



Valhalla Flora and Fauna Survey

Bennett Resources Pty Ltd

DOCUMENT TRACKING

Project Name	Valhalla Flora and Fauna Survey
Project Number	17692
Project Manager	Jeni Morris
Prepared by	Jeni Morris, Briana Wingfield
Reviewed by	Jeff Cargill
Approved by	Jeff Cargill
Status	Final
Version Number	v2
Last saved on	22 July 2021

This report should be cited as 'Eco Logical Australia 2021. *Valhalla Flora and Fauna Survey*. Prepared for Bennett Resources Pty Ltd.'

ACKNOWLEDGEMENTS

This document has been prepared by Eco Logical Australia Pty Ltd with support from Bennett Resources Pty Ltd.

Disclaimer

This document may only be used for the purpose for which it was commissioned and in accordance with the contract between Eco Logical Australia Pty Ltd and Bennett Resources Pty Ltd. The scope of services was defined in consultation with Bennett Resources Pty Ltd, by time and budgetary constraints imposed by the client, and the availability of reports and other data on the subject area. Changes to available information, legislation and schedules are made on an ongoing basis and readers should obtain up to date information. Eco Logical Australia Pty Ltd accepts no liability or responsibility whatsoever for or in respect of any use of or reliance upon this report and its supporting material by any third party. Information provided is not intended to be a substitute for site specific assessment or legal advice in relation to any matter. Unauthorised use of this report in any form is prohibited.

Contents

1. Introduction	8
1.1. Project background.....	8
1.2. Scope and objectives	8
2. Environmental setting	10
2.1.1. Climate.....	10
2.1.2. Interim-Biogeographic Regionalisation for Australia.....	11
2.1.3. Rangelands land systems mapping	11
2.1.4. Beard’s (1979) vegetation mapping.....	12
2.1.5. Hydrology.....	14
2.1.6. Areas of significance	14
3. Methodology.....	19
3.1. Desktop review	19
3.1.1. Database searches and literature review	19
3.1.2. Likelihood of occurrence assessment	20
3.2. Field survey.....	21
3.2.1. Survey team and timing	21
3.2.2. Flora and vegetation survey	21
3.2.3. Data analysis	23
3.2.4. Fauna survey	23
3.2.5. Nomenclature	24
3.2.6. Limitations	24
4. Results	28
4.1. Desktop review	28
4.1.1. Previous studies	28
4.1.2. Pre-survey likelihood of occurrence of conservation significant flora, fauna and ecological communities..	31
4.2. Flora and vegetation survey	35
4.2.1. Flora overview	35
4.2.2. Accumulated species- sites surveyed (species-area curve)	35
4.2.3. Conservation significant flora	35
4.2.4. Range extensions	36
4.2.5. Introduced flora	36
4.2.6. Vegetation communities.....	37
4.2.7. Vegetation of conservation significance	45
4.2.8. Vegetation condition	45
4.3. Fauna survey.....	46
4.3.1. Fauna habitats	46
4.3.2. Fauna overview.....	46

4.3.3. Conservation significant fauna	46
4.4. Aboriginal significant bush foods	49
5. Discussion	58
5.1. Flora and vegetation	58
5.1.1. Flora overview	58
5.1.2. Conservation significant flora	58
5.1.3. Range extensions	59
5.1.4. Introduced flora (weed) species	60
5.1.5. Vegetation communities and condition.....	61
5.2. Fauna	62
5.2.1. Fauna habitat	62
5.2.2. Fauna overview.....	63
5.2.3. Conservation significant fauna	63
5.3. Aboriginal significant bush foods.....	66
5.3.1. Aboriginal significant bush foods – flora.....	66
5.3.2. Aboriginal significant bush foods – fauna.....	66
6. References	68
Appendix A Framework for conservation significant flora and fauna ranking	72
Appendix B Likelihood of occurrence assessment criteria	77
Appendix C Flora likelihood of occurrence assessment	79
Appendix D Fauna likelihood of occurrence assessment	88
Appendix E Flora species by site matrix.....	101
Quadrats 1-32.....	101
Quadrats 33-64.....	106
Appendix F Quadrat site data	113
Appendix G Floristic quadrat data.....	118
Appendix H Site photos	161
Appendix I Location of introduced (weed) species within the Project Area.....	169
Appendix J Hierarchical clustering dendrogram	171
Appendix K Fauna species list	172

List of Figures

Figure 1: Project Area location.....	9
Figure 2: Rangelands Land System mapping of the Project Area (Payne and Schoknecht 2011).....	15
Figure 3: Beard’s (1979) vegetation associations of the Project Area	16
Figure 4: Hydrology of the Project Area.....	17
Figure 5: Nature Reserves / ESAs located in the vicinity of the Project Area	18

Figure 6: Survey effort and quadrat locations	27
Figure 7: Conservation significant flora and ecological communities previously recorded in the vicinity of the Project Area (DBCA 2021a;2021c)	33
Figure 8: Conservation significant fauna previously recorded in the vicinity of the Project Area (DBCA 2021b)	34
Figure 9: Locations of significant flora within the Project Area	50
Figure 10: Vegetation communities recorded within the Project Area	51
Figure 11: Vegetation condition recorded within the Project Area	53
Figure 12: Fauna habitat recorded within the Project Area	55
Figure 13: Conservation significant fauna recorded within the Project Area	57

List of Tables

Table 1: Rainfall data recorded at the Liveringa weather station (3100) 12 months prior to the March field survey compared to the long-term average (BoM 2021)	10
Table 2: Rainfall data recorded at the Liveringa weather station (3100) 12 months prior to the May field survey compared to the long-term average (BoM 2021)	11
Table 3: Rangelands Land System mapping of the Project Area	12
Table 4: Beard’s (1979) / Shepherd <i>et al.</i> (2002) vegetation associations of the Project Area	13
Table 5: Database searches undertaken for the Project Area	19
Table 6: Survey team	21
Table 7: Survey limitations	25
Table 8: Consolidated findings of literature review	29
Table 9: Vegetation communities recorded within the Project Area	38
Table 10: Vegetation condition within the Project Area	45
Table 11: Fauna habitat of the Project Area	46
Table 12: <i>Macrotis lagotis</i> (Greater Bilby) diggings recorded within the Project Area	47

Abbreviations

Abbreviation	Description
ALA	Atlas of Living Australia
BAM Act	State Biosecurity and Agriculture Management Act 2007
BC Act	State Biodiversity Conservation Act 2016
Bennett Resources	Bennett Resources Pty Ltd
BoM	Bureau of Meteorology
CLUSTER	Hierarchical Clustering
cm	centimetre
DAFWA	Department of Agriculture and Food Western Australia
DAWE	Department of Agriculture, Water and the Environment

Abbreviation	Description
DBCA	Department of Biodiversity, Conservation and Attractions
DPIRD	Department of Primary Industries and Regional Development
DRF	Declared Rare Flora
ELA	Eco Logical Australia
EN	Endangered
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 Area
ESD	Environmental Scoping Document
ha	hectare
IBRA	Interim Biogeographic Regionalisation for Australia
IBSA	Index of Biodiversity Surveys for Assessment
kg	kilogram
km	kilometre
m	metre
M	Migratory
mm	millimetre
OS	Other specially protected species
P	Priority
PEC	Priority Ecological Community
PMST	Protected Matters Search Tool
PRIMER	Plymouth Routines in Multivariate Ecological Research v6
The Proposal	The Valhalla Gas Exploration and Appraisal Program
RE	Range Extension
SEWPaC	Department of Sustainability, Environment, Water, Population and Communities
SIMPER	Similarity Percentages
SIMPROF	Similarity Profile Analysis
T	Threatened
TEC	Threatened Ecological Community
TSSC	Threatened Species Scientific Committee
VU	Vulnerable
WA	Western Australia
WAH	Western Australian Herbarium
WAM	Western Australian Museum

Executive Summary

Bennett Resources Pty Ltd (Bennett Resources) is proposing to undertake the Valhalla Gas Exploration and Appraisal Program located approximately 51 kilometres northwest of the townsite of Fitzroy Crossing (Shire of Derby-West Kimberley) in the Dampierland Bioregion in the State of Western Australia. Eco Logical Australia was commissioned by Bennett Resources to undertake a Detailed and Targeted flora and vegetation survey and a Basic fauna survey of the Project Area, which consists of access tracks, camp locations of proposed well pads (the Disturbance Footprint; 112.46 hectares), and an additional 15.69 hectares of alternative tracks (Additional Survey Area; 128.15 hectares total).

A desktop assessment of the Project Area was undertaken to inform local and regional context, to assess for the potential presence of conservation significant species and vegetation associations, and to inform the flora and fauna survey in terms of landform, vegetation associations, fauna habitat and accessibility. A Detailed and Targeted flora and vegetation survey and a Basic fauna survey were conducted by Eco Logical Australia from 3 to 10 March 2021. An additional supplementary survey was conducted from 25-27 May 2021.

A total of 235 flora species representing 54 families and 130 genera were recorded from the 64 quadrats established within the Project Area. Average species richness per quadrat was 27 species, ranging from a low of 7 species in ELA57 to a high of 53 species in ELA39. A species accumulation curve determined that the number of flora species recorded represents approximately 91.7% of the species potentially present within the Project Area. Families with the highest number of species included Fabaceae (42 species), Poaceae (40 species) and Malvaceae (18 species). *Acacia* was the best represented genus throughout the Project Area with seven taxa recorded.

No Threatened flora listed under the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* or the State *Biodiversity Conservation Act 2016* were recorded within the Project Area. One Priority flora species, *Nymphoides beaglensis* (listed as Priority 3 by the Department of Biodiversity, Conservation and Attractions), was recorded within the Project Area. This species was recorded from eight point-locations totalling 112 individuals, all of which were found within seasonally inundated depressions within the CbEc vegetation community. A total of four flora species were recorded as range extensions within the Project Area, namely *Cajanus latisepalus*, *Lindernia chrysoplectra*, *Lindernia clausa* and *Tephrosia remotiflora*.

A total of nine introduced flora (weed) species were recorded within the Project Area, one of which **Calotropis procera*, is listed as is listed as a Declared Pest – s22(2) under the State *Biosecurity and Agriculture Management Act 2007*. **Calotropis procera* was recorded within five quadrats in the Project Area, namely ELA20, ELA33, ELA35, ELA59 and ELA60.

A total of 13 vegetation communities were delineated and mapped within the Project Area, generally comprising broad mixtures of *Adansonia gregorii*, *Corymbia* and *Eucalyptus* spp., *Atalaya hemiglauca*, *Bauhinia cunninghamii* and *Erythrophleum chlorostachys* woodland over mixed *Acacia*, *Grevillea*, *Hakea* spp. shrubland over *Triodia* spp. hummock grassland and *Aristida*, *Eriachne*, *Eragrostis* and *Sorghum* spp. tussock grassland. Landforms recorded across the Project Area comprised sandy clay to light clay flats and gentle slopes, dune slopes, crests and swales and open depressions and creekline communities. None of the vegetation associations delineated within the Project Area were inferred to represent any

known or 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.

The Project Area contained three broad fauna habitat types, namely Fauna habitat 1: Mixed open woodland over grassland on sandy clay flats and slopes, Fauna habitat 2: Mixed open woodland over tussock grasses on dune slopes and crests and Fauna habitat 3: Eucalypt open woodland and mixed shrubland on closed depression and creekline. A total of 75 fauna species were recorded during the field survey. This number comprised of 52 birds, five mammals, eight reptiles and ten invertebrates.

Secondary signs (i.e. diggings) of the Greater Bilby (*Macrotis lagotis*), listed as Vulnerable under the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* and the State *Biodiversity Conservation Act 2016*, were recorded within the Project Area at four locations in the south-east of the Project Area within Fauna habitat 2.

A total of two flora species considered as Aboriginal significant bush foods were recorded within the Project Area, namely *Adansonia gregorii* (Boab) and *Carissa lanceolata* (Conkerberry). Within the Project Area, boab trees were recorded as a dominant or associated species within five of the 14 vegetation communities described, at a <5% cover. Of note was one particularly large Boab tree occurring across a portion of the track leading to the Midgard well site (m 685634E; m 7992864N). Conkerberry was recorded as a dominant or associated species within ten of the 14 vegetation communities described, at a <5% cover.

A total of four fauna species considered as Aboriginal significant bush foods were recorded within the Project Area, namely *Ardeotis australis* (Australian Bustard), *Osphranter rufus* (Red Kangaroo), *Varanus gouldii* (Sand Goanna) and *V. panoptes* (Yellow-spotted Monitor). Australian Bustard was recorded from one location within the Project Area (m 683743E; m 7992977 N), however is likely to utilise most habitats found throughout the Project Area for foraging. Red Kangaroo (*Osphranter rufus*) was recorded from scats throughout the Project Area and spotted in the distance at various locations and is likely to utilise most habitats found throughout the Project Area. During the field survey, both *Varanus gouldii* (Sand Goanna) and *V. panoptes* (Yellow-spotted Monitor) were spotted several times sunbaking along tracks. These species are likely to utilise all fauna habitats found throughout the Project Area for burrowing and/or foraging.

1. Introduction

1.1. Project background

Bennett Resources Pty Ltd (Bennett Resources) is proposing to undertake the Valhalla Gas Exploration and Appraisal Program (the Proposal) located approximately 51 kilometres (km) northwest of the townsite of Fitzroy Crossing (Shire of Derby-West Kimberley) in the Dampierland Bioregion in the State of Western Australia (WA; **Figure 1**).

The Proposal was initially referred to the Environmental Protection Authority (EPA) under Section 38 of the State *Environmental Protection Act 1986* on 25 June 2020 under the title: EP 371 Laurel Gas Exploration and Appraisal. The EPA set the level of assessment of the initial referral to a Public Environmental Review. On 3 December 2020, Bennett Resources formally terminated the assessment of the Proposal, and on 24 December 2020 referred to the EPA a revised program under a new Proposal title: Valhalla Gas Exploration and Appraisal Program.

In July 2021, the EPA Services drafted an Environmental Scoping Document (ESD) that details the baseline environmental studies required to form part of the Environmental Review Document.

As detailed in the ESD, Bennett Resources is required to undertake a biological (flora, vegetation and fauna) assessment of the proposed well sites, access tracks and camps within the Project Area.

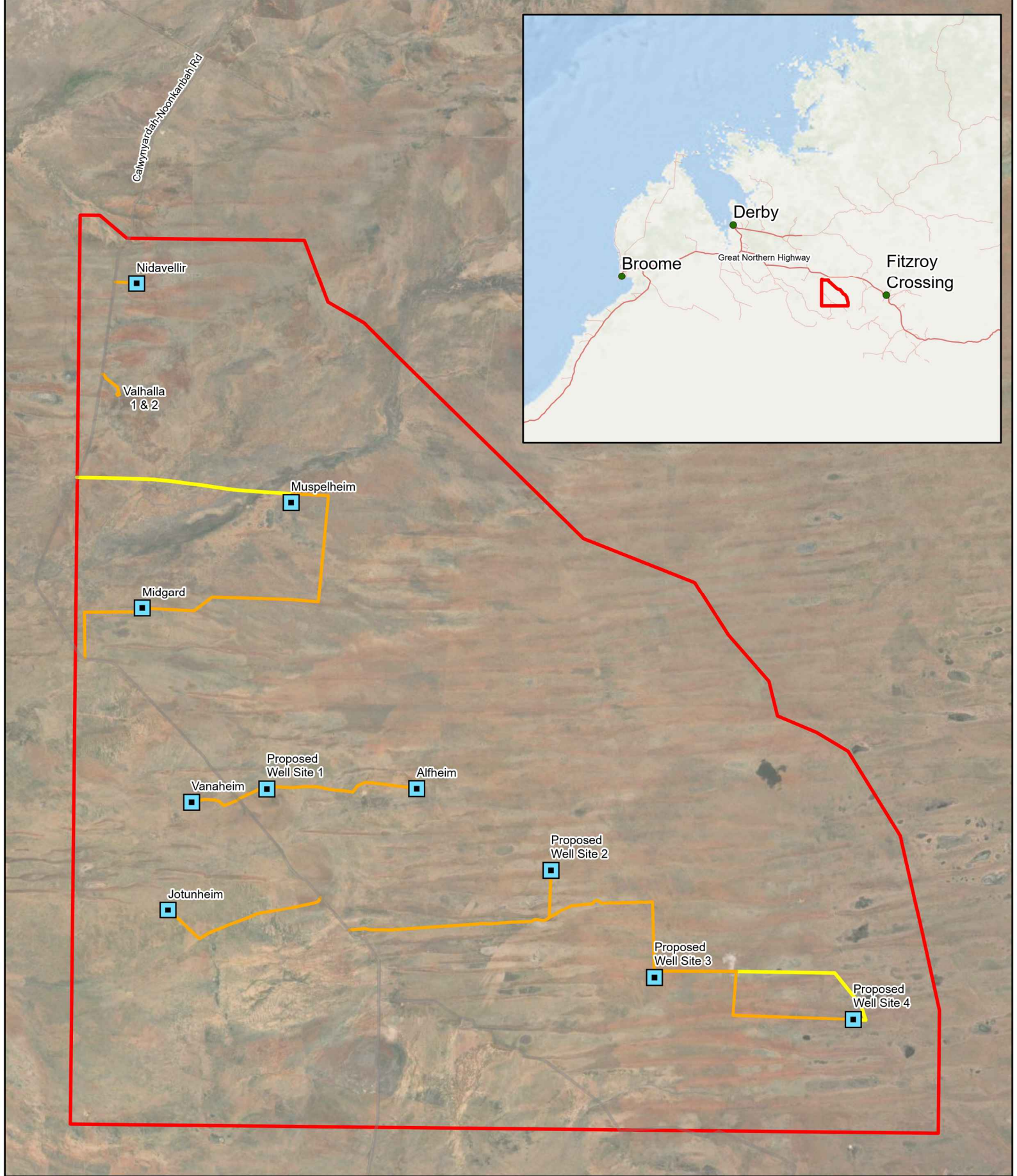
1.2. Scope and objectives

Eco Logical Australia (ELA) was commissioned by Bennett Resources to undertake a Detailed and Targeted flora and vegetation survey and a Basic fauna survey of the Project Area, which consists of access tracks, camp locations of proposed well pads (the Disturbance Footprint; 112.46 hectares [ha] total), and an additional 15.69 ha of alternative tracks (Additional Survey Area; 128.15 ha total; **Figure 1**). It is noted that the Project Area (described above) is located inside a broader Development Envelope, which has been included in relevant mapping for general context. Results discussed in this report relate specifically to the Project Area only.

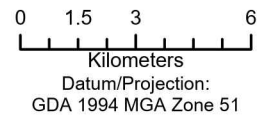
More specifically, the scope of work was to conduct:

- A desktop assessment of the Project Area to inform local and regional context, to assess for the potential presence of conservation significant species and vegetation associations, and to inform the flora and fauna survey in terms of landform, vegetation associations, fauna habitat and accessibility;
- A Detailed and Targeted flora and vegetation survey undertaken in accordance with the EPA *Technical Guidance: Flora and Vegetation Surveys for Environmental Impact Assessment (2016)*;
- A Basic fauna survey undertaken in accordance with the EPA *Technical Guidance: Terrestrial Vertebrate Fauna Surveys for Environmental Impact Assessment (2020)*;
- Preparation of a report combining findings of the desktop assessment and survey findings, including relevant mapping; and
- Provision of a spatial data package prepared in accordance with the Index of Biodiversity Surveys for Assessment (IBSA).

Figure 1: Project Area location



- Legend**
- Development Envelope
 - Project Area**
 - Proposed Well Site
 - Proposed access track / camp locations
 - Additional Survey Area



2. Environmental setting¹

2.1.1. Climate

The Project Area is located in the Dampierland bioregion of WA, as defined by the Interim Biogeographic Regionalisation for Australia (IBRA; Department of Agriculture, Water and the Environment [DAWE] 2021a). The Dampierland bioregion has a semiarid to tropical monsoonal climate (Bastin and the ACRIS Management Committee 2008).

Based on rainfall data from the nearby Bureau of Meteorology (BoM) Liveringa Station weather station (station number 3100, located approximately 20 km northwest of the Project Area; rainfall 2001-current), the area receives an average annual rainfall of 751.4 millimetres (mm), with most rainfall occurring during the months of December, January and February (123.1 mm, 222.3 mm and 175.5 mm, respectively; BoM 2021; **Table 1**).

In the 12 months preceding the field survey in March, the area received a total of 1,082.2 mm, which is above the long-term average. In the three months prior to the field survey in March, the area received a total of 756 mm of rainfall, which is well above average for the same time period (521.1 mm; **Table 1**; BoM 2021).

In the 12 months preceding the field survey in May, the area received a total of 1,193.6 mm, which is above the long-term average. In the three months prior to the field survey, the area received a total of 370.4 mm of rainfall, which is above average for the same time period (312.5 mm; **Table 2**; BoM 2021).

Monthly temperature data is available from the Fitzroy Crossing Aero weather station (station number 3093, located approximately 65 km east of the Project Area; data 1997-current). Maximum mean monthly temperatures in the region range from 30.6°C (June) to 41°C (November). Minimum mean monthly temperatures in the region range from 12.2°C (July) to 25.28°C (December). The temperature at the time of the March survey was hot, with a maximum temperature of 38.5°C and a minimum temperature of 22.9°C recorded (BoM 2021). The temperature at the time of the May survey was hot, with a maximum temperature of 36.8°C and a minimum temperature of 17.5°C recorded (BoM 2021).

Table 1: Rainfall data recorded at the Liveringa weather station (3100) 12 months prior to the March field survey compared to the long-term average (BoM 2021)

Month	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Total
Total monthly rainfall 2020-21 (mm)	156.6	9.8	87.4	0	0	0	0	0	72.4	266.4	397	92.6	1,082.2
Average monthly rainfall 2001 - current	120.5	16.3	22.7	7.2	7.7	2.7	0	7	46.2	123.1	222.3	175.7	751.4

¹ It is noted that the broader Development Envelope has been included in relevant mapping for general context, however results discussed in the following sections pertain to the Project Area only.

Table 2: Rainfall data recorded at the Liveringa weather station (3100) 12 months prior to the May field survey compared to the long-term average (BoM 2021)

Month	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	Total
Total monthly rainfall 2020-21 (mm)	87.4	0	0	0	0	0	72.4	266.4	397	92.6	277.8	0	1,193.6
Average monthly rainfall 2001 - current	22.7	7.2	7.7	2.7	0	7	46.2	123.1	222.3	175.7	120.5	16.3	751.4

2.1.2. Interim-Biogeographic Regionalisation for Australia

IBRA divides Western Australia into 26 biogeographic regions and 53 subregions based on dominant landscape characteristics of climate, lithology, geology, landform and vegetation (DAWE 2020a). The Project Area is located in the Dampierland (DAL) region, which is characterised by extensive plains, ranges and spectacular gorges, with vegetation characterised by acacia thickets with scattered trees and areas of grassland and savannahs (Bastin and the ACRIS Management Committee 2008). The Dampierland bioregion is further divided into two subregions, the Fitzroy Trough subregion (DAL01) and the Pindanland subregion (DAL02).

The Project Area occurs within the Fitzroy Trough (DAL01) subregion, which is described as having four basic components (Graham 2001):

- Quaternary sandplain overlying Jurassic and Mesozoic sandstones with Pindan. There are hummock grasslands on hills.
- Quaternary marine deposits on coastal plains, with mangal, samphire – *Sporobolus* spp. grasslands, *Melaleuca alsophila* low forests, and Spinifex spp. – *Crotalaria* spp. strand communities.
- Quaternary alluvial plains associated with the Permian and Mesozoic sediments of Fitzroy Trough support tree savannahs of ribbon grass (*Chrysopogon* spp.), bluegrass (*Dichanthium* spp.) and Mitchell grass (*Astrebla* spp.) scattered coolibah (*Eucalyptus microtheca*) - *Bauhinia cunninghamii*. There are riparian forests of river red gum (*Eucalyptus camaldulensis*) and Cadjeput (*Melaleuca* spp.) fringe drainages.
- Devonian reef limestones in the north and east support sparse tree steppe over lobed spinifex (*Triodia intermedia*) and limestone spinifex (*T. wiseana*) hummock grasses.

2.1.3. Rangelands land systems mapping

Rangeland Land Systems mapping, prepared by the Department of Primary Industries and Regional Development (DPIRD; formerly Department of Agriculture and Food Western Australia [DAFWA]; DPIRD 2021a), provides a comprehensive and standardised description of landscapes, soils and vegetation of the Kimberley region of Western Australia at a regional scale (Payne and Schoknecht 2011). These surveys describe the biophysical characteristics of each region and subsequently divide each region into land systems; land systems being defined as repeating patterns of topography, soils and vegetation.

A total of three Rangelands Land Systems have been mapped across the Project Area, namely the Calwynyardah Land System, the Camelgooda Land System and the Djada Land System (Payne and Schoknecht 2011; **Table 3; Figure 2**).

Table 3: Rangelands Land System mapping of the Project Area

Land system	Description	Total extent (ha)	Extent (ha) within the Disturbance Footprint	Extent (ha) within the Additional Survey Area	Total extent (ha) within the Project Area	Proportion of total extent within the Project Area (%)
Calwynyardah Land System	Alluvial plains with scalded tracts downslope from lateritic remnants with yellowish loamy soils supporting patchy beefwood-bauhinia low woodlands with curly spinifex and ribbon grass; also minor hard spinifex grasslands.	173,613.7	15.49	3.27	18.75	0.011
Camelgooda Land System	Sandplains, swales and linear sand dunes supporting low pindan woodlands of acacias and low woodlands of bauhinia and bloodwood with curly spinifex and ribbon grass.	1,798,104.1	96.97	7.01	103.98	0.006
Djada Land System	Active flood-plains with levees and levee back slopes supporting ghost gum open woodlands with frontage grasses, and cracking clay back plains supporting ribbon grass-blue grass and Mitchell grass grasslands.	443,548.6	0	5.41	5.41	0.001

2.1.4. Beard's (1979) vegetation mapping

Vegetation type and extent have been mapped at a regional scale by Beard (1979) who categorised vegetation into broad vegetation associations. Based on this mapping at a scale of 1:1,000,000, DPIRD (DAFWA) has compiled a list of vegetation extent and types across WA (Shepherd *et al.* 2002).

A total of four pre-European vegetation associations have been mapped across the Project Area, each of which have more than 99% of their total pre-European extents remaining within the Fitzroy Trough (DAL01) subregion (**Table 4; Figure 3**; Government of Western Australia 2019).

Table 4: Beard's (1979) / Shepherd *et al.* (2002) vegetation associations of the Project Area

Vegetation association	Description	Pre-European extent (ha) within the Fitzroy Trough (DAL01) subregion	Current extent (ha) within the Fitzroy Trough (DAL01) subregion	% remaining	Extent (ha) within the Disturbance Footprint	Extent (ha) within the Additional Survey Area	Extent (ha) within the Project Area	Proportion of extent (%) within the Project Area
NORTH FITZROY PLAINS_64	Grasslands, tall bunch grass savanna low tree; baobabs (<i>Adansonia gregorii</i>), bauhinia & beefwood (<i>Grevillea striata</i> over ribbon grass)	410,085.60	409,862.82	99.95	0.00	1.07	1.07	0.0003
NORTH FITZROY PLAINS_699	Shrublands, pindan; <i>Acacia eripoda</i> shrubland with scattered low bloodwood (<i>Eucalyptus dicromophloia</i>) & <i>E. setosa</i> over soft & curly spinifex on sandplain	180,118.58	179,963.89	99.91	6.58	7.48	14.06	0.0078
NORTH FITZROY PLAINS_700	Shrublands, pindan; <i>Acacia eripoda</i> shrubland with scattered low bloodwood & <i>Eucalyptus setosa</i> over soft & curly spinifex between dunes	212,971.66	212,971.66	100.00	92.62	7.14	99.72	0.0468
NORTH FITZROY PLAINS_710	Mosaic: Grasslands, tall bunch grass savanna low tree; baobabs, bauhinia & beefwood over ribbon grass / Hummock grasslands, grass steppe, <i>Trioda pungens</i>	25,596.64	25,596.64	100.00	13.26	0.00	13.26	0.0518

2.1.5. Hydrology

The Project Area is located in the Fitzroy River Catchment of the Fitzroy River Basin. The Fitzroy River Catchment area spans almost 94,000 km², covering more than 20% of the Kimberley region of Western Australia, extending from Derby in the west to Halls Creek and the Leopold Ranges in the east (Pusey and Kath 2015).

The Fitzroy River is the main major river system in the basin and is characterised by a braided channel, anabranching and billabongs on floodplain, with deep permanent pools occur along its whole length, separated by shallower reaches (Pusey and Kath 2015). Rivers, streams and wetlands of the Fitzroy River range from those that rarely flow or are inundated only occasionally (e.g. when large storm events occur) to those that flow most or all year round usually because of connections to groundwater (Pusey and Kath 2015).

One major tributary to the Fitzroy River runs through the Project Area, namely Mt. Hardman Creek (**Figure 4**). A number of rivers and creeks are located within a 30 km radius of the Project Area, including 8 Mile Creek, Fitzroy River, Mt Wynne Creek, Cherrabun Creek, Cunninghame river and Kalyeeda creek (**Figure 4**). Several additional smaller waterbodies (billabongs, waterholes, swamps and dams) are located within 30 km of the Project Area.

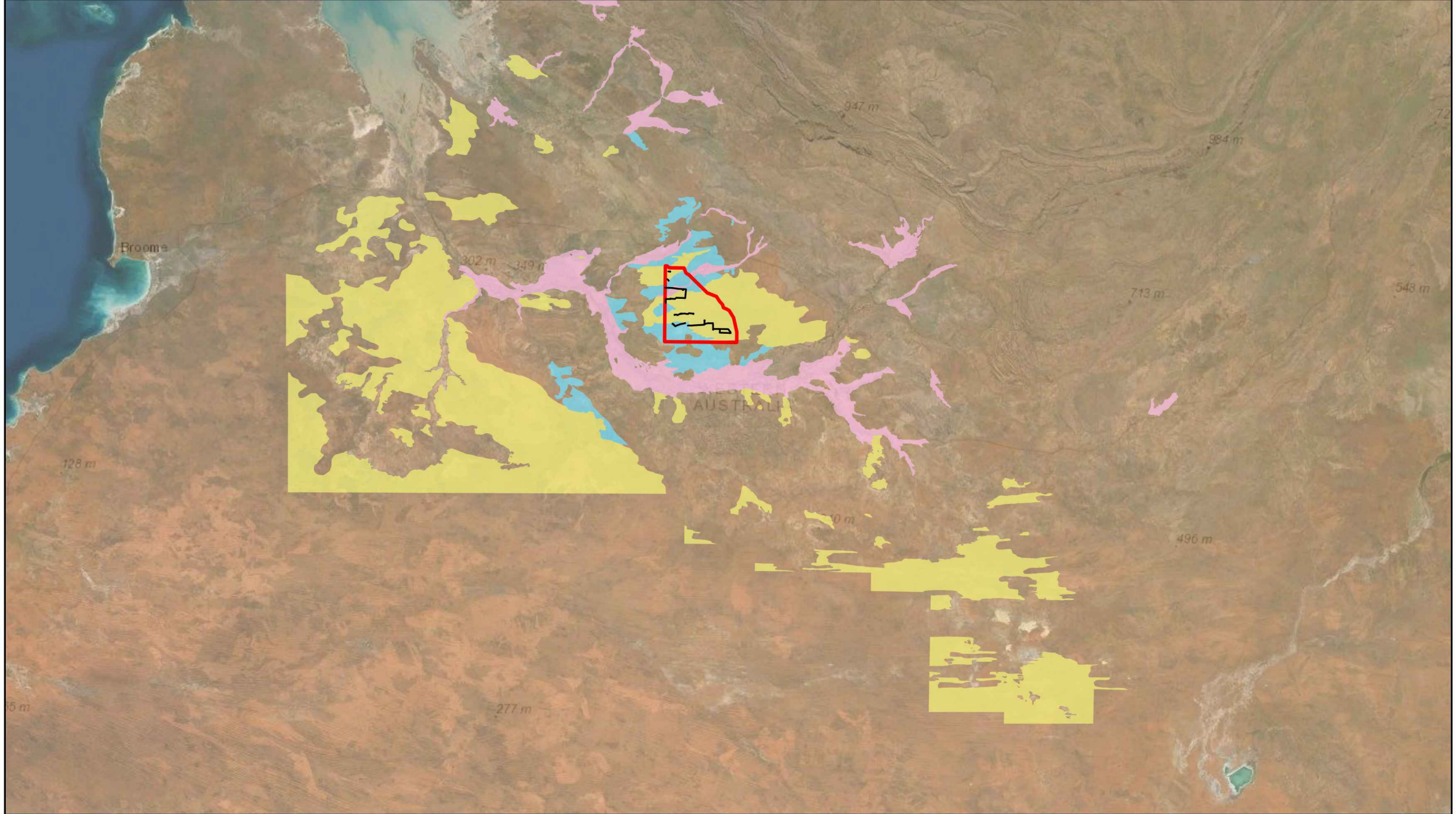
2.1.6. Areas of significance

Environmentally Sensitive Areas (ESAs) are defined in the Environmental Protection (Environmentally Sensitive Areas) Notice 2005 under s. 51B of the 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 Threatened Ecological Communities (TECs).

No ESAs are known to occur within the Project Area. One ESA, namely the Camballin Floodplain, listed on the Register of National Estate, is located approximately 27.2 km to the west of the Project Area (**Figure 5**). The Camballin Floodplain is listed in the Directory of Important Wetlands of Australia (DIWA WA017) and has been nominated for listing as a wetland of international significance under the Ramsar Convention (Place ID 18366; Department of Environment and Conservation [DEC] 2009). Its significance is due to the paucity of floodplains in the Kimberley region, usage of the site by migratory waterbirds and because it contains many sites of significance to the local Aboriginal people. Le Lievre Swamp (Iljamalkarda in the local dialect) is crucial to the hydrology of the floodplain and interacts with the regional groundwater system (DEC 2009).

The Project Area is not located within any Commonwealth or State listed Conservation reserves or Department of Biodiversity, Conservation and Attractions (DBCA) managed lands. A total of two nature reserves occur within 50 km of the Project Area, namely Tunnel Creek National Park and Devonian Reef Conservation Park, located 49.3 km and 42.8 km northwest of the Project Area, respectively (**Figure 5**).

Figure 2: Rangelands Land System mapping of the Project Area (Payne and Schoknecht 2011)



Legend

Development Envelope	Land system
Project Area	Calwynyardah Land System
	Camelgooda Land System
	Djada Land System

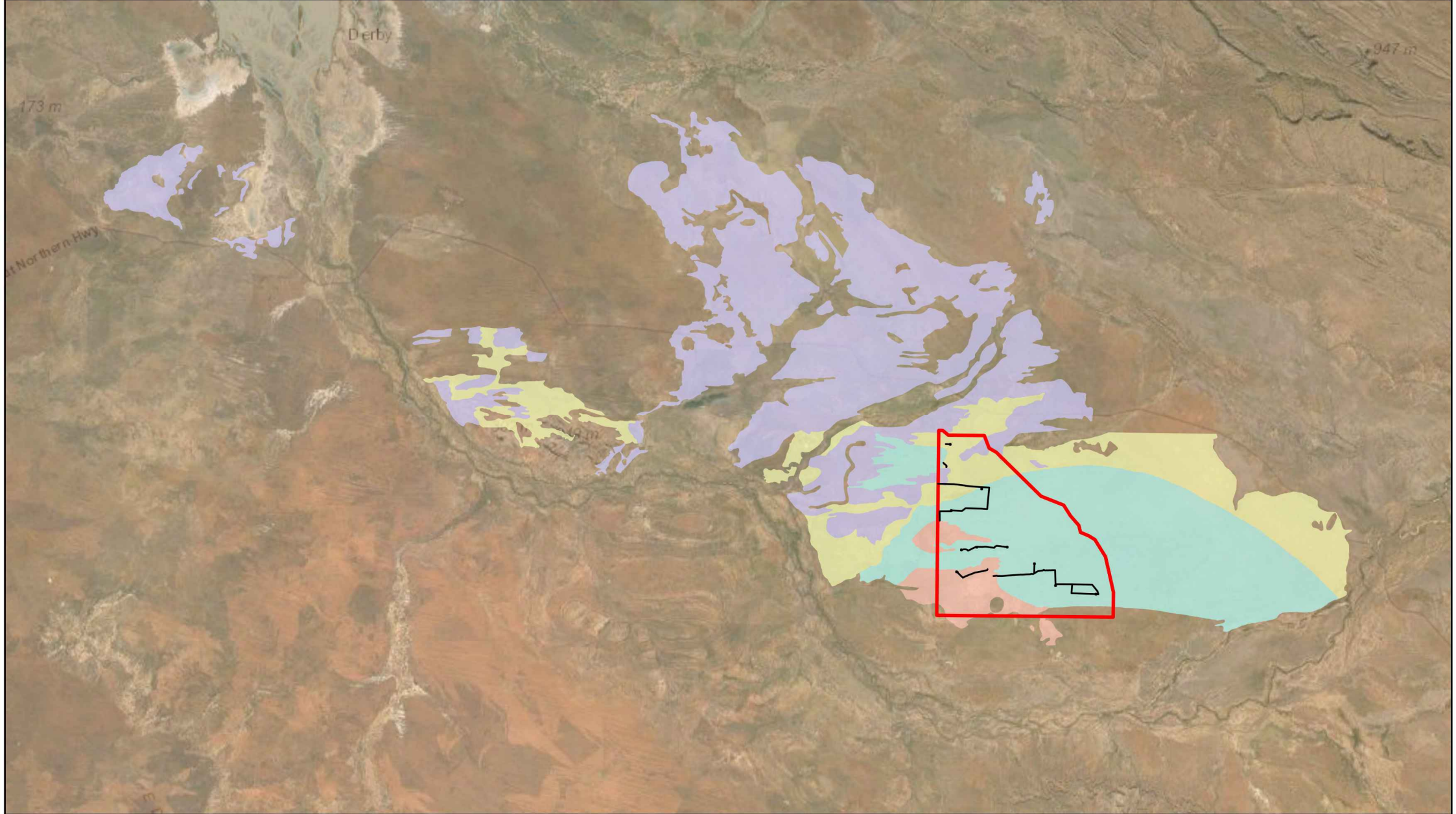
0 20 40 80
Kilometers
Datum/Projection:
GDA 1994 MGA Zone 51

N

eco
logical
AUSTRALIA
A TETRA TECH COMPANY

Prepared by: 17692-DD Date: 7/07/2021

Figure 3: Beard's (1979) vegetation associations of the Project Area



Legend

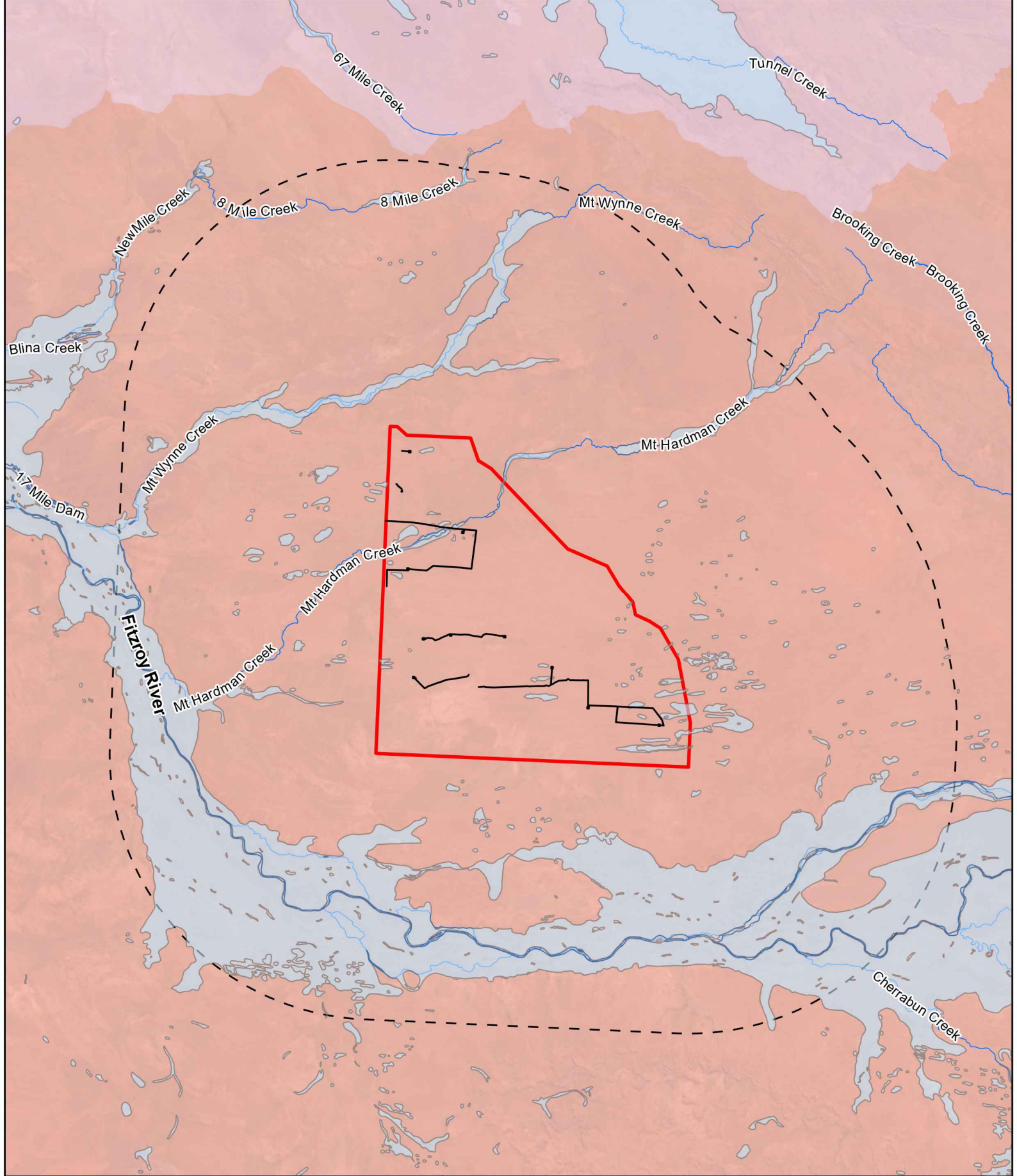
Development Envelope	Beard's (1979) vegetation association
Project Area	North Fitzroy Plains 64
	North Fitzroy Plains 699
	North Fitzroy Plains 700
	North Fitzroy Plains 710

0 5 10 20
Kilometers
Datum/Projection:
GDA 1994 MGA Zone 51

ecological AUSTRALIA
A TETRA TECH COMPANY

Prepared by: DD-17692 Date: 7/07/2021

Figure 4: Hydrology of the Project Area

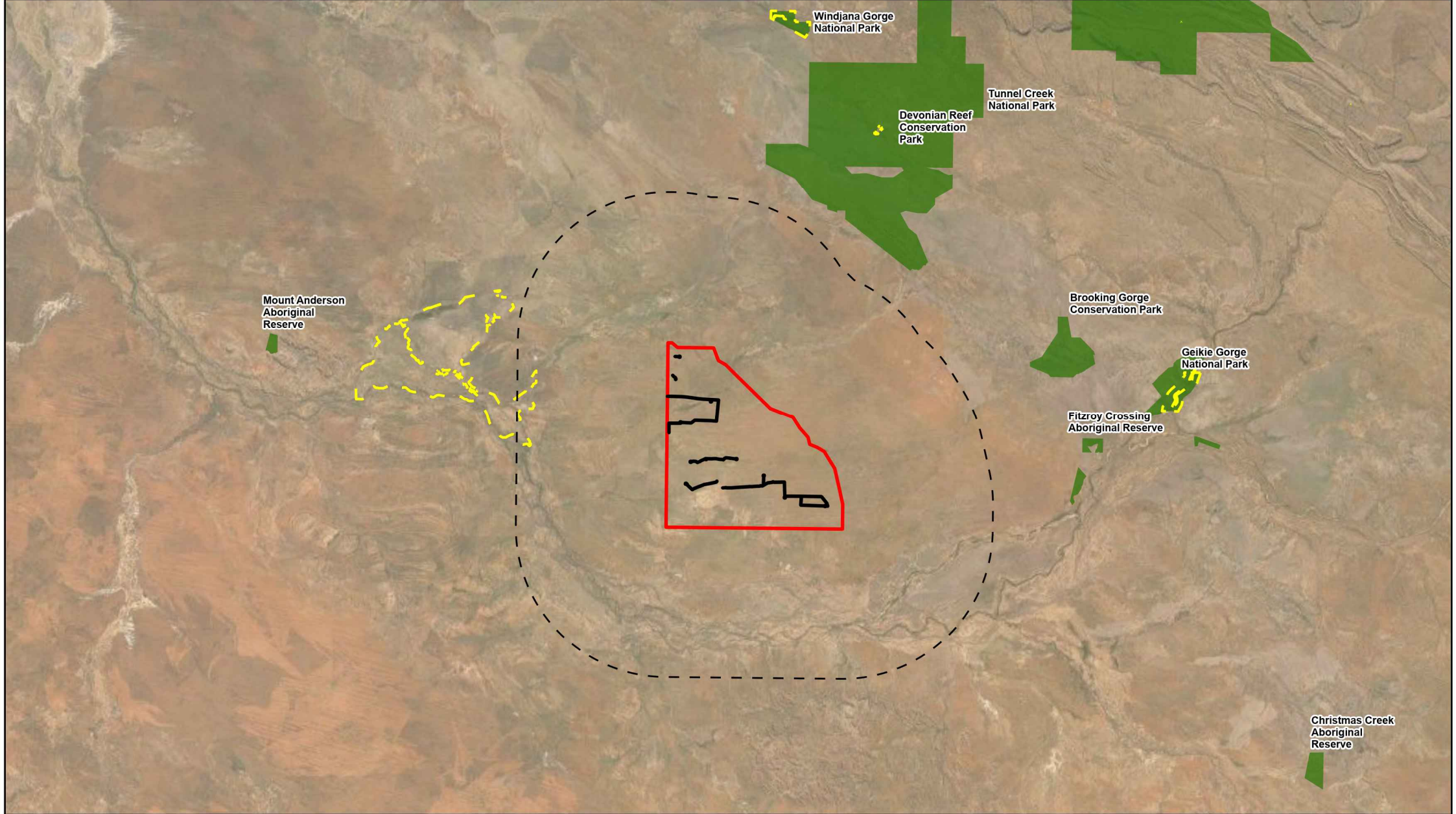


- Legend**
- Development Envelope
 - Project Area
 - Development Envelope 30km Buffer
 - Waterbodies (Statewide)
 - Major River
 - Minor Tributary

- Catchment Name**
- Fitzroy River
 - Lennard River

0 4.75 9.5 19
 Kilometers
 Datum/Projection:
 GDA 1994 MGA Zone 50

Figure 5: Nature Reserves / ESAs in the vicinity of the Project Area



Legend

- Development Envelope
- Development Envelope 30km Buffer
- Project Area
- Nature Reserves
- Environmentally Sensitive Area (ESA)

0 5 10 20
Kilometers
Datum/Projection: GDA 1994 MGA Zone 51

N
eco logical
AUSTRALIA
A TETRA TECH COMPANY

Prepared by: DD-17692 Date: 7/07/2021

3. Methodology

3.1. Desktop review

3.1.1. Database searches and literature review

The following Commonwealth and State databases were searched for information relation to conservation listed flora, fauna and ecological communities in order to compile and summarise existing data to inform the field survey. Database searches undertaken around the central coordinates 706862 metres (m) E; 7981169m N are provided in **Table 5** below. Applied buffers below are considered suitable based on flora and fauna assemblages expected to occur within the Project Area.

Table 5: Database searches undertaken for the Project Area

Database	Reference	Buffer (km)
Commonwealth <i>Environment Protection and Biodiversity Conservation Act 1999</i> (EPBC Act) Protected Matters Search Tool (PMST) for Threatened species and communities listed under the EPBC Act.	DAWE 2021b	30
DBCA and Western Australian Herbarium (WAH) NatureMap online database.	DBCA 2007-2021	30
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 2021a	100
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 2021b	80
DBCA Threatened and Priority Ecological Communities' database search	DBCA 2021c	50

In addition, the following documents pertaining to the Project Area were reviewed for conservation significant flora and fauna species and ecological communities:

- *Ophir, Paradise, Valhalla, Eden and Ellendale Flora, Vegetation and Fauna Survey Report* (Buru Energy and Outback Ecology 2014);
- *Level 1 Vegetation, Flora and Fauna Survey of Kurrajong, Yakka Munga and Valhalla Central Well Sites* (ELA 2016);
- *Valhalla Central 4 Flora and Fauna Survey* (ELA 2018);
- *Flora and Vegetation Survey: Valhalla North* (Low Ecological Services 2011a)
- *Valhalla East-1 Exploration Well: Flora and Fauna Survey* (Low Ecological Services 2011b);
- *Asgard-1 Exploration Well: Flora, Vegetation and Fauna Survey* (Low Ecological Services 2012a);
- *Asgard 2D Seismic Survey: Flora, Vegetation and Fauna Survey* (Low Ecological Services 2012b);
- *Flora and Fauna Assessment – Odin 2D and 3D seismic survey, Fitzroy Basin, Western Australia* (Low Ecological Services 2020);
- *Targeted bilby survey of proposed well site 'Valhalla Central', and immediate area* (Murdoch University 2016); and
- *Valhalla – 01 Well Site Flora and Vegetation Survey* (Woodman Environmental Consulting 2007).

3.1.2. Likelihood of occurrence assessment

A pre-survey likelihood of occurrence assessment was undertaken to identify conservation listed flora and fauna species that possibly occur within the Project Area, identified from a review of key datasets and literature, as specified above. Following the field survey, the pre-survey likelihood of occurrence assessment was reassessed based on results of the field survey (availability of suitable habitat). Aquatic and marine species were not considered in the likelihood of occurrence assessment as the Project Area does not contain core habitat that these species solely rely on for survival. 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**. Criteria used for this assessment is presented in **Appendix B**.

3.2. Field survey

3.2.1. Survey team and timing

A Detailed and Targeted flora and vegetation survey and a Basic fauna survey were conducted by Jeff Cargill (Senior Botanist), Emily Chetwin (Botanist), Jeni Morris (Ecologist) and Briana Wingfield (Ecologist) from 3 to 10 March 2021. An additional supplementary survey was undertaken by Emily Chetwin and Jeni Morris from 25-27 May 2021. The survey team's relevant qualifications, experience and licences are provided in **Table 6** below. There was 2.4 mm of rainfall recorded during the field survey in March (BoM 2021). No rainfall was recorded during the May field survey (BoM 2021).

Table 6: 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
Emily Chetwin	BSc Geology. Masters. Hons.	Emily is a botanist with over three years' experience undertaking flora and vegetation across multiple bioregions of Western Australia. She has conducted Detailed and Reconnaissance baseline flora and vegetation surveys, targeted Threatened species surveys, rehabilitation and vegetation monitoring and assessment, habitat assessments and bushland condition assessments.	Flora scientific collection licence: FB62000026-3 Declared Rare Flora (DRF) permit: TFL 124-2021
Jeni Morris	BSc Conservation and Wildlife Biology	Jeni has over six years' undertaking ecological survey and monitoring in Western Australia. She is competent in undertaking Baseline flora and fauna surveys and Targeted species surveys and has experience leading field teams in remote areas. Jeni has been undertaking flora and fauna surveys for mining and infrastructure in the Kimberley region since 2016.	Flora scientific collection licence: FB62000070 Declared Rare Flora (DRF) permit: TFL 13-1920
Briana Wingfield	BSc. Conservation and Wildlife Biology and Environmental Science (Hons)	Briana has seven years' experience conducting fauna surveys across multiple bioregions within Western Australia, including Detailed, Targeted and Basic fauna surveys and black cockatoo habitat assessments.	Flora scientific collection licence: FB62000316

3.2.2. Flora and vegetation survey

A Detailed and Targeted flora and vegetation survey was conducted in accordance with the EPA *Technical Guidance: Flora and Vegetation Surveys for Environmental Impact Assessment* (EPA 2016). A total of 64 quadrats were established within the Project Area (**Figure 6**). Dominant vegetation communities were described, with respect to dominant species, structure and overall condition. The survey involved the use of 50 x 50 m quadrats as recommended for the Dampierland bioregion (EPA

2016). Opportunistic sampling of species not recorded within the quadrats was undertaken where appropriate to supplement the existing list of species recorded from within the Project Area.

Photographs were taken from the northwest corner of each quadrat facing south-east. Within each quadrat, the following data was recorded:

- Site details (site name, site number, observers, date and location);
- Environmental information including landform, soil type and colour, bare ground and leaf litter cover, rock outcropping and time since last fire event; and
- Biological information including vegetation structure, vegetation condition in accordance with Keighery (1994), degree of disturbance, species present and species percentage cover.

A Targeted survey was completed within the Project Area to identify the following:

- TECs listed under the EPBC Act;
- Threatened (Declared Rare) Flora listed under the latest WA Wildlife Conservation (Rare Flora) Notice under the BC Act;
- Priority Ecological Communities (PECs) endorsed by the Western Australian Minister for the Environment;
- Priority (P) flora recognised by DBCA;
- Location of any culturally significant / Aboriginal significant bush foods; and
- Identification of the presence and extent of introduced flora (weed) species.

Where possible, field personnel walked meandering transects across suitable habitat within the Project Area to search for conservation significant flora species, with transects spaced apart depending on factors such as habitat type, disturbance (e.g. tracks) and landform. Due to access restrictions, not all of the Project Area was able to be traversed on foot. Survey limitations are discussed further in Section 3.2.6 below. Locations of survey transects are shown in **Figure 6** below. 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 flora species 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).

When conservation significant species were encountered the coordinates of individuals, and/or centroid of populations greater than 100, was recorded within a 20 m radial circumference. If a population extended outside of the Project Area individual were counted. Other information recorded includes the number of individuals and percentage of cover.

Specimen identification was undertaken by ELA Taxonomist Daniel Brassington. 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.

3.2.3. Data analysis

3.2.3.1. Flora species accumulation curve

A flora species accumulation curve was undertaken to indicate adequacy of the survey effort. 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.

3.2.3.2. 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). A 4th root transformation was applied to the percentage cover dataset to down weight the relative contributions of quantitatively dominant species. 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. Computation of similarity matrices was based on the Bray-Curtis similarity measure. Data were analysed using a series of multivariate analysis routines including Hierarchical Clustering (CLUSTER), Similarity Profile Analysis (SIMPROF) and Similarity Percentages (SIMPER). Results were used to inform and support interpretation of aerial photography and delineation of individual plant communities.

