OB32 SURPLUS WATER & HOMESTEAD CREEK WETTING FRONT

DETAILED FLORA & VEGETATION ASSESSMENT

PREPARED FOR: BHP WAIO



Spectrum ECOLOGY & SPATIAL

© Spectrum Ecology Pty Ltd
ABN 68 615 115 243
PO Box 314 Leederville
Western Australia 6902
Ph: (08) 9317 8233
Email: info@spectrumecology.com.au

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EXECUTIVE SUMMARY

BHP Western Australian Iron Ore engaged Spectrum Ecology & Spatial to undertake a detailed flora and vegetation survey covering the OB32 Surplus Water – Homestead Creek Wetting Front Survey Area (the Survey Area). The Survey Area extends from approximately 4.3 km to 65 km north-east of Newman and covers an area of approximately 14,786 ha.

A three-phase detailed flora and vegetation assessment was conducted at the Survey Area. The first phase was conducted from the 3 to 9 March 2021, following high summer rainfall, and the second phase was conducted from the 30 August to 4 September 2021, following the regions drier autumn-winter period. A total of 37 quadrats and 16 relevés were conducted during phase one, and 14 quadrats and 15 relevés were conducted during phase two. A third phase was undertaken between 17 and 18 February 2022, a total of 28 relevés were conducted to extend vegetation mapping.

A total of 342 taxa from 45 families and 142 genera were recorded during the survey, of which 330 (96.5% were native and 12 (3.5%) were introduced. The most species rich family was Fabaceae with 68 species, followed by Poaceae with 59 species. The most species rich genera were *Acacia* with 29 species recorded, followed by *Ptilotus* with 11 species recorded.

No Threatened flora (under the federal *Environment Protection and Biodiversity Conservation Act 1999* and state *Biodiversity Conservation Act 2016*) were recorded or are likely to occur within the Survey Area. Four Priority Flora taxa (as per the Department of Biodiversity Conservation and Attractions Priority Flora List) were recorded *Crotalaria smithiana* (P3), *Gymnanthera cunninghamii* (P3), *Eremophila youngii* subsp. *lepidota* (P4), and *Goodenia nuda* (P4). *Crotalaria smithiana* (P3) was considered to have high regional significance as the taxon is not widely distributed in the Pilbara, but locally common surrounding the Survey Area. Four Priority Flora species, *Amaranthus centralis* (P3), *Aristida jerichoensis* var. *subspinulifera* (P3), *Rhagodia* sp. Hamersley (M. Trudgen 17794) (P3), and *Themeda* sp. Hamersley Station (M.E. Trudgen 11431) (P3), were considered to have a High post-survey likelihood of occurrence within the Survey Area.

Twelve introduced flora species were recorded at the Survey Area, 11 of which are classified as permitted – s11 weeds; however, **Calotropis procera* is listed as a Declared Pest in Western Australia (as listed in the West Australian Organism List database) and regulated under the *Biosecurity and Agricultural Management Act 2007*. There are no controls required for these weed species.

A total of 13 vegetation types were described, of which, seven were common throughout the Survey Area. The major drainage line vegetation types (D1a, D1b) were characterised by an overstorey of *Eucalyptus camaldulensis* and *Acacia citrinoviridis*, with *Eucalyptus victrix* in the south, over an understorey of *Melaleuca glomerata*, *Eulalia aurea*, and *Cyperus vaginatus*. Floodplains (A1b, FP1) were characterised by *Acacia citrinoviridis* over **Cenchrus ciliaris* tussock grassland. Hummock grasslands on sandy plains (TP1a) were dominated by *Triodia pungens* with an overstorey of *Eucalyptus socialis* and *Eucalyptus xerothermica* in the south of the Survey Area (TP1b). Plains to the north of the Survey Area (A1a) were characterised by an overstorey of *Acacia aptaneura* over *Acacia tetragonophylla* and *Acacia synchronicia* sparse shrubland and a **Cenchrus ciliaris* and *Enneapogon cylindricus* open tussock grassland.

Vegetation type EP1 was assigned a high local significance as it was locally restricted and provided refuge to *Eremophila youngii* subsp. *lepidota* (P4). Additionally, EP1 was assigned a high regional significance as it was associated with a Beard vegetation sub-association and geological unit that have limited distributions. No other vegetation types were considered to have a high local or regional significance as they had wide

distributions, no historical threatening processes, did not provide role as refuge to significant flora, or provide important ecological function.

The vegetation condition of the Survey Area was predominantly classed as 'Good' due to moderate weed cover and grazing. Floodplains (A1b and FP1) were assigned a 'Good' to 'Poor' rating due to higher weed cover, reduced understorey diversity, and grazing. Minimal disturbance was recorded in vegetation types TP1a, EP1, and H1 and they were assigned an 'Excellent' condition rating. The cover of 'Degraded' and 'Completely Degraded' condition ratings were greatest in the south of the Survey Area, where clearing for infrastructure, high weed cover, and edge effects were prevalent.

No significant limitations and constraints impacted the collection of data or the outcome of the detailed flora and vegetation assessment.

1. INTRODUCTION

1.1. Project Background

BHP Western Australian Iron Ore BHP (WAIO) operates the OB23 mining area in the vicinity of Homestead Creek, in the Pilbara bioregion of Western Australia. BHP WAIO engaged Spectrum Ecology & Spatial (Spectrum) to undertake a two-season detailed flora and vegetation survey covering the OB32 Surplus Water – Homestead Creek Wetting Front Survey Area (the Survey Area). The Survey Area extends from approximately 4.3 km to 65 km north-east of Newman and covers an area of approximately 14,786 ha (Map 1.1).

1.2. Project Objectives

The project objective was to undertake a desktop assessment and two-season detailed flora and vegetation survey to describe flora and vegetation values across the Survey Area, in order to inform future environmental approvals.

1.3. Bioregion & Climate

The Interim Biogeographic Regionalisation for Australia (IBRA) classifies Australia into regions based on dominant landscape, climate, lithology, geology, landform, and vegetation (Thackway and Cresswell, 1995).

The Survey Area is located within the Pilbara IBRA bioregion which is divided into four sub-regions: Chichester, Fortescue Plains, Hamersley, and Roebourne. The Survey Area is located in the Fortescue Plains (85.8%) and Hamersley (9.0%) subregions (Figure 1.1). The Survey Area briefly crosses into the Augustus subregion of the Gascoyne IBRA bioregion (5.2%). The Fortescue Plains subregion includes alluvial plains and river frontage and deeply incised gorge systems with extensive salt marsh and wetland communities (Kendrick, 2001a). The Hamersley subregion is the southern section of the Pilbara Craton, a mountainous area of sedimentary ranges and plateaus dissected by gorges (Kendrick, 2001b). The Augustus subregion is the northern section of the Gascoyne and is described as rugged, low Proterozoic sedimentary and granite ranges divided by broad, flat valleys (Kendrick, 2001b).

The climate of the Pilbara bioregion is classified as tropical, arid to semi-arid, with a median annual rainfall of 300 mm. Rainfall for the region can be variable, falling mainly in summer cyclonic events from December to February (Thackway and Cresswell, 1995).

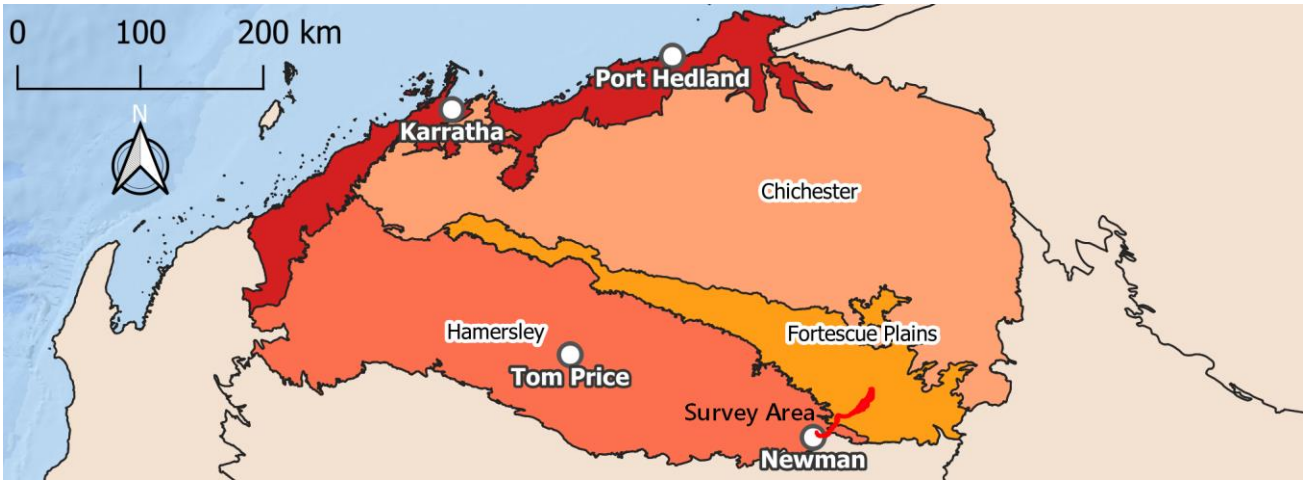
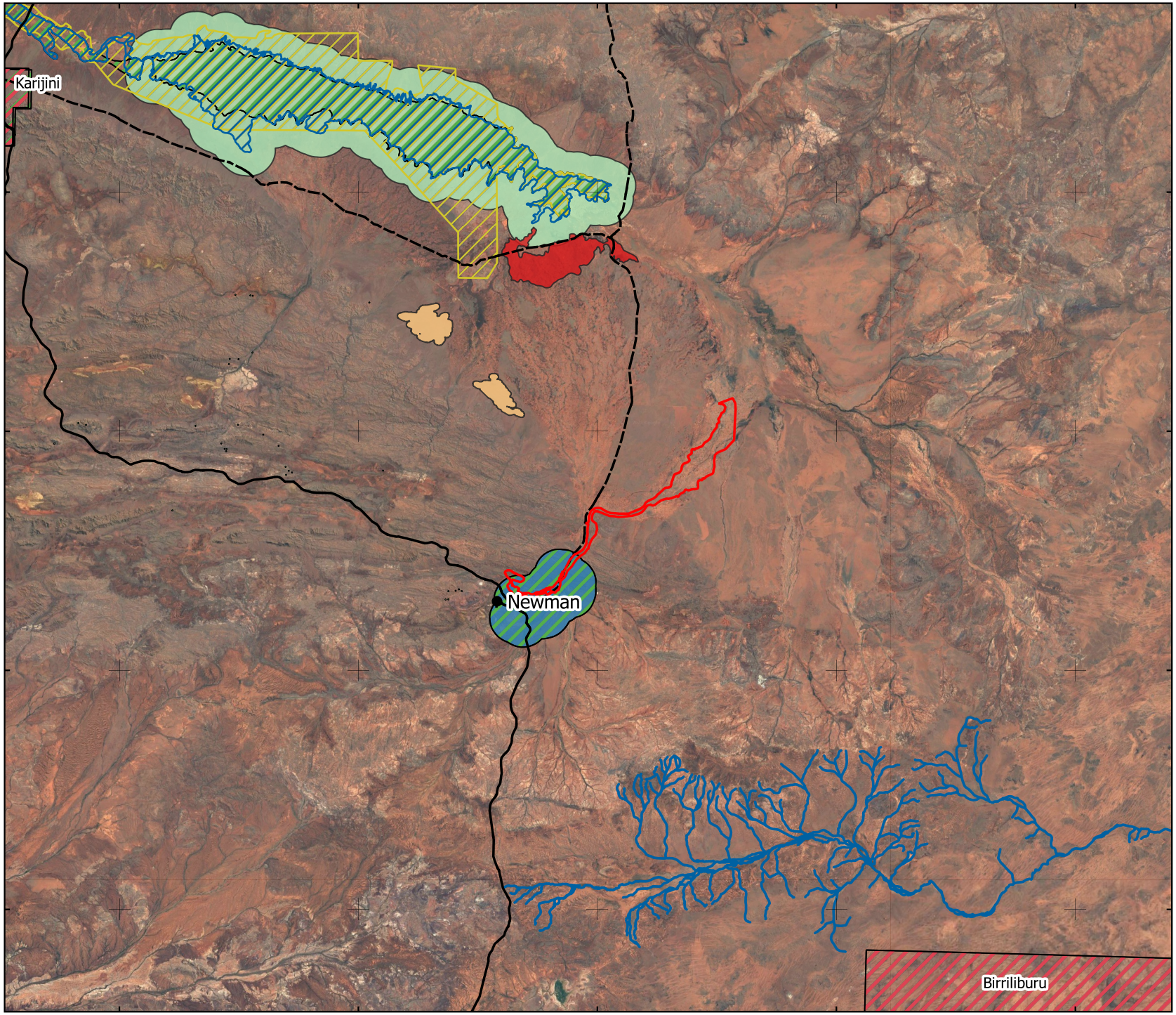


Figure 1.1: Location of the Survey Area in the Pilbara IBRA Region



Legend

- Survey Area
- Principal Road
- Secondary Road
- Conservation Estates
- Environmentally Sensitive Areas - DWER 2019
- Directory of Important Wetlands
- Ramsar Sites - DBCA

PEC & TEC

- Narbung System
- Fortescue Valley Sand Dunes
- Fortescue Marsh
- Ethel Gorge



N

0 10 20 30 40 km

Scale: 1:1,110,000

Coordinate System: GDA 1994 MGA Zone 50
Projection: Transverse Mercator
Units: Meter

Spectrum ECOLOGY • SPATIAL

Author: CS

Date: 01/07/2020

Survey Area Location & Significant Lands

OB32 Surplus Water & Homestead Creek Wetting Front

Prepared for
BHP WAIO

Map
1.1

1.4. Disturbance History

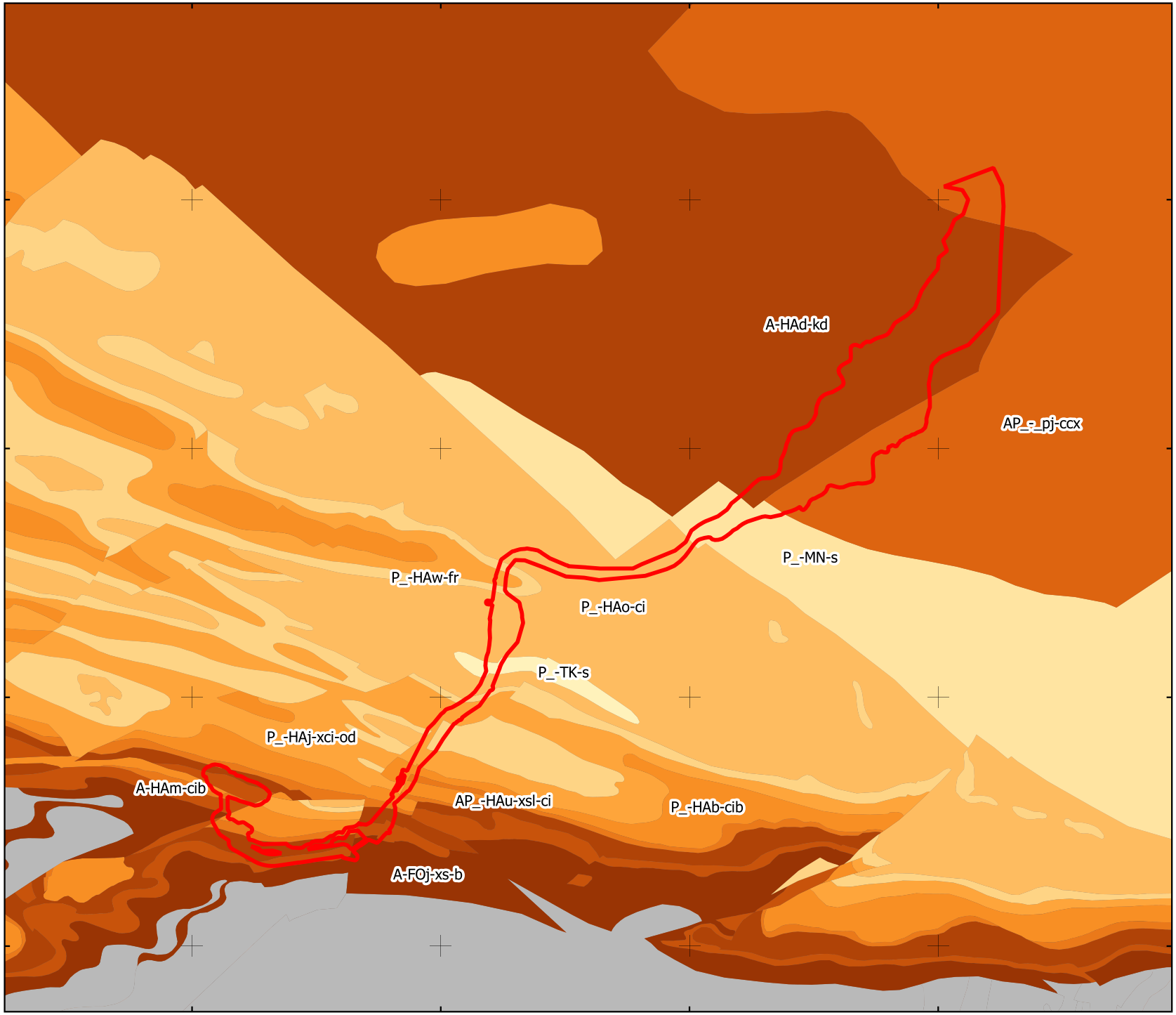
The dominant current and historical land uses across the region involves grazing of native pasture, conservation, crown reserves, mining leases, and Aboriginal lands and reserves (Kendrick, 2001a). Historically pastoralism has been the most significant land use within the Pilbara region. Since the 1960's mining, predominantly iron ore, has become a significant land use with much of the Pilbara now under mining tenure. Homestead Creek is in the vicinity of the Mount Whaleback, Eastern Ridge and Jimblebar BHP WAIO mine sites.

1.5. Geology

The surface geology of Western Australia (WA) has been mapped at a scale of 1:500,000 (DMIRS, 2019). Eleven units were mapped within the Survey Area; none of the geological units have over 1.1% of their total extent within the Survey Area. The Turee Creek Group (P_-TK-s) geological unit may be considered restricted as it is only distributed in the Pilbara and the unit's total area is relatively low. The geological units are listed in Table 1.1 and shown in Map 1.2.

Table 1.1: Geological Units (1:500,000)

Unit	Description	Area in Survey Area (ha)	Survey Area (%)	Area in Pilbara (ha)	Area in WA (ha)	WA Extent in Survey Area (%)
A-FOj-xs-b	Jeerinah Formation: Siliciclastic sedimentary rocks, mafic volcanic rocks and minor felsic volcanic rocks; local carbonate rocks, chert, and dolerite sills.	86	0.6	636,003	652,764	<0.1
A-HAd-kd	Wittenoom Formation: Thinly bedded dolomite and dolomitic shale, with minor black chert, shale, banded iron formation and sandstone.	8,045	54.4	1,353,373	1,355,589	0.6
A-HAm-cib	Marra Mamba Iron Formation: Chert, banded iron-formation, mudstone, and siltstone; minor carbonate; metamorphosed.	786	5.3	520,665	523,219	0.2
AP_-_pj-ccx	Pinjian Chert Breccia: Chert breccia and poorly bedded chert; overlies Carawine Dolomite.	2,513	17.0	709,813	710,245	0.4
AP_-HAu-xsl-ci	Mount McRae Shale and Mount Sylvia Formation: Mudstone, siltstone, chert, banded iron-formation, and dolomite; metamorphosed.	239	1.6	253,658	254,080	<0.1
P_-HAb-cib	Brockman Iron Formation: Banded iron-formation, chert, mudstone, and siltstone; metamorphosed.	195	1.3	1,338,772	1,345,403	<0.1
P_-HAj-xci-od	Weeli Wolli Formation: Banded iron-formation (commonly jaspilitic), mudstone, siltstone, and numerous dolerite sills; metamorphosed.	444	3.0	479,458	484,628	<0.1
P_-HAo-ci	Boolgeeda Iron Formation: Fine-grained, finely laminated iron-formation, mudstone, siltstone, and chert; metamorphosed.	1,574	10.6	146,215	147,586	1.1
P_-HAw-fr	Woongarra Rhyolite: Rhyolite, rhyodacite, rhyolitic breccia, and banded iron-formation; metamorphosed.	230	1.6	174,893	176,325	0.1
P_-MN-s	Manganese Group: Sandstone, siltstone, mudstone, conglomerate, chert, and dolostone.	604	4.1	571,680	716,449	<0.1
P_-TK-s	Turee Creek Group: Mudstone, siltstone, sandstone, conglomerate, dolomite; minor diamictite, limestone and iron formation; intruded by Balgara Dolerite sills.	70	0.5	123,396	123,621	<0.1



Legend

Survey Area

Geological Units

- A-FOj-xs-b
- A-HAd-kd
- A-HAm-cib
- AP_-_pj-ccx
- AP_-HAu-xsl-ci
- P_-HAb-cib
- P_-HAj-xci-od
- P_-HAo-ci
- P_-HAw-fr
- P_-MN-s
- P_-TK-s
- Geology Not Within Survey Area

N

0 2.5 5 7.5 10 12.5 km

Scale: 1:320,000

Coordinate System: GDA 1994 MGA Zone 50
Projection: Transverse Mercator
Units: Meter

Spectrum ECOLOGY • SPATIAL

Author: CS

Date: 28/03/2022

Geological Units (1:500,000)

OB32 Surplus Water & Homestead Creek Wetting Front

Prepared for BHP WAIO

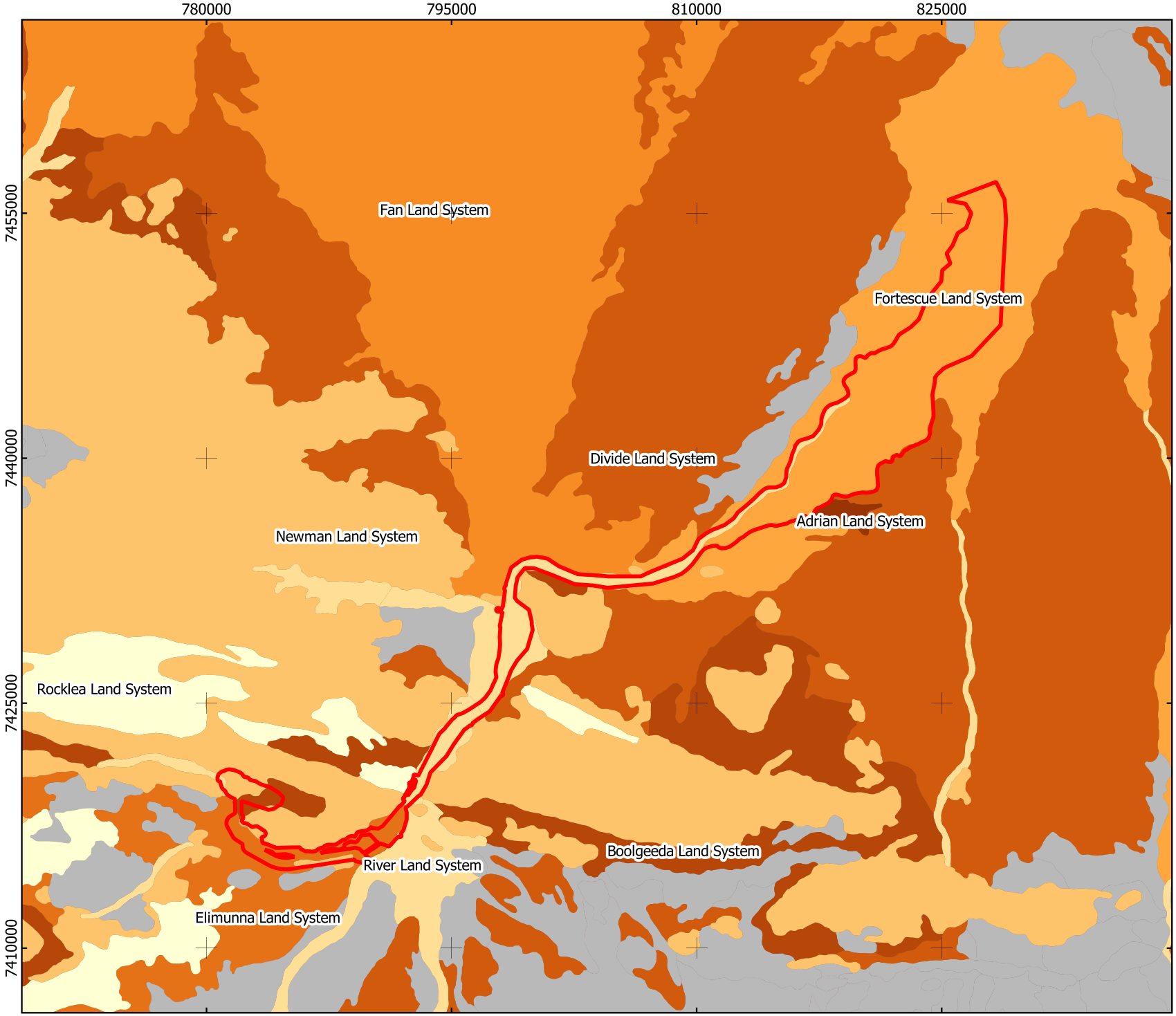
Map 1.2

1.6. Land Systems

Van Vreeswyk *et al.* (2004) completed an inventory of the Pilbara region to document the land systems and their condition. Land systems were described using the biophysical characteristics of geology, landforms, vegetation, and soils. The Survey Area includes nine land systems as described in Table 1.2 and shown in Map 1.3. The Fortescue land systems covers the majority of the Survey Area (66.7%) and 19.6% of the total land system is contained within the Survey Area. All other land systems were either wide-spread or a small percentage (<2%) of the total area occurred within the Survey Area.

Table 1.2: Land Systems

Land System	Description	Area in Survey Area (ha)	Survey Area (%)	Area in Pilbara (ha)	Area in WA (ha)	WA Extent in Survey Area (%)
Adrian	Stony plains and low silcrete hills supporting hard spinifex grasslands.	7	<0.1	24,056	24,480	<0.1
Boolgeeda	Stony plains and low silcrete hills supporting hard spinifex grasslands.	231	1.6	961,846	999,836	<0.1
Divide	Gently undulating sandplains with minor dunes, supporting hard spinifex hummock grasslands with numerous shrubs.	101	0.7	453,438	862,801	<0.1
Elimunna	Stony plains on basalt supporting sparse acacia and cassia shrublands and patchy tussock grasslands.	1,131	7.6	65,617	65,617	1.7
Fan	Stony plains and low silcrete hills supporting hard spinifex grasslands.	3	<0.1	148,028	148,028	<0.1
Fortescue	Alluvial plains and flood plains supporting patchy grassy eucalypt and acacia woodlands and shrublands and tussock grasslands.	9,861	66.7	50,388	50,338	19.6
Newman	Rugged jaspilite plateaux, ridges and mountains supporting hard spinifex grasslands.	557	3.8	1,997,587	1,999,780	<0.1
River	Narrow, seasonally active flood plains and major river channels supporting moderately close, tall shrublands or woodlands of acacias and fringing communities of eucalypts sometimes with tussock grasses or spinifex.	2,884	19.5	516,679	595,367	0.5
Rocklea	Shale, gravel and clay plains supporting eremophila-cassia shrublands, tussock grasslands, and halophytic shrublands.	11	<0.1	2,880,031	2,891,998	<0.1



Legend

Survey Area

Land System

- Adrian Land System
- Boolgeeda Land System
- Divide Land System
- Elimunna Land System
- Fan Land System
- Fortescue Land System
- Newman Land System
- River Land System
- Rocklea Land System
- System Not Within Survey Area

N

0 2.5 5 7.5 10 12.5 km

Scale: 1:320,000

Coordinate System: GDA 1994 MGA Zone 50
Projection: Transverse Mercator
Units: Meter

Spectrum ECOLOGY • SPATIAL

Author: CS

Date: 28/03/2022

Land Systems

OB32 Surplus Water &
Homestead Creek Wetting Front

Map 1.3

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1.7. Vegetation Associations

Pre-European vegetation mapping was originally undertaken by Beard at various scales across WA (Beard, 1975) and has since been updated to be consistent with Native Vegetation Information System (NVIS) descriptions at a scale of 1:250,000 (DPIRD, 2019). State-wide vegetation statistics are available for these units which lists pre-European extent, current extent, area in Department of Biodiversity, Conservation, and Attractions (DBCA) managed lands etc., and is a useful tool to determine if a vegetation unit is rare or otherwise significant (Government of Western Australia, 2019).

Eight vegetation sub-associations, including two mosaics, have been mapped within the Survey Area (Table 1.3; Map 1.4). The most common vegetation sub-association was 166.2, which covered 63.4% of the Survey Area. Furthermore, 36.7% of the total area covered by 166.2 sub-association in WA is contained within the Survey Area. The remaining seven sub-association covered less than 10.0% of the Survey Area individually and less than one percent of their total area is contained within the Survey Area. Over 99% of the pre-European vegetation extent remains for all eight sub-associations.

Table 1.3: Vegetation Sub-associations

Sub-Assoc.	NVIS Level V Description	Area in Survey Area (ha)	Survey Area (%)	Pre-European Area in Pilbara (ha)	Pre-European Extent WA (ha)	Current Extent WA (ha)	Remaining Extent WA (%)	Current Extent in Survey Area (%)
18.11	*Acacia aneura*, *Eremophila fraseri*, *Acacia pruinocarpa* open mid shrubland, over *Eremophila lanceolata* low open shrubland, over *Ptilotus schwartzii*, *Brachyscome* sp. mid open forbland.	700	4.7	580,556	580,556	575,851	99.2	0.1
29.0	*Acacia aneura* tall isolated clumps of shrubs.	1,309	8.9	883,349	3,530,312	3,529,440	99.9	<0.1
82.0	*Eucalyptus leucophloia* low isolated trees, over *Triodia wiseana* mid open hummock grassland.	22	0.1	50,178	51,202	50,989	99.6	<0.1
82.3	*Eucalyptus leucophloia*, *Eucalyptus gamophylla* low open woodland, over *Senna artemisioides* subsp. x *sturtii*, *Dodonaea viscosa*, *Grevillea wickhamii* mid sparse shrubland, over *Ptilotus rotundifolius*, *Acacia adoxa* low open shrubland, over *Triodia wiseana* mid open hummock grassland.	1,022	6.9	2,180,212	2,180,212	2,168,057	99.4	<0.1
	Eucalyptus kingsmillii, *Eucalyptus gamophylla*, *Eucalyptus leucophloia* low open mallee woodland, over *Senna artemisioides* subsp. x *sturtii*, *Dodonaea viscosa*, *Grevillea wickhamii* mid sparse shrubland, over *Ptilotus rotundifolius*, *Acacia adoxa* low open shrubland, over *Triodia wiseana* mid open hummock grassland.							
	Eucalyptus camaldulensis, *Eucalyptus victrix*, *Corymbia hamersleyana* low woodland, over *Hibiscus goldsworthii*, *Arivela viscosa* mid sparse shrubland, over *Swainsona stenodonta*, *Jasminum didymum* low sparse forbland.							

Sub-Assoc.	NVIS Level V Description	Area in Survey Area (ha)	Survey Area (%)	Pre-European Area in Pilbara (ha)	Pre-European Extent WA (ha)	Current Extent WA (ha)	Remaining Extent WA (%)	Current Extent in Survey Area (%)
111.1	*Eucalyptus gamophylla*, *Corymbia hamersleyana* low open mallee woodland, over *Acacia pachycarpa*, *Acacia pyrifolia*, *Senna* sp. tall sparse shrubland, over *Triodia basedowii*, *Triodia pungens*, *Ptilotus axillaris* mid open hummock grassland.	1,176	8.0	430,960	430,979	430,925	99.9	0.3
	Acacia aneura, *Corymbia hamersleyana*, *Eucalyptus* sp. aff. aspera low open woodland.							
	Eucalyptus gamophylla, *Hakea lorea* low open mallee woodland, over *Acacia pyrifolia* tall sparse shrubland, over *Triodia basedowii* mid open hummock grassland.							
157.0	*Triodia wiseana* mid open hummock grassland.	106	0.7	111,583	414,399	412,421	99.5	<0.1
166.2	*Acacia aneura* var. *aneura*, *Acacia victoriae*, *Acacia tetragonophylla* low woodland, over *Eremophila cuneifolia*, *Senna* sp. tall sparse shrubland, over *Ptilotus exaltatus* mid sparse forbland.	9,378	63.4	25,541	25,541	25,541	100	36.7
216.0	*Acacia aneura* low woodland, over *Triodia* sp. mid sparse hummock grassland.	1,073	7.3	26,669	280,759	279,237	99.5	0.4



Legend

Survey Area

Beard Vegetation Sub-Association

- 18.11
- 29.0
- 82.0
- 82.3
- 111.1
- 157.0
- 166.2
- 216.0
- Unit Not Within Survey Area

N

0 2.5 5 7.5 10 12.5 km

Scale: 1:320,000

Coordinate System: GDA 1994 MGA Zone 50
Projection: Transverse Mercator
Units: Meter

Spectrum ECOLOGY • SPATIAL

Author: CS

Date: 28/03/2022

Beard Vegetation Sub-associations

OB32 Surplus Water & Homestead Creek Wetting Front

Map 1.4

Prepared for BHP WAIO

1.8. Significant Lands

Several significant lands are located in the vicinity of the Survey Area. These are described in the following sections and mapped on Map 1.1.

1.8.1. Conservation Estates

The Western Australian conservation estate includes land and waters vested in the Conservation and Parks Commission under the *Conservation and Land Management Act 1984* (CALM). The conservation estate is generally managed by the Parks and Wildlife Service of DBCA to protect Western Australia's biodiversity, and includes National Parks, Nature Reserves, Conservation Reserves, and other areas managed primarily for biodiversity conservation (Department of the Environment and Energy, 2016).

No conservation estate occurs within the Survey Area. The closest known conservation estate is Karijini National Park, located 136 km west of the Survey Area boundary.

1.8.2. Environmentally Sensitive Areas

Environmentally Sensitive Areas (ESA) that are associated with flora and vegetation, and the Pilbara IBRA region, are areas that are defined by the Department of Water and Environmental Regulation (2019) as:

- A defined wetland and the area within 50 m of a wetland;
- The area covered by vegetation within 50 m of Threatened Flora, to the extent to which the vegetation is continuous with the vegetation in which the Threatened Flora is located; or
- The area covered by a Threatened Ecological Community (TEC).

Several small ESAs were mapped in and around the Survey Area. These areas relate to known locations of a diverse assemblage of Stygofaunal species including Oligochaeta and various species of crustaceans. The Ethel Gorge alluvium calcrete aquifer is the only known occurrence of this community and is listed as Endangered under the WA Minister Environmentally Sensitive areas list in policy.

1.8.3. Australian Wetlands Database

The Australian Wetlands Database includes nationally significant wetlands (as listed in the Directory of Important Wetlands), wetlands listed under the Ramsar convention, wetlands that are representative, rare or unique, or wetlands that are considered of international importance (Department of the Environment and Energy, 2019).

No nationally significant wetlands, including Ramsar wetlands, were mapped within the Survey Area. The closest known wetland of significance is the Fortescue Marsh located 70 km north of the Survey Area.

1.9. Legislation, Guidelines & Definitions

Flora in Western Australia are protected by various forms of legislation, including:

- The State *Biodiversity Conservation Act 2016* (BC Act);
- The State *Environmental Protection Act 1986* (EP Act); and
- The National *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act).

This detailed assessment is compliant with the appropriate flora guidelines as outlined in:

- Environmental Protection Authority (EPA) Technical Guidance: Flora and Vegetation Surveys for Environmental Impact Assessment (EPA, 2016b);

- DBCA Threatened and Priority Flora Report Form – Field Manual (Department of Biodiversity Conservation and Attractions, 2017b);
- National Vegetation Information System (NVIS) Australian Vegetation Attribute Manual (ESCAVI, 2003);
- BHP WAIO's Biological Survey Spatial Data Requirements (SPR-IEN-EMS-015); and
- BHP WAIO's Vegetation and Flora Survey Procedure (0124627).

