16	ELA17	ELA18	ELA19	ELA20	ELA21	ELA22	ELA23	ELA24	ELA25	ELA26
Rutaceae	<i>Diplolaena ferruginea</i>		X						X							X					X						
Sapindaceae	<i>Diplopeltis huegelii</i> subsp. <i>lehmanii</i>			X	X			X										X									
Stylidiaceae	<i>Levenhookia pusilla</i>	X	X			X															X						X
Stylidiaceae	<i>Stylidium crossocephalum</i>														X												
Stylidiaceae	<i>Stylidium drummondianum</i> (P3)										X																
Stylidiaceae	<i>Stylidium rigidulum</i>	X	X	X	X	X		X	X			X			X	X		X	X						X	X	X
Thymelaeaceae	<i>Pimelea angustifolia</i>			X			X								X	X											
Thymelaeaceae	<i>Pimelea microcephala</i>																										X
Thymelaeaceae	<i>Pimelea sulphurea</i>										X								X		X						
Xanthorrhoeaceae	<i>Chamaescilla corymbosa</i>										X		X	X													

Appendix G Summary of vegetation communities

Mapping code	AcEbHh	Woodman (2013) corresponding vegetation type	10 and 12	Extent of survey area mapped (ha)	69.3
Vegetation community description	<i>Allocasuarina campestris</i> tall sparse shrubland over <i>Eremaea beaufortioides</i> , <i>Calothamnus quadrifidus</i> subsp. <i>angustifolius</i> , <i>Isopogon tridens</i> mid sparse shrubland over <i>Hibbertia hypericoides</i> , <i>Melaleuca leuropoma</i> low open shrubland and <i>Ecdeiocolea monostachya</i> low open sedgeland.				
Associated species	<i>Allocasuarina microstachya</i> , <i>Banksia shuttleworthiana</i> , <i>Boronia cymosa</i> , <i>Dampiera alata</i> , <i>Dampiera altissima</i> , <i>Hibbertia spicata</i> , <i>Isotropis cuneifolia</i> , <i>Isopogon tridens</i> , <i>Melaleuca aspalathoides</i> , <i>Neurachne alopecuroidea</i> , <i>Opercularia vaginata</i> , <i>Schoenus clandestinus</i> and <i>Tripterococcus brunonis</i> .				
Assigned survey sites	ELA01, ELA02, ELA05, ELA09, ELA20 and ELA21		General vegetation condition	Excellent	
Common soil type	Sand with light clay	General soil notes	Grey over brown	Common landform	Flat with gentle slope
Rock type	Nil	Outcropping (%)	0	General time since fire	1-10 years
Average species richness	45		Similarity percentage (SIMPER)	50.9%	
Representative plate(s) of vegetation community					
					
ELA01			ELA02		



ELA05



ELA09



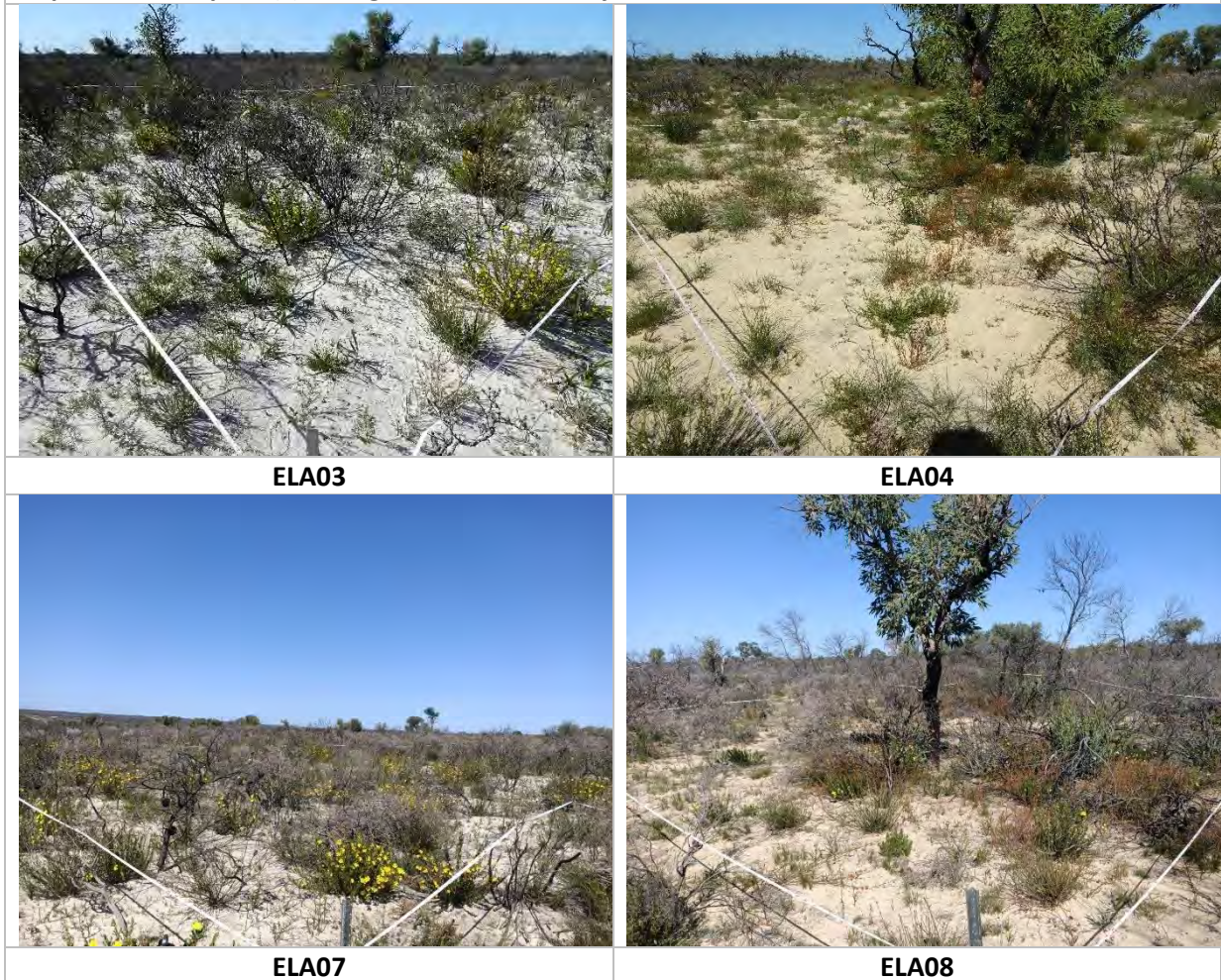
ELA20



ELA21

Mapping code	EtAhHh	Woodman (2013) corresponding vegetation type	13a	Extent of survey area mapped (ha)	55
Vegetation community description	<i>Eucalyptus tottiana</i> mid open woodland over <i>Allocasuarina humilis</i> , <i>Banksia scabrella</i> (P4), <i>Calothamnus sanguineus</i> mid open shrubland over <i>Hibbertia hypericoides</i> , <i>Melaleuca leuropoma</i> low open shrubland and <i>Caustis dioica</i> low open sedgeland.				
Associated species	<i>Acacia blakelyi</i> , <i>Acacia pulchella</i> , <i>Anigozanthos humilis</i> subsp. <i>humilis</i> , <i>Banksia dallanneyi</i> subsp. <i>media</i> , <i>Calothamnus quadrifidus</i> subsp. <i>angustifolius</i> , <i>Hakea trifurcata</i> , <i>Hibbertia spicata</i> , <i>Isotropis cuneifolia</i> , <i>Isopogon tridens</i> , <i>Mesomelaena pseudostygia</i> , <i>Neurachne alopecuroidea</i> and <i>Opercularia vaginata</i> .				
Assigned survey sites	ELA03, ELA04, ELA07, ELA08, ELA14 and ELA17			General vegetation condition	Excellent
Common soil type	Sand loam	General soil notes	Grey over brown	Common landform	Flat with gentle slope
Rock type	Nil	Outcropping (%)	0	General time since fire	1-10 years
Average species richness	44.33		Similarity percentage (SIMPER)	54.75%	

Representative plate(s) of vegetation community


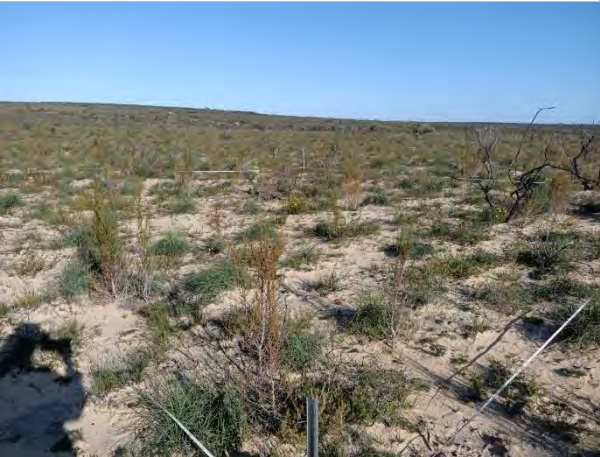





ELA14



ELA17

Mapping code	BpDdHh	Woodman (2013) corresponding vegetation type	13b	Extent of survey area mapped (ha)	12
Vegetation community description	<i>Banksia prionotes</i> mid open woodland over <i>Daviesia divaricata</i> , <i>Conospermum boreale</i> , <i>Allocasuarina humilis</i> mid open shrubland over <i>Hibbertia hypericoides</i> low open shrubland and <i>Ecdeiocolea monostachya</i> , <i>Mesomelaena pseudostygia</i> low open sedgeland.				
Associated species	<i>Banksia shuttleworthiana</i> , <i>Dampiera altissima</i> , <i>Desmocladius semiplanus</i> , <i>Gastrolobium calycinum</i> , <i>Leptospermum oligandrum</i> , <i>Lyginia imberbis</i> , <i>Melaleuca leuropoma</i> , <i>Neurachne alopecuroidea</i> , <i>Opercularia vaginata</i> , <i>Scaevola canescens</i> , <i>Schoenus clandestinus</i> and <i>Styphelia microdonta</i> .				
Assigned survey sites	ELA06, ELA11, ELA25 and ELA26			General vegetation condition	Excellent
Common soil type	Sand loam	General soil notes	Grey over brown	Common landform	Flat with gentle slope
Rock type	Nil	Outcropping (%)	0	General time since fire	1-10 years
Average species richness	36		Similarity percentage (SIMPER)		55.07%
Representative plate(s) of vegetation community					
					