3.2.4. Fauna survey

The Basic fauna survey was conducted in accordance with the EPA *Technical Guidance: Terrestrial Vertebrate Fauna Surveys for Environmental Impact Assessment* (EPA 2020). Broad habitat types within the Project Area were identified and described, and included the following information (where applicable):

- A colour photograph of representative habitat;
- Location of habitat type (GPS location where practical);
- Associated vegetation;
- Associated fauna species observed;
- Likely fauna of conservation significance to be hosted (based on immediate impressions);
- Habitat description, such as:
 - Hollow bearing trees and stag trees (average size and abundance);
 - Rocky outcrops (average rock size and extent);
 - Course woody debris, i.e. logs and fallen timber (abundance and size);
 - Substrate (description of composition, presence of algal crust and % cover of leaf litter);

- Presence of wetland habitats and watercourses, including drainage lines, billabongs, active floodplains, dams, etc.; and
- Any nests, roosts or other evidence of breeding habitat present; and
- Habitat condition and evidence of disturbance.

Fauna species were recorded opportunistically within the Project Area, and where possible meandering transects were conducted across suitable habitat to survey for conservation significant fauna and habitat supporting these species. Due to access restrictions, not all of the Project Area was able to be traversed on foot. Survey limitations are discussed further in Section 3.2.6 below. Locations of survey transects are shown in **Figure 6** below. Evidence recorded during searches included both direct evidence (vertebrate fauna seen or heard) and indirect (scats, tracks, dead specimens or burrows etc.). Opportunistic observations were also made between survey sites, including opportunistic observations of invertebrate species.

Habitats specifically supporting conservation significant fauna species likely to occur in the Project Area were targeted during the field survey and, where this habitat was identified, an estimate of extent and location boundaries was recorded. For any conservation significant fauna identified in the field, the following information was recorded:

- GPS locations;
- Estimated number of individuals observed, or estimated age of evidence observed;
- Associated habitat/landscape element;
- Time and date observed; and
- Observer details.

Identification of fauna species was undertaken by Jeni Morris and Briana Wingfield in the field. If any species were unable to be identified, photographs were taken when possible and were identified at a later date.

3.2.5. Nomenclature

Nomenclature used for the flora species within this report follows the WA Plant Census as available on FloraBase (DBCA and WAH 2021).

Nomenclature used for the vertebrate fauna species within this report follows the Western Australian Museum (WAM) Checklist of the Vertebrates of Western Australia, as available on the WAM website (WAM 2021). Where common names were not stated for certain species, the following references were consulted:

- Amphibians: Tyler and Doughty (2009);
- Reptiles: Wilson and Swan (2013);
- Birds: Morcombe (2003); and
- Mammals: Menkhorst and Knight (2011).

3.2.6. Limitations

The EPA *Technical Guide – Flora and Vegetation Surveys for Environmental Impact Assessment* (EPA 2016) recommends including discussion of the constraints and limitations of the survey methods used.

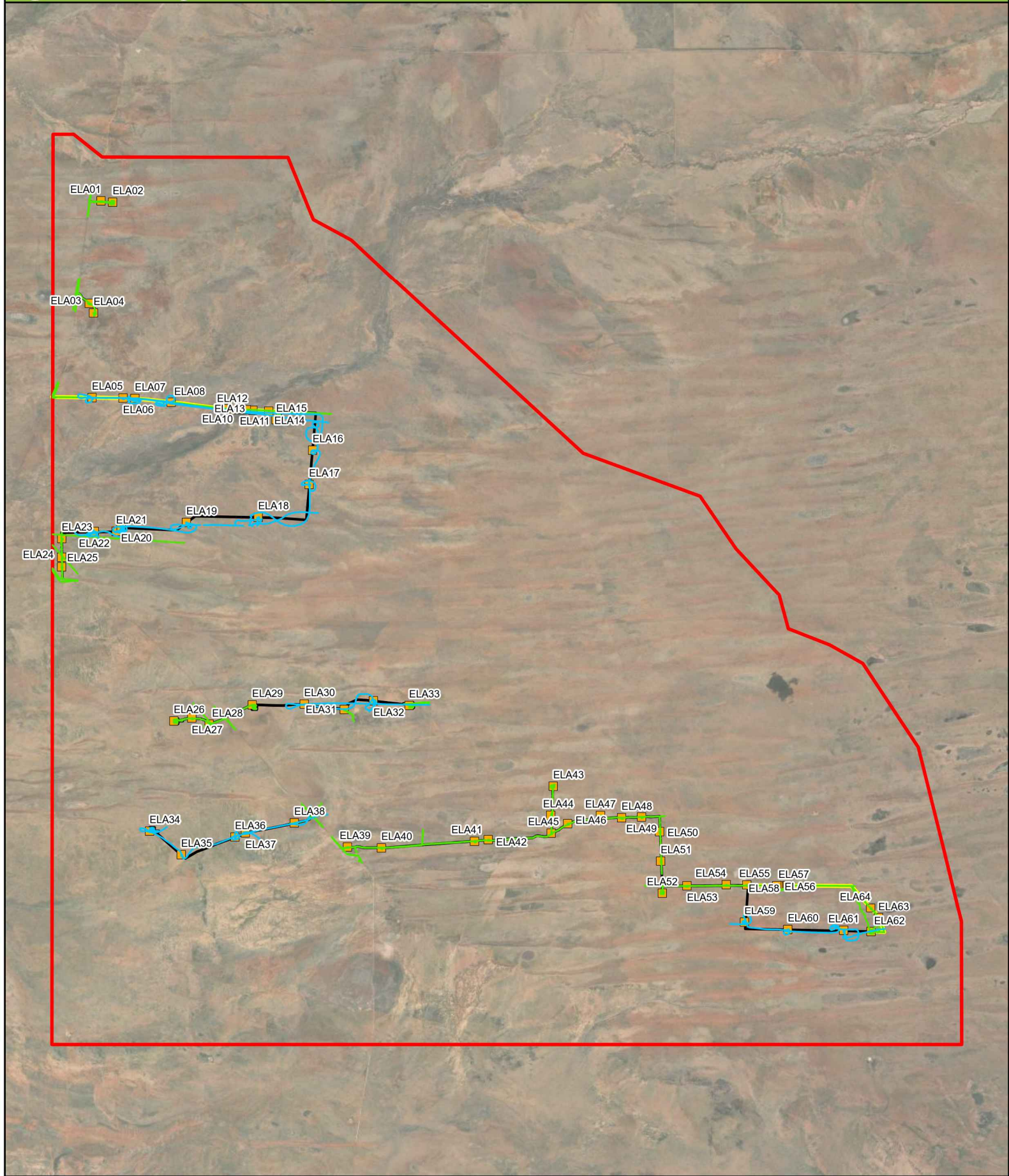
Constraints and limitations for the Reconnaissance flora and vegetation survey and the Basic fauna survey are summarised in **Table 7** below. Three potential constraints were identified.

Table 7: Survey limitations

Constraint	Limitations
Sources of information and availability of contextual information (i.e. pre-existing background versus new material).	<p>Not a constraint: 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. A number of relevant background reports, undertaken in the vicinity of the Project Area, were available. Available information was sufficient for the purposes of the work being undertaken and as such sources of information were not considered a major limitation.</p>
Scope (i.e. what life forms, etc., were sampled).	<p>Potential constraint: The survey requirement of a Targeted level flora survey was unable to be adequately met within all sections of the Project Area due to access restrictions, namely inaccessible (non-existent, overgrown or inundated) tracks. Foot traverses were undertaken where possible (and safe) to do so. Based on the desktop assessment (database searches and literature review) and a detailed post-survey flora likelihood of occurrence assessment based on detailed vegetation mapping and site characteristics, no Threatened flora species are considered as being likely or having the potential to occur within the Project Area.</p> <p>The survey requirement of a Targeted level fauna survey was unable to be adequately met within all sections of the Project Area due to access restrictions (above). Foot traverses were undertaken within appropriate habitat where possible (and safe) to do so. Of note, not all areas considered as potentially suitable to sustain populations of the Greater Bilby (<i>Macrotis lagotis</i>) were able to be traversed on foot. Secondary signs of this species were recorded within Fauna habitat 2 and, as such, this species is considered as being likely to occur throughout this habitat, which was mapped across an extent of 38.12 ha (29.75%) of the Project Area.</p> <p>In addition, a total of seven Threatened bird species are also considered as having the potential to occur within the Project Area. Due to the vagrant and mobile nature of these species, their likelihoods of occurrence are based on availability of potentially suitable habitat within the Project Area.</p> <p>The survey requirement of a Detailed level flora and vegetation survey and a Basic fauna survey within the Project Area was adequately met.</p>
Intensity of survey	<p>Potential constraint: The number of quadrats established was sufficient to determine the vegetation communities present within the Project Area (with a minimum of three quadrats established per vegetation community) and also identify possible vegetation communities of significance. Targeted survey for conservation significant flora and fauna species was unable to be completed within all sections of the Project Area due to access restrictions, however foot traverses were undertaken within appropriate habitat where possible (and safe) to do so. A conservative approach was undertaken to conservation listed flora and fauna species likelihood of occurrences within the Project Area, and this was informed through the desktop assessment process, on-ground vegetation/habitat mapping and opportunistic observations in the field.</p>
Proportion of flora collected and identified (based on sampling, timing and intensity).	<p>Not a constraint. Proportion of flora species collected was adequate to meet the requirements of the level of survey undertaken (Detailed level flora and vegetation survey), with approximately 91.7% of the flora species potentially present within the Project Area recorded. This high percentage reflects the common occurrence of key species across the landscape, which co-occur at varying levels of structural and compositional dominance; this point is reflected in vegetation community descriptions whereby subtle variations in the dominance of common species largely define the communities.</p>
Mapping reliability.	<p>Not a constraint. Delineation and mapping of vegetation communities was adequate based on requirements of a Detailed level vegetation survey. High quality aerial imagery was used for both the field survey and subsequent vegetation mapping. It is noted that fire scars are</p>

Constraint	Limitations
	<p>present across much of the Project Area, however this did not limit the ability to accurately delineate vegetation communities present. Mapping was undertaken based on results of statistical analysis on data and through interpretation of aerial photography and field notes.</p>
Timing, weather, season, cycle	<p>Not a constraint: The Project Area is located in the Northern botanical province of Western Australia. Recommended survey timing for this region includes the wet season (January – March) and post-wet season for flora (EPA 2016) and in the season following maximum rainfall for fauna (EPA 2020). The initial field survey was undertaken in season from 3-10 March 2021. A supplementary field survey, undertaken following amendments to the original Project Area boundary, was completed from 25-27 May 2021. Rainfall in the three months preceding both survey periods was above average (March; 756 mm compared to an average of 521.1 mm; May; 370.4 mm compared to an average of 312.5 mm; BoM 2021). As such, both field survey periods were considered suitable for identification of annual and cryptic perennial flora species.</p>
Disturbances	<p>Not a constraint: The Project Area traverses a large area and incorporates several disturbances, including pastoral activities (e.g. cattle grazing, tracks and congregating around water points), weeds, clearing/tracks and edge effects from main tracks. Large sections of the Project Area had been previously cleared for pastoral access (tracks) and were found to be in various stages of regrowth. The Project Area also had prevalence of fire with many areas being recently burnt, particularly preceding the field survey in May. These disturbances did not hinder the ability to determine vegetation communities within the Project Area, with the average number of species in quadrats established during the May field survey comparable to the average number established during the May field survey (25 species compared to 28 species, respectively).</p>
Resources	<p>Not a constraint: The personnel conducting this field survey were both suitably qualified to identify flora and fauna specimens in the Northern botanical province, having previously undertaken work in this region.</p>
Accessibility	<p>Potential constraint: Sections of the Project Area were unable to be accessed during the March field survey due to overgrown and inaccessible vehicle tracks. These areas were revisited during the May field survey by helicopter in order to establish quadrats for vegetation community and condition mapping, however, were unable to be traversed on foot to undertake targeted searches due to large distances, posing a safety risk for field staff.</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 within the Dampierland bioregion of Western Australia.</p>

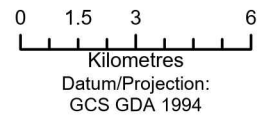
Figure 6: Survey effort and quadrat locations



Legend

- Development Envelope
- Project Area**
- Proposed access track / camp locations
- Additional Survey Area

- Quadrat 50x50m
- Vehicle Survey Track
- Helicopter Survey Track



4. Results

4.1. Desktop review

4.1.1. Previous studies

Consolidated findings of assessments undertaken within, or in the vicinity of the Project Area, as outlined in Section 3.1.1 is presented in **Table 8** below.

Table 8: Consolidated findings of literature review

Author	Report	Distance to Project Area	Significant flora	Significant ecological communities	Significant fauna	Declared Pests / WoNS
Low Ecological Services (2020)	Flora and Fauna Assessment – Odin 2D and 3D seismic survey, Fitzroy Basin, Western Australia	Similar if not overlapping.	Nil	Nil	Unconfirmed signs of the Northern Quoll (<i>Dasyurus hallucatus</i>) and Greater Bilby (<i>Macrotis lagotis</i>) were observed.	* <i>Calotropis procera</i>
ELA (2018)	Valhalla Central 4 Flora and Fauna Survey	Within Development Envelope along creekline track.	Nil	Nil	Nil	Nil
ELA (2016)	Level 1 Vegetation, Flora and Fauna Survey of Kurradjong, Yakka Munga and Valhalla Central Well Sites	Valhalla Central A is the only site relevant, located within Development Envelope near marsh-reroute.	<i>Pterocaulon intermedium</i> (no longer listed)	Nil at Valhalla Central A	Rainbow Bee-eater (<i>Merops ornatus</i>); listed as Marine only	Nil
Murdoch University (2016)	Targeted bilby survey of proposed well site 'Valhalla Central', and immediate area	Within Development Envelope, central.	Nil	Nil	Nil	Nil
Buru Energy and Outback Ecology (2014)	Ophir, Paradise, Valhalla, Eden and Ellendale Flora, Vegetation and Fauna Survey Report	Adjacent to the west.	Nil	Nil	<i>Ardea modesta</i> (not currently listed), <i>Ardeotis australis</i> (not currently listed), <i>Burhinus grallarius</i> (not currently listed), <i>Merops ornatus</i> (listed as Marine only), <i>Tringa nebularia</i> (IA), <i>Tringa stagnatilis</i> (IA)	Nil
Low Ecological Services (2012a)	Asgard-1 Exploration Well: Flora, Vegetation and Fauna Survey	33 km north-northwest of Development Envelope.	Nil	Nil	Nil	Nil

Author	Report	Distance to Project Area	Significant flora	Significant ecological communities	Significant fauna	Declared Pests / WoNS
Low Ecological Services (2012b)	Asgard 2D Seismic Survey: Flora, Vegetation and Fauna Survey	Similar if not overlapping.	<i>Trianthema kimberleyi</i> (P1), <i>Goodenia virgata</i> (P2)	Nil	Australian Bustard (<i>Ardeotis australis</i> ; not currently listed) and Rainbow Bee-eater (<i>Merops ornatus</i> ; not currently listed). Unconfirmed Greater Bilby burrow.	Nil
Low Ecological Services (2011a)	Flora and Vegetation Survey: Valhalla North	73 km north northwest of Development Envelope.	Nil	Nil	Rainbow Bee-eater (<i>Merops ornatus</i> ; not currently listed)	* <i>Calotropis procera</i>
Low Ecological Services (2011b)	Valhalla East-1 Exploration Well: Flora and Fauna Survey	Within Development Envelope centre north about 5 km south from northern extent.	Nil	Nil	Australian Bustard (<i>Ardeotis australis</i> ; not currently listed)	Nil
Woodman Environmental Consulting (2007)	Valhalla – 01 Well Site Flora and Vegetation Survey	Within Development Envelope to northwest.	<i>Goodenia byrnesii</i> (P1), <i>Triodia acutispicula</i> (P3), <i>Goodenia sepalosa</i> var. <i>glandulosa</i> (P3)	Nil	Nil	Nil

4.1.2. Pre-survey likelihood of occurrence of conservation significant flora, fauna and ecological communities

A pre-survey likelihood of occurrence assessment was undertaken to identify conservation listed flora and fauna species that possibly occur within the Project Area, identified from a review of key datasets and literature, as described in Section 3.1.1 above. A DBCA Threatened and Priority flora, fauna and ecological communities search (DBCA 2021a, 2021b, 2021c), PMST search (DAWE 2020b) and NatureMap search (DBCA 2007-2020) were conducted to identify conservation significant species and communities recorded within, or nearby to, the Project Area (current and historic). A review of previous reports relevant to the Project Area, as outlined in Section 3.1.1, was also completed.

Based on the pre-survey likelihood of occurrence assessment, an initial 35 conservation listed flora species, 54 conservation listed fauna species and three PECs were identified as possibly occurring within the Project Area.

Conservation significant flora species identified from the pre-survey likelihood of occurrence assessment include 16 species listed as P1 by DBCA, four species listed as P2 by DBCA and 15 species listed as P3 by DBCA. Of these, one species (*Goodenia byrnesii*; P3) was considered as being likely to occur within the Project Area, while a further nine flora species were considered as having the potential to occur within the Project Area, based on the presence of nearby recent records and availability of potentially suitable habitat. The remaining 25 flora species were considered as either unlikely (24 species) or not occurring (one species). The flora likelihood of occurrence assessment is presented in **Appendix C**.

Conservation significant fauna species identified from the pre-survey likelihood of occurrence assessment include 32 species listed as Threatened under the EPBC Act and BC Act, two species listed as Threatened under the EPBC Act and as Priority by DBCA, three species listed as Threatened under the BC Act, two species listed as specially protected under the BC Act and 15 species listed as Priority by DBCA. Of these, one species (*Macrotis lagotis*; Greater Bilby; listed as Vulnerable [VU] under the EPBC Act and BC Act) was considered as being likely to occur within the Project Area, while a further 29 fauna species were considered as having the potential to occur within the Project Area, based on the presence of nearby recent records and availability of potentially suitable habitat. The remaining 24 fauna species were considered as unlikely to occur. The fauna likelihood of occurrence assessment is presented in **Appendix D**.

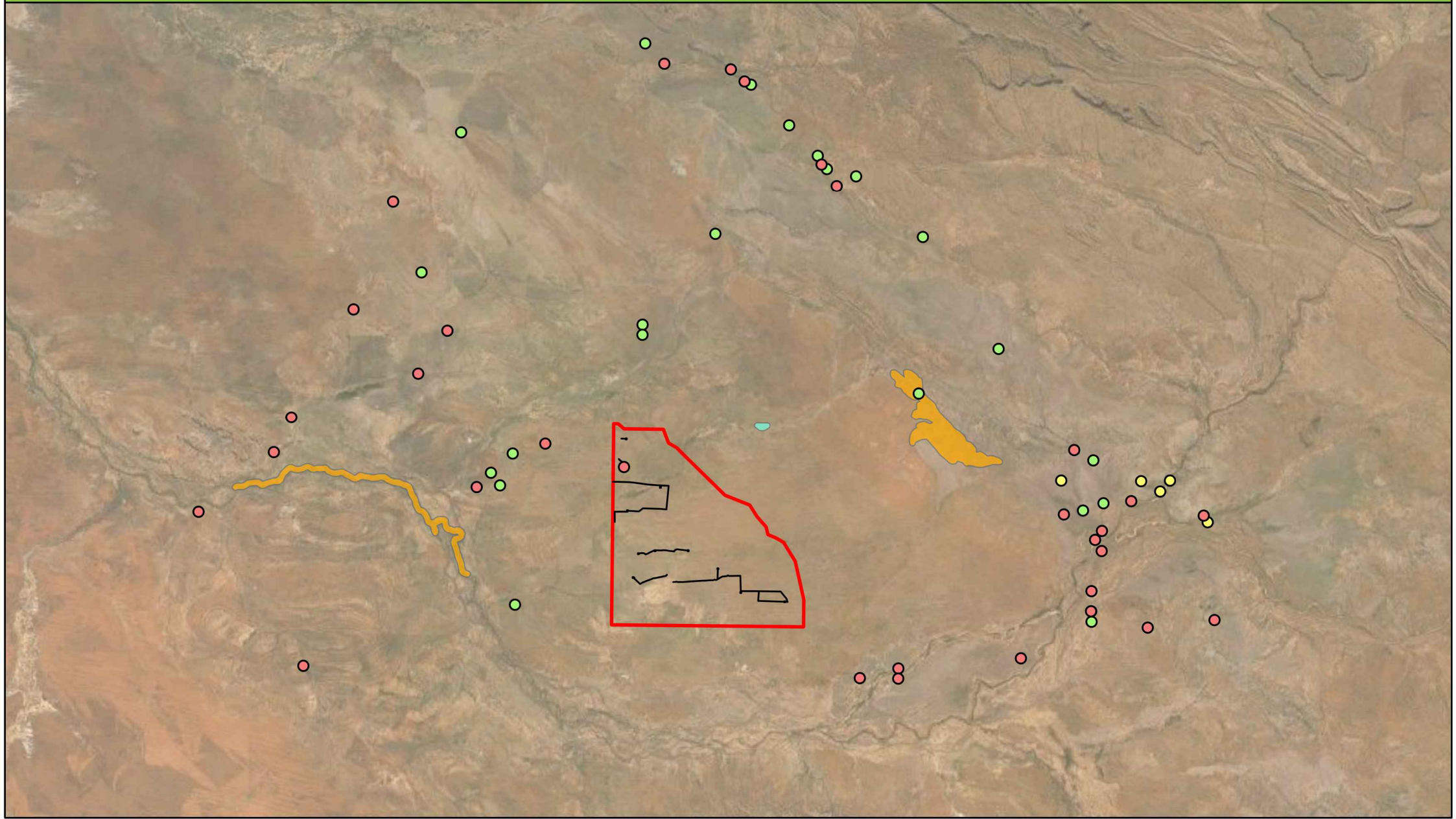
A total of three conservation significant ecological communities were identified from the desktop assessment, all of which were considered as having the potential to occur pre-survey:

- Kimberley Vegetation Association 760, described as 'shrublands, pindan; *Acacia tumida* shrubland with scattered low bloodwood & *Eucalyptus setosa* (excluded name) over ribbon & curly spinifex' (Priority 1, located approximately 20 km to the east of the Project Area; DBCA 2021c);
- Kimberley Vegetation Association 759, described as 'grasslands, tall bunch grass savanna woodland, coolabah over ribbon/blue grass (*Bothriochloa* spp.)' (Priority 3; located approximately 27 km to the west of the Project Area; DBCA 2021c); and

- Leopold Land System, described as ‘cracking clay plains and marginal outcrop alluvial plains, grasslands and very open grassy woodlands’ (Priority 3; located approximately 46 km to the east of the Project Area; DBCA 2021c).

Conservation significant flora and ecological communities and fauna species previously recorded within, and in proximity to the Project Area from DBCA database searches are presented in **Figure 7** and **Figure 8** respectively.

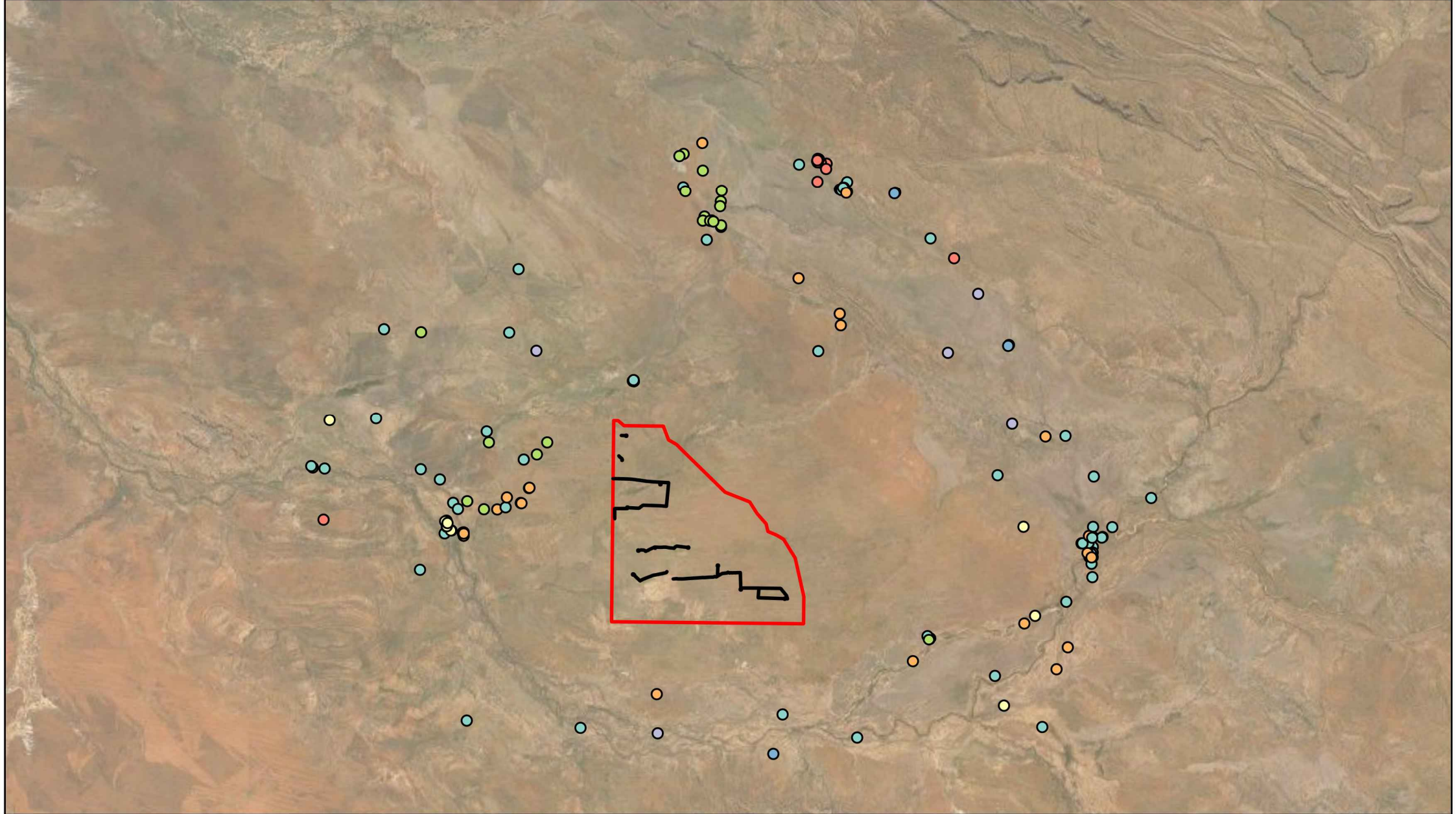
Figure 7: Conservation significant flora species and ecological communities previously recorded in the vicinity of the Project Area (DBCA 2021a, 2021c)



Legend

Development Envelope	Conservation Code	Threatened and Priority Ecological Communities (DBCA 2021c)	 Datum/Projection: GDA 1994 MGA Zone 51
Project Area	Priority 1 by DBCA	Priority 1	
	Priority 2 by DBCA	Priority 3	
	Priority 3 by DBCA		

Figure 8: Conservation significant fauna previously recorded in the vicinity of the Project Area (DBCA 2021b)



Legend
Development Envelope
Project Area

Conservation significant fauna (DBCA 2021b)

- Threatened (EPBC Act and BC Act)
- Threatened (EPBC Act) and Priority 3 by DBCA
- Threatened (EPBC Act) and Priority 4 by DBCA
- Threatened (BC Act)

- Specially Protected (BC Act)
- Priority 1 by DBCA
- Priority 2 by DBCA
- Priority 4 by DBCA

0 5 10 20
Kilometers
Datum/Projection:
GDA 1994 MGA Zone 51

4.2. Flora and vegetation survey

4.2.1. Flora overview

A total of 235 flora species representing 54 families and 130 genera were recorded from the 64 quadrats established within the Project Area. Average species richness per quadrat was 27 species, ranging from a low of 7 species in ELA57 to a high of 53 species in ELA39. Families with the highest number of species included Fabaceae (42 species), Poaceae (40 species) and Malvaceae (18 species). *Acacia* was the best represented genus throughout the Project Area with seven taxa recorded. A full species by site matrix is provided in **Appendix E**. Quadrat site data is presented in **Appendix F**. Floristic quadrat data and site photos are presented in **Appendix G** and **Appendix H**.

4.2.2. Accumulated species- sites surveyed (species-area curve)

A species accumulation curve was used to evaluate the adequacy of sampling. 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 256.31. Based on this value, and the total of 235 species recorded within the 64 quadrats, approximately 91.7% of the flora species potentially present within the Project Area were recorded. This high percentage indicates that a suitable proportion of flora potentially present within the Project Area were recorded, reflecting the common occurrence of key species across the landscape, which co-occur at varying levels of structural and compositional dominance. This point is further reflected in vegetation community descriptions whereby subtle variations in the dominance of common species largely define the communities.

4.2.3. Conservation significant flora

One conservation significant flora species, *Nymphoides beaglensis*, listed by DBCA as P3 was identified during the field survey as occurring within the Project Area, namely within the Additional Survey Area (**Figure 9**). This species was recorded from eight point-locations totalling 112 individuals. Individuals were found occurring within inundated areas and were flowering at the time of the field survey (**Plate 1**).



Plate 1: *Nymphoides beaglensis* (P3) recorded within the Project Area © Eco Logical 2021

Of the 35 conservation significant flora species identified from the pre-survey likelihood of occurrence assessment as possibly occurring within the Project Area, *Nymphoides beaglensis* was the only species recorded. Based on the post-survey likelihood of occurrence assessment, two of the remaining 34 flora conservation listed species are considered as being likely to occur within the Project Area, namely *Goodenia byrnesii* (P3) and *Goodenia sepalosa* var. *glandulosa* (P3). This assessment is based on the presence of suitable habitat within the Project Area for these species, and due to the presence of nearby recent records. An additional four species are considered as having the potential to occur within the Project Area, based on the presence of marginally suitable habitat and close proximity of previous records. A total of 27 flora species are considered as being unlikely to occur and one species, *Phyllanthus fuernrohrii* (P3), has been previously misidentified and therefore is considered as not occurring within the Project Area. The full flora likelihood of occurrence assessment is provided in **Appendix C**.

4.2.4. Range extensions

Four species were recorded within the Project Area as representing range extensions (RE), namely *Cajanus latisepalus*, *Lindernia chrysoplectra*, *Lindernia clausa* and *Tephrosia remotiflora*.

Cajanus latisepalus is currently known from 60 records in WA, over a range of approximately 500 km from Meda in the west across to the Northern Territory (NT) border in the east (DBCA 2007-2021). Within the Project Area, this species was recorded from one quadrat location; ELA29, within the AgBc vegetation community on moist light brown clay loam flats. This record represents a minor range extension of approximately 60 km to the southwest of the known range of this species.

Lindernia chrysoplectra is currently known from 12 records in WA, over a range of approximately 465 km from the Dampier Peninsula in the northwest to 180 km west of Sturt Creek in the southeast (DBCA 2007-2021). Within the Project Area, this species was recorded from one quadrat location; ELA64, within the CbEc vegetation community on waterlogged dark brown sandy clay on open depression. This record represents a range infill, joining the eastern and western populations of this species, with the closest records of this species approximately 170 km to the west and 150 km to the east-southeast of the Project Area.

Lindernia clausa is currently known from 22 records in WA, over a range of approximately 675 km from the Dampier Peninsula in the southwest to near Kununurra in the east (DBCA 2007-2021). Within the Project Area, this species was recorded from three quadrat locations; ELA26, ELA27 and ELA31, within the BcTc and Ag vegetation communities on moist brown clay on open depression. This record represents a range extension of approximately 110 km to the south of the known range of this species.

Tephrosia remotiflora is currently known from 53 records in WA, over a range of approximately 1,795 km from near Onslow in the south Kununurra and into the NT in the north (DBCA 2007-2021). Within the Project Area, this species was recorded from one quadrat location; ELA01, within the AgCgEc vegetation community on red brown sandy loam on a gentle slope. This record represents a minor range extension of approximately 65 km to the south of the known range of this species.

Locations of flora species recorded as range extensions within the Project Area is presented in **Figure 9**.

4.2.5. Introduced flora

A total of nine introduced flora (weed) species were recorded within the Project Area:

- *Calotropis procera* (Calotrope);
- *Cenchrus setiger* (Birdwood Grass);
- *Malvastrum americanum* (Spiked Malvastrum);
- *Melochia pyramidata* (Pyramid Flower);
- *Portulaca oleracea* (Common Purslane);
- *Portulaca pilosa* (Pink Purslane);
- *Stylosanthes hamata* (Verano Stylo);
- *Trianthema pilosum*; and
- *Vachellia farnesiana* (Mimosa Bush).

Of these species, *Calotropis procera* is listed as a Declared Pest – s22(2) under the State *Biosecurity and Agriculture Management Act 2007* (BAM Act). Declared Pests “must satisfy any applicable import requirements when imported and may be subject to an import permit if they are potential carriers of high-risk organisms. They may also be subject to control and keeping requirements once within Western Australia” (DPIRD 2021b). *Calotropis procera* was recorded from within five quadrats in the Project Area, namely ELA20, ELA33, ELA35, ELA59 and ELA60 (**Plate 2**). Of the remaining eight introduced (weed) species, all are classified under the BAM Act (2007) as permitted (s11) for the whole state and not assigned any control category for a local government area at this time. *Stylosanthes hamata* and *Portulaca pilosa* were the most commonly recorded weed species, recorded at 18 and 13 quadrats, respectively. Locations of weeds within the Project Area is provided in **Appendix I**.



Plate 2: *Calotropis procera* (Calotrope), listed as a Declared Pest – s22(2) under the BAM Act, recorded within the Project Area

4.2.6. Vegetation communities

A total of 13 vegetation communities were delineated and mapped within the Project Area (**Appendix J**). Vegetation community CgAgBc was the most widespread across the Project Area, covering 20.05 ha (15.64% of the Project Area; **Table 9; Figure 10**).

Table 9: Vegetation communities recorded within the Project Area



Photo	Code	Description	Associated species	Quadrats	Similarity %	Extent (ha) within the Disturbance Footprint (% total)	Extent (ha) within the Additional Survey Area (% total)	Total extent (ha) within the Project Area (% total)
	AgCgEc	<i>Adansonia gregorii</i> mid isolated trees and <i>Corymbia greeniana</i> , <i>Erythrophleum chlorostachys</i> , <i>Bauhinia cunninghamii</i> low open woodland over <i>Acacia colei</i> , <i>Grevillea pyramidalis</i> , <i>Carissa lanceolata</i> mid sparse shrubland over <i>Triodia bitextura</i> low open hummock grassland and <i>Sorghum plumosum</i> , <i>Chrysopogon fallax</i> tall open tussock grassland.	<i>Aristida holathera</i> , <i>Atalaya hemiglauca</i> , <i>Cajanus marmoratus</i> , <i>Cassytha filiformis</i> , <i>Corchorus sidoides</i> subsp. <i>sidoides</i> , <i>Dolichandrone occidentalis</i> , <i>Euphorbia psilosperma</i> , <i>Evolvulus alsinoides</i> var. <i>decumbens</i> , <i>Gomphrena canescens</i> , <i>Hakea macrocarpa</i> , <i>Indigofera colutea</i> , <i>Phyllanthus maderaspatensis</i> , <i>Pluchea tetranthera</i> , <i>Polymeria ambigua</i> , <i>Terminalia canescens</i> , <i>Tinospora smilacina</i> , <i>Triodia intermedia</i> .	ELA01, ELA02, ELA03, ELA41, ELA42	45.12	11.44 (10.18)	1.25 (7.96)	12.69 (9.91)
	EmEcAg	<i>Eucalyptus microtheca</i> , <i>Eucalyptus camaldulensis</i> , <i>Adansonia gregorii</i> tall open woodland and <i>Bauhinia cunninghamii</i> , <i>Atalaya hemiglauca</i> low open woodland over <i>Acacia colei</i> , <i>Terminalia platyphylla</i> , <i>*Vachellia farnesiana</i> tall open shrubland over <i>Corchorus fascicularis</i> low sparse shrubland and <i>Aristida latifolia</i> , <i>Sehima nervosum</i> tall open tussock grassland.	<i>Boerhavia coccinea</i> , <i>Carissa lanceolata</i> , <i>Corchorus sidoides</i> subsp. <i>vermicularis</i> , <i>Corymbia greeniana</i> , <i>Phyllanthus maderaspatensis</i> , <i>Polymeria ambigua</i> , <i>Senna notabilis</i> , <i>Spermacoce occidentalis</i> , <i>Sporobolus australasicus</i> .	ELA04, ELA09, ELA10, ELA11, ELA12, ELA55	38.95	1.15 (1.02)	1.31 (8.36)	2.46 (1.92)

Photo	Code	Description	Associated species	Quadrats	Similarity %	Extent (ha) within the Disturbance Footprint (% total)	Extent (ha) within the Additional Survey Area (% total)	Total extent (ha) within the Project Area (% total)
	CgAgBc	<i>Corymbia greeniana</i> , <i>Adansonia gregorii</i> mid open woodland and <i>Bauhinia cunninghamii</i> low open woodland over <i>Acacia colei</i> , <i>Hakea arborescens</i> , <i>Hakea chordophylla</i> tall sparse shrubland over <i>Sorghum plumosum</i> tall open tussock grassland and <i>Eriachne obtusa</i> , <i>Aristida hygrometrica</i> low sparse grassland.	<i>Bonamia linearis</i> , <i>Carissa lanceolata</i> , <i>Dolichandrone occidentalis</i> , <i>Fimbristylis ferruginea</i> , <i>Gomphrena canescens</i> , <i>Goodenia armitiana</i> , <i>Gossypium australe</i> , <i>Grevillea pyramidalis</i> , <i>Hakea macrocarpa</i> , <i>Indigofera linnaei</i> , <i>Pluchea tetranthera</i> , <i>Sporobolus australasicus</i> , <i>Stylosanthes hamata</i> .	ELA05, ELA06, ELA07, ELA08, ELA14, ELA15, ELA16, ELA22, ELA44, ELA46	44.89	14.24 (12.66)	5.81 (37)	20.05 (15.64)
	CbEc	<i>Corymbia bella</i> , <i>Eucalyptus coolabah</i> mid open woodland over <i>Acacia colei</i> , <i>Lophostemon grandiflorus</i> subsp. <i>riparius</i> , <i>Sesbania cannabina</i> tall sparse shrubland over <i>Triodia bitextura</i> low open hummock grassland and <i>Aristida hygrometrica</i> , <i>Eriachne obtusa</i> low sparse grassland.	<i>Arivela viscosa</i> , <i>Corchorus sidoides</i> subsp. <i>sidoides</i> , <i>Dolichandrone occidentalis</i> , <i>Eragrostis eriopoda</i> , <i>Evolvulus alsinoides</i> var. <i>villosicalyx</i> , <i>Fimbristylis ferruginea</i> , <i>Indigofera linifolia</i> , <i>Marsilea hirsuta</i> , <i>Nymphoides beaglensis</i> (P3), <i>Peplidium muelleri</i> , <i>Stylosanthes hamata</i> .	ELA13, ELA47, ELA56, ELA57, ELA58, ELA64	25.42	1.77 (1.58)	3.93 (25.07)	5.71 (4.45)



Photo	Code	Description	Associated species	Quadrats	Similarity %	Extent (ha) within the Disturbance Footprint (% total)	Extent (ha) within the Additional Survey Area (% total)	Total extent (ha) within the Project Area (% total)
	CgCzBc	open woodland over <i>Acacia platycarpa</i> , <i>Grevillea pyramidalis</i> , <i>Atalaya hemiglauca</i> tall sparse shrubland over <i>Sorghum plumosum</i> , <i>Sorghum stipoides</i> tall open tussock grassland and <i>Aristida latifolia</i> mid sparse tussock grassland.	<i>Corymbia greeniana</i> , <i>Corymbia zygophylla</i> , <i>Bonamia pannosa</i> , <i>Carissa lanceolata</i> , <i>Chamaecrista symonii</i> , <i>Chrysopogon fallax</i> , <i>Corchorus sidoides</i> subsp. <i>sidoides</i> , <i>Crotalaria ramosissima</i> , <i>Eriachne obtusa</i> , <i>Gomphrena canescens</i> , <i>Gyrocarpus americanus</i> , <i>Ptilotus calostachyus</i> , <i>Terminalia platyphylla</i> , <i>Trichodesma zeylanicum</i> var. <i>zeylanicum</i> , <i>Waltheria indica</i> .	ELA17, ELA18, ELA20	48.07	11.33 (10.07)	1.51 (9.64)	12.84 (10.02)
	AgBc	isolated trees and <i>Bauhinia cunninghamii</i> low open woodland over <i>Grevillea pyramidalis</i> , <i>Hakea arborescens</i> , <i>Hakea macrocarpa</i> tall sparse shrubland over <i>Indigofera colutea</i> low sparse shrubland, <i>Sorghum plumosum</i> tall open tussock grassland and <i>Eriachne obtusa</i> low sparse grassland.	<i>Abutilon otocarpum</i> , <i>Acacia ancistrocarpa</i> , <i>Acacia coleii</i> , <i>Aristida hygrometrica</i> , <i>Atalaya hemiglauca</i> , <i>Boerhavia coccinea</i> , <i>Cajanus marmoratus</i> , <i>Carissa lanceolata</i> , <i>Corchorus sidoides</i> subsp. <i>sidoides</i> , <i>Dolichandrone occidentalis</i> , <i>Euphorbia schultzei</i> var. <i>comans</i> , <i>Gomphrena canescens</i> , <i>Gossypium australe</i> , <i>Indigofera linifolia</i> , <i>Pluchea tetranthera</i> , <i>Pterocaulon intermedium</i> , <i>Stylosanthes hamata</i> , <i>Trichodesma zeylanicum</i> var. <i>zeylanicum</i> , <i>Triodia intermedia</i> .	ELA19, ELA21, ELA29, ELA30	47.38	12.35 (10.98)	0 (0)	12.35 (9.64)



Photo	Code	Description	Associated species	Quadrats	Similarity %	Extent (ha) within the Disturbance Footprint (% total)	Extent (ha) within the Additional Survey Area (% total)	Total extent (ha) within the Project Area (% total)
	BcCg	<p><i>Bauhinia cunninghamii</i>, <i>Corymbia greeniana</i> low open woodland over <i>Hakea macrocarpa</i>, <i>Grevillea pyramidalis</i>, <i>Acacia colei</i> tall sparse shrubland over <i>Triodia intermedia</i> low sparse hummock grassland, <i>Sorghum plumosum</i> tall open tussock grassland and <i>Eragrostis eriopoda</i> low sparse tussock grassland.</p>	<p><i>Acacia ancistrocarpa</i>, <i>Atalaya hemiglauca</i>, <i>Boerhavia coccinea</i>, <i>Cajanus marmoratus</i>, <i>Carissa lanceolata</i>, <i>Corchorus sidoides</i> subsp. <i>sidoides</i>, <i>Crotalaria brevis</i>, <i>Gomphrena canescens</i>, <i>Gossypium australe</i>, <i>Heliotropium diversifolium</i>, <i>Pluchea tetranthera</i>, <i>Polygala tepperi</i>, <i>Polymeria ambigua</i>, <i>Rhynchosia minima</i>, <i>Sehima nervosum</i>, <i>Terminalia canescens</i>, <i>Trichodesma zeylanicum</i> var. <i>zeylanicum</i>.</p>	ELA23, ELA24, ELA25, ELA38	52.20	3.3 (2.94)	0 (0)	3.3 (2.58)
	BcTc	<p><i>Bauhinia cunninghamii</i>, <i>Terminalia canescens</i> low open woodland over <i>Grevillea pyramidalis</i>, <i>Acacia ancistrocarpa</i>, <i>Acacia colei</i> tall sparse shrubland over <i>Triodia intermedia</i>, <i>Triodia bitextura</i> low sparse hummock grassland and <i>Sorghum plumosum</i> tall open tussock grassland.</p>	<p><i>Alysicarpus muelleri</i>, <i>Arivela tetrandra</i>, <i>*Cenchrus setiger</i>, <i>Corchorus sidoides</i> subsp. <i>vermicularis</i>, <i>Eriachne obtusa</i>, <i>Gomphrena brachystylis</i> subsp. <i>pindanensis</i>, <i>Goodenia sepalosa</i> var. <i>sepalosa</i>, <i>Gossypium australe</i>, <i>Hakea macrocarpa</i>, <i>Indigofera colutea</i>, <i>Indigofera linnaei</i>, <i>Perotis rara</i>, <i>Phyllanthus maderaspatensis</i>, <i>Pluchea tetranthera</i>, <i>Ptilotus corymbosus</i>, <i>Rhynchosia minima</i>, <i>Spermacoce occidentalis</i>, <i>Sporobolus australasicus</i>, <i>Stylosanthes hamata</i>.</p>	ELA26, ELA27, ELA28	52.31	7.25 (6.45)	0 (0)	7.25 (5.66)



Photo	Code	Description	Associated species	Quadrats	Similarity %	Extent (ha) within the Disturbance Footprint (% total)	Extent (ha) within the Additional Survey Area (% total)	Total extent (ha) within the Project Area (% total)
	Ag	Adansonia gregorii mid open woodland over Grevillea pyramidalis, Hakea chordophylla, Dolichandrone occidentalis tall sparse shrubland over Triodia intermedia low sparse hummock grassland, Sorghum plumosum tall sparse tussock grassland and Aristida holathera low sparse grassland.	Aristida hygrometrica, Boerhavia coccinea, Buchnera ramosissima, Corchorus sidoides subsp. vermicularis, Crotalaria medicaginea var. neglecta, Euphorbia psilosperma, Fimbristylis schultzei, Goodenia sepalosa var. sepalosa, Gossypium australe, Indigofera colutea, Indigofera linifolia, Indigofera linnaei, Pluchea tetranthera, Polymeria ambigua, Portulaca digyna, Pterocaulon intermedium, Rhynchosia minima, Sporobolus australasicus, Trichodesma zeylanicum var. zeylanicum, Urochloa holosericea.	ELA31, ELA33, ELA39, ELA40	55.10	9.16 (8.14)	0 (0)	9.16 (7.15)
	AtAcDo	Atalaya hemiglauca, Acacia synchronica, Dolichandrone occidentalis tall sparse shrubland over Carissa lanceolata, Gossypium australe, Chamaecrista symonii low sparse shrubland over Triodia intermedia, Triodia wiseana low hummock grassland and Eriachne obtusa low sparse grassland.	Abutilon otocarpum, Aristida latifolia, Arivela viscosa, Blumea integrifolia, Blumea tenella, Dactyloctenium radulans, Eragrostis tenellula, Fimbristylis schultzei, Gomphrena canescens, Indigofera linifolia, Indigofera linnaei, Ipomoea coptica, Panicum decompositum, Pluchea tetranthera, Sorghum plumosum, Sporobolus australasicus, Xerochloa barbata.	ELA32, ELA34, ELA35, ELA36, ELA37	37.41	12.38 (11.01)	0 (0)	12.38 (9.66)




Photo	Code	Description	Associated species	Quadrats	Similarity %	Extent (ha) within the Disturbance Footprint (% total)	Extent (ha) within the Additional Survey Area (% total)	Total extent (ha) within the Project Area (% total)
	BcGaCg	low open woodland over open shrubland and mid sparse shrubland over low sparse hummock grassland and low sparse grassland.	<i>Bauhinia cunninghamii</i> , <i>Gyrocarpus americanus</i> , <i>Corymbia greeniana</i> , <i>Acacia platycarpa</i> , <i>Acacia tumida</i> , <i>Carissa lanceolata</i> , <i>Triodia bitextura</i> , <i>Aristida hygrometrica</i> , <i>Eriachne obtusa</i> , <i>Arivela viscosa</i> , <i>Bonamia linearis</i> , <i>Bonamia pannosa</i> , <i>Cajanus marmoratus</i> , <i>Corchorus sidoides</i> subsp. <i>sidoides</i> , <i>Corymbia zygophylla</i> , <i>Dolichandrone occidentalis</i> , <i>Ehretia saligna</i> , <i>Euphorbia psilosperma</i> , <i>Euphorbia schultzei</i> var. <i>comans</i> , <i>Perotis rara</i> , <i>Polymeria ambigua</i> , <i>Tephrosia rosea</i> , <i>Trianthema pilosum</i> .	ELA43, ELA45, ELA51, ELA62, ELA63	46.62	11.45 (10.18)	1.88 (11.95)	13.33 (10.4)
	EcCg	low open woodland over tall sparse shrubland and mid sparse shrubland over low sparse shrubland and low open grassland.	<i>Erythrophleum chlorostachys</i> , <i>Corymbia greeniana</i> , <i>Acacia tumida</i> , <i>Acacia ancistrocarpa</i> , <i>Carissa lanceolata</i> , <i>Bonamia pannosa</i> , <i>Bonamia linearis</i> , <i>Aristida hygrometrica</i> , <i>Aristida latifolia</i> , <i>Atalaya hemiglauca</i> , <i>Bauhinia cunninghamii</i> , <i>Boerhavia coccinea</i> , <i>Corchorus sidoides</i> subsp. <i>sidoides</i> , <i>Cynodon convergens</i> , <i>Cyperus blakeanus</i> , <i>Dodonaea hispidula</i> var. <i>arida</i> , <i>Eragrostis eriopoda</i> , <i>Eucalyptus coolabah</i> , <i>Euphorbia psilosperma</i> , <i>Gomphrena canescens</i> , <i>Gossypium australe</i> , <i>Melaleuca alsophila</i> , <i>Pluchea tetranthera</i> , <i>Sorghum plumosum</i> , <i>Triodia bitextura</i> , <i>Waltheria indica</i> .	ELA48, ELA49, ELA53, ELA54	51.43	4.68 (4.16)	0 (0)	4.68 (3.65)

Photo	Code	Description	Associated species	Quadrats	Similarity %	Extent (ha) within the Disturbance Footprint (% total)	Extent (ha) within the Additional Survey Area (% total)	Total extent (ha) within the Project Area (% total)
	CzEcCg	<i>Corymbia zygophylla</i> , <i>Erythrophleum chlorostachys</i> , <i>Corymbia greeniana</i> low open woodland over <i>Acacia tumida</i> , <i>Acacia platycarpa</i> tall sparse shrubland and <i>Waltheria indica</i> low sparse shrubland over <i>Triodia bitextura</i> , <i>Triodia wiseana</i> low open hummock grassland and <i>Eriachne obtusa</i> low sparse grassland.	<i>Abutilon otocarpum</i> , <i>Aristida hygrometrica</i> , <i>Aristida latifolia</i> , <i>Bonamia linearis</i> , <i>Bonamia pannosa</i> , <i>Cajanus marmoratus</i> , <i>Chamaecrista symonii</i> , <i>Corchorus sidoides</i> subsp. <i>sidoides</i> , <i>Corynotheca micrantha</i> , <i>Dolichandrone occidentalis</i> , <i>Ehretia saligna</i> , <i>Euphorbia schultzei</i> var. <i>comans</i> , <i>Grevillea wickhamii</i> , <i>Melaleuca alsophila</i> , <i>Polymeria ambigua</i> , <i>Sorghum plumosum</i> , <i>Tephrosia rosea</i> , <i>Tinospora smilacina</i> .	ELA50, ELA52, ELA59, ELA60, ELA61	44.64	11.95 (10.63)	0 (0)	11.95 (9.33)
Total						112.46 (100)	15.69 (100)	128.15 (100)

4.2.7. Vegetation of conservation significance

None of the vegetation associations delineated within the Project Area were inferred to represent any known or potential conservation significant communities listed under the EPBC Act, the BC Act or by DBCA. A DBCA Threatened and Priority Communities database search (DBCA 2018c) identified three known occurrences of PECs within 50 km of the Project Area, namely the Kimberley Vegetation Association 760 (listed as P1), described as ‘shrublands, pindan; *Acacia tumida* shrubland with scattered low bloodwood & *Eucalyptus setosa* (excluded name) over ribbon & curly spinifex’, the Kimberley Vegetation Association 759 (listed as P3), described as ‘grasslands, tall bunch grass savanna woodland, coolabah over ribbon/blue grass (*Bothriochloa* spp.)’ and the Leopold Land System (listed as P3), described as ‘cracking clay plains and marginal outcrop alluvial plains, grasslands and very open grassy woodlands’. None of the 13 vegetation associations delineated within the Project Area are inferred as representing these PECs.

4.2.8. Vegetation condition

Vegetation recorded within the Project Area ranged from Excellent to Poor based on the vegetation condition scale adapted from Keighery (1994) and Trudgen (1988) provided in the EPA *Technical Guidance: Flora and Vegetation Surveys for Environmental Impact Assessment* (EPA 2016; **Table 10**). Majority of the vegetation within the Project Area was classed as Very Good (69.93 ha; 54.57% of the Project Area) and Excellent (45.28 ha; 35.34% of the Project Area; **Figure 11**). Disturbances within the Project Area included impacts from pastoral activities (e.g. cattle grazing, scats and tracks), previous clearing and adjacent tracks which facilitate edge effects and minor weed invasion. The Project Area also has prevalence of fire with many areas being recently burnt across the landscape, particularly preceding the field survey in May.

Table 10: Vegetation condition within the Project Area

Vegetation condition	Extent (ha) within the Disturbance Footprint (% total)	Extent (ha) within the Additional Survey Area (% total)	Total extent (ha) within the Project Area (% total)
Excellent	38.89 (34.58)	6.40 (40.76)	45.28 (35.34)
Very Good	62.48 (55.56)	7.45 (47.50)	69.93 (54.57)
Good	8.84 (7.86)	1.84 (11.73)	10.68 (8.34)
Poor	2.25 (2)	0 (0)	2.25 (1.75)
Degraded	0 (0)	0 (0)	0 (0)
Completely Degraded	0 (0)	0 (0)	0 (0)
Total	112.46 (100)	15.69 (100)	128.15 (100)

4.3. Fauna survey

4.3.1. Fauna habitats

A total of three broad fauna habitat types were mapped across the Project Area. These fauna habitats align with vegetation communities described in Section 4.2.6 above. Fauna habitat 1 was the most common within the Project Area, occurring across 81.86 ha (63.88%) of the Project Area. Fauna habitats are described in **Table 11** and presented in **Figure 12** below.