Significant flora can include (Environmental Protection Authority, 2016a):

- Being identified as Threatened: Critically Endangered, Endangered or Vulnerable (state listed BC Act and/or nationally listed EPBC Act);
- Being identified as Priority Flora species: Priority 1 to 4 (Department of Biodiversity Conservation and Attractions, 2019);
- Locally endemic or association with a restricted habitat type (e.g. surface water or groundwater dependent ecosystems);
- New species or anomalous features that indicate a potential new species;
- Representative of the range of a species (particularly, at the extremes of range, recently discovered range extensions, or isolated outliers of the main range);
- Unusual species, including restricted subspecies, varieties or naturally occurring hybrids; or
- Relictual status, being representative of taxonomic groups that no longer occur widely in the broader landscape.

Significant vegetation can include (Environmental Protection Authority, 2016a):

- Threatened Ecological Community (TEC): Critically Endangered, Endangered or Vulnerable (state listed BC Act and/or nationally listed EPBC Act);
- Priority Ecological Community (PEC): Priority 1 to 5 (Department of Biodiversity Conservation and Attractions, 2017a);
- Restricted distribution;
- Degree of historical impact from threatening processes;
- A role as a refuge; or
- Providing an important function required to maintain ecological integrity of a significant ecosystem.

Introduced flora can pose a threat to native vegetation and biodiversity. The Department of Primary Industries and Regional Development (DPIRD) manages the West Australian Organism List (WAOL) database of organisms that are Declared Pests in Western Australia (DPIRD, 2021). This WAOL is regulated under the state *Biosecurity and Agricultural Management Act 2007* (BAM Act). Legal status and control requirements for these environmentally significant weeds area defined in Appendix B.

1.10. Desktop Assessment

A desktop assessment of all relevant and available flora and vegetation data sources was undertaken prior to the field survey to assess the significant flora and vegetation likely to occur in the Survey Area.

1.10.1. Database Searches

The following databases were searched and reviewed for significant flora and vegetation and incorporated into the desktop assessment (Table 1.4).

Table 1.4: Database Searches

Data Source	Custodian	Details
Western Australian Herbarium (WAH)	DBCA	Date: 11/02/2021; Buffer: 100 km Reference: 02-0221FL
Threatened and Priority Flora	DBCA	Date: 11/02/2021; Buffer: 100 km Reference: 02-0221FL
Threatened and Priority Ecological Communities (TEC/PEC)	DBCA	Date: 18/02/2021; Buffer: 50 km Reference: 17-0221EC
NatureMap	Department of Parks and Wildlife (DPaW)	Date: 02/02/20; Buffer: 40 km North Centre Point: 120° 12' 21'' E,22° 58' 01'' S South Centre Point: 119° 46' 30'' E,23° 20' 19'' S
Protected Matters	Department of Agriculture, Water and the Environment (DAWE)	Date: 02/02/21 Buffer: 50 km Centre Point: -23.18485, 119.99268
Index of Biodiversity Surveys of Assessments (IBSA) database	Department of Water and Environmental Regulation (DWER)	Date: 02/02/2021; Buffer: 100 km
Australasian Virtual Herbarium (AVH)	Council of Heads of Australasian Herbaria (CHAH)	Date: 02/02/2021: Buffer 100 km North Centre Point: 120° 12' 21'' E,22° 58' 01'' S South Centre Point: 119° 46' 30'' E,23° 20' 19'' S

1.10.2. Literature Review

Thirty-one flora assessments were previously conducted near the Survey Area and used in the desktop assessment. Reports were incorporated if they were provided by BHP WAIO, or if they were publicly available. The reports incorporated into the desktop assessment are listed in Table 1.5.

Table 1.5: Previously Conducted Flora Assessments

Reference	Survey Type	Title	Prepared For
(Astron, 2018a)	Targeted	Caramulla Creek Flora and Vegetation Survey	BHP WAIO
(Astron, 2018b)	Detailed	Cathedral Gorge Level 2 Flora and Vegetation Survey	BHP WAIO
(Onshore Environmental Consultants, 2015a)	Detailed	Dynasty and West Jimblebar Level 2 Flora and Vegetation Survey	BHP WAIO
(ENV Australia, 2012)	Detailed	Eastern Ridge (OB23/24/25) Flora and Vegetation Assessment	BHP WAIO
(Onshore Environmental Consultants, 2013a)	Detailed	Flora & Vegetation and Vertebrate Fauna Review - Mt Whaleback AML 7/244	BHP WAIO
(Onshore Environmental Consultants, 2017)	Targeted	Flora and Vegetation and Vertebrate fauna survey of the Newman to MAC powerline corridor	BHP WAIO
(Onshore Environmental Consultants, 2015b)	Detailed	Fortescue River Riparian Flora and Vegetation Survey	BHP WAIO
(ENV Australia, 2009)	Detailed	Jimblebar Construction Water Supply Pipeline and Ammonium Nitrate Storage Facility	BHP WAIO
(Outback Ecology Services, 2010)	Detailed	Jimblebar Iron Ore Project Flora and Vegetation Assessment	BHP WAIO
(ENV Australia, 2006)	Detailed	Mt Whaleback Flora and Vegetation Assessment - Phase III Summary Report	BHP WAIO
(Onshore Environmental Consultants, 2009)	Detailed	Myopic Exploration Lease Biological Survey	BHP WAIO
(Ecoscape, 2013)	Detailed	Newman-Roy Hill Transmission Line Survey - Version 11. Unpublished report prepared for Alinta Energy.	BHP WAIO
(ecologia Environment, 2008)	Detailed	Newman Water Pipeline Enhancement Project: Vegetation and Flora Survey	BHP WAIO
(Onshore Environmental Consultants, 2014a)	Targeted	Orebody 18 to OB31 Infrastructure Corridor Targeted Flora Survey	BHP WAIO

Reference	Survey Type	Title	Prepared For
(Onshore Environmental Consultants, 2014b)	Detailed	Orebody 19 level 2 Flora and Vegetation Survey	BHP WAIO
(ecologia Environment, 2004)	Detailed	Orebody 24 Expansion Biological Survey	BHP WAIO
(ENV Australia, 2013)	Desktop	Orebody 24 Flora and Fauna Assessment Phase II	BHP WAIO
(Syrinx Environmental, 2011)	Detailed	Orebody 31 Flora and Vegetation Assessment	BHP WAIO
(Onshore Environmental Consultants, 2014c)	Detailed	Orebody 31 Level 2 Flora and Vegetation Survey	BHP WAIO
(Onshore Environmental Consultants, 2015c)	Detailed	Orebody 31 to Ophthalmia Dam Pipeline Level 1 Flora, Vegetation and Vertebrate Fauna Survey	BHP WAIO
(ENV Australia, 2010)	Detailed	Orebody 35 Surrounds Flora and Vegetation Survey	BHP WAIO
(Syrinx Environmental, 2010)	Detailed	Orebody 37 Flora and Vegetation Assessment	BHP WAIO
(ENV Australia, 2011)	Detailed	Orebody 42/43 Flora, Vegetation and Fauna Assessment	BHP WAIO
(ENV Australia, 2008)	Detailed	RGP5 Jimblebar Junction to Yandi Junction Railway Reserve Flora and Vegetation Assessment	BHP WAIO
(Onshore Environmental Consultants, 2013b)	Targeted	Targeted Flora and Vegetation Survey Orebody 24	BHP WAIO
(Onshore Environmental Consultants, 2012)	Targeted	Targeted Significant Flora Survey Vegetation Mapping of Homestead Creek	BHP WAIO
(ENV Australia, 2007)	Detailed	West Jimblebar Lease Flora and Vegetation Assessment	BHP WAIO
(Syrinx Environmental, 2012)	Detailed	Wheelarra Hill North Level 2 Flora and Vegetation Assessment	BHP WAIO

1.10.3. Likelihood of Occurrence Assessment

An assessment of each significant species or community identified in the above desktop assessment was completed with the following information provided:

- Conservation status;
- Description of species habitat requirements and presence of this habitat within the Survey Area;
- Summary of relevant records including source of record (DBCA databases, previous report etc.) and accuracy of the record location; and
- Likelihood of occurrence criteria assigned and justification of likelihood of occurrence that considers known habitats, survey effort etc. The likelihood of occurrence was determined based on the criteria outlined in Table 1.6.

Table 1.6: Likelihood of Occurrence Criteria

Likelihood	Criteria
Recorded	Species or community recorded within Survey Area.
High	Species or community recorded within 10 km of the Survey Area and suitable habitat occurs within.
Medium	Species or community recorded within 20 km of the Survey Area and suitable habitat may occur within.
Low	Species or community rarely or not recorded within 20 km of the Survey Area and suitable habitat does not occur within or recorded in close proximity to the Survey Area but no habitat within Survey Area.

1.10.4. Desktop Assessment – Significant Flora

Eighty significant taxa were identified during the desktop assessment (Table 1.7; Map 1.5; Map 1.6; Map 1.7). The likelihood of occurrence assessment is provided in Appendix A.

One Threatened flora taxon, *Pityrodia augustensis*, was previously identified, however was assigned a Low pre-survey likelihood of occurrence as the closest known record was more than 50 km away and there was

no suitable habitat within the Survey Area. The *Pityrodia augustensis* record was returned in the NatureMap database search, no precise location is provided, and it is not included in Map 1.5–Map 1.7.

Seven Priority Flora species were previously recorded within the Survey Area and 11 were assigned a High pre-survey likelihood of occurrence due to their proximity to the Survey Area (Table 1.7). Thirteen and 48 Priority Flora were assigned a Medium and Low pre-survey likelihood of occurrence, respectively.

Table 1.7: Significant Flora Recorded from Database Searches

Likelihood	Status	Species
Recorded	P3	*Aristida jerichoensis* var. *subspinulifera, Crotalaria smithiana, Gymnanthera cunninghamii, Rhagodia* sp. Hamersley (M. Trudgen 17794), *Themeda* sp. Hamersley Station (M.E. Trudgen 11431)
	P4	*Eremophila youngii* subsp. *lepidota, Goodenia nuda*
High	P1	*Triodia pascoeana*
	P2	*Aristida lazaridis, Euphorbia inappendiculata* var. *inappendiculata, Ipomoea racemigera*
	P3	*Amaranthus centralis, Calotis latiuscula, Eremophila magnifica* subsp. *velutina, Eremophila* sp. Hamersley Range (K. Walker KW 136), *Goodenia* sp. East Pilbara (A.A. Mitchell PRP 727), *Iotasperma sessilifolium, Swainsona thompsoniana*
Medium	P1	*Acacia corusca, Eremophila capricornica, Eremophila pilosa, Helichrysum oligochaetum, Stemodia* sp. Battle Hill (A.L. Payne 1006), *Vittadinia* sp. Coondewanna Flats (S. van Leeuwen 4684)
	P2	*Goodenia hartiana, Isotropis parviflora*
	P3	*Eragrostis crateriformis, Eremophila rigida, Eucalyptus rowleyi*
	P4	*Eremophila magnifica* subsp. *magnifica, Goodenia berringbinensis*
Low	T	*Pityrodia augustensis*
	P1	*Calotis squamigera, Eragrostis* sp. Mt Robinson (S. van Leeuwen 4109), *Eremophila rhegos, Eremophila* sp. West Angelas (S. van Leeuwen 4068), *Euphorbia parvicaruncula, Hibiscus campanulatus, Lindernia* sp. Pilbara (M.N. Lyons & L. Lewis FV 1069), *Myriocephalus scalpellus, Rorippa* sp. Fortescue Valley (M.N. Lyons & R.A. Coppen FV 0760), *Samolus* sp. Fortescue Marsh (A. Markey & R. Coppen FM 9702), *Synostemon hamersleyensis, Tecticornia globulifera, Tecticornia* sp. Christmas Creek (K.A. Shepherd & T. Colmer et al. KS 1063), *Triodia* sp. Karijini (S. van Leeuwen 4111), *Triodia veniciae*
	P2	*Eremophila pusilliflora, Eremophila* sp. Rudall River (P.G. Wilson 10512), *Hibiscus* sp. Gurinbiddy Range (M.E. Trudgen MET 15708), *Oxalis* sp. Pilbara (M.E. Trudgen 12725)
	P3	*Acacia subtiliformis, Atriplex flabelliformis, Atriplex lindleyi* subsp. *conduplicata, Comesperma sabulosum, Dampiera atriplicina, Dampiera metallorum, Eleocharis papillosa, Eragrostis* sp. Erect spikelets (P.K. Latz 2122), *Eremophila spongiocarpa, Euphorbia australis* var. *glabra, Fimbristylis sieberiana, Goodenia modesta, Grevillea saxicola, Indigofera gilesii, Maireana prosthecochaeta, Olearia mucronata, Pilbara trudgenii, Rostellularia adscendens* var. *latifolia,* Sida sp. Barlee Range (S. van Leeuwen 1642), *Solanum kentrocaule, Stylidium weeliwolli, Tecticornia medusa, Triodia birriliburu, Triodia* sp. Mt Ella (M.E. Trudgen 12739), *Xerochrysum boreale*
	P4	*Acacia bromilowiana, Lepidium catapycnon, Ptilotus mollis, Ptilotus trichocephalus*

1.10.5. Desktop Assessment – TEC & PEC

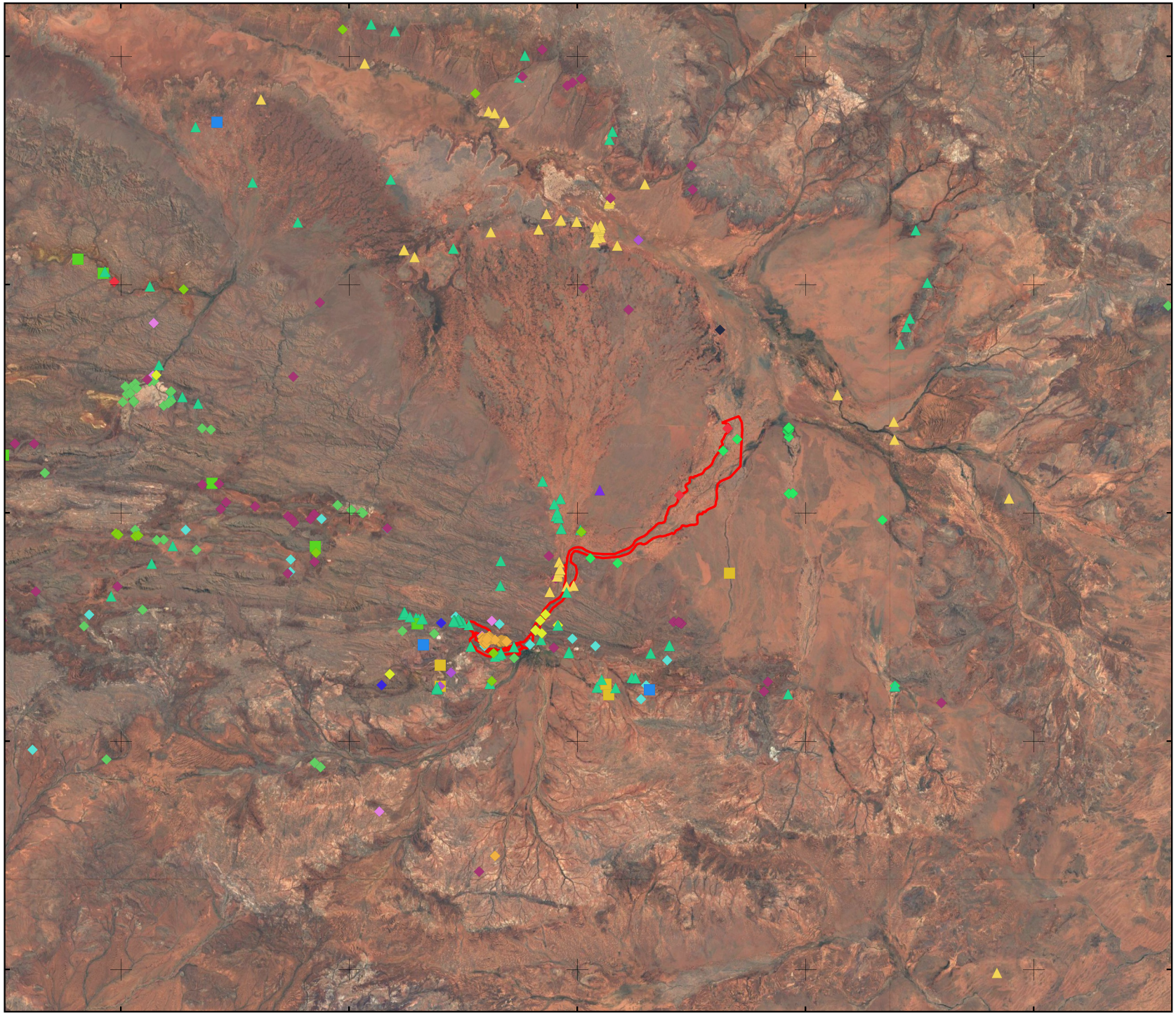
Three PECs were identified within 50 km of the Survey Area during the desktop assessment. One TEC, the Ethel Gorge aquifer stygobiont community, was also identified within the Survey Area. The three PECs were assigned a Low pre-survey likelihood of occurrence within the Survey Area (Table 1.8; Map 1.1).

Table 1.8: Threatened & Priority Ecological Communities

Likelihood	Status	Name	Distance from the Survey Area
Recorded	Endangered	Ethel Gorge aquifer stygobiont community	Recorded
Low	Priority 1	Fortescue Marsh (Marsh Land System)	45 km NW
	Priority 3	Vegetation of sand dunes of the Hamersley Range/Fortescue Valley (previously 'Fortescue Valley Sand Dunes')	25 km NW
	Priority 3	Narbung Land System	34 km NW

1.10.6. Ethel Gorge TEC

The Ethel Gorge aquifer stygobiont community is listed as Endangered under WA Minister Environmentally Sensitive Areas list in policy. The Ethel Gorge TEC is described as an alluvium calcrete aquifer on the Fortescue River in the vicinity of the town of Newman. It comprises a diverse assemblage of stygofaunal species. The main threats to the community include dewatering and salinization of the aquifer that supports the community. The Ethel Gorge TEC is not a floristic community and therefore is not within the scope of this assessment.



Legend

Survey Area

Significant Flora

- P1 - Triodia pascoeana
- P2 - Aristida lazaridis
- P2 - Euphorbia inappendiculata var. inappendiculata
- P2 - Ipomoea racemigera
- P3 - Amaranthus centralis
- P3 - Aristida jerichoensis var. subspinulifera
- P3 - Calotis latiuscula
- P3 - Crotalaria smithiana
- P3 - Eremophila magnifica subsp. velutina
- P3 - Eremophila sp. Hamersley Range
- P3 - Goodenia sp. East Pilbara
- P3 - Gymnanthera cunninghamii
- P3 - Iotasperma sessilifolium
- P3 - Rhagodia sp. Hamersley
- P3 - Swainsona thompsoniana
- P3 - Themeda sp. Hamersley Station
- P4 - Eremophila youngii subsp. lepidota
- P4 - Goodenia ?nuda
- P4 - Goodenia nuda

N

0 10 20 30 km

Scale: 1:930,000

Coordinate System: GDA 1994 MGA Zone 50
Projection: Transverse Mercator
Units: Meter

Spectrum ECOLOGY • SPATIAL

Author: CS

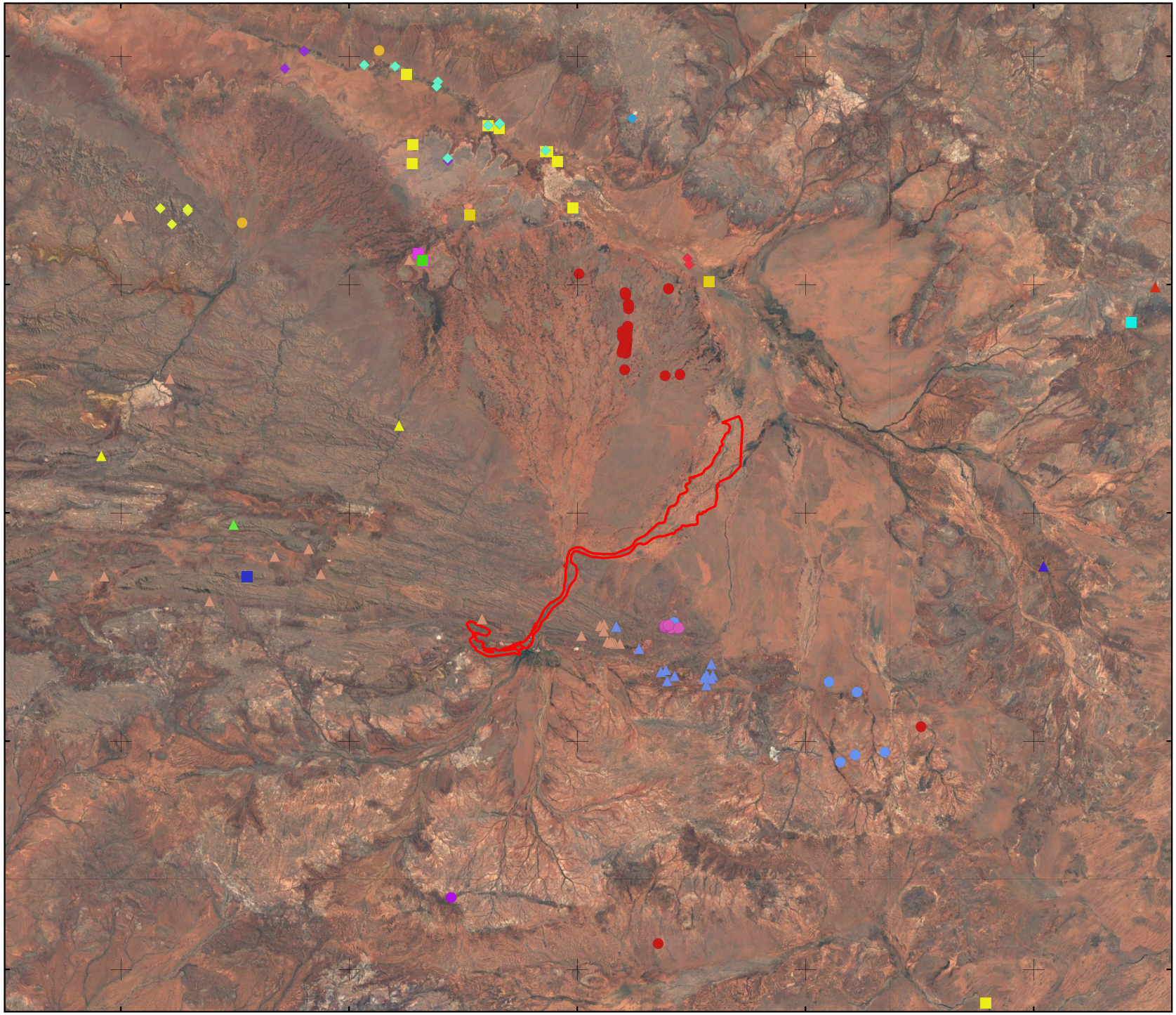
Date: 28/03/2022

Desktop Assessment Significant Flora – Recorded & High Likelihood

OB32 Surplus Water & Homestead Creek Wetting Front

Prepared for
BHP WAIO

Map
1.5



Legend

Survey Area

Significant Flora

- P1 - Acacia corusca
- P1 - Calotis squamigera
- P1 - Eragrostis sp. Mt Robinson
- P1 - Eremophila capricornica
- P1 - Eremophila pilosa
- P1 - Eremophila rhegos
- P1 - Eremophila sp. West Angelas
- P1 - Euphorbia parvicaruncula
- P1 - Helichrysum oligochaetum
- P1 - Lindernia sp. Pilbara
- P1 - Myriocephalus scalpellus
- P1 - Rorippa sp. Fortescue Valley
- P1 - Samolus sp. Fortescue Marsh
- P1 - Stemodia sp. Battle Hill
- P1 - Synostemon hamersleyensis
- P1 - Tecticornia globulifera
- P1 - Tecticornia sp. Christmas Creek
- P1 - Triodia sp. Karijini
- P1 - Triodia veniciae
- P1 - Vittadinia sp. Coondewanna Flats
- P2 - Eremophila pusilliflora
- P2 - Eremophila sp. Rudall River
- P2 - Goodenia hartiana
- P2 - Hibiscus sp. Gurinbiddy Range
- P2 - Isotropis parviflora
- P2 - Oxalis sp. Pilbara

N

0 10 20 30 km

Scale: 1:930,000

Coordinate System: GDA 1994 MGA Zone 50
Projection: Transverse Mercator
Units: Meter

Spectrum ECOLOGY • SPATIAL

Author: CS

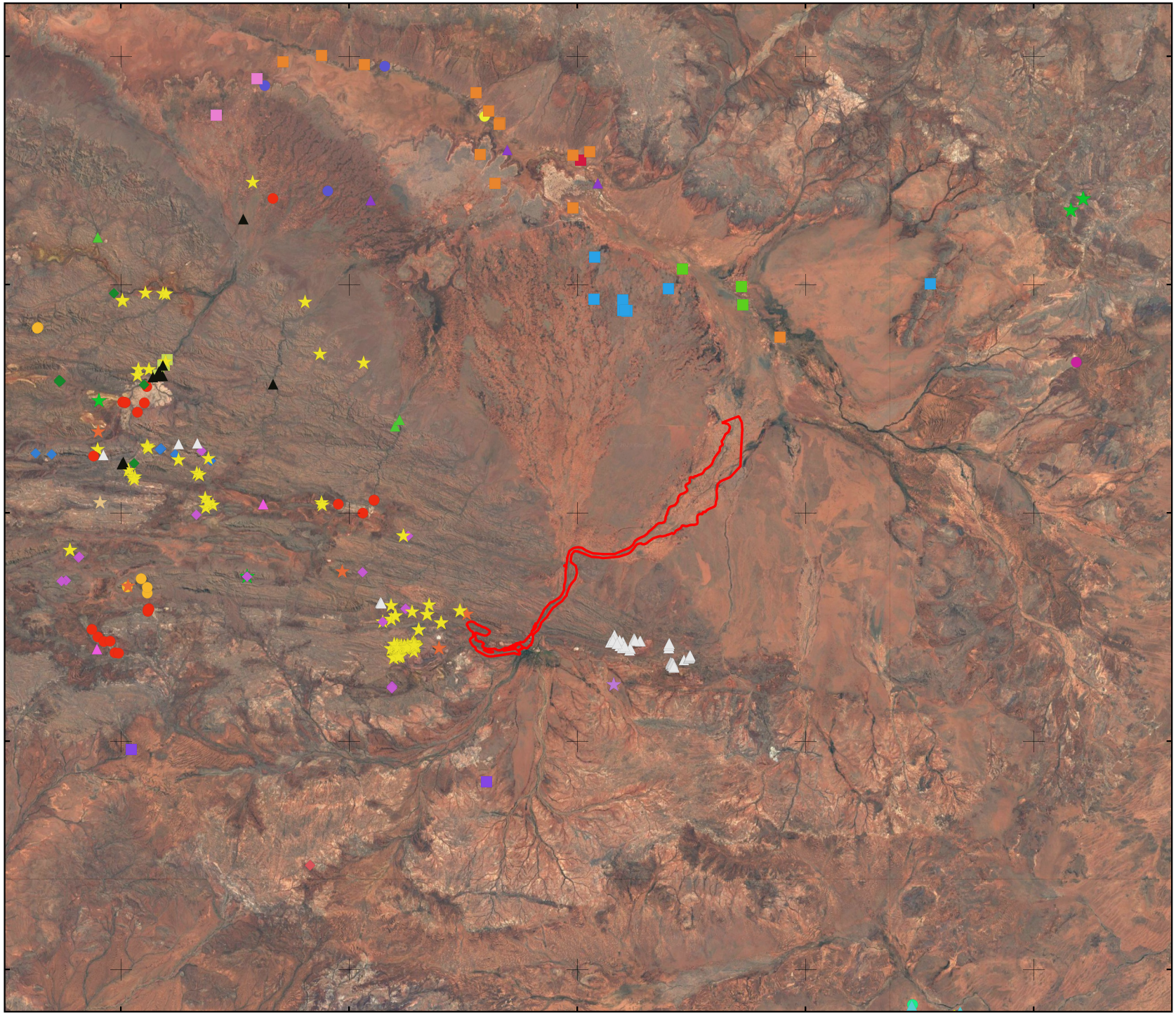
Date: 28/03/2022

Desktop Assessment Significant Flora – Medium & Low Likelihood; P1 & P2

OB32 Surplus Water & Homestead Creek Wetting Front

Prepared for
BHP WAIO

Map
1.6



Legend

Survey Area

Significant Flora

- P3 - Acacia subtiliformis
- P3 - Atriplex flabelliformis
- P3 - Atriplex lindleyi subsp. conduplicata
- P3 - Comesperma sabulosum
- P3 - Dampiera atriplicina
- P3 - Dampiera metallorum
- P3 - Eleocharis papillosa
- P3 - Eragrostis crateriformis
- P3 - Eragrostis sp. Erect spikelets
- P3 - Eremophila rigida
- P3 - Eremophila spongiocarpa
- P3 - Eucalyptus rowleyi
- P3 - Euphorbia australis var. glabra
- P3 - Fimbristylis sieberiana
- P3 - Goodenia modesta
- P3 - Grevillea saxicola
- P3 - Indigofera gilesii
- P3 - Maireana prosthecochaeta
- P3 - Olearia mucronata
- P3 - Pilbara trudgenii
- P3 - Rostellularia adscendens var. latifolia
- P3 - Sida sp. Barlee Range
- P3 - Solanum kentrocaule
- P3 - Stylidium weeliwolli
- P3 - Tecticornia medusa
- P3 - Triodia birriliburu
- P3 - Triodia sp. Mt Ella
- P3 - Xerochrysum boreale
- P4 - Acacia bromilowiana
- P4 - Eremophila magnifica subsp. magnifica
- P4 - Goodenia berringbinensis
- P4 - Lepidium catapycnon
- P4 - Ptilotus mollis
- P4 - Ptilotus trichocephalus

N

0 10 20 30 km

Scale: 1:930,000

Coordinate System: GDA 1994 MGA Zone 50
Projection: Transverse Mercator
Units: Meter

Spectrum ECOLOGY • SPATIAL

Author: CS

Date: 28/03/2022

Desktop Assessment Significant Flora – Medium & Low Likelihood; P3 & P4

OB32 Surplus Water & Homestead Creek Wetting Front

Prepared for
BHP WAIO

Map
1.7

2. METHODS

2.1. Field Survey Timing

A three-phase detailed flora and vegetation assessment was conducted at the Survey Area. The first phase was conducted from 3 March to 9 March 2021, following high summer rainfall, as indicated by climate data retrieved from the Bureau of Meteorology (2021; Figure 2.1). Rainfall for the three months preceding the first phase field survey was 216.8 mm, which is 102.7 mm higher than the long-term (1972-2020) median rainfall of 114.1 mm. The field survey therefore occurred in optimal conditions for plant growth and flowering for the region.

The second phase was conducted from 30 August to 4 September 2021, following the regions drier autumn-winter period, as indicated by climate data retrieved from the Bureau of Meteorology (2021) (Figure 2.1). Rainfall preceding the three months prior to the second phase was 10.0 mm, which was slightly lower than the long-term median rainfall for the same period of 14.1 mm. The field survey therefore occurred during typical conditions for plant growth and flowering for the region, the favourable rainfall conditions prior to the second phase resulted in increased herbaceous lifeforms recording a greater abundance within the Survey Area.

The third phase was conducted from 17 and 18 February 2022 (Figure 2.1). Rainfall preceding the three months prior to the third phase was 35.6 mm, which was approximately half the long-term median rainfall for the same period of 70.8 mm. The field survey therefore occurred during suboptimal conditions for plant growth and flowering for the region.

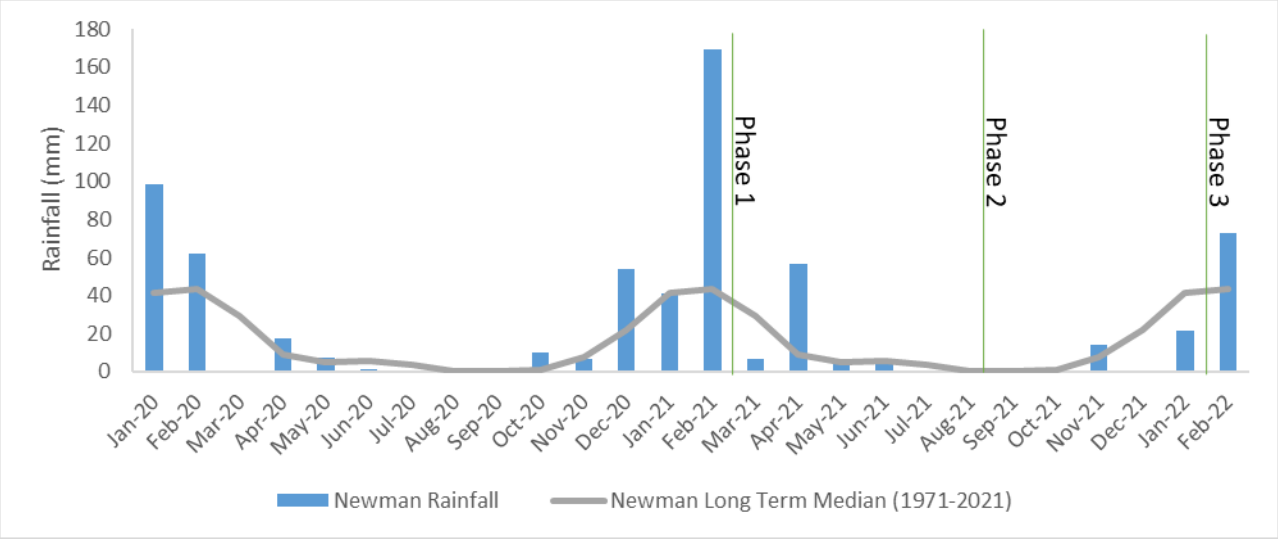


Figure 2.1: Rainfall Data for Newman, WA (BOM Station #7176)

2.2. Project Team & Licences

Spectrum staff involved in the assessment are listed in Table 2.1, along with their role, years of experience, and flora collection licences.

Table 2.1: Project Team

Staff	Role	Years of Experience	Licences
Melissa Hay	Principal Botanist – phase one field survey and reporting	15 years	FB2000006-2
Susan Murrey	Senior Botanist – Phase one and two field surveys	4 years	FB62000101-1b

Staff	Role	Years of Experience	Licences
Dr Chris Shaw	Senior Botanist – Phase one and two field surveys and reporting, plant identifications	6 years	FB62000241
Tamara Green	Botanist – Reporting	1 year	-
Raimond Orifici	Plant identifications	15 yrs	-
Udani Sirisena	Plant identifications	10 years	-

2.3. Sampling Effort & Methods

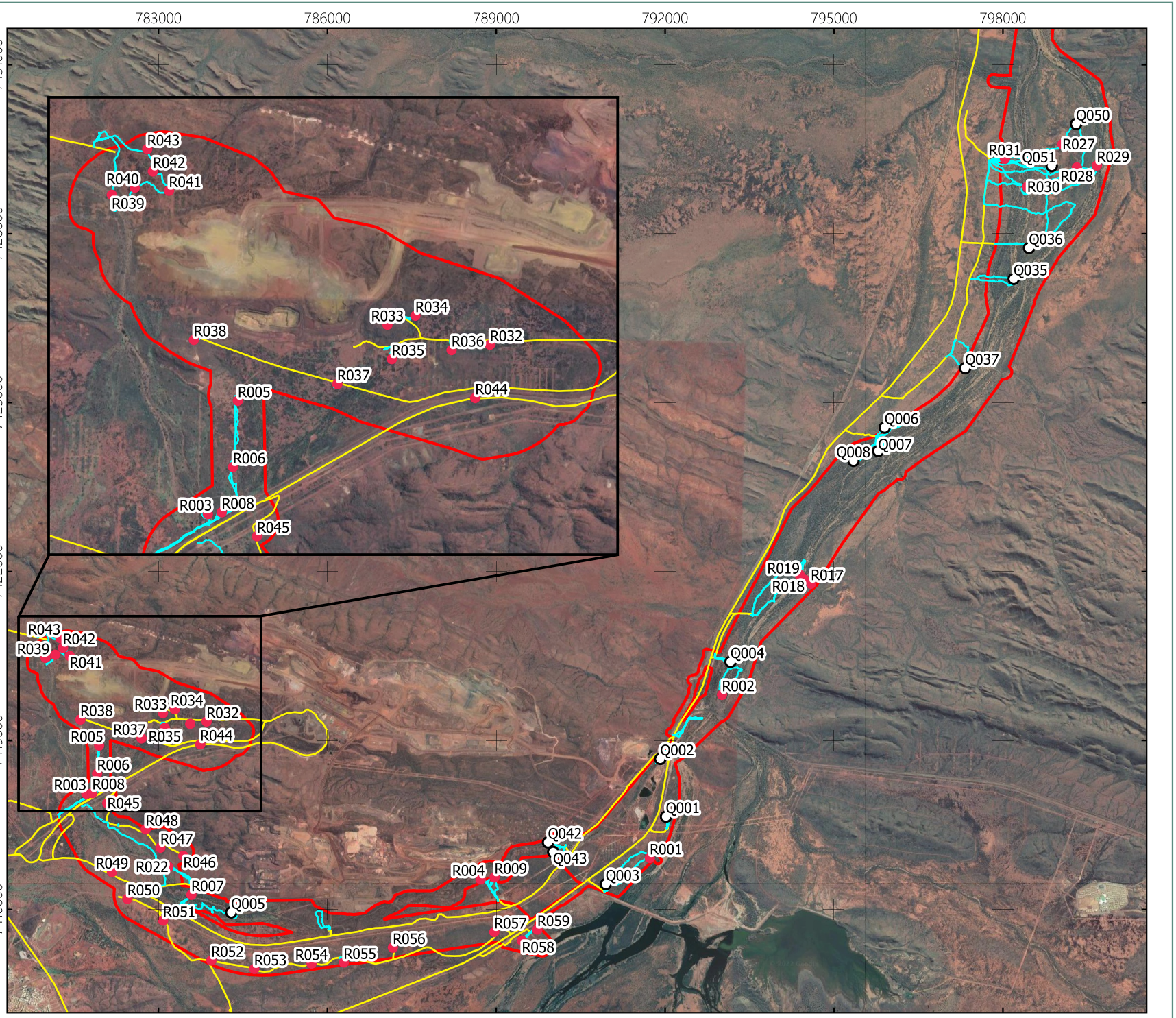
A combination of quadrats, relevés, targeted traverses, and opportunistic sampling were used to assess the area, which is appropriate for detailed surveys as stipulated in the guidance statement (EPA, 2016b). These survey techniques are described in Table 2.2.