ELA06			ELA11		
					
ELA25					

Mapping code	AcAhGp	Woodman (2013) corresponding vegetation type	9	Extent of survey area mapped (ha)	5.5
Vegetation community description	<i>Allocasuarina campestris</i> tall sparse shrubland over <i>Allocasuarina humilis</i> , <i>Hakea auriculata</i> , <i>Petrophile shuttleworthiana</i> mid open shrubland over <i>Gastrolobium plicatum</i> low open shrubland and <i>Ecdeiocolea monostachya</i> , <i>Schoenus armeria</i> low open sedgeland.				
Associated species	<i>Banksia fraseri</i> var. <i>fraseri</i> , <i>Boronia cymosa</i> , <i>Calothamnus sanguineus</i> , <i>Chamaescilla corymbosa</i> , <i>Daviesia incrassata</i> subsp. <i>teres</i> , <i>Gastrolobium calycinum</i> , <i>Guichenotia sarotes</i> , <i>Hakea lissocarpha</i> , <i>Melaleuca aspalathoides</i> , <i>Neurachne alopecuroidea</i> , <i>Pterochaeta paniculata</i> and <i>Scaevola glandulifera</i> .				
Assigned survey sites	ELA10, ELA12 and ELA13			General vegetation condition	Excellent
Common soil type	Sand loam	General soil notes	Grey	Common landform	Flat with gentle slope
Rock type	Laterite	Outcropping (%)	10-20	General time since fire	1-10 years
Average species richness	21.66		Similarity percentage (SIMPER)		63.33%
Representative plate(s) of vegetation community					
					
ELA10			ELA12		
					
ELA13					

Mapping code	AcDdMI	Woodman (2013) corresponding vegetation type	12	Extent of survey area mapped (ha)	35.2
Vegetation community description	<i>Allocasuarina campestris</i> tall isolated shrubs over <i>Daviesia divaricata</i> , <i>Conospermum boreale</i> , <i>Beaufortia elegans</i> mid open shrubland over <i>Melaleuca leuropoma</i> , <i>Hibbertia hypericoides</i> low open shrub over <i>Ecdeiocolea monostachya</i> low open sedgeland.				
Associated species	<i>Boronia cymosa</i> , <i>Calothamnus sanguineus</i> , <i>Caustis dioica</i> , <i>Dampiera altissima</i> , <i>Daviesia pedunculata</i> , <i>Desmocladus semiplanus</i> , <i>Leptospermum oligandrum</i> , <i>Mesomelaena pseudostygia</i> , <i>Opercularia vaginata</i> , <i>Scaevola canescens</i> , <i>Schoenus clandestinus</i> , <i>Tersonia cyathiflora</i> and <i>Verticordia grandis</i> .				
Assigned survey sites	ELA15, ELA16, ELA18 and ELA19			General vegetation condition	Excellent
Common soil type	Sand loam	General soil notes	Grey over brown	Common landform	Flat with gentle slope
Rock type	Nil	Outcropping (%)	0	General time since fire	1-10 years
Average species richness	36.25		Similarity percentage (SIMPER)	54.59%	

Representative plate(s) of vegetation community



ELA15






ELA16



ELA18



ELA19

Mapping code	EtBaHh	Woodman (2013) corresponding vegetation type	10, 13b	Extent of survey area mapped (ha)	22.5
Vegetation community description	<i>Eucalyptus todtiana</i> mid open woodland over <i>Banksia attenuata</i> , <i>Calothamnus blepharospermus</i> , <i>Eremaea beaufortioides</i> mid open shrubland over <i>Hibbertia hypericoides</i> , <i>Melaleuca leuropoma</i> low open shrubland and <i>Ecdeiocolea monostachya</i> low open sedgeland.				
Associated species	<i>Acacia tetragonophylla</i> , <i>Banksia dallanneyi</i> subsp. <i>media</i> , <i>Conospermum boreale</i> , <i>Jacksonia hakeoides</i> , <i>Leptospermum oligandrum</i> , <i>Lyginia imberbis</i> , <i>Melaleuca leuropoma</i> , <i>Mesomelaena pseudostygia</i> , <i>Scaevola canescens</i> , <i>Schoenus clandestinus</i> , <i>Scholtzia laxiflora</i> , <i>Tersonia cyathiflora</i> and <i>Verticordia grandis</i> .				
Assigned survey sites	ELA22, ELA23 and ELA24			General vegetation condition	Excellent
Common soil type	Sand loam	General soil notes	Grey	Common landform	Flat with gentle slope
Rock type	Nil	Outcropping (%)	0	General time since fire	1-10 years
Average species richness	33		Similarity percentage (SIMPER)	67.84%	
Representative plate(s) of vegetation community					
					
ELA22			ELA23		
					
ELA24					

Appendix H Locations of Priority species within the survey area

Species	DBCA listing	Number of individuals	Easting	Northing	Comments
<i>Banksia scabrella</i>	P4	1	323061	6745601	Dead, burnt
<i>Banksia scabrella</i>	P4	30	324493	6745648	Dead, burnt
<i>Banksia scabrella</i>	P4	2	324495	6745617	Dead, burnt
<i>Banksia scabrella</i>	P4	10	324535	6745651	Dead, burnt
<i>Banksia scabrella</i>	P4	20	324593	6745655	Dead, burnt
<i>Banksia scabrella</i>	P4	20	324626	6745629	Dead, burnt
<i>Banksia scabrella</i>	P4	4	324823	6745595	Dead, burnt
<i>Banksia scabrella</i>	P4	3	327024	6745536	Dead, burnt
<i>Banksia scabrella</i>	P4	10	327055	6745557	Dead, burnt
<i>Banksia scabrella</i>	P4	1	327118	6745523	Dead, burnt
<i>Banksia scabrella</i>	P4	10	327124	6745579	Dead, burnt
<i>Banksia scabrella</i>	P4	15	327213	6745558	Dead, burnt
<i>Banksia scabrella</i>	P4	13	327222	6745511	Dead, burnt
<i>Banksia scabrella</i>	P4	5	327246	6745571	Dead, burnt
<i>Banksia scabrella</i>	P4	5	327295	6745492	Dead, burnt
<i>Banksia scabrella</i>	P4	5	327338	6745545	Dead, burnt
<i>Banksia scabrella</i>	P4	4	327397	6745503	Dead, burnt
<i>Banksia scabrella</i>	P4	20	327402	6745575	Dead, burnt
<i>Banksia scabrella</i>	P4	10	327447	6745578	Dead, burnt
<i>Banksia scabrella</i>	P4	3	327449	6745500	Dead, burnt
<i>Banksia scabrella</i>	P4	5	327457	6745542	Dead, burnt
<i>Banksia scabrella</i>	P4	4	327471	6745519	Dead, burnt
<i>Banksia scabrella</i>	P4	2	328551	6745568	Dead, burnt
<i>Banksia scabrella</i>	P4	3	328585	6745569	Dead, burnt
<i>Banksia scabrella</i>	P4	5	328669	6745551	Dead, burnt
<i>Banksia scabrella</i>	P4	20	328717	6745582	Dead, burnt
<i>Banksia scabrella</i>	P4	5	328778	6745562	Dead, burnt
<i>Banksia scabrella</i>	P4	1	328817	6745553	Dead, burnt
<i>Banksia scabrella</i>	P4	5	328853	6745575	Dead, burnt
<i>Banksia scabrella</i>	P4	20	328903	6745574	Dead, burnt
<i>Banksia scabrella</i>	P4	20	328936	6745567	Dead, burnt
<i>Banksia scabrella</i>	P4	5	329032	6745558	Dead, burnt
<i>Banksia scabrella</i>	P4	6	329294	6745526	Dead, burnt

Species	DBCA listing	Number of individuals	Easting	Northing	Comments
<i>Banksia scabrella</i>	P4	10	329490	6745559	Dead, burnt
<i>Banksia scabrella</i>	P4	5	329508	6745492	Dead, burnt
<i>Banksia scabrella</i>	P4	30	329527	6745523	Dead, burnt
<i>Banksia scabrella</i>	P4	60	329546	6745561	Dead, burnt
<i>Banksia scabrella</i>	P4	30	329580	6745569	Dead, burnt
<i>Banksia scabrella</i>	P4	35	329588	6745489	Dead, burnt
<i>Banksia scabrella</i>	P4	50	329608	6745514	Dead, burnt
<i>Banksia scabrella</i>	P4	15	329638	6745504	Dead, burnt
<i>Banksia scabrella</i>	P4	10	329640	6745559	Dead, burnt
<i>Banksia scabrella</i>	P4	10	329733	6745517	Dead, burnt
<i>Banksia scabrella</i>	P4	10	329734	6745545	Dead, burnt
<i>Banksia scabrella</i>	P4	10	329747	6745522	Dead, burnt
<i>Banksia scabrella</i>	P4	15	329795	6745484	Dead, burnt
<i>Banksia scabrella</i>	P4	5	329810	6745561	Dead, burnt
<i>Banksia scabrella</i>	P4	10	329848	6745532	Dead, burnt
<i>Banksia scabrella</i>	P4	50	329862	6745493	Dead, burnt
<i>Banksia scabrella</i>	P4	10	329892	6745564	Dead, burnt
<i>Banksia scabrella</i>	P4	40	329949	6745559	Dead, burnt
<i>Banksia scabrella</i>	P4	30	329998	6745482	Dead, burnt
<i>Banksia scabrella</i>	P4	40	330018	6745569	Dead, burnt
<i>Banksia scabrella</i>	P4	30	330055	6745511	Dead, burnt
<i>Banksia scabrella</i>	P4	200	330081	6745565	Dead, burnt
<i>Banksia scabrella</i>	P4	50	330111	6745484	Dead, burnt
<i>Banksia scabrella</i>	P4	40	330114	6745521	Dead, burnt
<i>Banksia scabrella</i>	P4	150	330121	6745564	Dead, burnt
<i>Banksia scabrella</i>	P4	80	330168	6745558	Dead, burnt
<i>Banksia scabrella</i>	P4	60	330190	6745514	Dead, burnt
<i>Banksia scabrella</i>	P4	100	330206	6745588	Dead, burnt
<i>Banksia scabrella</i>	P4	60	330221	6745515	Dead, burnt
<i>Banksia scabrella</i>	P4	60	330262	6745578	Dead, burnt
<i>Banksia scabrella</i>	P4	40	330274	6745529	Dead, burnt
<i>Banksia scabrella</i>	P4	100	330280	6745582	Dead, burnt
<i>Banksia scabrella</i>	P4	25	330319	6745516	Dead, burnt
<i>Banksia scabrella</i>	P4	100	330327	6745591	Dead, burnt
<i>Banksia scabrella</i>	P4	25	330344	6745518	Dead, burnt
<i>Banksia scabrella</i>	P4	40	330375	6745527	Dead, burnt