Table 11: Fauna habitat of the Project Area

Fauna habitat description	Associated vegetation community	Extent (ha) within the Disturbance Footprint (% total)	Extent (ha) within the Additional Survey Area (% total)	Total extent (ha) within the Project Area (% total)
Fauna habitat 1: Mixed open woodland over grassland on sandy clay flats and slopes	Ag, AgBc, AgCgEc, AtAcDo, BcCg, BcTc, CgAgBc	74.80 (66.52)	7.06 (44.69)	81.86 (63.88)
Fauna habitat 2: Mixed open woodland over tussock grasses on dune slopes and crests	BcGaCg, CgCzBc, CzEcCg, EcCg	34.73 (30.88)	3.39 (21.60)	38.12 (29.75)
Fauna habitat 3: Eucalypt open woodland and mixed shrubland on closed depression and creekline	CbEc, EmEcAg	2.92 (2.6)	5.25 (33.44)	8.17 (6.37)
Total		112.46 (100)	15.69 (100)	128.15 (100)



4.3.2. Fauna overview



A total of 75 fauna species were recorded during the field survey. This number comprised of 52 birds, five mammals, eight reptiles and ten invertebrates. Two introduced fauna species, European Cattle (**Bos indicus*) and Dingo (**Canis familiaris dingo*), were directly observed in the Project Area. A full fauna species list is presented in **Appendix K**.

4.3.3. Conservation significant fauna

One fauna species of conservation significance was recorded within the Project Area; namely the Greater Bilby (*Macrotis lagotis*), listed as VU under the EPBC Act and BC Act. Evidence of this species in the form of diggings was recorded at four locations in the south-east of the Project Area within Fauna habitat 2 (**Table 12**; **Figure 13**). Greater Bilby diggings have a conical shape, which is a distinguishing feature of this species (Moseby *et al.* 2012, DSEWPaC 2011). Diggings were relatively fresh and intact (i.e. had not completely collapsed or washed away) and estimated to be less than one year old. No direct observations of this species were made.

Table 12: *Macrotis lagotis* (Greater Bilby) diggings recorded within the Project Area

Species	Conservation listing		Observation type	Coordinates		Photo
	EPBC Act	BC Act		Easting	Northing	
<i>Macrotis lagotis</i> (Greater Bilby)	VU	VU	Digging	716952	7976430	
<i>Macrotis lagotis</i> (Greater Bilby)	VU	VU	Digging	716839	7976443	

Species	Conservation listing		Observation type	Coordinates		Photo
	EPBC Act	BC Act		Easting	Northing	
<i>Macrotis lagotis</i> (Greater Bilby)	VU	VU	Digging	708708	7981144	
<i>Macrotis lagotis</i> (Greater Bilby)	VU	VU	Digging	708741	7979737	

Of the initial 54 conservation listed fauna species identified from the pre-likelihood of occurrence survey assessment as possibly occurring within the Project Area, *Macrotis lagotis* (Greater Bilby) was the only species recorded within the Project Area. Of the remaining 53 species, nine of these are considered as having the potential to occur post-survey, based on proximity of previous records to the Project Area and availability of suitable habitat within the Project Area:

- *Erythrura gouldiae* (Gouldian Finch; listed as Endangered [EN] under the EPBC Act and as P4 by DBCA);
- *Falco hypoleucos* (Grey Falcon; listed as VU under the EPBC Act and BC Act);
- *Actitis hypoleucos* (Common Sandpiper; listed as Migratory [M] under EPBC Act and BC Act);
- *Apus pacificus* (Fork-tailed swift; listed as M under EPBC Act and BC Act);
- *Calidris acuminata* (Sharp-tailed sandpiper; listed as M under EPBC Act and BC Act);
- *Plegadis falcinellus* (Glossy ibis; listed as M under the EPBC Act and BC Act).
- *Falco peregrinus* (Peregrine falcon; listed as Other specially protected species [OS] under BC Act);
- *Ctenotus uber johnstonii* (Spotted ctenotus (northeast); listed as P2 by DBCA); and
- *Leggadina lakedownensis* (Northern short-tailed mouse; listed as P4 by DBCA).

Of these, six species are vagrant and / or mobile migratory bird species, which may utilise habitat within the Project Area only when conditions are favourable (e.g. after periods of heavy rainfall).

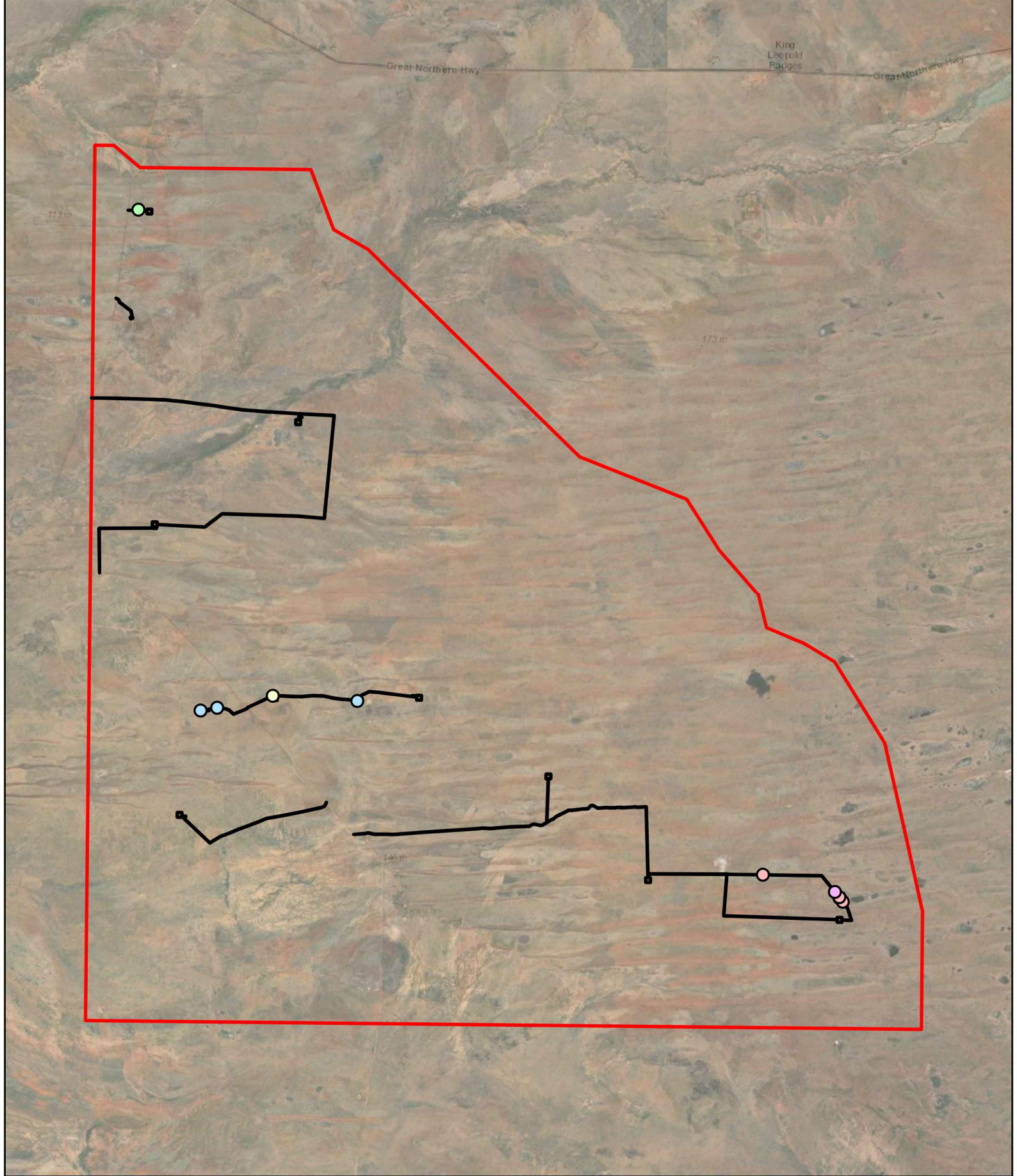
Of the remaining 44 species identified from the desktop assessment as possibly occurring within the Project Area, all are considered as unlikely to occur within the Project Area based on lack of suitable habitat present and nearby recent records of these species. The fauna likelihood of occurrence assessment is presented in **Appendix D**.

4.4. Aboriginal significant bush foods

Two Aboriginal significant bush food (flora) species were recorded within the Project Area, namely *Adansonia gregorii* (Boab) and *Carissa lanceolata* (Conkerberry). *Adansonia gregorii* was recorded as a dominant or associated species within five of the 14 vegetation communities described, at a <5% cover (AgCgEc, EmEcAg, CgAgBc, AgBc, Ag). Of note was one particularly large tree occurring across a portion of the track leading to the Midgard well site (m 685634E; m 7992864N). This tree was estimated to have a diameter of between 5 and 6 m. *Carissa lanceolata* was recorded as a dominant or associated species within ten of the 14 vegetation communities described, at a <5% cover (AgCgEc, EmEcAg, CgAgBc, CgCzBc, AgBc, BcCg, AtAcDo, AtAcDo, BcGaCg, EcCg).

Three Aboriginal significant bush food (fauna) species were recorded within the Project Area, namely *Ardeotis australis* (Australian Bustard), *Osphranter rufus* (Red Kangaroo), *Varanus gouldii* (Sand Goanna) and *V. panoptes* (Yellow-spotted Monitor). Australian Bustard was recorded from one location within the Project Area (m 683743E; m 7992977 N). Red Kangaroo was recorded from scats throughout the Project Area and spotted in the distance at various locations. Sand Goanna and Yellow-spotted Monitor were spotted several times sunbaking along tracks within and adjacent to the Project Area.

Figure 9: Locations of significant flora within the Project Area



Legend
Development Envelope

- Significant Flora Species**
- *Nymphoides beaglensis* (P3)
 - *Cajanus latisepalus* (RE)
 - *Lindernia chrysoplectra* (RE)
 - *Lindernia clausa* (RE)
 - *Tephrosia remotiflora* (RE)

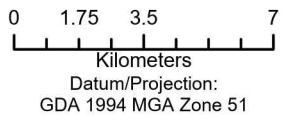
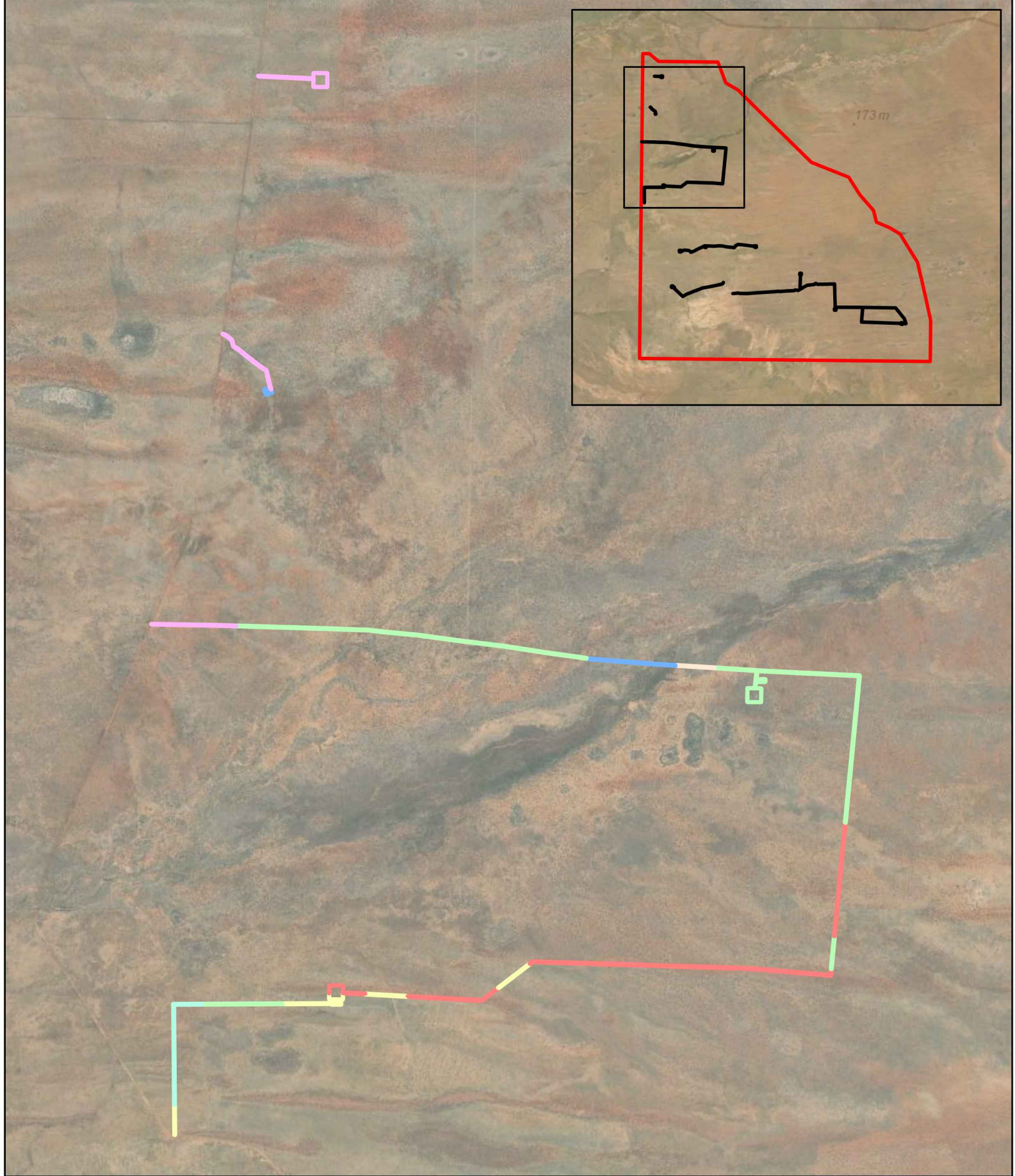


Figure 10: Vegetation communities recorded within the Project Area (Map 1 of 2)

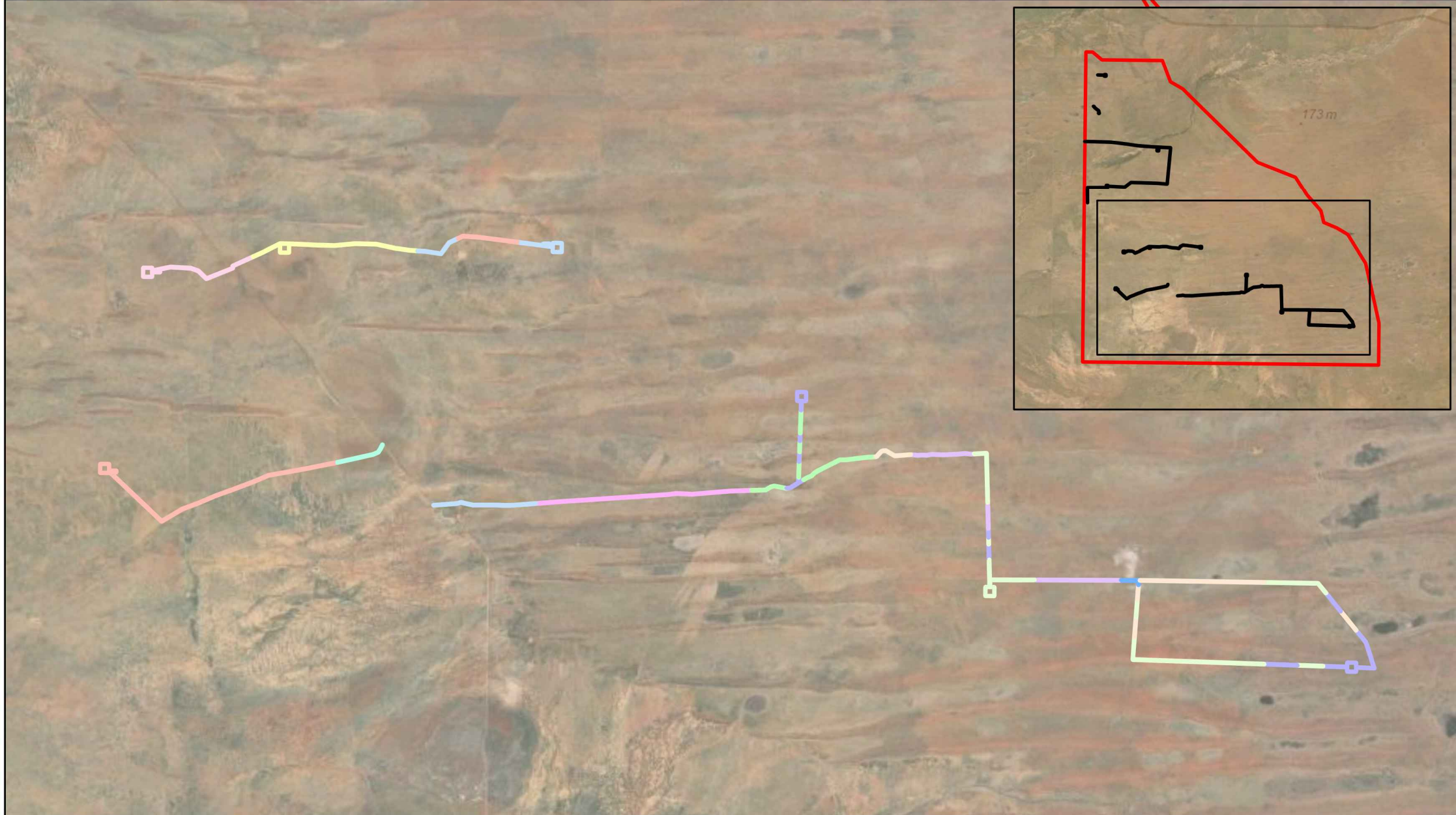


Legend
Development Envelope
Project Area

Vegetation Community
AgBc
AgCgEc
BcCg
CbEc
CgAgBc
CgCzBc
EmEcAg

0 0.5 1 2
Kilometers
Datum/Projection:
GDA 1994 MGA Zone 51

Figure 10: Vegetation communities recorded within the Project Area (Map 2 of 2)



- Legend**
- Development Envelope
 - Project Area
- Vegetation Community**
- Ag
 - AgBc
 - AgCgEc
 - AtAcDo
 - BcCg
 - BcGaCg
 - BcTc
 - CbEc
 - CgAgBc
 - CzEcCg
 - EcCg
 - EmEcAg

0 1,000 2,000 4,000
Metres

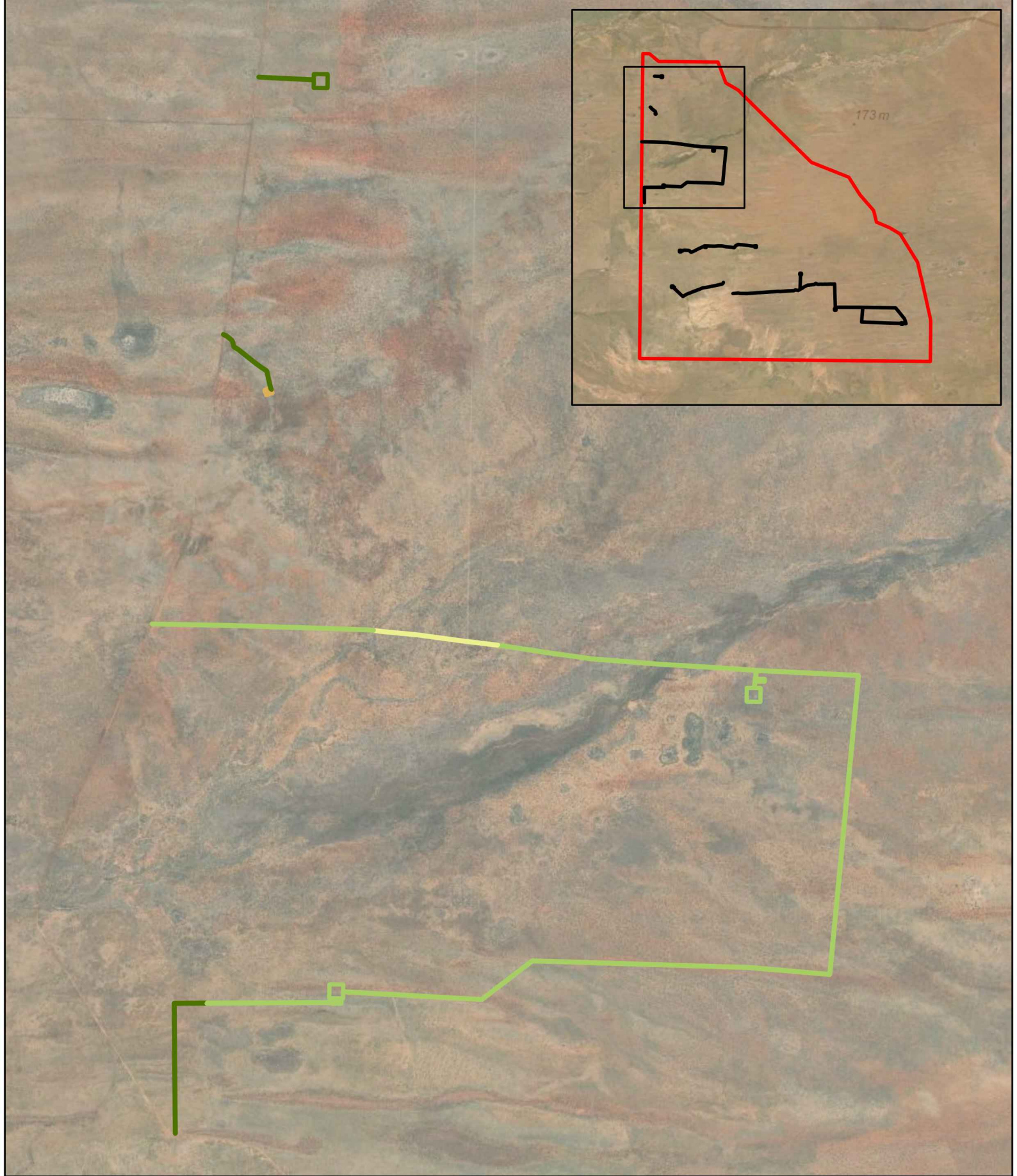
Datum/Projection:
GDA 1994 MGA Zone 51

N

eco
logical
AUSTRALIA
A TETRA TECH COMPANY

Prepared by: DD-17692 Date: 7/07/2021

Figure 11: Vegetation condition recorded within the Project Area (Map 1 of 2)



Legend
Development Envelope
Project Area







Vegetation Condition
Excellent
Very Good
Good
Poor

0 0.5 1 2
Kilometers
Datum/Projection:
GDA 1994 MGA Zone 51

Figure 11: Vegetation condition recorded within the Project Area (Map 2 of 2)




Legend

 Development Envelope	Vegetation Condition
 Project Area	 Excellent
	 Very Good
	 Good
	 Poor

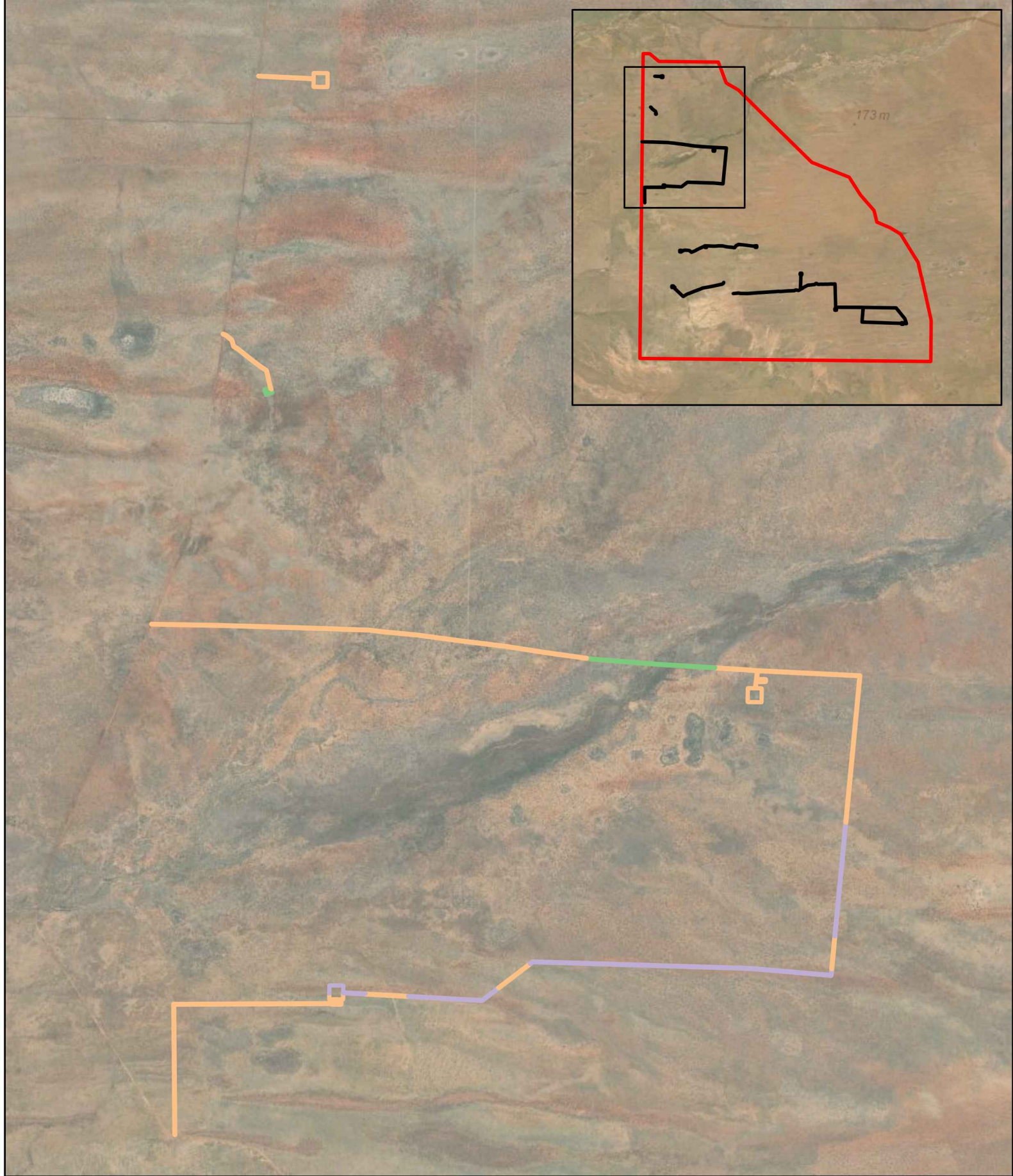
0 1,000 2,000 4,000
Metres

Datum/Projection:
GDA 1994 MGA Zone 51

 **eco logical**
AUSTRALIA
A TETRA TECH COMPANY

Prepared by: DD-17692 Date: 7/07/2021

Figure 12: Fauna habitat recorded within the Project Area (Map 1 of 2)



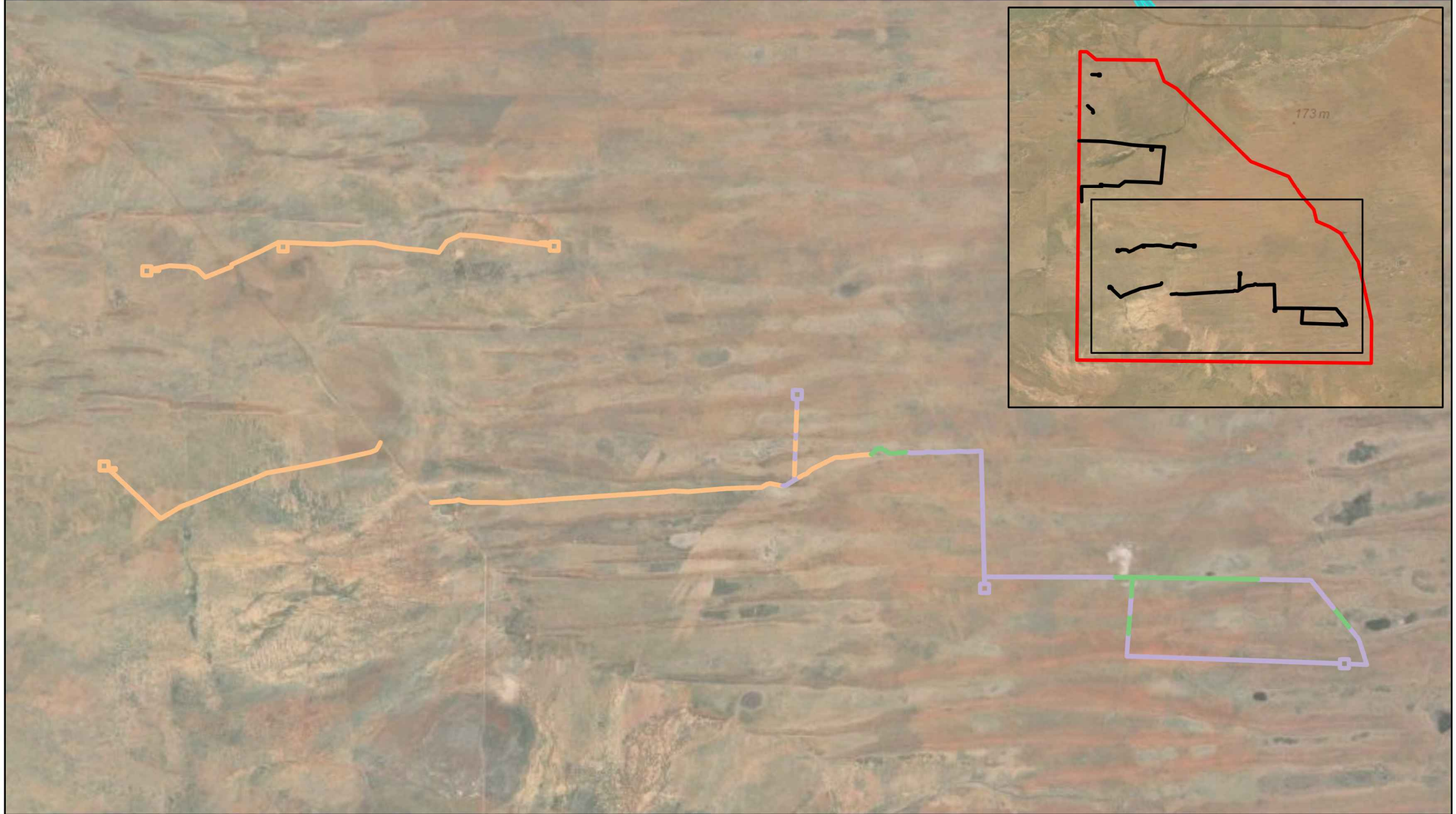
Legend
Development Envelope
Project Area

Fauna Habitat
Fauna habitat 1: Mixed open woodland over grassland on sandy clay flats and slopes
Fauna habitat 2: Mixed open woodland over tussock grasses on dune slopes and crests
Fauna habitat 3: Eucalypt open woodland and mixed shrubland on closed depression and creekline

0 500 1,000 2,000
Metres
Datum/Projection:
GDA 1994 MGA Zone 51



Figure 12: Fauna habitat recorded within the Project Area (Map 2 of 2)



Legend

- Development Envelope
- Project Area

Fauna Habitat

- Fauna habitat 1: Mixed open woodland over grassland on sandy clay flats and slopes
- Fauna habitat 2: Mixed open woodland over tussock grasses on dune slopes and crests
- Fauna habitat 3: Eucalypt open woodland and mixed shrubland on closed depression and creekline

0 1,000 2,000 4,000
Metres

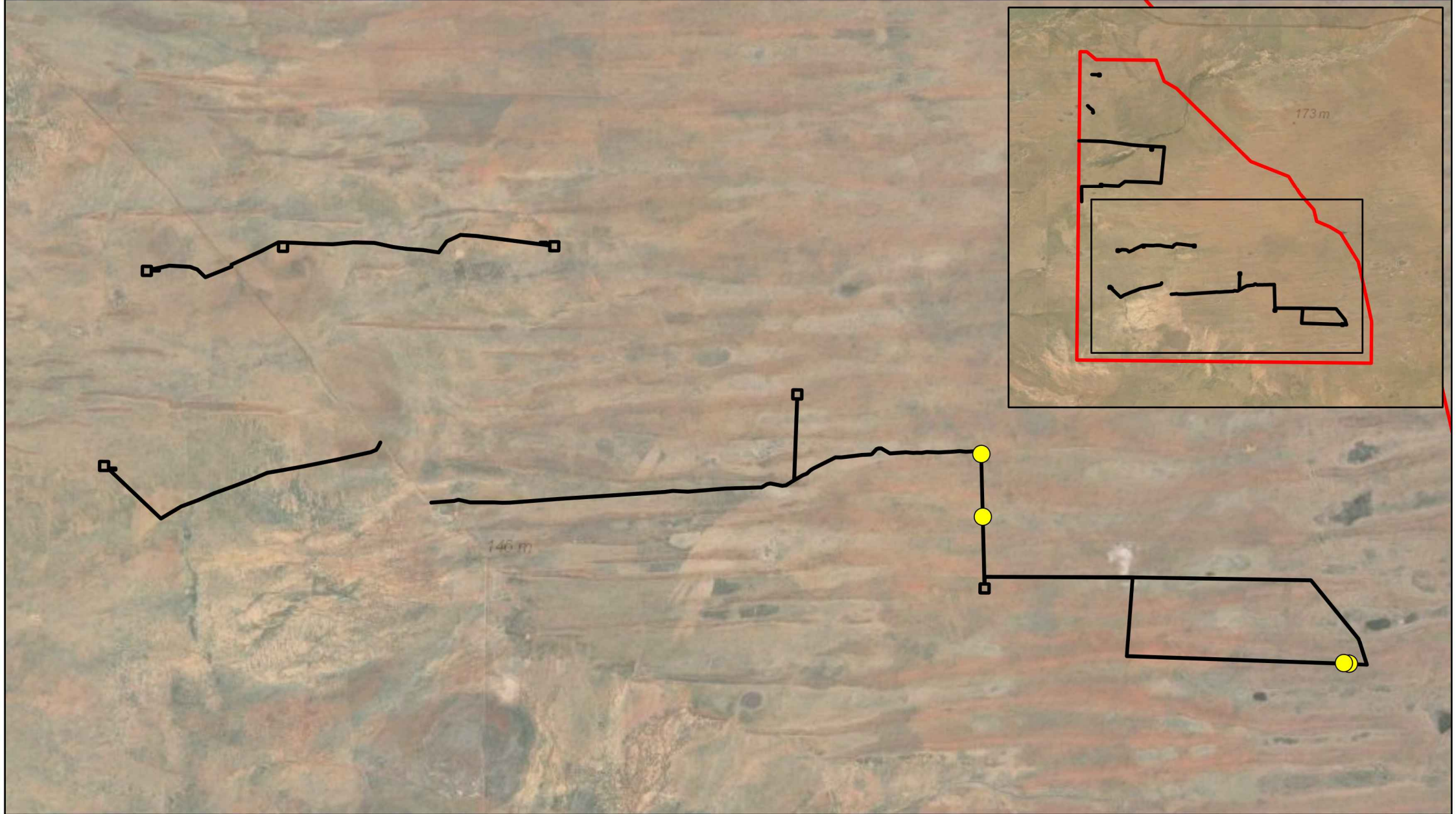
Datum/Projection:
GDA 1994 MGA Zone 51

N

eco logical
AUSTRALIA
A TETRA TECH COMPANY

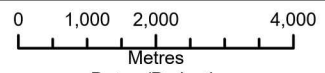
Prepared by: DD-17692 Date: 7/07/2021

Figure 13: Conservation significant fauna recorded within the Project Area



Legend
Development Envelope
Project Area

Conservation Significant Fauna
● *Macrotis lagotis* (Greater Bilby; VU) diggings



Datum/Projection:
GDA 1994 MGA Zone 51



5. Discussion

5.1. Flora and vegetation

5.1.1. Flora overview

A total of 235 flora species representing 54 families and 130 genera were recorded from the 64 quadrats established within the Project Area. Average species richness per quadrat was 27 species, ranging from a low of 7 species in ELA57 to a high of 53 species in ELA39. A species accumulation curve determined that the number of flora species recorded represents approximately 91.7% of the species potentially present within the Project Area. This high percentage indicates that a suitable proportion of flora potentially present within the Project Area were recorded, reflecting the common occurrence of key species across the landscape, which co-occur at varying levels of structural and compositional dominance. This number is also greater than that recorded from Reconnaissance level studies in the region conducted in 2012 (Low Ecological Services 2012b; 150 flora species recorded) and 2020 (Low Ecological Services 2020; 97 flora species recorded), who recorded a similar suite of species in their respective studies.

5.1.2. Conservation significant flora

No Threatened flora listed under the EPBC Act or the BC Act were recorded within the Project Area. These findings are consistent with results from the desktop review undertaken for the Project Area, which included a review of Commonwealth and State database searches and previous relevant studies in the region (Section 4.1), with no Threatened flora species recorded or identified as likely to occur in the local region from this review.

One Priority flora species, *Nymphoides beaglensis* (listed as P3 by DBCA), was recorded within the Project Area. Priority 3 species are poorly known species in need of further survey (**Appendix A**). *Nymphoides beaglensis* is an annual aquatic herb with white to pink and purple flowers from March to June (DBCA and WAH 2021). It is known from 20 records over a range of approximately 475 km from Roebuck in the southwest to the Mitchell Plateau in the northeast, with the nearest known record located approximately 38 km northwest of the Project Area (DBCA 2007-2021). The species is known to occur in shallow fresh water at the edges of permanent waterholes or in seasonally inundated claypans and depressions (DBCA and WAH 2021). Within the Project Area, *Nymphoides beaglensis* was recorded from eight point-locations totalling 112 individuals, all of which were found within seasonally inundated depressions within the CbEc vegetation community in the Additional Survey Area. This species was flowering at the time of the field survey in March.

Of the 35 conservation significant flora species identified from the pre-survey likelihood of occurrence assessment as possibly occurring within the Project Area, *Nymphoides beaglensis* was the only species recorded. Based on the post-survey likelihood of occurrence assessment, two of the remaining 34 conservation significant flora species are considered as being likely to occur within the Project Area, namely *Goodenia byrnesii* (P3) and *Goodenia sepalosa* var. *glandulosa* (P3). *Goodenia byrnesii* is considered as likely to occur due to the presence of potentially suitable habitat and associated species occurring within the Project Area, e.g. sandy creek edges with *Bauhinia cunninghamii* scattered low trees and grasses (DBCA and WAH 2021). Known records of this species also occur within 1 km of the Project Area. *Goodenia sepalosa* var. *glandulosa* is considered as likely to occur due to the presence of

potentially suitable habitat and associated species occurring within the Project Area, e.g. red sand or loam with *Bauhinia cunninghamii* open woodland over *Acacia tumida* var. *tumida* tall shrubland (DBCA and WAH 2021). Known records of this species also occur approximately 15 km to the west of the Project Area.

Of note, *Trianthema kimberleyi* (P1), *Goodenia virgata* (P2) and *Triodia acutispicula* (P3) were identified as having been recorded within previous survey reports in the local area, as outlined in **Table 8** above. Suitable habitat for *Trianthema kimberleyi* does not occur within the Project Area (e.g. schistous soils). Although Low Ecological Services (2012b) recorded this species <10 km from the Project Area, known information suggests that this species occurs only on schistous soils, a soil type that was not recorded within the Project Area. Additionally, the single known WAH record of this species occurs >200 km to the southeast of the Project Area. Suitable habitat for *Goodenia virgata* does not occur within the Project Area (e.g. red sandy loam near salt pans). Although Woodman Environmental Consulting (2007) recorded this species approximately 5 km from the Project Area, known information suggests that this species occurs near salt lakes, a habitat type not found within the Project Area. Additionally, WAH records all occur well to the south and southeast (>400 km) and are associated with inland salt pans. Although marginal habitat may occur within the Project Area for *Triodia acutispicula* (e.g. Pindan plains), this species predominantly occurs on river levees and rocky hillslopes and outcrops (DBCA and WAH 2021). Although Woodman Environmental Consulting (2007) recorded this species <5 km from the Project Area, known information shows that the majority of populations occur well to the north (>300 km from the Project Area). The nearest WAH record occurs >200 km to the north east at Mornington Camp. Based on current habitat information available for these species on Florabase (DBCA and WAH 2021), and from on-ground vegetation/habitat mapping, these three species are considered as being unlikely to occur within the bounds of the Project Area.

The post-survey likelihood of occurrence assessment identified an additional four species are considered as having the potential to occur within the Project Area, based on the presence of marginally suitable habitat and close proximity of previous records, namely *Heliotropium foveolatum* (P1), *Acacia monticola* x *tumida* var. *kulparn* (P3), *Corchorus fitzroyensis* (P3) and *Tephrosia pedleyi* (P3). A total of 27 flora species are considered as being unlikely to occur and one species, *Phyllanthus fuernrohrii* (P3), has been previously misidentified and therefore is considered as not occurring within the Project Area.

5.1.3. Range extensions

A total of four flora species were recorded as range extensions within the Project Area, namely *Cajanus latisepalus*, *Lindernia chrysopletra*, *Lindernia clausa* and *Tephrosia remotiflora*.

Cajanus latisepalus is an erect, spindly shrub with yellow pea flowers from March to August (DBCA and WAH 2021). It is known to grow in sandy or gravelly soils, sandstone and basalt on sandplains and rocky slopes (DBCA and WAH 2021). *Cajanus latisepalus* is currently known from 60 records in WA, over a range of approximately 500 km from Meda in the west across to the Northern Territory (NT) border in the east (DBCA 2007-2021). Within the Project Area, this species was recorded from one quadrat location; ELA29, within the AgBc vegetation community on moist light brown clay loam flats. This record represents a minor range extension of approximately 60 km to the southwest of the known range of this species.

Lindernia chrysoplectra is a delicate, fleshy-stemmed annual herb 0.1-0.3 m high with purple and white flowers from March to August (DBCA and WAH 2021). It is known to grow in sandy soils in seasonally wet areas (DBCA and WAH 2021). *Lindernia chrysoplectra* is currently known from 12 records in WA, over a range of approximately 465 km from the Dampier Peninsula in the northwest to 180 km west of Sturt Creek in the southeast (DBCA 2007-2021). Within the Project Area, this species was recorded from one quadrat location; ELA64, within the CbEc vegetation community on waterlogged dark brown sandy clay on open depression. This record represents a range infill, joining the eastern and western populations of this species, with the closest records of this species approximately 170 km to the west and 150 km to the east-southeast of the Project Area.

Lindernia clausa is a slender, erect annual herb 3 to 35 centimetres (cm) high with blue/purple flowers from February to August (DBCA and WAH 2021). It is known to grow on sand or loam on floodplains, creeklines or seepage areas (DBCA and WAH 2021). *Lindernia clausa* is currently known from 22 records in WA, over a range of approximately 675 km from the Dampier Peninsula in the southwest to near Kununurra in the east (DBCA 2007-2021). Within the Project Area, this species was recorded from three quadrat locations; ELA26, ELA27 and ELA31, within the BcTc and Ag vegetation communities on moist brown clay on open depression. This record represents a range extension of approximately 110 km to the south of the known range of this species.

Tephrosia remotiflora is a prostrate or sprawling sericeous shrubs 15 to 60 cm high with pink/ to purple flowers from February to June or September. (DBCA and WAH 2021). It is known to grow in red sand and sandstone on sand dunes and pindan (DBCA and WAH 2021). *Tephrosia remotiflora* is currently known from 53 records in WA, over a range of approximately 1,795 km from near Onslow in the south Kununurra and into the NT in the north (DBCA 2007-2021). Within the Project Area, this species was recorded from one quadrat location; ELA01, within the AgCgEc vegetation community on red brown sandy loam on a gentle slope. This record represents a minor range extension of approximately 65 km to the south of the known range of this species.

5.1.4. Introduced flora (weed) species

A total of nine introduced flora (weed) species were recorded within the Project Area, namely **Calotropis procera* (Calotrope), **Cenchrus setiger* (Birdwood Grass); **Malvastrum americanum* (Spiked Malvastrum), **Melochia pyramidata* (Pyramid Flower), **Portulaca oleracea* (Common Purslane), **Portulaca pilosa* (Pink Purslane), **Stylosanthes hamata* (Verano Stylo), **Trianthema pilosum* and **Vachellia farnesiana* (Mimosa Bush). Of these, **Calotropis procera* is listed as a Declared Pest – s22(2) under the State *Biosecurity and Agriculture Management Act 2007* (BAM Act). Declared Pests “must satisfy any applicable import requirements when imported and may be subject to an import permit if they are potential carriers of high-risk organisms. They may also be subject to control and keeping requirements once within Western Australia” (DPIRD 2021b).

**Calotropis procera* is a perennial shrub to tree in the Apocynaceae family, growing up to 4 m tall with smooth pale grey-green stems and a white milky sap. Flowers are purple to white with five waxy petals (DPIRD 2021b). This species distributed over much of northern Australia, in particular in Queensland, northwest WA and in northern parts of the NT, and is spread by seed over long distances by wind or through water or mud sticking to animals or vehicles. Its preferred habitat is disturbed sites, thriving on poor soils, particularly where overgrazing has removed competition from native grasses (Atlas of Living

Australia [ALA] 2021). **Calotropis procera* was recorded from within five quadrats in the Project Area, namely ELA20, ELA33, ELA35, ELA59 and ELA60.

Of the remaining eight introduced (weed) species, all are classified under the BAM Act (2007) as permitted (s11) for the whole state and not assigned any control category for a local government area at this time. **Stylosanthes hamata* and **Portulaca pilosa* were the most common weed species, being recorded at 18 and 13 quadrats, respectively. Given the prevalence of disturbance due to pastoral activities in the region, there is likely to be additional weeds to those that were recorded during the survey.

5.1.5. Vegetation communities and condition

A total of 13 vegetation communities were delineated and mapped within the Project Area, generally comprising broad mixtures of of *Adansonia gregorii*, *Corymbia* and *Eucalyptus* spp., *Atalaya hemiglauca*, *Bauhinia cunninghamii* and *Erythrophleum chlorostachys* woodland over mixed *Acacia*, *Grevillea*, *Hakea* spp. shrubland over *Triodia* spp. hummock grassland and *Aristida*, *Eriachne*, *Eragrostis* and *Sorghum* spp. tussock grassland. Landforms recorded across the Project Area broadly comprised sandy clay to light clay flats and gentle slopes (Ag, AgBc, AgCgEc, AtAcDo, BcCg, BcTc, CgAgBc), dune slopes, crests and swales (BcGaCg, CgCzBc, CzEcCg, EcCg) and open depressions and creekline communities (CbEc, EmEcAg).

A DBCA Threatened and Priority Communities database search (DBCA 2018c) identified three known occurrences of PECs within 50 km of the Project Area, none of which were inferred to represent any known or potential conservation significant communities listed under the EPBC Act, the BC Act or by DBCA. These findings are consistent with results from the desktop review undertaken for the Project Area, which included a review of Commonwealth and State database searches and previous relevant studies in the region (Section 4.1), with no TECs or PECs recorded or identified as likely to occur in the local region from this review.

The Kimberley Vegetation Association 760, listed as P1, is described as ‘shrublands, pindan; *Acacia tumida* shrubland with scattered low bloodwood & *Eucalyptus setosa* (excluded name) over ribbon & curly spinifex’ (DBCA 2021d). This PEC is restricted to two areas associated with the Fitzroy River and Lennard River systems, located approximately 28 km to the west and 70 km to the north of the Project Area (DBCA 2021c). Species assemblages associated with the Kimberley Vegetation Association 760 PEC, as described above, were not identified within any of the 13 vegetation associations delineated within the Project Area.

The Kimberley Vegetation Association 759 (listed as P3), described as ‘grasslands, tall bunch grass savanna woodland, coolabah over ribbon/blue grass (*Bothriochloa* spp.; DBCA 2021d). This PEC is restricted to two small patches located 23 km to the south and 68 km north-northeast of the Project Area (DBCA 2021c). Species assemblages associated with the Kimberley Vegetation Association 759 PEC, as described above, were not identified within any of the 13 vegetation associations delineated within the Project Area.

The Leopold Land System (listed as P3), described as ‘cracking clay plains and marginal outcrop alluvial plains, grasslands and very open grassy woodlands’ (DBCA 2021d). One patch of this PEC is located approximately 49 km to the east of the Project Area (DBCA 2021c). Landforms associated with the

Leopold Land System PEC (i.e. cracking clay plains and marginal outcrop alluvial plains) were not identified within the Project Area.

Vegetation communities mapped within the Project Area align with Beard's vegetation association mapping, as presented in Section 2.1.4 above. Vegetation communities Ag, AgBc, AgCgEc, AtAcDo, BcCg, BcGaCg, BcTc, CgAgBc, CgCzBc, EcCg and EmEcAg broadly comprise aspects of Beard's North Fitzroy Plains 64 and 710 vegetation associations with the presence of mixed hummock (*Triodia* spp.) and tussock grasslands, *Adansonia gregorii*, *Bauhinia cunninghamii* and ribbon grass (*Chrysopogon fallax*; Government of Western Australia 2019). Vegetation communities AgCgEc, CbEc, BcTc, BcGaCg, EcCg, CzEcCg broadly comprise aspects of Beard's North Fitzroy Plains 699 and 700 vegetation communities with the presence of shrublands over curly spinifex (*Triodia bitextura*) on sandplain or between dunes (Government of Western Australia 2019).

Each of these vegetation associations has greater than 99% of their extent remaining within Western Australia (Government of Western Australia 2019) and are therefore not considered locally restricted.

Vegetation communities recorded within the Project Area are similar to those recorded from previous studies within the region; Low Ecological Services (2012b) recorded a mix of *Bauhinia cunninghamii*, *Adansonia gregorii*, *Corymbia* spp. and *Acacia* spp. over hummock (*Triodia* spp.) and tussock grasslands (*Aristida*, *Sorghum*) within the Asgard 2D seismic survey area, located adjacent to and within the current Project Area. Low Ecological Services (2020) also recorded similar plant community structure and composition, including low open woodlands (*Adansonia gregorii*, *Bauhinia cunninghamii*, *Corymbia* spp.) and grasslands, riparian communities and low woodland on sand dunes within the Odin 2D and 3D seismic survey area, located adjacent to and within the current Project Area. Woodman Environmental (2007) also recorded a plant community of similar composition (open woodland of *Eucalyptus* and *Corymbia* over *Aristida* and *Eriachne* tussock grasses) within their Valhalla Well Site survey area.

Vegetation condition within the Project Area ranged from Excellent to Poor, with majority of the vegetation within the Project Area classed as Very Good (69.93 ha; 54.57%) and Excellent (45.28 ha; 35.34%). Disturbances within the Project Area included impacts from pastoral activities (e.g. cattle grazing, scats and tracks), previous clearing and adjacent tracks which facilitate edge effects and minor weed invasion. The Project Area also has prevalence of fire with many areas being recently burnt across the landscape, particularly preceding the field survey in May.

5.2. Fauna

5.2.1. Fauna habitat

The Project Area contained three broad fauna habitat types, namely Fauna habitat 1: Mixed open woodland over grassland on sandy clay flats and slopes, which correlates to vegetation communities Ag, AgBc, AgCgEc, AtAcDo, BcCg, BcTc and CgAgBc, Fauna habitat 2: Mixed open woodland over tussock grasses on dune slopes and crests, which correlates to vegetation communities BcGaCg, CgCzBc, CzEcCg and EcCg, and Fauna habitat 3: Eucalypt open woodland and mixed shrubland on closed depression and creekline, which correlates to vegetation communities CbEc and EmEcAg.

Fauna habitats within the Project Area broadly represent aspects of the Calwinyardah, Camelgooda and Djada Land Systems on which they occur, including the presence of woodlands and grasslands,

sandplains and sand dunes and floodplain supporting woodland and grasslands (DPIRD 2021a). These land systems are represented in the broader landscape and are not considered as locally restricted. Fauna habitats recorded within the Project Area are similar to those recorded from previous studies within the local area; Buru Energy and Outback Ecology (2014) recorded similar habitat types, including sand plains and dunes, alluvial channels and floodplains, located within their survey area (Ophir, Paradise, Valhalla, Eden and Ellendale) adjacent to the west of the Project Area, while ELA (2016) recorded a mixture of woodlands and grasslands on dunes and plains at their Valhalla Central A survey area, which is located within the adjacent to the Project Area.

5.2.2. Fauna overview

A total of 75 fauna species were recorded during the field survey. This number comprised of 52 birds, five mammals, eight reptiles and ten invertebrates. This is similar to other assemblages recorded in the local area, with Low Ecological Services (2020) recording a total of including 60 birds, 11 mammals, three amphibians and five reptile species within the Odin 2D and 3D seismic survey area, located adjacent to and within the current Project Area, and Buru Energy and Outback Ecology (2014) recording a total of 86 vertebrate fauna species including 72 birds, seven mammals, five reptiles and two amphibians within their survey area (Ophir, Paradise, Valhalla, Eden and Ellendale) adjacent to the west of the Project Area.

5.2.3. Conservation significant fauna

One fauna species of conservation significance was recorded within the Project Area; the Greater Bilby (*Macrotis lagotis*), listed as VU under the EPBC Act and BC Act. The Greater Bilby is a medium-sized burrowing marsupial of the Thylacomyidae family, with long, soft, blue-grey fur over most of the body and white to cream on the belly. It has large ears, a long-pointed snout and a black tail with a white tip (Threatened Species Scientific Committee [TSSC] 2016a). This species is currently known from 3303 records within Western Australia from the Dampier Peninsula in the north to Albany in the south (DBCA 2007-2021). The range of the Greater Bilby has, however, declined, with wild populations in Western Australia now reduced to the Gibson Desert, Little Sandy Desert, Great Sandy Desert and parts of the Pilbara and southern Kimberley (TSSC 2016a). The remaining populations of the Greater Bilby occupy three main habitats: open tussock grassland on uplands and hills, *Acacia aneura* (mulga) woodland/shrubland growing on ridges and rises, and hummock grassland in plains and alluvial areas (TSSC 2016a).

The Greater Bilby has been previously recorded in the local region, with unconfirmed signs recorded in both Low Ecological Services (2020) and Low Ecological Services (2012b). A previous record from 2002, identified from the DBCA Threatened and Priority fauna database search undertaken for the Project Area, is located approximately 47 km north of the Project Area (DBCA 2021b). Within the Project Area, evidence of this species in the form of diggings was recorded at four locations in the south-east within Fauna habitat 2. Greater Bilby diggings have a conical shape, which is a distinguishing feature of this species (Moseby *et al.* 2012, Department of Sustainability, Environment, Water, Population and Communities [SEWPaC] 2011). Diggings were relatively fresh and intact (i.e. had not completely collapsed or washed away) and estimated to be less than one year old. No direct observations of this species were made. Within the Project Area, Fauna habitat 2: Mixed open woodland over tussock grasses on dune slopes and crests is considered as providing suitable habitat for this species.