Table 2.2: Detailed Survey Techniques

Survey Technique	Description
Quadrat	Quadrats are a comprehensive survey technique for gathering information for detailed flora and vegetation surveys. Each vegetation type must be represented by a minimum of three quadrats where possible and have at least one corner permanently marked. Information collected at each quadrat include: • Site code, date; GPS coordinates; botanist; • Size and shape of quadrat (50x50 or 2,500 m^2 for Pilbara IBRA region); • Photograph from north-west corner; • Landform, including; slope, aspect, soil description and rock type; • Vegetation description (NVIS Level V); • Flora and vegetation information including a comprehensive species list; and • Vegetation condition and disturbances (including fire).
Relevé	Relevés are a low intensity survey technique for gathering information to provide additional information or where it is too unsafe to survey a quadrat during a detailed survey. Information collected at each relevé includes: • Site code, date, GPS coordinates, botanist; • A photograph; • Vegetation condition and disturbances (including fire); • Landform including; slope, soil, rock type, aspect; and • Flora and vegetation information; dominant cover, structure, and species count.
Traverse	A traverse is an unmarked route along which data is collected. Traverses are useful for identifying the boundaries and characteristics of vegetation types, selecting sites, and targeting significant flora or vegetation. Information recorded along a traverse is as for the relevé, with the addition of noting vegetation changes and relationships between vegetation and substrate.
Opportunistic Sampling	Flora and vegetation not recorded through other sampling methods was opportunistically sampled as encountered in the Survey Area. Opportunistic sampling also included recording locations of significant, introduced (weed) and unknown species.
Targeted Sampling	Areas likely to support significant flora or vegetation are targeted during the survey. Including areas with existing records of significant flora and areas which support ground water dependant species. Areas are selected based on existing records from database searches, geology, vegetation mapping and known ESAs. Where possible, unusual, and restricted geological features are sampled.

2.3.1. Detailed Flora & Vegetation Survey

A total of 51 quadrats, 59 relevés, and 226 km of traverses were conducted during the assessment (Map 2.1–Map 2.3). A total of 37 quadrats and 16 relevés were completed in the first phase of the field surveys, followed by 14 quadrats and 15 relevés in the second phase of the field surveys. Quadrats were not installed in the third phase, with 29 relevés completed to extend vegetation mapping. A total of 226 km of traverses were walked during the survey, 147 km, 72 km, and 7 km in the first, second and third phases, respectively. Site data is presented in Appendix C.



Legend

- Survey Area
- Vehicle Tracks

Sites

- Traverses
- Quadrat
- Releve

N

0 1 2 3 km

Scale: 1:92,000

Coordinate System: GDA 1994 MGA Zone 50
Projection: Transverse Mercator
Units: Meter

Spectrum ECOLOGY • SPATIAL

Author: CS

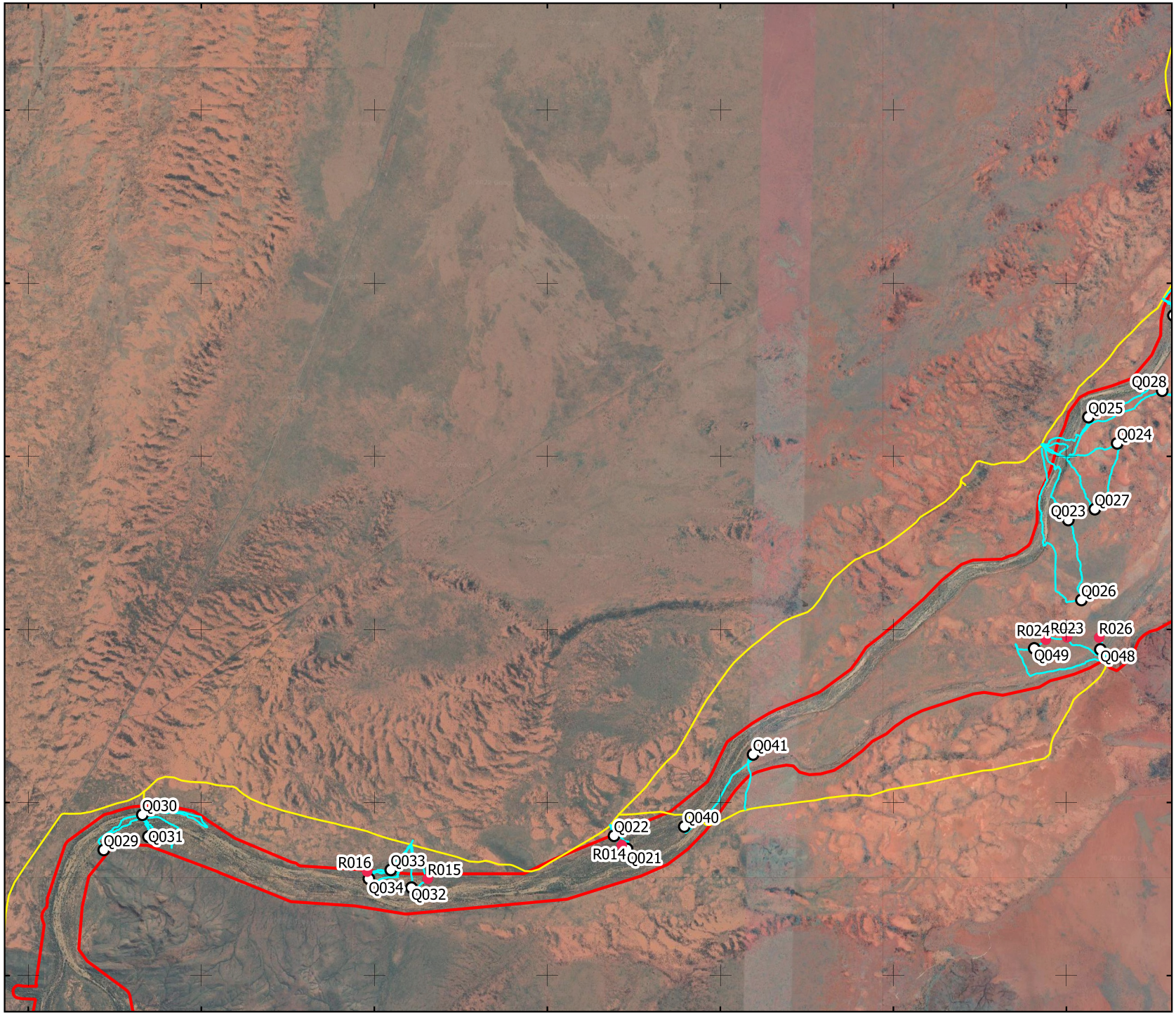
Date: 28/03/2022

Survey Effort - Homestead Creek South

OB32 Surplus Water & Homestead Creek Wetting Front

Map 2.1

Prepared for BHP WAIO



Legend

Survey Area
Vehicle Tracks

Sites

Traverses
Quadrat
Releve

N

0 1 2 3 km

Scale: 1:92,000

Coordinate System: GDA 1994 MGA Zone 50
Projection: Transverse Mercator
Units: Meter

Spectrum ECOLOGY • SPATIAL

Author: CS

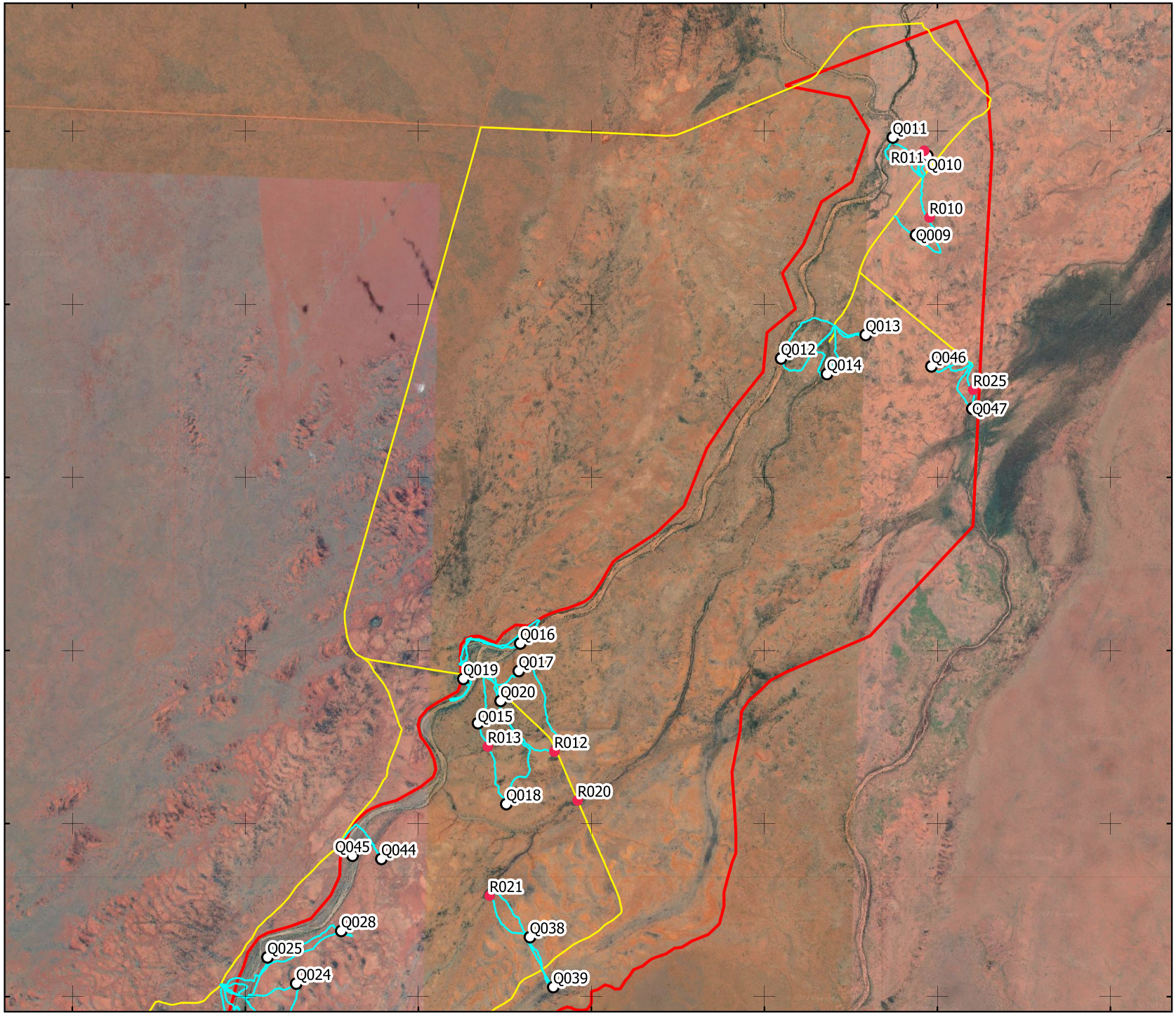
Date: 28/03/2022

Survey Effort - Homestead Creek

OB32 Surplus Water & Homestead Creek Wetting Front

Map 2.2

Prepared for BHP WAIO



Legend

- Survey Area
- Vehicle Tracks

Sites

- Traverses
- Quadrat
- Releve

N

0 1 2 3 km

Scale: 1:92,000

Coordinate System: GDA 1994 MGA Zone 50
Projection: Transverse Mercator
Units: Meter

Spectrum ECOLOGY • SPATIAL

Author: CS

Date: 28/03/2022

Survey Effort - Homestead Creek North

OB32 Surplus Water & Homestead Creek Wetting Front

Prepared for BHP WAIO

Map 2.3

2.4. Vegetation Mapping

The data collected from quadrats, relevés, and traverses, as well as general field notes, observations and aerial photography were used to map the vegetation across the Survey Area.

The vegetation types were defined floristically, where quadrats were statistically classified according to similarities in species composition. The statistical analysis was performed in R Core Team (R Core Team, 2019) using the "stats" and "vegan" (Oksanen *et al.*, 2019) packages. Dissimilarity indices were calculated using the vegdist function with the Jaccard index on a binary species matrix. Hierarchical clustering was performed using the hclust function using the 'average' or unweighted pair group with arithmetic mean (UPGMA) method. Figures of the hierarchical clustering were produced using the "dendextend" package (Galili, 2015).

Only taxa resolved to at least the species level were included in the floristic analysis. Subspecies and varieties were combined where they were unable to be identified in the field, and annuals and short-lived perennials were removed to account for seasonal differences. Three quadrats were also excluded from the analysis as they were surveyed in a mosaic of vegetation types. The site by species matrix used for this analysis has been provided in Appendix E.

The vegetation was described to NVIS Level V – association (referred to as a 'vegetation types' for the local scale in this report). This level of description provides information on the dominant growth form, height and cover for up to three species for each of the upper, mid and ground strata (ESCAVI, 2003). Vegetation types were also described according to BHP WAIO's Vegetation and Flora Survey Procedure (0124627) which is based on Specht (1970) as modified by Aplin (1979), and Trudgen (2002), and also describes vegetation to association level with the same parameters listed above.

2.5. Vegetation Condition

Vegetation condition was recorded at quadrats, relevés, and where other areas of different vegetation condition were observed opportunistically. The vegetation condition was then mapped across the Survey Area at the same scale as the vegetation mapping. Vegetation condition ratings will follow the scale recommended for the Eremaean Botanical Province (Gibson *et al.*, 1994; EPA, 2016b) and summarised in Table 2.3.

Table 2.3: Vegetation Condition Scale & Criteria

Condition	Disturbance Criteria
Excellent	Pristine or nearly so, no obvious signs of damage caused by human activities since European settlement.
Very Good	Some relatively slight signs of damage caused by human activities since European settlement. For example, some signs of damage to tree trunks caused by repeated fire, the presence of some relatively non-aggressive weeds, or occasional vehicle tracks.
Good	More obvious signs of damage caused by human activity since European settlement, including some obvious impact on the vegetation structure such as that caused by low levels of grazing or slightly aggressive weeds.
Poor	Still retains basic vegetation structure or ability to regenerate it after very obvious impact of human activities since European settlement, such as grazing, partial clearing, frequent fires or aggressive weeds.
Degraded	Severely impacted by grazing, very frequent fires, clearing or a combination of these activities. Scope for some regeneration but not to a state approaching good condition without intensive management. Usually with a number of weed species present including very aggressive species.
Completely Degraded	Areas that are completely or almost completely without native species in the structure of their vegetation; i.e. areas that are cleared or 'parkland cleared' with their flora comprising weed or crop species with isolated native trees or shrubs.

2.6. Significant Flora & Vegetation

As defined by the EPA's (2016a) Environmental Factor Guideline, flora and vegetation can be considered significant for a range of reasons (Section 1.9; Table 2.4). Significant flora and vegetation recorded during the assessment are then further considered at a local and regional scale in order to conduct an adequate assessment of impacts. Considerations used to determine the local and regional significance of flora and vegetation recorded at the Study Area are listed in Table 2.4.

Table 2.4: Flora & Vegetation Significance Definitions

Significant Definitions (EPA 2016a)		Local & Regional Significance	
Flora	• Being identified as Threatened (state listed WC Act and/or nationally listed EPBC Act). • Being identified as Priority species: Priority 1 to 4, (Department of Biodiversity Conservation and Attractions, 2019). • Locally endemic or association with a restricted habitat type (e.g. surface water or groundwater dependant ecosystems). • New species or anomalous features that indicate a potential new species. • Representative of the range of a species (particularly, at the extremes of range recently discovered range extensions, or isolated outliers of the main range). • Unusual species, including restricted subspecies, varieties or naturally occurring hybrids; • Relictual status, being representative of taxonomic groups that no longer occur widely in the broader landscape.	**Local**	**Rating**
		• Flora taxon well known from the local area. • Landforms/habitat the flora taxon occurs on are widespread through the local area. • Flora taxon occurs across multiple landforms and habitats.	Low
		• Flora taxon not well known from the local area. • Landforms/habitat the flora taxon occurs are restricted through the local area. • Flora taxon only occurs on one habitat type that is restricted.	High
		Regional	**Rating**
		• Flora taxon's known distribution extends over the IBRA region or sub-region. • Flora taxon's known distribution may span over multiple IBRA regions.	Low
		• Flora taxon's known distribution is only known from few locations across the IBRA region. • May be common in the local area, but only known from this area within the region or sub-region.	High
Vegetation	• Identified as TEC (state listed WC Act and/or nationally listed EPBC Act). • Identified as PEC (Department of Biodiversity Conservation and Attractions, 2017a). • Restricted distribution. • Degree of historical impact from threatening processes. • A role as a refuge. • Providing an important function required to maintain ecological integrity of a significant ecosystem. • Vegetation that is highly disturbed can reduce the significance.	**Local**	**Rating**
		• Vegetation type's mapped extent is widespread across the Study Area or local area. • Landforms/habitat the vegetation type occurs on are widespread in the local area.	Low
		• Vegetation type's mapped extent is restricted in the Study Area. • Landforms/habitat the vegetation type occurs on are restricted in the local area. • Vegetation type provides habitat for locally significant flora taxa.	High
		Regional	**Rating**
		• Determined by comparing vegetation types to the best available data source. This can include state-wide vegetation mapping (Beard), region specific (if available), land system and/or geology mapping. • Vegetation types are matched with regional mapping units that are widespread throughout the region.	Low
		• Vegetation types are matched with mapping that is restricted throughout the region. • Vegetation type provides habitat for regionally significant flora taxa.	High

2.7. Specimen Identification, Nomenclature, & Lodgement

At least one specimen of every flora species encountered was collected. Specimens were identified using the appropriate taxonomic keys and reference specimens and, where required, relevant taxonomic experts at the WAH were consulted. Specimens were vouchered with the WAH as per guidance; when they represent new populations of Threatened or Priority Flora, phrase-named taxa, or bioregional range extensions. Flora nomenclature used in this report is consistent with the WAH's plant census, provided on Florabase (WAH, 2019). All taxon names are current at the time of report preparation.

2.8. Data for the Index of Biodiversity Survey's for Assessment (IBSA)

The EPA has given instruction that all biological surveys collecting data on biodiversity will submit the report and associated raw data to IBSA as an IBSA data package. All survey data collected at the Survey Area has been provided electronically to comply with IBSA and BHP WAIO data standards.

2.9. Limitations & Constraints

Survey specific limitations and constraints for the detailed flora and vegetation assessment of the Survey Area are discussed in Table 2.5.

Table 2.5: Study Limitations & Constraints

Limitation	Constraint	Comment
Availability of contextual information at a regional and local scale.	No	Background information about the region was available and sufficient. There were numerous surveys undertaken within the vicinity of the Survey Area (Table 1.5), which were incorporated into the desktop assessment. Database searches supplied information on significant flora and vegetation occurring in the vicinity of the Survey Area.
Competency/experience of the team carrying out the survey, including experience in the bioregion surveyed.	No	Botanist Melissa Hay has 15 years' experience in conducting botanical surveys throughout Western Australia and is a Pilbara specialist. Susan Murrey and Chris Shaw have four- and six-years' experience conducting botanical surveys throughout Western Australia, respectively.
Proportion of flora recorded and/or collected, any identification issues.	No	At least one specimen of every flora species encountered was collected for taxonomic confirmation. Twenty-four specimens could not be confidently identified to species level due to insufficient floristic material. Plants were identified by taxonomists Raimond Orifici and Udani Sirisena who both have botanical and taxonomic experience throughout Western Australia and the Pilbara. Specialist taxonomists from WAH were consulted where complexities arose.
Survey effort and extent.	No	Prior to the field survey, quadrats were selected to represent the diversity of vegetation and geology present at the Survey Area. This was sufficient to map and classify vegetation across the creek line and plain vegetation types within the Survey Area. Previous records of significant flora were visited where possible and traverses were conducted within the Survey Area. Areas in the south, surrounded by mining infrastructure, were mostly surveyed by relevés only, which was suitable as the vegetation was highly disturbed.
Access restrictions within the survey area.	Partial	Access to some areas was restricted due to heritage and track suitability, resulting in some sections of the Survey Area not being traversed. There were few locations to cross the creek line in phase one of the survey due to high water levels, and sections to the north-east of Survey Area were only surveyed in phase two. This was unlikely to affect the vegetation mapping, however, it may have impacted the number of species recorded and the presence of annual significant flora.
Survey timing, rainfall, season of survey.	No	The survey was conducted over three phases with the primary (phase one) and secondary (phase two) surveys undertaken during the correct seasons for a detailed level assessment in the Pilbara region, as per (EPA, 2016b) guidance. Above median rainfall preceded the phase one survey, which led to optimal survey conditions with high numbers of annual and short-lived perennial species recorded across the Survey Area. Phase two was undertaken following a period of rainfall similar to the long-term median. Many annual and herb species were still recorded during the second phase, likely due to the above median rainfall conditions experienced at the start of the year. Phase three was conducted before summer rainfalls, however, only structurally dominant perennial species were recorded at relevés.
Disturbance that may have affected the results of survey such as fire, flood or clearing.	No	No disturbances such as fire, flood or clearing were present that affected the results of the survey.

3. RESULTS

3.1. Flora

A total of 342 taxa from 45 families and 142 genera were recorded during the survey, of which 330 (96.5% were native and 12 (3.5%) were introduced. The most species rich family was Fabaceae with 68 species, followed by Poaceae with 59 species. The most species rich genera were *Acacia* with 29 species recorded, followed by *Ptilotus* with 11 species recorded (Table 3.1; Appendix B). The mean number of flora taxa per quadrat was 31 (range 7–58).

Table 3.1: Number of Flora Taxa Recorded

Total Taxa	Native	Introduced	Total Families	Most Common Families	Total Genera	Most Common Genera	Most Common Taxa Based on % of Quadrats
342	330	12	45	Fabaceae – 68 Poaceae – 59 Malvaceae – 28 Amaranthaceae - 21	142	*Acacia* – 29 *Ptilotus* – 11 *Eremophila* - 10 *Senna* – 10	**Cenchrus ciliaris* – 80.4% *Acacia citrinoviridis* – 60.8% *Evolvulus alsinoides* var. *villosicalyx* – 58.8% *Arivela viscosa* – 56.9% *Triodia pungens* – 56.9% *Senna artemisioides* subsp. *oligophylla* – 49.0% *Boerhavia coccinea* – 47.1%

3.1.1. Species Accumulation Curve

Species accumulation curves (SAC) show the relationship between sampling effort and the number of species recorded and can therefore be used to discuss sampling adequacy. As sampling effort (quadrats) increases, the rate at which new species are recorded is reduced, and this is used to predict the number of species that are likely to be present within the Survey Area.

A SAC is presented in Figure 3.1, which was plotted using the *specaccum* function in the *vegan* package in R v.4 (R Core Team, 2019). The Chao 2 non-parametric species richness estimator was determined at 429, suggesting that 75% of flora species were recorded during the survey, based on the 322 taxa recorded within quadrats. Should the additional 20 taxa recorded during opportunistic collections and relevés be included in the total, the SAC suggests that 79% of flora taxa was recorded.

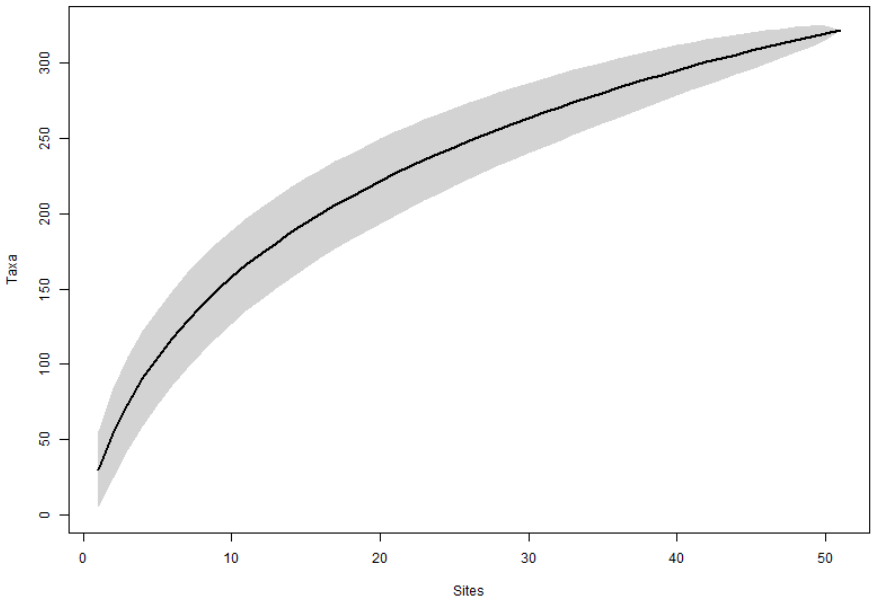


Figure 3.1: Species Accumulation Curve

3.1.2. Significant Flora

No Threatened flora were recorded within the Survey Area. Four Priority Flora taxa were recorded within the Survey Area (Map 3.1):

- Priority 3:
  - *Crotalaria smithiana*; and
  - *Gymnanthera cunninghamii*.
- Priority 4:
  - *Eremophila youngii* subsp. *lepidota*; and
  - *Goodenia nuda*.

Crotalaria smithiana (P3) was the most common significant flora species and was recorded in north of the Survey Area on floodplains. *Eremophila youngii* subsp. *lepidota* (P4) was common in one section in the north the Survey Area, where the creek line split, and stony soils were present. *Gymnanthera cunninghamii* (P3) was recorded on a sandy creek bed, and *Goodenia nuda* (P4) was recorded on a clay plan in the north of the Survey Area. Both *Gymnanthera cunninghamii* (P3) and *Goodenia nuda* (P4) were previously recorded in the Survey Area. All significant flora taxa are presented in Table 3.3 and Map 3.1.

Three Priority Flora were previously recorded from the Survey Area (identified during the desktop assessment), of which known locations were visited. *Rhagodia* sp. Hamersley (M. Trudgen 17794) (P3) was known from one location, however, the species was not present when visited. *Themeda* sp. Hamersley Station (M.E. Trudgen 11431) (P3) was known from one location, however, this record was close to a rail line and was not visited due to safety procedures and was likely cleared. Therefore, it is considered that these two taxa are unlikely to occur in the Survey Area (see Section 1.10.4). One of the two *Aristida jerichoensis var. subspinulifera* previous records was visited, however, this record was no longer present at the location. No other significant flora species as per Section 1.10.4 were recorded. However, Four Priority flora species, *Amaranthus centralis* (P3), *Aristida jerichoensis* var. *subspinulifera* (P3), *Rhagodia* sp. Hamersley (M. Trudgen 17794) (P3), *Themeda* sp. Hamersley Station (M.E. Trudgen 11431) (P3), were considered to have a High post-

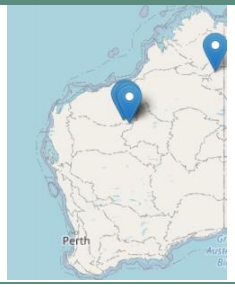
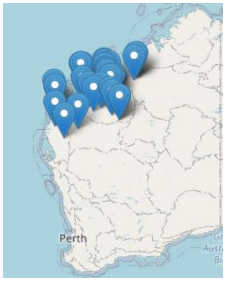
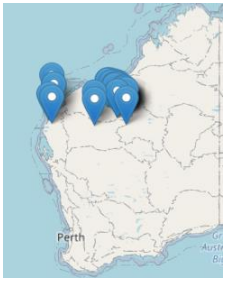
survey likelihood of occurrence within the Survey Area. Coordinates of all significant flora taxa recorded in the survey have been provided electronically with this report.

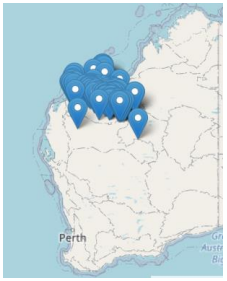
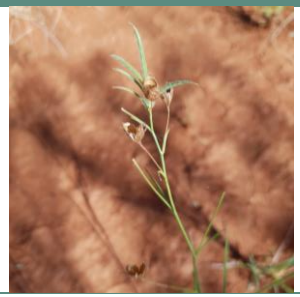
Five species were identified as range extensions as they were located greater than 150 km from specimens lodged with the WAH. These five species are detailed below in Table 3.2 and included in Map 3.1.

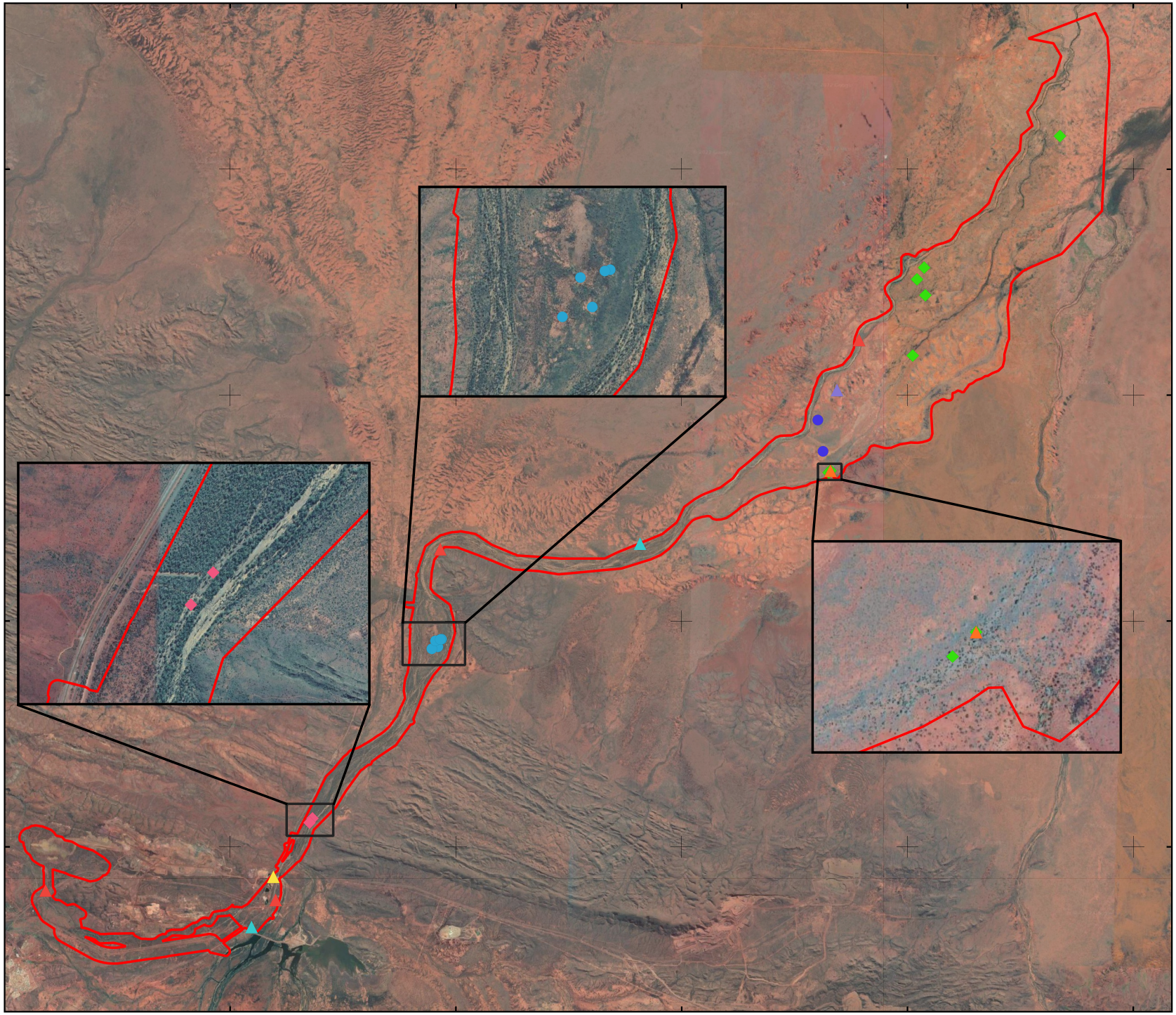
Table 3.2: Range Extensions

Taxa	Description	Landform in Survey Area	Approx. Distance (km)	No of Records
Convolvulus remotus	Climbing herb.	Clay soils, drainage line.	200	1
Corchorus incanus subsp. *incanus*	Shrub to 1 m, yellow flowers.	Hills and creek lines.	400	4
Dichrostachys spicata	Shrub to 1 m, spines.	Clay soils.	200	1
Eragrostis desertorum	Tussock grass to 0.5 m tall. Woolly base.	Tussock grass found on flat plains on sandy soils.	150	2
**Portulaca pilosa*	Introduced to WA. Succulent, prostrate herb to 0.15 m.	Clay soils.	150	1

Table 3.3: Significant Flora

Status	Taxa	Description	Landform in Survey Area	No of Records	No of Plants	Regional Distribution	Photograph
P3	*Crotalaria smithiana*	Semi-prostrate herb to 0.3m, yellow flowers, flower and fruiting during both phases.	Regeneration site on floodplain.	7	36		
P3	*Gymnanthera cunninghamii*	Erect shrub, 1-2 m high. Sterile during both phases.	Sandy soils, creeks and rivers.	2	2		
P4	*Eremophila youngii* subsp. *lepidota*	Dense, spreading shrub, 1-3 m high. Flowers red to purple, fruiting during second phase.	Stony red sandy loam. Flats plains, floodplains, sometimes semi-saline, clay flats.	5	69		

Status	Taxa	Description	Landform in Survey Area	No of Records	No of Plants	Regional Distribution	Photograph
P4	*Goodenia nuda*	Erect to ascending herb, to 0.5 m high. Flowers yellow.	Clay.	2	2		



Legend

Survey Area

Significant Flora

- P3: Crotalaria smithiana
- P3: Gymnanthera cunninghamii
- P4: Eremophila youngii subsp. lepidota
- P4: Goodenia nuda
- RE: Eragrostis desertorum
- RE: Convolvulus remotus
- RE: Corchorus incanus subsp. incanus
- RE: Dichrostachys spicata
- RE: *Portulaca pilosa

N

0 2.5 5 7.5 km

Scale: 1:235,000

Coordinate System: GDA 1994 MGA Zone 50
Projection: Transverse Mercator
Units: Meter

Spectrum ECOLOGY • SPATIAL

Author: CS

Date: 28/03/2022

Significant Flora

OB32 Surplus Water &
Homestead Creek Wetting Front

Map 3.1

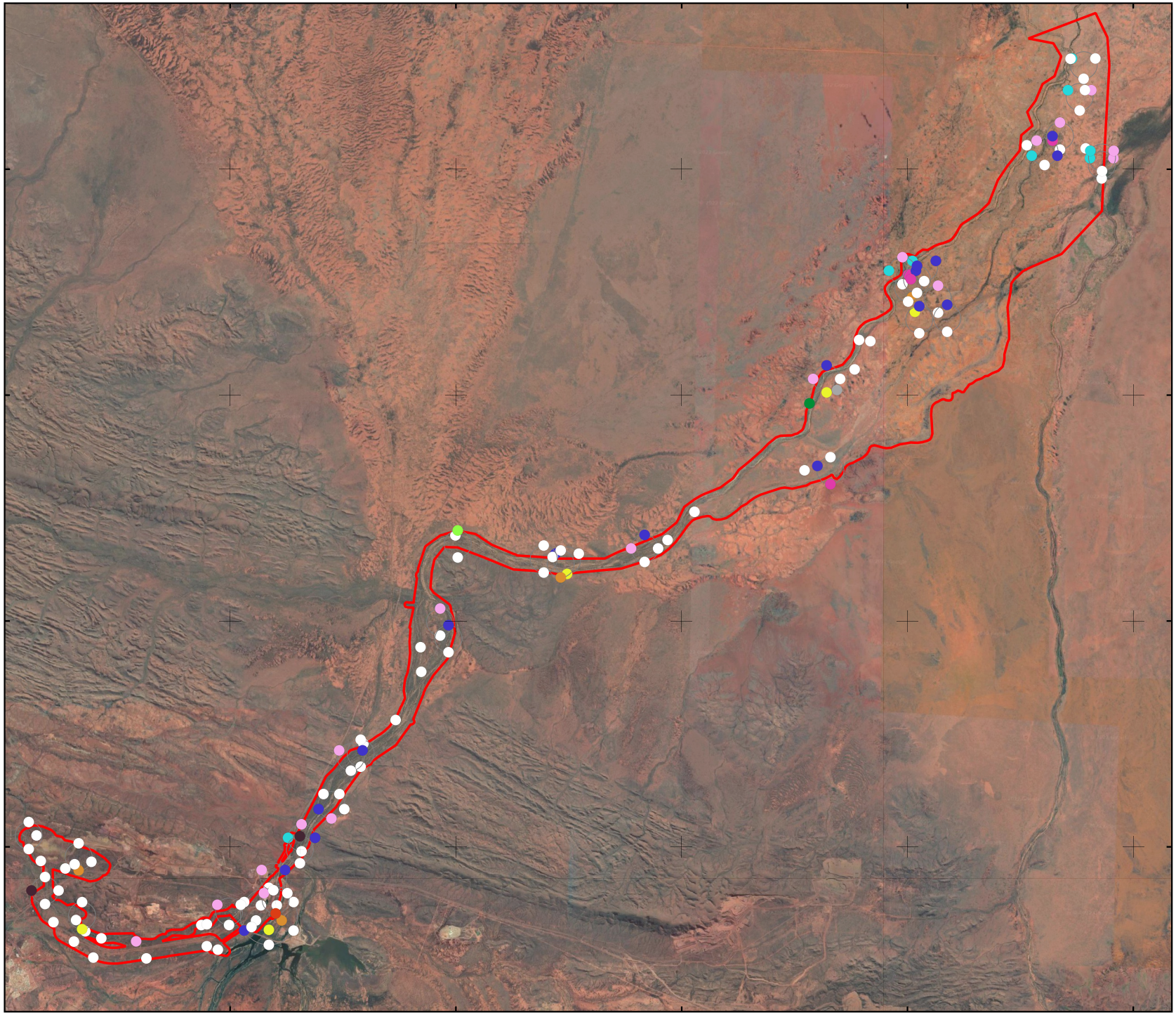
Prepared for
BHP WAIO

3.1.3. Introduced Flora

Twelve introduced flora species were recorded within the Survey Area (Table 3.3), eleven of which are classified as permitted – s11 weeds and one, **Calotropis procera*, is listed as Declared Pest – s22(2) in Western Australia (BAM Act). None of the weed species recorded in the Survey Area have control requirements. The floodplains within the Survey Area, particularly in the south, were characterised by a dominance of **Cenchrus ciliaris*. All other weeds were mostly recorded as a scattered individuals or isolated clumps (Table 3.4; Map 3.2).