Species	DBCA listing	Number of individuals	Easting	Northing	Comments
<i>Banksia scabrella</i>	P4	150	330412	6745595	Dead, burnt
<i>Banksia scabrella</i>	P4	50	330430	6745559	Dead, burnt
<i>Banksia scabrella</i>	P4	80	330452	6745580	Dead, burnt
<i>Banksia scabrella</i>	P4	1	330821	6745549	Dead, burnt
<i>Banksia scabrella</i>	P4	4	330835	6745501	Dead, burnt
<i>Banksia scabrella</i>	P4	1	330990	6745498	Dead, burnt
<i>Banksia scabrella</i>	P4	4	331026	6745519	Dead, burnt
<i>Banksia scabrella</i>	P4	8	331326	6745435	Dead, burnt
<i>Banksia scabrella</i>	P4	15	331399	6745433	Dead, burnt
<i>Banksia scabrella</i>	P4	5	331412	6745452	Dead, burnt
<i>Banksia scabrella</i>	P4	5	331421	6745424	Dead, burnt
<i>Banksia scabrella</i>	P4	5	331459	6745459	Dead, burnt
<i>Banksia scabrella</i>	P4	2	331462	6745402	Dead, burnt
<i>Banksia scabrella</i>	P4	10	331483	6745423	Dead, burnt
<i>Banksia scabrella</i>	P4	15	331486	6745440	Dead, burnt
<i>Banksia scabrella</i>	P4	2	331536	6745414	Dead, burnt
<i>Banksia scabrella</i>	P4	2	331602	6745380	Dead, burnt
<i>Banksia scabrella</i>	P4	10	331761	6745413	Dead, burnt
<i>Banksia scabrella</i>	P4	15	331770	6745453	Dead, burnt
<i>Banksia scabrella</i>	P4	3	331790	6745416	Dead, burnt
<i>Banksia scabrella</i>	P4	7	331804	6745443	Dead, burnt
<i>Banksia scabrella</i>	P4	8	331809	6745398	Dead, burnt
<i>Banksia scabrella</i>	P4	5	331810	6745411	Dead, burnt
<i>Banksia scabrella</i>	P4	5	331871	6745367	Dead, burnt
<i>Banksia scabrella</i>	P4	10	332347	6745340	Dead, burnt
<i>Banksia scabrella</i>	P4	2	332355	6745364	Alive
<i>Banksia scabrella</i>	P4	4	332355	6745364	Dead, burnt
<i>Banksia scabrella</i>	P4	11	332359	6745389	Dead, burnt
<i>Banksia scabrella</i>	P4	25	332398	6745335	Dead, burnt
<i>Banksia scabrella</i>	P4	10	332412	6745390	Dead, burnt
<i>Banksia scabrella</i>	P4	10	332431	6745383	Dead, burnt
<i>Banksia scabrella</i>	P4	8	332440	6745324	Dead, burnt
<i>Banksia scabrella</i>	P4	1	332450	6745388	Dead, burnt
<i>Banksia scabrella</i>	P4	3	332467	6745387	Dead, burnt
<i>Banksia scabrella</i>	P4	7	332468	6745413	Dead, burnt
<i>Banksia scabrella</i>	P4	15	332477	6745323	Dead, burnt

Species	DBCA listing	Number of individuals	Easting	Northing	Comments
<i>Banksia scabrella</i>	P4	5	332499	6745318	Dead, burnt
<i>Banksia scabrella</i>	P4	10	332520	6745351	Dead, burnt
<i>Banksia scabrella</i>	P4	2	332532	6745323	Dead, burnt
<i>Banksia scabrella</i>	P4	10	332543	6745347	Dead, burnt
<i>Banksia scabrella</i>	P4	30	332560	6745374	Dead, burnt
<i>Banksia scabrella</i>	P4	40	332577	6745353	Dead, burnt
<i>Banksia scabrella</i>	P4	10	332594	6745379	Dead, burnt
<i>Banksia scabrella</i>	P4	10	332610	6745354	Dead, burnt
<i>Banksia scabrella</i>	P4	15	332619	6745374	Dead, burnt
<i>Banksia scabrella</i>	P4	20	332644	6745339	Dead, burnt
<i>Banksia scabrella</i>	P4	20	332648	6745370	Dead, burnt
<i>Banksia scabrella</i>	P4	15	332675	6745370	Dead, burnt
<i>Banksia scabrella</i>	P4	5	332679	6745338	Dead, burnt
<i>Banksia scabrella</i>	P4	5	332681	6745313	Dead, burnt
<i>Banksia scabrella</i>	P4	12	332681	6745401	Dead, burnt
<i>Banksia scabrella</i>	P4	15	332713	6745400	Dead, burnt
<i>Banksia scabrella</i>	P4	3	332714	6745372	Dead, burnt
<i>Banksia scabrella</i>	P4	3	332833	6745336	Dead, burnt
<i>Banksia scabrella</i>	P4	5	332836	6745358	Dead, burnt
<i>Banksia scabrella</i>	P4	10	332870	6745342	Dead, burnt
<i>Banksia scabrella</i>	P4	4	332872	6745359	Dead, burnt
<i>Banksia scabrella</i>	P4	10	332905	6745352	Dead, burnt
<i>Banksia scabrella</i>	P4	70	332907	6745333	Dead, burnt
<i>Banksia scabrella</i>	P4	11	332909	6745387	Dead, burnt
<i>Banksia scabrella</i>	P4	20	332924	6745356	Dead, burnt
<i>Banksia scabrella</i>	P4	8	332927	6745303	Dead, burnt
<i>Banksia scabrella</i>	P4	90	332936	6745331	Dead, burnt
<i>Banksia scabrella</i>	P4	80	332943	6745360	Dead, burnt
<i>Banksia scabrella</i>	P4	50	332960	6745304	Dead, burnt
<i>Banksia scabrella</i>	P4	80	332971	6745359	Dead, burnt
<i>Banksia scabrella</i>	P4	70	332973	6745326	Dead, burnt
<i>Banksia scabrella</i>	P4	21	332986	6745383	Dead, burnt
<i>Banksia scabrella</i>	P4	30	332991	6745302	Dead, burnt
<i>Banksia scabrella</i>	P4	50	332999	6745356	Dead, burnt
<i>Banksia scabrella</i>	P4	5	333011	6745321	Dead, burnt
<i>Banksia scabrella</i>	P4	10	333015	6745304	Dead, burnt

Species	DBCA listing	Number of individuals	Easting	Northing	Comments
<i>Banksia scabrella</i>	P4	7	333021	6745386	Dead, burnt
<i>Banksia scabrella</i>	P4	20	333026	6745351	Dead, burnt
<i>Banksia scabrella</i>	P4	30	333049	6745324	Dead, burnt
<i>Banksia scabrella</i>	P4	10	333056	6745297	Dead, burnt
<i>Banksia scabrella</i>	P4	30	333062	6745354	Dead, burnt
<i>Banksia scabrella</i>	P4	22	333079	6745296	Dead, burnt
<i>Banksia scabrella</i>	P4	25	333086	6745356	Dead, burnt
<i>Banksia scabrella</i>	P4	30	333095	6745322	Dead, burnt
<i>Banksia scabrella</i>	P4	37	333103	6745382	Dead, burnt
<i>Banksia scabrella</i>	P4	30	333109	6745345	Dead, burnt
<i>Banksia scabrella</i>	P4	36	333130	6745375	Dead, burnt
<i>Banksia scabrella</i>	P4	20	333140	6745342	Dead, burnt
<i>Banksia scabrella</i>	P4	20	333142	6745324	Dead, burnt
<i>Banksia scabrella</i>	P4	20	333169	6745342	Dead, burnt
<i>Banksia scabrella</i>	P4	15	333182	6745318	Dead, burnt
<i>Banksia scabrella</i>	P4	8	333191	6745286	Dead, burnt
<i>Banksia scabrella</i>	P4	10	333202	6745344	Dead, burnt
<i>Banksia scabrella</i>	P4	10	333212	6745309	Dead, burnt
<i>Banksia scabrella</i>	P4	5	333222	6745289	Dead, burnt
<i>Banksia scabrella</i>	P4	15	333241	6745308	Dead, burnt
<i>Banksia scabrella</i>	P4	6	333244	6745341	Dead, burnt
<i>Banksia scabrella</i>	P4	4	333267	6745332	Dead, burnt
<i>Banksia scabrella</i>	P4	10	333270	6745310	Dead, burnt
<i>Banksia scabrella</i>	P4	5	333304	6745330	Dead, burnt
<i>Banksia scabrella</i>	P4	40	333307	6745307	Dead, burnt
<i>Banksia scabrella</i>	P4	15	333333	6745273	Dead, burnt
<i>Banksia scabrella</i>	P4	60	333335	6745302	Dead, burnt
<i>Banksia scabrella</i>	P4	10	333336	6745328	Dead, burnt
<i>Banksia scabrella</i>	P4	70	333362	6745298	Dead, burnt
<i>Banksia scabrella</i>	P4	40	333373	6745323	Dead, burnt
<i>Banksia scabrella</i>	P4	11	333383	6745357	Dead, burnt
<i>Banksia scabrella</i>	P4	26	333389	6745279	Dead, burnt
<i>Banksia scabrella</i>	P4	90	333390	6745303	Dead, burnt
<i>Banksia scabrella</i>	P4	60	333422	6745297	Dead, burnt
<i>Banksia scabrella</i>	P4	20	333422	6745276	Dead, burnt
<i>Banksia scabrella</i>	P4	30	333431	6745325	Dead, burnt