Of the remaining 53 conservation listed fauna species identified from the pre-likelihood of occurrence survey assessment as possibly occurring within the Project Area, nine of these are considered as having

the potential to occur post-survey, based on proximity of previous records to the Project Area and availability of suitable habitat within the Project Area:

- *Erythrura gouldiae* (Gouldian Finch; listed as EN under the EPBC Act and as P4 by DBCA);
- *Falco hypoleucos* (Grey Falcon; listed as VU under the EPBC Act and BC Act);
- *Actitis hypoleucos* (Common Sandpiper; listed as M under EPBC Act and BC Act);
- *Apus pacificus* (Fork-tailed swift; listed as M under EPBC Act and BC Act);
- *Calidris acuminata* (Sharp-tailed sandpiper; listed as M under EPBC Act and BC Act);
- *Plegadis falcinellus* (Glossy ibis; listed as M under the EPBC Act and BC Act).
- *Falco peregrinus* (Peregrine falcon; listed as OS under BC Act);
- *Ctenotus uber johnstonii* (Spotted ctenotus (northeast); listed as P2 by DBCA); and
- *Leggadina lakedownensis* (Northern short-tailed mouse; listed as P4 by DBCA).

Of these, four species (*Actitis hypoleucos*, *Apus pacificus*, *Calidris acuminata* and *Plegadis falcinellus*) are migratory bird species which may utilise habitat within the Project Area only when conditions are favourable (e.g. after periods of heavy rainfall). Due to the vagrant and mobile nature of these species, their likelihood of occurrence rating (potential) is based on the availability of potentially suitable habitat within the Project Area and close proximity of recent records of these species (within 50 km).

The Gouldian Finch (*Erythrura gouldiae*) is a small bird, 12-15 cm in length, weighing about 14-15 grams. The adults are vividly multi-coloured, and exhibit three different facial colour-morphs: black-headed (most common), red-headed and yellow-headed (rare; TSSC 2016b). This species is currently known from 466 records within WA over a range of approximately 800 km, from Broome in the west to Kununurra in the east (DBCA 2007-2021). A recent record of this species from 2010 is located within 30 km of the Project Area (DBCA 2021b). Its preferred habitat consists of open woodlands that are dominated by Eucalypt trees and support a ground cover of *Sorghum* and other grasses (TSSC 2016a). Within the Project Area, Fauna habitat 1: Mixed open woodland over grassland on sandy clay flats and slopes and Fauna habitat 2: Mixed open woodland over tussock grasses on dune slopes and crests are considered as providing potentially suitable habitat for this species and it is therefore considered as having the potential to occur within the Project Area.

The Peregrine Falcon (*Falco peregrinus*) and the Grey Falcon (*Falco hypoleucos*) are large, powerfully build raptors (Birdlife Australia 2021) that are considered as having the potential to occur within the Project Area due to their ranges and habitat requirements. These species have wide ranges, with records occurring across most bioregions of Western Australia from the South-west to the Kimberley region (DBCA 2007-2020). Habitat requirements for each of these species are broad and varied, some of which are met by all fauna habitats within the Project Area in the form of plains, grasslands and shrublands. Previous records of these species are located within 20 km (*Falco peregrinus*) and 55 km (*Falco hypoleucos*) of the Project Area (DBCA 2021b).

The Spotted Ctenotus (northeast; *Ctenotus uber johnstonii*) is a medium sized long tailed skink (to 24 cm long) with a pattern of stripes and spots, differentiated from *C. uber* by the presence of a well-developed vertebral stripe and contiguous nasal scales (Wilson and Swan 2010; Storr *et. al* 1999). The subspecies is known from 44 records within Western Australia, from near Derby in the north to south of Port Hedland in the south (DBCA 2007-2021). It has been recorded occurring in the arid northeast interior on hard, reddish soils (Storr *et. al* 1999). Due to the presence of potentially suitable habitat (hard

reddish soils of Fauna habitat 1) and the close proximity of two previous recent records to the Project Area (within 15 km from 2011; DBCA 2021b), this species is considered as having the potential to occur.

The Northern Short-tailed Mouse (*Leggadina lakedownensis*) is a small, nocturnal rodent endemic to northern Australia, occurring from the Pilbara region of Western Australia to Cape York in the east (Aplin *et al.* 2016). It occupies monsoonal tropical coast to semiarid areas in spinifex and tussock grasslands, samphire, sedgeland, *Acacia* shrublands, tropical *Eucalyptus* and *Melaleuca* woodlands and stony ranges (Van Dyck *et al.* 2003). Two recent records of this species from 2011 are located within 15 km of the Project Area (DBCA 2021b). Given the suitability of available habitat (spinifex and tussock grasslands, *Acacia* woodlands) and the presence of nearby records of this species, it is considered as having the potential to occur within the Project Area.

Of note, Low Ecological Services (2020) recorded unconfirmed signs (native mammal scats) of the Northern Quoll (*Dasyurus hallucatus*). Given the absence of species habitat requirements (rocky areas, Eucalypt forests etc.) and no previous records within 100 km of the Project Area (DBCA 2021b), this species is considered as unlikely to occur within the Project Area.

Several fauna species previously recorded in the vicinity of the Project Area as conservation significant species are no longer listed as such. These include *Ardea modesta* (Eastern Great Egret; Buru Energy and Outback Ecology 2014), *Ardeotis australis* (Australian Bustard; Buru Energy and Outback Ecology 2014; Low Ecological Services 2012b; Low Ecological Services 2011b), *Burhinus grallarius* (Bush Stone-curlew; Buru Energy and Outback Ecology 2014), and *Merops ornatus* (Rainbow Bee-eater; ELA 2016; Buru Energy and Outback Ecology 2014; Low Ecological Services 2012b; Low Ecological Services 2011a).

5.3. Aboriginal significant bush foods²

5.3.1. Aboriginal significant bush foods – flora

A total of two flora species considered as Aboriginal significant bush foods were recorded within the Project Area, namely *Adansonia gregorii* (Boab) and *Carissa lanceolata* (Conkerberry).

Boab trees (Aboriginal name: jumuluny) are a Kimberley icon, growing right across from the west coast of the Kimberley to the east, into the Northern Territory. Boabs range from 10-15 m in height and 9-12 m in width and have bright lime to dark green leaves shaped like a star (DBCA and WAH 2021). The boab tree produces a hard pod with light brown fur that grows on the outside. The hard pod is broken to reveal a fruit; a white, powdery pith containing 10 to 20 or more seeds. The powdery pith inside the nut, along with the seeds, is what can be eaten and has a sherbet texture and a sour, tangy flavour. The pith is commonly crushed and mixed with water and sugarbag droplets and then eaten. The seeds found inside the pith can be dried and eaten like peanuts. The boab also has other traditional uses, including the use of the bark to make strong, thick twine, the trunk to produce water and the fruit for medicinal or artistic purposes.

Within the Project Area, boab trees were recorded as a dominant or associated species within five of the 14 vegetation communities described, at a <5% cover. Of note was one particularly large tree occurring across a portion of the track leading to the Midgard well site (m 685634E; m 7992864N).

The conkerberry (Aboriginal name: piriyalji) is native mainly to the Top End and central Australia but is also found around Cape York in far north Queensland and in the Kimberley region of Western Australia. In a hot, dry climate this species grows on a wide range of terrains and soil types. The Conkerberry is a multi-stemmed shrub, 1-3 m high with glossy green narrow leaves, hard thorns, and white, star-shaped flowers from December to January. The small conkerberries, also known as bush currants, are 1-2 cm long and appear in February to March, turning a dark purple or black when ripe. Aboriginal people frequently eat conkerberries, as they have a sweet, refreshing taste. The conkerberry has other traditional uses, including burning of the wood to create smoke to treat colds and coughs (inhalation), the orange roots to burn to keep bad spirits away or as an insect deterrent.

Within the Project Area, conkerberry was recorded as a dominant or associated species within ten of the 14 vegetation communities described, at a <5% cover.

5.3.2. Aboriginal significant bush foods – fauna

A total of four fauna species considered as Aboriginal significant bush foods were recorded within the Project Area, namely *Ardeotis australis* (Australian Bustard), *Osphranter rufus* (Red Kangaroo), *Varanus gouldii* (Sand Goanna) and *V. panoptes* (Yellow-spotted Monitor).

Australian Bustard (Aboriginal name: wawun, kere artewe, kipara, danimila), also known as ‘bush turkey’ to Aboriginal people, are large ground birds that roam the grasslands, woodlands and open plains, mainly across the northern and central parts of Australia where the climate is warm and dry. They can grow to 1.5 m with a wingspan of 2.5 m, and the average male can weight 6.5 kilograms (kg). Australian

² Aboriginal significant bush food species information is sourced from Martin (2014) and Low (1991)

Bustard has played an important role in the diet of Indigenous people throughout the Kimberley, central desert and for North Queensland, and is still eaten today. This species also plays an important part in the dreamtime stories, with many Indigenous people having totemic spiritual connections with the animal. Australian Bustard was recorded from one location within the Project Area (m 683743E; m 7992977 N), however is likely to utilise most habitats found throughout the Project Area as they wander and search for food.

Kangaroos (Aboriginal name: ganuurr, kere aherre, malu, jarlangarnany, gangurru) are herbivorous marsupials with large, powerful hindlegs, large feet for leaping and a long, muscular tail for balance. They can be found across most of Australia occurring across a wide and varying range of habitat types. There are four species of kangaroo; Red, Eastern Grey, Western Grey and Antilopine. The Red Kangaroo is the largest of the four species, with males growing to 2 m and weighing up to 100 kg. In addition to being hunted for food, kangaroos play an important part in dreamtime stories of many Aboriginal language groups and has spiritual totemic significance for some tribes. Red Kangaroo (*Osphranter rufus*) was recorded from scats throughout the Project Area and spotted in the distance at various locations and is likely to utilise most habitats found throughout the Project Area.

Goannas (Aboriginal name: karda, ganyal, kanyarrany) are large, carnivorous lizards with sharp teeth and claws, growing to 2-3 m long. There are 30 species of goanna in the world, 25 of which can be found within Australia, generally in warmer climates. Goannas typically reside underground in burrows or hollow logs and typically prey on birds, bird eggs, or smaller mammals. Goanna is considered a delicacy amongst Aboriginal people, and to hunt a goanna takes a lot of skill and energy; it involves tracking the goanna to find its burrow and then flushing it out to catch it. Goannas also feature strongly in dreamtime stories and as individual, family and clan spiritual totems. During the field survey, both *Varanus gouldii* (Sand Goanna) and *V. panoptes* (Yellow-spotted Monitor) were spotted several times sunbaking along tracks. These species are likely to utilise all habitats found throughout the Project Area for foraging and/or burrowing.

6. References

- Aplin, K., Burbidge, A.A., Morrison, K. and Woinarski, J. 2016. *Leggadina lakedownensis*. The IUCN Red List of Threatened Species 2016 [online], available at: <http://www.iucnredlist.org/details/11384/0>. Accessed June 2021.
- Atlas of Living Australia (ALA). 2021. *WeedsAustralia Profile: Calotropis procera – Calotrope* [online]. Available from: <https://profiles.ala.org.au/opus/weeds-australia/profile/Calotropis%20procera>
- Barrett, R. L. and Telford, I. R. H. 2015. *Two new species of Phyllanthus from Northern Australia and notes on Phyllanthus, Sauropus and Synostemon (Phyllanthaceae) in Western Australia. Nuytsia 26: 149-166.*
- Bastin, G. and the ACRIS Management Committee, Rangelands 2008. 2008. *Taking the Pulse, published on behalf of the ACRIS Management Committee by the National Land & Water Resources Audit, Canberra.*
- Beard, J. S. 1979. Kimberley, 1:1 000,000 vegetation series: Explanatory notes to sheet 1, the vegetation of the Kimberley area. Nedlands, W.A.: University of Western Australia.
- Birdlife Australia. 2021. *Peregrine falcon: Falco peregrinus; and Grey Falcon: Falco hypoleucos* [online]. Accessed June 2021.
- Buru Energy and Outback Ecology. 2014. *Ophir, Paradise, Valhalla, Eden and Ellendale Flora, Vegetation and Fauna Survey Report*. August 2014.
- Clarke, K.R., and Gorley, R.N. (2006). *PRIMER v6: User Manual/Tutorial*. PRIMER-E: Plymouth.
- Department of Agriculture, Water and the Environment (DAWE). 2021a. *Australia's bioregions (IBRA)*. Available from: <https://www.environment.gov.au/land/nrs/science/ibra>.
- Department of Agriculture, Water and the Environment (DAWE). 2021b. *EPBC Act Protected Matters Search Tool (PMST)*. Available: <http://www.environment.gov.au/epbc/pmst/index.html>. Accessed January 2021.
- Department of Biodiversity, Conservation and Attractions (DBCA). 2007 - 2021. *NatureMap. Department of Parks and Wildlife and WA Museum*. Accessed January 2021. Available: <https://naturemap.dpaw.wa.gov.au/>
- Department of Biodiversity, Conservation and Attractions (DBCA). 2021a. *Threatened and Priority Flora database search*. Reference number 12-0221FL. Department of Biodiversity, Conservation and Attractions, Perth.
- Department of Biodiversity, Conservation and Attractions (DBCA). 2021b. *Threatened and Priority Fauna database search*. Reference number FAUNA#6601. Department of Biodiversity, Conservation and Attractions, Perth.

Department of Biodiversity, Conservation and Attractions (DBCA). 2021c. *Threatened and Priority Communities database search*. Reference number 05-0321EC. Department of Biodiversity, Conservation and Attractions, Perth.

Department of Biodiversity, Conservation and Attractions (DBCA). 2021d. *Priority ecological communities for Western Australia version 31, 20 March 2021*. Species and Communities Branch, Department of Biodiversity, Conservation and Attractions. Available from: <https://www.dpaw.wa.gov.au/plants-and-animals/threatened-species-and-communities/wa-s-threatened-ecological-communities>.

Department of Biodiversity, Conservation and Attractions and the Western Australian Herbarium (DBCA and WAH). 2021. *FloraBase—the Western Australian Flora*. Department of Biodiversity, Conservation and Attractions. Available from: <https://florabase.dpaw.wa.gov.au/>. Accessed March 2021.

Department of Environment and Conservation (DEC). 2009. *Resource Condition Report for a Significant Western Australian Wetland Le Lievre Swamp (Iljamalkarda)*. Prepared for Inland Aquatic Integrity Resource Condition Monitoring Project, Strategic Reserve Fund, Department of Environment and Conservation.

Department of Primary Industries and Regional Development (DPIRD). 2021a. *Rangelands Land-System Mapping for the Pastoral Area of Western Australia*. Accessed June 2021.

Department of Primary Industries and Regional Development (DPIRD). 2021b. *Western Australian Organism List*. Available from: <https://www.agric.wa.gov.au/organisms>

Department of Sustainability, Environment, Water, Population and Communities (DSEWPac). 2011. *Survey guidelines for Australia's threatened mammals*.

Eco Logical Australia (ELA). 2016. *Level 1 Vegetation, Flora and Fauna Survey of Kurrajong, Yakka Munga and Valhalla Central Well Sites*. Prepared for Buru Energy limited.

Eco Logical Australia (ELA). 2018. *Valhalla Central 4 Flora and Fauna Survey*. August 2018. Prepared for Buru Energy Limited.

Environmental Protection Authority (EPA). 2016. *Technical Guidance: Flora and Vegetation Surveys for Environmental Impact Assessment*. Perth, Western Australia.

Environmental Protection Authority (EPA). 2020. *Technical Guidance: Terrestrial Vertebrate Fauna Surveys for Environmental Impact Assessment*. Perth, Western Australia.

Government of Western Australia. 2019. *2018 Statewide Vegetation Statistics incorporating the CAR Reserve Analysis (Full Report)*. Current as of March 2019. WA Department of Biodiversity, Conservation and Attractions.

Graham, G. 2001. *Dampierland 1 (DL1 – Fitzroy Trough subregion)*. In: *A Biodiversity Audit of Western Australia's 53 Biogeographical Subregions in 2002*. Prepared by the Department of Conservation and Land Management.

- Low Ecological Services. 2020. *Flora and Fauna Assessment – Odin 2D and 3D seismic survey, Fitzroy Basin, Western Australia*. Report prepared for Bennett Resources Pty Ltd. Report drafted in March 2020.
- Low Ecological Services. 2012a. *Asgard-1 Exploration Well: Flora, Vegetation and Fauna Survey*. Report prepared for Buru Energy.
- Low Ecological Services. 2012b. *Asgard 2D Seismic Survey: Flora, Vegetation and Fauna Survey*. Report prepared for Buru Energy.
- Low Ecological Services. 2011a. *Flora and Vegetation Survey: Valhalla North*. October 2011. Report prepared for Buru Energy.
- Low Ecological Services. 2011b. *Valhalla East-1 Exploration Well: Flora and Fauna Survey*. September 2011. Report prepared for Buru Energy.
- Low, T. 1991. *Wild Food Plants of Australia*. Australian Nature Field Guide. Angus & Robertson Australia.
- Martin, S. 2014. *Bush Tukka Guide*. Explore Australia Publishing Pty Ltd. Richmond, Victoria.
- Menkhorst, P. and Knight, F. 2011. *Field Guide to Mammals of Australia*. Oxford University Press Australia, Melbourne.
- Morcombe, M. 2003. *Field Guide to Australian Birds*. Steve Parish Publications, Brisbane.
- Moseby, K., Nano, T. and Southgate, R. 2012. *Tales in the Sand – a guide to identifying Australian arid zone fauna using spoor and other signs*. Third Edition, Ecological Horizons Pty. Ltd.
- Murdoch University. 2016. *Targeted bilby survey of proposed well site 'Valhalla Central', and immediate area*. Perth, Western Australia.
- Payne, A. and Schoknecht, N. 2011. *Land Systems of the Kimberley Region, Western Australia*. Technical Bulletin No. 98, Department of Agriculture and Food.
- Pusey, B. J. and Kath, J. 2015. *Environmental Water Management in the Fitzroy River Valley - Information availability, knowledge gaps and research needs*. Northern Australia Environmental Resources Hub – National Environmental Science Program.
- Shepherd, D.P., Beeston, G.R., and Hopkins, A.J.M. 2002. *Native Vegetation in Western Australia – Extent, Type and Status*. Resource Management Technical Report 249, Department of Agriculture, Western Australia.
- Storr, G. M., Smith, L.A. and Johnstone, R. E. 1999. *Lizards of Western Australia 1: Skinks*. Western Australian Museum.
- Threatened Species Scientific Community (TSSC). 2016a. *Conservation Advice Macrotis lagotis greater bilby*. Canberra: Department of the Environment. Available from: <http://www.environment.gov.au/biodiversity/threatened/species/pubs/282-conservation-advice-15072016.pdf>. In effect under the EPBC Act from 15-Jul-2016.

Threatened Species Scientific Committee (TSSC). 2016b. *Conservation Advice Erythrura gouldiae Gouldian finch*. Canberra: Department of the Environment and Energy. Available from: <http://www.environment.gov.au/biodiversity/threatened/species/pubs/413-conservation-advice-07122016.pdf>. In effect under the EPBC Act from 07-Dec-2016.

Tyler, M. J., and Doughty, P. 2009. *Field Guide to Frogs of Western Australia*. Fourth Edition. Western Australian Museum, Perth.

Wilson, S., and Swan, G. 2010. *A Complete Guide to Reptiles of Australia*. Third Edition. New Holland Publishers, Sydney, Australia.

Van Dyck. S., Gynther. I. and Baker. A. (Editors). 2003. *Field Companion to The Mammals of Australia*. New Holland Publishers, Sydney.

Woodman Environmental Consulting. 2007. *Valhalla – 01 Well Site Flora and Vegetation Survey*. Woodman Environmental Consulting. July 2007. Report prepared for Arc Energy Limited.

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 (CR)	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 (M)	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	M	<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 project area from DBCA database search results and/or from previous surveys of the project 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 project 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 project area, and occurs in similar habitat to that which occurs within the project area core habitat and suitable landforms for the species occurs within the project 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 project area.
Potential	<p>The species has not previously been recorded from within the project 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 project area and suitable habitat occurring in the project area the project 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 project area by a previous consultant survey or there is historic evidence of species occurrence within the project 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 project 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 project area through DBCA database searches.</p> <p>The species has not been recorded in the project 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 project area despite adequate survey efforts at an appropriate time of year to detect the species within potentially suitable habitat.</p> <p>The project area lacks important habitat for a species that has highly selective habitat requirements.</p> <p>The species has been historically recorded within project 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

Taxon	Conservation status		Source	Species Information*	Habitat information*	Pre-survey Likelihood	Pre-survey likelihood justification^	Post-survey likelihood	Post-survey likelihood justification
	EPBC Act	BC Act / DBCA							
<i>Aristida polyclados</i>	-	P1	DBCA 2021a	Tufted annual, grass-like or herb, 0.3-0.4 m high. Fl. brown, Apr.	Alluvium. Limestone gorges.	Unlikely	Nearest record (1988) ~20 km N of Project Area. No suitable habitat in the Project Area.	Unlikely	Suitable habitat does not occur within the Project Area e.g. alluvial soils in limestone gorges. Known records are sparse being associated with gorges, with the nearest record approximately 20 km from the Project Area.
<i>Corymbia pedimontana</i>	-	P1	DBCA 2021a	Tree, to 10 m high, bark brownish-red, tessellated. Fl. Jun or Sep	Red sandy soils or red loam over limestone. Plains at base of hills.	Unlikely	Nearest records (1988) ~60 km NE of the Project Area. No suitable habitat in the Project Area.	Unlikely	Suitable habitat does not occur within the Project Area e.g. sandy soils over limestone at the base of hills. Known records occur in a distinct cluster approximately 60 km northeast of the Project Area
<i>Cucumis</i> sp. Bastion Range (A.A. Mitchell et al. AAM 10710)	-	P1	DBCA 2021a	Climbing woody herb (vine), 0.5 m high	Previous records are from margins of creek in sandstone country, foot slopes. Brown silty loam over dolerite. Sandstone / limestone.	Unlikely	Nearest record (1962) ~75 km E of the Project Area. Little suitable habitat in the Project Area.	Unlikely	Suitable habitat does not occur within the Project Area e.g. creek margins within sandstone and limestone foot slopes. Known records all occur to the north and northeast of the Project Area, with the closest being 75 km away.
<i>Cullen candidum</i>	-	P1	DBCA 2021a	Shrub, to 3 m high. Fl. white, Sep to Oct.	Previous records are from brown clayey sand, floodplain.	Unlikely	Nearest populations (1988) ~55 km E of the Project Area.	Unlikely	Suitable habitat does not occur within the Project Area e.g. floodplains with brown clayey sand. Known records are sparse, tending to occur to the east of the Project Area, the nearest being approximately 55 km away
<i>Eucalyptus distans</i>	-	P1	DBCA 2021a	Tree, to 9 m high, bark fine, grey, fissured	Loam, sandstone. Base of range.	Unlikely	Nearest record (1981) is ~50 km NW of the Project Area. No suitable habitat in the Project Area.	Unlikely	Suitable habitat does not occur within the Project Area e.g. sandstone at the base of ranges. Known records are very sparse, with majority occurring well to the north and northeast of the Project Area (>500 km). One record occurs approximately 40 km north of the Project Area, however this record is associated with rehabilitation trial at the Ellendale diamond mine.

Taxon	Conservation status		Source	Species Information*	Habitat information*	Pre-survey Likelihood	Pre-survey likelihood justification^	Post-survey likelihood	Post-survey likelihood justification
	EPBC Act	BC Act / DBCA							
<i>Fimbristylis dictyocolea</i>	-	P1	DBCA 2021a	Shortly rhizomatous, tufted perennial, grass-like or herb (sedge), 0.5-0.8 m high	Edge of swamps or in water, sand over clay.	Potential	Nearest record (2014, in rehab) ~40 km N of the Project Area.	Unlikely	Suitable habitat does not occur within the Project Area. Although standing water was present at the time of survey, this was result of sheet flow saturation, rather than presence of true swamp environments. The majority of known records occur near Katherine (Northern Territory), with a single record in Western Australia (collection date 1981), occurring approximately 50 km to the north of the Project Area
<i>Fimbristylis</i> sp. H Kimberley Flora (Carr 3944 & Beaglehole 47722)	-	P1	DBCA 2021a	Perennial, grass-like or herb (sedge), ca 0.3 m high. Fl. brown, Jul.	Occurs on sandy loam plains with meandering sandy drainage lines and brown sand soil.	Unlikely	Nearest record (1974) ~65 km NE of the Project Area.	Unlikely	Suitable habitat does not occur within the Project Area e.g. sandy drainage lines. One known record of the species occurs at Tunnel Creek in the Napier Range (collection date 1974), approximately 65 km northeast of the Project Area.
<i>Heliotropium foveolatum</i>	-	P1	DBCA 2021a	Ascending to spreading annual, herb, to 0.3 m high. Fl. Feb to Jul.	Seasonally inundated, orange sandy clay on plains in low open <i>Bauhinia</i> woodland or <i>Triodia</i> grassland.	Potential	Nearest record (1 plant, 2011) ~20 km W of Project Area.	Potential	Suitable habitat and associated species occur within the Project Area, e.g. seasonally inundated, orange sandy clay on plains in low open <i>Bauhinia</i> woodland or <i>Triodia</i> grassland. A cluster of known records occur approximately 20 km west of the Project Area.
<i>Heliotropium geocharis</i>	-	P1	DBCA 2021a	Erect annual, herb, to 0.5 m high. Fl. white, Jan to Apr.	Alluvium, black soils. Plains.	Unlikely	Nearest record (1952) ~20 km W of the Project Area. Most recent nearby record (1988) ~60 km E of Project Area.	Unlikely	Suitable habitat does not occur within the Project Area e.g. black alluvial soils. Known records are sparse, with the nearest being approximately 20 km west of the Project Area (it is noted that record has a collection date of 1953)

Taxon	Conservation status		Source	Species Information*	Habitat information*	Pre-survey Likelihood	Pre-survey likelihood justification^	Post-survey likelihood	Post-survey likelihood justification
	EPBC Act	BC Act / DBCA							
<i>Heliotropium parviantrum</i>	-	P1	DBCA 2021a	Erect annual, herb, to 0.15 m high. Fl. Feb to Jun.	Sandy soils. Flats, plains, rocky slopes.	Unlikely	Nearest record (1967) ~60 km NW of Project Area.	Unlikely	Marginal habitat may occur within the Project Area e.g. sandy soils on flats and plains. However, this assessment is based on very broad habitat descriptions (e.g. sandy soil), which do not contain sufficient detail. Known records are sparse, mostly occurring near Port Hedland. One record occurs approximately 60 km northwest of the Project Area (collection date 1967).
<i>Mitrasacme</i> sp. l Kimberley Flora (K.F. Kenneally s.n. PERTH 04115058)	-	P1	DBCA 2021a	Herb	In black soil of boggy soak with <i>Pandanus</i> .	Unlikely	Nearest record (1976) ~60 km NE of the Project Area. No suitable habitat in the Project Area.	Unlikely	Suitable habitat does not occur within the Project Area e.g. black soil of soggy soak. One record occurs at Little Spring, Leopold Downs, approximately 60 km NE of the Project Area
<i>Nymphaea carpentariae</i>	-	P1	DBCA 2021a	Aquatic plant with floating leaves	Ephemeral - semi - permanent floodplain pool on alluvial and colluvial flat surrounded by landscape of gneiss and granite hills and domes.	Unlikely	Nearest population (2019) ~60 km NE of the Project Area. Little suitable habitat in the Project Area.	Unlikely	Suitable habitat does not occur within the Project Area e.g. permanent wetlands. Two sparse records occur in association with rangelands, the nearest being 60 km northeast of the Project Area
<i>Nymphaea kimberleyensis</i>	-	P1	DBCA 2021a	Aquatic plant with floating leaves, gigantea-type; flowers blue.	Permanently inundated water bodies.	Unlikely	Nearest records (1998-2002) ~ km E of the Project Area. Little suitable habitat in the Project Area.	Unlikely	Suitable habitat does not occur within the Project Area e.g. permanently inundated water bodies. Known records form a cluster north of Fitzroy Crossing, approximately 60 km east of the Project Area.
<i>Trachymene oleracea</i> subsp. <i>sedimenta</i>	-	P1	DBCA 2021a	Annual, herb, 0.3-0.6 m high, Fl. white/blue, May to Jun.	Limestone sandstone or rocky slopes.	Unlikely	Nearest record (1971) ~70 km NE of the Project Area. No suitable habitat in the Project Area.	Unlikely	Suitable habitat does not occur within the Project Area e.g. limestone or sandstone rocky slopes. Known records are very sparse, mostly occurring >500 km northeast of Project Area. One record occurs approximately 70 km northeast of the Project Area within the Napier Range.

Taxon	Conservation status		Source	Species Information*	Habitat information*	Pre-survey Likelihood	Pre-survey likelihood justification^	Post-survey likelihood	Post-survey likelihood justification
	EPBC Act	BC Act / DBCA							
<i>Trianthema kimberleyi</i>	-	P1	Low Ecological Services 2012b	Prostrate, much-branched annual, herb. Fl. white-pink, Mar.	Schistous soils	Potential	Nearest record (1989) ~200 km SE of the Project Area. However, Low Ecological Services (2012b) shows a record of this species along Noonkanbah Rd <10 km from the Project Area. Suitable habitat may occur in the Project Area.	Unlikely	Suitable habitat does not occur within the Project Area e.g. schistous soils. Although a previous consultant survey recorded this species <10 km from the Project Area, known information suggests that this species occurs only on schistous soils, a soil type that was not recorded within the Project Area. The single known WAH record of this species occurs >200 km to the southeast of the Project Area.
<i>Triodia pascoeana</i>	-	P1	DBCA 2021a	Dense, tussock-forming perennial, grass-like or herb, 1-3 m high, non-resinous, Fl. Jan to Apr	Limestone. Limestone ranges & gorges, floodplains.	Unlikely	Nearest record (1988) is ~20 km N of the Project Area. Most recent record (2017) ~50 km NE of the Project Area. No suitable habitat in the Project Area.	Unlikely	Suitable habitat does not occur within the Project Area e.g. limestone soils and landscapes. Known records are sparse, with the nearest occurring approximately 50 km NE of the Project Area within the Napier Range
<i>Cayratia cardiophylla</i>	-	P2	DBCA 2021a	Deciduous climber. Fl. green-white, Aug to Dec.	Limestone. Seepage areas, amongst rocks.	Unlikely	Nearest records (1990) ~70 km E of Project Area. No suitable habitat in Project Area.	Unlikely	Suitable habitat does not occur within the Project Area e.g. limestone seepage areas amongst rocks. Known records are sparse, with the nearest occurring approximately 50 km NE of the Project Area within the Napier Range
<i>Goodenia virgata</i>	-	P2	Low Ecological Services 2012b	Ascending to erect, virgate perennial, herb, to 0.4 m high. Fl. yellow, Jul.	Red sandy loam. Near salt pans.	Potential	Nearest record (2000) ~400 km SE of the Project Area. However, Low Ecological Serviced 2012b shows a nearby record of this species within ~20 km of the Project Area.	Unlikely	Suitable habitat does not occur within the Project Area e.g. red sandy loam near salt pans. Although a previous consultant survey recorded this species 5 km from the Project Area, known information suggests that this species occurs near salt lakes, a habitat type not found within the Project Area. WAH records all occur well to the south and southeast (>400 km) associated with inland salt pans.

Taxon	Conservation status		Source	Species Information*	Habitat information*	Pre-survey Likelihood	Pre-survey likelihood justification^	Post-survey likelihood	Post-survey likelihood justification
	EPBC Act	BC Act / DBCA							
<i>Hibiscus calcicola</i>	-	P2	DBCA 2021a	Shrub, to 1.5 m high.	Red clay soils on limestone. At bases of rocky outcrops.	Unlikely	Nearest record (1981) ~70 km NE of the Project Area. No suitable habitat in the Project Area.	Unlikely	Suitable habitat does not occur within the Project Area e.g. red clay soils at the bases of rocky limestone outcrops. One known record occurs approximately 70 km northeast of the Project Area in the Geikie Gorge NP.
<i>Pterocaulon globuliflorum</i>	-	P2	DBCA 2021a	Erect, much-branched perennial, herb or shrub, 0.4-0.6 m high. Fl. white-cream, Jun.	Sand. Sandstone cliffs & scree slopes.	Unlikely	Nearest records (1974) ~70 km NE of the Project Area. Little suitable habitat in the Project Area.	Unlikely	Suitable habitat does not occur within the Project Area e.g. sandstone cliffs and scree slopes. One record occurs approximately 70 km northeast of the Project Area, within the Windjana Gorge National Park.
<i>Acacia monticola</i> x <i>tumida</i> var. <i>kulparrn</i>	-	P3	DBCA 2021a	Shrub to 2 m, bark grey and fissured on branches	Red sand/loam/rocky, sand.	Unlikely	Nearest record (1983) is ~60 km N of the Project Area.	Potential	Marginal habitat may occur within the Project Area e.g. red sand/loam. This species is known to occur with <i>Acacia tumida</i> , a common species within the Project Area. Known records are geographically separated as to those occurring east of Derby and those occurring along the coast. The nearest record to the Project Area occurs approximately 60 km to the north. It is noted that collection records of this species are under a Temporary Sorting Slip at the WAH, until species nomenclature is resolved.
<i>Corchorus fitzroyensis</i>	-	P3	DBCA 2021a	Low compact bushy shrub to 0.3 m high, spreading to 1 m, flowers golden yellow	Alluvial and colluvial flats. Red-brown sandy clay loam.	Potential	Several records (1988) ~20 km SE of the Project Area.	Potential	Suitable habitat occurs within the Project Area, e.g. alluvial and colluvial flats with red-brown sandy clay loam. Several known records occur approximately 20 km south east of the Project Area.

Taxon	Conservation status		Source	Species Information*	Habitat information*	Pre-survey Likelihood	Pre-survey likelihood justification^	Post-survey likelihood	Post-survey likelihood justification
	EPBC Act	BC Act / DBCA							
<i>Fimbristylis sieberiana</i>	-	P3	DBCA 2021a	Shortly rhizomatous, tufted perennial, grass-like or herb (sedge), 0.25-0.6 m high. Fl. brown, May to Jun.	Mud, skeletal soil pockets. Pool edges, sandstone cliffs. Riparian zones of permanent wetlands with high soil moisture maintained by groundwater flows (Pilbara).	Unlikely	Nearest record (1988) ~60 km E of the Project Area. No suitable habitat in the Project Area.	Unlikely	Suitable habitat does not occur within the Project Area e.g. pool edges and sandstone cliffs. Known occurrences are scattered throughout the Kimberley and Pilbara, in association with gorges and permanent water pools. The nearest record occurs approximately 60 km east of the survey, within the Brooking Gorge Conservation Park.
<i>Gomphrena leptophylla</i>	-	P3	DBCA 2021a	Prostrate or erect to spreading annual, herb, to 0.15 m high. Fl. white, Mar to Sep.	Sand, sandy to clayey loam, granite, quartzite. Open flats, sandy creek beds, edges salt pans & marshes, stony hillsides.	Unlikely	Nearest record (1972) ~60 km SW of the Project Area. Little suitable habitat in the Project Area.	Unlikely	Marginal habitat may occur within the Project Area e.g. sand, sandy to clayey loam. This species occurs across a range of different habitat types, with typical associated species not occurring within the Project Area (e.g. <i>Acacia bivenosa</i> , <i>Triodia epactia</i> , <i>Triodia lanigera</i>). Known records tend to occur within the Pilbara region, with only two records in the Kimberly region. The nearest record occurs approximately 60 km southwest of the Project Area (collection date 1972).
<i>Goodenia byrnesii</i>	-	P3	DBCA 2021a, Woodman Environmental Consulting 2007, Naturemap	Prostrate to decumbent herb, stems to 30 cm. Fl. yellow, Jan to Feb.	Sand. Edge of creek.	Likely	Nearest previous record (2007) ~700 m from the Project Area.	Likely	Suitable habitat and associated species occur within the Project Area, e.g. sandy creek edges with <i>Bauhinia cunninghamii</i> scattered low trees and grasses. Known records occur <1 km from the Project Area.
<i>Goodenia sepalosa</i> var. <i>glandulosa</i>	-	P3	DBCA 2021a, Woodman Environmental Consulting 2007	Prostrate to sprawling herb, 0.03-0.3 m high. Fl. yellow, Jan to Dec (mainly Apr-Jul).	Found in open woodland on red sand or loam. Midslope, very gentle.	Potential	Record of 1 plant (2011) ~13 km W of Project Area.	Likely	Suitable habitat and associated species occur within the Project Area, e.g. red sand or loams with <i>Bauhinia cunninghamii</i> open woodland over <i>Acacia tumida</i> var. <i>tumida</i> tall shrubland. A known record occurs <15 km from the Project Area.

Taxon	Conservation status		Source	Species Information*	Habitat information*	Pre-survey Likelihood	Pre-survey likelihood justification^	Post-survey likelihood	Post-survey likelihood justification
	EPBC Act	BC Act / DBCA							
<i>Nymphoides beaglensis</i>	-	P3	DBCA 2021a, Naturemap	Aquatic annual, herb. Fl. white/white-pink-purple, Mar to Jun.	In shallow freshwater. Edges of permanent waterholes or in seasonally inundated claypans & depressions.	Potential	Nearest record is 2 plants (1997) ~40 km N of Project Area.	Recorded	Species was recorded in a seasonally inundated depression within the Project Area from eight point-locations totalling 112 individuals.
<i>Phyllanthus fuernrohrii</i>	-	P3	DBCA 2021a	Low shrub to 1 m high, flowers green	While reasonably widespread in the Northern Territory, South Australia, Queensland and New South Wales, in Western Australia it is only known from a single collection in the Wingellina Hills.	Does not occur	Does not occur in most of WA except near the SA border - misidentified previously and should be <i>P. hamelinii</i> (Barrett and Telford 2015)	Does not occur	Does not occur within the Project Area. This name has previously been misapplied in Western Australia to specimens here recognised as <i>P. hamelinii</i> .
<i>Pterocaulon xenicum</i>	-	P3	DBCA 2021a	Perennial herb, to 0.5 m tall	Rocky or gravelly plains and slopes in <i>Acacia</i> shrubland over <i>Triodia</i> grassland	Unlikely	Nearest record (1952) ~80 km SE of the Project Area. Little suitable habitat in the Project Area.	Unlikely	Suitable habitat does not occur within the Project Area e.g. rocky or gravelly plains and slopes. Known records are scattered, with the majority occurring well to the south of the Project Area. The nearest record occurs approximately 80 km to the southeast of the Project Area associated with limestone outcropping.
<i>Schoenus punctatus</i>	-	P3	DBCA 2021a	Shortly rhizomatous, tufted perennial, grass-like or herb (sedge), ca 0.6 m high. Fl. brown, Aug.	Sand along watercourses in open eucalypt woodland.	Unlikely	Nearest record (2004) ~75 km E of the Project Area.	Unlikely	Marginal habitat may occur within the Project Area e.g. sand along watercourses in open eucalypt woodland. Known records are very sparse, with the majority occurring well to the northeast of the Project Area. The nearest record occurs approximately 75 km northeast of the Project Area

Taxon	Conservation status		Source	Species Information*	Habitat information*	Pre-survey Likelihood	Pre-survey likelihood justification^	Post-survey likelihood	Post-survey likelihood justification
	EPBC Act	BC Act / DBCA							
<i>Tephrosia pedleyi</i>	-	P3	DBCA 2021a	Prostrate, spreading or scrambling, shrub, spindly shrub (broom-like) or herb, flowers in June, July and August	Pindan sandplain, gently undulating sandplain. Very sparse open woodland.	Unlikely	Nearest record (1959) is ~75 km W of the Project Area.	Potential	Suitable habitat occurs within the Project Area, e.g. Pindan sandplain, very sparse open woodland. Known records are scattered to the south of the Project Area, the nearest being approximately 75 km to the southwest.
<i>Tephrosia rosea</i> var. Napier Range (C.R. Dunlop 7760 & B.K. Simon)	-	P3	DBCA 2021a	Erect, shrub, spindly shrub (broom-like) or herb, flowers in April.	Gritty, red clay soils, skeletal soils and between rock cracks, on plains and lower slopes of valleys. Eucalypt woodland over <i>Triodia</i> grassland.	Unlikely	Nearest records (1988, 1999) ~60 km NE of the Project Area. Little suitable habitat in the Project Area.	Unlikely	Suitable habitat does not occur within the Project Area e.g. gritty skeletal soils and slopes of valleys. Known records are scattered to the north and east of the Project Area, the nearest being approximately 60 km north east within the Devonian Reef Conservation Park.
<i>Tephrosia</i> sp. Mistake Creek (A.C. Beaglehole 54424)	-	P3	DBCA 2021a	Erect, shrub, spindly shrub (broom-like), flowers in May, July and November	Alluvial flats and in rocky stream beds; recorded as occurring in woodland of <i>Gyrocarpus</i> , <i>Terminalia</i> and <i>Bauhinia</i> .	Unlikely	Nearest record (2006) ~70 km NE of the Project Area.	Unlikely	Suitable habitat does not occur within the Project Area e.g. alluvial flats and rocky stream beds (limestone). Known records are scattered to the north and northeast of the Project Area, with the majority occurring >400 km away near Lake Argyle and Purnululu National Park. The nearest records occur approximately 70 km northeast of the Project Area, in a small cluster within the Napier Range associated with limestone outcrops.

Taxon	Conservation status		Source	Species Information*	Habitat information*	Pre-survey Likelihood	Pre-survey likelihood justification^	Post-survey likelihood	Post-survey likelihood justification
	EPBC Act	BC Act / DBCA							
<i>Triodia acutispicula</i>	-	P3	Woodman Environmental Consulting 2007	Tussock-forming perennial, grass-like or herb, 0.5-1.5 m high. Fl. cream-brown, Jan to Apr.	Sandy soils. River levees, pindan plains, rocky hillslopes & outcrops.	Potential	Nearest record (2010) ~200 km NE of the Project Area. However, Woodman Environmental Consulting 2007 shows a record of this species along Noonkanbah Rd <5 km from the Project Area. Suitable habitat may occur in the Project Area.	Unlikely	Marginal habitat may occur within the Project Area e.g. Pindan plains; however, the species tends to mostly occur on river levees and rocky hillslopes and outcrops. Although Woodman Environmental Consulting 2007 recorded this species <5 km from the Project Area, known information shows that the majority of populations occur well to the north of the Project Area (>300 km). The nearest record (DBCA and WAH 2021) occurs >200 km to the north east at Mornington Camp.
<i>Utricularia muelleri</i>	-	P3	DBCA 2021a, Naturemap	Floating aquatic perennial, herb. Fl. yellow-white, May to Jun.	Seasonal swamps.	Potential	Nearest record of a population (1997) ~40 km NW of Project Area.	Unlikely	Suitable habitat does not occur within the Project Area. Although standing water was present at the time of survey, this was result of sheet flow saturation, rather than presence of true swamp environments. The majority of known records occur well to the north of the Project Area, the nearest being approximately 40 km northeast within Lanlacatta Swamp.

*Species information available from DBCA and WAH 2021

^Species location information from DBCA 2021a

Appendix D Fauna likelihood of occurrence assessment

Species	Common name	Conservation status		Source	Habitat information	Pre-survey Likelihood	Pre-survey likelihood justification	Post-survey likelihood	Post-survey likelihood justification
		EPBC Act	BC Act / DBCA						
<i>Calidris ferruginea</i>	Curlew sandpiper	CR, IA	CR, IA	DBCA 2021a, PMST	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	Potential	Suitable habitat may be present for this species within the Project Area.	Unlikely	No suitable habitat for this species is present within the Project Area. A nearby record (2003) is located approximately 15 km to the west-southwest of the Project Area and is associated with the Fitzroy River.
<i>Numenius madagascariensis</i>	Eastern Curlew	CR, IA	CR, IA	PMST	Sheltered coasts, especially estuaries, bays, harbours, inlets and coastal lagoons, with large intertidal mudflats or sandflats, often with beds of seagrass	Unlikely	No suitable habitat for this species is present within the Project Area.	Unlikely	No habitat for this species is present within the Project Area.
<i>Pezoporus occidentalis</i>	Night Parrot	EN	CR	Unlikely	<i>Triodia</i> (Spinifex) grasslands and/or chenopod shrublands in the arid and semi-arid zones, and <i>Astrebla</i> spp. (Mitchell grass), shrubby samphire and chenopod associations, scattered trees and shrubs, <i>Acacia aneura</i> (Mulga) woodland, treeless areas and bare gibber.	Potential	Suitable habitat may be present for this species within the Project Area.	Unlikely	The closest confirmed record is over 400 km south-east of the Project Area.
<i>Malurus coronatus coronatus</i>	Purple-crowned fairy-wren (western)	EN	EN	DBCA 2021a, PMST	Dense, riparian vegetation in the wet-dry tropics of Western Australia and the Northern Territory. It is found near permanent rivers and springs (or associated billabongs and swamps), where it occupies dense thickets of <i>Pandanus aquaticus</i> or canegrass and also occurs, less frequently, in rushes and shrubs.	Potential	Suitable habitat may be present for this species within the Project Area.	Unlikely	No habitat for this species is present within the Project Area. Several historical records (1920 - 2000) 25 km east of the Project Area.

Species	Common name	Conservation status		Source	Habitat information	Pre-survey Likelihood	Pre-survey likelihood justification	Post-survey likelihood	Post-survey likelihood justification
		EPBC Act	BC Act / DBCA						
<i>Rostratula australis</i>	Australian Painted Snipe	EN	EN	PMST	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.	Potential	Suitable habitat may be present for this species within the Project Area.	Unlikely	No habitat for this species is present within the Project Area.
<i>Erythrura gouldiae</i>	Gouldian finch	EN	P4	DBCA 2021a, Naturemap, PMST	Feed on grass seeds, presence of <i>Sorghum plumosum</i> , <i>Chrysopogon fallax</i> , <i>Triodia schinzii</i> , <i>Sehima nervosum</i> .	Potential	Suitable habitat may be present for this species within the Project Area.	Potential	Potentially suitable habitat is present within the Project Area. Closest record is 30 km south of the Project Area from 2010.
<i>Petrogale lateralis</i> subsp. (West Kimberley)	West Kimberley black-footed rock-wallaby	VU	EN	DBCA 2021a, PMST	This species is known to occur on only a small number of scattered ranges and rocky outcrops in the West Kimberley. Species is likely to require woodlands dominated by <i>Eucalyptus</i> and <i>Corymbia</i> species with old and dead trees that have suitable nesting hollows	Unlikely	No suitable habitat for this species is present within the Project Area.	Unlikely	No habitat for this species is present within the Project Area. Three historical records (1901 and 1992) occur 30 km west of the Project Area.
<i>Falco hypoleucos</i>	Grey falcon	VU	VU	DBCA 2021a, PMST	It prefers timbered lowland plains (especially those that are acacia-dominated) which are interspersed with tree-lined watercourses. The majority of its habitat has an average rainfall of less than 500 mm but frequents other habitats including grassland and sand dune habitats.	Potential	Suitable habitat may be present for this species within the Project Area.	Potential	Marginally suitable habitat for this species occurs within the Project Area. Only one record 50 km south of the Project Area from 2002.
<i>Macroderma gigas</i>	Ghost bat	VU	VU	DBCA 2021a, PMST	Shrubland, rocky areas (eg. inland cliffs, mountain peaks), Forest, Caves and Subterranean Habitats (non-aquatic), Savanna.	Unlikely	No suitable habitat for this species is present within the Project Area.	Unlikely	No habitat for this species is present within the Project Area. Most recent record (2006) is 50 km north-east of the Project Area.

Species	Common name	Conservation status		Source	Habitat information	Pre-survey Likelihood	Pre-survey likelihood justification	Post-survey likelihood	Post-survey likelihood justification
		EPBC Act	BC Act / DBCA						
<i>Macrotis lagotis</i>	Bilby, dalgyte, ninu	VU	VU	DBCA 2021a, PMST	The remaining populations of the greater bilby occupy three main habitats: open tussock grassland on uplands and hills, <i>Acacia aneura</i> (mulga) woodland/shrubland growing on ridges and rises, and hummock grassland in plains and alluvial areas.	Likely	Suitable habitat may be present for this species within the Project Area. Nearby recent records located within 50 km of the Project Area.	Recorded	Diggings were recorded within the Project Area
<i>Pristis pristis</i>	Freshwater sawfish	VU	P3	DBCA 2021a, Naturemap, PMST	They inhabit the sandy or muddy bottoms of shallow coastal waters, estuaries and river mouths, as well as the central and upper reaches of freshwater rivers and isolated water holes, with records of large tooth sawfish up to 400 km inland	Unlikely	No suitable habitat for this species is present within the Project Area.	Unlikely	No habitat for this species is present within the Project Area. Records are confined to the Fitzroy River.
<i>Polytelis alexandrae</i>	Princess Parrot, Alexandra's Parrot	VU	P4	PMST	Sand dunes and sand flats in the arid zone of western and central Australia. It occurs in open savanna woodlands and shrublands that usually consist of scattered stands of <i>Eucalyptus</i> , <i>Casuarina</i> or <i>Allocasuarina</i> trees; an understorey of shrubs such as <i>Acacia</i> , <i>Cassia</i> , <i>Eremophila</i> , <i>Grevillea</i> , <i>Hakea</i> and <i>Senna</i> ; and a ground cover dominated by <i>Triodia</i> species. The species is usually recorded from shrubland in swales between sand dunes with sites having a variety of shrubs among scattered emergent trees and a groundcover of spinifex (<i>Triodia</i> sp.), and less often in woodland.	Unlikely	Project Area is at the northern extent of this species range, with most records confined to the Great Sandy Desert, Little Sandy Desert, Great Victoria Desert and Central Ranges bioregions. One historical record is located within 100 km of the Project Area.	Unlikely	Project Area is at the northern extent of this species range, with most records confined to the Great Sandy Desert, Little Sandy Desert, Great Victoria Desert and Central Ranges bioregions. One historical record is located within 100km of the Project Area.
<i>Actitis hypoleucos</i>	Common Sandpiper	IA	IA	DBCA 2021a, Naturemap	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.	Potential	Suitable habitat may be present for this species within the Project Area.	Potential	Two records from 2009 occur 10 km north of the project area. Sections of the project area are likely to provide marginally suitable habitat seasonally and after major rainfall events.

Species	Common name	Conservation status		Source	Habitat information	Pre-survey Likelihood	Pre-survey likelihood justification	Post-survey likelihood	Post-survey likelihood justification
		EPBC Act	BC Act / DBCA						
<i>Apus pacificus</i>	Fork-tailed swift	IA	IA	DBCA 2021a, Naturemap	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.	Potential	Suitable habitat may be present for this species within the Project Area.	Potential	This species occurs across a variety of habitats. One record from 2010 occurs 15 km west of the project area.
<i>Calidris acuminata</i>	Sharp-tailed sandpiper	IA	IA	DBCA 2021a, Naturemap	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.	Potential	Suitable habitat may be present for this species within the Project Area.	Potential	One record from 2009 occurs 10 km north of the project area. Sections of the project area are likely to provide marginally suitable habitat seasonally and after major rainfall events.
<i>Calidris melanotos</i>	Pectoral Sandpiper	IA	IA	PMST	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.	Potential	Suitable habitat may be present for this species within the Project Area.	Unlikely	No suitable habitat for this species is present within the Project Area.
<i>Calidris ruficollis</i>	Red-necked stint	IA	IA	DBCA 2021a	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.	Potential	Suitable habitat may be present for this species within the Project Area.	Unlikely	No suitable habitat for this species is present within the Project Area. A nearby record (2003) is located approximately 15 km to the west-southwest of the Project Area and is associated with the Fitzroy River.

Species	Common name	Conservation status		Source	Habitat information	Pre-survey Likelihood	Pre-survey likelihood justification	Post-survey likelihood	Post-survey likelihood justification
		EPBC Act	BC Act / DBCA						
<i>Calidris subminuta</i>	Long-toed Stint	IA	IA	DBCA 2021a	The Long-toed Stint occurs in a variety of terrestrial wetlands. They prefer shallow freshwater or brackish wetlands including lakes, swamps, river floodplains, streams, lagoons and sewage ponds. The species is also fond of areas of muddy shoreline, growths of short grass, weeds, sedges, low or floating aquatic vegetation, reeds, rushes and occasionally stunted samphire.	Potential	Suitable habitat may be present for this species within the Project Area.	Unlikely	No suitable habitat for this species is present within the Project Area. A nearby record (2003) is located approximately 15 km to the west-southwest of the Project Area and is associated with the Fitzroy River.
<i>Cecropis daurica</i>	Red-rumped Swallow	IA	IA	PMST	This species is found in open hilly country and mountains, river gorges, valleys, sea cliffs, as well as in cultivated areas and human habitations, including towns.	Unlikely	No suitable habitat for this species is present within the Project Area.	Unlikely	No suitable habitat for this species is present within the Project Area.
<i>Charadrius veredus</i>	Oriental plover	IA	IA	DBCA 2021a, Naturemap, PMST	Inhabit flat, open, semi-arid or arid grasslands, where the grass is short and sparse, and interspersed with hard, bare ground, such as claypans, dry paddocks, playing fields, lawns and cattle camps, or open areas that have been recently burnt. At the onset of the Wet Season, some may move into lightly wooded grasslands.	Potential	Suitable habitat may be present for this species within the Project Area.	Unlikely	One record from 2010 occurs 20 km west of the Project Area. Sections of the project area may provide marginally suitable habitat seasonally and after major rainfall events, however majority of records of this species are confined to coastal areas.
<i>Cuculus optatus</i>	Oriental Cuckoo	IA	IA	PMST	Forest, Monsoon forests; wet sclerophyll forests; paperbark swamps; mangroves.	Potential	Suitable habitat may be present for this species within the Project Area.	Unlikely	No habitat for this species is present within the Project Area.

Species	Common name	Conservation status		Source	Habitat information	Pre-survey Likelihood	Pre-survey likelihood justification	Post-survey likelihood	Post-survey likelihood justification
		EPBC Act	BC Act / DBCA						
<i>Gelochelidon nilotica</i>	Gull-billed tern	IA	IA	DBCA 2021a	It breeds in a variety of locations with bare or sparsely vegetated islands, banks, flats, or spits of dry mud and sand including barrier beaches (shoals), dunes, saltmarshes, salt pans, freshwater lagoons, estuaries, deltas, inland lakes, rivers, marshes and swamps.	Unlikely	No suitable habitat for this species is present within the Project Area.	Unlikely	No habitat for this species is present within the Project Area. Records are confined to the Fitzroy River.
<i>Glareola maldivarum</i>	Oriental pratincole	IA	IA	DBCA 2021a, Naturemap	Open plains, floodplains or short grassland (including farmland or airstrips), often with extensive bare areas. Terrestrial wetlands, such as billabongs, lakes or creeks, and artificial wetlands such as reservoirs, saltworks and sewage farms, especially around the margins. The species also occurs along the coast, inhabiting beaches, mudflats and islands, or around coastal lagoons.	Potential	Suitable habitat may be present for this species within the Project Area.	Unlikely	No habitat for this species is present within the Project Area. Only one record 50 km west of the Project Area from 2003.
<i>Hirundo rustica</i>	Barn Swallow	IA	IA	PMST	In Australia, the Barn Swallow is recorded in open country in coastal lowlands, often near water, towns and cities. Birds are often sighted perched on overhead wires, and also in or over freshwater wetlands, paperbark Melaleuca woodland, mesophyll shrub thickets and tussock grassland.	Potential	Suitable habitat may be present for this species within the Project Area.	Unlikely	No habitat for this species is present within the Project Area.
<i>Hydroprogne caspia</i>	Caspian Tern	IA	IA	DBCA 2021a, Naturemap	The Caspian Tern is mostly found in sheltered coastal embayment (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.	Potential	Suitable habitat may be present for this species within the Project Area.	Unlikely	No habitat for this species is present within the Project Area. Records are over 40 km away from the Project Area.