Table 3.4: Introduced Flora

Species	No of Records	No of Plants	Distribution
**Aerva javanica*	5	100	Scattered throughout and not restricted to one habitat, uncommon.
**Bidens bipinnata*	4	1,518	Scattered throughout and not restricted to one habitat, uncommon.
**Bidens subalternans* var. *araneosa*	1	10	Found in one location in the south of the Survey Area where disturbance was highest.
**Calotropis procera*	1	5	Single location near floodplain.
**Cenchrus ciliaris*	85	623,422	Throughout survey area, most prominent along creek lines and river. The most recorded flora taxon during the survey.
**Cenchrus setiger*	17	3,313	Throughout survey area, most prominent along creek lines and river.
**Citrullus amarus*	4	13	Occurred in the north of the Survey Area in the pastoral station.
**Datura leichhardtii* subsp. *leichhardtii*	1	10	Single location near river.
**Echinochloa colona*	2	20	Found in the south of the Survey Area along watercourses.
**Malvastrum americanum*	17	1,033	Scattered throughout and not restricted to one habitat.
**Portulaca pilosa*	1	1	Single location likely distributed by cattle.
**Vachellia farnesiana*	8	122	Occurred in the north of the Survey Area in the pastoral station.



Legend

Survey Area

Introduced Flora

- *Aerva javanica
- *Bidens bipinnata
- *Bidens subalternans var. araneosa
- *Calotropis procera
- *Cenchrus ciliaris
- *Cenchrus setiger
- *Citrullus amarus
- *Datura leichhardtii subsp. leichhardtii
- *Echinochloa colona
- *Malvastrum americanum
- *Portulaca pilosa
- *Vachellia farnesiana

N

0 2.5 5 7.5 km

Scale: 1:235,000

Coordinate System: GDA 1994 MGA Zone 50
Projection: Transverse Mercator
Units: Meter

Spectrum ECOLOGY • SPATIAL

Author: CS

Date: 28/03/2022

Introduced Flora

OB32 Surplus Water &
Homestead Creek Wetting Front

Prepared for
BHP WAIO

Map
3.2

3.2. Vegetation

3.2.1. Vegetation Types

A total of 13 vegetation types were described from the Survey Area, including seven derived from floristic analysis of quadrat data (Figure 3.2), three structural groups within floristic groups, and three additional structural groups using the relevé data for vegetation with a small area (<3.1% of the Survey Area) and/or characterised by 'Poor' vegetation condition. Vegetation types are mapped across the Survey Area in Map 3.3–Map 3.5. The vegetation code, vegetation description in BHP and NVIS formats, significant flora or species frequently associated with the vegetation type, landform, monitoring sites, and a representative photograph are presented in Table 3.5.

The drainage lines were grouped into two floristic groups (D1 and D2) which were further refined into three structural groups (D1a, D1b, and D2). The first drainage line vegetation type (D1) was characterised by *Eucalyptus camaldulensis* and split into structural groups using the presence of *Eucalyptus victrix*. The second drainage line vegetation type (D2) was defined by a dominant layer of *Acacia citrinoviridis* and scattered *Eucalyptus victrix*.

The floodplains were grouped into two floristic groups (A1b and FP1). These were characterised by *Acacia citrinoviridis* and **Cenchrus ciliaris*. A1b was present throughout the Survey Area and was located predominantly alongside creek lines. However, FP1 only occurred in the south of the Survey Area, included *Corymbia hamersleyana* in the overstorey layer, and was often adjacent to A1b.

The flat plains were dominated by two vegetation types, *Triodia* plains (TP1a and TP1b) and *Acacia* overstorey (A1a). TP1a and TP1b were characterised by open hummock grassland of *Triodia pungens* and a sparse shrub layer. TP1b occurred in the south of the Survey Area on a rockier substrate and was differentiated from TP1a by an overstorey of *Eucalyptus socialis* and *Eucalyptus xerothermica*. A1a was characterised by a sparse overstorey of *Acacia aptaneura* sparse tall and low shrub layers, over **Cenchrus ciliaris* and *Enneapogon cylindricus* tussock grasses.

Three other vegetation types that were located on plains, *Eremophila* plains (EP1), Banded Mulga (BM1), and Mulga Plains (MP1). The EP1 and BM1 vegetation types occupied little of the Survey Area (<2 ha). The MP1 vegetation type was recorded in the south of the Survey Area surrounding mining infrastructure and it was characterised by *Acacia aptaneura* and *Acacia pruinocarpa* and could be found with and without *Triodia pungens*.

Vegetation types of hills and slopes (H1, S1) were uncommon and characterised a low open woodland of *Eucalyptus leucophloia* subsp. *leucophloia* over *Triodia pungens* on H1 and *Triodia vanleeuwenii* and *Triodia pungens* on S1. Likewise, Rehabilitated vegetation (R1) was uncommon in the Survey Area and mapped separately from natural vegetation.

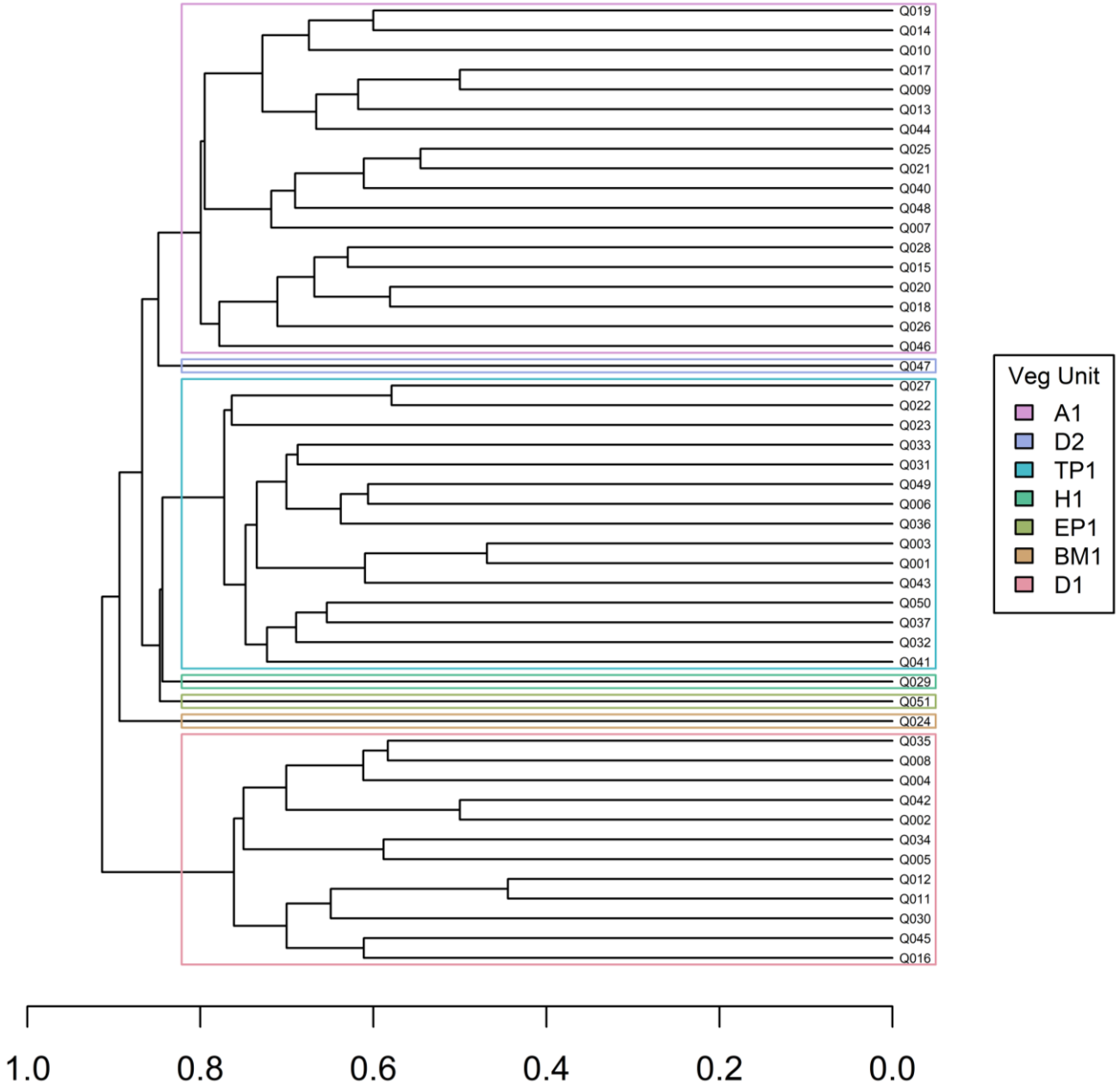


Figure 3.2: Dendrogram of Floristic Analysis

Table 3.5: Vegetation Types

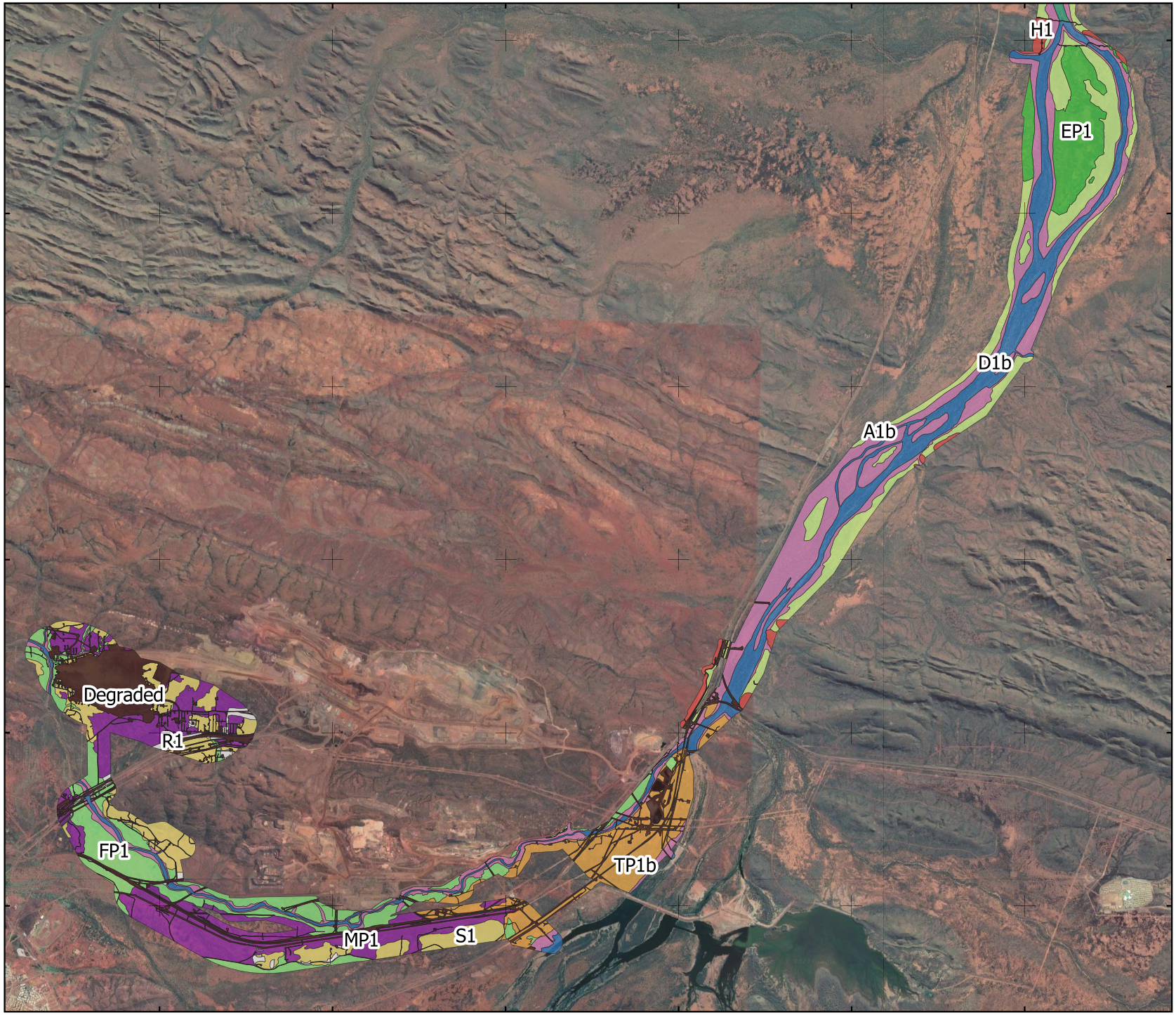
Code	Vegetation Description	Associated Species	Landform	Sites	Cover (%)	Representative Photo
Drainage						
D1a	BHP: MA Ecr AciAhe Mgl: Woodland of *Eucalyptus camaldulensis* with Low Open Woodland of *Acacia citrinoviridis* with High Open Shrubland of *Melaleuca glomerata* and Low Scattered Shrubs of *Acacia pyrifolia* var. *morrisonii*, and *Acacia pyrifolia* var. *pyrifolia* over Scattered Sedges of *Cyperus vaginatus* on orange sandy clay in major creek lines. NVIS: *Eucalyptus camaldulensis* mid open woodland, over *Acacia citrinoviridis* low open woodland with *Melaleuca glomerata* and over *Acacia pyrifolia* var. *morrisonii* tall sparse shrubland, over +/- *Eulalia aurea* tall sparse tussock grassland and *Cyperus vaginatus* tall sparse sedgeland.	*Acacia coriacea* subsp. *pendens* *Corchorus crozophorifolius* *Goodenia lamprosperma*	Creek line or river	Q011, Q012, Q016, Q030, Q045, R014	5.6	
D1b	BHP: MA EcrEvi Aci Mgl: Woodland of *Eucalyptus camaldulensis* and *Eucalyptus victrix* with Low Woodland of *Acacia citrinoviridis* and High Open Shrubland of *Melaleuca glomerata* with Low Scattered Shrubs of *Corchorus crozophorifolius* over Scattered Hummock Grass of *Triodia pungens* with Open Tussock Grassland of **Cenchrus ciliaris* and *Eulalia aurea* with Scattered Sedges of *Cyperus vaginatus* on orange sandy clay in major creek lines. NVIS: *Eucalyptus camaldulensis and Eucalyptus victrix* mid open woodland, over and *Acacia citrinoviridis* low open woodland, over *Melaleuca glomerata* tall sparse shrubland, over *Corchorus crozophorifolius* mid sparse shrubland, over *Triodia pungens* low sparse hummock grassland, and **Cenchrus ciliaris* low sparse tussock grassland with *Cyperus vaginatus* tall sparse sedgeland.	*Acacia coriacea* subsp. *pendens* *Petalostylis labicheoides* *Gymnanthera cunninghamii* (P3) *Acacia pyrifolia* var. *morrisonii* *Tephrosia rosea* var. Fortescue creeks (M.I.H. Brooker 2186) *Phyllanthus maderaspatensis*	Creek line or river	Q002, Q004, Q005, Q008, Q034, Q035, Q042, R002, R0019, R029, R030, R039	3.1	
D2	BHP: Mi AciEviCleMam Cci: Low Open Forest of *Acacia citrinoviridis* and *Eucalyptus victrix* over High Open Shrubland of *Cullen leucanthum* and **Malvastrum americanum* and Very Open Herbs of *Pterocaulon sphacelatum* over Open Tussock Grassland of **Cenchrus ciliaris* on orange clay minor creek lines. NVIS: *Acacia citrinoviridis* and *Eucalyptus victrix* low woodland, over *Cullen leucanthum* and **Malvastrum americanum* tall sparse shrubland, over **Cenchrus ciliaris* low open tussock grassland.	*Acacia coriacea* subsp. *pendens* *Chrysopogon fallax* *Pterocaulon sphacelatum*	Drainage or minor creek line	Q047, R20, R025	0.9	

Code	Vegetation Description	Associated Species	Landform	Sites	Cover (%)	Representative Photo
Triodia Plain						
TP1a	**BHP: SA Tpu SaoSahAdi EerAhh:** Open Hummock Grassland of *Triodia pungens* with a Shrubland of *Senna artemisioides* subsp. *oligophylla*, *Senna artemisioides* subsp. *helmsii*, and *Acacia dictyophleba* over Open Tussock Grassland of *Eragrostis eriopoda* and *Aristida holathera* var. *holathera* on orange sand plains. **NVIS**: *Senna artemisioides* subsp. *oligophylla*, *Senna artemisioides* subsp. *helmsii*, and *Acacia dictyophleba* mid sparse shrubland, over *Triodia pungens* low open hummock grassland with *Eragrostis eriopoda* and *Aristida holathera* var. *holathera* low sparse tussock grassland.	*Hakea lorea* subsp. *lorea* *Paraneurachne muelleri* *Eriachne aristidea* *Tribulus macrocarpus* *Goodenia nuda* (P4)	Flat sandy plains	Q006, Q022, Q023, Q027, Q031, Q032, Q033, Q036, Q037, Q041, Q049, Q050, R016, R017, R024, R026	10.8	
TP1b	**BHP: RP Tpu EsoExe AciAscAbi:** Hummock Grassland of *Triodia pungens* and Low Woodland of *Eucalyptus socialis* and *Eucalyptus xerothermica* over High Open Shrubland of *Acacia citrinoviridis*, *Acacia sclerosperma*, and *Acacia bivenosa* and Very Open Tussock Grassland of **Cenchrus ciliaris* and *Paraneurachne muelleri* on rocky plains. **NVIS**: *Eucalyptus socialis* and *Eucalyptus xerothermica* mid open mallee woodland, over *Acacia citrinoviridis*, *Acacia sclerosperma*, and *Acacia bivenosa* tall sparse shrubland, over *Triodia pungens* mid open hummock grassland with **Cenchrus ciliaris* and *Paraneurachne muelleri* low sparse tussock grassland.	*Hakea lorea* *Ptilotus obovatus* *Acacia pruinocarpa*	Flat plain with sandy soils.	Q001, Q003, Q043, R059	1.8	
Acacia Overstorey						
A1a	**BHP: SC CceEcy Aap SaoSah:** Open Tussock Grassland of **Cenchrus ciliaris* and *Enneapogon cylindricus* with Low Woodland of *Acacia aptaneura* over High Open Shrubland of Acacia tetragonophylla and Acacia synchronicia with Low Open Shrubland of *Senna artemisioides* subsp. *helmsii* and *Senna artemisioides* subsp. *oligophylla* on orange sand clay on plains. **NVIS**: *Acacia aptaneura* low open woodland, with *Acacia tetragonophylla*, *Acacia synchronicia* and +/-**Vachellia farnesiana* tall sparse shrubland, over *Senna artemisioides* subsp. *helmsii* low sparse shrubland, over **Cenchrus ciliaris* and *Enneapogon cylindricus* low open tussock grassland.	*Acacia aneura* *Acacia macraneura* *Acacia paraneura* *Solanum lasiophyllum* *Ptilotus obovatus* *Crotalaria smithiana* (P3) *Goodenia nuda* (P4) *Dactyloctenium radulans* *Aristida contorta* *Eragrostis xerophila*	Flat clay pans and clay sand soils.	Q009, Q010, Q013, Q014, Q015, Q017, Q018, Q019, Q020, Q026, Q028, Q038, Q039, Q044, Q046, R010, R011, R012, R013, R021, R023	56.8	

Code	Vegetation Description	Associated Species	Landform	Sites	Cover (%)	Representative Photo
A1b	**BHP: SC CciEpo Aci:** Tussock Grassland of **Cenchrus ciliaris* and *Enneapogon polyphyllus* and Low Woodland of *Acacia citrinoviridis* on orange brown sand and clay on floodplains. **NVIS**: *Acacia citrinoviridis* low woodland, over **Cenchrus ciliaris* and *Enneapogon polyphyllus* low tussock grassland.	*Eucalyptus victrix* *Abutilon lepidum* *Abutilon otocarpum* *Solanum lasiophyllum* *Triodia pungens* *Arivela viscosa* *Rhynchosia minima*	Floodplains between and surrounding major creek lines.	Q007, Q021, Q025, Q040, Q048, R003, R007, R015, R018	8.0	
Banded Mulga						
BM1	**BHP: CL DctCpuPra Aap:** Tussock Grassland of *Digitaria ctenantha*, *Chloris pumilio*, and *Paspalidium rarum* and Low Open Forest of *Acacia aptaneura* on brown sand and clay on plains. **NVIS**: *Acacia aptaneura* low woodland, over *Digitaria ctenantha*, *Chloris pumilio*, and *Paspalidium rarum* low open tussock grassland.	*Eremophila forrestii* subsp. *forrestii* *Hibiscus burtonii*	Flat plains with clay soils.	Q024	1.1	
Eremophila Plain						
EP1	**BHP**: **CL Tpu EcuSsy Aap**: Open Hummock Grassland of *Triodia pungens* with Shrubland of *Eremophila cuneifolia and Senna symonii* and Scattered Low Trees of *Acacia aptaneura* over Scattered Tussock Grass of *Aristida holathera* and *Aristida contorta* on orange clay on plains. **NVIS**: *Acacia aptaneura* low open woodland, over *Eremophila cuneifolia and Senna symonii* mid sparse shrubland, over *Triodia pungens* low open hummock grassland, and *Aristida holathera* and *Aristida contorta* low sparse tussock grassland.	*Acacia paraneura* *Acacia synchronicia* *Acacia wanyu* *Eremophila forrestii* subsp. *forrestii* *Eremophila latrobei* subsp. *filiformis* *Eremophila youngii* subsp. *lepidota* (P4) *Senna glutinosa* subsp. *×luerssenii*	Flat to low sloping plains with sandy clay to stony soils.	Q051, R027, R028, R031	1.4	

Code	Vegetation Description	Associated Species	Landform	Sites	Cover (%)	Representative Photo
Hills and Slopes						
H1	BHP: HS Tpu Cii Ell: Open Hummock Grassland of *Triodia pungens* with Low Open Shrubland of *Corchorus incanus* subsp. *incanus* and Low Open Woodland of *Eucalyptus leucophloia* subsp. *leucophloia* over Scattered Tall Shrubs of *Senna glutinosa* subsp. *glutinosa* on orange sand clay hills. NVIS: *Eucalyptus leucophloia* subsp. *leucophloia* low open woodland with *Senna glutinosa* subsp. *glutinosa* tall sparse shrubland, over *Corchorus incanus* subsp. *incanus* low sparse shrubland, over *Triodia pungens* low sparse hummock grassland.	*Dampiera candicans* *Hakea lorea* *Acacia bivenosa*	Hills and slopes.	Q029	0.4	
S1	BHP: SL TvuTpu EllApr SggAbi: Open Hummock Grassland of *Triodia vanleeuwenii and Triodia pungens* with Open Woodland of *Eucalyptus leucophloia* subsp. *leucophloia* and *Acacia pruinocarpa over* High Open Shrubland of *Senna glutinosa* subsp. *glutinosa* and *Acacia bivenosa* on orange sand clay slopes. NVIS: *Eucalyptus leucophloia* subsp. *leucophloia, Acacia pruinocarpa*, and +/- *Eucalyptus gamophylla* low open woodland over *Senna glutinosa* subsp. *glutinosa* and *Acacia bivenosa* tall sparse shrubland, over *Triodia vanleeuwenii* and *Triodia pungens* low open hummock grassland.	*Acacia inaequilatera* *Acacia hilliana* *Corymbia hamersleyana* *Gompholobium oreophilum*	Sandy to stony slopes.	R022, R033, R036, R038, R043, R044, R045, R046, R047, R048, R054, R056, R057	1.8	
Flood Plain						
FP1	BHP: FP Cci ChaAci AbiApr: Tussock Grassland of *Cenchrus ciliaris* with Low Woodland of *Corymbia hamersleyana* and *Acacia citrinoviridis* over High Shrubland of *Acacia bivenosa* and *Acacia pruinocarpa* over Open Hummock Grassland of *Triodia pungens* on orange sand on floodplains. NVIS: *Corymbia hamersleyana* +/- *Acacia citrinoviridis* low open woodland with *Acacia bivenosa* and *Acacia pruinocarpa* tall sparse shrubland, over +/- *Triodia pungens* low sparse hummock grassland with *Cenchrus ciliaris* low tussock grassland.	*Eucalyptus victrix* *Corymbia aspera* *Corymbia candida*	Floodplains surrounding major creek line.	R004, R006, R008, R009, R049, R055, R058	2.5	

Code	Vegetation Description	Associated Species	Landform	Sites	Cover (%)	Representative Photo
Mulga Plain						
MP1	**BHP: SA AanApr Tpu:** Low Open Forest of *Acacia pteraneura and Acacia pruinocarpa* over Open Hummock Grassland of *Triodia pungens* on red sand clay on plains. **NVIS**: *Acacia aptaneura* and *Acacia pruinocarpa* low woodland, over +/- *Triodia pungens* low hummock grassland and **Cenchrus ciliaris* sparse tussock grasses.	*Acacia aneura* *Acacia pteraneura* *Acacia macraneura* *Chrysopogon fallax* *Aristida inaequiglumis* *Eremophila forrestii*	Flat plain with sandy clay soils.	R005 R032, R034, R035, R037, R040, R042, R050, R051, R052	3.1	
Rehabilitation						
R1	Rehabilitation that was previously mining infrastructure or drill pads.	-	-	-	0.2	



Legend

Vegetation Units

- A1a
- H1
- BM1
- TP1b
- S1
- TP1a
- FP1
- EP1
- D1a
- D1b
- D2
- MP1
- A1b
- R1
- Degraded

N

0 1 2 3 km

Scale: 1:92,000

Coordinate System: GDA 1994 MGA Zone 50
Projection: Transverse Mercator
Units: Meter

Spectrum ECOLOGY • SPATIAL

Author: CS

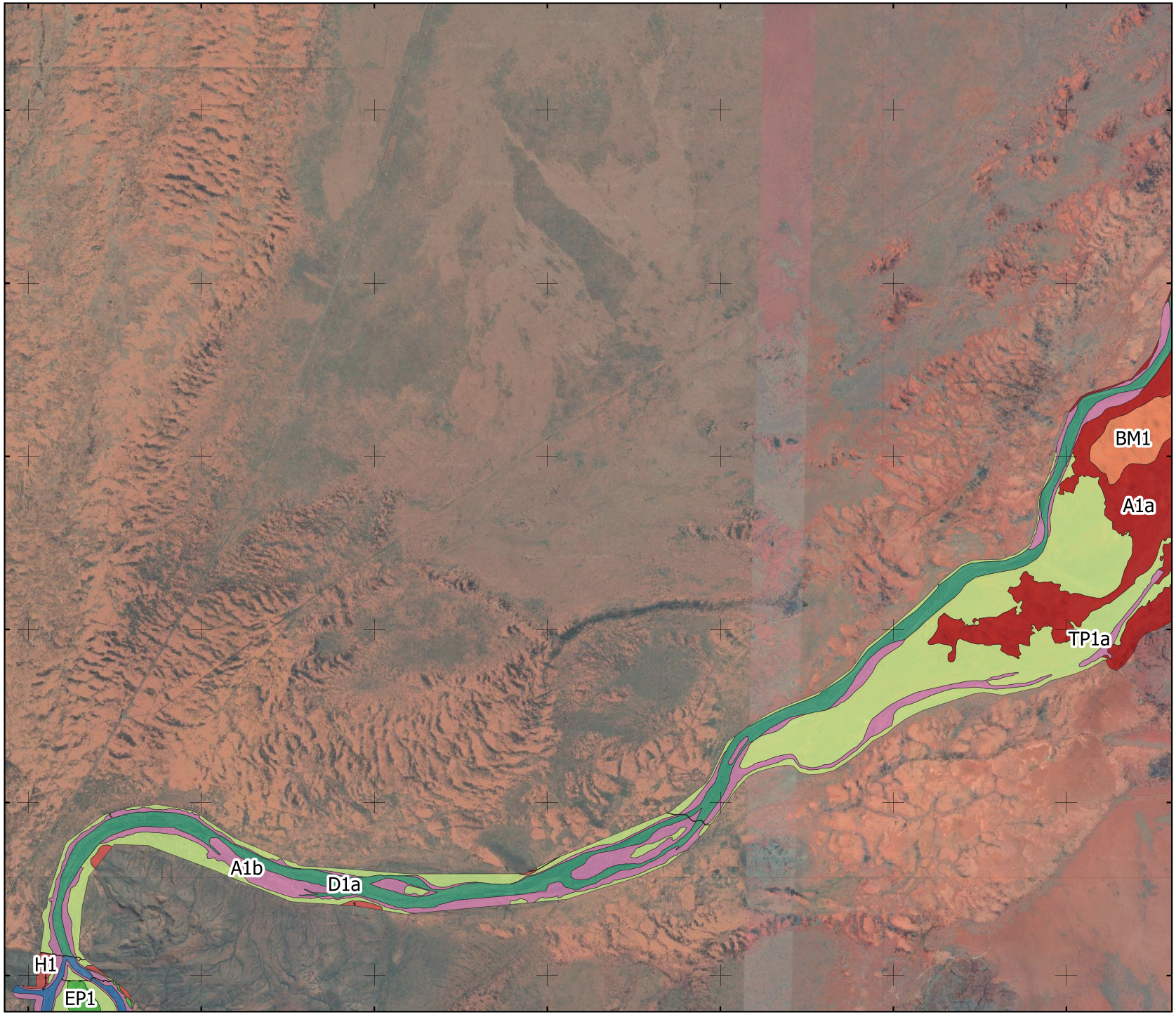
Date: 28/03/2022

Vegetation Types - Homestead Creek South

OB32 Surplus Water & Homestead Creek Wetting Front

Prepared for BHP WAIO

Map 3.3



Legend

Vegetation Units

- A1a
- H1
- BM1
- TP1b
- S1
- TP1a
- FP1
- EP1
- D1a
- D1b
- D2
- MP1
- A1b
- R1
- Degraded

N

0 1 2 3 km

Scale: 1:92,000

Coordinate System: GDA 1994 MGA Zone 50
Projection: Transverse Mercator
Units: Meter

Spectrum ECOLOGY • SPATIAL

Author: CS

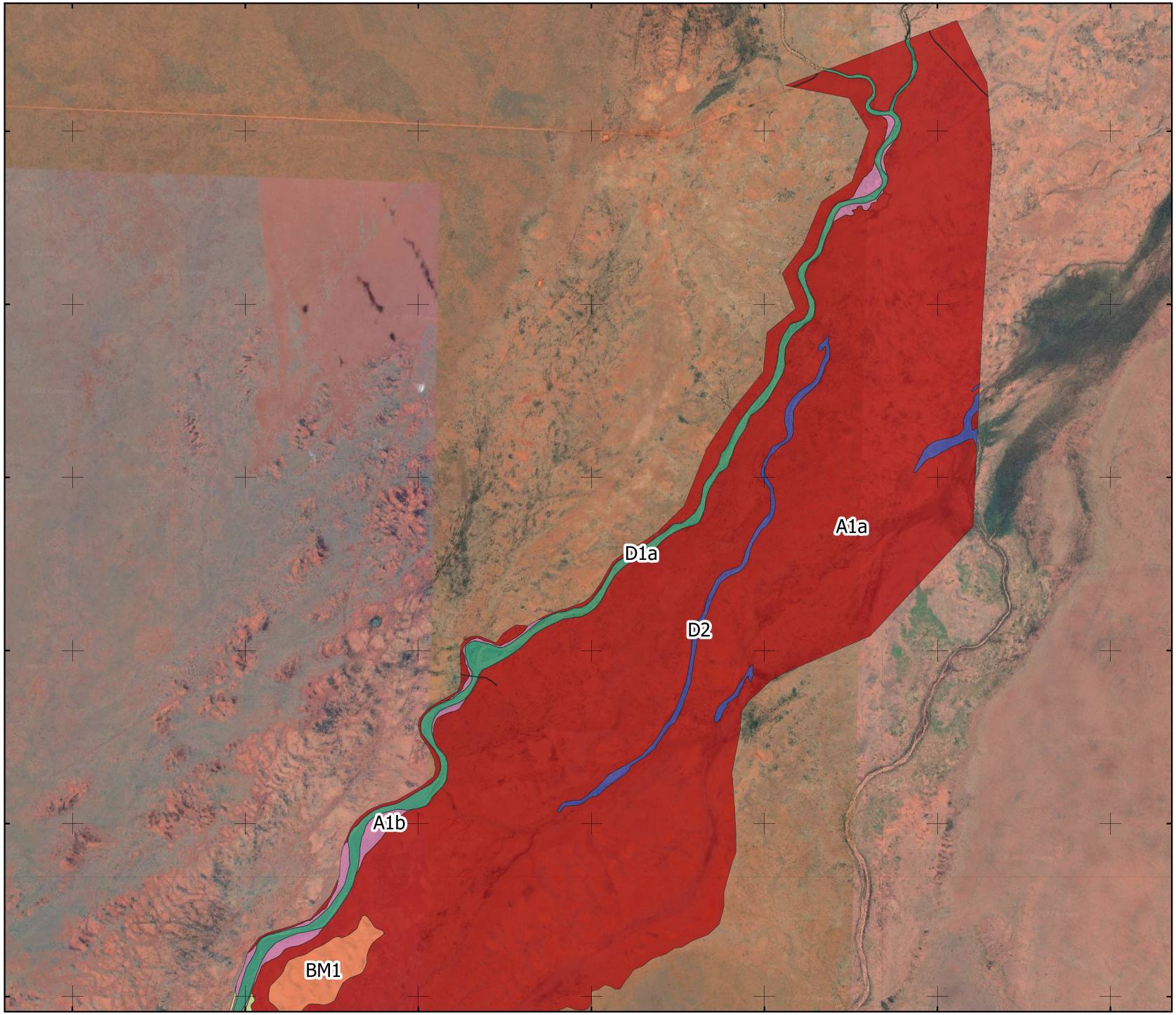
Date: 28/03/2022

Vegetation Types - Homestead Creek

OB32 Surplus Water & Homestead Creek Wetting Front

Map 3.4

Prepared for BHP WAIO



Legend

Vegetation Units

- A1a
- H1
- BM1
- TP1b
- S1
- TP1a
- FP1
- EP1
- D1a
- D1b
- D2
- MP1
- A1b
- R1
- Degraded

N

0 1 2 3 km

Scale: 1:92,000

Coordinate System: GDA 1994 MGA Zone 50
Projection: Transverse Mercator
Units: Meter

Spectrum ECOLOGY • SPATIAL

Author: CS

Date: 28/03/2022

Vegetation Types - Homestead Creek North

OB32 Surplus Water & Homestead Creek Wetting Front

Map 3.5

Prepared for BHP WAIO

3.2.2. Vegetation Condition

The majority of the Survey Area was mapped as 'Good' condition. This covered 55.1% of the Survey Area. The floodplains, northern sections of pastoral lease, and vegetation surrounding infrastructure in the southern section of the Survey Area were often classified as 'Good' condition. This vegetation condition was more specifically associated with the A1a, A1b, and FP1 vegetation types in which **Cenchrus ciliaris* formed a dominant component of the vegetation. The A1b and FP1 vegetation types surrounding the creeks had high weed cover and a low level of grazing. The A1a vegetation type was associated with moderate to low weed cover and a high level of grazing.