Species	DBCA listing	Number of individuals	Easting	Northing	Comments
<i>Banksia scabrella</i>	P4	2	333446	6745295	Alive
<i>Banksia scabrella</i>	P4	30	333446	6745295	Dead, burnt
<i>Banksia scabrella</i>	P4	50	333460	6745328	Dead, burnt
<i>Banksia scabrella</i>	P4	100	333466	6745301	Dead, burnt
<i>Banksia scabrella</i>	P4	25	333475	6745270	Dead, burnt
<i>Banksia scabrella</i>	P4	60	333484	6745325	Dead, burnt
<i>Banksia scabrella</i>	P4	3	333501	6745291	Alive
<i>Banksia scabrella</i>	P4	90	333501	6745291	Dead, burnt
<i>Banksia scabrella</i>	P4	28	333501	6745269	Dead, burnt
<i>Banksia scabrella</i>	P4	2	333508	6745323	Alive
<i>Banksia scabrella</i>	P4	30	333508	6745323	Dead, burnt
<i>Banksia scabrella</i>	P4	9	333510	6745350	Dead, burnt
<i>Banksia scabrella</i>	P4	40	333517	6745325	Dead, burnt
<i>Banksia scabrella</i>	P4	20	333531	6745302	Dead, burnt
<i>Banksia scabrella</i>	P4	40	333537	6745323	Dead, burnt
<i>Banksia scabrella</i>	P4	35	333542	6745262	Dead, burnt
<i>Banksia scabrella</i>	P4	22	333566	6745261	Dead, burnt
<i>Banksia scabrella</i>	P4	50	333567	6745302	Dead, burnt
<i>Banksia scabrella</i>	P4	1	333570	6745322	Alive
<i>Banksia scabrella</i>	P4	10	333570	6745322	Dead, burnt
<i>Banksia scabrella</i>	P4	10	333592	6745293	Dead, burnt
<i>Banksia scabrella</i>	P4	50	333597	6745261	Dead, burnt
<i>Banksia scabrella</i>	P4	6	333598	6745341	Dead, burnt
<i>Banksia scabrella</i>	P4	8	333600	6745322	Alive
<i>Banksia scabrella</i>	P4	10	333600	6745322	Dead, burnt
<i>Banksia scabrella</i>	P4	10	333607	6745294	Dead, burnt
<i>Banksia scabrella</i>	P4	5	333613	6745315	Alive
<i>Banksia scabrella</i>	P4	20	333613	6745315	Dead, burnt
<i>Banksia scabrella</i>	P4	15	333622	6745263	Dead, burnt
<i>Banksia scabrella</i>	P4	4	333636	6745314	Alive
<i>Banksia scabrella</i>	P4	10	333636	6745314	Dead, burnt
<i>Banksia scabrella</i>	P4	20	333644	6745284	Dead, burnt
<i>Banksia scabrella</i>	P4	4	333645	6745337	Dead, burnt
<i>Banksia scabrella</i>	P4	30	333659	6745312	Dead, burnt
<i>Banksia scabrella</i>	P4	40	333661	6745265	Dead, burnt
<i>Banksia scabrella</i>	P4	5	333674	6745310	Dead, burnt

Species	DBCA listing	Number of individuals	Easting	Northing	Comments
<i>Banksia scabrella</i>	P4	1	333676	6745344	Dead, burnt
<i>Banksia scabrella</i>	P4	50	333677	6745282	Dead, burnt
<i>Banksia scabrella</i>	P4	4	333700	6745306	Alive
<i>Banksia scabrella</i>	P4	20	333700	6745306	Dead, burnt
<i>Banksia scabrella</i>	P4	30	333707	6745287	Dead, burnt
<i>Banksia scabrella</i>	P4	15	333711	6745270	Dead, burnt
<i>Banksia scabrella</i>	P4	50	333724	6745311	Dead, burnt
<i>Banksia scabrella</i>	P4	60	333737	6745287	Dead, burnt
<i>Banksia scabrella</i>	P4	12	333753	6745335	Dead, burnt
<i>Banksia scabrella</i>	P4	40	333754	6745306	Dead, burnt
<i>Banksia scabrella</i>	P4	15	333764	6745265	Dead, burnt
<i>Banksia scabrella</i>	P4	60	333764	6745285	Dead, burnt
<i>Banksia scabrella</i>	P4	4	333776	6745345	Dead, burnt
<i>Banksia scabrella</i>	P4	20	333781	6745308	Dead, burnt
<i>Banksia scabrella</i>	P4	40	333790	6745285	Dead, burnt
<i>Banksia scabrella</i>	P4	20	333913	6745258	Dead, burnt
<i>Banksia scabrella</i>	P4	1	333914	6745306	Dead, burnt
<i>Banksia scabrella</i>	P4	15	333919	6745276	Dead, burnt
<i>Banksia scabrella</i>	P4	15	333957	6745295	Dead, burnt
<i>Banksia scabrella</i>	P4	40	333985	6745265	Dead, burnt
<i>Banksia scabrella</i>	P4	30	333988	6745294	Dead, burnt
<i>Banksia scabrella</i>	P4	30	334006	6745241	Dead, burnt
<i>Banksia scabrella</i>	P4	12	334009	6745241	Alive
<i>Banksia scabrella</i>	P4	50	334013	6745257	Dead, burnt
<i>Banksia scabrella</i>	P4	2	334016	6745297	Alive
<i>Banksia scabrella</i>	P4	10	334016	6745297	Dead, burnt
<i>Banksia scabrella</i>	P4	6	334023	6745324	Dead, burnt
<i>Banksia scabrella</i>	P4	25	334032	6745238	Dead, burnt
<i>Banksia scabrella</i>	P4	100	334040	6745255	Dead, burnt
<i>Banksia scabrella</i>	P4	30	334046	6745296	Dead, burnt
<i>Banksia scabrella</i>	P4	25	334058	6745236	Dead, burnt
<i>Banksia scabrella</i>	P4	60	334072	6745258	Dead, burnt
<i>Banksia scabrella</i>	P4	20	334075	6745296	Dead, burnt
<i>Banksia scabrella</i>	P4	15	334082	6745234	Dead, burnt
<i>Banksia scabrella</i>	P4	4	334090	6745314	Dead, burnt
<i>Banksia scabrella</i>	P4	50	334103	6745284	Dead, burnt

Species	DBCA listing	Number of individuals	Easting	Northing	Comments
<i>Banksia scabrella</i>	P4	40	334105	6745258	Dead, burnt
<i>Banksia scabrella</i>	P4	40	334132	6745282	Dead, burnt
<i>Banksia scabrella</i>	P4	60	334132	6745258	Dead, burnt
<i>Banksia scabrella</i>	P4	20	334151	6745310	Dead, burnt
<i>Banksia scabrella</i>	P4	40	334162	6745289	Dead, burnt
<i>Banksia scabrella</i>	P4	20	334166	6745259	Dead, burnt
<i>Banksia scabrella</i>	P4	30	334188	6745286	Dead, burnt
<i>Banksia scabrella</i>	P4	90	334201	6745249	Dead, burnt
<i>Banksia scabrella</i>	P4	20	334202	6745225	Dead, burnt
<i>Banksia scabrella</i>	P4	14	334204	6745313	Dead, burnt
<i>Banksia scabrella</i>	P4	30	334217	6745282	Dead, burnt
<i>Banksia scabrella</i>	P4	12	334231	6745311	Dead, burnt
<i>Banksia scabrella</i>	P4	3	334247	6745287	Alive
<i>Banksia scabrella</i>	P4	30	334247	6745287	Dead, burnt
<i>Banksia scabrella</i>	P4	100	334254	6745251	Dead, burnt
<i>Banksia scabrella</i>	P4	22	334267	6745309	Dead, burnt
<i>Banksia scabrella</i>	P4	20	334276	6745218	Dead, burnt
<i>Banksia scabrella</i>	P4	25	334278	6745283	Dead, burnt
<i>Banksia scabrella</i>	P4	70	334286	6745250	Dead, burnt
<i>Banksia scabrella</i>	P4	15	334291	6745217	Dead, burnt
<i>Banksia scabrella</i>	P4	18	334312	6745308	Dead, burnt
<i>Banksia scabrella</i>	P4	20	334319	6745252	Dead, burnt
<i>Banksia scabrella</i>	P4	10	334323	6745277	Dead, burnt
<i>Banksia scabrella</i>	P4	10	334343	6745275	Dead, burnt
<i>Banksia scabrella</i>	P4	60	334350	6745246	Dead, burnt
<i>Banksia scabrella</i>	P4	10	334359	6745220	Dead, burnt
<i>Banksia scabrella</i>	P4	9	334360	6745301	Dead, burnt
<i>Banksia scabrella</i>	P4	5	334367	6745272	Dead, burnt
<i>Banksia scabrella</i>	P4	15	334375	6745218	Dead, burnt
<i>Banksia scabrella</i>	P4	30	334380	6745242	Dead, burnt
<i>Banksia scabrella</i>	P4	8	334400	6745301	Dead, burnt
<i>Banksia scabrella</i>	P4	40	334401	6745218	Dead, burnt
<i>Banksia scabrella</i>	P4	30	334404	6745274	Dead, burnt
<i>Banksia scabrella</i>	P4	40	334412	6745245	Dead, burnt
<i>Banksia scabrella</i>	P4	25	334432	6745272	Dead, burnt
<i>Banksia scabrella</i>	P4	20	334434	6745213	Dead, burnt