Species	Common name	Conservation status		Source	Habitat information	Pre-survey Likelihood	Pre-survey likelihood justification	Post-survey likelihood	Post-survey likelihood justification
		EPBC Act	BC Act / DBCA						
<i>Limicola falcinellus</i>	Broad-billed sandpiper	IA	IA	DBCA 2021a	The Broad-billed Sandpiper occurs in sheltered parts of the coast, favouring estuarine mudflats but also occasionally occur on saltmarshes, shallow freshwater lagoons, saltworks and sewage farms, and in areas with large soft intertidal mudflats, which may have shell or sandbanks nearby.	Unlikely	No suitable habitat for this species is present within the Project Area.	Unlikely	No habitat for this species is present within the Project Area. Only one record 50km west of the Project Area from 1979.
<i>Limosa limosa</i>	Black-tailed godwit	IA	IA	DBCA 2021a	The bar-tailed godwit occurs mainly in coastal habitats such as large intertidal sandflats, banks, mudflats, estuaries, inlets, harbours, coastal lagoons and bays. It has also been recorded in coastal sewage farms and saltworks, salt lakes and brackish wetlands near coasts, sandy ocean beaches, rock platforms, and coral reef-flats.	Unlikely	No suitable habitat for this species is present within the Project Area.	Unlikely	No habitat for this species is present within the Project Area. Only one record 10 km north of the Project Area associated with the Fitzroy River.
<i>Motacilla cinerea</i>	Grey Wagtail	IA	IA	PMST	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 where there are artificial waterfalls, weirs, millraces or lock gates.	Unlikely	No suitable habitat for this species is present within the Project Area.	Unlikely	No habitat for this species is present within the Project Area.
<i>Motacilla flava</i>	Yellow Wagtail	IA	IA	PMST	Range of damp or wet habitats with low vegetation, from damp meadows, marshes, waterside pastures, sewage farms and bogs to damp steppe and grassy tundra. In the north of its range it is also found in large forest clearings.	Potential	Suitable habitat may be present for this species within the Project Area.	Unlikely	No habitat for this species is present within the Project Area.
<i>Pandion cristatus</i>	Osprey, eastern osprey	IA	IA	DBCA 2021a, PMST	Eastern Ospreys occur in littoral and coastal habitats and terrestrial wetlands of tropical and temperate Australia and offshore islands. They are mostly found in coastal areas but occasionally travel inland along major rivers, particularly in northern Australia	Potential	Suitable habitat may be present for this species within the Project Area.	Unlikely	No habitat for this species is present within the Project Area. Records are over 50 km east and west of the Project Area associated with the Fitzroy River.

Species	Common name	Conservation status		Source	Habitat information	Pre-survey Likelihood	Pre-survey likelihood justification	Post-survey likelihood	Post-survey likelihood justification
		EPBC Act	BC Act / DBCA						
<i>Plegadis falcinellus</i>	Glossy ibis	IA	IA	DBCA 2021a, Naturemap	The Glossy Ibis' preferred habitat for foraging and breeding are freshwater marshes at the edges of lakes and rivers, lagoons, floodplains, 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.	Potential	Suitable habitat may be present for this species within the Project Area.	Potential	Several records surrounding the project area, with the closest occurring 10 km north. Marginal habitat for this species is present within the Project Area.
<i>Pluvialis fulva</i>	Pacific golden plover	IA	IA	DBCA 2021a, Naturemap	In Australia this species usually inhabits coastal habitats, though it occasionally occurs around inland wetlands. Pacific Golden Plovers usually occur on beaches, mudflats and sandflats (sometimes in vegetation such as mangroves, low saltmarsh such as Sarcocornia, or beds of seagrass) in sheltered areas including harbours, estuaries and lagoons, and also in evaporation ponds in saltworks.	Unlikely	No suitable habitat for this species is present within the Project Area.	Unlikely	No habitat for this species is present within the Project Area. Two historical records (1978 and 2003) occur over 50 km west and east of the Project Area.
<i>Tringa glareola</i>	Wood sandpiper	IA	IA	DBCA 2021a	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.	Potential	Suitable habitat may be present for this species within the Project Area.	Unlikely	No habitat for this species is present within the Project Area. Closest record is 10 km north of the Project Area associated with the Fitzroy River.

Species	Common name	Conservation status		Source	Habitat information	Pre-survey Likelihood	Pre-survey likelihood justification	Post-survey likelihood	Post-survey likelihood justification
		EPBC Act	BC Act / DBCA						
<i>Tringa nebularia</i>	Common greenshank	IA	IA	DBCAs 2021a, Naturemap, PMST	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 embayment, harbours, river estuaries, deltas and lagoons and are recorded less often in round tidal pools, rock-flats and rock platforms	Unlikely	No suitable habitat for this species is present within the Project Area.	Unlikely	No habitat for this species is present within the Project Area. Several records 30 km west of the Project Area from 2010.
<i>Tringa stagnatilis</i>	Marsh sandpiper	IA	IA	DBCAs 2021a, Naturemap, PMST	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.	Potential	Suitable habitat may be present for this species within the Project Area.	Unlikely	No habitat for this species is present within the Project Area. Only one record 50 km west of the Project Area.
<i>Mouldingia occidentalis</i>	A camaenid land snail (eastern Napier Ranges)	-	CR	DBCAs 2021a	No habitat information is available for this species	Unlikely	Records of this species are 60 km north-east of the Project Area. The most recent records are from 2014.	Unlikely	Records of this species are 60 km north-east of the Project Area. The most recent records are from 2014.
<i>Trichosurus vulpecula arnhemensis</i> (Kimberley)	Northern brushtail possum (Kimberley)	-	VU	DBCAs 2021a, Naturemap	It occurs mainly in tall eucalypt open forests with large hollow-bearing trees, particularly where the understorey includes some shrubs that bear fleshy fruits. However, the subspecies also occurs in some mangrove communities (especially where these contain hollow bearing trees).	Potential	Suitable habitat may be present for this species within the Project Area.	Unlikely	No habitat for this species is present within the Project Area. Only one record 50 km east of the Project Area from 1965.

Species	Common name	Conservation status		Source	Habitat information	Pre-survey Likelihood	Pre-survey likelihood justification	Post-survey likelihood	Post-survey likelihood justification
		EPBC Act	BC Act / DBCA						
<i>Westraltrachia alterna</i>	A camaenid land snail (McSherry Gap and Cyclad Hill)	-	VU	DBCA 2021a	No habitat information is available for this species	Unlikely	Records of this species are 60 km north-east of the Project Area. The most recent records are from 2014.	Unlikely	Records of this species are 60 km north-east of the Project Area. The most recent records are from 2014.
<i>Crocodylus johnstoni</i>	Australian freshwater crocodile	-	OS	DBCA 2021a, Naturemap	Various permanent freshwater areas such as lakes, billabongs and swamps, plus less saline upstream areas of river systems and creeks. Marginal populations are found in upstream sandstone escarpment country. Generally, not found near the coast, where the high salinity and competition with the more dominant <i>C. porosus</i> makes the habitat far less favourable.	Unlikely	No suitable habitat for this species is present within the Project Area. Majority of nearby records are confined to the Fitzroy River.	Unlikely	No suitable habitat for this species is present within the Project Area. Majority of nearby records are confined to the Fitzroy River.
<i>Falco peregrinus</i>	Peregrine falcon	-	OS	DBCA 2021a, Naturemap	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	Potential	Suitable habitat may be present for this species within the Project Area	Potential	This species occurs across a variety of habitats. Several records surround the project area.
<i>Anilius micromma</i>	Small-eyed blind snake (Leopold Downs)	-	P1	DBCA 2021a	Known from only one specimen, collected in 1924 at Leopold Downs Station in semi-arid sw. interior of the Kimberley, WA.	Unlikely	Species is known from two historical records (1900 and 1924) located 95 km east of the Project Area.	Unlikely	Species is known from two historical records (1900 and 1924) located 95 km east of the Project Area.
<i>Anilius troglodytes</i>	Sandamara blind snake (Napier Range)	-	P1	DBCA 2021a	Southern Kimberley, WA, from Napier Range to Kununurra. Tunnel Cave, Napier Range, Western Australia. No habitat information available.	Unlikely	Records of this species are historical (1975) and are located 85 km northeast of the Project Area.	Unlikely	Records of this species are historical (1975) and are located 85 km northeast of the Project Area.

Species	Common name	Conservation status		Source	Habitat information	Pre-survey Likelihood	Pre-survey likelihood justification	Post-survey likelihood	Post-survey likelihood justification
		EPBC Act	BC Act / DBCA						
<i>Hannia greenwayi</i>	Greenway's grunter	-	P1	DBCA 2021a, Naturemap	Freshwater streams.	Unlikely	Records are confined to the Fitzroy River.	Unlikely	Records are confined to the Fitzroy River. Creeklines are unlikely to remain inundated throughout the year and would be potentially unsuitable to support a population of this species within the Project Area.
<i>Lerista robusta</i>	Broad-eyed slider (Kimberley)	-	P1	DBCA 2021a	Arid grasslands south of St. George Ranges, southern interior of Kimberley. Known from one population.	Unlikely	Species is known from seven historical records (1989) located 75km south of the Project Area.	Unlikely	Species is known from seven historical records (1989) located 75km south of the Project Area.
<i>Pilsbrycharopa tumida</i>	A charopid land snail (Noonkanbah)	-	P1	DBCA 2021a	No habitat information is available for this species	Unlikely	One record of this species is 30km south of the Project Area in 1988.	Unlikely	One record of this species is 30km south of the Project Area in 1988.
<i>Craterocephalus lentiginosus</i>	Prince Regent hardyhead	-	P2	DBCA 2021a, Naturemap	Found only in the Kimberley region of north Western Australia. Freshwater streams, brackish water.	Potential	May occur within the Fitzroy River tributary occurring within the Project Area.	Unlikely	No habitat for this species is present within the Project Area. Records are confined to the Fitzroy River.
<i>Vespadelus douglasorum</i>	Yellow-lipped cave bat	-	P2	DBCA 2021a	Restricted to the Kimberley region and is widespread within this range. The areas in which they forage are streams running through tropical woodland, riparian zones dominated by pandanus and melaleuca trees within the 800 mm isohyet. They roost in limestone and sandstone caves in colonies.	Unlikely	Several historical records (1958 to 1982) 70 km east of the Project Area.	Unlikely	No habitat for this species is present within the Project Area. Several historical records (1958 to 1982) 70 km east of the Project Area.

Species	Common name	Conservation status		Source	Habitat information	Pre-survey Likelihood	Pre-survey likelihood justification	Post-survey likelihood	Post-survey likelihood justification
		EPBC Act	BC Act / DBCA						
<i>Westraltrachia lievrena</i>	Le Lievre Ridge camaenid land snail	-	P2	DBCA 2021a	No habitat information is available for this species.	Unlikely	Nearby records are historical.	Unlikely	Two records of this species are 40 km north-east of the Project Area from 1976 and 1986.
<i>Westraltrachia subtila</i>	A camaenid land snail (Ninety Seven Mile Creek)	-	P2	DBCA 2021a	No habitat information is available for this species.	Unlikely	Nearby records are historical.	Unlikely	One record of this species is 60km north-east of the Project Area from 1977.
<i>Ctenotus johnstonei</i>	<i>uber</i> Spotted ctenotus (northeast)	-	P2	DBCA 2021a, Naturemap	The <i>Ctenotus uber</i> group is known to prefer the hard, reddish soils. This skink is known from the arid interior of Western Australia.	Potential	Suitable habitat may be present for this species within the Project Area.	Potential	Several records recorded 15 km west of the project area between 2009 and 2011 and suitable habitat present within the project area.
<i>Petropseudes dahli</i>	Rock ringtail possum, wogoit	-	P3	DBCA 2021a	Rock ringtail possums live in rocky, sandstone outcrops where they are sheltered during the day. At night they move out of their sheltered rock crevices to feed in the trees within the area, often traveling no further than 10 m from their dens. These rocky areas usually are surrounded by flatter, lowland areas. The rocky encampments have increased water holding potential and are sometimes flooded in areas.	Potential	Suitable habitat may be present for this species within the Project Area.	Unlikely	No habitat for this species is present within the Project Area. Only one record 50 km north of the Project Area.
<i>Rhinonicteris aurantia</i>	Orange leaf-nosed bat	-	P4	DBCA 2021a	Tropical woodland to semi-arid grasslands. During the dry season it roosts in caves, sometimes in large numbers, and disperses in the wet, using other roosts. This species is very selective in choosing hot, humid roosting sites.	Unlikely	Nearby records of this species are historical (1965 to 1980), occurring 40 km north of the Project Area.	Unlikely	No habitat for this species is present within the Project Area. Historical records (1965 to 1980) 40 km north of the Project Area.

Species	Common name	Conservation status		Source	Habitat information	Pre-survey Likelihood	Pre-survey likelihood justification	Post-survey likelihood	Post-survey likelihood justification
		EPBC Act	BC Act / DBCA						
<i>Lagorchestes conspicillatus leichardti</i>	Spectacled hare-wallaby (mainland)	-	P4	DBCA 2021a, Naturemap	Open forests, open woodland, tall shrublands, tussock grasslands and hummock grasslands.	Potential	Suitable habitat may be present for this species within the Project Area.	Unlikely	No habitat for this species is present within the Project Area. Closest record is 25 km east from 2011 and only moderately certain.
<i>Leggadina lakedownensis</i>	Northern short-tailed mouse, Lakeland Downs mouse, kerakenga	-	P4	DBCA 2021a, Naturemap	Northern Short-tailed Mice occupy a diverse range of environments from the monsoon tropical coast to semi-arid climates, including spinifex and tussock grasslands, samphire and sedgeland, <i>Acacia</i> shrub-lands, tropical <i>Eucalyptus</i> and <i>Melaleuca</i> woodlands and stony ranges. Most habitats, however, are seasonally inundated on red or white sandy-clay soils.	Potential	Suitable habitat may be present for this species within the Project Area	Potential	Two records recorded 15 km west of the project area in 2011 and suitable habitat present.

Appendix E Flora species by site matrix

Quadrats 1-32

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	ELA27	ELA28	ELA29	ELA30	ELA31	ELA32		
Acanthaceae	<i>Rostellularia adscendens</i> var. <i>clementii</i>										X	X	X																						
Aizoaceae	* <i>Trianthema pilosum</i>															X											X								
Aizoaceae	<i>Trianthema oxycalyptum</i> var. <i>oxycalyptum</i>																																		
Amaranthaceae	<i>Achyranthes aspera</i>																																		
Amaranthaceae	<i>Alternanthera angustifolia</i>							X													X														
Amaranthaceae	<i>Alternanthera nana</i>							X																											
Amaranthaceae	<i>Amaranthus mitchellii</i>																																		
Amaranthaceae	<i>Amaranthus undulatus</i>																														X				
Amaranthaceae	<i>Gomphrena brachystylis</i> subsp. <i>pindanensis</i>																										X	X							
Amaranthaceae	<i>Gomphrena canescens</i>	X	X	X		X	X	X	X					X		X	X	X	X	X	X	X	X	X	X	X			X	X	X		X		
Amaranthaceae	<i>Gomphrena occulta</i>																																		
Amaranthaceae	<i>Ptilotus calostachyus</i>	X	X																X																
Amaranthaceae	<i>Ptilotus corymbosus</i>		X																	X		X					X	X	X						
Amaranthaceae	<i>Ptilotus fusiformis</i>																										X					X			
Apocynaceae	* <i>Calotropis procera</i>																				X														
Apocynaceae	<i>Carissa lanceolata</i>			X		X		X	X	X		X	X	X		X				X	X					X	X		X	X	X	X	X		
Apocynaceae	<i>Gymnanthera oblonga</i>																													X					
Asteraceae	<i>Blumea integrifolia</i>																																		X
Asteraceae	<i>Blumea tenella</i>							X																											X
Asteraceae	<i>Pluchea tetranthera</i>		X	X				X	X			X		X		X			X		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Asteraceae	<i>Pterocaulon intermedium</i>																									X				X	X	X			
Asteraceae	<i>Pterocaulon serrulatum</i> var. <i>velutinum</i>								X											X								X		X	X				X
Asteraceae	<i>Pterocaulon</i> sp.													X														X							
Bignoniaceae	<i>Dolichandrone occidentalis</i>		X			X	X	X						X					X			X				X			X						
Boraginaceae	<i>Ehretia saligna</i>	X						X																							X				
Boraginaceae	<i>Heliotropium cunninghamii</i>																										X		X						
Boraginaceae	<i>Heliotropium diversifolium</i>																						X	X	X										
Boraginaceae	<i>Heliotropium foliatum</i>																							X		X									
Boraginaceae	<i>Heliotropium</i> sp.					X																													
Boraginaceae	<i>Trichodesma zeylanicum</i> var. <i>zeylanicum</i>					X	X												X	X	X				X				X	X	X	X	X		
Byblidaceae	<i>Byblis filifolia</i>																										X								
Capparaceae	<i>Capparis lasiantha</i>																																		
Caryophyllaceae	<i>Polycarpaea corymbosa</i>			X	X																								X						
Caryophyllaceae	<i>Polycarpaea holtzei</i>																																		
Caryophyllaceae	<i>Polycarpaea longiflora</i>																																		
Celastraceae	<i>Stackhousia intermedia</i>																																X	X	
Cleomaceae	<i>Arivela tetrandra</i>																										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	ELA27	ELA28	ELA29	ELA30	ELA31	ELA32		
Cleomaceae	<i>Arivela viscosa</i>																							X								X	X		
Combretaceae	<i>Terminalia canescens</i>																							X	X		X	X	X			X			
Combretaceae	<i>Terminalia platyphylla</i>										X	X	X								X														
Commelinaceae	<i>Murdannia graminea</i>															X																			
Convolvulaceae	? <i>Opeculina</i> sp.																																		
Convolvulaceae	<i>Bonamia linearis</i>					X	X	X									X	X																	
Convolvulaceae	<i>Bonamia pannosa</i>																	X	X																
Convolvulaceae	<i>Evolvulus alsinoides</i>													X							X		X					X					X		
Convolvulaceae	<i>Evolvulus alsinoides</i> var. <i>decumbens</i>				X																			X	X										
Convolvulaceae	<i>Evolvulus alsinoides</i> var. <i>villosicalyx</i>																							X											
Convolvulaceae	<i>Ipomoea coptica</i>																																X		
Convolvulaceae	<i>Ipomoea costata</i>										X																								
Convolvulaceae	<i>Ipomoea eriocarpa</i>																					X													
Convolvulaceae	<i>Ipomoea plebeia</i>												X																						
Convolvulaceae	<i>Ipomoea polymorpha</i>																																		
Convolvulaceae	<i>Polymeria ambigua</i>	X		X	X					X	X	X	X	X	X			X		X				X	X	X		X		X	X	X			
Cucurbitaceae	<i>Cucumis melo</i>																	X																	
Cucurbitaceae	<i>Cucumis picriocarpus</i>									X																									
Cucurbitaceae	<i>Cucumis variabilis</i>																													X					
Cyperaceae	<i>Cyperaceae</i> sp.											X																							
Cyperaceae	<i>Cyperus blakeanus</i>			X																													X		
Cyperaceae	<i>Cyperus latzii</i>																																		
Cyperaceae	<i>Cyperus pulchellus</i>																																		
Cyperaceae	<i>Cyperus</i> sp.																																		
Cyperaceae	<i>Fimbristylis ferruginea</i>													X	X	X																			
Cyperaceae	<i>Fimbristylis schultzi</i>									X																								X	
Cyperaceae	<i>Schoenoplectiella lateriflora</i> var. <i>lateriflora</i>																																		
Droseraceae	<i>Drosera derbyensis</i>		X																															X	
Elatinaceae	<i>Bergia henschallii</i>																																		
Elatinaceae	<i>Bergia trimera</i>																					X													
Eriocaulaceae	<i>Eriocaulon cinereum</i>																																		
Euphorbiaceae	<i>Euphorbia cinerea</i>																																		
Euphorbiaceae	<i>Euphorbia psilosperma</i>	X	X									X																						X	
Euphorbiaceae	<i>Euphorbia schultzi</i> var. <i>comans</i>				X	X	X													X		X	X	X		X				X					
Euphorbiaceae	<i>Euphorbia trigonosperma</i>																																		
Fabaceae	* <i>Stylosanthes hamata</i>				X	X	X	X	X				X	X	X					X		X					X	X	X	X				X	
Fabaceae	* <i>Vachellia farnesiana</i>										X	X	X																						
Fabaceae	<i>Acacia ancistrocarpa</i>							X												X		X	X	X	X		X	X						X	
Fabaceae	<i>Acacia coleii</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	X	X	X	X	X
Fabaceae	<i>Acacia eriopoda</i>			X	X																														
Fabaceae	<i>Acacia inaequilatera</i>																																		
Fabaceae	<i>Acacia platycarpa</i>		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	ELA27	ELA28	ELA29	ELA30	ELA31	ELA32	
Fabaceae	<i>Acacia synchronicia</i>																																	
Fabaceae	<i>Acacia tumida</i>																																	
Fabaceae	<i>Alysicarpus muelleri</i>													X												X	X	X						
Fabaceae	<i>Bauhinia cunninghamii</i>	X			X			X	X	X	X	X				X			X	X	X	X		X	X	X	X	X	X	X	X	X		
Fabaceae	<i>Cajanus latisepalus</i>																												X					
Fabaceae	<i>Cajanus marmoratus</i>	X	X				X												X		X		X	X	X				X			X		
Fabaceae	<i>Chamaecrista symonii</i>																	X															X	
Fabaceae	<i>Crotalaria brevis</i>																						X	X				X						
Fabaceae	<i>Crotalaria cunninghamii</i>				X				X																				X					
Fabaceae	<i>Crotalaria medicaginea</i> var. <i>neglecta</i>										X	X												X				X		X				
Fabaceae	<i>Crotalaria montana</i> var. <i>angustifolia</i>								X				X		X																			
Fabaceae	<i>Crotalaria ramosissima</i>					X	X	X										X			X												X	
Fabaceae	<i>Cullen badocanum</i>					X																X	X									X		
Fabaceae	<i>Cullen corallum</i>															X																		
Fabaceae	<i>Dichrostachys spicata</i>																																	
Fabaceae	<i>Glycine tomentella</i>																										X							
Fabaceae	<i>Grona filiformis</i>																																	
Fabaceae	<i>Indigofera colutea</i>		X								X								X		X				X	X		X	X	X	X	X	X	
Fabaceae	<i>Indigofera hirsuta</i>																																	
Fabaceae	<i>Indigofera linifolia</i>		X						X	X			X						X		X			X			X	X	X	X	X	X	X	
Fabaceae	<i>Indigofera linnaei</i>					X	X		X				X	X					X							X	X	X				X	X	
Fabaceae	<i>Indigofera trita</i>																																	
Fabaceae	<i>Neptunia gracilis</i> forma. <i>gracilis</i>												X												X								X	
Fabaceae	<i>Rhynchosia minima</i>											X												X	X	X		X					X	
Fabaceae	<i>Senna artemisioides</i> subsp. <i>Oligophylla</i>																																	
Fabaceae	<i>Senna costata</i>		X																															
Fabaceae	<i>Senna notabilis</i>				X	X			X																			X						
Fabaceae	<i>Sesbania cannabina</i>																																	
Fabaceae	<i>Tephrosia leptoclada</i>						X																											
Fabaceae	<i>Tephrosia remotiflora</i>	X																																
Fabaceae	<i>Tephrosia rosea</i>				X																													
Fabaceae	<i>Zornia chaetophora</i>																																	X
Fabaceae	<i>Zornia prostrata</i> var. <i>prostrata</i>						X	X	X				X											X						X	X			
Fabaceae	<i>Zornia</i> sp.					X																												
Fabaceae	<i>Erythrophleum chlorostachys</i>	X	X																															
Goodeniaceae	<i>Goodenia armitiana</i>					X	X	X	X							X							X									X		
Goodeniaceae	<i>Goodenia lamprosperma</i>																																	
Goodeniaceae	<i>Goodenia sepalosa</i> var. <i>sepalosa</i>		X			X			X				X	X											X		X	X	X				X	
Goodeniaceae	<i>Goodenia</i> sp.		X																															
Hemerocallidaceae	<i>Corynotheca micrantha</i>																																	
Hernandiaceae	<i>Gyrocarpus americanus</i>					X												X			X													
Lamiaceae	<i>Clerodendrum ?floribundum</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	ELA27	ELA28	ELA29	ELA30	ELA31	ELA32	
Lauraceae	<i>Cassytha filiformis</i>	X	X																															
Linderniaceae	<i>Lindernia chrysoplectra</i>																																	
Linderniaceae	<i>Lindernia clausa</i>																										X	X				X		
Loganiaceae	<i>Mitrasacme exserta</i>						X																	X		X	X	X	X					
Loganiaceae	<i>Mitrasacme hispida</i>																									X	X							
Loganiaceae	<i>Mitrasacme lutea</i>																																	
Malvaceae	<i>*Malvastrum americanum</i>										X																							
Malvaceae	<i>*Melochia pyramidata</i>							X																										
Malvaceae	<i>Abutilon hannii</i>																											X	X	X				
Malvaceae	<i>Abutilon lepidum</i>																																	
Malvaceae	<i>Abutilon otocarpum</i>					X														X	X	X											X	
Malvaceae	<i>Abutilon</i> sp.							X																										
Malvaceae	<i>Abutilon</i> sp. Dioicum (A.A. Mitchell PRP 1618)																					X												
Malvaceae	<i>Adansonia gregorii</i>			X		X	X	X	X		X	X	X		X	X	X			X									X	X	X			
Malvaceae	<i>Corchorus fascicularis</i>									X		X		X													X	X					X	
Malvaceae	<i>Corchorus sidoides</i> subsp. <i>sidoides</i>	X	X	X	X	X		X										X	X	X	X			X	X	X			X	X				
Malvaceae	<i>Corchorus sidoides</i> subsp. <i>vermicularis</i>						X	X		X		X	X						X							X	X					X	X	
Malvaceae	<i>Gossypium australe</i>					X		X	X				X		X		X			X		X			X	X	X	X	X	X	X	X	X	
Malvaceae	<i>Hibiscus austrinus</i>									X																								
Malvaceae	Malvaceae sp.									X	X	X	X																					
Malvaceae	<i>Melhania oblongifolia</i>																																	
Malvaceae	<i>Sida</i> aff. <i>fibulifera</i>																																	
Malvaceae	<i>Sida fibulifera</i>										X																							
Malvaceae	<i>Waltheria indica</i>							X											X															
Marsileaceae	<i>Marsilea hirsuta</i>																																	
Menispermaceae	<i>Tinospora smilacina</i>	X	X	X											X						X						X							
Menyanthaceae	<i>Nymphoides beaglesensis</i> (P3)																																	
Molluginaceae	<i>Trigastrotheca molluginea</i>					X																												
Montiaceae	<i>Calandrinia</i> sp.																																	
Montiaceae	<i>Calandrinia strophiolata</i>	X	X																															
Montiaceae	<i>Calandrinia tepperiana</i>																																	
Myrtaceae	<i>Corymbia bella</i>													X																				
Myrtaceae	<i>Corymbia greeniana</i>	X	X	X	X		X	X	X				X		X	X	X	X					X	X	X									
Myrtaceae	<i>Corymbia zygophylla</i>																			X														
Myrtaceae	<i>Eucalyptus camaldulensis</i>										X	X																						
Myrtaceae	<i>Eucalyptus chlorophylla</i>			X			X		X																									
Myrtaceae	<i>Eucalyptus coolabah</i>		X					X							X																			
Myrtaceae	<i>Eucalyptus microtheca</i>									X	X	X	X																					
Myrtaceae	<i>Eucalyptus tectifera</i>												X																					
Myrtaceae	<i>Lophostemon grandiflorus</i> subsp. <i>riparius</i>																																	
Myrtaceae	<i>Melaleuca alsophila</i>														X	X																		
Nyctaginaceae	<i>Boerhavia coccinea</i>	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	ELA27	ELA28	ELA29	ELA30	ELA31	ELA32		
Orobanchaceae	<i>Buchnera asperata</i>					X	X	X	X																										
Orobanchaceae	<i>Buchnera ramosissima</i>					X	X																				X	X	X	X					
Orobanchaceae	<i>Striga curviflora</i>						X																X												
Pedaliaceae	<i>Josephinia papillosa</i>																																		
Phrymaceae	<i>Peplidium muelleri</i>		X					X	X					X		X																			
Phrymaceae	<i>Uvedalia linearis</i> var. <i>linearis</i>																																		
Phyllanthaceae	<i>Flueggea virosa</i> subsp. <i>melanthesoides</i>							X																											
Phyllanthaceae	<i>Phyllanthus maderaspatensis</i>	X	X					X		X	X	X	X	X											X	X	X	X	X			X			
Plantaginaceae	<i>Stemodia lathraia</i>							X																											
Poaceae	* <i>Cenchrus setiger</i>																										X	X							
Poaceae	? <i>Austrostipa</i> sp.																		X																
Poaceae	<i>Aristida holathera</i>	X	X	X	X		X																					X				X			
Poaceae	<i>Aristida hygrometrica</i>	X			X			X						X	X	X				X									X			X			
Poaceae	<i>Aristida latifolia</i>				X					X	X	X	X					X	X		X		X			X							X		
Poaceae	<i>Chrysopogon fallax</i>	X	X					X													X												X		
Poaceae	<i>Cymbopogon ambiguus</i>																																	X	
Poaceae	<i>Cynodon convergens</i>				X	X						X																							
Poaceae	<i>Dactyloctenium radulans</i>																																	X	
Poaceae	<i>Enneapogon pallidus</i>																				X														
Poaceae	<i>Enneapogon purpurascens</i>																			X															
Poaceae	<i>Eragrostis cumingii</i>																																		
Poaceae	<i>Eragrostis eriopoda</i>	X																						X	X			X							
Poaceae	<i>Eragrostis exigua</i>													X																					
Poaceae	<i>Eragrostis tenellula</i>																																		
Poaceae	<i>Eriachne glauca</i>																																		
Poaceae	<i>Eriachne helmsii</i>																																		
Poaceae	<i>Eriachne melicacea</i>																																		
Poaceae	<i>Eriachne obtusa</i>					X	X	X	X					X	X	X	X	X	X	X	X	X	X	X			X	X	X	X	X	X	X	X	
Poaceae	<i>Eriachne pindanica</i>																																		
Poaceae	<i>Eulalia aurea</i>							X																			X								
Poaceae	<i>Panicum decompositum</i>				X			X							X	X												X			X	X			
Poaceae	<i>Panicum effusum</i>																																		
Poaceae	<i>Perotis rara</i>																											X	X					X	
Poaceae	Poaceae sp. 1 (sterile)					X																													
Poaceae	Poaceae sp. 2 (sterile)							X																											
Poaceae	Poaceae sp. 3 (sterile)																																		
Poaceae	<i>Sehima nervosum</i>									X	X	X	X									X			X	X			X						
Poaceae	<i>Setaria surgens</i>																																		
Poaceae	<i>Sorghum plumosum</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	X	X	
Poaceae	<i>Sorghum stipoideum</i>																				X														
Poaceae	<i>Sporobolus australasicus</i>				X	X		X	X	X	X																X	X	X	X			X	X	
Poaceae	<i>Triodia bitextura</i>	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	ELA27	ELA28	ELA29	ELA30	ELA31	ELA32		
Poaceae	<i>Triodia epactia</i>																																		
Poaceae	<i>Triodia intermedia</i>					X		X																X	X	X	X	X	X	X	X	X	X		
Poaceae	<i>Triodia</i> sp.																	X			X														
Poaceae	<i>Triodia wiseana</i>																																	X	
Poaceae	<i>Urochloa holosericea</i>																																	X	
Poaceae	<i>Urochloa occidentalis</i> var. <i>occidentalis</i>											X																							
Poaceae	<i>Xerochloa barbata</i>																																		
Polygalaceae	<i>Polygala galeocephala</i>			X										X									X		X	X				X					
Polygalaceae	<i>Polygala tepperi</i>	X	X																					X	X										
Portulacaceae	* <i>Portulaca oleracea</i>				X								X																					X	
Portulacaceae	* <i>Portulaca pilosa</i>																							X	X		X	X	X	X	X	X	X		
Portulacaceae	<i>Portulaca digyna</i>				X										X																			X	
Portulacaceae	<i>Portulaca oligosperma</i>									X																									
Proteaceae	<i>Grevillea pyramidalis</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		
Proteaceae	<i>Grevillea wickhamii</i>	X																																	
Proteaceae	<i>Hakea arborescens</i>				X			X			X	X	X	X	X	X			X			X		X					X	X	X				
Proteaceae	<i>Hakea chordophylla</i>				X	X	X	X					X										X				X						X		
Proteaceae	<i>Hakea macrocarpa</i>					X	X	X														X		X	X	X	X		X	X	X				
Rubiaceae	<i>Psyrax</i> sp.																																		
Rubiaceae	<i>Scleromitron scleranthoides</i>																							X											
Rubiaceae	<i>Spermacoce occidentalis</i>									X	X	X	X	X					X								X	X	X	X			X		
Santalaceae	<i>Santalum lanceolatum</i>											X																							
Sapindaceae	<i>Atalaya hemiglauca</i>	X							X		X	X	X							X	X				X	X			X	X	X			X	
Sapindaceae	<i>Cardiospermum halicacabum</i> var. <i>halicacabum</i>										X		X																						
Sapindaceae	<i>Dodonaea hispidula</i> var. <i>arida</i>																																		
Solanaceae	<i>Solanum quadriloculatum</i>				X																														
Thymelaeaceae	<i>Pimelea punicea</i>																																		
Violaceae	<i>Afrohybanthus aurantiacus</i>																																		
Violaceae	<i>Afrohybanthus enneaspermus</i>										X																				X			X	
Zygophyllaceae	<i>Roepera</i> sp.																																		X

Quadrats 33-64

Family	Species	ELA33	ELA34	ELA35	ELA36	ELA37	ELA38	ELA39	ELA40	ELA41	ELA42	ELA43	ELA44	ELA45	ELA46	ELA47	ELA48	ELA49	ELA50	ELA51	ELA52	ELA53	ELA54	ELA55	ELA56	ELA57	ELA58	ELA59	ELA60	ELA61	ELA62	ELA63	ELA64		
Acanthaceae	<i>Rostellularia adscendens</i> var. <i>clementii</i>																																		
Aizoaceae	* <i>Trianthema pilosum</i>										X		X					X			X			X								X			
Aizoaceae	<i>Trianthema oxycalyptum</i> var. <i>oxycalyptum</i>		X		X																														
Amaranthaceae	<i>Achyranthes aspera</i>																												X						

Family	Species	ELA33	ELA34	ELA35	ELA36	ELA37	ELA38	ELA39	ELA40	ELA41	ELA42	ELA43	ELA44	ELA45	ELA46	ELA47	ELA48	ELA49	ELA50	ELA51	ELA52	ELA53	ELA54	ELA55	ELA56	ELA57	ELA58	ELA59	ELA60	ELA61	ELA62	ELA63	ELA64	
Convolvulaceae	<i>Evolvulus alsinoides</i> var. <i>villosicalyx</i>															X	X							X		X								
Convolvulaceae	<i>Ipomoea coptica</i>		X		X																													
Convolvulaceae	<i>Ipomoea costata</i>																																	
Convolvulaceae	<i>Ipomoea eriocarpa</i>																																	
Convolvulaceae	<i>Ipomoea plebeia</i>																																	
Convolvulaceae	<i>Ipomoea polymorpha</i>																															X		
Convolvulaceae	<i>Polymeria ambigua</i>	X					X	X	X	X	X	X							X	X	X		X	X			X	X		X	X			
Cucurbitaceae	<i>Cucumis melo</i>						X																									X		
Cucurbitaceae	<i>Cucumis picriocarpus</i>																																	
Cucurbitaceae	<i>Cucumis variabilis</i>																																	
Cyperaceae	<i>Cyperaceae</i> sp.																																	
Cyperaceae	<i>Cyperus blakeanus</i>															X		X																
Cyperaceae	<i>Cyperus latzii</i>																								X									
Cyperaceae	<i>Cyperus pulchellus</i>																																X	
Cyperaceae	<i>Cyperus</i> sp.						X																											
Cyperaceae	<i>Fimbristylis ferruginea</i>												X		X																		X	
Cyperaceae	<i>Fimbristylis schultzii</i>		X	X	X			X	X	X																								X
Cyperaceae	<i>Schoenoplectiella lateriflora</i> var. <i>lateriflora</i>																																X	
Droseraceae	<i>Drosera derbyensis</i>												X																					
Elatinaceae	<i>Bergia henshallii</i>									X						X																		
Elatinaceae	<i>Bergia trimera</i>																	X																
Eriocaulaceae	<i>Eriocaulon cinereum</i>																																X	
Euphorbiaceae	<i>Euphorbia cinerea</i>	X																															X	
Euphorbiaceae	<i>Euphorbia psilosperma</i>	X						X	X	X	X	X	X	X	X		X	X		X	X	X	X		X									
Euphorbiaceae	<i>Euphorbia schultzii</i> var. <i>comans</i>				X							X							X		X						X			X	X			
Euphorbiaceae	<i>Euphorbia trigonosperma</i>					X																												
Fabaceae	* <i>Stylosanthes hamata</i>		X								X																							X
Fabaceae	* <i>Vachellia farnesiana</i>				X					X														X	X		X							
Fabaceae	<i>Acacia ancistrocarpa</i>																					X											X	
Fabaceae	<i>Acacia colei</i>									X	X				X								X	X		X								
Fabaceae	<i>Acacia eriopoda</i>																																	
Fabaceae	<i>Acacia inaequilatera</i>							X																										
Fabaceae	<i>Acacia platycarpa</i>										X		X							X								X		X	X			
Fabaceae	<i>Acacia synchronicia</i>				X	X	X																											
Fabaceae	<i>Acacia tumida</i>																		X	X	X	X					X	X	X	X	X			
Fabaceae	<i>Alysicarpus muelleri</i>													X																				
Fabaceae	<i>Bauhinia cunninghamii</i>						X			X	X		X						X	X	X		X				X		X					
Fabaceae	<i>Cajanus latisepalus</i>																																	
Fabaceae	<i>Cajanus marmoratus</i>			X			X	X	X	X	X		X	X				X		X	X	X					X			X	X			
Fabaceae	<i>Chamaecrista symonii</i>		X	X	X	X													X		X							X						
Fabaceae	<i>Crotalaria brevis</i>						X			X		X		X																				
Fabaceae	<i>Crotalaria cunninghamii</i>										X																					X		

Family	Species	ELA33	ELA34	ELA35	ELA36	ELA37	ELA38	ELA39	ELA40	ELA41	ELA42	ELA43	ELA44	ELA45	ELA46	ELA47	ELA48	ELA49	ELA50	ELA51	ELA52	ELA53	ELA54	ELA55	ELA56	ELA57	ELA58	ELA59	ELA60	ELA61	ELA62	ELA63	ELA64
Fabaceae	<i>Crotalaria medicaginea</i> var. <i>neglecta</i>	X					X	X	X	X			X											X								X	
Fabaceae	<i>Crotalaria montana</i> var. <i>angustifolia</i>				X																												
Fabaceae	<i>Crotalaria ramosissima</i>		X																														
Fabaceae	<i>Cullen badocanum</i>				X	X																											
Fabaceae	<i>Cullen corallum</i>																																
Fabaceae	<i>Dichrostachys spicata</i>					X	X																										
Fabaceae	<i>Glycine tomentella</i>											X																					
Fabaceae	<i>Grona filiformis</i>		X	X											X						X			X									
Fabaceae	<i>Indigofera colutea</i>	X				X	X	X	X	X	X	X		X		X																	
Fabaceae	<i>Indigofera hirsuta</i>																							X	X								
Fabaceae	<i>Indigofera linifolia</i>	X	X	X	X	X	X	X	X				X			X					X	X			X		X					X	
Fabaceae	<i>Indigofera linnaei</i>	X	X			X		X																								X	
Fabaceae	<i>Indigofera trita</i>			X																													
Fabaceae	<i>Neptunia gracilis</i> forma. <i>gracilis</i>	X								X																							
Fabaceae	<i>Rhynchosia minima</i>	X					X	X	X	X						X																	
Fabaceae	<i>Senna artemisioides</i> subsp. <i>Oligophylla</i>									X																							
Fabaceae	<i>Senna costata</i>											X																X					
Fabaceae	<i>Senna notabilis</i>							X	X		X										X		X			X				X			
Fabaceae	<i>Sesbania cannabina</i>																								X							X	
Fabaceae	<i>Tephrosia leptoclada</i>									X																							
Fabaceae	<i>Tephrosia remotiflora</i>																																
Fabaceae	<i>Tephrosia rosea</i>							X	X											X	X									X	X		
Fabaceae	<i>Zornia chaetophora</i>																															X	
Fabaceae	<i>Zornia prostrata</i> var. <i>prostrata</i>																										X			X			
Fabaceae	<i>Zornia</i> sp.																																
Fabaceae	<i>Erythrophleum chlorostachys</i>																X	X	X	X	X	X	X									X	
Goodeniaceae	<i>Goodenia armitiana</i>																											X		X			
Goodeniaceae	<i>Goodenia lamprosperma</i>															X																	
Goodeniaceae	<i>Goodenia sepalosa</i> var. <i>sepalosa</i>	X		X			X	X	X					X			X						X							X			
Goodeniaceae	<i>Goodenia</i> sp.																					X											
Hemerocallidaceae	<i>Corynotheca micrantha</i>																											X					
Hernandiaceae	<i>Gyrocarpus americanus</i>											X	X							X							X		X	X			
Lamiaceae	<i>Clerodendrum ?floribundum</i>																																
Lauraceae	<i>Cassytha filiformis</i>		X		X		X	X		X	X								X	X				X					X				
Linderniaceae	<i>Lindernia chrysopletra</i>																																X
Linderniaceae	<i>Lindernia clausa</i>																																
Loganiaceae	<i>Mitrasacme exserta</i>	X																															
Loganiaceae	<i>Mitrasacme hispida</i>																																
Loganiaceae	<i>Mitrasacme lutea</i>																																X
Malvaceae	* <i>Malvastrum americanum</i>																																
Malvaceae	* <i>Melochia pyramidata</i>																																
Malvaceae	<i>Abutilon hannii</i>																																

Family	Species	ELA33	ELA34	ELA35	ELA36	ELA37	ELA38	ELA39	ELA40	ELA41	ELA42	ELA43	ELA44	ELA45	ELA46	ELA47	ELA48	ELA49	ELA50	ELA51	ELA52	ELA53	ELA54	ELA55	ELA56	ELA57	ELA58	ELA59	ELAG0	ELAG1	ELAG2	ELAG3	ELAG4		
Malvaceae	<i>Abutilon lepidum</i>							X			X												X												
Malvaceae	<i>Abutilon otocarpum</i>			X		X					X	X				X								X			X	X	X						
Malvaceae	<i>Abutilon</i> sp.																																		
Malvaceae	<i>Abutilon</i> sp. Dioicum (A.A. Mitchell PRP 1618)																																		
Malvaceae	<i>Adansonia gregorii</i>	X	X					X	X	X	X		X		X																				
Malvaceae	<i>Corchorus fascicularis</i>	X					X	X		X	X	X				X								X											
Malvaceae	<i>Corchorus sidoides</i> subsp. <i>sidoides</i>							X	X			X	X	X			X	X		X	X	X	X		X		X	X	X	X	X	X			
Malvaceae	<i>Corchorus sidoides</i> subsp. <i>vermicularis</i>	X				X	X	X	X		X													X											
Malvaceae	<i>Gossypium australe</i>	X		X	X	X	X	X	X	X					X	X	X						X	X											
Malvaceae	<i>Hibiscus austrinus</i>									X														X											
Malvaceae	Malvaceae sp.																																		
Malvaceae	<i>Melhanian oblongifolia</i>											X																							
Malvaceae	<i>Sida</i> aff. <i>fibulifera</i>																																X		
Malvaceae	<i>Sida fibulifera</i>																																		
Malvaceae	<i>Waltheria indica</i>																		X		X		X					X	X	X					
Marsileaceae	<i>Marsilea hirsuta</i>															X									X								X		
Menispermaceae	<i>Tinospora smilacina</i>											X						X	X	X	X			X			X	X							
Menyanthaceae	<i>Nymphoides beaglensis</i> (P3)																								X	X							X		
Molluginaceae	<i>Trigastrotheca molluginea</i>							X	X														X												
Montiaceae	<i>Calandrinia</i> sp.																					X													
Montiaceae	<i>Calandrinia stropholata</i>											X				X	X		X	X						X	X								
Montiaceae	<i>Calandrinia tepperiana</i>		X																															X	
Myrtaceae	<i>Corymbia bella</i>																								X	X	X								
Myrtaceae	<i>Corymbia greeniana</i>										X		X		X	X			X	X		X	X				X			X	X				
Myrtaceae	<i>Corymbia zygophylla</i>										X								X	X	X						X	X							
Myrtaceae	<i>Eucalyptus camaldulensis</i>																																		
Myrtaceae	<i>Eucalyptus chlorophylla</i>																																		
Myrtaceae	<i>Eucalyptus coolabah</i>															X		X																X	
Myrtaceae	<i>Eucalyptus microtheca</i>																																		
Myrtaceae	<i>Eucalyptus tectifera</i>																																		
Myrtaceae	<i>Lophostemon grandiflorus</i> subsp. <i>riparius</i>																								X	X									
Myrtaceae	<i>Melaleuca alsophila</i>										X	X						X						X							X				
Nyctaginaceae	<i>Boerhavia coccinea</i>	X					X	X	X	X		X	X	X	X		X	X	X	X	X	X	X	X	X						X	X			
Orobanchaceae	<i>Buchnera asperata</i>		X		X																												X		
Orobanchaceae	<i>Buchnera ramosissima</i>				X			X	X													X												X	
Orobanchaceae	<i>Striga curviflora</i>							X																											
Pedaliaceae	<i>Josephinia papillosa</i>							X																											
Phrymaceae	<i>Peplidium muelleri</i>															X									X	X	X								
Phrymaceae	<i>Uvedalia linearis</i> var. <i>linearis</i>																																	X	
Phyllanthaceae	<i>Flueggea virosa</i> subsp. <i>melanthesoides</i>										X	X												X											
Phyllanthaceae	<i>Phyllanthus maderaspatensis</i>		X					X	X	X	X																								

Family	Species	ELA33	ELA34	ELA35	ELA36	ELA37	ELA38	ELA39	ELA40	ELA41	ELA42	ELA43	ELA44	ELA45	ELA46	ELA47	ELA48	ELA49	ELA50	ELA51	ELA52	ELA53	ELA54	ELA55	ELA56	ELA57	ELA58	ELA59	ELAG0	ELAG1	ELAG2	ELAG3	ELAG4			
Plantaginaceae	<i>Stemodia lathraia</i>				X																															
Poaceae	* <i>Cenchrus setiger</i>							X	X					X		X																X				
Poaceae	? <i>Austrostipa</i> sp.																																			
Poaceae	<i>Aristida holathera</i>	X						X	X																											
Poaceae	<i>Aristida hygrometrica</i>						X	X	X		X	X	X	X	X	X	X	X	X	X	X	X	X			X	X			X	X					
Poaceae	<i>Aristida latifolia</i>		X	X		X					X					X	X				X	X					X	X				X				
Poaceae	<i>Chrysopogon fallax</i>									X																										
Poaceae	<i>Cymbopogon ambiguus</i>	X																										X								
Poaceae	<i>Cynodon convergens</i>					X		X	X	X	X						X	X																		
Poaceae	<i>Dactyloctenium radulans</i>		X		X	X	X			X																										
Poaceae	<i>Enneapogon pallidus</i>					X																														
Poaceae	<i>Enneapogon purpurascens</i>																																			
Poaceae	<i>Eragrostis cumingii</i>					X																														
Poaceae	<i>Eragrostis eriopoda</i>						X	X	X	X						X	X	X			X	X			X	X							X			
Poaceae	<i>Eragrostis exigua</i>																																			
Poaceae	<i>Eragrostis tenellula</i>		X	X		X																														
Poaceae	<i>Eriachne glauca</i>				X																															
Poaceae	<i>Eriachne helmsii</i>	X																																		
Poaceae	<i>Eriachne melicacea</i>																																	X		
Poaceae	<i>Eriachne obtusa</i>		X	X		X					X		X	X	X				X	X	X		X				X	X	X	X	X			X		
Poaceae	<i>Eriachne pindanica</i>																																X			
Poaceae	<i>Eulalia aurea</i>																																		X	
Poaceae	<i>Panicum decompositum</i>		X			X		X		X																										
Poaceae	<i>Panicum effusum</i>												X			X																				
Poaceae	<i>Perotis rara</i>	X					X				X	X	X	X	X																				X	
Poaceae	Poaceae sp. 1 (sterile)																																			
Poaceae	Poaceae sp. 2 (sterile)																																			
Poaceae	Poaceae sp. 3 (sterile)				X																															
Poaceae	<i>Sehima nervosum</i>				X	X	X																													
Poaceae	<i>Setaria surgens</i>																		X															X		
Poaceae	<i>Sorghum plumosum</i>	X	X	X			X	X	X	X	X		X		X		X				X															
Poaceae	<i>Sorghum stipoideum</i>																																			
Poaceae	<i>Sporobolus australasicus</i>	X		X	X	X	X	X	X	X					X	X																				
Poaceae	<i>Triodia bitextura</i>									X	X				X	X			X	X	X		X				X			X	X	X	X	X		
Poaceae	<i>Triodia epactia</i>																																			X
Poaceae	<i>Triodia intermedia</i>	X	X	X	X		X	X	X	X																									X	
Poaceae	<i>Triodia sp.</i>																																			
Poaceae	<i>Triodia wiseana</i>					X																			X			X	X							
Poaceae	<i>Urochloa holosericea</i>	X																																		
Poaceae	<i>Urochloa occidentalis</i> var. <i>occidentalis</i>																																			
Poaceae	<i>Xerochloa barbata</i>		X	X	X	X																														
Polygalaceae	<i>Polygala galeocephala</i>																																			

Family	Species	ELA33	ELA34	ELA35	ELA36	ELA37	ELA38	ELA39	ELA40	ELA41	ELA42	ELA43	ELA44	ELA45	ELA46	ELA47	ELA48	ELA49	ELA50	ELA51	ELA52	ELA53	ELA54	ELA55	ELA56	ELA57	ELA58	ELA59	ELA60	ELAG1	ELAG2	ELAG3	ELAG4	
Polygalaceae	<i>Polygala tepperi</i>					X								X			X			X														
Portulacaceae	<i>*Portulaca oleracea</i>	X							X	X	X								X				X											
Portulacaceae	<i>*Portulaca pilosa</i>		X							X	X	X	X	X		X										X								
Portulacaceae	<i>Portulaca digyna</i>	X						X	X										X	X		X												
Portulacaceae	<i>Portulaca oligosperma</i>																																	
Proteaceae	<i>Grevillea pyramidalis</i>						X	X	X	X	X				X												X							
Proteaceae	<i>Grevillea wickhamii</i>																				X													
Proteaceae	<i>Hakea arborescens</i>	X									X																							
Proteaceae	<i>Hakea chordophylla</i>	X						X	X						X																			
Proteaceae	<i>Hakea macrocarpa</i>						X	X		X	X	X	X	X	X							X						X		X				
Rubiaceae	<i>Psyrax</i> sp.														X																			
Rubiaceae	<i>Scleromitron scleranthoides</i>																																X	
Rubiaceae	<i>Spermacoce occidentalis</i>	X	X																														X	
Santalaceae	<i>Santalum lanceolatum</i>																																	
Sapindaceae	<i>Atalaya hemiglauca</i>	X			X	X				X	X	X	X	X	X	X	X	X	X	X				X							X			
Sapindaceae	<i>Cardiospermum halicacabum</i> var. <i>halicacabum</i>																																	
Sapindaceae	<i>Dodonaea hispidula</i> var. <i>arida</i>																					X												
Solanaceae	<i>Solanum quadriloculatum</i>						X																				X	X						
Thymelaeaceae	<i>Pimelea punicea</i>	X																																
Violaceae	<i>Afrohybanthus aurantiacus</i>							X	X																					X	X			
Violaceae	<i>Afrohybanthus enneaspermus</i>	X				X				X	X																							
Zygophyllaceae	<i>Roepera</i> sp.																			X														

Appendix F Quadrat site data

Quadrat number	Date	Quadrat type	Easting	Northing	Zone	Landform	Aspect	Slope (%)	Soil description	Vegetation condition	Disturbance notes	Age since fire (years)	Vegetation Community	Fauna habitat
ELA01	6/03/2021	50 x 50	687296	8006395	51	Slope	NW	1	Moist red brown sandy loam	Excellent	N/A	Young (1-10)	AgCgEc	Fauna habitat 1
ELA02	6/03/2021	50 x 50	687746	8006336	51	Slope / flat dune crest	W	1	Moist brown sandy loam	Excellent	N/A	Young (1-10)	AgCgEc	Fauna habitat 1
ELA03	6/03/2021	50 x 50	686802	8002232	51	Flat	N/A	N/A	Moist brown sandy loam	Excellent	N/A	Old (>20)	AgCgEc	Fauna habitat 1
ELA04	6/03/2021	50 x 50	686963	8001840	51	Slope	SW	0.5	Dry red sand / fine gravel	Poor	Previous clearing, weeds	Old (>20)	EmEcAg	Fauna habitat 3
ELA05	25/05/2021	50 x 50	686873	7998414	51	Flat	N/A	N/A	Dry red brown sand	Very Good	Minor weeds, tracks	Recent (<1)	CgAgBc	Fauna habitat 1
ELA06	25/05/2021	50 x 50	688074	7998385	51	Flat	N/A	N/A	Dry light brown to red sandy clay	Very Good	Tracks, weeds	Young (1-10)	CgAgBc	Fauna habitat 1
ELA07	25/05/2021	50 x 50	688535	7998364	51	Gentle slope	SE	1	Dry light brown sandy clay	Good	Weeds, tracks, rubbish dumping	Young (1-10)	CgAgBc	Fauna habitat 1
ELA08	25/05/2021	50 x 50	689942	7998198	51	Flat	N/A	N/A	Dry light brown sandy clay	Good	Cattle tracks and adjacent vehicle tracks, weeds	Young (1-10)	CgAgBc	Fauna habitat 1
ELA09	6/03/2021	50 x 50	692110	7997908	51	Flat	N/A	N/A	Moist brown clay loam	Very Good	Cattle grazing	Old (>20)	EmEcAg	Fauna habitat 3
ELA10	6/03/2021	50 x 50	692546	7997874	51	Flat	E	0.5	Moist brown clay loam	Very Good	Cattle grazing and weeds	Old (>20)	EmEcAg	Fauna habitat 3
ELA11	9/03/2021	50 x 50	692598	7997881	51	Slope / drainage line / creek embankment	W	0.5	Dry brown light clay	Very Good	Cattle tracks, weeds	Old (>20)	EmEcAg	Fauna habitat 3
ELA12	9/03/2021	50 x 50	692853	7997861	51	Slope / creek embankment	W	0.5	Dry red brown sand	Very Good	Tracks, cattle activity, weeds	Old (>20)	EmEcAg	Fauna habitat 3