The 'Very Good' vegetation condition covered 21.4% of the Survey Area and was characterised by low weed cover. The creek line vegetation types (D1a and D1b) were typically classified as 'Very Good' as they had a low level of weed cover and some vehicle tracks were observed in the creek bed in the dry season. The TP1b vegetation type was associated with this condition due to edge effects, low to moderate weed cover was present as it was surrounded by roads and infrastructure in the south of the Survey Area.

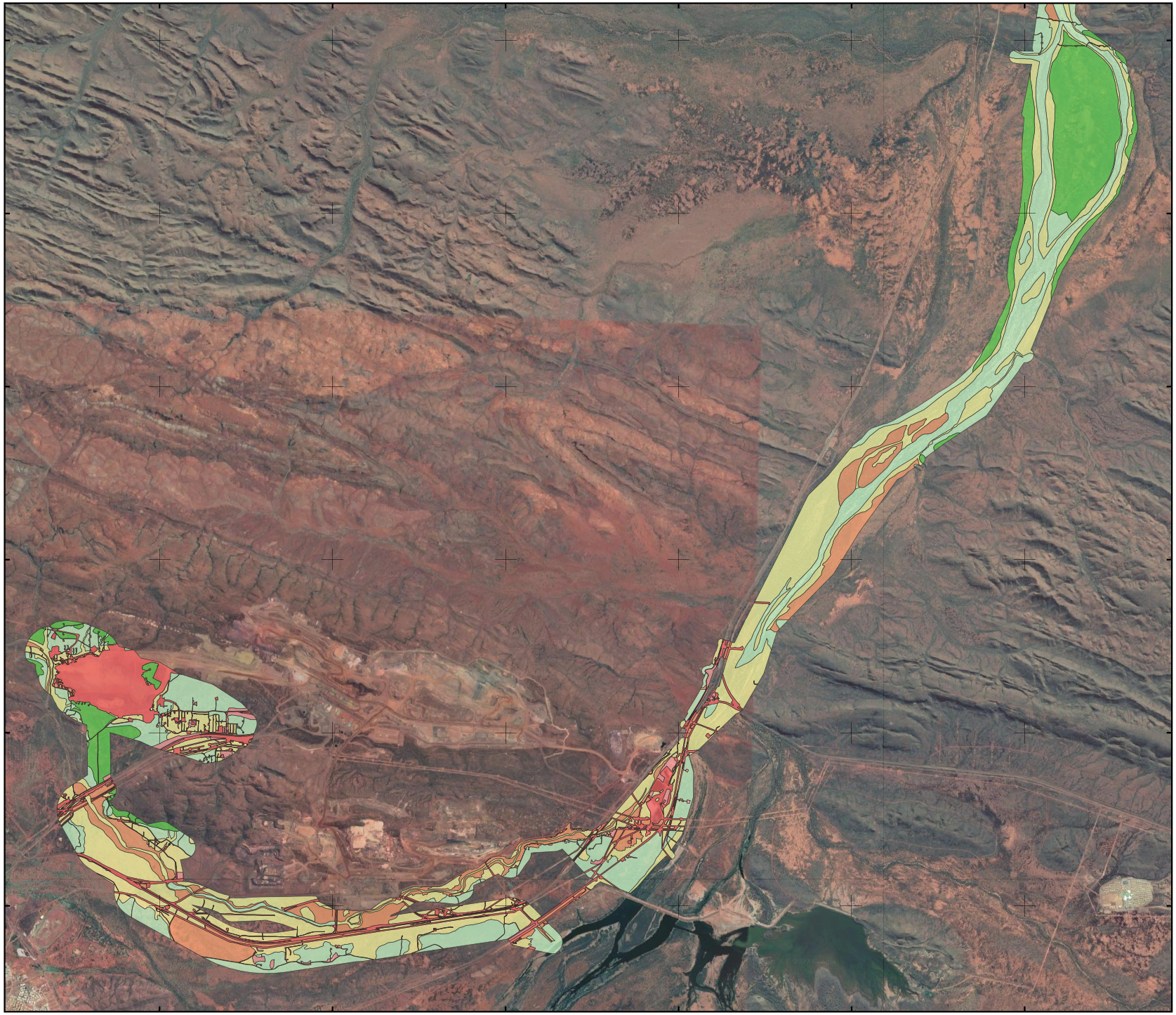
The *Eremophila* plain (EP1), hills (H1), Mulga Plains (MP1), and *Triodia* plains (TP1a) vegetation types were typically classified as 'Excellent' as they contained no obvious disturbance. These vegetation types were typically outside pastoral leases, away from floodplains, and contained minimal infrastructure.

The 'Poor' vegetation condition covered 8.5% of the Survey Area and was associated with floodplains surrounding creek lines and or sections with a high level of infrastructure disturbance. Specifically, the A1b, FP1, and D2 vegetation types were classed as 'Poor'. This vegetation condition was associated with reduced understorey diversity, moderate creek bank erosion, tramping, and or high levels of weed cover and grazing. In the southern section of the Survey Area the TP1b vegetation type contained revegetated drill pads and moderate levels of weed cover.

The 'Degraded' and 'Completely Degraded' vegetation conditions occurred primarily in the south of the Survey Area. Patches classed as 'Degraded' were typically rehabilitation and small fragmented areas of vegetation surrounding 'Completely Degraded' roads and infrastructure and contained high weed cover. Vegetation condition within the Survey Area is further described in Table 3.6, and shown in Map 3.6–Map 3.8.

Table 3.6: Vegetation Condition

Vegetation Condition	Disturbance Details	Area (ha)	% of Survey Area
Excellent	No obvious disturbances. Including hills (H1), *Triodia* plains (TP1a), *Eremophila* plains (EP1).	1,752	11.8
Very Good	Some scattered weeds throughout and low levels of grazing. Includes the majority of the creek line north of the Eastern Ridge mining operations (D1a, D1b), *Triodia* plains (TP1a, TP1b), some areas of *Acacia* overstorey (A1a).	3,164	21.4
Good	Moderate levels of grazing and weeds (**Cenchrus ciliaris*) noted. Includes *Acacia* overstorey on flood plains surrounding the creek line (A1b), flat plains with clay soils (A1a), and flood plains (FP1).	8,153	55.1
Poor	Understorey vegetation structure notably altered by high levels of grazing and weeds (**Cenchrus ciliaris*) that dominated this stratum of the vegetation. Includes along the floodplains parallel to the creek line (A1b, FP1), areas on flat plains with clay soils (A1a), a minor creek line (D2), and surrounding roads and infrastructure.	1,259	8.5
Degraded	Small patches of vegetation surrounding roads and infrastructure, includes rehabilitation (R1).	51	0.3
Completely Degraded	Roads and cleared areas.	407	2.8



Legend

Vegetation Condition

- Excellent
- Very Good
- Good
- Poor
- Degraded
- Completely Degraded

N

0 1 2 3 km

Scale: 1:92,000

Coordinate System: GDA 1994 MGA Zone 50
Projection: Transverse Mercator
Units: Meter

Spectrum ECOLOGY • SPATIAL

Author: CS

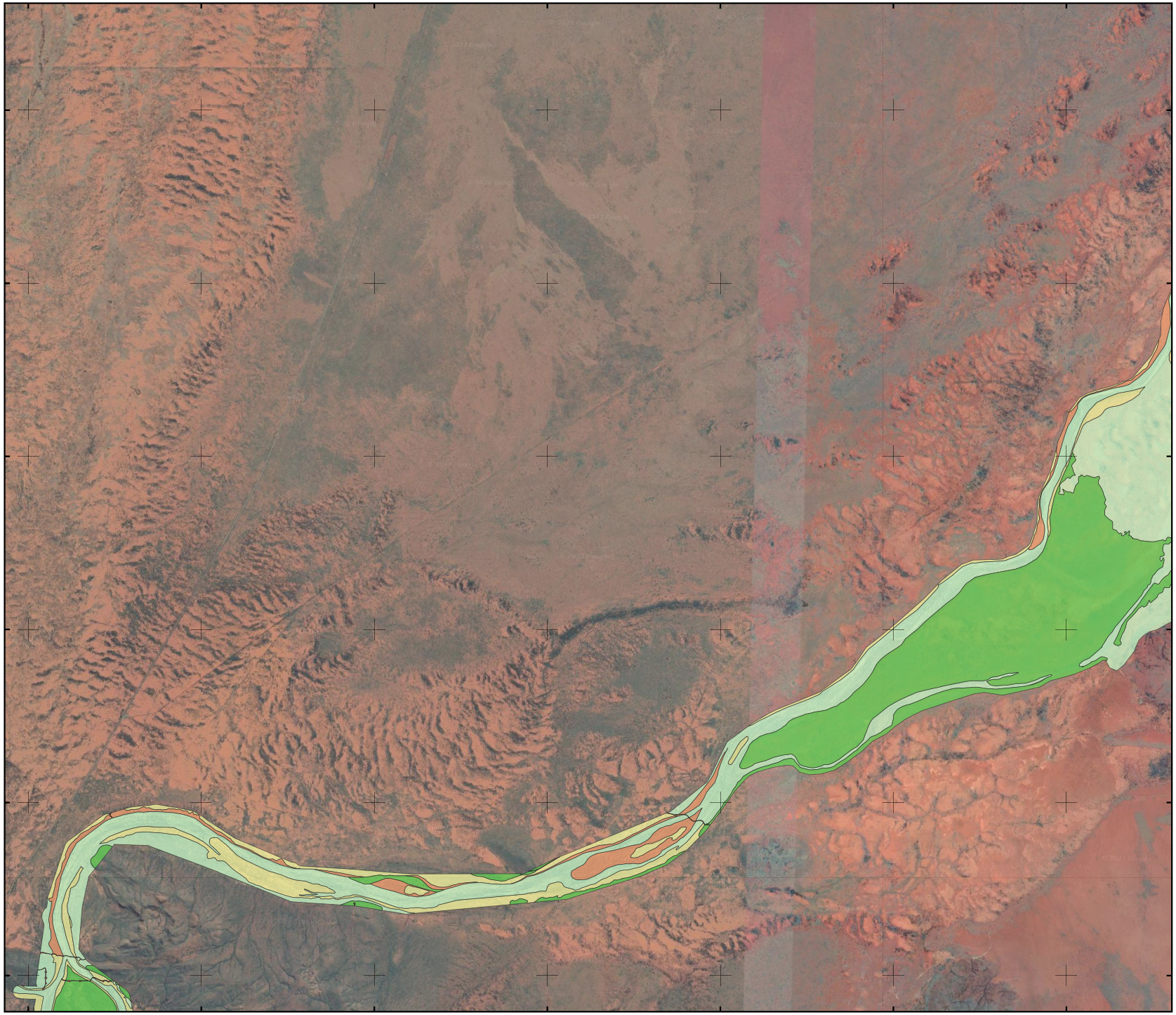
Date: 28/03/2022

Vegetation Condition - Homestead Creek South

OB32 Surplus Water & Homestead Creek Wetting Front

Map 3.6

Prepared for BHP WAIO



Legend

Vegetation Condition

- Excellent
- Very Good
- Good
- Poor
- Degraded
- Completely Degraded

N

0 1 2 3 km

Scale: 1:92,000

Coordinate System: GDA 1994 MGA Zone 50
Projection: Transverse Mercator
Units: Meter

Spectrum ECOLOGY • SPATIAL

Author: CS

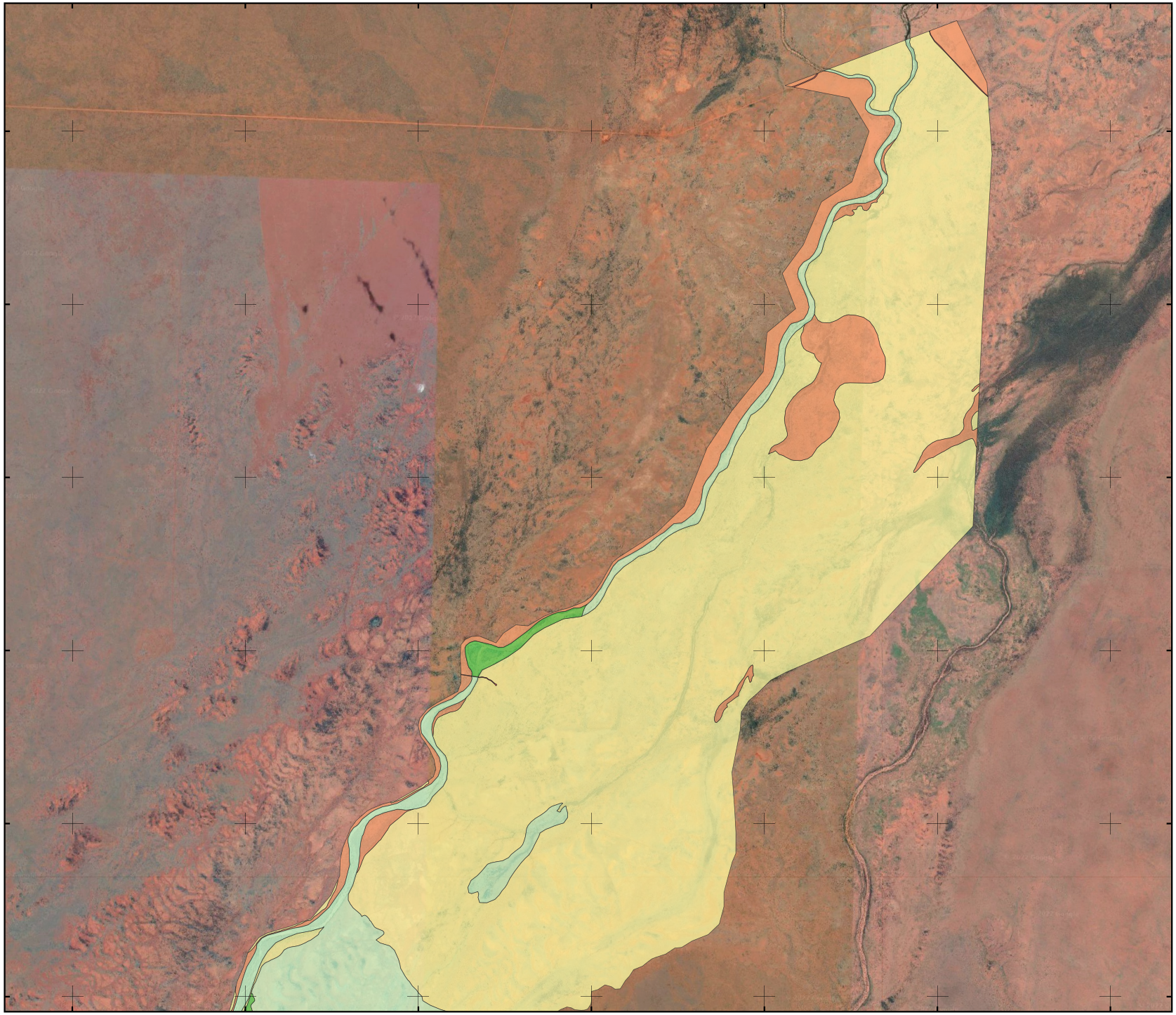
Date: 28/03/2022

Vegetation Condition - Homestead Creek

OB32 Surplus Water & Homestead Creek Wetting Front

Prepared for BHP WAIO

Map 3.7



Legend

Vegetation Condition

- Excellent
- Very Good
- Good
- Poor
- Degraded
- Completely Degraded

N

0 1 2 3 km

Scale: 1:92,000

Coordinate System: GDA 1994 MGA Zone 50
Projection: Transverse Mercator
Units: Meter

Spectrum ECOLOGY • SPATIAL

Author: CS

Date: 28/03/2022

Vegetation Condition - Homestead Creek North

OB32 Surplus Water & Homestead Creek Wetting Front

Map 3.8

Prepared for BHP WAIO

3.2.3. Significant Vegetation

Vegetation types determined to be significant based on the definitions listed in Section 1.9 are listed and described in Table 3.7 and mapped in Map 3.3–Map 3.5.

One of the 13 vegetation types (EP1) may be considered locally and regionally significant due to its restricted distribution and its role as a refuge. This vegetation type occupied a small percentage of the total Survey Area (1.4%), does not appear to be more widespread in the local area, and likely has a restricted distribution. Furthermore, the Priority Four taxon *Eremophila youngii* subsp. *lepidota* was only recorded within this vegetation type. *Eremophila youngii* subsp. *lepidota* is common locally outside the Survey Area but appears to be recorded in the same or similar vegetation types. The EP1 vegetation type was situated between two creek lines in the Survey Area and may provide refuge for *Eremophila youngii* subsp. *lepidota* against potential impacts from pastoral grazing.

The BM1 vegetation type may be considered to have a restricted distribution as it occupied a small percentage of the total Survey Area (1.1%). However, banded mulga vegetation is common on a local scale (10–40 km) and therefore not considered to be significant based on this attribute.

The D1b vegetation type contains *Gymnanthera cunninghamii* and may be considered significant as it could act as refuge for the Priority Three taxon. *Gymnanthera cunninghamii* was only recorded within D1b vegetation type within the Survey Area; however, it is a very widespread taxon across the Pilbara and other bioregions. For this reason, *Gymnanthera cunninghamii* is likely to be recorded in other local creek line vegetation communities surrounding the Survey Area and D1b is not considered a significant vegetation type.

The BM1 and two major creek line (D1a, D1b) vegetation types may be considered as significant due to risk from mining activities. The two major creek line vegetation types D1a and D1b may be at risk from water drawdown activities due to the presence of the phreatophytic or groundwater dependent species *Eucalyptus camaldulensis*. However, *Eucalyptus camaldulensis* is widespread across the length of the major creek line in the Survey Area and may only be impacted in very local areas close to drawdown activities. The BM1 vegetation type is associated with weakly banded mulga and may be at risk from alterations to surface water flow. Dewatering activities from mining are unlikely to impact surface water flow and the BM1 vegetation type due to its distance from the major creek line.

Table 3.7: Significant Vegetation

Significant Vegetation Definition	Vegetation Type	Description
Threatened Ecological Community	-	-
Priority Ecological Community	-	-
Restricted distribution	EP1	The vegetation type occupied a small percentage of the total Survey Area, and it does not appear to be more widespread in the local area and may have a restricted distribution.
Degree of historical impact from threatening processes	-	-
A role as a refuge	EP1	*Eremophila youngii* subsp. *lepidota* was only recorded within this vegetation type. Given EP1 is uncommon in the local area it may provide a role as refuge from potential grazing impacts.
Providing an important function required to maintain ecological integrity of a significant ecosystem	-	-
Other – vegetation at risk from mining activities	-	-

4. DISCUSSION

4.1. Flora

4.1.1. Threatened Flora

No Threatened taxa were recorded during the detailed survey. One Threatened taxon, *Pityrodia augustensis*, was recorded in the desktop assessment, however, it was assigned a low likelihood of occurrence as there was no matching habitat and the closest record was >50 km from the Survey Area.

4.1.2. Local & Regional Significance

Four significant flora taxa were recorded from the Survey Area, all Priority Flora species which have previously been recorded and are known from the local area. Local and regional significance is detailed in Table 4.1.

All Priority taxa were found to have low local significance as they are known from the vicinity of the Survey Area.

One Priority taxon was found to have high regional significance: *Crotalaria smithiana* (P3). Suitable habitat and previous records are common within 50 km of the Survey Area (low local significance). However, the records from this area of the Pilbara are a disjunct population from the majority of the known records which are commonly recorded throughout central Australia.

The remaining taxa have low regional significance as they are widespread across the Pilbara and multiple IBRA regions.

Table 4.1: Local & Regional Significance of Significant Flora

Taxon	Local Significance		Regional Significance	
Priority 3				
Crotalaria smithiana	Many records in the vicinity of the Survey Area and a large amount of suitable habitat present locally.	Low	The vast majority of the records within WA have been collected from this small area of the Pilbara. This taxon is widespread throughout central Australia, however, these records are a disjunct population from the majority of the known records throughout central Australia.	High
Gymnanthera cunninghamii	Many records in the vicinity of the Survey Area and a large amount of suitable habitat present locally. Fifteen of the 19 local records (within 100 km of Survey Area) occur within a small section of the D1b vegetation type.	Low	Known from many locations across the Pilbara, Gascoyne, and Carnarvon IBRA bioregions.	Low
Priority 4				
Eremophila youngii subsp. *Lepidota*	Many records within 100 km of the Survey Area.	Low	Known from many locations across the Pilbara, Gascoyne, and Carnarvon IBRA bioregions.	Low
Goodenia nuda	Many records within 100 km of the Survey Area.	Low	Many known records from across the Pilbara.	Low

4.2. Vegetation

4.2.1. TEC/PECs

None of the vegetation types within the Survey Area resemble any known TEC or PECs (BC/EPBC Act).

4.2.2. Local & Regional Significance

Regional significance of vegetation types was determined by comparing the vegetation types mapped at the Survey Area with the pre-European vegetation and land systems mapping to determine potential regional extent. Local significance of vegetation types was determined using the potential local distribution based on habitat availability, and if it plays a refuge for locally or regionally significant flora species. In addition, surveys conducted in the local area were reviewed for presence of the vegetation type. Local and regional significance for each vegetation type is discussed in Table 4.2.

One vegetation type was assessed as having high local and regional significance. The EP1 vegetation type was assigned a high local significance as it was uncommon in and surrounding the Survey Area and provided refuge for a significant flora, *Eremophila youngii* subsp. *lepidota* (P4). The vegetation type is associated and characteristic of the regionally restricted Beard (DPIRD, 2019) vegetation sub-association (216.0) and geological unit (P_-Hao-ci). Therefore, EP1 was also assessed as having a high regional significance.

No other vegetation types were assessed as having high local or regional significance.

Table 4.2: Local & Regional Significance of Vegetation Types

Vegetation Type	Local Significance		Regional Significance	
D1a: *Eucalyptus camaldulensis* mid open woodland, over *Acacia citrinoviridis* low open woodland with *Melaleuca glomerata* and over *Acacia pyrifolia* var. *morrisonii* tall sparse shrubland, over +/- *Eulalia aurea* tall sparse tussock grassland and *Cyperus vaginatus* tall sparse sedgeland.	Located on major drainage channels which are not restricted in the local area. Associated with ground water dependent species *Eucalyptus camaldulensis*.	Low	Does not appear to be associated with a specific Beard vegetation or geological unit. Associated with the River Land System which is widespread across the Pilbara.	Low
D1b: *Eucalyptus camaldulensis and Eucalyptus victrix* mid open woodland, over and *Acacia citrinoviridis* low open woodland, over *Melaleuca glomerata* tall sparse shrubland, over *Corchorus crozophorifolius* mid sparse shrubland, over *Triodia pungens* low sparse hummock grassland, and **Cenchrus ciliaris* low sparse tussock grassland with *Cyperus vaginatus* tall sparse sedgeland.	Located on major drainage channels which are not restricted in the local area. Associated with ground water dependent species *Eucalyptus camaldulensis*. Provides habitat for *Gymnanthera cunninghamii* (P3) which has low local and regional significance.	Low	Does not appear to be associated with a specific Beard vegetation or geological unit. Associated with the River and Elimunna Land Systems. River Land System widespread and Elimunna not characterised by drainage lines. Does not provide refuge for regionally significant flora.	Low
D2: *Acacia citrinoviridis* and *Eucalyptus victrix* low woodland, over *Cullen leucanthum* and **Malvastrum americanum* tall sparse shrubland, over **Cenchrus ciliaris* low open tussock grassland.	Located on minor drainage channels which do not appear restricted in the local area. 'Poor' condition rating due to high grazing and weed cover. Does not provide refuge for significant flora or contain ground water dependent species.	Low	Associated with the 166.2 Beard vegetation sub-association and Fortescue Land System; however, it is not characteristic of these restricted units in the Pilbara. The associated geological units are widespread through the Pilbara.	Low
TP1a: *Senna artemisioides* subsp. *oligophylla*, *Senna artemisioides* subsp. *helmsii*, and *Acacia dictyophleba* mid sparse shrubland, over *Triodia pungens* low open hummock grassland with *Eragrostis eriopoda* and *Aristida holathera* var. *holathera* low sparse tussock grassland.	Widespread throughout the central sections of the Survey Area, occurring on plains surrounding the creek system. Vegetation units appears to be common surrounding the Survey Area. Does not contain significant flora.	Low	Does not appear to be associated with a specific Beard vegetation, land system, or geological unit. Despite occurring on the Fortescue and River Land Systems it isn't characteristic of the vegetation.	Low
TP1b: *Eucalyptus socialis* and *Eucalyptus xerothermica* mid open mallee woodland, over *Acacia citrinoviridis*, *Acacia sclerosperma*, and *Acacia bivenosa* tall sparse shrubland, over *Triodia pungens* mid open hummock grassland with **Cenchrus ciliaris* and *Paraneurachne muelleri* low sparse tussock grassland.	Commonly mapped in the south of the Survey Area. Large patches of the vegetation type in 'Very Good' condition, however, small patches have 'Good' to 'Degraded' condition due to surrounding infrastructure and mining exploration. Does not act as refuge for significant flora.	Low	Does not appear to be associated with a specific geological unit. Associated with the 29.0 Beard vegetation sub-association and Elimunna Land System, however, not characteristic of either unit.	Low
A1a: *Acacia aptaneura* low open woodland, with *Acacia tetragonophylla*, *Acacia synchronicia* and +/-**Vachellia farnesiana* tall sparse shrubland, over *Senna artemisioides* subsp. *helmsii* low sparse shrubland, over **Cenchrus ciliaris* and *Enneapogon cylindricus* low open tussock grassland.	Largest vegetation type in the Survey Area, predominantly classed as 'Good' condition due to grazing and weed cover. Despite association with *Crotalaria smithiana* (P3) it does not act as refuge due to grazing.	Low	Representative of the 166.2 Beard vegetation sub-association and Fortescue Land System that are not widespread through the Pilbara. Vegetation type is in 'Good' condition with high levels of weeds and grazing.	Low

Vegetation Type	Local Significance		Regional Significance	
A1b: *Acacia citrinoviridis* low woodland, over **Cenchrus ciliaris* and *Enneapogon polyphyllus* low tussock grassland.	Large distribution throughout Survey Area and in 'Good' to 'Poor' condition. Vegetation type appears to be widely distributed through the local area.	Low	Does not appear to be associated with a specific Beard vegetation or geological unit. Associated with the River Land System which is widespread across the Pilbara.	Low
BM1: *Acacia aptaneura* low woodland, over *Digitaria ctenantha*, *Chloris pumilio*, and *Paspalidium rarum* low open tussock grassland.	Restricted distribution within the Survey Area, however, Banded Mulga vegetation common within 2–40 km of the Survey Area. May be a susceptible to changes in surface water as Banded Mulga is a Sheet Flow Dependent Vegetation	Low	Associated with the 166.2 Beard vegetation sub-association and Fortescue Land System; however, it is not characteristic of these restricted units in the Pilbara. The associated geological units are widespread through the Pilbara.	Low
EP1: *Acacia aptaneura* low open woodland, over *Eremophila cuneifolia and Senna symonii* mid sparse shrubland, over *Triodia pungens* low open hummock grassland, and *Aristida holathera* and *Aristida contorta* low sparse tussock grassland.	Restricted distribution within Survey Area and local area. Unique location of vegetation type between creek lines. Provides refuge for *Eremophila youngii* subsp. *lepidota* (P4).	High	Associated and characteristic of the 216.0 Beard vegetation sub-association which has a restricted distribution in the Pilbara region. Associated with the P_-Hao-ci geological unit which has a limited distribution in the Pilbara.	High
H1: *Eucalyptus leucophloia* subsp. *leucophloia* low open woodland with *Senna glutinosa* subsp. *glutinosa* tall sparse shrubland, over *Corchorus incanus* subsp. *incanus* low sparse shrubland, over *Triodia pungens* low sparse hummock grassland.	Limited distribution within the Survey Area due to Survey Area location. Not a locally restricted vegetation type.	Low	Associated with the widespread Newman Land System.	Low
S1: *Eucalyptus leucophloia* subsp. *leucophloia*, *Acacia pruinocarpa*, and +/- *Eucalyptus gamophylla* low open woodland over *Senna glutinosa* subsp. *glutinosa* and *Acacia bivenosa* tall sparse shrubland, over *Triodia vanleeuwenii* and *Triodia pungens* low open hummock grassland.	Limited distribution within the Survey Area due to location. Not a locally restricted vegetation type.	Low	Associated with the widespread Newman Land System.	Low
FP1: *Corymbia hamersleyana* +/- *Acacia citrinoviridis* low open woodland with *Acacia bivenosa* and *Acacia pruinocarpa* tall sparse shrubland, over +/- *Triodia pungens* low sparse hummock grassland with **Cenchrus ciliaris* low tussock grassland.	Commonly distributed on floodplains in the south of the Survey Area around mining infrastructure. 'Good' to 'Poor' condition and vegetation defined by high **Cenchrus ciliaris* cover.	Low	Associated with widespread geological unit. Un-characteristic of Beard vegetation sub-association and land system.	Low
MP1 *Acacia aptaneura* and *Acacia pruinocarpa* low woodland, over +/- *Triodia pungens* low hummock grassland and **Cenchrus ciliaris* sparse tussock grasses.	The vegetation type was not widely distributed in the Survey Area and appears to be locally common.	Low	Characteristic of the wide-spread 18.11 Beard vegetation sub-association and Boolgeeda Land System.	Low

5. CONCLUSIONS

5.1. Flora

No Threatened Flora were recorded, or likely to occur, within the Survey Area. Four Priority Flora taxa were recorded from nine locations during the current survey, all of which had been previously recorded within the Survey Area (or surrounds). Four Priority Flora species, *Amaranthus centralis* (P3), *Aristida jerichoensis* var. *subspinulifera* (P3), *Rhagodia* sp. Hamersley (M. Trudgen 17794) (P3), *Themeda* sp. Hamersley Station (M.E. Trudgen 11431) (P3), were considered to have a High post-survey likelihood of occurrence within the Survey Area. *Crotalaria smithiana* (P3) was assigned a high regional significance due to its limited distribution in the Pilbara. The remaining three Priority Flora (*Gymnanthera cunninghamii*, *Eremophila youngii* subsp. *Lepidota*, and *Goodenia nuda*) have low local and regional significance as they are widespread in the vicinity of the Survey Area and known from multiple locations across the Pilbara region, often into other IBRA regions.

5.2. Vegetation

Thirteen vegetation types were identified from the Survey Area. The majority of the Survey Area was mapped as *Acacia aptaneura* low open woodland on plains in the north (A1a), *Triodia pungens* low open hummock grassland (TP1a), *Acacia citrinoviridis* low open woodlands on floodplains (A1b), and *Eucalyptus camaldulensis/ Eucalyptus victrix* mid open woodland in creek lines (D1a and D1b). Vegetation condition of A1a and A1b was typically 'Good' with impacts from either grazing or weed cover, 'Excellent' on TP1a plains and hills (H1), and 'Very Good' in D1a and D1b creek lines. Vegetation condition declined in the south of the Survey Area due to increased weed cover, reduced understorey species diversity, land clearing for infrastructure, and small patch sizes.

None of the vegetation types within the Survey Area resemble any known TEC or PECs (BC/EPBC Act). One vegetation type, EP1, was assigned a high local and regional significance. This vegetation type is associated with and characteristic of a Beard vegetation sub-association and geological unit that have restricted distributions in the Pilbara. Locally, EP1 has a restricted distribution within and surrounding the Survey Area, is in a unique location in the landscape, and provides refuge for the Priority Flora species *Eremophila youngii* subsp. *lepidota* (P4).

6. REFERENCES

Aplin (1979) *The flora in: Environment & Science*.

Astron (2018a) *Caramulla Creek: Flora and Vegetation Survey*. Perth WA. doi: 2464-18-BISR-1Rev0_190411.

Astron (2018b) *Cathedral Gorge Level 2 Flora and Vegetation Survey*.

Beard, J. S. (1975) 'The vegetation survey of Western Australia', *Vegetatio*, 30(3), pp. 179–187.

Bureau of Meteorology (2021) 'Climate Data Online'. Available at: http://www.bom.gov.au/climate/data/.

Department of Biodiversity Conservation and Attractions (2017a) 'Priority Ecological Communities for Western Australia Version 27'. Species and Communities Branch, Department of Biodiversity, Conservation and Attractions.

Department of Biodiversity Conservation and Attractions (2017b) 'Threatened and Priority Flora Report Form - Field Manual'. Department of Biodiversity, Conservation and Attractions.

Department of Biodiversity Conservation and Attractions (2019) 'Conservation Codes for Western Australian Flora and Fauna'. Department of Parks and Wildlife.

Department of Mines Industry and Regulation (2019) 'Geological Series of Western Australia 1:250,000 Map Sheets Robertson (5113) & Balfour Downs (5109)'. Government of Western Australia.

Department of Primary Industry and Regional Development (2019) 'Pre-European Vegetation - Western Australia (NVIS Compliant Version 20110715)'.

Department of the Environment and Energy (2016) 'Collaborative Australian Protected Areas Database - Terrestrial CAPAD2016'. Australian Government.

Department of the Environment and Energy (2019) 'Australian Wetlands Database'. Australian Government.

Department of Water and Environmental Regulation (2019) 'Clearing Regulations - Environmentally Sensitive Areas'. Government of Western Australia.

ecologia Environment (2004) *Orebody 24 Expansion Biological Survey*.

ecologia Environment (2008) *Newman Water Pipeline Enhancement Project : Vegetation and Flora Survey BHPBIO Newman Water Pipeline Enhancement Project : Vegetation and Flora Survey Version 3*.