Species	DBCA listing	Number of individuals	Easting	Northing	Comments
<i>Banksia scabrella</i>	P4	8	334442	6745304	Dead, burnt
<i>Banksia scabrella</i>	P4	30	334443	6745240	Dead, burnt
<i>Banksia scabrella</i>	P4	20	334467	6745210	Dead, burnt
<i>Banksia scabrella</i>	P4	10	334475	6745264	Dead, burnt
<i>Banksia scabrella</i>	P4	80	334476	6745231	Dead, burnt
<i>Banksia scabrella</i>	P4	20	334489	6745261	Dead, burnt
<i>Banksia scabrella</i>	P4	17	334491	6745294	Dead, burnt
<i>Banksia scabrella</i>	P4	30	334503	6745208	Dead, burnt
<i>Banksia scabrella</i>	P4	30	334507	6745265	Dead, burnt
<i>Banksia scabrella</i>	P4	30	334514	6745207	Dead, burnt
<i>Banksia scabrella</i>	P4	30	334527	6745226	Dead, burnt
<i>Banksia scabrella</i>	P4	60	334537	6745203	Dead, burnt
<i>Banksia scabrella</i>	P4	20	334539	6745265	Dead, burnt
<i>Banksia scabrella</i>	P4	5	334563	6745265	Dead, burnt
<i>Banksia scabrella</i>	P4	40	334569	6745228	Dead, burnt
<i>Banksia scabrella</i>	P4	60	334574	6745206	Dead, burnt
<i>Banksia scabrella</i>	P4	30	334595	6745263	Dead, burnt
<i>Banksia scabrella</i>	P4	19	334598	6745289	Dead, burnt
<i>Banksia scabrella</i>	P4	20	334603	6745226	Dead, burnt
<i>Banksia scabrella</i>	P4	40	334603	6745198	Dead, burnt
<i>Banksia scabrella</i>	P4	6	334621	6745195	Dead, burnt
<i>Banksia scabrella</i>	P4	10	334624	6745252	Alive
<i>Banksia scabrella</i>	P4	20	334624	6745252	Dead, burnt
<i>Banksia scabrella</i>	P4	10	334637	6745218	Dead, burnt
<i>Banksia scabrella</i>	P4	17	334639	6745292	Dead, burnt
<i>Banksia scabrella</i>	P4	20	334644	6745256	Dead, burnt
<i>Banksia scabrella</i>	P4	5	334652	6745194	Dead, burnt
<i>Banksia scabrella</i>	P4	10	334679	6745254	Dead, burnt
<i>Banksia scabrella</i>	P4	60	334686	6745215	Dead, burnt
<i>Banksia scabrella</i>	P4	19	334689	6745288	Dead, burnt
<i>Banksia scabrella</i>	P4	30	334706	6745255	Dead, burnt
<i>Banksia scabrella</i>	P4	36	334712	6745283	Dead, burnt
<i>Banksia scabrella</i>	P4	50	334722	6745217	Dead, burnt
<i>Banksia scabrella</i>	P4	4	334724	6745203	Dead, burnt
<i>Banksia scabrella</i>	P4	4	334732	6745253	Alive
<i>Banksia scabrella</i>	P4	30	334732	6745253	Dead, burnt

Species	DBCA listing	Number of individuals	Easting	Northing	Comments
<i>Banksia scabrella</i>	P4	10	334759	6745217	Dead, burnt
<i>Banksia scabrella</i>	P4	5	334767	6745190	Dead, burnt
<i>Banksia scabrella</i>	P4	6	334829	6745187	Dead, burnt
<i>Banksia scabrella</i>	P4	3	334843	6745212	Dead, burnt
<i>Banksia scabrella</i>	P4	2	334981	6745244	Dead, burnt
<i>Banksia scabrella</i>	P4	51	334992	6745439	Dead, burnt
<i>Banksia scabrella</i>	P4	33	334993	6745507	Dead, burnt
<i>Banksia scabrella</i>	P4	85	334995	6745468	Dead, burnt
<i>Banksia scabrella</i>	P4	3	335006	6745388	Dead, burnt
<i>Banksia scabrella</i>	P4	1	335029	6745164	Dead, burnt
<i>Banksia scabrella</i>	P4	90	335044	6745474	Dead, burnt
<i>Banksia scabrella</i>	P4	1	335047	6745366	Dead, burnt
<i>Banksia scabrella</i>	P4	40	335048	6745391	Dead, burnt
<i>Banksia scabrella</i>	P4	40	335048	6745457	Dead, burnt
<i>Banksia scabrella</i>	P4	50	335052	6745582	Alive
<i>Banksia scabrella</i>	P4	20	335052	6745526	Alive
<i>Banksia scabrella</i>	P4	10	335052	6745526	Dead, burnt
<i>Banksia scabrella</i>	P4	5	335054	6745498	Alive
<i>Banksia scabrella</i>	P4	60	335054	6745498	Dead, burnt
<i>Banksia scabrella</i>	P4	100	335054	6745423	Dead, burnt
<i>Banksia scabrella</i>	P4	50	335056	6745551	Alive
<i>Banksia scabrella</i>	P4	10	335091	6745583	Alive
<i>Banksia scabrella</i>	P4	30	335099	6745466	Dead, burnt
<i>Banksia scabrella</i>	P4	10	335100	6745528	Alive
<i>Banksia scabrella</i>	P4	40	335100	6745528	Dead, burnt
<i>Banksia scabrella</i>	P4	40	335101	6745489	Dead, burnt
<i>Banksia scabrella</i>	P4	70	335101	6745430	Dead, burnt
<i>Banksia scabrella</i>	P4	30	335103	6745391	Dead, burnt
<i>Banksia scabrella</i>	P4	10	335108	6745347	Dead, burnt
<i>Banksia scabrella</i>	P4	29	335131	6745457	Dead, burnt
<i>Banksia scabrella</i>	P4	32	335135	6745426	Dead, burnt
<i>Banksia scabrella</i>	P4	46	335136	6745490	Dead, burnt
<i>Banksia scabrella</i>	P4	9	335137	6745393	Dead, burnt
<i>Banksia scabrella</i>	P4	8	335174	6745328	Dead, burnt
<i>Banksia scabrella</i>	P4	8	335176	6745361	Dead, burnt
<i>Banksia scabrella</i>	P4	12	335176	6745459	Dead, burnt

Species	DBCA listing	Number of individuals	Easting	Northing	Comments
<i>Banksia scabrella</i>	P4	2	335178	6745390	Dead, burnt
<i>Banksia scabrella</i>	P4	24	335178	6745441	Dead, burnt
<i>Banksia scabrella</i>	P4	6	335197	6745156	Dead, burnt
<i>Banksia scabrella</i>	P4	1	335200	6745197	Dead, burnt
<i>Banksia scabrella</i>	P4	13	335204	6745253	Dead, burnt
<i>Banksia scabrella</i>	P4	10	335205	6745390	Dead, burnt
<i>Banksia scabrella</i>	P4	10	335207	6745285	Dead, burnt
<i>Banksia scabrella</i>	P4	25	335207	6745429	Dead, burnt
<i>Banksia scabrella</i>	P4	50	335207	6745460	Dead, burnt
<i>Banksia scabrella</i>	P4	10	335209	6745347	Dead, burnt
<i>Banksia scabrella</i>	P4	40	335209	6745485	Dead, burnt
<i>Banksia scabrella</i>	P4	40	335210	6745314	Dead, burnt
<i>Banksia scabrella</i>	P4	20	335226	6745378	Dead, burnt
<i>Banksia scabrella</i>	P4	3	335232	6745247	Dead, burnt
<i>Banksia scabrella</i>	P4	40	335232	6745347	Dead, burnt
<i>Banksia scabrella</i>	P4	6	335233	6745290	Dead, burnt
<i>Banksia scabrella</i>	P4	38	335235	6745465	Dead, burnt
<i>Banksia scabrella</i>	P4	15	335237	6745425	Dead, burnt
<i>Banksia scabrella</i>	P4	38	335253	6745313	Dead, burnt
<i>Banksia scabrella</i>	P4	12	335254	6745258	Dead, burnt
<i>Banksia scabrella</i>	P4	37	335255	6745409	Dead, burnt
<i>Banksia scabrella</i>	P4	22	335256	6745216	Dead, burnt
<i>Banksia scabrella</i>	P4	45	335259	6745450	Dead, burnt
<i>Banksia scabrella</i>	P4	29	335259	6745360	Dead, burnt
<i>Banksia scabrella</i>	P4	30	335259	6745184	Dead, burnt
<i>Banksia scabrella</i>	P4	63	335278	6745450	Dead, burnt
<i>Banksia scabrella</i>	P4	50	335280	6745408	Dead, burnt
<i>Banksia scabrella</i>	P4	5	335283	6745227	Dead, burnt
<i>Banksia scabrella</i>	P4	24	335284	6745323	Dead, burnt
<i>Banksia scabrella</i>	P4	38	335286	6745273	Dead, burnt
<i>Banksia scabrella</i>	P4	36	335286	6745365	Dead, burnt
<i>Banksia scabrella</i>	P4	7	335287	6745151	Dead, burnt
<i>Banksia scabrella</i>	P4	13	335289	6745182	Dead, burnt
<i>Banksia scabrella</i>	P4	20	335320	6745369	Dead, burnt
<i>Banksia scabrella</i>	P4	35	335320	6745167	Dead, burnt
<i>Banksia scabrella</i>	P4	8	335320	6745199	Dead, burnt

Species	DBCA listing	Number of individuals	Easting	Northing	Comments
<i>Banksia scabrella</i>	P4	30	335320	6745276	Dead, burnt
<i>Banksia scabrella</i>	P4	12	335321	6745253	Dead, burnt
<i>Banksia scabrella</i>	P4	10	335322	6745320	Dead, burnt
<i>Banksia scabrella</i>	P4	20	335327	6745418	Dead, burnt
<i>Banksia scabrella</i>	P4	30	335345	6745261	Dead, burnt
<i>Banksia scabrella</i>	P4	10	335345	6745203	Dead, burnt
<i>Banksia scabrella</i>	P4	15	335346	6745234	Dead, burnt
<i>Banksia scabrella</i>	P4	10	335347	6745436	Dead, burnt
<i>Banksia scabrella</i>	P4	5	335348	6745394	Dead, burnt
<i>Banksia scabrella</i>	P4	5	335348	6745287	Dead, burnt
<i>Banksia scabrella</i>	P4	1	335349	6745175	Alive
<i>Banksia scabrella</i>	P4	20	335349	6745175	Dead, burnt
<i>Banksia scabrella</i>	P4	30	335349	6745369	Dead, burnt
<i>Banksia scabrella</i>	P4	30	335349	6745422	Dead, burnt
<i>Banksia scabrella</i>	P4	10	335351	6745317	Dead, burnt
<i>Banksia scabrella</i>	P4	2	335352	6745155	Dead, burnt
<i>Banksia scabrella</i>	P4	8	335352	6745345	Dead, burnt
<i>Banksia scabrella</i>	P4	6	335372	6745362	Dead, burnt
<i>Banksia scabrella</i>	P4	5	335373	6745263	Dead, burnt
<i>Banksia scabrella</i>	P4	3	335377	6745200	Dead, burnt
<i>Banksia scabrella</i>	P4	2	335379	6745313	Dead, burnt
<i>Banksia scabrella</i>	P4	2	335386	6745446	Dead, burnt
<i>Banksia scabrella</i>	P4	7	335402	6745418	Dead, burnt
<i>Banksia scabrella</i>	P4	5	335405	6745454	Dead, burnt
<i>Banksia scabrella</i>	P4	10	335432	6745428	Dead, burnt
<i>Banksia scabrella</i>	P4	5	335439	6745387	Alive
<i>Banksia scabrella</i>	P4	15	335443	6745250	Alive
<i>Banksia scabrella</i>	P4	5	335443	6745196	Dead, burnt
<i>Banksia scabrella</i>	P4	4	335444	6745174	Alive
<i>Banksia scabrella</i>	P4	3	335444	6745174	Dead, burnt
<i>Banksia scabrella</i>	P4	6	335444	6745267	Alive
<i>Banksia scabrella</i>	P4	2	335462	6745178	Dead, burnt
<i>Banksia scabrella</i>	P4	5	335467	6745209	Dead, burnt
<i>Banksia scabrella</i>	P4	2	335468	6745258	Dead, burnt
<i>Banksia scabrella</i>	P4	5	335469	6745331	Dead, burnt
<i>Banksia scabrella</i>	P4	6	335470	6745439	Dead, burnt