Quadrat number	Date	Quadrat type	Easting	Northing	Zone	Landform	Aspect	Slope (%)	Soil description	Vegetation condition	Disturbance notes	Age since fire (years)	Vegetation Community	Fauna habitat
ELA13	9/03/2021	50 x 50	693108	7997839	51	Flat / open depression	N/A	N/A	Slightly moist brown grey clay	Very Good	Minor cattle tracks, weeds	Young (1-10) (Likely unundated recently)	CbEc	Fauna habitat 3
ELA14	9/03/2021	50 x 50	693720	7997803	51	Flat	N/A	N/A	Moist light red brown sandy clay loam	Very Good	Cattle tracks and adjacent vehicle tracks, weeds	Young (1-10)	CgAgBc	Fauna habitat 1
ELA15	9/03/2021	50 x 50	694001	7997454	51	Open depression	N/A	N/A	Moist brown to orange clay with a sandy surface	Very Good	Cattle tracks	Young (1-10)	CgAgBc	Fauna habitat 1
ELA16	25/05/2021	50 x 50	695406	7996200	51	Flat	N/A	N/A	Dry light brown clay	Very Good	Minor cattle activity	Recent (<1)	CgAgBc	Fauna habitat 1
ELA17	25/05/2021	50 x 50	695254	7994817	51	Flat	N/A	N/A	Dry light brown to red sand	Very Good	Cattle tracks	Moderate (10-20)	CgCzBc	Fauna habitat 2
ELA18	25/05/2021	50 x 50	693266	7993507	51	Gentle slope, dune slope	SE	3	Dry red sand	Very Good	Cattle activity	Recent (<1)	CgCzBc	Fauna habitat 2
ELA19	26/05/2021	50 x 50	690482	7993326	51	Flat between dunes	N/A	N/A	Dry light brown clay	Very Good	Cattle tracks, minor weeds	Young (1-10)	AgBc	Fauna habitat 1
ELA20	26/05/21	50 x 50	687949	7993198	51	Dune slope / crest	N	3	Dry red sand	Very Good	Cattle grazing and tracks, weeds	Young (1-10)	CgCzBc	Fauna habitat 2
ELA21	26/05/21	50 x 50	687755	7992990	51	Flat	N/A	N/A	Dry light brown sandy clay	Very Good	Minor cattle activity, weeds	Recent (<1)	AgBc	Fauna habitat 1
ELA22	26/05/21	50 x 50	686909	7992992	51	Flat	N/A	N/A	Dry sandy light brown clay	Very Good	Minor cattle activity	Recent (<1)	CgAgBc	Fauna habitat 1
ELA23	9/03/21	50 x 50	685643	7992721	51	Flat / upland	N/A	N/A	Moist sand brown	Excellent	N/A	Old (>20)	BcCg	Fauna habitat 1
ELA24	9/03/21	50 x 50	685634	7991962	51	Flat / upland	N/A	N/A	Moist sand brown	Excellent	Tracks, cattle activity, weeds	Old (>20)	BcCg	Fauna habitat 1
ELA25	9/03/21	50 x 50	685626	7991575	51	Slope	NW	0.5	Dry pale brown light clay	Excellent	Weeds	Old (>20)	BcCg	Fauna habitat 1
ELA26	9/03/21	50 x 50	689918	7985266	51	Open depression	N/A	N/A	Moist clay brown	Very Good	Cattle tracks and scats, weeds	Young (1-10)	BcTc	Fauna habitat 1

Quadrat number	Date	Quadrat type	Easting	Northing	Zone	Landform	Aspect	Slope (%)	Soil description	Vegetation condition	Disturbance notes	Age since fire (years)	Vegetation Community	Fauna habitat
ELA27	9/03/21	50 x 50	690616	7985383	51	Open depression	N/A	N/A	Moist brown loam to clay	Very Good	Cattle tracks, weeds	Moderate (10-20)	BcTc	Fauna habitat 1
ELA28	8/03/21	50 x 50	691284	7985129	51	Flat	N/A	N/A	Moist brown clay loam	Excellent	Cattle tracks and adjacent vehicle tracks, weeds	Old (>20)	BcTc	Fauna habitat 1
ELA29	9/03/21	50 x 50	692961	7985886	51	Flat	N/A	N/A	Moist light brown clay loam	Good	Cattle tracks, weeds	Young (1-10)	AgBc	Fauna habitat 1
ELA30	27/05/21	50 x 50	694977	7985901	51	Flat	N/A	N/A	Dry light brown sandy clay	Very Good	Minor cattle activity	Young (1-10)	AgBc	Fauna habitat 1
ELA31	9/03/21	50 x 50	696524	7985668	51	Flat / open depression	N/A	N/A	Moist light brown clay	Good	Grazing, tracks, heavy cattle activity, weeds	Young (1-10)	Ag	Fauna habitat 1
ELA32	27/05/21	50 x 50	697659	7986009	51	Flat	N/A	N/A	Dry red brown sandy clay	Very Good	Minor cattle activity	Moderate (10-20)	AtAcDo	Fauna habitat 1
ELA33	9/03/21	50 x 50	699041	7985804	51	Gentle slope / open depression	SE	1	Dry red brown clay pan	Very Good	Cattle tracks, weeds	Young (1-10)	Ag	Fauna habitat 1
ELA34	26/05/21	50 x 50	688934	7980819	51	Flat / open depression	N/A	N/A	Dry light brown clay	Very Good	Minor cattle activity, weeds	Young (1-10)	AtAcDo	Fauna habitat 1
ELA35	26/05/21	50 x 50	690150	7979852	51	Flat / open depression	N/A	N/A	Dry brown clay loam with surface crust	Very Good	Minor cattle activity, weeds	Young (1-10)	AtAcDo	Fauna habitat 1
ELA36	26/05/21	50 x 50	692240	7980547	51	Flat to gentle slope or open depression	N/A	N/A	Dry light brown clay	Good	Grazing, tracks, heavy cattle activity, weeds	Young (1-10)	AtAcDo	Fauna habitat 1
ELA37	27/05/21	50 x 50	692645	7980711	51	Flat	N/A	N/A	Dry light brown sandy clay	Very Good	Cattle pugging, tracks, scats	Young (1-10)	AtAcDo	Fauna habitat 1
ELA38	9/03/21	50 x 50	694543	7981096	51	Flat	N/A	N/A	Dry brown light clay	Excellent	Adjacent tracks	Old (>20)	BcCg	Fauna habitat 1
ELA39	7/03/21	50 x 50	696593	7980098	51	Gentle slope	NW	0.5	Dry light brown clay	Poor	Previous clearing, cattle scats, weeds	Young (1-10)	Ag	Fauna habitat 1

Quadrat number	Date	Quadrat type	Easting	Northing	Zone	Landform	Aspect	Slope (%)	Soil description	Vegetation condition	Disturbance notes	Age since fire (years)	Vegetation Community	Fauna habitat
ELA40	7/03/21	50 x 50	697909	7980047	51	Flat	SE	0.5	Moist grey brown sandy loam to clay	Good	Cattle tracks, scats and grazing, previous clearing	Young (1-10)	Ag	Fauna habitat 1
ELA41	7/03/21	50 x 50	701517	7980279	51	Flat	N/A	N/A	Moist brown clay loam	Excellent	Tracks, weeds	Old (>20)	AgCgEc	Fauna habitat 1
ELA42	7/03/21	50 x 50	702048	7980340	51	Flat	N/A	N/A	Dry light brown clay loam	Excellent	Tracks, cattle activity, weeds	N/A	AgCgEc	Fauna habitat 1
ELA43	8/03/21	50 x 50	704590	7982476	51	Dune crest	N/A	N/A	Dry red sand	Excellent	Weeds	Moderate (10-20)	BcGaCg	Fauna habitat 2
ELA44	8/03/21	50 x 50	704483	7981302	51	Flat / open depression	N/A	N/A	Moist brown sand	Excellent	Weeds	Old (>20)	CgAgBc	Fauna habitat 1
ELA45	8/03/21	50 x 50	704492	7980578	51	Flat	NW	0.5	Dry orange red sandy clay	Very Good	Adjacent tracks, weeds	Young (1-10)	BcGaCg	Fauna habitat 2
ELA46	8/03/21	50 x 50	705136	7980954	51	Flat	N/A	N/A	Dry light brown to red sandy clay	Excellent	Adjacent tracks	Young (1-10)	CgAgBc	Fauna habitat 1
ELA47	8/03/21	50 x 50	706410	7981270	51	Slope / wetland fringe	S	1	Moist brown sandy loam	Excellent	Tracks, weeds	Old (>20)	CbEc	Fauna habitat 3
ELA48	8/03/21	50 x 50	707228	7981171	51	Flat	N/A	N/A	Moist orange brown sand	Excellent	Tracks, weeds	Old (>20)	EcCg	Fauna habitat 2
ELA49	8/03/21	50 x 50	708001	7981195	51	Flat	N/A	N/A	Moist orange brown sand	Excellent	Tracks	Old (>20)	EcCg	Fauna habitat 2
ELA50	8/03/21	50 x 50	708693	7980594	51	Flat	N/A	N/A	Dry red sand to clay	Excellent	Fire	Young (1-10)	CzEcCg	Fauna habitat 2
ELA51	8/03/21	50 x 50	708722	7979400	51	Dune slope / swale	N/A	N/A	Dry red sand / dune swale	Excellent	Fire	Young (1-10)	BcGaCg	Fauna habitat 2
ELA52	7/03/21	50 x 50	708773	7978101	51	Flat	N/A	N/A	Dry red sand	Very Good	Cattle grazing and tracks	Young (1-10)	CzEcCg	Fauna habitat 2
ELA53	7/03/21	50 x 50	709731	7978391	51	Flat	N/A	N/A	Dry red sand	Very Good	Tracks, previous clearing, burnt	North = Young (1-10), South = Old (>20)	EcCg	Fauna habitat 2

Quadrat number	Date	Quadrat type	Easting	Northing	Zone	Landform	Aspect	Slope (%)	Soil description	Vegetation condition	Disturbance notes	Age since fire (years)	Vegetation Community	Fauna habitat
ELA54	7/03/21	50 x 50	711252	7978417	51	Flat	N/A	N/A	Dry light brown to red sandy clay	Very Good	Fire, minor cattle activity	Young (1-10)	EcCg	Fauna habitat 2
ELA55	7/03/21	50 x 50	712051	7978400	51	Flat	N/A	N/A	Dry light brown sandy loam	Poor	Heavy cattle grazing and tracks, minor rubbish dumping, weeds	Moderate (10-20)	EmEcAg	Fauna habitat 3
ELA56	7/03/21	50 x 50	713211	7978357	51	Slope / wetland fringe	W	2	Moist brown orange sandy clay loam	Excellent	Weeds	Old (>20)	CbEc	Fauna habitat 3
ELA57	7/03/21	50 x 50	713276	7978347	51	Closed depression	N/A	N/A	Inundated brown light clay with moss	Very Good	Cattle tracks and scats	Moderate (10-20)	CbEc	Fauna habitat 3
ELA58	7/03/21	50 x 50	713620	7978355	51	Slope / wetland fringe	W	2	Moist brown bark sandy clay loam	Excellent	Tracks, weeds	Old (>20)	CbEc	Fauna habitat 3
ELA59	27/05/21	50 x 50	711942	7976870	51	Gentle dune slope	S	2	Dry red sand	Very Good	Minor cattle activity, weeds	Young (1-10)	CzEcCg	Fauna habitat 2
ELA60	27/05/21	50 x 50	713616	7976552	51	Gentle dune slope / crest	N	1.5	Dry red sand	Very Good	Minor cattle activity, weeds	Young (1-10)	CzEcCg	Fauna habitat 2
ELA61	27/05/21	50 x 50	715782	7976497	51	Dune swale / flat	N/A	N/A	Dry light brown to red clay	Very Good	Cattle tracks	Young (1-10)	CzEcCg	Fauna habitat 2
ELA62	4/03/21	50 x 50	716840	7976435	51	Dune ridge	S	2	Dry red sand	Excellent	Minor weeds	Moderate (10-20)	BcGaCg	Fauna habitat 2
ELA63	4/03/21	50 x 50	717133	7977000	51	Slope / broad dune	E	0.5	Dry red sand	Excellent	N/A	Moderate (10-20)	BcGaCg	Fauna habitat 2
ELA64	4/03/21	50 x 50	716838	7977401	51	Flat / open depression / wetland	N/A	N/A	Water logged to inundated dark brown sand to clay	Excellent	Weeds	Old (>20)	CbEc	Fauna habitat 3

Appendix G Floristic quadrat data and site photos

Quadrat	Species	Stratum	Lifeform	Cover (%)
ELA01	<i>Bauhinia cunninghamii</i>	U	Trees <10m	0.5
	<i>Corymbia greeniana</i>	U	Trees <10m	5
	<i>Ehretia saligna</i>	U	Trees <10m	0.2
	<i>Erythrophleum chlorostachys</i>	U	Trees <10m	2
	<i>Acacia coleii</i>	M	Shrubs 1-2m	1.5
	<i>Atalaya hemiglaucua</i>	M	Shrubs <1m	0.1
	<i>Corchorus sidoides</i> subsp. <i>sidoides</i>	M	Shrubs <1m	0.5
	<i>Aristida holathera</i>	G	Grasses	0.5
	<i>Aristida hygrometrica</i>	G	Grasses	0.2
	<i>Chrysopogon fallax</i>	G	Grasses	1.5
	<i>Eragrostis eriopoda</i>	G	Grasses	3
	<i>Sorghum plumosum</i>	G	Grasses	2
	<i>Triodia bitextura</i>	G	Grasses	30
	<i>Boerhavia coccinea</i>	G	Herbs	0.05
	<i>Cajanus marmoratus</i>	G	Herbs	0.1
	<i>Calandrinia strophiolata</i>	G	Herbs	0.01
	<i>Cassytha filiformis</i>	G	Herbs	0.01
	<i>Euphorbia psilosperma</i>	G	Herbs	0.1
	<i>Gomphrena canescens</i>	G	Herbs	0.1
	<i>Phyllanthus maderaspatensis</i>	G	Herbs	0.2
	<i>Polygala tepperi</i>	G	Herbs	0.1
	<i>Polymeria ambigua</i>	G	Herbs	0.01
	<i>Ptilotus calostachyus</i>	G	Herbs	0.05
<i>Tephrosia remotiflora</i>	G	Herbs	0.2	
<i>Tinospora smilacina</i>	G	Herbs	0.01	
ELA02	<i>Corymbia greeniana</i>	U	Trees <10m	1
	<i>Erythrophleum chlorostachys</i>	U	Trees <10m	3
	<i>Eucalyptus coolabah</i>	U	Trees <10m	0.5
	<i>Acacia coleii</i>	M	Shrubs 1-2m	1.5
	<i>Acacia platycarpa</i>	M	Shrubs 1-2m	0.1
	<i>Grevillea pyramidalis</i>	M	Shrubs 1-2m	0.2
	<i>Grevillea wickhamii</i>	M	Shrubs 1-2m	0.2
	<i>Senna costata</i>	M	Shrubs 1-2m	0.2
	<i>Corchorus sidoides</i> subsp. <i>sidoides</i>	M	Shrubs <1m	0.5
	<i>Dolichandrone occidentalis</i>	M	Shrubs <1m	0.5
	<i>Indigofera colutea</i>	M	Shrubs <1m	0.1
	<i>Indigofera linifolia</i>	M	Shrubs <1m	0.1
	<i>Aristida holathera</i>	G	Grasses	2

Quadrat	Species	Stratum	Lifeform	Cover (%)
	<i>Chrysopogon fallax</i>	G	Grasses	2.5
	<i>Sorghum plumosum</i>	G	Grasses	0.5
	<i>Triodia bitextura</i>	G	Grasses	40
	<i>Cajanus marmoratus</i>	G	Herbs	0.05
	<i>Calandrinia strophiolata</i>	G	Herbs	0.01
	<i>Drosera derbyensis</i>	G	Herbs	0.01
	<i>Euphorbia psilosperma</i>	G	Herbs	0.05
	<i>Gomphrena canescens</i>	G	Herbs	0.1
	<i>Goodenia sepalosa</i> var. <i>sepalosa</i>	G	Herbs	0.01
	<i>Goodenia</i> sp.	G	Herbs	0.01
	<i>Peplidium muelleri</i>	G	Herbs	0.02
	<i>Phyllanthus maderaspatensis</i>	G	Herbs	0.05
	<i>Pluchea tetranthera</i>	G	Herbs	0.1
	<i>Polygala tepperi</i>	G	Herbs	0.1
	<i>Ptilotus calostachyus</i>	G	Herbs	0.01
	<i>Ptilotus corymbosus</i>	G	Herbs	0.1
	<i>Tinospora smilacina</i>	G	Herbs	0.01
	<i>Adansonia gregorii</i>	U	Trees 10-20m	2
	<i>Corymbia greeniana</i>	U	Trees <10m	2
	<i>Eucalyptus chlorophylla</i>	U	Trees <10m	1.8
	<i>Acacia colei</i>	M	Shrubs >2m	3
	<i>Acacia eriopoda</i>	M	Shrubs >2m	5
	<i>Carissa lanceolata</i>	M	Shrubs 1-2m	2.5
	<i>Grevillea pyramidalis</i>	M	Shrubs 1-2m	0.5
	<i>Corchorus sidoides</i> subsp. <i>sidoides</i>	M	Shrubs <1m	0.3
	<i>Aristida holathera</i>	G	Grasses	6
	<i>Sorghum plumosum</i>	G	Grasses	15
	<i>Triodia bitextura</i>	G	Grasses	35
	<i>Cyperus blakeanus</i>	G	Sedges	0.1
	<i>Cassytha filiformis</i>	G	Herbs	0.1
	<i>Evolvulus alsinoides</i> var. <i>decumbens</i>	G	Herbs	0.05
	<i>Gomphrena canescens</i>	G	Herbs	0.1
	<i>Pluchea tetranthera</i>	G	Herbs	0.05
	<i>Polycarpha corymbosa</i>	G	Herbs	0.02
	<i>Polygala galeocephala</i>	G	Herbs	0.1
	<i>Polymeria ambigua</i>	G	Herbs	0.02
	<i>Tinospora smilacina</i>	G	Herbs	0.05
ELA03	<i>Acacia eriopoda</i>	U	Trees <10m	3
	<i>Bauhinia cunninghamii</i>	U	Trees <10m	0.5
	<i>Corymbia greeniana</i>	U	Trees <10m	0.5
	<i>Acacia colei</i>	M	Shrubs >2m	0.5
ELA04				

Quadrat	Species	Stratum	Lifeform	Cover (%)
	<i>*Stylosanthes hamata</i>	M	Shrubs <1m	0.1
	<i>Corchorus sidoides</i> subsp. <i>sidoides</i>	M	Shrubs <1m	0.5
	<i>Senna notabilis</i>	M	Shrubs <1m	0.2
	<i>Solanum quadriloculatum</i>	M	Shrubs <1m	0.1
	<i>Aristida holathera</i>	G	Grasses	0.05
	<i>Aristida hygrometrica</i>	G	Grasses	0.1
	<i>Aristida latifolia</i>	G	Grasses	12
	<i>Cynodon convergens</i>	G	Grasses	0.5
	<i>Panicum decompositum</i>	G	Grasses	0.2
	<i>Sorghum plumosum</i>	G	Grasses	0.2
	<i>Sporobolus australasicus</i>	G	Grasses	0.05
	<i>Boerhavia coccinea</i>	G	Herbs	0.5
	<i>Crotalaria cunninghamii</i>	G	Herbs	0.05
	<i>Euphorbia schultzii</i> var. <i>comans</i>	G	Herbs	0.1
	<i>Polycarpha corymbosa</i>	G	Herbs	0.05
	<i>Polymeria ambigua</i>	G	Herbs	0.01
	<i>Portulaca digyna</i>	G	Herbs	0.02
	<i>Portulaca oleracea</i>	G	Herbs	0.01
	<i>Tephrosia rosea</i>	G	Herbs	0.1
	<i>Adansonia gregorii</i>	U	Trees <10m	1
	<i>Gyrocarpus americanus</i>	U	Trees <10m	0.01
	<i>Hakea arborescens</i>	U	Trees <10m	1
	<i>Hakea chordophylla</i>	U	Trees <10m	0.8
	<i>Acacia colei</i>	M	Shrubs >2m	3
	<i>Grevillea pyramidalis</i>	M	Shrubs 1-2m	0.02
	<i>*Stylosanthes hamata</i>	M	Shrubs <1m	0.01
	<i>Abutilon otocarpum</i>	M	Shrubs <1m	0.2
	<i>Carissa lanceolata</i>	M	Shrubs <1m	0.02
	<i>Corchorus sidoides</i> subsp. <i>sidoides</i>	M	Shrubs <1m	0.01
	<i>Cullen badocanum</i>	M	Shrubs <1m	0.01
	<i>Dolichandrone occidentalis</i>	M	Shrubs <1m	0.04
	<i>Gossypium australe</i>	M	Shrubs <1m	0.1
	<i>Indigofera linnaei</i>	M	Shrubs <1m	0.01
	<i>Senna notabilis</i>	M	Shrubs <1m	0.01
	<i>Cynodon convergens</i>	G	Grasses	0.01
	<i>Eriachne obtusa</i>	G	Grasses	0.02
	Poaceae sp. 1 (sterile)	G	Grasses	0.01
	<i>Sorghum plumosum</i>	G	Grasses	70
	<i>Sporobolus australasicus</i>	G	Grasses	0.01
	<i>Triodia intermedia</i>	G	Grasses	2
	<i>Bonamia linearis</i>	G	Herbs	0.01
ELA05				

Quadrat	Species	Stratum	Lifeform	Cover (%)
	<i>Buchnera asperata</i>	G	Herbs	0.01
	<i>Buchnera ramosissima</i>	G	Herbs	0.01
	<i>Crotalaria ramosissima</i>	G	Herbs	0.02
	<i>Euphorbia schultzii</i> var. <i>comans</i>	G	Herbs	0.01
	<i>Gomphrena canescens</i>	G	Herbs	1.5
	<i>Goodenia armitiana</i>	G	Herbs	0.01
	<i>Goodenia sepalosa</i> var. <i>sepalosa</i>	G	Herbs	0.01
	<i>Heliotropium</i> sp.	G	Herbs	0.01
	<i>Trichodesma zeylanicum</i> var. <i>zeylanicum</i>	G	Herbs	0.01
	<i>Trigastrotheca molluginea</i>	G	Herbs	0.01
	<i>Zornia</i> sp.	G	Herbs	0.01
	<i>Eucalyptus chlorophylla</i>	U	Trees 10-20m	10
	<i>Adansonia gregorii</i>	U	Trees <10m	0.01
	<i>Corymbia greeniana</i>	U	Trees <10m	3
	<i>Hakea chordophylla</i>	U	Trees <10m	0.1
	<i>Hakea macrocarpa</i>	U	Trees <10m	0.05
	<i>Acacia colei</i>	M	Shrubs >2m	5
	<i>Dolichandrone occidentalis</i>	M	Shrubs 1-2m	1.5
	<i>Grevillea pyramidalis</i>	M	Shrubs 1-2m	0.01
	* <i>Stylosanthes hamata</i>	M	Shrubs <1m	1
	<i>Corchorus sidoides</i> subsp. <i>vermicularis</i>	M	Shrubs <1m	0.05
	<i>Indigofera linnaei</i>	M	Shrubs <1m	0.05
	<i>Aristida holathera</i>	G	Grasses	0.05
	<i>Eriachne obtusa</i>	G	Grasses	0.05
ELA06	<i>Sorghum plumosum</i>	G	Grasses	50
	<i>Bonamia linearis</i>	G	Herbs	0.01
	<i>Buchnera asperata</i>	G	Herbs	0.01
	<i>Buchnera ramosissima</i>	G	Herbs	0.01
	<i>Cajanus marmoratus</i>	G	Herbs	0.01
	<i>Crotalaria ramosissima</i>	G	Herbs	0.04
	<i>Euphorbia schultzii</i> var. <i>comans</i>	G	Herbs	0.01
	<i>Gomphrena canescens</i>	G	Herbs	0.5
	<i>Goodenia armitiana</i>	G	Herbs	0.01
	<i>Mitrasacme exserta</i>	G	Herbs	0.01
	<i>Striga curviflora</i>	G	Herbs	0.01
	<i>Tephrosia leptoclada</i>	G	Herbs	0.01
	<i>Trichodesma zeylanicum</i> var. <i>zeylanicum</i>	G	Herbs	0.05
	<i>Zornia prostrata</i> var. <i>prostrata</i>	G	Herbs	0.01
ELA07	<i>Corymbia greeniana</i>	U	Trees 10-20m	4
	<i>Eucalyptus coolabah</i>	U	Trees 10-20m	8
	<i>Adansonia gregorii</i>	U	Trees <10m	0.01

Quadrat	Species	Stratum	Lifeform	Cover (%)
	<i>Bauhinia cunninghamii</i>	U	Trees <10m	3
	<i>Ehretia saligna</i>	U	Trees <10m	0.02
	<i>Hakea chordophylla</i>	U	Trees <10m	0.05
	<i>Hakea macrocarpa</i>	U	Trees <10m	0.05
	<i>Acacia colei</i>	M	Shrubs >2m	6
	<i>Acacia ancistrocarpa</i>	M	Shrubs 1-2m	0.5
	<i>Carissa lanceolata</i>	M	Shrubs 1-2m	0.2
	<i>Flueggea virosa</i> subsp. <i>melanthesoides</i>	M	Shrubs 1-2m	0.05
	<i>Gossypium australe</i>	M	Shrubs 1-2m	0.05
	* <i>Stylosanthes hamata</i>	M	Shrubs <1m	1
	<i>Abutilon</i> sp.	M	Shrubs <1m	0.01
	<i>Corchorus sidoides</i> subsp. <i>sidoides</i>	M	Shrubs <1m	0.01
	<i>Corchorus sidoides</i> subsp. <i>vermicularis</i>	M	Shrubs <1m	0.01
	<i>Dolichandrone occidentalis</i>	M	Shrubs <1m	0.01
	<i>Waltheria indica</i>	M	Shrubs <1m	0.01
	<i>Aristida hygrometrica</i>	G	Grasses	0.5
	<i>Chrysopogon fallax</i>	G	Grasses	4
	<i>Eriachne obtusa</i>	G	Grasses	2
	<i>Eulalia aurea</i>	G	Grasses	4
	<i>Panicum decompositum</i>	G	Grasses	0.01
	Poaceae sp. 2 (sterile)	G	Grasses	1
	<i>Sorghum plumosum</i>	G	Grasses	2
	<i>Sporobolus australasicus</i>	G	Grasses	0.02
	<i>Triodia intermedia</i>	G	Grasses	1
	* <i>Melochia pyramidata</i>	G	Herbs	0.01
	<i>Alternanthera angustifolia</i>	G	Herbs	0.01
	<i>Alternanthera nana</i>	G	Herbs	0.01
	<i>Blumea tenella</i>	G	Herbs	0.01
	<i>Bonamia linearis</i>	G	Herbs	0.01
	<i>Buchnera asperata</i>	G	Herbs	0.01
	<i>Crotalaria ramosissima</i>	G	Herbs	0.01
	<i>Gomphrena canescens</i>	G	Herbs	0.5
	<i>Goodenia armitiana</i>	G	Herbs	0.01
	<i>Peplidium muelleri</i>	G	Herbs	0.01
	<i>Phyllanthus maderaspatensis</i>	G	Herbs	0.04
	<i>Pluchea tetranthera</i>	G	Herbs	0.5
	<i>Stemodia lathraia</i>	G	Herbs	0.01
	<i>Zornia prostrata</i> var. <i>prostrata</i>	G	Herbs	0.01
ELA08	<i>Adansonia gregorii</i>	U	Trees <10m	0.01
	<i>Corymbia greeniana</i>	U	Trees <10m	1.5
	<i>Eucalyptus chlorophylla</i>	U	Trees <10m	2

Quadrat	Species	Stratum	Lifeform	Cover (%)
	<i>Hakea arborescens</i>	U	Trees <10m	2.5
	<i>Hakea chordophylla</i>	U	Trees <10m	0.2
	<i>Hakea macrocarpa</i>	U	Trees <10m	0.1
	<i>Acacia colei</i>	M	Shrubs >2m	3
	<i>Atalaya hemiglauc</i>	M	Shrubs 1-2m	0.01
	<i>Carissa lanceolata</i>	M	Shrubs 1-2m	0.04
	* <i>Stylosanthes hamata</i>	M	Shrubs <1m	1
	<i>Gossypium australe</i>	M	Shrubs <1m	0.05
	<i>Indigofera linifolia</i>	M	Shrubs <1m	0.01
	<i>Indigofera linnaei</i>	M	Shrubs <1m	0.05
	<i>Eriachne obtusa</i>	G	Grasses	40
	<i>Sorghum plumosum</i>	G	Grasses	20
	<i>Sporobolus australasicus</i>	G	Grasses	0.01
	<i>Fimbristylis schultzei</i>	G	Sedges	0.01
	<i>Buchnera asperata</i>	G	Herbs	0.01
	<i>Gomphrena canescens</i>	G	Herbs	0.5
	<i>Goodenia armitiana</i>	G	Herbs	0.01
	<i>Goodenia sepalosa</i> var. <i>sepalosa</i>	G	Herbs	0.01
	<i>Peplidium muelleri</i>	G	Herbs	0.01
	<i>Pluchea tetranthera</i>	G	Herbs	0.02
	<i>Pterocaulon serrulatum</i> var. <i>velutinum</i>	G	Herbs	0.01
	<i>Zornia prostrata</i> var. <i>prostrata</i>	G	Herbs	0.02
	<i>Eucalyptus microtheca</i>	U	Trees 10-20m	5
	<i>Bauhinia cunninghamii</i>	U	Trees <10m	10
	<i>Acacia colei</i>	M	Shrubs 1-2m	2
	<i>Carissa lanceolata</i>	M	Shrubs 1-2m	1.5
	<i>Corchorus fascicularis</i>	M	Shrubs <1m	10
	<i>Corchorus sidoides</i> subsp. <i>vermicularis</i>	M	Shrubs <1m	0.3
	<i>Hibiscus austrinus</i>	M	Shrubs <1m	0.1
	<i>Indigofera linifolia</i>	M	Shrubs <1m	15
	Malvaceae sp.	M	Shrubs <1m	0.1
	<i>Senna notabilis</i>	M	Shrubs <1m	0.1
ELA09	<i>Aristida latifolia</i>	G	Grasses	1.5
	<i>Sehima nervosum</i>	G	Grasses	0.5
	<i>Sporobolus australasicus</i>	G	Grasses	0.5
	<i>Boerhavia coccinea</i>	G	Herbs	0.2
	<i>Crotalaria cunninghamii</i>	G	Herbs	0.2
	<i>Crotalaria montana</i> var. <i>angustifolia</i>	G	Herbs	0.1
	<i>Cucumis picriocarpus</i>	G	Herbs	0.1
	<i>Phyllanthus maderaspatensis</i>	G	Herbs	0.1
	<i>Polymeria ambigua</i>	G	Herbs	0.5

Quadrat	Species	Stratum	Lifeform	Cover (%)
	<i>Portulaca oligosperma</i>	G	Herbs	0.05
	<i>Spermacoce occidentalis</i>	G	Herbs	0.1
ELA10	<i>Adansonia gregorii</i>	U	Trees 10-20m	5
	<i>Eucalyptus microtheca</i>	U	Trees 10-20m	8
	<i>Atalaya hemiglauc</i>	U	Trees <10m	10
	<i>Eucalyptus camaldulensis</i>	U	Trees <10m	15
	<i>Terminalia platyphylla</i>	U	Trees <10m	40
	* <i>Vachellia farnesiana</i>	M	Shrubs >2m	2
	<i>Acacia colei</i>	M	Shrubs >2m	0.4
	<i>Indigofera colutea</i>	M	Shrubs <1m	0.05
	<i>Malvaceae</i> sp.	M	Shrubs <1m	0.2
	<i>Sida fibulifera</i>	M	Shrubs <1m	0.2
	<i>Aristida latifolia</i>	G	Grasses	2
	<i>Sehima nervosum</i>	G	Grasses	4
	<i>Sporobolus australasicus</i>	G	Grasses	0.2
	* <i>Malvastrum americanum</i>	G	Herbs	0.5
	<i>Afrohybanthus enneaspermus</i>	G	Herbs	0.2
	<i>Boerhavia coccinea</i>	G	Herbs	0.1
	<i>Cardiospermum halicacabum</i> var. <i>halicacabum</i>	G	Herbs	0.1
	<i>Ipomoea costata</i>	G	Herbs	0.1
	<i>Phyllanthus maderaspatensis</i>	G	Herbs	0.1
	<i>Polymeria ambigua</i>	G	Herbs	0.1
	<i>Rostellularia adscendens</i> var. <i>clementii</i>	G	Herbs	0.01
	<i>Spermacoce occidentalis</i>	G	Herbs	0.1
ELA11	<i>Eucalyptus camaldulensis</i>	U	Trees 10-20m	4
	<i>Adansonia gregorii</i>	U	Trees <10m	1.8
	<i>Bauhinia cunninghamii</i>	U	Trees <10m	1
	<i>Eucalyptus microtheca</i>	U	Trees <10m	8
	<i>Hakea arborescens</i>	U	Trees <10m	0.1
	<i>Terminalia platyphylla</i>	U	Trees <10m	40
	<i>Acacia colei</i>	M	Shrubs >2m	1.5
	<i>Santalum lanceolatum</i>	M	Shrubs >2m	1
	* <i>Vachellia farnesiana</i>	M	Shrubs 1-2m	0.2
	<i>Atalaya hemiglauc</i>	M	Shrubs 1-2m	0.8
	<i>Carissa lanceolata</i>	M	Shrubs 1-2m	0.05
	<i>Corchorus fascicularis</i>	M	Shrubs <1m	0.02
	<i>Corchorus sidoides</i> subsp. <i>vermicularis</i>	M	Shrubs <1m	0.01
	<i>Malvaceae</i> sp.	M	Shrubs <1m	0.01
	<i>Rostellularia adscendens</i> var. <i>clementii</i>	M	Shrubs <1m	0.01
	<i>Aristida latifolia</i>	G	Grasses	15
	<i>Cynodon convergens</i>	G	Grasses	0.01

Quadrat	Species	Stratum	Lifeform	Cover (%)
	<i>Sehima nervosum</i>	G	Grasses	0.04
	<i>Urochloa occidentalis</i> var. <i>occidentalis</i>	G	Grasses	0.01
	<i>Cyperaceae</i> sp.	G	Sedges	0.05
	<i>Boerhavia coccinea</i>	G	Herbs	0.02
	<i>Crotalaria medicaginea</i> var. <i>neglecta</i>	G	Herbs	0.01
	<i>Euphorbia psilosperma</i>	G	Herbs	0.01
	<i>Phyllanthus maderaspatensis</i>	G	Herbs	0.01
	<i>Polymeria ambigua</i>	G	Herbs	0.02
	<i>Spermacoce occidentalis</i>	G	Herbs	0.01
	<i>Adansonia gregorii</i>	U	Trees <10m	3
	<i>Bauhinia cunninghamii</i>	U	Trees <10m	1.2
	<i>Corymbia greeniana</i>	U	Trees <10m	1.5
	<i>Eucalyptus microtheca</i>	U	Trees <10m	6
	<i>Eucalyptus tectifera</i>	U	Trees <10m	6
	<i>Hakea arborescens</i>	U	Trees <10m	0.8
	<i>Terminalia platyphylla</i>	U	Trees <10m	20
	<i>Acacia coleii</i>	M	Shrubs >2m	1.5
	<i>Atalaya hemiglauc</i>	M	Shrubs 1-2m	0.04
	<i>Carissa lanceolata</i>	M	Shrubs 1-2m	0.04
	* <i>Stylosanthes hamata</i>	M	Shrubs <1m	0.01
	* <i>Vachellia farnesiana</i>	M	Shrubs <1m	0.02
	<i>Corchorus sidoides</i> subsp. <i>vermicularis</i>	M	Shrubs <1m	0.02
	<i>Gossypium australe</i>	M	Shrubs <1m	0.01
ELA12	<i>Malvaceae</i> sp.	M	Shrubs <1m	0.01
	<i>Aristida latifolia</i>	G	Grasses	15
	<i>Sehima nervosum</i>	G	Grasses	0.04
	<i>Boerhavia coccinea</i>	G	Herbs	0.01
	<i>Cardiospermum halicacabum</i> var. <i>halicacabum</i>	G	Herbs	0.01
	<i>Crotalaria medicaginea</i> var. <i>neglecta</i>	G	Herbs	0.01
	<i>Goodenia sepalosa</i> var. <i>sepalosa</i>	G	Herbs	0.01
	<i>Ipomoea plebeia</i>	G	Herbs	0.01
	<i>Phyllanthus maderaspatensis</i>	G	Herbs	0.01
	<i>Pluchea tetranthera</i>	G	Herbs	0.02
	<i>Polymeria ambigua</i>	G	Herbs	0.01
	<i>Rhynchosia minima</i>	G	Herbs	0.01
	<i>Rostellularia adscendens</i> var. <i>clementii</i>	G	Herbs	0.01
	<i>Spermacoce occidentalis</i>	G	Herbs	0.01
	<i>Zornia prostrata</i> var. <i>prostrata</i>	G	Herbs	0.01
ELA13	<i>Corymbia bella</i>	U	Trees 10-20m	20
	<i>Hakea arborescens</i>	U	Trees <10m	2
	<i>Acacia coleii</i>	M	Shrubs 1-2m	0.5

Quadrat	Species	Stratum	Lifeform	Cover (%)
	<i>*Stylosanthes hamata</i>	M	Shrubs <1m	0.2
	<i>Corchorus fascicularis</i>	M	Shrubs <1m	0.3
	<i>Dolichandrone occidentalis</i>	M	Shrubs <1m	0.1
	<i>Indigofera linifolia</i>	M	Shrubs <1m	0.5
	<i>Indigofera linnaei</i>	M	Shrubs <1m	0.2
	<i>Aristida hygrometrica</i>	G	Grasses	3
	<i>Eragrostis exigua</i>	G	Grasses	0.1
	<i>Eriachne obtusa</i>	G	Grasses	30
	<i>Sorghum plumosum</i>	G	Grasses	0.2
	<i>Fimbristylis ferruginea</i>	G	Sedges	0.1
	<i>Boerhavia coccinea</i>	G	Herbs	0.5
	<i>Crotalaria montana</i> var. <i>angustifolia</i>	G	Herbs	0.2
	<i>Neptunia gracilis</i> forma. <i>gracilis</i>	G	Herbs	0.2
	<i>Peplidium muelleri</i>	G	Herbs	0.3
	<i>Phyllanthus maderaspatensis</i>	G	Herbs	0.1
	<i>Polymeria ambigua</i>	G	Herbs	0.05
	<i>Portulaca oleracea</i>	G	Herbs	0.01
	<i>Spermacoce occidentalis</i>	G	Herbs	0.01
	<i>Adansonia gregorii</i>	U	Trees 10-20m	15
	<i>Eucalyptus coolabah</i>	U	Trees 10-20m	5
	<i>Corymbia greeniana</i>	U	Trees <10m	1
	<i>Hakea arborescens</i>	U	Trees <10m	5
	<i>Hakea chordophylla</i>	U	Trees <10m	0.5
	<i>Melaleuca alsophila</i>	U	Trees <10m	2
	<i>Grevillea pyramidalis</i>	M	Shrubs >2m	0.2
	<i>Acacia coleii</i>	M	Shrubs 1-2m	1.5
	<i>Carissa lanceolata</i>	M	Shrubs 1-2m	1
	<i>*Stylosanthes hamata</i>	M	Shrubs <1m	2.5
	<i>Gossypium australe</i>	M	Shrubs <1m	0.01
ELA14	<i>Indigofera linnaei</i>	M	Shrubs <1m	0.2
	<i>Aristida hygrometrica</i>	G	Grasses	0.5
	<i>Eriachne obtusa</i>	G	Grasses	2
	<i>Sorghum plumosum</i>	G	Grasses	45
	<i>Fimbristylis ferruginea</i>	G	Sedges	0.1
	<i>Alysicarpus muelleri</i>	G	Herbs	0.01
	<i>Boerhavia coccinea</i>	G	Herbs	0.2
	<i>Evolvulus alsinoides</i>	G	Herbs	0.05
	<i>Gomphrena canescens</i>	G	Herbs	0.05
	<i>Goodenia sepalosa</i> var. <i>sepalosa</i>	G	Herbs	0.01
	<i>Pluchea tetranthera</i>	G	Herbs	0.01
	<i>Polygala galeocephala</i>	G	Herbs	0.1

Quadrat	Species	Stratum	Lifeform	Cover (%)
	<i>Polymeria ambigua</i>	G	Herbs	0.1
	<i>Pterocaulon</i> sp.	G	Herbs	0.01
	<i>Tinospora smilacina</i>	G	Herbs	0.01
ELA15	<i>Adansonia gregorii</i>	U	Trees 10-20m	5
	<i>Corymbia greeniana</i>	U	Trees <10m	2
	<i>Hakea arborescens</i>	U	Trees <10m	8
	<i>Melaleuca alsophila</i>	U	Trees <10m	10
	<i>Acacia colei</i>	M	Shrubs >2m	3
	<i>Aristida hygrometrica</i>	G	Grasses	1
	<i>Eriachne obtusa</i>	G	Grasses	10
	<i>Panicum decompositum</i>	G	Grasses	0.1
	<i>Sorghum plumosum</i>	G	Grasses	20
	<i>Fimbristylis ferruginea</i>	G	Sedges	5
	<i>Crotalaria montana</i> var. <i>angustifolia</i>	G	Herbs	0.01
	<i>Murdannia graminea</i>	G	Herbs	0.01
	<i>Portulaca digyna</i>	G	Herbs	0.01
	<i>Trianthema pilosum</i>	G	Herbs	0.01
ELA16	<i>Adansonia gregorii</i>	U	Trees 10-20m	1.5
	<i>Corymbia greeniana</i>	U	Trees 10-20m	3.5
	<i>Bauhinia cunninghamii</i>	U	Trees <10m	0.8
	<i>Hakea arborescens</i>	U	Trees <10m	1
	<i>Acacia colei</i>	M	Shrubs >2m	0.4
	<i>Grevillea pyramidalis</i>	M	Shrubs >2m	0.2
	<i>Carissa lanceolata</i>	M	Shrubs 1-2m	0.5
	<i>Gossypium australe</i>	M	Shrubs 1-2m	0.01
	<i>Cullen corallum</i>	M	Shrubs <1m	0.01
	<i>Eriachne obtusa</i>	G	Grasses	0.5
	<i>Sorghum plumosum</i>	G	Grasses	60
	<i>Bonamia linearis</i>	G	Herbs	0.1
	<i>Gomphrena canescens</i>	G	Herbs	0.02
	<i>Goodenia armitiana</i>	G	Herbs	0.01
	<i>Peplidium muelleri</i>	G	Herbs	0.01
<i>Pluchea tetranthera</i>	G	Herbs	0.01	
ELA17	<i>Corymbia greeniana</i>	U	Trees <10m	2
	<i>Gyrocarpus americanus</i>	U	Trees <10m	0.05
	<i>Acacia platycarpa</i>	M	Shrubs >2m	6
	<i>Grevillea pyramidalis</i>	M	Shrubs 1-2m	0.01
	<i>Corchorus sidoides</i> subsp. <i>sidoides</i>	M	Shrubs <1m	0.01
	<i>Aristida latifolia</i>	G	Grasses	0.1
	<i>Eriachne obtusa</i>	G	Grasses	0.5
<i>Panicum decompositum</i>	G	Grasses	0.01	

Quadrat	Species	Stratum	Lifeform	Cover (%)
	<i>Sorghum plumosum</i>	G	Grasses	70
	<i>Triodia</i> sp.	G	Grasses	0.5
	<i>Bonamia linearis</i>	G	Herbs	0.7
	<i>Bonamia pannosa</i>	G	Herbs	0.01
	<i>Crotalaria ramosissima</i>	G	Herbs	0.01
	<i>Cucumis melo</i>	G	Herbs	0.01
	<i>Gomphrena canescens</i>	G	Herbs	0.02
	<i>Polymeria ambigua</i>	G	Herbs	0.01
	<i>Corymbia zygophylla</i>	U	Trees 10-20m	4
	<i>Acacia platycarpa</i>	M	Shrubs >2m	6
	<i>Chamaecrista symonii</i>	M	Shrubs <1m	0.7
	<i>Corchorus sidoides</i> subsp. <i>sidoides</i>	M	Shrubs <1m	0.02
	<i>Corchorus sidoides</i> subsp. <i>vermicularis</i>	M	Shrubs <1m	0.01
	<i>Grevillea pyramidalis</i>	M	Shrubs <1m	0.01
	<i>Waltheria indica</i>	M	Shrubs <1m	0.02
ELA18	? <i>Austrostipa</i> sp.	G	Grasses	6
	<i>Aristida latifolia</i>	G	Grasses	8
	<i>Eriachne obtusa</i>	G	Grasses	0.5
	<i>Sorghum plumosum</i>	G	Grasses	15
	<i>Bonamia pannosa</i>	G	Herbs	0.8
	<i>Gomphrena canescens</i>	G	Herbs	0.01
	<i>Ptilotus calostachyus</i>	G	Herbs	0.01
	<i>Spermacoce occidentalis</i>	G	Herbs	0.04
	<i>Adansonia gregorii</i>	U	Trees 10-20m	1
	<i>Atalaya hemiglauca</i>	U	Trees <10m	0.02
	<i>Bauhinia cunninghamii</i>	U	Trees <10m	1
	<i>Hakea arborescens</i>	U	Trees <10m	0.5
	<i>Acacia ancistrocarpa</i>	M	Shrubs >2m	2
	<i>Acacia coleii</i>	M	Shrubs 1-2m	0.5
	<i>Carissa lanceolata</i>	M	Shrubs 1-2m	0.04
	<i>Grevillea pyramidalis</i>	M	Shrubs 1-2m	0.1
	* <i>Stylosanthes hamata</i>	M	Shrubs <1m	0.01
ELA19	<i>Abutilon otocarpum</i>	M	Shrubs <1m	0.01
	<i>Corchorus sidoides</i> subsp. <i>sidoides</i>	M	Shrubs <1m	0.01
	<i>Dolichandrone occidentalis</i>	M	Shrubs <1m	0.04
	<i>Gossypium australe</i>	M	Shrubs <1m	0.1
	<i>Indigofera colutea</i>	M	Shrubs <1m	0.02
	<i>Indigofera linifolia</i>	M	Shrubs <1m	0.01
	<i>Indigofera linnaei</i>	M	Shrubs <1m	0.01
	<i>Aristida hygrometrica</i>	G	Grasses	0.1
	<i>Enneapogon purpurascens</i>	G	Grasses	0.2

Quadrat	Species	Stratum	Lifeform	Cover (%)
	<i>Eriachne obtusa</i>	G	Grasses	0.05
	<i>Sorghum plumosum</i>	G	Grasses	40
	<i>Boerhavia coccinea</i>	G	Herbs	0.02
	<i>Cajanus marmoratus</i>	G	Herbs	0.01
	<i>Euphorbia schultzei</i> var. <i>comans</i>	G	Herbs	0.5
	<i>Gomphrena canescens</i>	G	Herbs	0.02
	<i>Pluchea tetranthera</i>	G	Herbs	0.01
	<i>Polymeria ambigua</i>	G	Herbs	0.01
	<i>Pterocaulon serrulatum</i> var. <i>velutinum</i>	G	Herbs	0.01
	<i>Ptilotus corymbosus</i>	G	Herbs	0.01
	<i>Trichodesma zeylanicum</i> var. <i>zeylanicum</i>	G	Herbs	0.01
ELA20	<i>Bauhinia cunninghamii</i>	U	Trees <10m	1
	<i>Gyrocarpus americanus</i>	U	Trees <10m	0.01
	<i>Terminalia platyphylla</i>	U	Trees <10m	0.01
	<i>Acacia platycarpa</i>	M	Shrubs >2m	5
	<i>Grevillea pyramidalis</i>	M	Shrubs >2m	0.05
	<i>Atalaya hemiglauca</i>	M	Shrubs 1-2m	0.5
	<i>Carissa lanceolata</i>	M	Shrubs 1-2m	0.5
	* <i>Calotropis procera</i>	M	Shrubs <1m	0.01
	<i>Abutilon otocarpum</i>	M	Shrubs <1m	0.01
	<i>Corchorus sidoides</i> subsp. <i>sidoides</i>	M	Shrubs <1m	0.05
	<i>Aristida latifolia</i>	G	Grasses	0.1
	<i>Chrysopogon fallax</i>	G	Grasses	8
	<i>Enneapogon pallidus</i>	G	Grasses	0.1
	<i>Eriachne obtusa</i>	G	Grasses	0.5
	<i>Sorghum plumosum</i>	G	Grasses	8
	<i>Sorghum stipoideum</i>	G	Grasses	0.05
	<i>Triodia</i> sp.	G	Grasses	0.05
	<i>Alternanthera angustifolia</i>	G	Herbs	0.01
	<i>Crotalaria ramosissima</i>	G	Herbs	0.01
	<i>Evolvulus alsinoides</i>	G	Herbs	0.01
<i>Tinospora smilacina</i>	G	Herbs	0.02	
<i>Trichodesma zeylanicum</i> var. <i>zeylanicum</i>	G	Herbs	0.01	
ELA21	<i>Bauhinia cunninghamii</i>	U	Trees <10m	0.05
	<i>Hakea macrocarpa</i>	U	Trees <10m	0.1
	<i>Acacia ancistrocarpa</i>	M	Shrubs >2m	0.1
	<i>Acacia coleii</i>	M	Shrubs >2m	10
	<i>Grevillea pyramidalis</i>	M	Shrubs >2m	0.8
	* <i>Stylosanthes hamata</i>	M	Shrubs <1m	0.01
	<i>Abutilon otocarpum</i>	M	Shrubs <1m	0.01
	<i>Abutilon</i> sp. <i>Dioicum</i> (A.A. Mitchell PRP 1618)	M	Shrubs <1m	0.01

Quadrat	Species	Stratum	Lifform	Cover (%)
	<i>Cullen badocanum</i>	M	Shrubs <1m	0.01
	<i>Gossypium australe</i>	M	Shrubs <1m	0.05
	<i>Indigofera colutea</i>	M	Shrubs <1m	0.01
	<i>Indigofera linifolia</i>	M	Shrubs <1m	0.01
	<i>Eriachne obtusa</i>	G	Grasses	0.02
	<i>Sehima nervosum</i>	G	Grasses	35
	<i>Bergia trimera</i>	G	Herbs	0.2
	<i>Cajanus marmoratus</i>	G	Herbs	0.01
	<i>Euphorbia schultzii</i> var. <i>comans</i>	G	Herbs	0.02
	<i>Gomphrena canescens</i>	G	Herbs	0.01
	<i>Ipomoea eriocarpa</i>	G	Herbs	0.01
	<i>Pluchea tetranthera</i>	G	Herbs	0.02
	<i>Ptilotus corymbosus</i>	G	Herbs	0.01
	<i>Bauhinia cunninghamii</i>	U	Trees <10m	0.4
	<i>Corymbia greeniana</i>	U	Trees <10m	0.2
	<i>Hakea arborescens</i>	U	Trees <10m	0.2
	<i>Hakea chordophylla</i>	U	Trees <10m	0.1
	<i>Acacia ancistrocarpa</i>	M	Shrubs >2m	2
	<i>Acacia colei</i>	M	Shrubs >2m	3
	<i>Grevillea pyramidalis</i>	M	Shrubs 1-2m	0.5
	<i>Cullen badocanum</i>	M	Shrubs <1m	0.01
ELA22	<i>Aristida latifolia</i>	G	Grasses	15
	<i>Eriachne obtusa</i>	G	Grasses	0.1
	<i>Sorghum plumosum</i>	G	Grasses	25
	<i>Evolvulus alsinoides</i>	G	Herbs	0.01
	<i>Gomphrena canescens</i>	G	Herbs	0.1
	<i>Goodenia armitiana</i>	G	Herbs	0.01
	<i>Pluchea tetranthera</i>	G	Herbs	0.01
	<i>Trichodesma zeylanicum</i> var. <i>zeylanicum</i>	G	Herbs	0.01
	<i>Corymbia greeniana</i>	U	Trees <10m	0.1
	<i>Dolichandrone occidentalis</i>	U	Trees <10m	0.04
	<i>Hakea macrocarpa</i>	U	Trees <10m	0.7
	<i>Terminalia canescens</i>	U	Trees <10m	0.15
	<i>Acacia ancistrocarpa</i>	M	Shrubs >2m	5
	<i>Acacia colei</i>	M	Shrubs >2m	0.1
ELA23	<i>Grevillea pyramidalis</i>	M	Shrubs >2m	0.8
	<i>Corchorus sidoides</i> subsp. <i>sidoides</i>	M	Shrubs <1m	0.02
	<i>Eragrostis eriopoda</i>	G	Grasses	0.05
	<i>Sorghum plumosum</i>	G	Grasses	45
	<i>Triodia intermedia</i>	G	Grasses	2
	<i>Arivela viscosa</i>	G	Herbs	0.02