Ecoscape (2013) *Newman-Roy Hill Transmission Line Survey - Version 11*.

ENV Australia (2006) *Mt Whaleback Flora and Vegetation Assessment - Phase III Summary Report*.

ENV Australia (2007) *West Jimblebar Lease Flora and Vegetation Assessment*.

ENV Australia (2008) *RGP5 Jimblebar Junction to Yandi Junction Railway Reserve Flora and Vegetation Assessment*.

ENV Australia (2009) *Jimblebar Construction Water Supply Pipeline and Ammonium Nitrate Storage Facility*.

ENV Australia (2010) *Orebody 35 Vegetation Clearing Permit Area Flora and Fauna Assessment*.

ENV Australia (2011) *Orebody 42/43 Flora, Vegetation and Fauna Assessment*.

ENV Australia (2012) *Eastern Ridge (OB23/24/25) Flora and Vegetation Assessment*.

ENV Australia (2013) *Orebody 24 Flora and Fauna Assessment Phase II*.

Environmental Protection Authority (2016a) 'EPA Environmental Factor Guideline: Flora and Vegetation'. Western Australia: EPA.

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

ESCAVI (2003) 'Australian Vegetation Attribute Manual: National Vegetation Information System, Version 6.0'. Canberra: Executive Steering Committee for Australian Vegetation information. Department of Environment and Heritage.

Galili, T. (2015) 'Dendextend: an R package for visualizing, adjusting, and comparing trees of hierarchical clustering. Bioinformatics.' doi: 10.1093/bioinformatics/btv428.

Gibson, N. *et al.* (1994) 'A Floristic survey of the southern Swan Coastal Plain'. Department of Conservation and Land Management and Conservation Council of Western Australia.

Government of Western Australia (2019) '2018 Statewide Vegetation Statistics Incorporating the CAR Reserve Analysis (Full Report). Current as of December 2018'. Perth: WA Department of Biodiversity, Conservation and Attractions.

Kendrick, P. (2001a) 'Pilbara 1 (PIL1 - Fortescue Plains Subregion)', in *A Biodiversity Audit of Western Australia's 53 Biogeographic Subregions in 2002*. Department of Conservation and Land Management, pp. 559–567.

Kendrick, P. (2001b) 'Pilbara 3 (PIL3 – Hamersley Subregion)', in *A Biodiversity Audit of Western Australia's 53 Biogeographic Subregions in 2002*. Department of Conservation and Land Management, pp. 568–580.

Oksanen, J. *et al.* (2019) 'vegan: Community Ecology Package. R package version 2.5-6.'

Onshore Environmental Consultants (2009) *Myopic Exploration Lease Biological Survey*.

Onshore Environmental Consultants (2012) *Targeted Significant Flora Survey Vegetation Mapping of Homestead Creek*.

Onshore Environmental Consultants (2013a) *Flora & Vegetation and Vertibrate Fauna Review - Mt Whaleback AML 7/244*.

Onshore Environmental Consultants (2013b) *Targeted Flora and Vegetation Survey Orebody 24*.

Onshore Environmental Consultants (2014a) *Orebody 18 to OB31 Infrastructure Corridor Targeted Flora Survey*.

Onshore Environmental Consultants (2014b) *Orebody 19 level 2 Flora and Vegetation Survey*.

Onshore Environmental Consultants (2014c) *Orebody 31 Level 2 Flora and Vegetation Survey*.

Onshore Environmental Consultants (2015a) *Dynasty and West Jimblebar Level 2 Flora and Vegetation Survey*.

Onshore Environmental Consultants (2015b) *Fortescue River Riparian Flora and Vegetation Survey*.

Onshore Environmental Consultants (2015c) *Orebody 31 to Ophthalmia Dam Pipeline - Flora, Vegetation, and Vertebrate Fauna Survey*.

Onshore Environmental Consultants (2017) *Flora and Vegetation and Vertebrate fauna survey of the Newman to MAC powerline corridor*.

Outback Ecology Services (2010) *Jimblebar Iron Ore Project Flora and Vegetation Assessment*.

R Core Team (2019) 'R: A language and environment for statistical computing. R Foundation for Statistical

Computing, Vienna, Austria'.

Specht (1970) *Vegetation 4th Edition, in The Australian Environment*.

Syrinx Environmental (2010) *Orebody 37 Flora and Vegetation Assessment*.

Syrinx Environmental (2011) *Orebody 31 Flora and Vegetation Assessment*.

Syrinx Environmental (2012) *Wheelarra Hill North Level 2 Flora And Vegetation Assessment*.

Thackway, R. and Cresswell, I. D. (1995) 'An Interim Biogeographic Regionalisation for Australia (IBRA)'.

The Department of Primary Industry Regulation and Development (2021) *West Australia Organism List*.

Trudgen, M. E. (2002) *A flora, vegetation and floristic survey of the Burrup Peninsula, some adjoining areas and part of the Dampier Archipelago, with comparisons to the floristics of areas on the adjoining mainland*.

Van Vreeswyk, A. M. E. *et al.* (2004) 'An inventory and condition survey of the Pilbara region, Western Australia'. Department of Agriculture and Food.

Western Australian Herbarium (2020) 'FloraBase—the Western Australian Flora. Department of Biodiversity, Conservation and Attractions'. Available at: https://florabase.dpaw.wa.gov.au/.

Appendix A: Significant Flora Likelihood of Occurrence

Status	Family	Taxon	Longevity	Lifeform	Flowering Time	Description	Habitat	Closest Record (km)	Likelihood
P3	Poaceae	*Aristida jerichoensis var. subspinulifera*	Perennial	Herb	Unknown.	Compactly tufted perennial, grass-like or herb, 0.3-0.8 m high, lemma groove muricate.	Flat terrain. Red clay loam, low in landscape. Hardpan plains.	0.0	Recorded
P3	Fabaceae	*Crotalaria smithiana*	Annual	Herb	Jun.	Annual, herb, to 0.4 m high. Fl. yellow,	Regeneration site on floodplain.	0.0	Recorded
P3	Apocynaceae	*Gymnanthera cunninghamii*	Perennial	Shrub	Jan to Dec.	Erect shrub, 1-2 m high. Fl. cream-yellow-green	Sandy soils. Drainage lines.	0.0	Recorded
P3	Chenopodiaceae	*Rhagodia sp. Hamersley (M. Trudgen 17794)*	Perennial	Shrub	Unknown.	Erect shrub to 1.5m.	Flat plain. Floodplain. Hillslope. Red sandy loam with surface cobbles.	0.0	Recorded
P3	Poaceae	*Themeda sp. Hamersley Station (M.E. Trudgen 11431)*	Perennial	Other Grass	Unknown.	Tussock grass.	Flat terrain, low in landscape. Red loamy soil with some alluvial sand material and stones.	0.0	Recorded
P4	Scrophulariaceae	*Eremophila youngii* subsp. *lepidota*	Perennial	Shrub	Unknown.	Eremophila youngii is an erect, highly-branched, shrub which grows to a height of between 1 and 4 m.	Stony red sandy loam. Flats plains. Floodplains, sometimes semi-saline. Clay flats.	0.0	Recorded
P4	Goodeniaceae	*Goodenia nuda*	Perennial	Herb	Apr to Aug.	Erect to ascending herb, to 0.5 m high. Fl. Yellow.	Drainage line. Red/brown clay loam soils. Floodplains. Brown loam/ironstone.	0.0	Recorded
P1	Poaceae	*Triodia pascoeana*	Perennial	Hummock Grass	Jan to Apr	Dense, tussock-forming perennial, grass-like or herb, 1-3 m high, non-resinous, panicle long-linear, extremely scabrous, lemma 3-lobed, awnless. Fl. Jan to Apr.	Limestone. Limestone ranges & gorges, floodplains.	9.7	High
P2	Poaceae	*Aristida lazaridis*	Perennial	Herb	April	Tufted perennial, grass-like or herb, 0.4-1.5 m high. Fl. green/purple, Apr.	Clay plains of an ephemeral lake. Floodplain/drainage zone. Sand or loam.	11.6	High
P2	Euphorbiaceae	*Euphorbia inappendiculata var. inappendiculata*	Annual	Herb	Unknown.	Herb to 2 cm.	Flat, red brown loam. Cracking clay.	9.9	High
P2	Convolvulaceae	*Ipomoea racemigera*	Annual	Climber	Unknown.	Creeping annual, herb or climber. Fl. white.	Fringing vegetation of river.	7.5	High
P3	Amaranthaceae	*Amaranthus centralis*	Annual	Herb	Flowers throughout the year	Erect, to 60 cm high. Stems angular, sometimes reddish, sparsely hairy with glandular or multicellular hairs or becoming glabrous.	Red sand in ephemeral watercourses. Sandy to clayey loam. River banks. Edges of	0.0	High

Status	Family	Taxon	Longevity	Lifeform	Flowering Time	Description	Habitat	Closest Record (km)	Likelihood
							permanent pools in eucalypt lined channels.		
P3	Asteraceae	*Calotis latiuscula*	Perennial	Herb	Jun to Oct.	Erect herb, to 0.5 m high. Fl. yellow,	Sand, loam. Rocky hillsides, floodplains, rocky creeks or river beds.	7.9	High
P3	Scrophulariaceae	*Eremophila magnifica* subsp. *velutina*	Perennial	Shrub	Aug. to Sept.	Shrub, 0.5-1.5 m high. Fl. blue-purple, Aug to Sep.	Skeletal soils over ironstone. Summits.	0.7	High
P3	Scrophulariaceae	*Eremophila sp. Hamersley Range (K. Walker KW 136)*	Perennial	Shrub	Unknown.	Shrub to 2m tall. Rounded crowded canopy. Flowers white-cream-yellow-pink-purple.	Hill crest. Creek embankments. Gullies.	1.9	High
P3	Goodeniaceae	*Goodenia sp. East Pilbara (A.A. Mitchell PRP 727)*	Annual	Herb	Unknown.	Open, erect annual or biennial, herb, to 0.2 m high. Fl. yellow.	Red-brown clay soil. Calcrete pebbles. Low undulating plain, swampy plains.	1.7	High
P3	Asteraceae	*Iotasperma sessilifolium*	Annual	Herb	Unknown.	Erect herb. Fl. pink.	Cracking clay, black loam. Edges of waterholes, plains.	15.5	High
P3	Fabaceae	*Swainsona thompsoniana*	Perennial	Herb	Unknown.	Erect, herb. Stems terete, not spiny, glabrous.	Flat crabhole plain.	6.6	High
P1	Fabaceae	*Acacia corusca*	Perennial	Shrub	April to Aug	Rounded to broadly rounded, robust, multi-stemmed shrub or small tree 1.5-4.0 (-5.0) m high, 1.5-5 (-6.0) m wide	Grows in red-brown sandy-loam soils on hill crests, ridges, slopes and minor drainage lines upon low, subdued and undulating stony hills.	14.2	Medium
P1	Scrophulariaceae	*Eremophila capricornica*	Perennial	Shrub	June-August	A small shrub 50–75 cm high, 50–75 cm wide. Branches terete, with woolly dendritic hairs; Leaves alternate, clustered towards the ends of branches, sessile, rounded in cross section, with woolly dendritic indumentum.	Found from east of Newman across to Jigalong, growing in sandy clay loams in open mulga shrubland with an understory of Triodia spp. and other grasses	14.6	Medium
P1	Scrophulariaceae	*Eremophila pilosa*	Perennial	Shrub	Sep	Shrub, ca 0.8 m high. Fl. Purple	Grows in red-brown clay loam on sandy plains between Jigalong and Roy Hill	11.1	Medium

Status	Family	Taxon	Longevity	Lifeform	Flowering Time	Description	Habitat	Closest Record (km)	Likelihood
P1	Asteraceae	*Helichrysum oligochaetum*	Annual	Herb	Aug to Nov.	Erect annual, herb, to ca 0.25 m high. Fl. yellow,	Red clay. Alluvial plains.	24.1	Medium
P1	Plantaginaceae	*Stemodia sp. Battle Hill (A.L. Payne 1006)*	Perennial	Shrub	Unknown.	Low shrub.	Cracking clay. Floodplain.	27.9	Medium
P1	Asteraceae	*Vittadinia sp. Coondewanna Flats (S. van Leeuwen 4684)*	Annual / Perennial	Herb	Unknown.	Tall daisy to 1 m , open canopy, in late flower and dehiscing fruit, cream/white flowers.	Flat terrain, low in landscape. Red clay loam with some stone. Gilgai. Drainage lines.	22.0	Medium
P2	Goodeniaceae	*Goodenia hartiana*	Perennial	Herb / Shrub	Unknown.	Erect to spreading, multistemmed perennial, herb or shrub (sub-shrub).	Sand. Sand dune swales, sandhills.	10.2	Medium
P2	Fabaceae	*Isotropis parviflora*	Perennial	Shrub	Unknown.	Shrub, 0.1 m high. Fl. white/pink, Mar.	Low rocky hill. Red-brown loam soils and ironstone gravel.	4.9	Medium
P3	Poaceae	*Eragrostis crateriformis*	Annual	Herb	Jan to May or Jul.	Annual, grass-like or herb, 0.17-0.42 m high.	Clayey loam or clay. Creek banks. Depressions.	19.5	Medium
P3	Scrophulariaceae	*Eremophila rigida*	Perennial	Shrub	September	Bushy shrub, 0.3-4 m high. Fl. cream, Sep.	Red sand alluvium. Hardpan plains, stony clay depressions.	22.7	Medium
P3	Myrtaceae	*Eucalyptus rowleyi*	Perennial	Mallee Tree	Unknown.	Mallee, 3–5 m tall, lignotuber present. Bark smooth throughout, not powdery, grey to pale tan-orange over cream, decorticating in strips and short ribbons.	Occurs on red sandy loams on plains and very minor and broad flood-out plains (similar to the habitat of E. lucasii).	25.2	Medium
P4	Scrophulariaceae	*Eremophila magnifica* subsp. *magnifica*	Perennial	Shrub	Aug. to Nov.	Shrub, 0.5-1.5 m high. Fl. blue, Aug to Nov.	Skeletal soils over ironstone. Rocky screes.	6.2	Medium
P4	Goodeniaceae	*Goodenia berringbinensis*	Annual	Herb	Oct.	Ascending annual, herb, 0.1-0.3 m high. Fl. yellow,	Red sandy loam. Along watercourses.	16.4	Medium
P1	Asteraceae	*Calotis squamigera*	Annual	Herb	Unknown.	Procumbent annual, herb, to 0.21 m high.	Pebbly loam. Flat. Red brown loam clay.	81.2	Low
P1	Poaceae	*Eragrostis sp. Mt Robinson (S. van Leeuwen 4109)*	Perennial	Herb	Sep	Tussock-forming perennial, grass-like or herb, to 0.3 m high. Fl. Sep.	Red-brown skeletal soils. Ironstone. Steep slopes. Summits.	96.3	Low
P1	Scrophulariaceae	*Eremophila rhegos*	Perennial	Shrub	Sep	Erect shrub, ca 1 m high. Fl. blue-purple-white	Skeletal stony loam over granite.	43.6	Low
P1	Scrophulariaceae	*Eremophila sp. West Angelas (S. van Leeuwen 4068)*	Perennial	Shrub	Unknown.	Spindly shrub to 3 m high.	Summits of hills. Slopes.	42.6	Low

Status	Family	Taxon	Longevity	Lifeform	Flowering Time	Description	Habitat	Closest Record (km)	Likelihood
P1	Euphorbiaceae	*Euphorbia parvicaruncula*	Annual / Perennial	Herb	Unknown.	Short-lived annual or perennial, herb, to 0.2 m high.	On rocks.	70.3	Low
P1	Malvaceae	*Hibiscus campanulatus*	Perennial	Shrub / Tree	Mar - Nov	Shrub or tree. Stems hairy.	Plants grow within incised ironstone gullies, protected areas below cliffs, rocky creeklines and below breakaways, often with underlying loamy to skeletal ironstone soils.	0.0	Low
P1	Linderniaceae	*Lindernia sp. Pilbara (M.N. Lyons & L. Lewis FV 1069)*	Annual / Perennial	Herb	Unknown.	Annual or perennial herb, to 0.6 cm high.	Riparian slopes at water's edge, claypan low dune, edge of wetland.	56.9	Low
P1	Asteraceae	*Myriocephalus scalpellus*	Annual	Herb	Unknown.	Semi-erect herb, 0.03-0.08 m high.	Clay. Depression on flood plain.	56.5	Low
P1	Brassicaceae	*Rorippa sp. Fortescue Valley (M.N. Lyons & R.A. Coppen FV 0760)*	Annual / Perennial	Herb	Unknown.	Herb.	Riparian slope at water's edge.	56.9	Low
P1	Primulaceae	*Samolus sp. Fortescue Marsh (A. Markey & R. Coppen FM 9702)*	Perennial	Shrub	Unknown.	Low shrub 1 m tall by 0.6 m wide.	Fortescue Marsh, restricted to both the margins of semi-permanent/permanent freshwater pools and the margins of samphire shrublands where creeks discharge freshwater following periods of high rainfall.	45.8	Low
P1	Phyllanthaceae	*Synostemon hamersleyensis*	Perennial	Shrub	Unknown.	Glabrous monoecious or dioecious subshrub from a perennating, woody rootstock with stems much branched, to 50 cm high, bright green when fresh, becoming grey-green on drying with cuticular wax shed in flakes.	Narrow gorge in upper hillslope.	89.6	Low
P1	Chenopodiaceae	*Tecticornia globulifera*	Perennial	Shrub	Unknown.	Perennial shrub to 0.3–0.5 m high. Vegetative articles globular to obovoid, not compressed green or pink to red.	Moderately saline flats on red-brown gritty clay.	66.4	Low

Status	Family	Taxon	Longevity	Lifeform	Flowering Time	Description	Habitat	Closest Record (km)	Likelihood
P1	Chenopodiaceae	*Tecticornia sp. Christmas Creek (K.A. Shepherd & T. Colmer et al. KS 1063)*	Perennial	Shrub	Unknown.	Perennial shrub.	Moderately saline flats on red-brown gritty clay.	56.8	Low
P1	Poaceae	*Triodia sp. Karijini (S. van Leeuwen 4111)*	Perennial	Hummock Grass	Unknown.	Hummock grass to 1 m high.	Upper hill slope. Moderately steep ridgeline. Ironstone outcropping with boulders and cobbles. Skeletal dark orange-brown loam soil.	94.6	Low
P1	Poaceae	*Triodia veniciae*	Perennial	Hummock Grass	Feb - March	Hummock grass, 30 cm high. Foliage strongly resinous, leaf sheaths sparsely to moderately hairy.	Occurs on slopes of low hills of broken shale on the northern/eastern flanks of Marra Mamba mesa formations, along a 140 km transect of the eastern Chichester Ranges, between Roy Hill Station in the east and Mulga Downs Station in the west	55.5	Low
P2	Scrophulariaceae	*Eremophila pusilliflora*	Perennial	Shrub	April - Sept	It is a low, open shrub with narrow egg-shaped leaves and flowers which vary in colour from red to cream with a red tinge. A low-growing, open shrub 30–50 cm high, 50–100 cm wide.	Found on seasonally inundated alluvial plains between Turee Creek, Pingandy Creek and drainage systems leading into the Ashburton River (Figure 2), growing in red-brown sandy loam soils in open low shrubland with Acacia aneura, Ptilotus nobilis, Goodenia and Triodia species.	55.9	Low
P2	Scrophulariaceae	*Eremophila sp. Rudall River (P.G. Wilson 10512)*	Perennial	Shrub	Unknown.	Shrub to 1.5 m high. Pink/mauve flowers.	Rocky, quartz soil surface. Red sand/quartz.	76.2	Low
P2	Malvaceae	*Hibiscus sp. Gurinbiddy Range (M.E. Trudgen MET 15708)*	Perennial	Shrub	Unknown.	Spindly upright shrub to 3 m tall, purple flower.	Rocky (boulder) slope below low cliffs. Gully. Gravelly, pebbly red-brown loam.	37.1	Low
P2	Oxalidaceae	*Oxalis sp. Pilbara (M.E. Trudgen 12725)*	Annual / Perennial	Herb	Unknown.	Small herb to 10 cm tall. Leaves green above, purple below; yellow flowers.	Gully. Brown-red loam.	48.2	Low

Status	Family	Taxon	Longevity	Lifeform	Flowering Time	Description	Habitat	Closest Record (km)	Likelihood
P3	Fabaceae	*Acacia subtiliformis*	Perennial	Shrub	June, yellow	Spindly, slender, erect shrub, to 3.5 m high, phyllodes green, new growth slightly viscid, resinous, aromatic; inflorescence in heads to 6 mm diameter; peduncles red. Fl. yellow, Jun.	Rocky calcrete plateau.	31.1	Low
P3	Chenopodiaceae	*Atriplex flabelliformis*	Perennial	Herb	Unknown.	Monoecious, erect, rounded perennial, herb, to 0.35 m high.	Clay loam, loam. Saline flats or marshes.	76.0	Low
P3	Chenopodiaceae	*Atriplex lindleyi* subsp. *conduplicata*	Annual / Perennial	Herb	Unknown.	Monoecious, short-lived annual or perennial, herb, ca 0.2 m high.	Crabhole plains.	59.5	Low
P3	Polygalaceae	*Comesperma sabulosum*	Perennial	Shrub	Unknown.	Erect shrub to 1 m.	Deep red sands of major dune system.	98.0	Low
P3	Goodeniaceae	*Dampiera atriplicina*	Perennial	Shrub	May or Jul.	Spreading, robust shrub, to 0.5(-1.2) m high. Fl. pink,	Red sand. Sand ridges.	92.2	Low
P3	Goodeniaceae	*Dampiera metallorum*	Perennial	Herb	April/June - Oct.	Rounded, multi-stemmed perennial, herb, to 0.5 m high. Fl. blue, Apr or Jun to Oct.	Skeletal red-brown gravelly soil over banded ironstone. Steep slopes. Summits of hills.	59.0	Low
P3	Cyperaceae	*Eleocharis papillosa*	Annual	Sedge	Nov.	Annual, herb. Fl. brown,	Red clay over granite, open clay flats. Claypans.	67.9	Low
P3	Poaceae	*Eragrostis sp. Erect spikelets (P.K. Latz 2122)*	Perennial	Other Grass	Unknown.	Erect perennial grass to 0.3 m.	Calcrete platform, near saline flat.	52.2	Low
P3	Scrophulariaceae	*Eremophila spongiocarpa*	Perennial	Shrub	May or Sep	Compact succulent-leaved shrub to 1m.	Alluvial semi saline clay plain.	0.0	Low
P3	Euphorbiaceae	*Euphorbia australis var. glabra*	Annual / Perennial	Herb	Unknown.	Prostrate annual or perennial, herb, 0.02-0.1 m high. Fl. red-pink, Apr to Nov.	Broad, flat plain calcrete platform. Plains.	98.2	Low
P3	Cyperaceae	*Fimbristylis sieberiana*	Perennial	Sedge	May to Jun.	Shortly rhizomatous, tufted perennial, grass-like or herb (sedge), 0.25-0.6 m high. Fl. Brown.	Mud, skeletal soil pockets. Pool edges. Sandstone cliffs.	73.6	Low
P3	Goodeniaceae	*Goodenia modesta*	Annual	Herb	Jan to Dec.	Herb, to 0.5 m high. Fl. yellow, probably	Red loam, sand.	97.0	Low
P3	Proteaceae	*Grevillea saxicola*	Perennial	Shrub	Unknown.	Tall shrub to 2.5 m.	Breakaway. Scree slope.	57.3	Low
P3	Fabaceae	*Indigofera gilesii*	Perennial	Shrub	May or August	Shrub, to 1.5 m high. Fl. purple-pink, May or Aug.	Pebbly loam. Amongst boulders & outcrops, hills.	14.6	Low

Status	Family	Taxon	Longevity	Lifeform	Flowering Time	Description	Habitat	Closest Record (km)	Likelihood
P3	Chenopodiaceae	*Maireana prosthecochaeta*	Perennial	Shrub	Unknown.	Open, densely-leaved shrub, 0.3-0.6 m high.	Laterite. Hills, salty places.	48.3	Low
P3	Asteraceae	*Olearia mucronata*	Perennial	Shrub	Unknown.	Densely branched, unpleasantly aromatic shrub, 0.6-1 m high. Fl. white & yellow, Aug to Dec or Jan.	Schistose hills. Drainage channels.	99.2	Low
P3	Asteraceae	*Pilbara trudgenii*	Perennial	Shrub	Unknown.	Gnarled, aromatic shrub, to 1 m high. Fl. Sep.	Skeletal, red stony soil over ironstone. Hill summits. Steep slopes. Screes. Cliff faces.	94.2	Low
P3	Acanthaceae	*Rostellularia adscendens var. latifolia*	Perennial	Herb	Apr to May.	Herb or shrub, 0.1-0.3 m high. Fl. blue-purple-violet.	Drainage area with red-brown loam soils. Ironstone soils. Creeks. Rocky hills.	68.6	Low
P3	Malvaceae	*Sida sp. Barlee Range (S. van Leeuwen 1642)*	Perennial	Shrub	Aug.	Spreading shrub, to 0.5 m high. Fl. Yellow.	Skeletal red soils pockets. Steep slope.	37.6	Low
P3	Solanaceae	*Solanum kentrocaule*	Perennial	Shrub	Unknown.	Shrub to 1.5 m high, extremely prickly. Purple flowers.	Brown/rocky soil. Gorge. Drainage line.	95.3	Low
P3	Stylidiaceae	*Stylidium weeliwolli*	Annual	Herb	Aug to Sep.	Annual, herb, 0.1-0.25 m high, throat appendages 4, rod-shaped. Fl. pink & red.	Gritty sand soil, sandy clay. Edge of watercourses.	58.6	Low
P3	Chenopodiaceae	*Tecticornia medusa*	Perennial	Shrub	Jul - Nov	0.3–0.7 m high, long vegetative branches	This species is restricted to the floodplains of Fortescue Marsh and Weelarrana Lake. Grows in red-brown gritty clay on a saline alluvial plain and is found in dense populations some distance from the shoreline	47.2	Low
P3	Poaceae	*Triodia birriliburu*	Perennial	Hummock Grass	Unknown.	Erect hummock grass to 1.0 m high by 1.0 m wide.	Sandplain, top of dune.	92.3	Low
P3	Poaceae	*Triodia sp. Mt Ella (M.E. Trudgen 12739)*	Perennial	Hummock Grass	Unknown.	Perennial, grass-like or herb, 0.4 m high.	Gullies. Hill slopes. Drainage lines.	10.9	Low
P3	Asteraceae	*Xerochrysum boreale*	Perennial	Herb	Unknown.	Erect perennial, branched herb to 50 cm high. Stems glandular-hirtellus.	Stony surface. Red brown clay loam.	45.4	Low
P4	Fabaceae	*Acacia bromilowiana*	Perennial	Shrub / Tree	July- August. yellow/pink	Tree or shrub, to 12 m high, bark dark grey, fibrous; phyllodes more or less glaucous & slightly pruinose;	High in landscape. Edge of cliff. Rocky ironstone scree. Skeletal soil.	42.6	Low

Status	Family	Taxon	Longevity	Lifeform	Flowering Time	Description	Habitat	Closest Record (km)	Likelihood
						inflorescence in spikes. Fl. yellow/pink, Jul to Aug.			
P4	Brassicaceae	*Lepidium catapycnon*	Perennial	Herb / Shrub	Unknown.	Open, woody perennial, herb or shrub, 0.2-0.3 m high, stems zigzag. Fl. white, Oct.	Skeletal soils. Hillsides.	7.2	Low
P4	Amaranthaceae	*Ptilotus mollis*	Perennial	Shrub	May or Sep.	Compact, perennial shrub, to 0.5 m high, soft grey foliage. Fl. white/pink.	Moderately steep midslope of BIF.	71.2	Low
P4	Amaranthaceae	*Ptilotus trichocephalus*	Perennial	Herb	Sep.	Prostrate, spreading perennial, herb. Fl. white,	Sandy soils. Colluvial plains.	75.4	Low
T (VU/VU)	Lamiaceae	*Pityrodia augustensis*	Perennial	Shrub	Aug to Sept	Bushy shrub, ca 1 m high. Fl. purple/purple-red, Aug to Sep.	Amongst rocks on slopes or in drainage lines.	>50 km	Low

Appendix B: Conservation Codes

Appendix B1: Definitions of Conservation Categories Under the EPBC Act

Category	Definition
Extinct	A native species is eligible to be included in the extinct category at a particular time if, at that time, there is no reasonable doubt that the last member of the species has died.
Extinct in the Wild	A native species is eligible to be included in the extinct in the wild category at a particular time if, at that time: (a) it is known only to survive in cultivation, in captivity or as a naturalised population well outside its past range; or (b) it 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	A native species is eligible to be included in the critically endangered category at a particular time if, at that time, it is facing an extremely high risk of extinction in the wild in the immediate future, as determined in accordance with the prescribed criteria.
Endangered	A native species is eligible to be included in the endangered category at a particular time if, at that time: (a) it is not critically endangered; and (b) it is facing a very high risk of extinction in the wild in the near future, as determined in accordance with the prescribed criteria.
Vulnerable	A native species is eligible to be included in the vulnerable category at a particular time if, at that time: (a) it is not critically endangered or endangered; and (b) it is facing a high risk of extinction in the wild in the medium term future, as determined in accordance with the prescribed criteria.
Conservation Dependent	A native species is eligible to be included in the conservation dependent category at a particular time if, at that time: (a) the species is the focus of a specific conservation program the cessation of which would result in the species becoming vulnerable, endangered or critically endangered; or (b) the following subparagraphs are satisfied: (i) the species is a species of fish; (ii) the species is the focus of a plan of management that provides for management actions necessary to stop the decline of, and support the recovery of, the species so that its chances of long term survival in nature are maximised; (iii) the plan of management is in force under a law of the Commonwealth or of a State or Territory; (iv) cessation of the plan of management would adversely affect the conservation status of the species.

Appendix B2: Definitions of Conservation Categories under the BC Act (DBCA 2019)

Threatened Species: Listed by order of the Minister as Threatened in the category of critically endangered, endangered or vulnerable under section 19(1), or is a rediscovered species to be regarded as Threatened species under section 26(2) of the Biodiversity Conservation Act 2016 (BC Act).
Threatened fauna s 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	Definition
CR	**Critically endangered species** Threatened species considered to be "facing an extremely high risk of extinction in the wild in the immediate future, as determined in accordance with criteria set out in the ministerial guidelines". Listed as critically endangered under section 19(1)(a) of the BC Act in accordance with the criteria set out in section 20 and the ministerial guidelines. Published under schedule 1 of the Wildlife Conservation (Specially Protected Fauna) Notice 2018 for critically endangered fauna or the Wildlife Conservation (Rare Flora) Notice 2018 for critically endangered flora.
EN	**Endangered species** Threatened species considered to be "facing a very high risk of extinction in the wild in the near future, as determined in accordance with criteria set out in the ministerial guidelines". Listed as endangered under section 19(1)(b) of the BC Act in accordance with the criteria set out in section 21 and the ministerial guidelines. Published under schedule 2 of the Wildlife Conservation (Specially Protected Fauna) Notice 2018 for endangered fauna or the Wildlife Conservation (Rare Flora) Notice 2018 for endangered flora.
VU	**Vulnerable species** Threatened species considered to be "facing a high risk of extinction in the wild in the medium-term future, as determined in accordance with criteria set out in the ministerial guidelines". Listed as vulnerable under section 19(1)(c) of the BC Act in accordance with the criteria set out in section 22 and the ministerial guidelines. Published under schedule 3 of the Wildlife Conservation (Specially Protected Fauna) Notice 2018 for vulnerable fauna or the Wildlife Conservation (Rare Flora) Notice 2018 for vulnerable flora.

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.

Category	Definition
EX	**Extinct species** Species where "there is no reasonable doubt that the last member of the species has died", and listing is otherwise in accordance with the ministerial guidelines (section 24 of the BC Act). Published as presumed extinct under schedule 4 of the Wildlife Conservation (Specially Protected Fauna) Notice 2018 for extinct fauna or the Wildlife Conservation (Rare Flora) Notice 2018 for extinct flora.
EW	**Extinct in the wild species** Species that "is known only to survive in cultivation, in captivity or as a naturalised population well outside its past range; and it has not been recorded in its known habitat or expected habitat, at appropriate seasons, anywhere in its past range, despite surveys over a time frame appropriate to its life cycle and form", and listing is otherwise in accordance with the ministerial guidelines (section 25 of the BC Act). Currently there are no Threatened fauna or Threatened flora species listed as extinct in the wild. If listing of a species as extinct in the wild occurs, then a schedule will be added to the applicable notice.

Appendix B3: Definitions of Priority Species Classification (DBCA 2019)

Priority species: Possibly Threatened species that do not meet survey criteria, or are otherwise data deficient, are added to the Priority Fauna or Priority Flora Lists under Priorities 1, 2 or 3. These three categories are ranked in order of Priority for survey and evaluation of conservation status so that consideration can be given to their declaration as Threatened fauna or flora.
Species that are adequately known, are rare but not Threatened, or meet criteria for near Threatened, or that have been recently removed from the Threatened species or other specially protected fauna lists for other than taxonomic reasons, are placed in Priority 4. These species require regular monitoring.
Assessment of Priority codes is based on the Western Australian distribution of the species, unless the distribution in WA is part of a contiguous population extending into adjacent States, as defined by the known spread of locations.

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

Appendix B4: Legal Status Definition of Listed Plants in Western Australia

Legal Status	Definition
Declared Pest, Prohibited – s12	Prohibited organisms are declared pests by virtue of section 22(1) and may only be imported and kept subject to permits.
Declared Pest – s22(2)	Declared pests must satisfy any applicable import requirements when imported and may be subject to control keeping requirements.
Permitted – s11	Permitted organisms must satisfy applicable import requirements and import permits (where required).
Permitted, Requires Permit – r73	Regulation 73 permitted organisms may be subject to restriction under legislation other than the BAM Act (2007).
Unlisted	Unlisted organisms are prohibited in WA.
Control Categories	**Definition**
C1 Exclusion	Organisms should be excluded from parts or all of WA.
C2 Eradication	Organisms should be eradicated from all or parts of WA.
C3 Management	Organisms should have some form of management applied that will alleviate the harmful impact of the organism, reduce the numbers or distribution of the organism or prevent or contain the spread of the organism.
Unassigned	Declared pest that are recognised as having a harmful impact under certain circumstances where their subsequent control requirements are determined by a plan or other legislative arrangements under the Act.
Keeping Categories	**Definition**
Prohibited keeping	Can only be kept under a permit for public display, education or scientific purposes.
Restricted keeping	Kept under a permit by private individuals due to a low risk of becoming a problem for the environment.
Exempt keeping	No permit or conditions are required for keeping. Organism may be subject to restrictions under the Wildlife Conservation Act (WCA, 1950).