Species	DBCA listing	Number of individuals	Easting	Northing	Comments
<i>Banksia scabrella</i>	P4	9	335502	6745423	Dead, burnt
<i>Banksia scabrella</i>	P4	4	335503	6745244	Dead, burnt
<i>Banksia scabrella</i>	P4	8	335505	6745395	Dead, burnt
<i>Banksia scabrella</i>	P4	6	335518	6745359	Dead, burnt
<i>Banksia scabrella</i>	P4	12	335532	6745394	Dead, burnt
<i>Banksia scabrella</i>	P4	15	335557	6745396	Dead, burnt
<i>Banksia scabrella</i>	P4	14	335557	6745335	Dead, burnt
<i>Banksia scabrella</i>	P4	5	335559	6745289	Dead, burnt
<i>Banksia scabrella</i>	P4	10	335562	6745364	Dead, burnt
<i>Banksia scabrella</i>	P4	4	335583	6745337	Dead, burnt
<i>Banksia scabrella</i>	P4	10	335585	6745485	Dead, burnt
<i>Banksia scabrella</i>	P4	40	335589	6745430	Dead, burnt
<i>Banksia scabrella</i>	P4	1	335589	6745403	Dead, burnt
<i>Banksia scabrella</i>	P4	1	335590	6745171	Dead, burnt
<i>Banksia scabrella</i>	P4	8	335590	6745557	Dead, burnt
<i>Banksia scabrella</i>	P4	10	335590	6745456	Dead, burnt
<i>Banksia scabrella</i>	P4	1	335615	6745300	Dead, burnt
<i>Banksia scabrella</i>	P4	1	335616	6745501	Dead, burnt
<i>Banksia scabrella</i>	P4	8	335619	6745452	Dead, burnt
<i>Banksia scabrella</i>	P4	8	335628	6745374	Dead, burnt
<i>Banksia scabrella</i>	P4	4	335634	6745440	Dead, burnt
<i>Banksia scabrella</i>	P4	3	335639	6745484	Dead, burnt
<i>Banksia scabrella</i>	P4	1	335642	6745256	Dead, burnt
<i>Banksia scabrella</i>	P4	2	335678	6745342	Dead, burnt
<i>Banksia scabrella</i>	P4	3	335683	6745275	Dead, burnt
<i>Banksia scabrella</i>	P4	2	335702	6745272	Dead, burnt
<i>Banksia scabrella</i>	P4	35	335703	6745443	Dead, burnt
<i>Banksia scabrella</i>	P4	15	335703	6745413	Dead, burnt
<i>Banksia scabrella</i>	P4	2	335706	6745143	Dead, burnt
<i>Banksia scabrella</i>	P4	20	335731	6745164	Dead, burnt
<i>Banksia scabrella</i>	P4	1	335736	6745201	Dead, burnt
<i>Banksia scabrella</i>	P4	2	335738	6745353	Dead, burnt
<i>Banksia scabrella</i>	P4	1	335738	6745286	Dead, burnt
<i>Banksia scabrella</i>	P4	7	335764	6745180	Dead, burnt
<i>Banksia scabrella</i>	P4	5	335772	6745145	Dead, burnt
<i>Banksia scabrella</i>	P4	2	335773	6745271	Dead, burnt

Species	DBCA listing	Number of individuals	Easting	Northing	Comments
<i>Banksia scabrella</i>	P4	11	335774	6745324	Dead, burnt
<i>Banksia scabrella</i>	P4	1	335790	6745196	Dead, burnt
<i>Banksia scabrella</i>	P4	30	335793	6745325	Dead, burnt
<i>Banksia scabrella</i>	P4	16	335794	6745345	Dead, burnt
<i>Banksia scabrella</i>	P4	15	335797	6745283	Dead, burnt
<i>Banksia scabrella</i>	P4	5	335799	6745236	Dead, burnt
<i>Banksia scabrella</i>	P4	18	335800	6745301	Dead, burnt
<i>Banksia scabrella</i>	P4	12	335821	6745622	Dead, burnt
<i>Banksia scabrella</i>	P4	30	335824	6745332	Dead, burnt
<i>Banksia scabrella</i>	P4	6	335825	6745244	Dead, burnt
<i>Banksia scabrella</i>	P4	10	335826	6745359	Dead, burnt
<i>Banksia scabrella</i>	P4	4	335829	6745259	Dead, burnt
<i>Banksia scabrella</i>	P4	13	335830	6745283	Dead, burnt
<i>Banksia scabrella</i>	P4	8	335830	6745206	Dead, burnt
<i>Banksia scabrella</i>	P4	1	335832	6745299	Alive
<i>Banksia scabrella</i>	P4	20	335832	6745140	Dead, burnt
<i>Banksia scabrella</i>	P4	2	335851	6745588	Dead, burnt
<i>Banksia scabrella</i>	P4	5	335852	6745333	Dead, burnt
<i>Banksia scabrella</i>	P4	4	335853	6745533	Dead, burnt
<i>Banksia scabrella</i>	P4	15	335853	6745619	Dead, burnt
<i>Banksia scabrella</i>	P4	8	335853	6745209	Dead, burnt
<i>Banksia scabrella</i>	P4	10	335856	6745279	Dead, burnt
<i>Banksia scabrella</i>	P4	6	335857	6745264	Dead, burnt
<i>Banksia scabrella</i>	P4	12	335858	6745242	Dead, burnt
<i>Eucalyptus macrocarpa</i> subsp. <i>elachantha</i>	P4	10	330671	6745515	
<i>Guichenotia alba</i>	P3	5	322387	6745584	
<i>Guichenotia alba</i>	P3	20	322403	6745582	
<i>Guichenotia alba</i>	P3	5	322405	6745567	
<i>Guichenotia alba</i>	P3	25	322407	6745613	
<i>Guichenotia alba</i>	P3	5	322411	6745640	
<i>Guichenotia alba</i>	P3	35	322419	6745565	
<i>Guichenotia alba</i>	P3	30	322419	6745583	
<i>Guichenotia alba</i>	P3	20	322427	6745607	
<i>Guichenotia alba</i>	P3	1	322430	6745546	
<i>Guichenotia alba</i>	P3	10	322431	6745636	

Species	DBCA listing	Number of individuals	Easting	Northing	Comments
<i>Guichenotia alba</i>	P3	2	322445	6745552	
<i>Guichenotia alba</i>	P3	20	322446	6745612	
<i>Guichenotia alba</i>	P3	15	322449	6745593	
<i>Guichenotia alba</i>	P3	3	322449	6745555	
<i>Guichenotia alba</i>	P3	20	322455	6745638	
<i>Guichenotia alba</i>	P3	30	322462	6745617	
<i>Guichenotia alba</i>	P3	22	322465	6745570	
<i>Guichenotia alba</i>	P3	6	322466	6745598	
<i>Guichenotia alba</i>	P3	1	322469	6745559	
<i>Guichenotia alba</i>	P3	5	322477	6745621	
<i>Guichenotia alba</i>	P3	5	322486	6745622	
<i>Guichenotia alba</i>	P3	1	322493	6745639	
<i>Guichenotia alba</i>	P3	3	322493	6745558	
<i>Guichenotia alba</i>	P3	3	323626	6745565	
<i>Guichenotia alba</i>	P3	1	323732	6745674	
<i>Guichenotia alba</i>	P3	1	323739	6745649	
<i>Guichenotia alba</i>	P3	5	323744	6745682	
<i>Guichenotia alba</i>	P3	9	323765	6745681	
<i>Guichenotia alba</i>	P3	5	323777	6745664	
<i>Guichenotia alba</i>	P3	6	323810	6745683	
<i>Guichenotia alba</i>	P3	2	323814	6745657	
<i>Guichenotia alba</i>	P3	3	323824	6745619	
<i>Guichenotia alba</i>	P3	4	323827	6745645	
<i>Guichenotia alba</i>	P3	3	323844	6745702	
<i>Guichenotia alba</i>	P3	10	323861	6745708	
<i>Guichenotia alba</i>	P3	1	323866	6745640	
<i>Guichenotia alba</i>	P3	6	323878	6745723	
<i>Guichenotia alba</i>	P3	3	323879	6745645	
<i>Guichenotia alba</i>	P3	15	323880	6745690	
<i>Guichenotia alba</i>	P3	1	323886	6745641	
<i>Guichenotia alba</i>	P3	5	323888	6745713	
<i>Guichenotia alba</i>	P3	20	323902	6745725	
<i>Guichenotia alba</i>	P3	20	323906	6745688	
<i>Guichenotia alba</i>	P3	5	323907	6745709	
<i>Guichenotia alba</i>	P3	2	323922	6745687	
<i>Guichenotia alba</i>	P3	10	323930	6745710	