Quadrat	Species	Stratum	Lifeform	Cover (%)
	<i>Cajanus marmoratus</i>	G	Herbs	0.01
	<i>Crotalaria brevis</i>	G	Herbs	0.01
	<i>Euphorbia schultzei</i> var. <i>comans</i>	G	Herbs	0.01
	<i>Gomphrena canescens</i>	G	Herbs	0.01
	<i>Heliotropium diversifolium</i>	G	Herbs	0.01
	<i>Pluchea tetranthera</i>	G	Herbs	0.01
	<i>Polygala galeocephala</i>	G	Herbs	0.01
	<i>Polymeria ambigua</i>	G	Herbs	0.01
	<i>Striga curviflora</i>	G	Herbs	0.01
	<i>Adansonia gregorii</i>	U	Trees 10-20m	6
	<i>Bauhinia cunninghamii</i>	U	Trees <10m	1
	<i>Corymbia greeniana</i>	U	Trees <10m	0.1
	<i>Hakea arborescens</i>	U	Trees <10m	0.05
	<i>Hakea macrocarpa</i>	U	Trees <10m	1.2
	<i>Terminalia canescens</i>	U	Trees <10m	7
	<i>Acacia ancistrocarpa</i>	M	Shrubs >2m	0.4
	<i>Grevillea pyramidalis</i>	M	Shrubs >2m	0.1
	<i>Acacia colei</i>	M	Shrubs 1-2m	1
	<i>Atalaya hemiglauca</i>	M	Shrubs 1-2m	0.06
	<i>Carissa lanceolata</i>	M	Shrubs 1-2m	0.08
	<i>Clerodendrum ?floribundum</i>	M	Shrubs 1-2m	0.05
	<i>Corchorus sidoides</i> subsp. <i>sidoides</i>	M	Shrubs <1m	0.01
	<i>Gossypium australe</i>	M	Shrubs <1m	0.01
	<i>Indigofera linifolia</i>	M	Shrubs <1m	0.01
	<i>Eragrostis eriopoda</i>	G	Grasses	0.02
	<i>Sehima nervosum</i>	G	Grasses	0.4
	<i>Sorghum plumosum</i>	G	Grasses	45
	<i>Triodia intermedia</i>	G	Grasses	3
	* <i>Portulaca pilosa</i>	G	Herbs	0.01
	<i>Boerhavia coccinea</i>	G	Herbs	0.01
	<i>Cajanus marmoratus</i>	G	Herbs	0.01
	<i>Crotalaria brevis</i>	G	Herbs	0.01
	<i>Crotalaria medicaginea</i> var. <i>neglecta</i>	G	Herbs	0.01
	<i>Evolvulus alsinoides</i> var. <i>decumbens</i>	G	Herbs	0.01
	<i>Evolvulus alsinoides</i> var. <i>villosicalyx</i>	G	Herbs	0.01
	<i>Gomphrena canescens</i>	G	Herbs	0.01
	<i>Goodenia sepalosa</i> var. <i>sepalosa</i>	G	Herbs	0.02
	<i>Heliotropium diversifolium</i>	G	Herbs	0.01
	<i>Heliotropium foliatum</i>	G	Herbs	0.01
	<i>Mitrasacme exserta</i>	G	Herbs	0.01
	<i>Phyllanthus maderaspatensis</i>	G	Herbs	0.02

ELA24

Quadrat	Species	Stratum	Lifeform	Cover (%)
	<i>Pluchea tetranthera</i>	G	Herbs	0.02
	<i>Polygala tepperi</i>	G	Herbs	0.01
	<i>Polymeria ambigua</i>	G	Herbs	0.01
	<i>Rhynchosia minima</i>	G	Herbs	0.01
	<i>Scleromitron scleranthoides</i>	G	Herbs	0.01
	<i>Zornia prostrata</i> var. <i>prostrata</i>	G	Herbs	0.01
	<i>Bauhinia cunninghamii</i>	U	Trees <10m	0.08
	<i>Hakea macrocarpa</i>	U	Trees <10m	1
	<i>Grevillea pyramidalis</i>	M	Shrubs >2m	0.1
	<i>Acacia colei</i>	M	Shrubs 1-2m	0.05
	<i>Atalaya hemiglauca</i>	M	Shrubs 1-2m	0.05
	<i>Carissa lanceolata</i>	M	Shrubs <1m	0.08
	<i>Corchorus sidoides</i> subsp. <i>sidoides</i>	M	Shrubs <1m	0.01
	<i>Gossypium australe</i>	M	Shrubs <1m	0.03
	<i>Indigofera colutea</i>	M	Shrubs <1m	0.02
	<i>Aristida latifolia</i>	G	Grasses	0.02
	<i>Sehima nervosum</i>	G	Grasses	0.02
	<i>Sorghum plumosum</i>	G	Grasses	90
	<i>Sporobolus australasicus</i>	G	Grasses	0.01
	<i>Triodia intermedia</i>	G	Grasses	1.5
	* <i>Portulaca pilosa</i>	G	Herbs	0.01
	<i>Bergia henshallii</i>	G	Herbs	0.02
	<i>Boerhavia coccinea</i>	G	Herbs	0.01
	<i>Cajanus marmoratus</i>	G	Herbs	0.01
	<i>Euphorbia schultzii</i> var. <i>comans</i>	G	Herbs	0.02
	<i>Evolvulus alsinoides</i> var. <i>decumbens</i>	G	Herbs	0.01
	<i>Gomphrena canescens</i>	G	Herbs	0.01
	<i>Heliotropium diversifolium</i>	G	Herbs	0.01
	<i>Neptunia gracilis</i> forma. <i>gracilis</i>	G	Herbs	0.02
	<i>Pluchea tetranthera</i>	G	Herbs	0.5
	<i>Polygala galeocephala</i>	G	Herbs	0.01
	<i>Polygala tepperi</i>	G	Herbs	0.02
	<i>Polymeria ambigua</i>	G	Herbs	0.01
	<i>Pterocaulon intermedium</i>	G	Herbs	0.04
	<i>Rhynchosia minima</i>	G	Herbs	0.01
	<i>Tinospora smilacina</i>	G	Herbs	0.01
	<i>Trichodesma zeylanicum</i> var. <i>zeylanicum</i>	G	Herbs	0.05
	<i>Bauhinia cunninghamii</i>	U	Trees <10m	1
	<i>Hakea chordophylla</i>	U	Trees <10m	2
	<i>Hakea macrocarpa</i>	U	Trees <10m	1
	<i>Terminalia canescens</i>	U	Trees <10m	10

Quadrat	Species	Stratum	Lifform	Cover (%)
	<i>Acacia ancistrocarpa</i>	M	Shrubs 1-2m	0.5
	<i>Dolichandrone occidentalis</i>	M	Shrubs 1-2m	0.5
	<i>Grevillea pyramidalis</i>	M	Shrubs 1-2m	0.5
	* <i>Stylosanthes hamata</i>	M	Shrubs <1m	0.2
	<i>Corchorus sidoides</i> subsp. <i>vermicularis</i>	M	Shrubs <1m	0.1
	<i>Gossypium australe</i>	M	Shrubs <1m	0.1
	<i>Indigofera colutea</i>	M	Shrubs <1m	0.5
	<i>Indigofera linnaei</i>	M	Shrubs <1m	0.2
	<i>Eriachne obtusa</i>	G	Grasses	0.2
	<i>Eulalia aurea</i>	G	Grasses	0.3
	<i>Sorghum plumosum</i>	G	Grasses	60
	<i>Sporobolus australasicus</i>	G	Grasses	0.5
	<i>Triodia intermedia</i>	G	Grasses	5
	<i>Alysicarpus muelleri</i>	G	Herbs	0.01
	<i>Arivela tetrandra</i>	G	Herbs	0.01
	<i>Byblis filifolia</i>	G	Herbs	0.02
	<i>Glycine tomentella</i>	G	Herbs	0.05
	<i>Gomphrena brachystylis</i> subsp. <i>pindanensis</i>	G	Herbs	1
	<i>Goodenia sepalosa</i> var. <i>sepalosa</i>	G	Herbs	0.02
	<i>Heliotropium cunninghamii</i>	G	Herbs	0.1
	<i>Heliotropium foliatum</i>	G	Herbs	0.01
	<i>Lindernia clausa</i>	G	Herbs	0.01
	<i>Mitrasacme exserta</i>	G	Herbs	0.01
	<i>Mitrasacme hispida</i>	G	Herbs	0.01
	<i>Phyllanthus maderaspatensis</i>	G	Herbs	0.02
	<i>Pluchea tetranthera</i>	G	Herbs	0.1
	<i>Polygala galeocephala</i>	G	Herbs	0.01
	<i>Ptilotus corymbosus</i>	G	Herbs	0.01
	<i>Ptilotus fusiformis</i>	G	Herbs	0.01
	<i>Rhynchosia minima</i>	G	Herbs	0.1
	<i>Spermacoce occidentalis</i>	G	Herbs	0.01
ELA27	<i>Terminalia canescens</i>	U	Trees <10m	5
	<i>Acacia ancistrocarpa</i>	M	Shrubs >2m	10
	<i>Grevillea pyramidalis</i>	M	Shrubs >2m	0.2
	<i>Acacia colei</i>	M	Shrubs 1-2m	0.2
	* <i>Stylosanthes hamata</i>	M	Shrubs <1m	0.1
	<i>Corchorus fascicularis</i>	M	Shrubs <1m	0.05
	<i>Corchorus sidoides</i> subsp. <i>vermicularis</i>	M	Shrubs <1m	0.5
	<i>Gossypium australe</i>	M	Shrubs <1m	0.1
	<i>Indigofera linnaei</i>	M	Shrubs <1m	0.1
	<i>Senna notabilis</i>	M	Shrubs <1m	0.05

Quadrat	Species	Stratum	Lifeform	Cover (%)
	<i>*Cenchrus setiger</i>	G	Grasses	0.1
	<i>Aristida holathera</i>	G	Grasses	0.5
	<i>Eragrostis eriopoda</i>	G	Grasses	0.2
	<i>Perotis rara</i>	G	Grasses	0.05
	<i>Sorghum plumosum</i>	G	Grasses	15
	<i>Sporobolus australasicus</i>	G	Grasses	0.1
	<i>Triodia bitextura</i>	G	Grasses	4
	<i>Triodia intermedia</i>	G	Grasses	0.5
	<i>*Portulaca pilosa</i>	G	Herbs	0.01
	<i>Alysicarpus muelleri</i>	G	Herbs	0.02
	<i>Arivela tetrandra</i>	G	Herbs	0.01
	<i>Arivela viscosa</i>	G	Herbs	0.01
	<i>Buchnera ramosissima</i>	G	Herbs	0.2
	<i>Drosera derbyensis</i>	G	Herbs	0.01
	<i>Euphorbia psilosperma</i>	G	Herbs	0.01
	<i>Gomphrena brachystylis</i> subsp. <i>pindanensis</i>	G	Herbs	1
	<i>Goodenia sepalosa</i> var. <i>sepalosa</i>	G	Herbs	0.05
	<i>Lindernia clausa</i>	G	Herbs	0.01
	<i>Mitrasacme exserta</i>	G	Herbs	0.01
	<i>Mitrasacme hispida</i>	G	Herbs	0.01
	<i>Phyllanthus maderaspatensis</i>	G	Herbs	0.3
	<i>Pluchea tetranthera</i>	G	Herbs	0.5
	<i>Pterocaulon</i> sp.	G	Herbs	0.01
	<i>Ptilotus corymbosus</i>	G	Herbs	0.05
	<i>Spermacoce occidentalis</i>	G	Herbs	0.01
	<i>Stackhousia intermedia</i>	G	Herbs	0.01
	<i>Trianthema pilosum</i>	G	Herbs	0.01
ELA28	<i>Acacia coleii</i>	U	Trees <10m	12
	<i>Atalaya hemiglauca</i>	U	Trees <10m	0.2
	<i>Bauhinia cunninghamii</i>	U	Trees <10m	0.5
	<i>Hakea macrocarpa</i>	U	Trees <10m	0.5
	<i>Terminalia canescens</i>	U	Trees <10m	8
	<i>Grevillea pyramidalis</i>	M	Shrubs >2m	0.5
	<i>*Stylosanthes hamata</i>	M	Shrubs <1m	0.5
	<i>Abutilon hannii</i>	M	Shrubs <1m	0.1
	<i>Carissa lanceolata</i>	M	Shrubs <1m	0.4
	<i>Corchorus fascicularis</i>	M	Shrubs <1m	0.01
	<i>Gossypium australe</i>	M	Shrubs <1m	0.1
	<i>Indigofera colutea</i>	M	Shrubs <1m	0.1
	<i>Indigofera linifolia</i>	M	Shrubs <1m	0.1
	<i>Indigofera linnaei</i>	M	Shrubs <1m	0.8

Quadrat	Species	Stratum	Lifeform	Cover (%)
	<i>*Cenchrus setiger</i>	G	Grasses	0.1
	<i>Dactyloctenium radulans</i>	G	Grasses	0.1
	<i>Eriachne obtusa</i>	G	Grasses	4
	<i>Panicum decompositum</i>	G	Grasses	0.1
	<i>Perotis rara</i>	G	Grasses	0.5
	<i>Sehima nervosum</i>	G	Grasses	0.5
	<i>Sorghum plumosum</i>	G	Grasses	30
	<i>Sporobolus australasicus</i>	G	Grasses	0.2
	<i>Triodia intermedia</i>	G	Grasses	10
	<i>*Portulaca pilosa</i>	G	Herbs	0.01
	<i>Alysicarpus muelleri</i>	G	Herbs	0.05
	<i>Boerhavia coccinea</i>	G	Herbs	0.05
	<i>Crotalaria brevis</i>	G	Herbs	0.01
	<i>Evolvulus alsinoides</i>	G	Herbs	0.01
	<i>Gomphrena canescens</i>	G	Herbs	0.01
	<i>Goodenia sepalosa</i> var. <i>sepalosa</i>	G	Herbs	0.02
	<i>Heliotropium cunninghamii</i>	G	Herbs	0.01
	<i>Phyllanthus maderaspatensis</i>	G	Herbs	0.02
	<i>Pluchea tetranthera</i>	G	Herbs	0.1
	<i>Polycarpha corymbosa</i>	G	Herbs	0.1
	<i>Polymeria ambigua</i>	G	Herbs	0.2
	<i>Pterocaulon serrulatum</i> var. <i>velutinum</i>	G	Herbs	0.01
	<i>Ptilotus corymbosus</i>	G	Herbs	0.01
	<i>Rhynchosia minima</i>	G	Herbs	0.1
	<i>Spermacoce occidentalis</i>	G	Herbs	0.1
ELA29	<i>Adansonia gregorii</i>	U	Trees <10m	0.5
	<i>Atalaya hemiglauca</i>	U	Trees <10m	0.5
	<i>Bauhinia cunninghamii</i>	U	Trees <10m	2
	<i>Hakea arborescens</i>	U	Trees <10m	0.5
	<i>Hakea macrocarpa</i>	U	Trees <10m	0.3
	<i>Grevillea pyramidalis</i>	M	Shrubs >2m	0.5
	<i>Carissa lanceolata</i>	M	Shrubs 1-2m	0.2
	<i>Dolichandrone occidentalis</i>	M	Shrubs 1-2m	0.5
	<i>Gossypium australe</i>	M	Shrubs 1-2m	0.1
	<i>*Stylosanthes hamata</i>	M	Shrubs <1m	0.2
	<i>Abutilon hannii</i>	M	Shrubs <1m	0.2
	<i>Corchorus sidoides</i> subsp. <i>sidoides</i>	M	Shrubs <1m	0.5
	<i>Gymnanthera oblonga</i>	M	Shrubs <1m	0.01
	<i>Indigofera colutea</i>	M	Shrubs <1m	0.5
	<i>Indigofera linifolia</i>	M	Shrubs <1m	0.1
	<i>Aristida hygrometrica</i>	G	Grasses	0.5

Quadrat	Species	Stratum	Lifeform	Cover (%)
	<i>Eriachne obtusa</i>	G	Grasses	0.02
	<i>Sorghum plumosum</i>	G	Grasses	0.5
	<i>Triodia intermedia</i>	G	Grasses	30
	* <i>Portulaca pilosa</i>	G	Herbs	0.01
	<i>Afrohybanthus enneaspermus</i>	G	Herbs	0.01
	<i>Boerhavia coccinea</i>	G	Herbs	0.1
	<i>Buchnera ramosissima</i>	G	Herbs	0.1
	<i>Cajanus latisepalus</i>	G	Herbs	2
	<i>Crotalaria cunninghamii</i>	G	Herbs	0.05
	<i>Crotalaria medicaginea</i> var. <i>neglecta</i>	G	Herbs	0.1
	<i>Cucumis variabilis</i>	G	Herbs	0.01
	<i>Gomphrena canescens</i>	G	Herbs	0.1
	<i>Mitrasacme exserta</i>	G	Herbs	0.01
	<i>Phyllanthus maderaspatensis</i>	G	Herbs	0.01
	<i>Pluchea tetranthera</i>	G	Herbs	0.5
	<i>Polygala galeocephala</i>	G	Herbs	0.01
	<i>Pterocaulon intermedium</i>	G	Herbs	0.1
	<i>Spermacoce occidentalis</i>	G	Herbs	0.01
	<i>Stackhousia intermedia</i>	G	Herbs	0.01
	<i>Trichodesma zeylanicum</i> var. <i>zeylanicum</i>	G	Herbs	0.05
	<i>Adansonia gregorii</i>	U	Trees 10-20m	0.01
	<i>Bauhinia cunninghamii</i>	U	Trees <10m	0.1
	<i>Ehretia saligna</i>	U	Trees <10m	0.7
	<i>Hakea arborescens</i>	U	Trees <10m	0.3
	<i>Hakea chordophylla</i>	U	Trees <10m	0.05
	<i>Hakea macrocarpa</i>	U	Trees <10m	0.05
	<i>Atalaya hemiglauca</i>	M	Shrubs 1-2m	0.05
	<i>Carissa lanceolata</i>	M	Shrubs 1-2m	0.2
	<i>Gossypium australe</i>	M	Shrubs 1-2m	0.1
	<i>Grevillea pyramidalis</i>	M	Shrubs 1-2m	0.03
ELA30	<i>Abutilon hannii</i>	M	Shrubs <1m	0.05
	<i>Corchorus sidoides</i> subsp. <i>sidoides</i>	M	Shrubs <1m	0.01
	<i>Cullen badocanum</i>	M	Shrubs <1m	0.01
	<i>Indigofera colutea</i>	M	Shrubs <1m	0.02
	<i>Indigofera linifolia</i>	M	Shrubs <1m	0.01
	<i>Eriachne obtusa</i>	G	Grasses	0.7
	<i>Sorghum plumosum</i>	G	Grasses	90
	<i>Triodia intermedia</i>	G	Grasses	0.1
	<i>Cyperus blakeanus</i>	G	Sedges	1
	<i>Amaranthus undulatus</i>	G	Herbs	0.01
	<i>Boerhavia coccinea</i>	G	Herbs	0.05

Quadrat	Species	Stratum	Lifeform	Cover (%)
	<i>Buchnera ramosissima</i>	G	Herbs	0.01
	<i>Cajanus marmoratus</i>	G	Herbs	0.02
	<i>Crotalaria ramosissima</i>	G	Herbs	0.01
	<i>Euphorbia schultzii</i> var. <i>comans</i>	G	Herbs	0.01
	<i>Gomphrena canescens</i>	G	Herbs	0.01
	<i>Goodenia armitiana</i>	G	Herbs	0.01
	<i>Mitrasacme exserta</i>	G	Herbs	0.01
	<i>Pluchea tetranthera</i>	G	Herbs	0.01
	<i>Polymeria ambigua</i>	G	Herbs	0.01
	<i>Pterocaulon intermedium</i>	G	Herbs	0.4
	<i>Pterocaulon serrulatum</i> var. <i>velutinum</i>	G	Herbs	0.01
	<i>Trichodesma zeylanicum</i> var. <i>zeylanicum</i>	G	Herbs	0.01
	<i>Zornia chaetophora</i>	G	Herbs	0.01
	<i>Zornia prostrata</i> var. <i>prostrata</i>	G	Herbs	0.01
	<i>Adansonia gregorii</i>	U	Trees <10m	2
	<i>Bauhinia cunninghamii</i>	U	Trees <10m	0.5
	<i>Hakea arborescens</i>	U	Trees <10m	0.1
	<i>Terminalia canescens</i>	U	Trees <10m	0.5
	<i>Grevillea pyramidalis</i>	M	Shrubs >2m	0.5
	<i>Acacia ancistrocarpa</i>	M	Shrubs 1-2m	0.5
	<i>Acacia colei</i>	M	Shrubs 1-2m	0.05
	<i>Carissa lanceolata</i>	M	Shrubs 1-2m	0.2
	* <i>Stylosanthes hamata</i>	M	Shrubs <1m	0.5
	<i>Corchorus fascicularis</i>	M	Shrubs <1m	0.1
	<i>Corchorus sidoides</i> subsp. <i>vermicularis</i>	M	Shrubs <1m	0.2
	<i>Gossypium australe</i>	M	Shrubs <1m	0.2
	<i>Indigofera colutea</i>	M	Shrubs <1m	0.1
ELA31	<i>Indigofera linifolia</i>	M	Shrubs <1m	0.1
	<i>Indigofera linnaei</i>	M	Shrubs <1m	0.5
	<i>Aristida holathera</i>	G	Grasses	0.5
	<i>Aristida hygrometrica</i>	G	Grasses	0.1
	<i>Aristida latifolia</i>	G	Grasses	0.2
	<i>Chrysopogon fallax</i>	G	Grasses	0.1
	<i>Cymbopogon ambiguus</i>	G	Grasses	1
	<i>Eriachne obtusa</i>	G	Grasses	0.2
	<i>Panicum decompositum</i>	G	Grasses	0.1
	<i>Sorghum plumosum</i>	G	Grasses	3
	<i>Sporobolus australasicus</i>	G	Grasses	0.2
	<i>Triodia intermedia</i>	G	Grasses	10
	<i>Urochloa holosericea</i>	G	Grasses	1.5
	<i>Fimbristylis schultzii</i>	G	Sedges	0.1

Quadrat	Species	Stratum	Lifform	Cover (%)
	<i>*Portulaca pilosa</i>	G	Herbs	0.01
	<i>Afrohybanthus enneaspermus</i>	G	Herbs	0.05
	<i>Arivela viscosa</i>	G	Herbs	0.01
	<i>Boerhavia coccinea</i>	G	Herbs	0.2
	<i>Buchnera ramosissima</i>	G	Herbs	0.3
	<i>Crotalaria medicaginea</i> var. <i>neglecta</i>	G	Herbs	0.2
	<i>Euphorbia psilosperma</i>	G	Herbs	0.01
	<i>Goodenia sepalosa</i> var. <i>sepalosa</i>	G	Herbs	0.01
	<i>Lindernia clausa</i>	G	Herbs	0.05
	<i>Neptunia gracilis</i> forma. <i>gracilis</i>	G	Herbs	0.5
	<i>Phyllanthus maderaspatensis</i>	G	Herbs	0.05
	<i>Pluchea tetranthera</i>	G	Herbs	0.1
	<i>Polymeria ambigua</i>	G	Herbs	0.1
	<i>Portulaca digyna</i>	G	Herbs	0.01
	<i>Portulaca oleracea</i>	G	Herbs	0.01
	<i>Pterocaulon intermedium</i>	G	Herbs	0.01
	<i>Ptilotus fusiformis</i>	G	Herbs	0.01
	<i>Rhynchosia minima</i>	G	Herbs	0.1
	<i>Roepera</i> sp.	G	Herbs	0.01
	<i>Spermacoce occidentalis</i>	G	Herbs	0.1
	<i>Trichodesma zeylanicum</i> var. <i>zeylanicum</i>	G	Herbs	0.1
	<i>Zornia prostrata</i> var. <i>prostrata</i>	G	Herbs	0.02
	<i>Acacia coleii</i>	M	Shrubs 1-2m	0.04
	<i>Abutilon otocarpum</i>	M	Shrubs <1m	0.02
	<i>Atalaya hemiglauca</i>	M	Shrubs <1m	0.1
	<i>Carissa lanceolata</i>	M	Shrubs <1m	0.05
	<i>Chamaecrista symonii</i>	M	Shrubs <1m	1
	<i>Corchorus sidoides</i> subsp. <i>vermicularis</i>	M	Shrubs <1m	0.01
	<i>Gossypium australe</i>	M	Shrubs <1m	0.05
	<i>Indigofera linifolia</i>	M	Shrubs <1m	0.01
	<i>Indigofera linnaei</i>	M	Shrubs <1m	0.01
ELA32	<i>Eriachne obtusa</i>	G	Grasses	0.05
	<i>Panicum decompositum</i>	G	Grasses	0.01
	<i>Perotis rara</i>	G	Grasses	0.1
	<i>Sporobolus australasicus</i>	G	Grasses	0.05
	<i>Triodia wiseana</i>	G	Grasses	90
	<i>Arivela viscosa</i>	G	Herbs	0.01
	<i>Blumea integrifolia</i>	G	Herbs	0.01
	<i>Blumea tenella</i>	G	Herbs	0.4
	<i>Cajanus marmoratus</i>	G	Herbs	0.02
	<i>Evolvulus alsinoides</i>	G	Herbs	0.01

Quadrat	Species	Stratum	Lifeform	Cover (%)
	<i>Gomphrena canescens</i>	G	Herbs	0.01
	<i>Ipomoea coptica</i>	G	Herbs	0.01
	<i>Pluchea tetranthera</i>	G	Herbs	0.05
	<i>Pterocaulon serrulatum</i> var. <i>velutinum</i>	G	Herbs	0.01
	<i>Trichodesma zeylanicum</i> var. <i>zeylanicum</i>	G	Herbs	0.01
ELA33	<i>Adansonia gregorii</i>	U	Trees <10m	0.5
	<i>Hakea arborescens</i>	U	Trees <10m	1.5
	<i>Hakea chordophylla</i>	U	Trees <10m	2
	<i>Terminalia canescens</i>	U	Trees <10m	2
	<i>Atalaya hemiglauc</i>	M	Shrubs 1-2m	0.2
	<i>Carissa lanceolata</i>	M	Shrubs 1-2m	0.2
	* <i>Calotropis procera</i>	M	Shrubs <1m	0.05
	<i>Corchorus fascicularis</i>	M	Shrubs <1m	0.1
	<i>Corchorus sidoides</i> subsp. <i>vermicularis</i>	M	Shrubs <1m	0.1
	<i>Gossypium australe</i>	M	Shrubs <1m	0.1
	<i>Indigofera colutea</i>	M	Shrubs <1m	0.1
	<i>Indigofera linifolia</i>	M	Shrubs <1m	0.5
	<i>Indigofera linnaei</i>	M	Shrubs <1m	0.1
	<i>Pimelea punicea</i>	M	Shrubs <1m	0.05
	<i>Aristida holathera</i>	G	Grasses	0.5
	<i>Cymbopogon ambiguus</i>	G	Grasses	0.05
	<i>Eriachne helmsii</i>	G	Grasses	0.1
	<i>Perotis rara</i>	G	Grasses	0.05
	<i>Sorghum plumosum</i>	G	Grasses	0.5
	<i>Sporobolus australasicus</i>	G	Grasses	0.2
	<i>Triodia intermedia</i>	G	Grasses	0.5
	<i>Urochloa holosericea</i>	G	Grasses	0.5
	<i>Afrohybanthus enneaspermus</i>	G	Herbs	0.05
	<i>Arivela viscosa</i>	G	Herbs	0.01
	<i>Boerhavia coccinea</i>	G	Herbs	0.5
	<i>Crotalaria medicaginea</i> var. <i>neglecta</i>	G	Herbs	0.5
	<i>Euphorbia cinerea</i>	G	Herbs	0.01
	<i>Euphorbia psilosperma</i>	G	Herbs	0.1
	<i>Gomphrena brachystylis</i> subsp. <i>pindanensis</i>	G	Herbs	0.5
	<i>Goodenia sepalosa</i> var. <i>sepalosa</i>	G	Herbs	0.05
	<i>Heliotropium cunninghamii</i>	G	Herbs	0.05
	<i>Mitrasacme exserta</i>	G	Herbs	0.01
	<i>Neptunia gracilis</i> forma. <i>gracilis</i>	G	Herbs	0.5
	<i>Pluchea tetranthera</i>	G	Herbs	0.1
	<i>Polycarpaea holtzei</i>	G	Herbs	0.1
	<i>Polymeria ambigua</i>	G	Herbs	0.1

Quadrat	Species	Stratum	Lifeform	Cover (%)
	<i>Portulaca digyna</i>	G	Herbs	0.01
	<i>Portulaca oleracea</i>	G	Herbs	0.02
	<i>Pterocaulon intermedium</i>	G	Herbs	0.01
	<i>Rhynchosia minima</i>	G	Herbs	0.2
	<i>Spermacoce occidentalis</i>	G	Herbs	0.02
	<i>Stackhousia intermedia</i>	G	Herbs	0.2
	<i>Trichodesma zeylanicum</i> var. <i>zeylanicum</i>	G	Herbs	0.1
	<i>Adansonia gregorii</i>	U	Trees 10-20m	0.01
	* <i>Stylosanthes hamata</i>	M	Shrubs <1m	0.01
	<i>Chamaecrista symonii</i>	M	Shrubs <1m	0.1
	<i>Dolichandrone occidentalis</i>	M	Shrubs <1m	0.1
	<i>Grona filiformis</i>	M	Shrubs <1m	0.01
	<i>Indigofera linifolia</i>	M	Shrubs <1m	0.01
	<i>Indigofera linnaei</i>	M	Shrubs <1m	0.01
	<i>Aristida latifolia</i>	G	Grasses	0.1
	<i>Dactyloctenium radulans</i>	G	Grasses	0.01
	<i>Eragrostis tenellula</i>	G	Grasses	0.02
	<i>Eriachne obtusa</i>	G	Grasses	0.05
	<i>Panicum decompositum</i>	G	Grasses	0.02
	<i>Sorghum plumosum</i>	G	Grasses	30
	<i>Triodia intermedia</i>	G	Grasses	30
	<i>Xerochloa barbata</i>	G	Grasses	0.01
ELA34	<i>Fimbristylis schultzei</i>	G	Sedges	0.01
	* <i>Portulaca pilosa</i>	G	Herbs	0.01
	<i>Arivela viscosa</i>	G	Herbs	0.01
	<i>Blumea integrifolia</i>	G	Herbs	0.01
	<i>Buchnera asperata</i>	G	Herbs	0.01
	<i>Calandrinia tepperiana</i>	G	Herbs	0.01
	<i>Cassytha filiformis</i>	G	Herbs	0.05
	<i>Crotalaria ramosissima</i>	G	Herbs	0.02
	<i>Evolvulus alsinoides</i>	G	Herbs	0.01
	<i>Gomphrena canescens</i>	G	Herbs	0.5
	<i>Ipomoea coptica</i>	G	Herbs	0.01
	<i>Phyllanthus maderaspatensis</i>	G	Herbs	0.01
	<i>Pluchea tetranthera</i>	G	Herbs	0.04
	<i>Spermacoce occidentalis</i>	G	Herbs	0.01
	<i>Trianthema oxycalyptum</i> var. <i>oxycalyptum</i>	G	Herbs	0.01
ELA35	* <i>Calotropis procera</i>	M	Shrubs <1m	0.01
	<i>Abutilon otocarpum</i>	M	Shrubs <1m	0.01
	<i>Chamaecrista symonii</i>	M	Shrubs <1m	0.6
	<i>Dolichandrone occidentalis</i>	M	Shrubs <1m	0.02

Quadrat	Species	Stratum	Lifeform	Cover (%)
	<i>Gossypium australe</i>	M	Shrubs <1m	0.01
	<i>Grona filiformis</i>	M	Shrubs <1m	0.01
	<i>Indigofera linifolia</i>	M	Shrubs <1m	0.02
	<i>Indigofera trita</i>	M	Shrubs <1m	0.02
	<i>Aristida latifolia</i>	G	Grasses	0.03
	<i>Eragrostis tenellula</i>	G	Grasses	0.01
	<i>Eriachne obtusa</i>	G	Grasses	0.5
	Poaceae sp. 3 (sterile)	G	Grasses	0.02
	<i>Sorghum plumosum</i>	G	Grasses	0.1
	<i>Sporobolus australasicus</i>	G	Grasses	0.01
	<i>Triodia intermedia</i>	G	Grasses	50
	<i>Xerochloa barbata</i>	G	Grasses	0.01
	<i>Fimbristylis schultzii</i>	G	Sedges	0.01
	<i>Cajanus marmoratus</i>	G	Herbs	0.01
	<i>Gomphrena canescens</i>	G	Herbs	0.01
	<i>Goodenia sepalosa</i> var. <i>sepalosa</i>	G	Herbs	0.01
	<i>Pluchea tetranthera</i>	G	Herbs	0.1
	<i>Acacia synchronicia</i>	M	Shrubs 1-2m	0.5
	<i>Carissa lanceolata</i>	M	Shrubs 1-2m	0.4
	* <i>Vachellia farnesiana</i>	M	Shrubs <1m	0.05
	<i>Atalaya hemiglauca</i>	M	Shrubs <1m	0.02
	<i>Chamaecrista symonii</i>	M	Shrubs <1m	0.02
	<i>Cullen badocanum</i>	M	Shrubs <1m	0.05
	<i>Gossypium australe</i>	M	Shrubs <1m	0.05
	<i>Indigofera linifolia</i>	M	Shrubs <1m	0.01
	<i>Dactyloctenium radulans</i>	G	Grasses	0.01
	<i>Eriachne glauca</i>	G	Grasses	0.05
	<i>Sehima nervosum</i>	G	Grasses	0.05
	<i>Sporobolus australasicus</i>	G	Grasses	0.5
	<i>Triodia intermedia</i>	G	Grasses	50
	<i>Xerochloa barbata</i>	G	Grasses	0.1
	<i>Fimbristylis schultzii</i>	G	Sedges	0.01
	<i>Arivela viscosa</i>	G	Herbs	0.01
	<i>Blumea integrifolia</i>	G	Herbs	0.01
	<i>Blumea tenella</i>	G	Herbs	0.02
	<i>Buchnera asperata</i>	G	Herbs	0.02
	<i>Buchnera ramosissima</i>	G	Herbs	0.01
	<i>Cassutha filiformis</i>	G	Herbs	0.05
	<i>Crotalaria montana</i> var. <i>angustifolia</i>	G	Herbs	0.02
	<i>Euphorbia schultzii</i> var. <i>comans</i>	G	Herbs	0.01
	<i>Gomphrena canescens</i>	G	Herbs	0.1
ELA36				

Quadrat	Species	Stratum	Lifeform	Cover (%)
	<i>Ipomoea coptica</i>	G	Herbs	0.02
	<i>Stemodia lathraia</i>	G	Herbs	0.01
	<i>Trianthema oxycalyptum</i> var. <i>oxycalyptum</i>	G	Herbs	0.01
	<i>Atalaya hemiglauca</i>	U	Trees <10m	2.5
	<i>Acacia synchronicia</i>	M	Shrubs >2m	3
	<i>Abutilon otocarpum</i>	M	Shrubs 1-2m	0.04
	<i>Carissa lanceolata</i>	M	Shrubs 1-2m	3.5
	<i>Dichrostachys spicata</i>	M	Shrubs 1-2m	0.5
	<i>Gossypium australe</i>	M	Shrubs 1-2m	0.04
	<i>Chamaecrista symonii</i>	M	Shrubs <1m	0.01
	<i>Corchorus sidoides</i> subsp. <i>vermicularis</i>	M	Shrubs <1m	0.01
	<i>Cullen badocanum</i>	M	Shrubs <1m	0.02
	<i>Indigofera colutea</i>	M	Shrubs <1m	0.02
	<i>Indigofera linifolia</i>	M	Shrubs <1m	0.01
	<i>Indigofera linnaei</i>	M	Shrubs <1m	0.01
	<i>Aristida latifolia</i>	G	Grasses	0.04
	<i>Cynodon convergens</i>	G	Grasses	0.02
ELA37	<i>Dactyloctenium radulans</i>	G	Grasses	0.05
	<i>Enneapogon pallidus</i>	G	Grasses	0.5
	<i>Eragrostis cumingii</i>	G	Grasses	0.5
	<i>Eragrostis tenellula</i>	G	Grasses	0.1
	<i>Eriachne obtusa</i>	G	Grasses	1
	<i>Panicum decompositum</i>	G	Grasses	0.02
	<i>Sehima nervosum</i>	G	Grasses	5
	<i>Sporobolus australasicus</i>	G	Grasses	2
	<i>Triodia wiseana</i>	G	Grasses	25
	<i>Xerochloa barbata</i>	G	Grasses	0.05
	<i>Afrohybanthus enneaspermus</i>	G	Herbs	0.01
	<i>Arivela viscosa</i>	G	Herbs	0.01
	<i>Blumea tenella</i>	G	Herbs	0.02
	<i>Evolvulus alsinoides</i>	G	Herbs	0.01
	<i>Gomphrena canescens</i>	G	Herbs	0.01
	<i>Bauhinia cunninghamii</i>	U	Trees <10m	0.03
	<i>Hakea macrocarpa</i>	U	Trees <10m	0.05
	<i>Acacia synchronicia</i>	M	Shrubs 1-2m	0.05
	<i>Carissa lanceolata</i>	M	Shrubs 1-2m	0.1
ELA38	<i>Dichrostachys spicata</i>	M	Shrubs 1-2m	0.06
	<i>Corchorus fascicularis</i>	M	Shrubs <1m	0.01
	<i>Corchorus sidoides</i> subsp. <i>vermicularis</i>	M	Shrubs <1m	0.01
	<i>Gossypium australe</i>	M	Shrubs <1m	0.03
	<i>Grevillea pyramidalis</i>	M	Shrubs <1m	0.05

Quadrat	Species	Stratum	Lifeform	Cover (%)
	<i>Indigofera colutea</i>	M	Shrubs <1m	0.01
	<i>Indigofera linifolia</i>	M	Shrubs <1m	0.01
	<i>Solanum quadriloculatum</i>	M	Shrubs <1m	0.01
	<i>Aristida hygrometrica</i>	G	Grasses	20
	<i>Dactyloctenium radulans</i>	G	Grasses	0.01
	<i>Eragrostis eriopoda</i>	G	Grasses	5
	<i>Perotis rara</i>	G	Grasses	0.01
	<i>Sehima nervosum</i>	G	Grasses	0.02
	<i>Sorghum plumosum</i>	G	Grasses	20
	<i>Sporobolus australasicus</i>	G	Grasses	0.01
	<i>Triodia intermedia</i>	G	Grasses	30
	<i>Cyperus</i> sp.	G	Sedges	0.01
	<i>Boerhavia coccinea</i>	G	Herbs	0.01
	<i>Cajanus marmoratus</i>	G	Herbs	0.01
	<i>Cassutha filiformis</i>	G	Herbs	0.04
	<i>Crotalaria brevis</i>	G	Herbs	0.01
	<i>Crotalaria medicaginea</i> var. <i>neglecta</i>	G	Herbs	0.02
	<i>Cucumis melo</i>	G	Herbs	0.01
	<i>Euphorbia trigonosperma</i>	G	Herbs	0.03
	<i>Gomphrena canescens</i>	G	Herbs	0.02
	<i>Gomphrena occulta</i>	G	Herbs	0.02
	<i>Goodenia sepalosa</i> var. <i>sepalosa</i>	G	Herbs	0.03
	<i>Murdannia graminea</i>	G	Herbs	0.01
	<i>Pluchea tetranthera</i>	G	Herbs	0.03
	<i>Polycarpha longiflora</i>	G	Herbs	0.01
	<i>Polygala tepperi</i>	G	Herbs	0.03
	<i>Polymeria ambigua</i>	G	Herbs	0.01
	<i>Rhynchosia minima</i>	G	Herbs	0.01
	<i>Trichodesma zeylanicum</i> var. <i>zeylanicum</i>	G	Herbs	0.06
ELA39	<i>Adansonia gregorii</i>	U	Trees 10-20m	1
	<i>Hakea chordophylla</i>	U	Trees <10m	0.1
	<i>Hakea macrocarpa</i>	U	Trees <10m	0.1
	<i>Acacia inaequilatera</i>	M	Shrubs 1-2m	1
	<i>Dolichandrone occidentalis</i>	M	Shrubs 1-2m	0.5
	<i>Abutilon lepidum</i>	M	Shrubs <1m	0.02
	<i>Corchorus fascicularis</i>	M	Shrubs <1m	0.01
	<i>Corchorus sidoides</i> subsp. <i>sidoides</i>	M	Shrubs <1m	0.05
	<i>Corchorus sidoides</i> subsp. <i>vermicularis</i>	M	Shrubs <1m	0.5
	<i>Gossypium australe</i>	M	Shrubs <1m	0.1
	<i>Grevillea pyramidalis</i>	M	Shrubs <1m	0.5
	<i>Indigofera colutea</i>	M	Shrubs <1m	0.5

Quadrat	Species	Stratum	Lifeform	Cover (%)
	<i>Indigofera linifolia</i>	M	Shrubs <1m	0.5
	<i>Indigofera linnaei</i>	M	Shrubs <1m	4
	<i>Senna notabilis</i>	M	Shrubs <1m	0.1
	* <i>Cenchrus setiger</i>	G	Grasses	2
	<i>Aristida holathera</i>	G	Grasses	0.02
	<i>Aristida hygrometrica</i>	G	Grasses	0.5
	<i>Cynodon convergens</i>	G	Grasses	0.05
	<i>Eragrostis eriopoda</i>	G	Grasses	0.2
	<i>Panicum decompositum</i>	G	Grasses	0.1
	<i>Sorghum plumosum</i>	G	Grasses	0.5
	<i>Sporobolus australasicus</i>	G	Grasses	0.1
	<i>Triodia intermedia</i>	G	Grasses	15
	<i>Fimbristylis schultzei</i>	G	Sedges	0.01
	<i>Afrohybanthus aurantiacus</i>	G	Herbs	0.05
	<i>Arivela tetrandra</i>	G	Herbs	0.01
	<i>Arivela viscosa</i>	G	Herbs	0.1
	<i>Boerhavia coccinea</i>	G	Herbs	0.01
	<i>Bonamia pannosa</i>	G	Herbs	0.1
	<i>Buchnera ramosissima</i>	G	Herbs	0.1
	<i>Cajanus marmoratus</i>	G	Herbs	0.01
	<i>Cassytha filiformis</i>	G	Herbs	0.01
	<i>Crotalaria medicaginea</i> var. <i>neglecta</i>	G	Herbs	0.5
	<i>Euphorbia psilosperma</i>	G	Herbs	0.5
	<i>Evolvulus alsinoides</i>	G	Herbs	0.2
	<i>Gomphrena canescens</i>	G	Herbs	0.01
	<i>Goodenia sepalosa</i> var. <i>sepalosa</i>	G	Herbs	0.01
	<i>Heliotropium foliatum</i>	G	Herbs	0.05
	<i>Josephinia papillosa</i>	G	Herbs	0.01
	<i>Phyllanthus maderaspatensis</i>	G	Herbs	0.01
	<i>Pluchea tetranthera</i>	G	Herbs	0.2
	<i>Polycarpha corymbosa</i>	G	Herbs	0.01
	<i>Polymeria ambigua</i>	G	Herbs	0.1
	<i>Portulaca digyna</i>	G	Herbs	0.01
	<i>Pterocaulon intermedium</i>	G	Herbs	0.05
	<i>Ptilotus corymbosus</i>	G	Herbs	0.05
	<i>Ptilotus fusiformis</i>	G	Herbs	0.01
	<i>Rhynchosia minima</i>	G	Herbs	0.05
	<i>Striga curviflora</i>	G	Herbs	0.2
	<i>Tephrosia rosea</i>	G	Herbs	0.01
	<i>Trichodesma zeylanicum</i> var. <i>zeylanicum</i>	G	Herbs	0.01
	<i>Trigastrotheca molluginea</i>	G	Herbs	0.1

Quadrat	Species	Stratum	Lifeform	Cover (%)
ELA40	<i>Adansonia gregorii</i>	U	Trees 10-20m	0.5
	<i>Dolichandrone occidentalis</i>	U	Trees <10m	4
	<i>Hakea chordophylla</i>	U	Trees <10m	1.5
	<i>Grevillea pyramidalis</i>	M	Shrubs >2m	0.5
	<i>Corchorus sidoides</i> subsp. <i>sidoides</i>	M	Shrubs <1m	0.2
	<i>Corchorus sidoides</i> subsp. <i>vermicularis</i>	M	Shrubs <1m	0.3
	<i>Gossypium australe</i>	M	Shrubs <1m	0.05
	<i>Indigofera colutea</i>	M	Shrubs <1m	1.5
	<i>Indigofera linifolia</i>	M	Shrubs <1m	0.5
	<i>Senna notabilis</i>	M	Shrubs <1m	0.05
	<i>Aristida holathera</i>	G	Grasses	0.2
	<i>Aristida hygrometrica</i>	G	Grasses	0.4
	<i>Cenchrus setiger</i>	G	Grasses	0.2
	<i>Cynodon convergens</i>	G	Grasses	0.5
	<i>Eragrostis eriopoda</i>	G	Grasses	0.2
	<i>Sorghum plumosum</i>	G	Grasses	15
	<i>Sporobolus australasicus</i>	G	Grasses	0.05
	<i>Triodia intermedia</i>	G	Grasses	10
	<i>Fimbristylis schultzei</i>	G	Sedges	0.2
	<i>Afrohybanthus aurantiacus</i>	G	Herbs	0.1
	<i>Arivela tetrandra</i>	G	Herbs	0.3
	<i>Boerhavia coccinea</i>	G	Herbs	0.15
	<i>Bonamia pannosa</i>	G	Herbs	0.2
	<i>Buchnera ramosissima</i>	G	Herbs	0.1
	<i>Cajanus marmoratus</i>	G	Herbs	0.1
	<i>Crotalaria medicaginea</i> var. <i>neglecta</i>	G	Herbs	0.5
	<i>Euphorbia psilosperma</i>	G	Herbs	0.3
	<i>Evolvulus alsinoides</i>	G	Herbs	0.01
	<i>Gomphrena canescens</i>	G	Herbs	0.5
	<i>Goodenia sepalosa</i> var. <i>sepalosa</i>	G	Herbs	0.05
	<i>Heliotropium foliatum</i>	G	Herbs	0.1
	<i>Phyllanthus maderaspatensis</i>	G	Herbs	0.05
	<i>Pluchea tetranthera</i>	G	Herbs	0.1
	<i>Polycarpaea corymbosa</i>	G	Herbs	0.01
	<i>Polymeria ambigua</i>	G	Herbs	0.1
	<i>Portulaca digyna</i>	G	Herbs	0.1
	<i>Pterocaulon intermedium</i>	G	Herbs	0.2
	<i>Ptilotus fusiformis</i>	G	Herbs	0.05
	<i>Rhynchosia minima</i>	G	Herbs	0.2
	<i>Tephrosia rosea</i>	G	Herbs	0.05
<i>Trichodesma zeylanicum</i> var. <i>zeylanicum</i>	G	Herbs	0.01	

Quadrat	Species	Stratum	Lifeform	Cover (%)
ELA41	<i>Trigastrotheca molluginea</i>	G	Herbs	0.1
	<i>Adansonia gregorii</i>	U	Trees <10m	2
	<i>Atalaya hemiglauca</i>	U	Trees <10m	4.5
	<i>Dolichandrone occidentalis</i>	U	Trees <10m	0.5
	<i>Hakea macrocarpa</i>	U	Trees <10m	0.5
	<i>Terminalia canescens</i>	U	Trees <10m	2
	<i>Acacia colei</i>	M	Shrubs >2m	5
	<i>Melaleuca alsophila</i>	M	Shrubs >2m	6
	* <i>Vachellia farnesiana</i>	M	Shrubs 1-2m	0.5
	<i>Carissa lanceolata</i>	M	Shrubs 1-2m	2
	<i>Flueggea virosa</i> subsp. <i>melanthesoides</i>	M	Shrubs 1-2m	1.5
	<i>Grevillea pyramidalis</i>	M	Shrubs 1-2m	0.5
	<i>Corchorus fascicularis</i>	M	Shrubs <1m	0.2
	<i>Gossypium australe</i>	M	Shrubs <1m	0.1
	<i>Hibiscus austrinus</i>	M	Shrubs <1m	0.02
	<i>Indigofera colutea</i>	M	Shrubs <1m	1.5
	<i>Senna artemisioides</i> subsp. <i>Oligophylla</i>	M	Shrubs <1m	0.2
	<i>Chrysopogon fallax</i>	G	Grasses	0.5
	<i>Cynodon convergens</i>	G	Grasses	0.1
	<i>Dactyloctenium radulans</i>	G	Grasses	0.05
	<i>Eragrostis eriopoda</i>	G	Grasses	0.2
	<i>Panicum decompositum</i>	G	Grasses	0.05
	<i>Sorghum plumosum</i>	G	Grasses	2
	<i>Sporobolus australasicus</i>	G	Grasses	0.5
	<i>Triodia bitextura</i>	G	Grasses	30
	<i>Triodia intermedia</i>	G	Grasses	5
	<i>Fimbristylis schultzei</i>	G	Sedges	0.01
	* <i>Portulaca oleracea</i>	G	Herbs	0.01
	<i>Afrohybanthus enneaspermus</i>	G	Herbs	0.01
	<i>Bergia henshallii</i>	G	Herbs	0.01
	<i>Boerhavia coccinea</i>	G	Herbs	0.1
	<i>Cajanus marmoratus</i>	G	Herbs	0.01
	<i>Cassytha filiformis</i>	G	Herbs	0.1
	<i>Crotalaria brevis</i>	G	Herbs	0.01
	<i>Crotalaria medicaginea</i> var. <i>neglecta</i>	G	Herbs	0.01
	<i>Euphorbia psilosperma</i>	G	Herbs	0.1
	<i>Evolvulus alsinoides</i> var. <i>decumbens</i>	G	Herbs	0.01
	<i>Gomphrena canescens</i>	G	Herbs	0.1
	<i>Neptunia gracilis</i> forma. <i>gracilis</i>	G	Herbs	0.2
	<i>Phyllanthus maderaspatensis</i>	G	Herbs	0.03
	<i>Pluchea tetranthera</i>	G	Herbs	0.1

Quadrat	Species	Stratum	Lifeform	Cover (%)
	<i>Polymeria ambigua</i>	G	Herbs	0.2
	<i>Rhynchosia minima</i>	G	Herbs	0.2
	<i>Tephrosia leptoclada</i>	G	Herbs	0.01
	<i>Adansonia gregorii</i>	U	Trees <10m	2
	<i>Atalaya hemiglauca</i>	U	Trees <10m	0.5
	<i>Bauhinia cunninghamii</i>	U	Trees <10m	1.5
	<i>Corymbia greeniana</i>	U	Trees <10m	1
	<i>Hakea arborescens</i>	U	Trees <10m	0.05
	<i>Hakea macrocarpa</i>	U	Trees <10m	1.8
	<i>Terminalia canescens</i>	U	Trees <10m	1
	<i>Melaleuca alsophila</i>	M	Shrubs >2m	0.5
	<i>Acacia colei</i>	M	Shrubs 1-2m	0.4
	<i>Carissa lanceolata</i>	M	Shrubs 1-2m	1
	<i>Flueggea virosa</i> subsp. <i>melanthesoides</i>	M	Shrubs 1-2m	0.15
	<i>Grevillea pyramidalis</i>	M	Shrubs 1-2m	0.05
	* <i>Stylosanthes hamata</i>	M	Shrubs <1m	0.01
	<i>Abutilon otocarpum</i>	M	Shrubs <1m	0.02
	<i>Corchorus fascicularis</i>	M	Shrubs <1m	0.02
	<i>Corchorus sidoides</i> subsp. <i>vermicularis</i>	M	Shrubs <1m	0.02
	<i>Indigofera colutea</i>	M	Shrubs <1m	0.01
	<i>Cynodon convergens</i>	G	Grasses	0.01
	<i>Eriachne obtusa</i>	G	Grasses	5
	<i>Sorghum plumosum</i>	G	Grasses	20
	<i>Sporobolus australasicus</i>	G	Grasses	0.01
	<i>Triodia bitextura</i>	G	Grasses	40
	* <i>Portulaca oleracea</i>	G	Herbs	0.01
	* <i>Portulaca pilosa</i>	G	Herbs	0.01
	<i>Afrohybanthus enneaspermus</i>	G	Herbs	0.02
	<i>Cajanus marmoratus</i>	G	Herbs	0.01
	<i>Capparis lasiantha</i>	G	Herbs	0.02
	<i>Cassytha filiformis</i>	G	Herbs	1.5
	<i>Euphorbia psilosperma</i>	G	Herbs	0.02
	<i>Evolvulus alsinoides</i> var. <i>decumbens</i>	G	Herbs	0.01
	<i>Gomphrena canescens</i>	G	Herbs	0.05
	<i>Phyllanthus maderaspatensis</i>	G	Herbs	0.02
	<i>Pluchea tetranthera</i>	G	Herbs	1
	<i>Polymeria ambigua</i>	G	Herbs	0.01
ELA42				
	<i>Atalaya hemiglauca</i>	U	Trees <10m	0.5
	<i>Bauhinia cunninghamii</i>	U	Trees <10m	10
	<i>Corymbia zygophylla</i>	U	Trees <10m	4
	<i>Ehretia saligna</i>	U	Trees <10m	2
ELA43				

Quadrat	Species	Stratum	Lifform	Cover (%)
	<i>Gyrocarpus americanus</i>	U	Trees <10m	3
	<i>Acacia platycarpa</i>	M	Shrubs >2m	3
	<i>Carissa lanceolata</i>	M	Shrubs 1-2m	0.5
	<i>Senna costata</i>	M	Shrubs 1-2m	0.2
	<i>Abutilon lepidum</i>	M	Shrubs <1m	0.1
	<i>Abutilon otocarpum</i>	M	Shrubs <1m	0.2
	<i>Corchorus fascicularis</i>	M	Shrubs <1m	0.01
	<i>Corchorus sidoides</i> subsp. <i>sidoides</i>	M	Shrubs <1m	0.2
	<i>Indigofera colutea</i>	M	Shrubs <1m	0.1
	<i>Senna notabilis</i>	M	Shrubs <1m	0.1
	<i>Aristida hygrometrica</i>	G	Grasses	25
	<i>Aristida latifolia</i>	G	Grasses	0.05
	<i>Perotis rara</i>	G	Grasses	0.1
	* <i>Portulaca pilosa</i>	G	Herbs	0.01
	<i>Amaranthus undulatus</i>	G	Herbs	0.02
	<i>Arivela viscosa</i>	G	Herbs	0.1
	<i>Boerhavia coccinea</i>	G	Herbs	0.2
	<i>Bonamia linearis</i>	G	Herbs	0.5
	<i>Calandrinia strophiolata</i>	G	Herbs	0.01
	<i>Crotalaria brevis</i>	G	Herbs	0.5
	<i>Crotalaria cunninghamii</i>	G	Herbs	0.8
	<i>Euphorbia psilosperma</i>	G	Herbs	0.05
	<i>Euphorbia schultzii</i> var. <i>comans</i>	G	Herbs	0.2
	<i>Glycine tomentella</i>	G	Herbs	0.5
	<i>Melhania oblongifolia</i>	G	Herbs	0.1
	<i>Polymeria ambigua</i>	G	Herbs	0.1
	<i>Portulaca oleracea</i>	G	Herbs	0.01
	<i>Pterocaulon serrulatum</i> var. <i>velutinum</i>	G	Herbs	0.05
	<i>Tinospora smilacina</i>	G	Herbs	0.1
	<i>Trianthema pilosum</i>	G	Herbs	0.2
ELA44	<i>Adansonia gregorii</i>	U	Trees 10-20m	1
	<i>Corymbia greeniana</i>	U	Trees <10m	6
	<i>Dolichandrone occidentalis</i>	U	Trees <10m	0.5
	<i>Hakea macrocarpa</i>	U	Trees <10m	0.5
	<i>Carissa lanceolata</i>	M	Shrubs 1-2m	2
	<i>Corchorus sidoides</i> subsp. <i>sidoides</i>	M	Shrubs <1m	0.1
	<i>Indigofera linifolia</i>	M	Shrubs <1m	0.5
	<i>Aristida hygrometrica</i>	G	Grasses	0.6
	<i>Eriachne obtusa</i>	G	Grasses	0.1
	<i>Panicum effusum</i>	G	Grasses	0.1
	<i>Perotis rara</i>	G	Grasses	0.01