Appendix C: Quadrat & Relevé Site Data

Site: Q001	Type: Quadrat	Size: 50 x 50	Date: 03/03/2021	Botanist: Susan Murrey
Landform:	Flat, Rocky Outcrop			
Slope, aspect:	1° - Very Gentle None			
Soil:	Clay, Red/brown			
Rocks:	Calcrete Ironstone			
Abundance:	10 -20% Common			
Size:	60-200 mm - Cobbles			
Fire:	> 5 yrs			
Condition:	Very Good			
Notes:	Tracks,Weeds (Low)			
Veg Unit:	TP1b			
Location (NW):	-23.3247449900954, 119.85553602688			



Species	Height	Cover	Species	Height	Cover
Abutilon lepidum	0.3	0.1	*Heliotropium tanythrix*	0.3	0.1
Acacia citrinoviridis	5	4	*Hibiscus burtonii*	0.3	0.1
Acacia pruinocarpa	5	0.2	*Iseilema dolichotrichum*	0.2	0.1
Acacia sclerosperma subsp. *sclerosperma*	2	0.3	*Malvastrum americanum*	0.5	0.1
Aristida contorta	0.3	0.3	*Paraneurachne muelleri*	0.4	2
Arivela viscosa	0.3	0.1	*Phyllanthus maderaspatensis*	0.2	0.3
Bidens subalternans var. araneosa	0.1	0.1	*Pluchea dunlopii*	0.1	0.1
Boerhavia coccinea	0.1	0.1	*Polygala glaucifolia*	0.1	0.1
Cenchrus ciliaris	0.4	5	*Portulaca oleracea*	0.1	0.1
Corchorus incanus subsp. *incanus*	0.4	0.3	*Ptilotus exaltatus*	0.3	0.5
Corchorus tridens	0.3	0.1	*Ptilotus obovatus*	0.3	0.1
Cucumis variabilis	0.5	0.1	*Ptilotus polystachyus*	0.5	0.1
Dactyloctenium radulans	0.3	0.1	*Rhynchosia minima*	0.3	0.1
Duperreya commixta	0.5	0.5	*Scaevola amblyanthera var. centralis*	0.1	0.1
Enneapogon caerulescens	0.5	0.1	*Senna artemisioides* subsp. *oligophylla*	1	0.2
Enneapogon cylindricus	0.1	10	*Sida fibulifera*	0.2	0.1
Eragrostis eriopoda	0.4	0.1	*Solanum lasiophyllum*	0.3	0.3
Eucalyptus xerothermica	5	5	*Sporobolus australasicus*	0.2	0.1
Euphorbia australis var. subtomentosa	0.1	0.1	*Swainsona leeana*	0.1	0.1
Euphorbia boophthona	0.3	0.1	*Synostemon rhytidospermus*	0.2	0.1
Gomphrena canescens subsp. *canescens*	0.2	0.1	*Tragus australianus*	0.3	0.3
Goodenia ?microptera	0.3	0.1	*Tribulopis angustifolia*	0.2	0.1
Goodenia muelleriana	0.3	0.1	*Tribulus hirsutus*	0.1	0.01
Goodenia prostrata	0.3	0.1	*Triodia pungens*	1	40
Hakea lorea	2	1			

Site: Q002	Type: Quadrat	Size: 30 x 83.3	Date: 04/03/2021	Botanist: Chris Shaw, Melissa Hay, Susan Murrey

Landform:	Drainage, Creek/River
Slope, aspect:	<1° - Level None
Soil:	Clay, Sandy clay, Red/brown
Rocks:	Creek stones Ironstone
Abundance:	50-90% Abundant
Size:	60-200 mm - Cobbles
Fire:	> 5 yrs
Condition:	Good
Notes:	Grazing (Low),Weeds (High)
Veg Unit:	D1b
Location (NW):	-23.315505031496201, 119.854342024773



Species	Height	Cover	Species	Height	Cover
?Amaranthus sp.	0.1	0.1	*Eucalyptus camaldulensis* subsp. *refulgens*	12	40
?Pluchea rubelliflora	0.2	0.1	*Eucalyptus victrix*	10	5
Acacia citrinoviridis	2	5	*Eulalia aurea*	0.3	5
Acacia ligulata	1.6	0.2	*Euphorbia ?biconvexa*	0.2	0.1
Acacia pyrifolia var. morrisonii	2	1	*Glycine canescens*	0.5	0.1
Acacia sclerosperma subsp. *sclerosperma*	2	0.5	*Malvastrum americanum*	0.3	0.3
Arivela viscosa	0.1	0.1	*Melaleuca glomerata*	1.5	0.5
Cenchrus ciliaris	0.5	25	*Petalostylis labicheoides*	2.2	2
Cenchrus setiger	0.3	0.5	*Phyllanthus maderaspatensis*	0.3	0.1
Corchorus crozophorifolius	0.3	0.1	*Polymeria ambigua*	0.3	0.1
Cynodon sp. 1	0.2	2	*Rhynchosia minima*	0.3	0.1
Cyperus vaginatus	0.5	5	*Tephrosia rosea var. Fortescue creeks (M.I.H. Brooker 2186)*	0.5	0.3
Dichrostachys spicata	1	0.1	*Trichodesma zeylanicum*	0.5	0.1
Duperreya commixta	0.1	0.1			

Site: Q003	Type: Quadrat	Size: 50 x 50	Date: 04/03/2021	Botanist: Chris Shaw, Melissa Hay, Susan Murrey

Landform:	Flat, Rocky Outcrop
Slope, aspect:	3° - Gentle None
Soil:	Clay, Red/brown
Rocks:	Calcrete
Abundance:	10 -20% Common
Size:	60-200 mm - Cobbles
Fire:	> 5 yrs
Condition:	Very Good
Notes:	Tracks,Weeds (Low)
Veg Unit:	TP1b
Location (NW):	-23.335758978500898, 119.845316978171



Species	Height	Cover	Species	Height	Cover
Acacia bivenosa	2	1	*Gomphrena kanisii*	0.3	0.1
Acacia citrinoviridis	4	2	*Goodenia microptera*	0.5	0.1
Acacia pruinocarpa	1	0.5	*Goodenia muelleriana*	0.3	0.1
Acacia sclerosperma	5	5	*Hakea lorea* subsp. *lorea*	4	0.2
Arivela viscosa	0.5	0.1	*Indigofera sp.*	0.1	0.1
Cenchrus ciliaris	0.3	1	*Paraneurachne muelleri*	0.5	0.1
Chrysopogon fallax	1	0.5	*Petalostylis labicheoides*	1.5	2
Duperreya commixta	0.2	0.1	*Portulaca oleracea*	0.1	0.1
Enneapogon caerulescens	0.5	0.1	*Ptilotus clementii*	0.3	0.1
Eragrostis desertorum	0.5	0.1	*Ptilotus exaltatus*	0.3	1
Eucalyptus socialis	6	15	*Ptilotus obovatus*	1	0.5
Eucalyptus xerothermica	4	2	*Senna artemisioides* subsp. *oligophylla*	1.2	0.5
Euphorbia biconvexa	0.3	0.1	*Sida fibulifera*	0.2	0.1
Euphorbia tannensis subsp. *eremophila*	0.1	0.1	*Solanum lasiophyllum*	0.5	0.1
Evolvulus alsinoides var. villosicalyx	0.3	0.1	*Sporobolus australasicus*	0.2	0.1
			Tribulus hirsutus	0.5	0.1
			Triodia pungens	0.5	30

Site: Q004	Type: Quadrat	Size: 25 x 100	Date: 04/03/2021	Botanist: Chris Shaw, Melissa Hay, Susan Murrey

Landform:	Drainage, Creek/River
Slope, aspect:	1° - Very Gentle None
Soil:	Sandy clay, Red
Rocks:	Ironstone
Abundance:	50-90% Abundant
Size:	60-200 mm - Cobbles
Fire:	> 5 yrs
Condition:	Very Good
Notes:	Weeds (Medium)
Veg Unit:	D1b
Location (NW):	-23.299728026613501, 119.866205016151



Species	Height	Cover	Species	Height	Cover
Abutilon amplum	1	0.5	*Eucalyptus camaldulensis*	14	10
Acacia citrinoviridis	4	4	*Eulalia aurea*	0.4	0.1
Acacia pyrifolia	1	0.5	*Euphorbia ?biconvexa*	0.2	0.1
Acacia sclerosperma	4	2	*Euphorbia australis*	0.1	0.1
Acacia sericophylla	7	0.5	*Evolvulus alsinoides var. decumbens*	0.25	0.1
Aristida contorta	0.3	0.1	*Gomphrena cunninghamii*	0.1	0.1
Aristida inaequiglumis	0.5	0.2	*Indigofera linnaei*	0.2	0.2
Arivela viscosa	0.5	0.1	*Ipomoea muelleri*	0.2	0.1
Boerhavia coccinea	0.1	0.1	*Malvastrum americanum*	0.4	0.1
Cenchrus ciliaris	0.4	10	*Melaleuca glomerata*	5	15
Cenchrus setiger	0.3	0.1	*Phyllanthus maderaspatensis*	0.3	0.1
Corchorus crozophorifolius	0.5	7	*Ptilotus exaltatus*	0.5	0.1
Crotalaria medicaginea var. neglecta	0.2	0.1	*Rhynchosia minima*	0.2	0.1
Cullen leucanthum	1	0.2	*Salsola australis*	0.2	0.1
Cymbopogon obtectus	0.5	0.2	*Tephrosia rosea var. Fortescue creeks (M.I.H. Brooker 2186)*	0.4	0.2
Cynodon sp. 1	0.15	0.5	*Trichodesma zeylanicum*	0.4	0.1
Cyperus vaginatus	0.5	3	*Triodia pungens*	0.4	0.5
Digitaria brownii	0.5	0.2	*Vachellia farnesiana*	0.4	0.1
Enneapogon lindleyanus	0.75	0.2	*Waltheria indica*	0.5	0.1
Eriachne pulchella subsp. *dominii*	0.2	0.1			

Site: Q005	Type: Quadrat	Size: 30 x 83.3	Date: 05/03/2021	Botanist: Melissa Hay
Landform:	Drainage, Creek/River			
Slope, aspect:	<1° - Level None			
Soil:	Sandy clay, Red/orange/brown			
Rocks:	Ironstone			
Abundance:	>90% Continuous			
Size:	60-200 mm - Cobbles			
Fire:	> 5 yrs			
Condition:	Very Good			
Notes:	Weeds (Low)			
Veg Unit:	D1b			
Location (NW):	-23.341447021812201, 119.78040198795399			



Species	Height	Cover	Species	Height	Cover
?Waltheria sp.	0.3	0.1	*Eriachne pulchella* subsp. *dominii*	0.1	0.1
Acacia citrinoviridis	6	3	*Eucalyptus victrix*	13	10
Acacia pyrifolia	2.2	3	*Euphorbia biconvexa*	0.3	0.1
Alternanthera nodiflora	0.2	0.1	*Gomphrena cunninghamii*	0.1	0.1
Arivela viscosa	0.2	0.1	*Goodenia lamprosperma*	0.2	0.1
Boerhavia coccinea	0.3	0.1	*Heliotropium tenuifolium*	0.1	0.1
Cenchrus ciliaris	0.4	5	*Paspalidium clementii*	0.3	0.1
Corchorus crozophorifolius	0.5	0.5	*Phyllanthus maderaspatensis*	0.3	0.1
Cymbopogon ambiguus	0.5	1	*Pluchea rubelliflora*	0.1	0.1
Enneapogon robustissimus	0.3	0.1	*Tephrosia rosea var. clementii*	0.3	1
Eriachne benthamii	0.5	0.1	*Trichodesma zeylanicum*	0.3	0.1
			Triodia pungens	0.5	0.5

Site: Q006	Type: Quadrat	Size: 50 x 50	Date: 05/03/2021	Botanist: Melissa Hay
Landform:	Flat, Plain			
Slope, aspect:	<1° - Level None			
Soil:	Sandy clay, Sand, Red/orange			
Rocks:				
Abundance:	No rocks			
Size:				
Fire:	> 5 yrs			
Condition:	Very Good			
Notes:	Tracks,Weeds (Low)			
Veg Unit:	TP1a			
Location (NW):	-23.261680975556299, 119.892147006466			



Species	Height	Cover	Species	Height	Cover
Abutilon otocarpum	0.3	0.1	*Goodenia microptera*	0.2	0.1
Acacia ?adsurgens	3	0.1	*Hakea lorea*	3	0.5
Acacia sclerosperma	3	1	*Hibiscus sturtii var. platychlamys*	0.3	0.1
Aristida contorta	0.3	0.1	*Indigofera linnaei*	0.3	0.1
Aristida holathera	0.3	1	*Paraneurachne muelleri*	0.3	0.1
Arivela viscosa	0.1	0.1	*Ptilotus exaltatus*	0.2	0.1
Cenchrus ciliaris	0.3	5	*Rhagodia eremaea*	0.4	0.1
Corymbia hamersleyana	4	1	*Sida cardiophylla*	0.3	0.1
Cymbopogon obtectus	1	0.1	*Sida fibulifera*	0.2	0.1
Dactyloctenium radulans	0.1	0.1	*Solanum lasiophyllum*	0.3	0.1
Eragrostis eriopoda	0.3	0.2	*Sporobolus australasicus*	0.1	0.1
Eragrostis xerophila	0.3	0.1	*Streptoglossa odora*	0.2	0.1
Eriachne aristidea	0.2	0.1	*Tephrosia rosea var. Fortescue creeks (M.I.H. Brooker 2186)*	0.1	0.1
Euphorbia boophthona	0.2	0.1	*Trianthema pilosum*	0.1	0.1
Evolvulus alsinoides var. villosicalyx	0.2	0.1	*Trianthema triquetrum*	0.1	0.1
Gomphrena canescens subsp. *canescens*	0.3	0.1	*Tribulus macrocarpus*	0.2	0.3
			Triodia pungens	0.5	45

Site: Q007	Type: Quadrat	Size: 50 x 50	Date: 05/03/2021	Botanist: Susan Murrey
Landform:	Flat, Plain			
Slope, aspect:	1° - Very Gentle None			
Soil:	Sandy clay loam, Brown			
Rocks:				
Abundance:	No rocks			
Size:				
Fire:	> 5 yrs			
Condition:	Poor			
Notes:	Weeds (High)			
Veg Unit:	A1b			
Location (NW):	-23.265469599999999, 119.89110839999999			



Species	Height	Cover	Species	Height	Cover
Abutilon lepidum	0.5	0.2	*Evolvulus alsinoides var. decumbens*	0.1	0.2
Abutilon otocarpum	0.6	0.1	*Melhania oblongifolia*	0.5	0.1
Acacia citrinoviridis	5	20	*Polymeria ?ambigua*	0.1	0.1
Acacia sclerosperma subsp. *sclerosperma*	3	1.05	*Portulaca oleracea*	0.1	0.1
Arivela viscosa	0.3	1	*Ptilotus astrolasius*	0.5	0.1
Boerhavia coccinea	0.1	0.1	*Ptilotus exaltatus*	0.2	0.2
Cenchrus ciliaris	0.5	75	*Rhynchosia minima*	0.1	0.1
Cucumis variabilis	1	0.1	*Senna notabilis*	0.3	0.1
Enchylaena tomentosa	0.3	0.1	*Sporobolus australasicus*	0.2	0.1
Enneapogon polyphyllus	0.5	0.1	*Trichodesma zeylanicum*	0.8	0.1
			Triodia pungens	0.5	0.1

Site: Q008	Type: Quadrat	Size: 25 x 100	Date: 05/03/2021	Botanist: Chris Shaw
Landform:	Drainage, Creek/River			
Slope, aspect:	<1° - Level None			
Soil:	Sandy clay, Red			
Rocks:	Ironstone			
Abundance:	50-90% Abundant			
Size:	60-200 mm - Cobbles			
Fire:	> 5 yrs			
Condition:	Good			
Notes:	Weeds (Medium)			
Veg Unit:	D1b			
Location (NW):	-23.2671199925243, 119.886838998645			



Species	Height	Cover	Species	Height	Cover
Acacia citrinoviridis	5	2	*Euphorbia coghlanii*	0.25	0.1
Acacia coriacea subsp. *pendens*	6	1.2	*Evolvulus alsinoides var. decumbens*	0.2	0.5
Amaranthus undulatus	0.3	0.3	*Glycine canescens*	0.2	0.1
Aristida holathera var. holathera	0.4	0.6	*Gomphrena canescens* subsp. *canescens*	0.2	0.1
Arivela viscosa	0.3	0.1	*Gossypium robinsonii*	2	0.2
Boerhavia coccinea	0.1	0.1	*Ipomoea muelleri*	0.1	0.1
Cenchrus ciliaris	0.75	10	*Malvastrum americanum*	0.5	0.4
Cenchrus setiger	0.3	2	*Melaleuca glomerata*	6	4
Corchorus crozophorifolius	1	2	*Petalostylis labicheoides*	1	0.2
Corchorus sidoides subsp. *sidoides*	0.3	0.1	*Phyllanthus maderaspatensis*	0.25	0.1
Cullen ?leucanthum	0.5	0.1	*Phyllanthus maderaspatensis*	0.1	0.1
Cyperus vaginatus	0.75	1	*Pterocaulon sphaeranthoides*	0.4	0.2
Enneapogon lindleyanus	0.6	1	*Rhynchosia minima*	0.3	0.1
Eucalyptus camaldulensis	12	15	*Senna notabilis*	0.3	0.1
Eulalia aurea	1	0.75	*Themeda triandra*	1	0.25
Euphorbia australis var. subtomentosa	0.1	0.1	*Trichodesma zeylanicum*	1	0.2
Euphorbia boophthona	0.4	0.1	*Triodia pungens*	0.3	1

Site: Q009	Type: Quadrat	Size: 50 x 50	Date: 06/03/2021	Botanist: Melissa Hay
Landform:	Flat, Plain			
Slope, aspect:	<1° - Level None			
Soil:	Sandy clay, Red/orange			
Rocks:				
Abundance:	No rocks			
Size:				
Fire:	> 5 yrs			
Condition:	Good			
Notes:	Grazing (High),Weeds (High)			
Veg Unit:	A1a			
Location (NW):	-22.9973360337316, 120.195776000618			



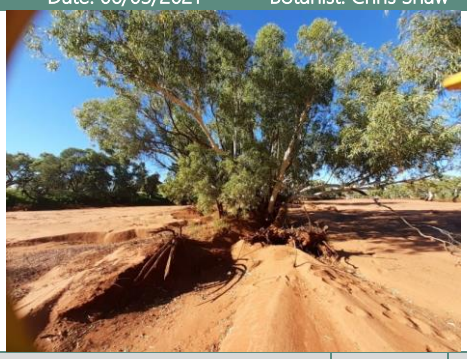
Species	Height	Cover	Species	Height	Cover
Acacia ?aptaneura	4	2	*Enneapogon polyphyllus*	0.1	0.1
Acacia synchronicia	2.1	4	*Ipomoea muelleri*	0.2	0.2
Amaranthus undulatus	0.1	0.1	*Malvastrum americanum*	0.1	0.1
Boerhavia coccinea	0.1	0.1	*Rhagodia eremaea*	1	0.1
Cenchrus ciliaris	0.4	20	*Salsola australis*	0.2	0.1
Corchorus tridens	0.1	2	*Senna artemisioides* subsp. *oligophylla*	1	2
Cullen pogonocarpum	0.1	0.1	*Senna notabilis*	0.1	0.1
Dactyloctenium radulans	0.1	0.1	*Vachellia farnesiana*	2.1	1
			Zaleya galericulata	0.2	1

Site: Q010	Type: Quadrat	Size: 50 x 50	Date: 06/03/2021	Botanist: Susan Murrey
Landform:	Flat, Plain			
Slope, aspect:	<1° - Level None			
Soil:	Sandy clay, Brown			
Rocks:				
Abundance:	No rocks			
Size:				
Fire:	> 5 yrs			
Condition:	Poor			
Notes:	Weeds (High)			
Veg Unit:	A1a			
Location (NW):	-22.984888991340899, 120.19737300462999			



Species	Height	Cover	Species	Height	Cover
Acacia citrinoviridis	4	2	*Corchorus tridens*	0.1	0.1
Acacia macraneura	4	1	*Corymbia hamersleyana*	1.5	0.5
Acacia synchronicia	1	0.5	*Eragrostis xerophila*	0.2	0.1
Acacia tetragonophylla	3	1	*Portulaca oleracea*	0.1	0.1
Boerhavia ?coccinea	0.1	0.1	*Salsola australis*	0.3	0.1
Cenchrus ciliaris	0.5	35	*Vachellia farnesiana*	2	10

Site: Q011	Type: Quadrat	Size: 30 x 83.3	Date: 06/03/2021	Botanist: Chris Shaw
Landform:	Drainage, Creek/River			
Slope, aspect:	<1° - Level None			
Soil:	Sand, Red/orange			
Rocks:	Ironstone			
Abundance:	2-10% Few			
Size:	<6 mm - Fine gravel			
Fire:	> 5 yrs			
Condition:	Very Good			
Notes:	Weeds (Low)			
Veg Unit:	D1a			
Location (NW):	-22.982166968285998, 120.191493015736			



Species	Height	Cover	Species	Height	Cover
Acacia citrinoviridis	6	2	*Eucalyptus camaldulensis*	18	25
Acacia pyrifolia var. morrisonii	1.2	0.2	*Euphorbia coghlanii*	0.4	0.1
Atalaya hemiglauca	2.5	1	*Phyllanthus maderaspatensis*	0.3	0.1
Cenchrus ciliaris	0.3	1			

Site: Q012	Type: Quadrat	Size: 50 x 50	Date: 06/03/2021	Botanist: Melissa Hay
Landform:	Drainage, Creek/River			
Slope, aspect:	<1° - Level None			
Soil:	Sand, Orange			
Rocks:	Ironstone			
Abundance:	20-50% Many			
Size:	60-200 mm - Cobbles			
Fire:	> 5 yrs			
Condition:	Very Good			
Notes:	Grazing (Low),Weeds (Low)			
Veg Unit:	D1a			
Location (NW):	-23.017088994383801, 120.173429008573			



Species	Height	Cover	Species	Height	Cover
Acacia citrinoviridis	4	1	*Cyperus vaginatus*	0.4	0.2
Acacia pyrifolia var. pyrifolia	2	0.1	*Eucalyptus camaldulensis*	10	5
Atalaya hemiglauca	2	0.1	*Euphorbia coghlanii*	0.2	0.1
Cenchrus ciliaris	0.2	0.5	*Goodenia lamprosperma*	0.2	0.1
Corchorus crozophorifolius	0.5	0.1	*Gossypium robinsonii*	2	0.1
Corchorus tridens	0.1	0.1	*Phyllanthus ?maderaspatensis*	0.2	0.1

Site: Q013	Type: Quadrat	Size: 50 x 50	Date: 06/03/2021	Botanist: Susan Murrey
Landform:	Flat, Plain			
Slope, aspect:	<1° - Level None			
Soil:	Sandy clay, Brown			
Rocks:				
Abundance:	No rocks			
Size:				
Fire:	> 5 yrs			
Condition:	Poor			
Notes:	Weeds (High)			
Veg Unit:	A1a			
Location (NW):	-23.0131289642304, 120.18764496780901			



Species	Height	Cover	Species	Height	Cover
Abutilon lepidum	0.5	0.1	*Crotalaria smithiana*	0.3	0.1
Acacia aptaneura	4	25	*Cucumis melo*	0.5	0.2
Acacia citrinoviridis	4	0.5	*Cullen pogonocarpum*	0.8	5
Acacia tetragonophylla	1	0.5	*Evolvulus alsinoides var. villosicalyx*	0.3	0.1
Alternanthera sp.	0.5	3	*Ipomoea muelleri*	0.5	0.2
Amaranthus undulatus	0.3	0.1	*Malvastrum americanum*	0.5	0.5
Boerhavia sp.	0.1	0.1	*Pluchea dentex*	0.3	0.1
Cenchrus ciliaris	0.5	55	*Rhynchosia minima*	0.1	0.1
Corchorus tridens	0.1	0.1	*Senna artemisioides* subsp. *oligophylla*	0.3	0.1
			Streptoglossa decurrens	0.3	0.1

Site: Q014	Type: Quadrat	Size: 50 x 50	Date: 06/03/2021	Botanist: Chris Shaw
Landform:	Flat, Plain			
Slope, aspect:	<1° - Level None			
Soil:	Sandy clay, Red/orange			
Rocks:				
Abundance:	No rocks			
Size:				
Fire:	> 5 yrs			
Condition:	Poor			
Notes:	Grazing (Medium),Weeds (High)			
Veg Unit:	A1a			
Location (NW):	-23.019372979179, 120.181235997006			



Species	Height	Cover	Species	Height	Cover
Abutilon lepidum	0.5	0.5	*Corymbia hamersleyana*	1	0.2
Acacia ?macraneura	3	4	*Cucumis melo*	0.1	0.1
Acacia citrinoviridis	3.5	25	*Cullen ?pogonocarpum*	1	0.5
Amaranthus undulatus	0.35	0.1	*Malvastrum americanum*	1	1
Atalaya hemiglauca	2.5	2	*Portulaca oleracea*	0.1	0.2
Boerhavia coccinea	0.1	0.2	*Pterocaulon sphaeranthoides*	0.4	0.2
Cenchrus ciliaris	0.3	35	*Ptilotus exaltatus*	0.3	0.1
Cenchrus setiger	0.5	2	*Salsola australis*	0.5	0.1
Corchorus tridens	0.35	0.1	*Vachellia farnesiana*	1	0.1
			Zaleya galericulata	0.1	0.2

Site: Q015	Type: Quadrat	Size: 50 x 50	Date: 07/03/2021	Botanist: Melissa Hay
Landform:	Flat, Plain			
Slope, aspect:	<1° - Level None			
Soil:	Clay, Sandy clay, Red/orange			
Rocks:				
Abundance:	No rocks			
Size:				
Fire:	> 5 yrs			
Condition:	Good			
Notes:	Weeds (High)			
Veg Unit:	A1a			
Location (NW):	-23.075146, 120.123527			



Species	Height	Cover	Species	Height	Cover
?Portulaca filifolia	0.2	0.1	*Indigofera linnaei*	0.2	0.1
Acacia ?aptaneura	5	3	*Ipomoea muelleri*	0.1	0.1
Acacia citrinoviridis	5	0.2	*Maireana planifolia*	0.3	0.1
Aristida contorta	0.3	0.1	*Perotis rara*	0.1	0.1
Arivela viscosa	0.3	0.1	*Portulaca oleracea*	0.1	0.1
Boerhavia coccinea	0.1	0.1	*Rhagodia eremaea*	1	0.1
Cenchrus ciliaris	0.3	30	*Sclerolaena densiflora*	0.1	0.1
Citrullus amarus	0.1	0.1	*Senna artemisioides* subsp. *helmsii*	0.3	0.3
Corchorus tridens	0.1	0.1	*Senna artemisioides* subsp. *oligophylla*	0.3	0.1
Corymbia hamersleyana	4	1	*Solanum lasiophyllum*	0.2	0.1
Dactyloctenium radulans	0.1	0.1	*Swainsona ?elegantoides*	0.1	0.1
Enneapogon polyphyllus	0.1	0.1	*Tephrosia sp. Newman (A.A. Mitchell PRP 29)*	0.3	0.1
Eragrostis xerophila	0.2	0.1	*Tephrosia sp. Northern (K.F. Kenneally 11950)*	0.1	0.1
Evolvulus alsinoides var. villosicalyx	0.1	0.1	*Tragus australianus*	0.1	0.1
Goodenia prostrata	0.1	0.1	*Trianthema pilosum*	0.1	0.1
Indigofera colutea	0.2	0.2	*?Portulaca filifolia*	0.2	0.1
Indigofera linifolia	0.1	0.1			

Site: Q016	Type: Quadrat	Size: 25 x 100	Date: 07/03/2021	Botanist: Susan Murrey
Landform:	Drainage, Drainage line on flat			
Slope, aspect:	<1° - Level None			
Soil:	Sandy clay, Orange			
Rocks:	Ironstone			
Abundance:	50-90% Abundant			
Size:	60-200 mm - Cobbles			
Fire:	> 5 yrs			
Condition:	Excellent			
Notes:	None			
Veg Unit:	D1a			
Location (NW):	-23.062531985342499, 120.130383996292			



Species	Height	Cover	Species	Height	Cover
Acacia coriacea subsp. *pendens*	1.5	0.5	*Eucalyptus camaldulensis*	12	20
Acacia pyrifolia var. morrisonii	1.2	1	*Eulalia aurea*	0.5	0.5
Cyperus vaginatus	0.5	1	*Goodenia lamprosperma*	0.3	0.2
			Melaleuca glomerata	1.5	1

Site: Q017	Type: Quadrat	Size: 50 x 50	Date: 07/03/2021	Botanist: Chris Shaw
Landform:	Flat, Plain			
Slope, aspect:	<1° - Level None			
Soil:	Clay, Sandy clay, Red			
Rocks:				
Abundance:	No rocks			
Size:				
Fire:	> 5 yrs			
Condition:	Good			
Notes:	Weeds (Medium)			
Veg Unit:	A1a			
Location (NW):	-23.066845983266798, 120.130234966054			



Species	Height	Cover	Species	Height	Cover
?Portulaca filifolia	0.3	0.2	*Dactyloctenium radulans*	0.2	0.5
Acacia ?paraneura	4	10	*Enneapogon cylindricus*	0.2	0.1
Acacia aptaneura	1.5	1	*Evolvulus alsinoides var. decumbens*	0.2	0.5
Acacia citrinoviridis	2	0.3	*Evolvulus alsinoides var. villosicalyx*	0.2	0.1
Acacia paraneura	4	1	*Indigofera colutea*	0.25	2.5
Acacia synchronicia	1	3	*Indigofera linifolia*	0.3	1
Acacia tetragonophylla	1	2	*Ipomoea muelleri*	0.1	0.1
Arivela viscosa	0.3	0.1	*Portulaca oleracea*	0.1	0.1
Boerhavia coccinea	0.1	3	*Rhagodia eremaea*	1	0.3
Cenchrus ciliaris	0.3	12	*Salsola australis*	0.3	0.5
Cenchrus setiger	0.3	1	*Senna artemisioides* subsp. *helmsii*	1	0.2
Corchorus tridens	0.1	1	*Tephrosia sp. 1*	0.1	0.1
Crotalaria smithiana	0.2	0.2	*Tragus australianus*	0.1	0.1
Cullen ?pogonocarpum	0.5	0.1	*Vachellia farnesiana*	1	0.2
			?Portulaca filifolia	0.3	0.2

Site: Q018	Type: Quadrat	Size: 50 x 50	Date: 07/03/2021	Botanist: Melissa Hay
Landform:	Flat, Plain			
Slope, aspect:	<1° - Level None			
Soil:	Sandy clay, Sand, Red/orange			
Rocks:				
Abundance:	No rocks			
Size:				
Fire:	> 5 yrs			
Condition:	Good			
Notes:	Grazing (Low),Weeds (Medium)			
Veg Unit:	A1a			
Location (NW):	-23.087698984891102, 120.128604015335			



Species	Height	Cover	Species	Height	Cover
?Portulaca filifolia	0.2	0.1	*Heliotropium tanythrix*	0.2	0.1
Acacia macraneura	4	3	*Indigofera colutea*	0.2	5
Acacia pruinocarpa	4	1	*Indigofera linnaei*	0.2	0.1
Acacia synchronicia	1	0.1	*Ipomoea muelleri*	0.2	0.1
Acacia tetragonophylla	1	0.1	*Maireana tomentosa*	0.3	0.1
Aristida contorta	0.2	0.1	*Perotis rara*	0.1	0.1
Arivela viscosa	0.3	0.2	*Ptilotus obovatus*	0.2	0.1
Boerhavia coccinea	0.2	0.1	*Rhagodia eremaea*	0.6	0.1
Cenchrus ciliaris	0.3	2	*Rhagodia eremaea*	1	0.1
Cenchrus setiger	0.3	0.1	*Rhynchosia minima*	0.3	0.1
Chrysopogon fallax	0.2	0.1	*Sclerolaena densiflora*	0.2	0.1
Dactyloctenium radulans	0.1	0.1	*Senna artemisioides* subsp. *helmsii*	1	0.2
Enneapogon polyphyllus	0.2	35	*Senna artemisioides* subsp. *oligophylla*	1	0.1
Eragrostis xerophila	0.3	0.1	*Senna notabilis*	0.2	0.1
Eremophila forrestii	0.5	0.1	*Tephrosia sp. Newman (A.A. Mitchell PRP 29)*	0.2	0.1
Euphorbia coghlanii	0.2	0.1	*Tephrosia sp. Northern (K.F. Kenneally 11950)*	0.2	0.1
Evolvulus alsinoides var. villosicalyx	0.1	0.2	*Tragus australianus*	0.1	0.1
Gomphrena canescens subsp. *canescens*	0.3	0.1	*Triumfetta chaetocarpa*	0.2	0.1
Goodenia prostrata	0.1	0.2			

Site: Q019	Type: Quadrat	Size: 50 x 50	Date: 07/03/2021	Botanist: Susan Murrey
Landform:	Flat, Plain			
Slope, aspect:	<1° - Level None			
Soil:	Sandy clay, Orange/brown			
Rocks:				
Abundance:	No rocks			
Size:				
Fire:	> 5 yrs			
Condition:	Poor			
Notes:	Weeds (High)			
Veg Unit:	A1a			
Location (NW):	-23.0682610161602, 120.120892999693			



Species	Height	Cover	Species	Height	Cover
Abutilon lepidum	1	0.1	*Cucumis melo*	0.2	0.1
Acacia citrinoviridis	6	30	*Cucumis variabilis*	1	0.5
Boerhavia coccinea	0.1	0.1	*Duperreya commixta*	0.4	0.2
Capparis spinosa	1	0.1	*Evolvulus alsinoides var. villosicalyx*	0.3	0.1
Cenchrus ciliaris	0.5	65	*Malvastrum americanum*	0.5	0.1
Cenchrus setiger	0.5	5	*Portulaca oleracea*	0.1	0.1
Clerodendrum ?floribundum	1	0.1	*Sida fibulifera*	0.8	0.1
Corymbia hamersleyana	7	5	*Trichodesma zeylanicum*	0.5	0.1
			Vachellia farnesiana	2	1

Site: Q020	Type: Quadrat	Size: 50 x 50	Date: 07/03/2021	Botanist: Chris Shaw
Landform:	Flat, Plain			
Slope, aspect:	1° - Very Gentle East			
Soil:	Clay, Sandy clay, Red/orange			
Rocks:				
Abundance:	No rocks			
Size:				
Fire:	> 5 yrs			
Condition:	Good			
Notes:	Weeds (Medium)			
Veg Unit:	A1a			
Location (NW):	-23.071593996137299, 120.127271041274			



Species	Height	Cover	Species	Height	Cover
?Portulaca filifolia	0.2	0.2	*Goodenia muelleriana*	0.1	0.1
Abutilon lepidum	0.4	0.1	*Hakea lorea*	2.5	0.2
Acacia ?paraneura	3	3	*Heliotropium tanythrix*	0.3	0.5
Acacia aneura	2	0.5	*Indigofera colutea*	0.2	0.5
Acacia dictyophleba	2	2	*Indigofera linifolia*	0.1	0.4
Acacia pruinocarpa	1	0.2	*Ipomoea muelleri*	0.1	0.1
Acacia tetragonophylla	0.75	0.1	*Iseilema vaginiflorum*	0.2	0.3
Alysicarpus muelleri	0.5	0.2	*Portulaca cyclophylla*	0.1	0.2
Boerhavia coccinea	0.1	0.2	*Portulaca oleracea*	0.1	0.1
Cenchrus ciliaris	0.3	20	*Pterocaulon sphaeranthoides*	0.5	0.1
Cenchrus setiger	0.3	1	*Ptilotus helipteroides*	0.3	0.2
Chrysopogon fallax	0.7	0.4	*Ptilotus obovatus*	0.4	0.5
Corchorus sidoides subsp. *sidoides*	0.3	0.1	*Rhagodia eremaea*	0.5	0.3
Corchorus tridens	0.1	0.1	*Rhynchosia minima*	0.1	0.1
Crotalaria smithiana	0.4	0.5	*Salsola australis*	0.3	0.1
Cullen ?pogonocarpum	0.2	0.1	*Senna artemisioides* subsp. *helmsii*	1	3
Dactyloctenium radulans	0.1	0.1	*Senna artemisioides* subsp. *oligophylla*	1	1
Duperreya commixta	0.4	0.1	*Senna notabilis*	0.2	0.1
Enneapogon cylindricus	0.3	4	*Solanum lasiophyllum*	0.3	0.1
Euphorbia coghlanii	0.3	0.1	*Tephrosia sp. 1*	0.15	0.1
Evolvulus alsinoides var. villosicalyx	0.1	0.1			
Gomphrena canescens subsp. *canescens*	0.2	0.1			

Site: Q021	Type: Quadrat	Size: 50 x 50	Date: 07/03/2021	Botanist: Melissa Hay
Landform:	Drainage, Floodplain			
Slope, aspect:	<1° - Level None			
Soil:	Sandy clay, Red/orange			
Rocks:				
Abundance:	No rocks			
Size:				
Fire:	> 5 yrs			
Condition:	Poor			
Notes:	Weeds (High)			
Veg Unit:	A1b			
Location (NW):	-23.181500025093499, 120.01225397922001			