Species	DBCA listing	Number of individuals	Easting	Northing	Comments
<i>Guichenotia alba</i>	P3	1	323938	6745727	
<i>Guichenotia alba</i>	P3	4	323956	6745707	
<i>Guichenotia alba</i>	P3	3	323969	6745675	
<i>Guichenotia alba</i>	P3	2	323970	6745719	
<i>Guichenotia alba</i>	P3	5	323973	6745705	
<i>Guichenotia alba</i>	P3	28	323977	6745689	
<i>Guichenotia alba</i>	P3	17	323982	6745727	
<i>Guichenotia alba</i>	P3	30	323992	6745697	
<i>Guichenotia alba</i>	P3	10	324002	6745725	
<i>Guichenotia alba</i>	P3	10	324011	6745686	
<i>Guichenotia alba</i>	P3	16	324015	6745707	
<i>Guichenotia alba</i>	P3	5	324022	6745717	
<i>Guichenotia alba</i>	P3	4	324024	6745680	
<i>Guichenotia alba</i>	P3	20	324028	6745691	
<i>Guichenotia alba</i>	P3	20	324031	6745706	
<i>Guichenotia alba</i>	P3	15	324042	6745691	
<i>Guichenotia alba</i>	P3	14	324046	6745717	
<i>Guichenotia alba</i>	P3	19	324066	6745719	
<i>Guichenotia alba</i>	P3	1	324113	6745724	
<i>Guichenotia alba</i>	P3	1	326938	6745551	
<i>Lasiopetalum ogilvianum</i>	P1	2	327338	6745545	
<i>Lasiopetalum ogilvianum</i>	P1	12	329327	6745484	
<i>Lasiopetalum ogilvianum</i>	P1	2	329892	6745564	
<i>Lasiopetalum ogilvianum</i>	P1	3	330122	6745522	
<i>Lasiopetalum ogilvianum</i>	P1	6	330144	6745567	
<i>Lasiopetalum ogilvianum</i>	P1	2	330156	6745494	
<i>Lasiopetalum ogilvianum</i>	P1	1	330262	6745578	
<i>Lasiopetalum ogilvianum</i>	P1	3	330280	6745582	
<i>Lasiopetalum ogilvianum</i>	P1	4	330314	6745586	
<i>Lasiopetalum ogilvianum</i>	P1	1	330878	6745535	
<i>Lasiopetalum ogilvianum</i>	P1	1	332409	6745386	
<i>Lasiopetalum ogilvianum</i>	P1	3	332905	6745352	
<i>Lasiopetalum ogilvianum</i>	P1	18	332908	6745297	
<i>Lasiopetalum ogilvianum</i>	P1	2	332915	6745353	
<i>Lasiopetalum ogilvianum</i>	P1	5	333070	6745319	
<i>Lasiopetalum ogilvianum</i>	P1	9	333169	6745342	

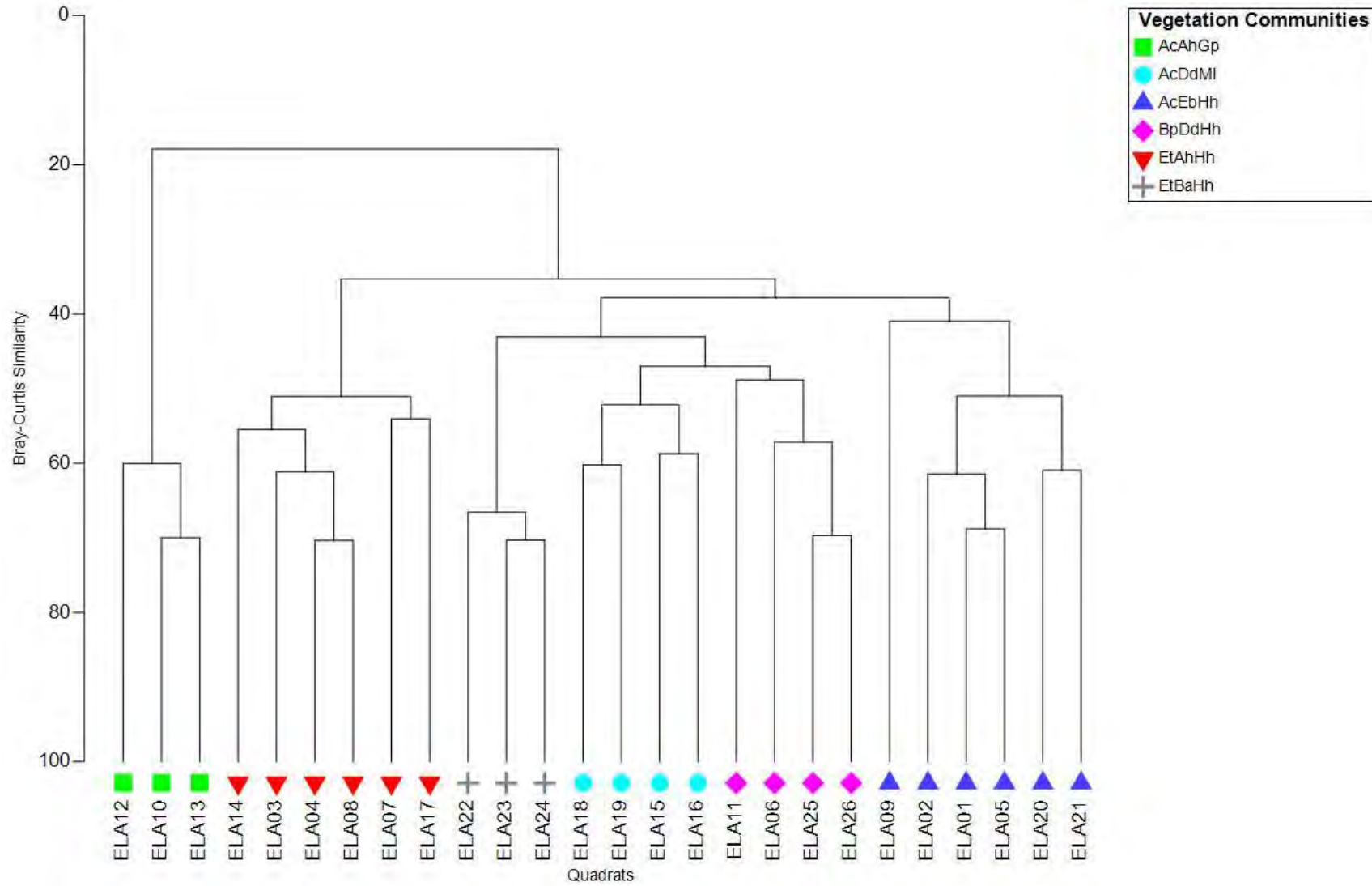
Species	DBCA listing	Number of individuals	Easting	Northing	Comments
<i>Lasiopetalum ogilvieanum</i>	P1	2	333275	6745287	
<i>Lasiopetalum ogilvieanum</i>	P1	15	335499	6745351	
<i>Lasiopetalum ogilvieanum</i>	P1	2	335668	6745409	
<i>Lasiopetalum ogilvieanum</i>	P1	1	335831	6745304	
<i>Lasiopetalum ogilvieanum</i>	P1	6	335832	6745140	
<i>Mesomelaena stygia</i> subsp. <i>deflexa</i>	P3	5	332288	6745356	
<i>Mesomelaena stygia</i> subsp. <i>deflexa</i>	P3	15	332289	6745333	
<i>Mesomelaena stygia</i> subsp. <i>deflexa</i>	P3	8	332317	6745395	
<i>Mesomelaena stygia</i> subsp. <i>deflexa</i>	P3	20	332317	6745359	
<i>Mesomelaena stygia</i> subsp. <i>deflexa</i>	P3	5	332355	6745364	
<i>Mesomelaena stygia</i> subsp. <i>deflexa</i>	P3	10	332359	6745389	
<i>Mesomelaena stygia</i> subsp. <i>deflexa</i>	P3	6	332450	6745388	
<i>Mesomelaena stygia</i> subsp. <i>deflexa</i>	P3	10	332520	6745351	
<i>Mesomelaena stygia</i> subsp. <i>deflexa</i>	P3	10	332924	6745356	
<i>Mesomelaena stygia</i> subsp. <i>deflexa</i>	P3	5	332972	6745302	
<i>Mesomelaena stygia</i> subsp. <i>deflexa</i>	P3	20	333079	6745296	
<i>Mesomelaena stygia</i> subsp. <i>deflexa</i>	P3	1	333142	6745324	
<i>Mesomelaena stygia</i> subsp. <i>deflexa</i>	P3	40	333202	6745344	
<i>Mesomelaena stygia</i> subsp. <i>deflexa</i>	P3	20	333241	6745308	
<i>Mesomelaena stygia</i> subsp. <i>deflexa</i>	P3	80	333244	6745341	
<i>Mesomelaena stygia</i> subsp. <i>deflexa</i>	P3		333259	6745368	
<i>Mesomelaena stygia</i> subsp. <i>deflexa</i>	P3	500	333265	6745285	
<i>Mesomelaena stygia</i> subsp. <i>deflexa</i>	P3	100	333267	6745332	
<i>Mesomelaena stygia</i> subsp. <i>deflexa</i>	P3	80	333270	6745310	
<i>Mesomelaena stygia</i> subsp. <i>deflexa</i>	P3		333284	6745367	
<i>Mesomelaena stygia</i> subsp. <i>deflexa</i>	P3	300	333285	6745282	
<i>Mesomelaena stygia</i> subsp. <i>deflexa</i>	P3		333296	6745363	
<i>Mesomelaena stygia</i> subsp. <i>deflexa</i>	P3	120	333304	6745330	
<i>Mesomelaena stygia</i> subsp. <i>deflexa</i>	P3	150	333307	6745307	
<i>Mesomelaena stygia</i> subsp. <i>deflexa</i>	P3	180	333318	6745279	
<i>Mesomelaena stygia</i> subsp. <i>deflexa</i>	P3		333331	6745363	
<i>Mesomelaena stygia</i> subsp. <i>deflexa</i>	P3	40	333333	6745273	
<i>Mesomelaena stygia</i> subsp. <i>deflexa</i>	P3	200	333335	6745302	
<i>Mesomelaena stygia</i> subsp. <i>deflexa</i>	P3	150	333336	6745328	
<i>Mesomelaena stygia</i> subsp. <i>deflexa</i>	P3	80	333354	6745277	
<i>Mesomelaena stygia</i> subsp. <i>deflexa</i>	P3	200	333362	6745298	