Quadrat	Species	Stratum	Lifeform	Cover (%)
	<i>Sorghum plumosum</i>	G	Grasses	30
	<i>Fimbristylis ferruginea</i>	G	Sedges	0.5
	* <i>Portulaca pilosa</i>	G	Herbs	0.01
	<i>Boerhavia coccinea</i>	G	Herbs	0.2
	<i>Cajanus marmoratus</i>	G	Herbs	0.05
	<i>Crotalaria medicaginea</i> var. <i>neglecta</i>	G	Herbs	0.1
	<i>Drosera derbyensis</i>	G	Herbs	0.01
	<i>Euphorbia psilosperma</i>	G	Herbs	0.2
	<i>Gomphrena canescens</i>	G	Herbs	0.1
	<i>Atalaya hemiglauca</i>	U	Trees <10m	1.5
	<i>Bauhinia cunninghamii</i>	U	Trees <10m	4
	<i>Dolichandrone occidentalis</i>	U	Trees <10m	2
	<i>Ehretia saligna</i>	U	Trees <10m	0.5
	<i>Gyrocarpus americanus</i>	U	Trees <10m	1
	<i>Acacia platycarpa</i>	M	Shrubs >2m	3
	<i>Carissa lanceolata</i>	M	Shrubs 1-2m	0.2
	<i>Corchorus sidoides</i> subsp. <i>sidoides</i>	M	Shrubs <1m	0.2
	<i>Gossypium australe</i>	M	Shrubs <1m	0.2
	<i>Indigofera colutea</i>	M	Shrubs <1m	0.1
	* <i>Cenchrus setiger</i>	G	Grasses	0.05
	<i>Aristida hygrometrica</i>	G	Grasses	45
	<i>Eriachne obtusa</i>	G	Grasses	0.1
	<i>Perotis rara</i>	G	Grasses	0.01
	* <i>Portulaca pilosa</i>	G	Herbs	0.05
	<i>Alysicarpus muelleri</i>	G	Herbs	0.01
	<i>Boerhavia coccinea</i>	G	Herbs	0.1
	<i>Bonamia pannosa</i>	G	Herbs	0.05
	<i>Cajanus marmoratus</i>	G	Herbs	0.01
	<i>Crotalaria brevis</i>	G	Herbs	0.1
	<i>Euphorbia psilosperma</i>	G	Herbs	0.01
	<i>Goodenia sepalosa</i> var. <i>sepalosa</i>	G	Herbs	0.01
	<i>Polygala tepperi</i>	G	Herbs	0.01
	<i>Trianthema pilosum</i>	G	Herbs	0.5
	<i>Adansonia gregorii</i>	U	Trees <10m	0.5
	<i>Corymbia greeniana</i>	U	Trees <10m	5
	<i>Hakea chordophylla</i>	U	Trees <10m	1
	<i>Hakea macrocarpa</i>	U	Trees <10m	0.2
	<i>Dolichandrone occidentalis</i>	M	Shrubs 1-2m	0.1
	<i>Grevillea pyramidalis</i>	M	Shrubs 1-2m	0.2
	<i>Psydrax</i> sp.	M	Shrubs 1-2m	0.1
	<i>Grona filiformis</i>	M	Shrubs <1m	0.01

Quadrat	Species	Stratum	Lifeform	Cover (%)
	<i>Aristida hygrometrica</i>	G	Grasses	1
	<i>Eriachne obtusa</i>	G	Grasses	0.1
	<i>Sorghum plumosum</i>	G	Grasses	30
	<i>Sporobolus australasicus</i>	G	Grasses	0.05
	<i>Triodia bitextura</i>	G	Grasses	0.5
	<i>Fimbristylis ferruginea</i>	G	Sedges	2
	<i>Boerhavia coccinea</i>	G	Herbs	0.05
	<i>Euphorbia psilosperma</i>	G	Herbs	0.05
	<i>Gomphrena canescens</i>	G	Herbs	0.1
	<i>Pluchea tetranthera</i>	G	Herbs	0.1
	<i>Eucalyptus coolabah</i>	U	Trees 10-20m	40
	<i>Atalaya hemiglauca</i>	M	Shrubs 1-2m	0.02
	<i>Abutilon otocarpum</i>	M	Shrubs <1m	0.01
	<i>Acacia colei</i>	M	Shrubs <1m	0.01
	<i>Corchorus fascicularis</i>	M	Shrubs <1m	0.02
	<i>Dolichandrone occidentalis</i>	M	Shrubs <1m	0.01
	<i>Gossypium australe</i>	M	Shrubs <1m	0.02
	<i>Indigofera colutea</i>	M	Shrubs <1m	0.01
	<i>Indigofera linifolia</i>	M	Shrubs <1m	0.05
	<i>Aristida hygrometrica</i>	G	Grasses	40
	<i>Aristida latifolia</i>	G	Grasses	0.01
	<i>Eragrostis eriopoda</i>	G	Grasses	0.5
	<i>Panicum effusum</i>	G	Grasses	0.01
	<i>Perotis rara</i>	G	Grasses	0.01
	<i>Sporobolus australasicus</i>	G	Grasses	0.01
	<i>Triodia bitextura</i>	G	Grasses	20
	<i>Cyperus blakeanus</i>	G	Sedges	0.5
	* <i>Portulaca pilosa</i>	G	Herbs	0.01
	<i>Bergia henshallii</i>	G	Herbs	0.02
	<i>Calandrinia strophiolata</i>	G	Herbs	0.02
	<i>Evolvulus alsinoides</i> var. <i>decumbens</i>	G	Herbs	0.01
	<i>Evolvulus alsinoides</i> var. <i>villosicalyx</i>	G	Herbs	0.01
	<i>Goodenia lamprosperma</i>	G	Herbs	0.2
	<i>Marsilea hirsuta</i>	G	Herbs	0.01
	<i>Peplidium muelleri</i>	G	Herbs	0.05
	<i>Pluchea tetranthera</i>	G	Herbs	0.01
	<i>Pterocaulon serrulatum</i> var. <i>velutinum</i>	G	Herbs	0.01
	<i>Rhynchosia minima</i>	G	Herbs	0.02
	<i>Corymbia greeniana</i>	U	Trees <10m	6
	<i>Erythrophleum chlorostachys</i>	U	Trees <10m	1.5
	<i>Atalaya hemiglauca</i>	M	Shrubs 1-2m	0.05

Quadrat	Species	Stratum	Lifeform	Cover (%)
	<i>Carissa lanceolata</i>	M	Shrubs 1-2m	0.1
	<i>Corchorus sidoides</i> subsp. <i>sidoides</i>	M	Shrubs <1m	0.08
	<i>Gossypium australe</i>	M	Shrubs <1m	0.04
	* <i>Cenchrus setiger</i>	G	Grasses	0.01
	<i>Aristida hygrometrica</i>	G	Grasses	80
	<i>Aristida latifolia</i>	G	Grasses	0.1
	<i>Cynodon convergens</i>	G	Grasses	0.01
	<i>Eragrostis eriopoda</i>	G	Grasses	0.5
	<i>Sorghum plumosum</i>	G	Grasses	0.01
	? <i>Operculina</i> sp.	G	Herbs	0.05
	<i>Boerhavia coccinea</i>	G	Herbs	0.1
	<i>Bonamia linearis</i>	G	Herbs	0.05
	<i>Bonamia pannosa</i>	G	Herbs	0.03
	<i>Calandrinia strophiolata</i>	G	Herbs	0.02
	<i>Euphorbia psilosperma</i>	G	Herbs	0.01
	<i>Evolvulus alsinoides</i> var. <i>villosicalyx</i>	G	Herbs	0.01
	<i>Gomphrena canescens</i>	G	Herbs	0.04
	<i>Goodenia sepalosa</i> var. <i>sepalosa</i>	G	Herbs	0.01
	<i>Erythrophleum chlorostachys</i>	U	Trees <10m	1.5
	<i>Eucalyptus coolabah</i>	U	Trees <10m	5
	<i>Atalaya hemiglauca</i>	M	Shrubs <1m	0.01
	<i>Corchorus sidoides</i> subsp. <i>sidoides</i>	M	Shrubs <1m	0.02
	<i>Melaleuca alsophila</i>	M	Shrubs <1m	0.05
	<i>Aristida hygrometrica</i>	G	Grasses	80
	<i>Cynodon convergens</i>	G	Grasses	0.01
	<i>Eragrostis eriopoda</i>	G	Grasses	0.1
	<i>Cyperus blakeanus</i>	G	Sedges	0.1
ELA49	<i>Arivela viscosa</i>	G	Herbs	0.01
	<i>Bergia trimera</i>	G	Herbs	0.01
	<i>Boerhavia coccinea</i>	G	Herbs	0.05
	<i>Bonamia linearis</i>	G	Herbs	0.03
	<i>Bonamia pannosa</i>	G	Herbs	0.05
	<i>Cajanus marmoratus</i>	G	Herbs	0.01
	<i>Euphorbia psilosperma</i>	G	Herbs	0.01
	<i>Pluchea tetranthera</i>	G	Herbs	0.03
	<i>Polygala tepperi</i>	G	Herbs	0.01
	<i>Tinospora smilacina</i>	G	Herbs	0.02
ELA50	<i>Corymbia zygomphylla</i>	U	Trees <10m	4
	<i>Erythrophleum chlorostachys</i>	U	Trees <10m	5
	<i>Acacia tumida</i>	M	Shrubs >2m	20
	<i>Chamaecrista symonii</i>	M	Shrubs <1m	0.02

Quadrat	Species	Stratum	Lifeform	Cover (%)
	<i>Waltheria indica</i>	M	Shrubs <1m	0.2
	<i>Aristida hygrometrica</i>	G	Grasses	30
	<i>Eriachne obtusa</i>	G	Grasses	1.5
	<i>Setaria surgens</i>	G	Grasses	0.2
	<i>Triodia bitextura</i>	G	Grasses	10
	<i>Boerhavia coccinea</i>	G	Herbs	0.2
	<i>Bonamia linearis</i>	G	Herbs	0.1
	<i>Bonamia pannosa</i>	G	Herbs	0.2
	<i>Calandrinia strophiolata</i>	G	Herbs	0.01
	<i>Cassytha filiformis</i>	G	Herbs	0.01
	<i>Euphorbia schultzei</i> var. <i>comans</i>	G	Herbs	0.1
	<i>Evolvulus alsinoides</i> var. <i>decumbens</i>	G	Herbs	0.01
	<i>Goodenia sepalosa</i> var. <i>sepalosa</i>	G	Herbs	0.01
	<i>Polymeria ambigua</i>	G	Herbs	0.2
	<i>Ptilotus corymbosus</i>	G	Herbs	0.01
	<i>Tinospora smilacina</i>	G	Herbs	0.1
	<i>Atalaya hemiglauca</i>	U	Trees <10m	0.5
	<i>Bauhinia cunninghamii</i>	U	Trees <10m	0.5
	<i>Corymbia greeniana</i>	U	Trees <10m	5
	<i>Corymbia zygophylla</i>	U	Trees <10m	2
	<i>Dolichandrone occidentalis</i>	U	Trees <10m	0.5
	<i>Erythrophleum chlorostachys</i>	U	Trees <10m	8
	<i>Gyrocarpus americanus</i>	U	Trees <10m	0.5
	<i>Acacia platycarpa</i>	M	Shrubs >2m	10
	<i>Acacia tumida</i>	M	Shrubs 1-2m	0.5
	<i>Carissa lanceolata</i>	M	Shrubs 1-2m	3
	<i>Corchorus sidoides</i> subsp. <i>sidoides</i>	M	Shrubs <1m	0.2
	<i>Aristida hygrometrica</i>	G	Grasses	12
ELA51	<i>Eriachne obtusa</i>	G	Grasses	0.5
	<i>Triodia bitextura</i>	G	Grasses	5
	<i>Arivela tetrandra</i>	G	Herbs	0.01
	<i>Arivela viscosa</i>	G	Herbs	0.1
	<i>Boerhavia coccinea</i>	G	Herbs	0.15
	<i>Bonamia linearis</i>	G	Herbs	0.2
	<i>Bonamia pannosa</i>	G	Herbs	0.05
	<i>Cajanus marmoratus</i>	G	Herbs	0.01
	<i>Calandrinia strophiolata</i>	G	Herbs	0.01
	<i>Cassytha filiformis</i>	G	Herbs	0.1
	<i>Euphorbia psilosperma</i>	G	Herbs	0.02
	<i>Polymeria ambigua</i>	G	Herbs	0.1
	<i>Portulaca digyna</i>	G	Herbs	0.01

Quadrat	Species	Stratum	Lifform	Cover (%)
	<i>Portulaca oleracea</i>	G	Herbs	0.01
	<i>Roepera</i> sp.	G	Herbs	0.01
	<i>Tephrosia rosea</i>	G	Herbs	0.05
	<i>Tinospora smilacina</i>	G	Herbs	0.01
	<i>Trianthema pilosum</i>	G	Herbs	0.3
	<i>Bauhinia cunninghamii</i>	U	Trees <10m	0.5
	<i>Corymbia greeniana</i>	U	Trees <10m	0.5
	<i>Corymbia zygophylla</i>	U	Trees <10m	5
	<i>Erythrophleum chlorostachys</i>	U	Trees <10m	5
	<i>Grevillea wickhamii</i>	U	Trees <10m	0.2
	<i>Acacia tumida</i>	M	Shrubs >2m	10
	<i>Chamaecrista symonii</i>	M	Shrubs <1m	0.2
	<i>Corchorus sidoides</i> subsp. <i>sidoides</i>	M	Shrubs <1m	0.2
	<i>Indigofera linifolia</i>	M	Shrubs <1m	0.1
	<i>Waltheria indica</i>	M	Shrubs <1m	0.2
	<i>Aristida hygrometrica</i>	G	Grasses	0.4
	<i>Eragrostis eriopoda</i>	G	Grasses	0.4
	<i>Eriachne obtusa</i>	G	Grasses	0.5
	<i>Sorghum plumosum</i>	G	Grasses	0.2
	<i>Triodia bitextura</i>	G	Grasses	40
	<i>Boerhavia coccinea</i>	G	Herbs	0.05
	<i>Bonamia linearis</i>	G	Herbs	0.2
	<i>Cajanus marmoratus</i>	G	Herbs	0.01
	<i>Euphorbia psilosperma</i>	G	Herbs	0.05
	<i>Euphorbia schultzii</i> var. <i>comans</i>	G	Herbs	0.1
	<i>Evolvulus alsinoides</i>	G	Herbs	0.01
	<i>Polygala tepperi</i>	G	Herbs	0.02
	<i>Polymeria ambigua</i>	G	Herbs	0.1
	<i>Portulaca digyna</i>	G	Herbs	0.01
	<i>Tephrosia rosea</i>	G	Herbs	0.1
	<i>Tinospora smilacina</i>	G	Herbs	0.1
ELA52	<i>Bauhinia cunninghamii</i>	U	Trees <10m	0.3
	<i>Erythrophleum chlorostachys</i>	U	Trees <10m	10
	<i>Acacia tumida</i>	M	Shrubs >2m	0.2
	<i>Carissa lanceolata</i>	M	Shrubs <1m	0.03
	<i>Corchorus sidoides</i> subsp. <i>sidoides</i>	M	Shrubs <1m	0.05
	<i>Dolichandrone occidentalis</i>	M	Shrubs <1m	0.02
	<i>Grona filiformis</i>	M	Shrubs <1m	0.02
	<i>Indigofera linifolia</i>	M	Shrubs <1m	0.04
	<i>Senna notabilis</i>	M	Shrubs <1m	0.01
	<i>Aristida hygrometrica</i>	G	Grasses	65
ELA53	<i>Bauhinia cunninghamii</i>	U	Trees <10m	0.3
	<i>Erythrophleum chlorostachys</i>	U	Trees <10m	10
	<i>Acacia tumida</i>	M	Shrubs >2m	0.2
	<i>Carissa lanceolata</i>	M	Shrubs <1m	0.03
	<i>Corchorus sidoides</i> subsp. <i>sidoides</i>	M	Shrubs <1m	0.05
	<i>Dolichandrone occidentalis</i>	M	Shrubs <1m	0.02
	<i>Grona filiformis</i>	M	Shrubs <1m	0.02
	<i>Indigofera linifolia</i>	M	Shrubs <1m	0.04
	<i>Senna notabilis</i>	M	Shrubs <1m	0.01
	<i>Aristida hygrometrica</i>	G	Grasses	65

Quadrat	Species	Stratum	Lifform	Cover (%)
	<i>Aristida latifolia</i>	G	Grasses	0.5
	<i>Eragrostis eriopoda</i>	G	Grasses	1
	<i>Arivela tetrandra</i>	G	Herbs	0.01
	<i>Arivela viscosa</i>	G	Herbs	0.01
	<i>Boerhavia coccinea</i>	G	Herbs	0.05
	<i>Bonamia linearis</i>	G	Herbs	0.05
	<i>Bonamia pannosa</i>	G	Herbs	0.1
	<i>Buchnera ramosissima</i>	G	Herbs	0.02
	<i>Cajanus marmoratus</i>	G	Herbs	0.01
	<i>Calandrinia</i> sp.	G	Herbs	0.01
	<i>Euphorbia psilosperma</i>	G	Herbs	0.01
	<i>Gomphrena canescens</i>	G	Herbs	0.02
	<i>Goodenia</i> sp.	G	Herbs	0.01
	<i>Trianthema pilosum</i>	G	Herbs	0.3
	<i>Corymbia greeniana</i>	U	Trees <10m	4
	<i>Erythrophleum chlorostachys</i>	U	Trees <10m	2
	<i>Hakea macrocarpa</i>	U	Trees <10m	0.2
	<i>Acacia ancistrocarpa</i>	M	Shrubs 1-2m	5
	<i>Carissa lanceolata</i>	M	Shrubs 1-2m	1.5
	<i>Dodonaea hispidula</i> var. <i>arida</i>	M	Shrubs 1-2m	3
	<i>Corchorus sidoides</i> subsp. <i>sidoides</i>	M	Shrubs <1m	0.2
	<i>Gossypium australe</i>	M	Shrubs <1m	0.02
	<i>Waltheria indica</i>	M	Shrubs <1m	0.1
	<i>Aristida hygrometrica</i>	G	Grasses	30
	<i>Aristida latifolia</i>	G	Grasses	0.1
ELA54	<i>Eriachne obtusa</i>	G	Grasses	2.5
	<i>Triodia bitextura</i>	G	Grasses	0.5
	<i>Bonamia linearis</i>	G	Herbs	0.5
	<i>Bonamia pannosa</i>	G	Herbs	0.1
	<i>Euphorbia psilosperma</i>	G	Herbs	0.1
	<i>Gomphrena canescens</i>	G	Herbs	0.1
	<i>Goodenia sepalosa</i> var. <i>sepalosa</i>	G	Herbs	0.01
	<i>Pluchea tetranthera</i>	G	Herbs	0.05
	<i>Polymeria ambigua</i>	G	Herbs	0.1
	<i>Portulaca digyna</i>	G	Herbs	0.01
	<i>Stackhousia intermedia</i>	G	Herbs	0.01
	<i>Trigastrotheca molluginea</i>	G	Herbs	0.05
	<i>Atalaya hemiglauca</i>	U	Trees <10m	2.5
ELA55	<i>Bauhinia cunninghamii</i>	U	Trees <10m	15
	<i>Corymbia greeniana</i>	U	Trees <10m	5
	<i>Flueggea virosa</i> subsp. <i>melanthesoides</i>	M	Shrubs >2m	3

Quadrat	Species	Stratum	Lifeform	Cover (%)
	<i>*Vachellia farnesiana</i>	M	Shrubs 1-2m	0.5
	<i>Acacia colei</i>	M	Shrubs 1-2m	0.5
	<i>Carissa lanceolata</i>	M	Shrubs 1-2m	1
	<i>Abutilon lepidum</i>	M	Shrubs <1m	0.1
	<i>Corchorus fascicularis</i>	M	Shrubs <1m	20
	<i>Corchorus sidoides</i> subsp. <i>vermicularis</i>	M	Shrubs <1m	0.2
	<i>Gossypium australe</i>	M	Shrubs <1m	0.2
	<i>Hibiscus austrinus</i>	M	Shrubs <1m	0.1
	<i>Senna notabilis</i>	M	Shrubs <1m	0.1
	<i>Amaranthus mitchellii</i>	G	Herbs	0.1
	<i>Arivela viscosa</i>	G	Herbs	2
	<i>Boerhavia coccinea</i>	G	Herbs	0.5
	<i>Cassutha filiformis</i>	G	Herbs	0.1
	<i>Crotalaria medicaginea</i> var. <i>neglecta</i>	G	Herbs	0.02
	<i>Evolvulus alsinoides</i>	G	Herbs	0.05
	<i>Indigofera hirsuta</i>	G	Herbs	30
	<i>Polymeria ambigua</i>	G	Herbs	0.1
	<i>Portulaca oleracea</i>	G	Herbs	0.1
	<i>Tinospora smilacina</i>	G	Herbs	0.01
	<i>Corymbia bella</i>	U	Trees <10m	8
	<i>Lophostemon grandiflorus</i> subsp. <i>riparius</i>	U	Trees <10m	0.5
	<i>Acacia colei</i>	M	Shrubs 1-2m	0.04
	<i>*Vachellia farnesiana</i>	M	Shrubs <1m	0.01
	<i>Abutilon otocarpum</i>	M	Shrubs <1m	0.01
	<i>Corchorus sidoides</i> subsp. <i>sidoides</i>	M	Shrubs <1m	0.02
	<i>Dolichandrone occidentalis</i>	M	Shrubs <1m	0.01
	<i>Grona filiformis</i>	M	Shrubs <1m	0.01
	<i>Indigofera linifolia</i>	M	Shrubs <1m	0.04
	<i>Melaleuca alsophila</i>	M	Shrubs <1m	0.05
	<i>Eragrostis eriopoda</i>	G	Grasses	0.01
	<i>Triodia bitextura</i>	G	Grasses	80
	<i>Triodia wiseana</i>	G	Grasses	2
	<i>Cyperus latzii</i>	G	Sedges	0.04
	<i>Arivela viscosa</i>	G	Herbs	0.05
	<i>Boerhavia coccinea</i>	G	Herbs	0.03
	<i>Euphorbia psilosperma</i>	G	Herbs	0.01
	<i>Evolvulus alsinoides</i> var. <i>villosicalyx</i>	G	Herbs	0.01
	<i>Gomphrena canescens</i>	G	Herbs	0.03
	<i>Indigofera hirsuta</i>	G	Herbs	0.01
	<i>Peplidium muelleri</i>	G	Herbs	0.02
	<i>Pluchea tetranthera</i>	G	Herbs	0.03
ELA56				

Quadrat	Species	Stratum	Lifeform	Cover (%)
	<i>Trianthema pilosum</i>	G	Herbs	0.02
ELA57	<i>Corymbia bella</i>	U	Trees <10m	50
	<i>Lophostemon grandiflorus</i> subsp. <i>riparius</i>	U	Trees <10m	25
	<i>Sesbania cannabina</i>	M	Shrubs 1-2m	0.5
	<i>Arivela viscosa</i>	G	Herbs	0.2
	<i>Marsilea hirsuta</i>	G	Herbs	0.1
	<i>Nymphoides beaglsensis</i> (P3)	G	Herbs	0.5
	<i>Peplidium muelleri</i>	G	Herbs	2
ELA58	<i>Corymbia bella</i>	U	Trees <10m	20
	<i>Acacia colei</i>	M	Shrubs 1-2m	0.2
	* <i>Vachellia farnesiana</i>	M	Shrubs <1m	0.01
	<i>Corchorus sidoides</i> subsp. <i>sidoides</i>	M	Shrubs <1m	0.05
	<i>Indigofera linifolia</i>	M	Shrubs <1m	0.02
	<i>Aristida hygrometrica</i>	G	Grasses	0.2
	<i>Eragrostis eriopoda</i>	G	Grasses	0.01
	<i>Triodia bitextura</i>	G	Grasses	60
	<i>Schoenoplectiella lateriflora</i> var. <i>lateriflora</i>	G	Sedges	0.01
	* <i>Portulaca pilosa</i>	G	Herbs	0.02
	<i>Alternanthera angustifolia</i>	G	Herbs	0.05
	<i>Arivela viscosa</i>	G	Herbs	0.1
	<i>Calandrinia strophiolata</i>	G	Herbs	0.01
	<i>Eriocaulon cinereum</i>	G	Herbs	0.01
	<i>Evolvulus alsinoides</i> var. <i>villosicalyx</i>	G	Herbs	0.01
<i>Nymphoides beaglsensis</i> (P3)	G	Herbs	0.01	
<i>Peplidium muelleri</i>	G	Herbs	0.5	
ELA59	<i>Corymbia greeniana</i>	U	Trees 10-20m	2.5
	<i>Corymbia zygophylla</i>	U	Trees <10m	6
	<i>Erythrophleum chlorostachys</i>	U	Trees <10m	2
	<i>Acacia tumida</i>	M	Shrubs >2m	35
	<i>Grevillea pyramidalis</i>	M	Shrubs 1-2m	0.01
	* <i>Calotropis procera</i>	M	Shrubs <1m	0.01
	<i>Abutilon otocarpum</i>	M	Shrubs <1m	0.05
	<i>Corchorus sidoides</i> subsp. <i>sidoides</i>	M	Shrubs <1m	0.05
	<i>Dolichandrone occidentalis</i>	M	Shrubs <1m	0.04
	<i>Senna notabilis</i>	M	Shrubs <1m	0.01
	<i>Solanum quadriloculatum</i>	M	Shrubs <1m	0.01
	<i>Aristida hygrometrica</i>	G	Grasses	0.5
	<i>Eriachne melicacea</i>	G	Grasses	0.01
	<i>Eriachne obtusa</i>	G	Grasses	25
	<i>Triodia wiseana</i>	G	Grasses	0.2
<i>Amaranthus undulatus</i>	G	Herbs	0.02	

Quadrat	Species	Stratum	Lifeform	Cover (%)
	<i>Bonamia linearis</i>	G	Herbs	0.2
	<i>Bonamia pannosa</i>	G	Herbs	0.2
	<i>Cajanus marmoratus</i>	G	Herbs	0.02
	<i>Calandrinia strophiolata</i>	G	Herbs	0.01
	<i>Euphorbia cinerea</i>	G	Herbs	0.01
	<i>Euphorbia schultzii</i> var. <i>comans</i>	G	Herbs	0.01
	<i>Goodenia armitiana</i>	G	Herbs	0.02
	<i>Goodenia sepalosa</i> var. <i>sepalosa</i>	G	Herbs	0.01
	<i>Polymeria ambigua</i>	G	Herbs	0.01
	<i>Pterocaulon serrulatum</i> var. <i>velutinum</i>	G	Herbs	0.01
	<i>Tinospora smilacina</i>	G	Herbs	0.01
	<i>Bauhinia cunninghamii</i>	U	Trees 10-20m	0.05
	<i>Corymbia zygophylla</i>	U	Trees 10-20m	3.5
	<i>Ehretia saligna</i>	U	Trees <10m	0.04
	<i>Gyrocarpus americanus</i>	U	Trees <10m	0.05
	<i>Acacia platycarpa</i>	M	Shrubs >2m	1
	<i>Acacia tumida</i>	M	Shrubs >2m	10
	<i>Senna costata</i>	M	Shrubs 1-2m	0.02
	<i>Waltheria indica</i>	M	Shrubs 1-2m	0.05
	* <i>Calotropis procera</i>	M	Shrubs <1m	0.01
	<i>Abutilon otocarpum</i>	M	Shrubs <1m	0.03
	<i>Capparis lasiantha</i>	M	Shrubs <1m	0.01
	<i>Chamaecrista symonii</i>	M	Shrubs <1m	8
	<i>Corchorus sidoides</i> subsp. <i>sidoides</i>	M	Shrubs <1m	0.1
	<i>Corynotheca micrantha</i>	M	Shrubs <1m	5
ELA60	<i>Gymnanthera oblonga</i>	M	Shrubs <1m	0.01
	<i>Sida</i> aff. <i>fibulifera</i>	M	Shrubs <1m	0.01
	<i>Solanum quadrilocolatum</i>	M	Shrubs <1m	0.01
	<i>Aristida latifolia</i>	G	Grasses	30
	<i>Cymbopogon ambiguus</i>	G	Grasses	0.02
	<i>Eriachne obtusa</i>	G	Grasses	25
	<i>Triodia wiseana</i>	G	Grasses	1
	<i>Achyranthes aspera</i>	G	Herbs	0.01
	<i>Bonamia linearis</i>	G	Herbs	0.05
	<i>Bonamia pannosa</i>	G	Herbs	0.01
	<i>Evolvulus alsinoides</i>	G	Herbs	0.01
	<i>Gomphrena canescens</i>	G	Herbs	0.01
	<i>Polymeria ambigua</i>	G	Herbs	0.05
	<i>Tinospora smilacina</i>	G	Herbs	0.01
	<i>Zornia prostrata</i> var. <i>prostrata</i>	G	Herbs	0.01
ELA61	<i>Hakea macrocarpa</i>	U	Trees <10m	0.01









Quadrat	Species	Stratum	Lifeform	Cover (%)
	<i>Acacia tumida</i>	M	Shrubs >2m	7
	<i>Waltheria indica</i>	M	Shrubs 1-2m	0.02
	<i>Abutilon otocarpum</i>	M	Shrubs <1m	0.01
	<i>Corchorus sidoides</i> subsp. <i>sidoides</i>	M	Shrubs <1m	0.02
	<i>Gymnanthera oblonga</i>	M	Shrubs <1m	0.02
	<i>Melaleuca alsophila</i>	M	Shrubs <1m	5
	<i>Aristida latifolia</i>	G	Grasses	10
	<i>Eriachne obtusa</i>	G	Grasses	8
	<i>Eriachne pindanica</i>	G	Grasses	0.02
	<i>Triodia bitextura</i>	G	Grasses	35
	<i>Bonamia linearis</i>	G	Herbs	0.01
	<i>Bonamia pannosa</i>	G	Herbs	0.01
	<i>Buchnera asperata</i>	G	Herbs	0.01
	<i>Cassytha filiformis</i>	G	Herbs	0.05
	<i>Goodenia armitiana</i>	G	Herbs	0.01
	<i>Atalaya hemiglauc</i>	U	Trees <10m	2
	<i>Bauhinia cunninghamii</i>	U	Trees <10m	0.5
	<i>Corymbia greeniana</i>	U	Trees <10m	0.5
	<i>Gyrocarpus americanus</i>	U	Trees <10m	1.5
	<i>Acacia platycarpa</i>	M	Shrubs >2m	0.5
	<i>Acacia tumida</i>	M	Shrubs >2m	20
	<i>Carissa lanceolata</i>	M	Shrubs 1-2m	0.5
	<i>Corchorus sidoides</i> subsp. <i>sidoides</i>	M	Shrubs <1m	0.5
	<i>Senna notabilis</i>	M	Shrubs <1m	0.05
	<i>Waltheria indica</i>	M	Shrubs <1m	0.1
	* <i>Cenchrus setiger</i>	G	Grasses	0.1
	<i>Aristida hygrometrica</i>	G	Grasses	40
	<i>Eriachne obtusa</i>	G	Grasses	0.1
	<i>Perotis rara</i>	G	Grasses	0.02
	<i>Triodia bitextura</i>	G	Grasses	5
	* <i>Trianthema pilosum</i>	G	Herbs	0.02
	<i>Afrohybanthus aurantiacus</i>	G	Herbs	0.01
	<i>Arivela viscosa</i>	G	Herbs	0.01
	<i>Boerhavia coccinea</i>	G	Herbs	0.2
	<i>Bonamia pannosa</i>	G	Herbs	0.3
	<i>Cajanus marmoratus</i>	G	Herbs	0.01
	<i>Crotalaria cunninghamii</i>	G	Herbs	0.1
	<i>Crotalaria medicaginea</i> var. <i>neglecta</i>	G	Herbs	0.2
	<i>Cucumis melo</i>	G	Herbs	0.1
	<i>Euphorbia schultzei</i> var. <i>comans</i>	G	Herbs	0.1
	<i>Goodenia sepulosa</i> var. <i>sepulosa</i>	G	Herbs	0.01








ELA62









Quadrat	Species	Stratum	Lifeform	Cover (%)
	<i>Heliotropium diversifolium</i>	G	Herbs	0.1
	<i>Ipomoea polymorpha</i>	G	Herbs	0.01
	<i>Polymeria ambigua</i>	G	Herbs	0.05
	<i>Tephrosia rosea</i>	G	Herbs	0.05
	<i>Zornia chaetophora</i>	G	Herbs	0.01
	<i>Zornia prostrata</i> var. <i>prostrata</i>	G	Herbs	0.1
	<i>Corymbia greeniana</i>	U	Trees <10m	10
	<i>Gyrocarpus americanus</i>	U	Trees <10m	0.5
	<i>Hakea macrocarpa</i>	U	Trees <10m	0.5
	<i>Acacia tumida</i>	M	Shrubs >2m	0.5
	<i>Acacia ancistrocarpa</i>	M	Shrubs 1-2m	8
	<i>Acacia platycarpa</i>	M	Shrubs 1-2m	0.1
	<i>Carissa lanceolata</i>	M	Shrubs 1-2m	0.5
	<i>Corchorus sidoides</i> subsp. <i>sidoides</i>	M	Shrubs <1m	0.1
	<i>Indigofera linifolia</i>	M	Shrubs <1m	0.05
	<i>Indigofera linnaei</i>	M	Shrubs <1m	0.01
	<i>Aristida hygrometrica</i>	G	Grasses	0.5
	<i>Aristida latifolia</i>	G	Grasses	4
	<i>Eragrostis eriopoda</i>	G	Grasses	2
ELA63	<i>Setaria surgens</i>	G	Grasses	0.2
	<i>Triodia bitextura</i>	G	Grasses	5
	<i>Triodia intermedia</i>	G	Grasses	6
	<i>Afrohybanthus aurantiacus</i>	G	Herbs	0.01
	<i>Boerhavia coccinea</i>	G	Herbs	0.01
	<i>Bonamia pannosa</i>	G	Herbs	0.1
	<i>Buchnera ramosissima</i>	G	Herbs	0.1
	<i>Cajanus marmoratus</i>	G	Herbs	0.01
	<i>Euphorbia schultzei</i> var. <i>comans</i>	G	Herbs	0.2
	<i>Evolvulus alsinoides</i> var. <i>decumbens</i>	G	Herbs	0.08
	<i>Pluchea tetranthera</i>	G	Herbs	0.2
	<i>Polymeria ambigua</i>	G	Herbs	0.05
	<i>Spermacoce occidentalis</i>	G	Herbs	0.1
	<i>Tephrosia rosea</i>	G	Herbs	0.01
	<i>Eucalyptus coolabah</i>	U	Trees <10m	4
	<i>Sesbania cannabina</i>	M	Shrubs 1-2m	0.2
	* <i>Stylosanthes hamata</i>	M	Shrubs <1m	0.5
ELA64	<i>Eriachne obtusa</i>	G	Grasses	0.5
	<i>Eulalia aurea</i>	G	Grasses	0.5
	<i>Triodia bitextura</i>	G	Grasses	2
	<i>Triodia epactia</i>	G	Grasses	50
	<i>Cyperus pulchellus</i>	G	Sedges	0.1









Quadrat	Species	Stratum	Lifeform	Cover (%)
	<i>Fimbristylis ferruginea</i>	G	Sedges	0.2
	<i>Fimbristylis schultzei</i>	G	Sedges	0.1
	<i>Bonamia pannosa</i>	G	Herbs	0.05
	<i>Byblis filifolia</i>	G	Herbs	0.01
	<i>Calandrinia tepperiana</i>	G	Herbs	0.01
	<i>Lindernia chrysoplectra</i>	G	Herbs	0.01
	<i>Marsilea hirsuta</i>	G	Herbs	0.01
	<i>Mitrasacme lutea</i>	G	Herbs	0.01
	<i>Murdannia graminea</i>	G	Herbs	0.01
	<i>Nymphoides beaglesensis</i> (P3)	G	Herbs	0.01
	<i>Scleromitron scleranthoides</i>	G	Herbs	0.1
	<i>Uvedalia linearis</i> var. <i>linearis</i>	G	Herbs	0.01









Appendix H Site photos








Quadrat number	Photo	Quadrat number	Photo
ELA01		ELA02	
ELA03		ELA04	
ELA05		ELA06	
ELA07		ELA08	









Quadrat number	Photo	Quadrat number	Photo
ELA09		ELA10	
ELA11	N/A	ELA12	N/A
ELA13	N/A	ELA14	
ELA15		ELA16	
ELA17		ELA18	







Quadrat number	Photo	Quadrat number	Photo
ELA19		ELA20	
ELA21		ELA22	
ELA23		ELA24	
ELA25		ELA26	

Quadrat number	Photo	Quadrat number	Photo
ELA27		ELA28	
ELA29		ELA30	
ELA31		ELA32	
ELA33		ELA34	

Quadrat number	Photo	Quadrat number	Photo
ELA35		ELA36	
ELA37		ELA38	
ELA39		ELA40	
ELA41		ELA42	

Quadrat number	Photo	Quadrat number	Photo
ELA43		ELA44	N/A
ELA45		ELA46	
ELA47		ELA48	
ELA49		ELA50	

Quadrat number	Photo	Quadrat number	Photo
ELA51		ELA52	
ELA53		ELA54	
ELA55		ELA56	
ELA57		ELA58	

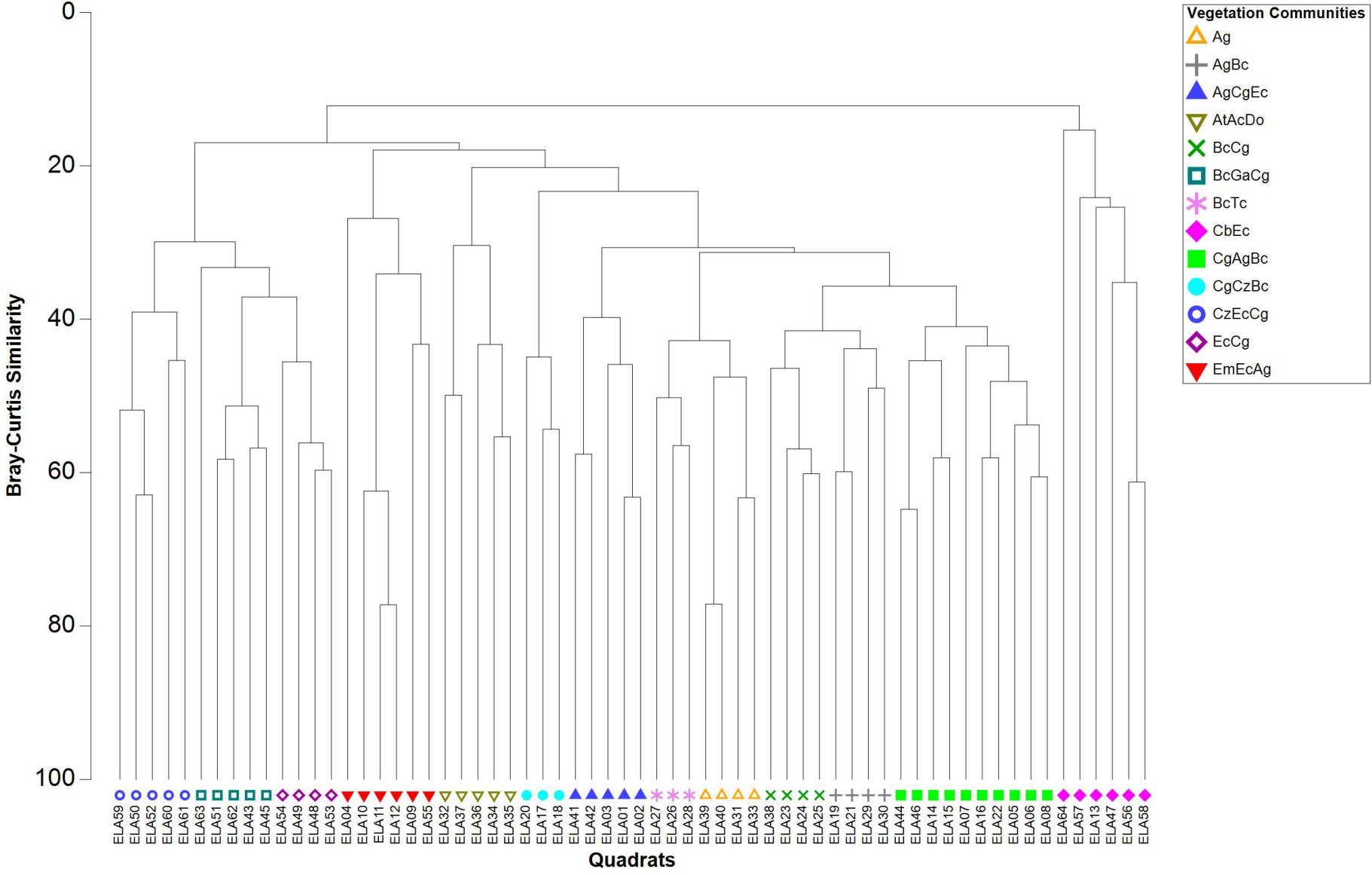
Quadrat number	Photo	Quadrat number	Photo
ELA59		ELA60	
ELA61		ELA62	
ELA63		ELA64	

Appendix I Location of introduced (weed) species within the Project Area

Species	Ranking	Quadrat number	Easting	Northing
* <i>Calotropis procera</i> (Calotrope)	Declared Pest – s22(2)	ELA20	687949	7993198
* <i>Calotropis procera</i> (Calotrope)	Declared Pest – s22(2)	ELA33	699041	7985804
* <i>Calotropis procera</i> (Calotrope)	Declared Pest – s22(2)	ELA35	690150	7979852
* <i>Calotropis procera</i> (Calotrope)	Declared Pest – s22(2)	ELA59	711942	7976870
* <i>Calotropis procera</i> (Calotrope)	Declared Pest – s22(2)	ELA60	713616	7976552
* <i>Cenchrus setiger</i> (Birdwood Grass)	Permitted – s11	ELA27	690616	7985383
* <i>Cenchrus setiger</i> (Birdwood Grass)	Permitted – s11	ELA28	691284	7985129
* <i>Cenchrus setiger</i> (Birdwood Grass)	Permitted – s11	ELA39	696593	7980098
* <i>Cenchrus setiger</i> (Birdwood Grass)	Permitted – s11	ELA45	704492	7980578
* <i>Cenchrus setiger</i> (Birdwood Grass)	Permitted – s11	ELA48	707228	7981171
* <i>Cenchrus setiger</i> (Birdwood Grass)	Permitted – s11	ELA62	716840	7976435
* <i>Malvastrum americanum</i> (Spiked Malvastrum)	Permitted – s11	ELA10	692546	7997874
* <i>Melochia pyramidata</i> (Pyramid Flower)	Permitted – s11	ELA07	688535	7998364
* <i>Portulaca oleracea</i> (Common Purslane)	Permitted – s11	ELA41	701517	7980279
* <i>Portulaca oleracea</i>	Permitted – s11	ELA42	702048	7980340
* <i>Portulaca pilosa</i> (Pink Purslane)	Permitted – s11	ELA24	685634	7991962
* <i>Portulaca pilosa</i> (Pink Purslane)	Permitted – s11	ELA25	685626	7991575
* <i>Portulaca pilosa</i> (Pink Purslane)	Permitted – s11	ELA27	690616	7985383
* <i>Portulaca pilosa</i> (Pink Purslane)	Permitted – s11	ELA28	691284	7985129
* <i>Portulaca pilosa</i> (Pink Purslane)	Permitted – s11	ELA29	692961	7985886
* <i>Portulaca pilosa</i> (Pink Purslane)	Permitted – s11	ELA31	696524	7985668
* <i>Portulaca pilosa</i> (Pink Purslane)	Permitted – s11	ELA34	688934	7980819
* <i>Portulaca pilosa</i> (Pink Purslane)	Permitted – s11	ELA42	702048	7980340
* <i>Portulaca pilosa</i> (Pink Purslane)	Permitted – s11	ELA43	704590	7982476
* <i>Portulaca pilosa</i> (Pink Purslane)	Permitted – s11	ELA44	704483	7981302
* <i>Portulaca pilosa</i> (Pink Purslane)	Permitted – s11	ELA45	704492	7980578
* <i>Portulaca pilosa</i> (Pink Purslane)	Permitted – s11	ELA47	706410	7981270
* <i>Portulaca pilosa</i> (Pink Purslane)	Permitted – s11	ELA58	713620	7978355
* <i>Stylosanthes hamata</i> (Verano Stylo)	Permitted – s11	ELA04	686963	8001840
* <i>Stylosanthes hamata</i> (Verano Stylo)	Permitted – s11	ELA05	686873	7998414
* <i>Stylosanthes hamata</i> (Verano Stylo)	Permitted – s11	ELA06	688074	7998385
* <i>Stylosanthes hamata</i> (Verano Stylo)	Permitted – s11	ELA07	688535	7998364

Species	Ranking	Quadrat number	Easting	Northing
* <i>Stylosanthes hamata</i> (Verano Stylo)	Permitted – s11	ELA08	689942	7998198
* <i>Stylosanthes hamata</i> (Verano Stylo)	Permitted – s11	ELA12	692853	7997861
* <i>Stylosanthes hamata</i> (Verano Stylo)	Permitted – s11	ELA13	693108	7997839
* <i>Stylosanthes hamata</i> (Verano Stylo)	Permitted – s11	ELA14	693720	7997803
* <i>Stylosanthes hamata</i> (Verano Stylo)	Permitted – s11	ELA19	690482	7993326
* <i>Stylosanthes hamata</i> (Verano Stylo)	Permitted – s11	ELA21	687755	7992990
* <i>Stylosanthes hamata</i> (Verano Stylo)	Permitted – s11	ELA26	689918	7985266
* <i>Stylosanthes hamata</i> (Verano Stylo)	Permitted – s11	ELA27	690616	7985383
* <i>Stylosanthes hamata</i> (Verano Stylo)	Permitted – s11	ELA28	691284	7985129
* <i>Stylosanthes hamata</i> (Verano Stylo)	Permitted – s11	ELA29	692961	7985886
* <i>Stylosanthes hamata</i> (Verano Stylo)	Permitted – s11	ELA31	696524	7985668
* <i>Stylosanthes hamata</i> (Verano Stylo)	Permitted – s11	ELA34	688934	7980819
* <i>Stylosanthes hamata</i> (Verano Stylo)	Permitted – s11	ELA42	702048	7980340
* <i>Stylosanthes hamata</i> (Verano Stylo)	Permitted – s11	ELA64	716838	7977401
* <i>Trianthema pilosum</i>	Permitted – s11	ELA62	716840	7976435
* <i>Vachellia farnesiana</i> (Mimosa Bush)	Permitted – s11	ELA10	692546	7997874
* <i>Vachellia farnesiana</i> (Mimosa Bush)	Permitted – s11	ELA11	692598	7997881
* <i>Vachellia farnesiana</i> (Mimosa Bush)	Permitted – s11	ELA12	692853	7997861
* <i>Vachellia farnesiana</i> (Mimosa Bush)	Permitted – s11	ELA36	692240	7980547
* <i>Vachellia farnesiana</i> (Mimosa Bush)	Permitted – s11	ELA41	701517	7980279
* <i>Vachellia farnesiana</i> (Mimosa Bush)	Permitted – s11	ELA55	712051	7978400
* <i>Vachellia farnesiana</i> (Mimosa Bush)	Permitted – s11	ELA56	713211	7978357
* <i>Vachellia farnesiana</i> (Mimosa Bush)	Permitted – s11	ELA58	713620	7978355

Appendix J Hierarchical clustering dendrogram



Appendix K Fauna species list

Species	Common name	Sign
Birds		
<i>Accipiter fasciatus</i>	Brown Goshawk	Directly observed
<i>Aprosmictus erythropterus</i>	Red-winged Parrot	Directly observed
<i>Aquila audax</i>	Wedge-tailed Eagle	Directly observed
<i>Ardea pacifica</i>	White-necked Heron	Directly observed
<i>Ardeotis australis</i>	Australian Bustard	Directly observed
<i>Artamus cinereus</i>	Black-faced Woodswallow	Directly observed
<i>Artamus personatus</i>	Masked Woodswallow	Directly observed
<i>Cacatua sanguinea</i>	Little Corella	Directly observed
<i>Calyptorhynchus banksii</i>	Red-tailed Black Cockatoo	Heard
<i>Chrysococcyx basalis</i>	Horsfield's Bronze Cuckoo	Heard
<i>Cincloramphus mathewsi</i>	Rufous Songlark	Directly observed
<i>Conopophila rufogularis</i>	Rufous-throated Honeyeater	Directly observed
<i>Coracina novaehollandiae</i>	Black-faced Cuckooshrike	Directly observed
<i>Corvus bennetti</i>	Little Crow	Directly observed
<i>Corvus orru</i>	Torresian Crow	Directly observed
<i>Cracticus nigrogularis</i>	Pied Butcherbird	Directly observed
<i>Dendrocygna eytoni</i>	Plumed Whistling Duck	Directly observed
<i>Egretta novaehollandiae</i>	White-faced Heron	Directly observed
<i>Elseyornis melanops</i>	Black-fronted Dotteral	Directly observed
<i>Eolophus roseicapilla</i>	Galah	Directly observed
<i>Falco berigora</i>	Brown Falcon	Directly observed
<i>Falco subniger</i>	Black Falcon	Directly observed
<i>Geopelia cuneata</i>	Diamond Dove	Directly observed
<i>Geopelia placida</i>	Peaceful Dove	Heard
<i>Grallina cyanoleuca</i>	Magpie-lark	Directly observed
<i>Grus rubicunda</i>	Brolga	Directly observed
<i>Haliastur sphenurus</i>	Whistling Kite	Heard
<i>Lichenostomus penicillatus</i>	White-plumed Honeyeater	Directly observed
<i>Lichenostomus virescens</i>	Singing Honeyeater	Heard
<i>Lichmera indistincta</i>	Brown Honeyeater	Heard
<i>Malurus coronatus</i>	Purple-crowned Fairywren	Directly observed
<i>Malurus lamberti</i>	Variiegated Fairywren	Directly observed
<i>Malurus melanocephalus</i>	Red-backed Fairywren	Directly observed
<i>Manorina flavigula</i>	Yellow-throated Miner	Directly observed

Species	Common name	Sign
<i>Merops ornatus</i>	Rainbow Bee-eater	Heard
<i>Milvus migrans</i>	Black Kite	Directly observed
<i>Nymphicus hollandicus</i>	Cockatiel	Heard
<i>Ocyphaps lophotes</i>	Crested Pigeon	Directly observed
<i>Pachycephala rufiventris</i>	Rufous Whistler	Heard
<i>Phaps chalcoptera</i>	Common Bronzewing	Directly observed
<i>Philemon citreogularis</i>	Little Friarbird	Directly observed
<i>Pomatostomus temporalis</i>	Grey-crowned Babbler	Heard
<i>Poodytes carteri</i>	Spinifexbird	Heard
<i>Ptilotula flavescens</i>	Yellow-tinted Honeyeater	Directly observed
<i>Rhipidura leucophrys</i>	Willie Wagtail	Directly observed
<i>Smicronis brevirostris</i>	Weebill	Heard
<i>Spilopelia senegalensis</i>	Laughing Turtle Dove	Directly observed
<i>Taeniopygia guttata</i>	Zebra Finch	Directly observed
<i>Threskiornis spinicollis</i>	Straw-necked Ibis	Directly observed
<i>Todiramphus sanctus</i>	Sacred Kingfisher	Directly observed
<i>Turnix velox</i>	Little Buttonquail	Directly observed
<i>Vanellus miles</i>	Masked Lapwing	Directly observed
Mammals		
* <i>Bos indicus</i>	Cattle	Directly observed, scats and tracks
* <i>Canis familiaris dingo</i>	Dingo	Directly observed
<i>Macropus agilis</i>	Agile Wallaby	Directly observed
<i>Macrotis lagotis</i>	Greater Bilby	Diggings
<i>Osphranter rufus</i>	Red Kangaroo	Scats and tracks
Reptiles		
<i>Ctenophorus isolepis</i>	Central Military Dragon	Directly observed
<i>Ctenophorus nuchalis</i>	Central Netted Dragon	Directly observed
<i>Menetia greyii</i>	Common Dwarf Skink	Directly observed
<i>Pogona minor mitchelli</i>	Bearded Dragon	Directly observed
<i>Pseudonaja mengdeni</i>	Western Brown Snake	Directly observed
<i>Tiliqua multifasciata</i>	Central Bluetongue	Directly observed
<i>Varanus gouldii</i>	Sand Goanna	Directly observed
<i>Varanus panoptes</i>	Yellow-spotted Monitor	Directly observed
Invertebrates		
<i>Araneidae</i> sp.	Orb-weaver Spider	Directly Observed
<i>Austracantha minax</i>	Jewel Spider/Christmas Spider	Directly Observed
<i>Diptera</i> sp.	True Flies	Directly Observed

Species	Common name	Sign
<i>Grylloidea</i> sp.	Cricket	Directly Observed
<i>Halyomorpha halys</i>	Stink Bug	Directly Observed
<i>Isoptera</i> sp.	Termites	Directly Observed
<i>Phasmatodea</i> sp.	Stick Insect	Directly Observed
<i>Synemon</i> sp.	Sun Moth	Directly Observed
<i>Tetragonula</i> sp.	Stingless Bee	Directly Observed
<i>Vespula</i> sp.	Wasp	Directly Observed