Species	DBCA listing	Number of individuals	Easting	Northing	Comments
<i>Mesomelaena stygia</i> subsp. <i>deflexa</i>	P3	200	333373	6745323	
<i>Mesomelaena stygia</i> subsp. <i>deflexa</i>	P3		333383	6745357	
<i>Mesomelaena stygia</i> subsp. <i>deflexa</i>	P3	200	333390	6745303	
<i>Mesomelaena stygia</i> subsp. <i>deflexa</i>	P3		333419	6745359	
<i>Mesomelaena stygia</i> subsp. <i>deflexa</i>	P3	200	333422	6745297	
<i>Mesomelaena stygia</i> subsp. <i>deflexa</i>	P3	12	333430	6745275	
<i>Mesomelaena stygia</i> subsp. <i>deflexa</i>	P3	200	333431	6745325	
<i>Mesomelaena stygia</i> subsp. <i>deflexa</i>	P3		333445	6745359	
<i>Mesomelaena stygia</i> subsp. <i>deflexa</i>	P3	200	333446	6745295	
<i>Mesomelaena stygia</i> subsp. <i>deflexa</i>	P3	250	333454	6745274	
<i>Mesomelaena stygia</i> subsp. <i>deflexa</i>	P3	150	333460	6745328	
<i>Mesomelaena stygia</i> subsp. <i>deflexa</i>	P3	50	333466	6745301	
<i>Mesomelaena stygia</i> subsp. <i>deflexa</i>	P3		333466	6745362	
<i>Mesomelaena stygia</i> subsp. <i>deflexa</i>	P3	80	333484	6745325	
<i>Mesomelaena stygia</i> subsp. <i>deflexa</i>	P3		333486	6745354	
<i>Mesomelaena stygia</i> subsp. <i>deflexa</i>	P3	30	333488	6745294	
<i>Mesomelaena stygia</i> subsp. <i>deflexa</i>	P3		333499	6745333	
<i>Mesomelaena stygia</i> subsp. <i>deflexa</i>	P3	30	333508	6745323	
<i>Mesomelaena stygia</i> subsp. <i>deflexa</i>	P3	4	333592	6745293	
<i>Mesomelaena stygia</i> subsp. <i>deflexa</i>	P3	50	333800	6745269	
<i>Mesomelaena stygia</i> subsp. <i>deflexa</i>	P3	50	333823	6745263	
<i>Mesomelaena stygia</i> subsp. <i>deflexa</i>	P3	30	333858	6745259	
<i>Mesomelaena stygia</i> subsp. <i>deflexa</i>	P3	100	333858	6745277	
<i>Mesomelaena stygia</i> subsp. <i>deflexa</i>	P3	150	333891	6745279	
<i>Micromyrtus rogeri</i>	P1	30	330488	6745551	
<i>Micromyrtus rogeri</i>	P1	20	330527	6745584	
<i>Micromyrtus rogeri</i>	P1	40	330545	6745580	
<i>Micromyrtus rogeri</i>	P1	70	331913	6745390	
<i>Micromyrtus rogeri</i>	P1	100	331921	6745405	
<i>Micromyrtus rogeri</i>	P1	50	331924	6745388	
<i>Micromyrtus rogeri</i>	P1	80	332099	6745430	
<i>Micromyrtus rogeri</i>	P1	100	332100	6745374	
<i>Micromyrtus rogeri</i>	P1	100	332100	6745394	
<i>Micromyrtus rogeri</i>	P1	100	332102	6745413	
<i>Micromyrtus rogeri</i>	P1	10	332108	6745363	
<i>Micromyrtus rogeri</i>	P1	70	332110	6745440	

Species	DBCA listing	Number of individuals	Easting	Northing	Comments
<i>Micromyrtus rogeri</i>	P1	30	332117	6745385	
<i>Micromyrtus rogeri</i>	P1	30	332120	6745417	
<i>Micromyrtus rogeri</i>	P1	20	332122	6745401	
<i>Micromyrtus rogeri</i>	P1	60	332126	6745368	
<i>Micromyrtus rogeri</i>	P1	3	332137	6745358	
<i>Micromyrtus rogeri</i>	P1	45	332145	6745337	
<i>Micromyrtus rogeri</i>	P1	26	332147	6745342	
<i>Stawellia dimorphantha</i>	P4	1	321241	6745586	
<i>Stawellia dimorphantha</i>	P4	10	321357	6745607	
<i>Stawellia dimorphantha</i>	P4	5	321401	6745591	
<i>Stawellia dimorphantha</i>	P4	2	321416	6745566	
<i>Stawellia dimorphantha</i>	P4	5	321424	6745609	
<i>Stawellia dimorphantha</i>	P4	1	321428	6745630	
<i>Stawellia dimorphantha</i>	P4	3	321448	6745630	
<i>Stawellia dimorphantha</i>	P4	5	321462	6745610	
<i>Stawellia dimorphantha</i>	P4	5	321473	6745592	
<i>Stawellia dimorphantha</i>	P4	1	321480	6745613	
<i>Stawellia dimorphantha</i>	P4	10	321487	6745635	
<i>Stawellia dimorphantha</i>	P4	2	321506	6745642	
<i>Stawellia dimorphantha</i>	P4	10	321508	6745625	
<i>Stawellia dimorphantha</i>	P4	5	321509	6745613	
<i>Stawellia dimorphantha</i>	P4	20	321518	6745591	
<i>Stawellia dimorphantha</i>	P4	1	321531	6745558	
<i>Stawellia dimorphantha</i>	P4	10	321535	6745592	
<i>Stawellia dimorphantha</i>	P4	2	321536	6745618	
<i>Stawellia dimorphantha</i>	P4	5	321538	6745603	
<i>Stawellia dimorphantha</i>	P4	10	321546	6745631	
<i>Stawellia dimorphantha</i>	P4	20	321549	6745620	
<i>Stawellia dimorphantha</i>	P4	5	321551	6745606	
<i>Stawellia dimorphantha</i>	P4	5	321554	6745614	
<i>Stawellia dimorphantha</i>	P4	20	321568	6745609	
<i>Stylidium drummondianum</i>	P3	20	330467	6745513	
<i>Stylidium drummondianum</i>	P3	4	330663	6745563	
<i>Stylidium drummondianum</i>	P3	5	330717	6745557	
<i>Stylidium drummondianum</i>	P3	12	330722	6745557	
<i>Stylidium drummondianum</i>	P3	1	330762	6745530	

Species	DBCA listing	Number of individuals	Easting	Northing	Comments
<i>Stylidium drummondianum</i>	P3	1	331766	6745392	
<i>Stylidium drummondianum</i>	P3	15	332079	6745427	
<i>Stylidium drummondianum</i>	P3	3	332080	6745414	
<i>Stylidium drummondianum</i>	P3	6	332464	6745348	
<i>Stylidium drummondianum</i>	P3	2	332500	6745317	
<i>Stylidium drummondianum</i>	P3	6	332505	6745319	
<i>Stylidium drummondianum</i>	P3	1	332520	6745351	

Appendix I Hierarchical clustering dendrogram



Appendix J Fauna habitat photos



Fauna habitat 1: *Allocasuarina campestris* tall sparse shrubland over shrubs and sedgeland on sandy plains



Fauna habitat 2: *Banksia* spp. and occasional *Eucalyptus tottiana* mid open woodland over shrubs and sedgeland on sandy plains



Fauna habitat 3: *Allocasuarina campestris* tall sparse shrubland over shrubs and sedgeland on stony rises

Appendix K Fauna species list

Species	Common name	Sign
<i>Accipiter fasciatus</i>	Brown Goshawk	Observed/heard
<i>Anthus novaeseelandiae</i>	Australasian Pipit	Observed/heard
<i>Artamus personatus</i>	Masked Woodswallow	Observed/heard
<i>Barnardius zonarius</i>	Australian Ringneck	Observed/heard
<i>Chrysococcyx basalis</i>	Horsfield's Bronze-cuckoo	Observed/heard
<i>Coracina novaehollandiae</i>	Black-faced Cuckoo Shrike	Observed/heard
<i>Corvus coronoides</i>	Australian Raven	Observed/heard
<i>Cracticus tibicen</i>	Australian Magpie	Observed/heard
<i>Dromaius novaehollandiae</i>	Emu	Observed/heard
<i>Eolophus roseicapilla</i>	Galah	Observed/heard
<i>Falco cenchroides</i>	Nankeen Kestrel	Observed/heard
<i>Gliciphila melanops</i>	Tawny-crowned Honeyeater	Observed/heard
<i>Grallina cyanoleuca</i>	Magpie-lark	Observed/heard
<i>Lalage tricolor</i>	White-winged Triller	Observed/heard
<i>Lichenostomus virescens</i>	Singing Honeyeater	Observed/heard
<i>Lichmera indistincta</i>	Brown Honeyeater	Observed/heard
<i>Malurus lamberti</i>	Variiegated Fairywren	Observed/heard
<i>Malurus leucopterus</i>	White-winged Fairy Wren	Observed/heard
<i>Malurus splendens</i>	Splendid Fairy Wren	Observed/heard
<i>Merops ornatus</i>	Rainbow Bee-eater	Observed/heard
<i>Motacilla alba</i>	White Wagtail	Observed/heard
<i>Ocyphaps lophotes</i>	Crested Pigeon	Observed/heard
<i>Pachycephala rufiventris</i>	Rufous Whistler	Observed/heard
<i>Phaps chalcoptera</i>	Common Bronzewing	Observed/heard
<i>Phylidonyris niger</i>	White-cheeked Honeyeater	Observed/heard
<i>Phylidonyris novaehollandiae</i>	New Holland Honeyeater	Observed/heard
<i>Rhipidura leucophrys</i>	Willie Wagtail	Observed/heard
<i>Stipiturus malachurus</i>	Southern Emu-wren	Observed/heard
* <i>Bos taurus</i>	Cattle	Observed, tracks, scats
* <i>Canis lupus familiaris</i>	Domestic Dog	Tracks, scats
* <i>Capra hircus</i>	Goat	Tracks, scats
<i>Macropus fuliginosus</i>	Western Grey Kangaroo	Observed, scats
* <i>Oryctolagus cuniculus</i>	European Rabbit	Observed, scats
<i>Ctenophorus maculatus</i> subsp. <i>maculatus</i>	Spotted Military Dragon	Observed
<i>Notechis scutatus</i>	Tiger Snake	Observed