Species	Height	Cover	Species	Height	Cover
?Portulaca filifolia	0.1	0.1	*Evolvulus alsinoides var. villosicalyx*	0.1	0.1
Abutilon lepidum	0.2	0.1	*Gomphrena canescens* subsp. *canescens*	0.1	0.1
Abutilon otocarpum	0.3	0.1	*Indigofera linnaei*	0.2	0.1
Acacia citrinoviridis	8	40	*Ipomoea muelleri*	0.3	0.1
Amaranthus cuspidifolius	0.1	0.1	*Jasminum didymum* subsp. *lineare*	0.2	0.1
Arivela viscosa	0.1	0.1	*Malvastrum americanum*	0.2	0.1
Cenchrus ciliaris	0.4	60	*Perotis rara*	0.1	0.1
Cenchrus setiger	1	0.1	*Ptilotus helipteroides*	0.2	0.1
Corchorus tridens	0.1	0.1	*Senna artemisioides* subsp. *helmsii*	1	0.1
Duperreya commixta	0.2	0.1	*Solanum lasiophyllum*	0.2	0.1
Dysphania rhadinostachya	0.1	0.1	*Sporobolus australasicus*	0.1	0.1
Enneapogon polyphyllus	0.2	0.1	*Trianthema pilosum*	0.1	0.1
			Triodia pungens	0.1	0.1

Site: Q022	Type: Quadrat	Size: 50 x 50	Date: 07/03/2021	Botanist: Chris Shaw, Susan Murrey
Landform:	Flat, Plain			
Slope, aspect:	<1° - Level None			
Soil:	Sand, Red/orange			
Rocks:				
Abundance:	No rocks			
Size:				
Fire:	2-5 yrs			
Condition:	Excellent			
Notes:	None			
Veg Unit:	TP1a			
Location (NW):	-23.179484009742701, 120.010007964447			



Species	Height	Cover	Species	Height	Cover
Acacia dictyophleba	0.1	1	*Hibiscus sturtii var. campylochlamys*	0.3	0.1
Acacia pachyacra	0.4	0.2	*Paraneurachne muelleri*	0.5	0.1
Aristida contorta	0.3	0.1	*Paspalidium rarum*	0.5	0.1
Aristida holathera var. holathera	0.5	0.1	*Perotis rara*	0.2	0.1
Aristida hygrometrica	0.5	1	*Portulaca oleracea*	0.1	0.1
Arivela viscosa	0.5	0.1	*Ptilotus exaltatus*	0.2	0.1
Boerhavia coccinea	0.1	0.1	*Ptilotus helipteroides*	0.2	0.1
Cymbopogon ambiguus	0.5	0.1	*Ptilotus obovatus*	0.1	1
Dactyloctenium radulans	0.2	0.1	*Senna artemisioides* subsp. *helmsii*	0.5	1
Eragrostis desertorum	0.3	0.1	*Senna artemisioides* subsp. *oligophylla*	0.5	4
Eragrostis eriopoda	0.5	0.1	*Senna notabilis*	0.2	0.5
Eriachne aristidea	0.3	0.5	*Sporobolus australasicus*	0.2	0.1
Eriachne pulchella subsp. *pulchella*	0.1	0.2	*Tephrosia sp. Newman (A.A. Mitchell PRP 29)*	0.1	0.1
Euphorbia tannensis subsp. *eremophila*	0.5	0.1	*Trianthema pilosum*	0.1	0.2
Fimbristylis dichotoma	0.4	0.5	*Tribulus macrocarpus*	0.1	0.1
Goodenia microptera	0.3	0.2	*Trichodesma zeylanicum*	0.3	0.1
Goodenia muelleriana	0.3	0.2	*Triodia pungens*	0.3	10

Site: Q023	Type: Quadrat	Size: 50 x 50	Date: 08/03/2021	Botanist: Melissa Hay
Landform:	Flat, Plain			
Slope, aspect:	<1° - Level None			
Soil:	Sand, Red/orange			
Rocks:				
Abundance:	No rocks			
Size:				
Fire:	> 5 yrs			
Condition:	Excellent			
Notes:	None			
Veg Unit:	TP1a			
Location (NW):	-23.1286200229078, 120.085739968344			



Species	Height	Cover	Species	Height	Cover
?Portulaca filifolia	0.2	0.1	*Goodenia tenuiloba*	0.2	0.1
Abutilon macrum	0.3	0.1	*Hakea chordophylla*	0.5	0.1
Abutilon otocarpum	0.3	0.1	*Hakea lorea*	3	1
Acacia dictyophleba	2.1	1	*Heliotropium inexplicitum*	0.2	0.1
Acacia tetragonophylla	1.8	0.1	*Hibiscus sturtii var. campylochlamys*	0.2	0.1
Aristida contorta	0.3	0.1	*Indigofera linifolia*	0.1	0.1
Aristida holathera var. holathera	0.2	0.5	*Indigofera linnaei*	0.2	0.1
Aristida latifolia	0.3	0.1	*Paraneurachne muelleri*	0.3	1
Boerhavia coccinea	0.1	0.1	*Polygala ?glaucifolia*	0.1	0.1
Corchorus sidoides subsp. *sidoides*	0.3	0.1	*Pterocaulon sphacelatum*	0.3	0.1
Cucumis variabilis	0.1	0.1	*Ptilotus astrolasius*	0.4	0.1
Enneapogon polyphyllus	0.2	0.1	*Ptilotus exaltatus*	0.2	0.1
Eragrostis eriopoda	0.2	0.1	*Ptilotus helipteroides*	0.1	0.1
Euphorbia australis var. subtomentosa	0.2	0.1	*Rhynchosia minima*	0.2	0.1
Euphorbia coghlanii	0.2	0.1	*Senna artemisioides* subsp. *helmsii*	0.5	0.3
Evolvulus alsinoides var. villosicalyx	0.2	0.1	*Sida clementii*	0.3	0.1
Gomphrena canescens subsp. *canescens*	0.3	0.1	*Sida fibulifera*	0.3	0.1
Goodenia nuda	0.2	0.1	*Solanum lasiophyllum*	0.5	0.1
Goodenia prostrata	0.2	0.1	*Streptoglossa ?decurrens*	0.2	0.1
			Tephrosia sp. Northern (K.F. Kenneally 11950)	0.1	0.5
			Tribulus sp. 1	0.1	0.1
			Triodia pungens	0.3	35

Site: Q024	Type: Quadrat	Size: 50 x 50	Date: 08/03/2021	Botanist: Susan Murrey
Landform:	Flat, Plain			
Slope, aspect:	<1° - Level None			
Soil:	Sandy clay, Brown			
Rocks:				
Abundance:	No rocks			
Size:				
Fire:	> 5 yrs			
Condition:	Very Good			
Notes:	None			
Veg Unit:	BM1			
Location (NW):	-23.1164690293371, 120.09373404085601			



Species	Height	Cover	Species	Height	Cover
?Lysiana sp.	0.4	0.1	*Evolvulus alsinoides var. villosicalyx*	0.3	0.1
Abutilon oxycarpum subsp. *Prostrate (A.A. Mitchell PRP 1266)*	0.4	0.1	*Gomphrena kanisii*	0.3	0.1
Acacia aptaneura	5	35	*Goodenia muelleriana*	0.15	0.2
Arivela viscosa	0.5	0.1	*Heliotropium sp. 1*	0.3	1
Blumea tenella	0.15	0.1	*Hibiscus burtonii*	0.5	0.1
Chloris pumilio	0.5	5	*Paspalidium rarum*	0.2	3
Corchorus sp.	0.2	0.1	*Perotis rara*	0.2	1
Corchorus tridens	0.2	0.1	*Poaceae sp. 1*	1	0.2
Dichanthium sericeum	0.2	0.1	*Portulaca pilosa*	0.2	0.1
Digitaria ctenantha	0.5	40	*Ptilotus gaudichaudii*	0.4	0.1
Eremophila forrestii subsp. *forrestii*	0.8	0.5	*Senna artemisioides* subsp. *oligophylla*	0.3	0.1
Euphorbia coghlanii	0.3	0.1	*Sida fibulifera*	0.5	0.1
Euphorbia sp. 1	0.2	0.1	*Themeda triandra*	0.3	0.5

Site: Q025	Type: Quadrat	Size: 50 x 50	Date: 08/03/2021	Botanist: Chris Shaw
Landform:	Flat, Plain			
Slope, aspect:	3° - Gentle West			
Soil:	Clay, Sandy clay, Red/orange			
Rocks:	Ironstone			
Abundance:	<2% Very few			
Size:	6-20 mm - Medium gravel			
Fire:	> 5 yrs			
Condition:	Good			
Notes:	Grazing (Medium),Weeds (Medium)			
Veg Unit:	A1b			
Location (NW):	-23.112459965050199, 120.08877597749201			



Species	Height	Cover	Species	Height	Cover
?Portulaca filifolia	0.1	0.1	*Gomphrena canescens* subsp. *canescens*	0.3	0.1
Abutilon ?otocarpum	0.3	0.2	*Goodenia prostrata*	0.1	0.2
Acacia citrinoviridis	2.5	12	*Heliotropium crispatum*	0.3	0.1
Acacia tetragonophylla	1.5	0.5	*Heliotropium tanythrix*	0.2	0.1
Alysicarpus muelleri	0.1	0.2	*Indigofera colutea*	0.2	0.1
Arivela viscosa	0.3	1.5	*Ipomoea muelleri*	0.2	0.1
Boerhavia coccinea	0.1	1	*Maireana ?planifolia*	1	0.1
Bothriochloa sp.	0.3	0.1	*Malvastrum americanum*	0.3	0.1
Cenchrus ciliaris	0.3	18	*Phyllanthus maderaspatensis*	0.15	0.1
Cenchrus setiger	0.3	0.1	*Portulaca oleracea*	0.1	0.2
Corymbia hamersleyana	4	2	*Ptilotus exaltatus*	0.2	0.1
Dactyloctenium radulans	0.1	0.2	*Ptilotus helipteroides*	0.1	0.1
Duperreya commixta	0.4	0.1	*Rhynchosia minima*	0.2	0.1
Euphorbia boophthona	0.25	0.1	*Sclerolaena costata*	0.3	0.1
Euphorbia coghlanii	0.3	0.1	*Senna artemisioides* subsp. *helmsii*	1	0.2
Euphorbia ferdinandi var. ferdinandi	0.1	0.1	*Senna artemisioides* subsp. *oligophylla*	1	0.5
Evolvulus alsinoides var. decumbens	0.2	0.1	*Solanum lasiophyllum*	0.3	0.1
Evolvulus alsinoides var. villosicalyx	0.2	0.4	*Sporobolus australasicus*	0.2	0.2
Glycine canescens	0.3	0.1	*Tephrosia sp. Northern (K.F. Kenneally 11950)*	0.1	0.3
?Portulaca filifolia	0.1	0.1	*Trianthema pilosum*	0.1	0.1
			Triodia ?pungens	0.3	0.2
			Zaleya galericulata	0.1	0.1

Site: Q026	Type: Quadrat	Size: 50 x 50	Date: 08/03/2021	Botanist: Melissa Hay
Landform:	Flat, Plain			
Slope, aspect:	<1° - Level None			
Soil:	Clay, Red/orange			
Rocks:				
Abundance:	No rocks			
Size:				
Fire:	> 5 yrs			
Condition:	Excellent			
Notes:	Grazing (Low),Weeds (Low)			
Veg Unit:	A1a			
Location (NW):	-23.141081985086199, 120.088244983926			



Species	Height	Cover	Species	Height	Cover
?Portulaca filifolia	0.2	0.1	*Gomphrena canescens* subsp. *canescens*	0.2	0.1
Abutilon macrum	0.3	0.1	*Goodenia nuda*	0.2	0.1
Abutilon macrum	0.2	0.1	*Goodenia prostrata*	0.1	0.2
Acacia macraneura	5	3	*Heliotropium sp. 2*	0.1	0.1
Acacia synchronicia	0.5	0.1	*Hibiscus sturtii*	0.3	0.1
Aristida contorta	0.3	60	*Hibiscus sturtii var. campylochlamys*	0.2	0.1
Arivela viscosa	0.2	0.1	*Ipomoea muelleri*	0.1	0.1
Boerhavia coccinea	0.2	0.1	*Maireana planifolia*	0.5	0.1
Chloris pumilio	0.2	0.5	*Portulaca oleracea*	0.1	0.1
Chrysopogon fallax	0.3	0.5	*Ptilotus helipteroides*	0.2	0.1
Dactyloctenium radulans	0.1	0.1	*Rhynchosia minima*	0.5	0.1
Enneapogon polyphyllus	0.2	0.1	*Senna artemisioides* subsp. *helmsii*	1	0.2
Eragrostis setifolia	0.3	5	*Senna artemisioides* subsp. *oligophylla*	1	3
Eragrostis sp.	0.2	0.1	*Sida fibulifera*	0.2	0.1
Eremophila lanceolata	0.1	0.1	*Solanum lasiophyllum*	0.3	0.1
Euphorbia coghlanii	0.2	0.1	*Tephrosia rosea var. clementii*	0.3	0.5
Euphorbia sp. 2	0.1	0.1	*Tephrosia sp. Northern (K.F. Kenneally 11950)*	0.2	0.1
Evolvulus alsinoides var. villosicalyx	0.1	0.1	*Tragus australianus*	0.1	0.1
			Triodia pungens	0.3	0.1

Site: Q027	Type: Quadrat	Size: 50 x 50	Date: 08/03/2021	Botanist: Susan Murrey
Landform:	Flat, Plain			
Slope, aspect:	<1° - Level None			
Soil:	Sand, Orange			
Rocks:				
Abundance:	No rocks			
Size:				
Fire:	> 5 yrs			
Condition:	Excellent			
Notes:	None			
Veg Unit:	TP1a			
Location (NW):	-23.126836018636801, 120.090176006779			



Species	Height	Cover	Species	Height	Cover
Acacia dictyophleba	2	5	*Hibiscus sturtii var. campylochlamys*	0.3	0.1
Aristida holathera var. holathera	0.3	0.5	*Paraneurachne muelleri*	0.5	0.1
Enneapogon polyphyllus	0.3	0.1	*Ptilotus exaltatus*	0.3	0.1
Eragrostis eriopoda	0.5	1	*Senna artemisioides* subsp. *oligophylla*	0.2	0.1
Euphorbia sp. 1	0.2	0.1	*Streptoglossa ?decurrens*	0.3	0.1
Evolvulus alsinoides var. villosicalyx	0.3	0.1	*Tephrosia rosea var. Fortescue creeks (M.I.H. Brooker 2186)*	0.2	0.5
Gomphrena kanisii	0.3	0.1	*Tephrosia sp. 2*	0.2	0.1
Goodenia microptera	0.4	0.1	*Trianthema pilosum*	0.1	0.1
Goodenia muelleriana	0.1	0.2	*Tribulus macrocarpus*	0.1	1
Hakea lorea subsp. *lorea*	3	1	*Trichodesma zeylanicum*	0.5	0.1
			Triodia pungens	0.5	50

Site: Q028	Type: Quadrat	Size: 50 x 50	Date: 08/03/2021	Botanist: Chris Shaw
Landform:	Flat, Plain			
Slope, aspect:	<1° - Level None			
Soil:	Clay, Red/orange			
Rocks:				
Abundance:	No rocks			
Size:				
Fire:	> 5 yrs			
Condition:	Very Good			
Notes:	Weeds (Low), Grazing (Low)			
Veg Unit:	A1a			
Location (NW):	-23.108086036518198, 120.101154958829			



Species	Height	Cover	Species	Height	Cover
?Portulaca filifolia	0.15	0.1	*Indigofera linnaei*	0.25	0.2
Acacia aptaneura	3	7	*Iseilema vaginiflorum*	0.2	0.2
Acacia synchronicia	1	0.2	*Maireana planifolia*	0.4	0.5
Alysicarpus muelleri	0.1	0.1	*Perotis rara*	0.1	0.1
Amaranthus sp.	0.1	0.1	*Polygala glaucifolia*	0.05	0.1
Aristida contorta	0.25	4	*Portulaca cyclophylla*	0.1	0.1
Arivela viscosa	0.3	0.1	*Portulaca oleracea*	0.1	0.1
Boerhavia coccinea	0.1	0.2	*Ptilotus helipteroides*	0.1	0.15
Cenchrus ciliaris	0.5	0.3	*Ptilotus obovatus*	1	0.1
Chloris pectinata	0.3	0.1	*Rhynchosia minima*	0.1	0.1
Cymbopogon obtectus	0.3	0.1	*Senna artemisioides* subsp. *helmsii*	1	5
Dactyloctenium radulans	0.1	0.5	*Senna artemisioides* subsp. *oligophylla*	1	1
Dichanthium sericeum subsp. *humilius*	0.3	0.2	*Solanum lasiophyllum*	0.3	0.1
Enneapogon cylindricus	0.2	2	*Stemodia viscosa*	0.2	0.1
Eragrostis xerophila	0.2	5	*Swainsona decurrens*	0.25	0.1
Euphorbia coghlanii	0.2	0.1	*Tephrosia sp. 2*	0.1	0.1
Euphorbia ferdinandi var. ferdinandi	0.1	0.1	*Tephrosia sp. Northern (K.F. Kenneally 11950)*	0.2	0.2
Evolvulus alsinoides var. decumbens	0.15	2	*Tragus australianus*	0.2	0.2
Evolvulus alsinoides var. villosicalyx	0.2	0.1			
Gomphrena canescens subsp. *canescens*	0.4	0.2			
Gomphrena cunninghamii	0.25	0.1			
Goodenia ?muelleriana	0.1	0.1			
Goodenia prostrata	0.1	0.5			
Heliotropium cunninghamii	0.2	5			
Heliotropium heteranthum	0.1	0.1			
Hibiscus sturtii var. campylochlamys	0.3	0.1			
Indigofera colutea	0.1	0.2			
Indigofera linifolia	0.3	0.1			

Site: Q029	Type: Quadrat	Size: 50 x 50	Date: 08/03/2021	Botanist: Melissa Hay
Landform:	Hill,Slope,Simple			
Slope, aspect:	3° - Gentle North			
Soil:	Sandy clay, Red/orange			
Rocks:	Ironstone			
Abundance:	>90% Continuous			
Size:	200-600 mm - Stones			
Fire:	2-5 yrs			
Condition:	Excellent			
Notes:	None			
Veg Unit:	H1			
Location (NW):	-23.183325016870999, 119.923709984868			



Species	Height	Cover	Species	Height	Cover
Acacia bivenosa	2	0.1	*Paraneurachne muelleri*	0.2	0.1
Acacia citrinoviridis	1.5	0.1	*Portulaca cyclophylla*	0.1	0.1
Acacia pruinocarpa	2.2	0.1	*Ptilotus astrolasius*	0.3	0.1
Afrohybanthus aurantiacus	0.2	0.1	*Ptilotus calostachyus*	0.2	0.1
Aristida holathera var. holathera	0.3	0.2	*Ptilotus exaltatus*	0.2	0.1
Corchorus incanus subsp. *incanus*	0.5	4	*Ptilotus rotundifolius*	0.5	0.1
Dampiera candicans	0.5	0.1	*Senna glutinosa* subsp. *glutinosa*	1	0.3
Dolichocarpa crouchiana	0.1	0.1	*Sida arenicola*	0.6	0.1
Eucalyptus leucophloia	5	3	*Solanum lasiophyllum*	0.3	0.1
Evolvulus alsinoides var. villosicalyx	0.2	0.1	*Streptoglossa decurrens*	0.3	0.1
Fimbristylis simulans	0.2	0.1	*Stylobasium spathulatum*	1	0.1
Gomphrena canescens subsp. *canescens*	0.2	0.1	*Tephrosia sp. Newman (A.A. Mitchell PRP 29)*	0.3	0.1
Goodenia muelleriana	0.2	0.1	*Trachymene oleracea*	0.1	0.1
Hakea lorea	1	0.1	*Tribulus suberosus*	0.3	0.1
Heliotropium ovalifolium	0.2	0.1	*Trigastrotheca molluginea*	0.2	0.1
			Triodia pungens	0.4	15

Site: Q030	Type: Quadrat	Size: 50 x 50	Date: 08/03/2021	Botanist: Susan Murrey
Landform:	Drainage, Drainage line on flat			
Slope, aspect:	<1° - Level None			
Soil:	Sandy clay, Orange			
Rocks:	Creek stones			
Abundance:	20-50% Many			
Size:	20-60 mm - Coarse gravel			
Fire:	> 5 yrs			
Condition:	Very Good			
Notes:	Grazing (Low)			
Veg Unit:	D1a			
Location (NW):	-23.177701011300002, 119.93011903948999			



Species	Height	Cover	Species	Height	Cover
Acacia citrinoviridis	3	1	*Indigofera monophylla*	1.2	1
Acacia pyrifolia var. morrisonii	1	0.5	*Ipomoea muelleri*	0.1	0.1
Acacia sericophylla	2	1	*Jasminum didymum* subsp. *lineare*	0.2	0.1
Alternanthera denticulata	0.5	0.1	*Melaleuca glomerata*	3	5
Atalaya hemiglauca	0.5	0.1	*Phyllanthus maderaspatensis*	0.5	0.1
Cenchrus ciliaris	0.5	1	*Pluchea dentex*	0.3	0.1
Corchorus ?crozophorifolius	0.1	0.1	*Sesbania cannabina*	1.5	0.1
Cyperus vaginatus	0.5	2	*Tephrosia sp. Newman (A.A. Mitchell PRP 29)*	0.5	0.1
Eucalyptus camaldulensis subsp. *refulgens*	12	10			
Eulalia aurea	0.5	0.5			

Site: Q031	Type: Quadrat	Size: 50 x 50	Date: 08/03/2021	Botanist: Chris Shaw
Landform:	Flat, Plain			
Slope, aspect:	<1° - Level None			
Soil:	Sandy clay, Red/orange			
Rocks:				
Abundance:	No rocks			
Size:				
Fire:	> 5 yrs			
Condition:	Very Good			
Notes:	Weeds (Low)			
Veg Unit:	TP1a			
Location (NW):	-23.181096017360598, 119.931217990815			



Species	Height	Cover	Species	Height	Cover
?Portulaca filifolia	0.2	0.1	*Indigofera colutea*	0.15	0.1
Acacia citrinoviridis	2.5	15	*Indigofera monophylla*	0.4	0.1
Aristida contorta	0.3	2	*Maireana ?villosa*	0.3	0.2
Aristida hygrometrica	0.3	12	*Perotis rara*	0.2	0.4
Aristida inaequiglumis	0.8	0.5	*Polycarpaea corymbosa*	0.25	0.1
Arivela viscosa	0.5	0.5	*Portulaca oleracea*	0.1	0.1
Boerhavia coccinea	0.2	0.1	*Ptilotus exaltatus*	0.4	0.1
Bonamia pilbarensis	0.1	0.1	*Ptilotus obovatus*	0.3	0.1
Bulbostylis barbata	0.1	0.1	*Sclerolaena costata*	0.3	0.1
Calotropis procera	3	0.3	*Senna artemisioides* subsp. *helmsii*	1	2
Cenchrus ciliaris	0.3	0.5	*Senna artemisioides* subsp. *oligophylla*	1	2
Corymbia hamersleyana	1	0.2	*Senna notabilis*	0.1	0.2
Dactyloctenium radulans	0.2	0.1	*Sida fibulifera*	0.2	0.1
Digitaria ctenantha	0.3	0.1	*Sporobolus australasicus*	0.3	0.1
Duperreya commixta	0.2	0.1	*Tephrosia sp. Newman (A.A. Mitchell PRP 29)*	0.1	0.2
Enneapogon caerulescens	0.3	0.2	*Tragus australianus*	0.2	0.2
Enneapogon cylindricus	0.3	2	*Trianthema pilosum*	0.1	0.1
Eragrostis eriopoda	0.6	1	*Tribulus astrocarpus*	0.1	0.1
Eriachne aristidea	0.3	0.3	*Tribulus macrocarpus*	0.1	0.2
Eriachne pulchella subsp. *pulchella*	0.2	0.1	*Trichodesma zeylanicum var. zeylanicum*	0.4	0.1
Evolvulus alsinoides var. decumbens	0.2	0.1	*Trigastrotheca molluginea*	0.2	0.75
Evolvulus alsinoides var. villosicalyx	0.2	0.1	*Triodia pungens*	0.3	0.4
Gomphrena canescens subsp. *canescens*	0.4	0.2	*Tripogonella loliiformis*	0.1	0.1
Goodenia muelleriana	0.3	0.2	*Triumfetta chaetocarpa*	1	0.5
Hakea lorea subsp. *lorea*	2.5	1	*Yakirra australiensis*	0.3	0.3
Heliotropium cunninghamii	0.2	0.1			
Hibiscus burtonii	0.3	0.1			
Hibiscus sturtii var. campylochlamys	0.4	0.2			

Site: Q032	Type: Quadrat	Size: 50 x 50	Date: 09/03/2021	Botanist: Melissa Hay
Landform:	Drainage, Floodplain			
Slope, aspect:	<1° - Level None			
Soil:	Sandy clay, Red/orange			
Rocks:				
Abundance:	No rocks			
Size:				
Fire:	> 5 yrs			
Condition:	Good			
Notes:	Grazing (Medium),Weeds (High)			
Veg Unit:	TP1a			
Location (NW):	-23.1882430147379, 119.975910969078			



Species	Height	Cover	Species	Height	Cover
?Portulaca filifolia	0.2	0.1	*Goodenia microptera*	0.3	0.1
Abutilon lepidum	0.6	0.1	*Hakea lorea*	3	0.2
Abutilon otocarpum	0.7	0.5	*Hibiscus burtonii*	0.3	0.1
Acacia ?adsurgens	3	0.1	*Hibiscus sturtii var. platychlamys*	0.4	0.1
Acacia citrinoviridis	6	25	*Indigofera colutea*	0.3	0.1
Acacia sclerosperma	2.2	0.1	*Indigofera linnaei*	0.3	0.1
Anthobolus leptomerioides	1	0.1	*Maireana planifolia*	1	0.1
Aristida holathera var. holathera	0.3	0.1	*Paspalidium sp. 2*	0.3	0.1
Arivela viscosa	0.2	0.2	*Perotis rara*	0.1	0.1
Atalaya hemiglauca	1	0.5	*Pterocaulon sphacelatum*	0.3	0.1
Bidens bipinnata	0.5	0.1	*Ptilotus astrolasius*	0.3	0.1
Boerhavia coccinea	0.3	0.1	*Ptilotus exaltatus*	0.3	0.1
Cenchrus ciliaris	0.3	55	*Ptilotus obovatus*	0.5	0.1
Corchorus crozophorifolius	0.4	0.1	*Ptilotus polystachyus*	0.2	0.1
Corchorus tridens	0.2	0.1	*Rhagodia eremaea*	0.5	0.1
Cucumis variabilis	0.5	0.1	*Sclerolaena densiflora*	0.2	0.1
Digitaria brownii	0.4	0.1	*Senna artemisioides* subsp. *helmsii*	0.1	0.1
Digitaria ctenantha	0.2	0.1	*Senna notabilis*	0.1	0.1
Duperreya commixta	0.2	0.1	*Solanum lasiophyllum*	0.3	0.1
Enchylaena tomentosa	1	0.1	*Tephrosia rosea var. clementii*	0.3	0.1
Enneapogon polyphyllus	0.2	0.1	*Tragus australianus*	0.2	0.1
Eriachne aristidea	0.2	0.1	*Trianthema pilosum*	0.1	0.1
Euphorbia coghlanii	0.3	0.1	*Tribulus macrocarpus*	0.3	0.2
Euphorbia tannensis subsp. *eremophila*	0.2	0.1	*Trichodesma zeylanicum*	1	0.1
Evolvulus alsinoides var. decumbens	0.2	0.1	*Triodia pungens*	0.3	15
Evolvulus alsinoides var. villosicalyx	0.2	0.1	*Urochloa occidentalis var. occidentalis*	0.1	0.1
Gomphrena canescens subsp. *canescens*	0.3	0.1	*Waltheria indica*	0.5	0.1

Site: Q033	Type: Quadrat	Size: 50 x 50	Date: 09/03/2021	Botanist: Susan Murrey
Landform:	Flat, Plain			
Slope, aspect:	<1° - Level None			
Soil:	Sandy clay, Orange/brown			
Rocks:				
Abundance:	No rocks			
Size:				
Fire:	2-5 yrs			
Condition:	Very Good			
Notes:	Weeds (Low)			
Veg Unit:	TP1a			
Location (NW):	-23.185532977804499, 119.972347989678			



Species	Height	Cover	Species	Height	Cover
Abutilon otocarpum	1	0.5	*Indigofera linnaei*	0.6	1
Aristida contorta	0.5	1	*Paraneurachne muelleri*	0.5	0.5
Aristida holathera var. holathera	0.5	25	*Portulaca oleracea*	0.3	0.1
Arivela viscosa	0.5	5	*Ptilotus exaltatus*	0.3	0.1
Cenchrus ciliaris	0.5	0.5	*Ptilotus helipteroides*	0.3	0.1
Corymbia hamersleyana	6	1	*Senna artemisioides* subsp. *oligophylla*	0.8	0.4
Cullen ?lachnostachys	1	0.2	*Senna notabilis*	0.3	0.1
Dactyloctenium radulans	0.2	0.1	*Sida fibulifera*	0.3	0.1
Eragrostis eriopoda	0.5	1	*Streptoglossa bubakii*	0.2	0.1
Eriachne aristidea	0.3	0.1	*Trianthema pilosum*	0.3	0.1
Eriachne pulchella subsp. *dominii*	0.2	0.1	*Tribulopis angustifolia*	0.1	0.1
Eulalia aurea	0.8	0.1	*Tribulus macrocarpus*	0.1	2
Evolvulus alsinoides var. villosicalyx	0.3	0.1	*Tribulus occidentalis*	0.1	0.1
Goodenia prostrata	0.2	0.1	*Trichodesma zeylanicum*	0.5	0.1
Hakea lorea subsp. *lorea*	3	0.5	*Triodia pungens*	0.4	10
Heliotropium inexplicitum	0.2	0.1	*Triumfetta chaetocarpa*	1	0.1
			Yakirra australiensis var. australiensis	0.2	0.1

Site: Q034	Type: Quadrat	Size: 50 x 50	Date: 09/03/2021	Botanist: Chris Shaw
Landform:	Drainage, Creek/River			
Slope, aspect:	<1° - Level None			
Soil:	Sand, Red/orange			
Rocks:	Ironstone			
Abundance:	50-90% Abundant			
Size:	60-200 mm - Cobbles			
Fire:	> 5 yrs			
Condition:	Excellent			
Notes:	Weeds (Low)			
Veg Unit:	D1b			
Location (NW):	-23.1869859807193, 119.968666993081			



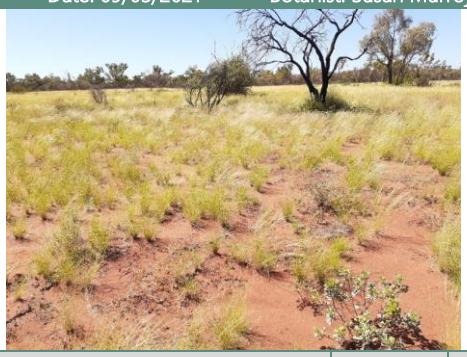
Species	Height	Cover	Species	Height	Cover
Acacia citrinoviridis	2.5	5	*Euphorbia australis var. subtomentosa*	0.1	0.2
Acacia pyrifolia var. morrisonii	2	0.5	*Evolvulus alsinoides var. decumbens*	0.2	0.2
Arivela viscosa	0.3	0.2	*Gomphrena canescens* subsp. *canescens*	0.2	0.1
Boerhavia coccinea	0.1	0.1	*Indigofera monophylla*	1	4
Cenchrus ciliaris	0.4	0.1	*Phyllanthus maderaspatensis*	0.5	0.1
Corchorus crozophorifolius	1	7	*Tephrosia rosea var. Fortescue creeks (M.I.H. Brooker 2186)*	0.5	2
Cucumis variabilis	0.3	0.1	*Tephrosia sp. Newman (A.A. Mitchell PRP 29)*	0.2	0.1
Cymbopogon obtectus	0.4	0.5	*Trichodesma zeylanicum var. zeylanicum*	0.3	0.1
Digitaria brownii	0.5	0.3	*Triodia pungens*	0.4	0.1
Eriachne pulchella subsp. *dominii*	0.15	0.2			
Eucalyptus victrix	16	4			

Site: Q035	Type: Quadrat	Size: 30 x 83.3	Date: 09/03/2021	Botanist: Melissa Hay
Landform:	Drainage, Creek/River			
Slope, aspect:	<1° - Level None			
Soil:	Sand, Orange/cream			
Rocks:	Ironstone			
Abundance:	50-90% Abundant			
Size:	200-600 mm - Stones			
Fire:	> 5 yrs			
Condition:	Good			
Notes:	Weeds (Medium)			
Veg Unit:	D1b			
Location (NW):	-23.237459035590199, 119.914001980796			



Species	Height	Cover	Species	Height	Cover
Acacia citrinoviridis	6	6	*Euphorbia biconvexa*	0.2	0.1
Acacia coriacea subsp. *pendens*	3	3	*Evolvulus alsinoides var. decumbens*	0.2	0.1
Acacia pyrifolia var. morrisonii	1	0.1	*Ipomoea coptica*	0.3	0.1
Arivela viscosa	0.3	0.1	*Ipomoea muelleri*	0.2	0.1
Cenchrus ciliaris	0.5	5	*Melaleuca glomerata*	2.5	15
Corchorus crozophorifolius	0.6	0.5	*Phyllanthus maderaspatensis*	0.3	0.1
Corchorus tridens	0.2	0.1	*Rhynchosia minima*	0.3	0.1
Digitaria ctenantha	0.5	0.1	*Stemodia viscosa*	0.3	0.1
Eucalyptus camaldulensis	12	8	*Triodia pungens*	0.3	0.1

Site: Q036	Type: Quadrat	Size: 50 x 50	Date: 09/03/2021	Botanist: Susan Murrey
Landform:	Flat, Plain			
Slope, aspect:	<1° - Level None			
Soil:	Sandy clay, Sand, Red/orange			
Rocks:				
Abundance:	No rocks			
Size:				
Fire:	2-5 yrs			
Condition:	Good			
Notes:	Weeds (Low)			
Veg Unit:	TP1a			
Location (NW):	-23.232455961406199, 119.916551001369			



Species	Height	Cover	Species	Height	Cover
Abutilon otocarpum	0.5	0.1	*Hibiscus ?burtonii*	0.3	0.1
Acacia ?sclerosperma subsp. *sclerosperma*	1	0.2	*Hibiscus sturtii var. platychlamys*	0.6	0.2
Acacia pachyacra	1.2	0.5	*Petalostylis labicheoides*	1	0.5
Acacia pruinocarpa	1	0.5	*Ptilotus exaltatus*	0.3	0.1
Aristida holathera var. holathera	0.5	25	*Ptilotus obovatus*	0.6	0.1
Arivela viscosa	0.5	0.2	*Scaevola parvifolia* subsp. *pilbarae*	0.5	0.1
Boerhavia coccinea	0.2	0.1	*Senna artemisioides* subsp. *oligophylla*	1	5
Bonamia erecta	0.3	0.1	*Senna artemisioides* subsp. *oligophylla x helmsii*	1	1
Cenchrus ciliaris	0.5	0.5	*Senna notabilis*	0.2	2
Corymbia hamersleyana	6	2	*Sida cardiophylla*	0.3	0.1
Duperreya commixta	0.4	0.5	*Sida fibulifera*	0.3	0.1
Eragrostis eriopoda	0.6	5	*Stylobasium spathulatum*	0.8	1
Eremophila fraseri	0.8	0.2	*Tephrosia rosea var. ?clementii*	0.3	0.1
Evolvulus alsinoides var. decumbens	0.3	0.1	*Tribulus macrocarpus*	0.1	5
Evolvulus alsinoides var. villosicalyx	0.3	0.1	*Triodia ?pungens*	0.5	1
Goodenia microptera	0.3	0.1	*Triodia pungens*	0.5	1
			Yakirra australiensis var. australiensis	0.2	0.1

Site: Q037	Type: Quadrat	Size: 50 x 50	Date: 09/03/2021	Botanist: Chris Shaw
Landform:	Flat, Plain			
Slope, aspect:	<1° - Level None			
Soil:	Clay, Sandy clay, Red/orange			
Rocks:				
Abundance:	No rocks			
Size:				
Fire:	2-5 yrs			
Condition:	Excellent			
Notes:	None			
Veg Unit:	TP1a			
Location (NW):	-23.251917986199199, 119.905896009877			



Species	Height	Cover	Species	Height	Cover
?Portulaca filifolia	0.2	0.1	*Gomphrena canescens* subsp. *canescens*	0.25	0.1
Abutilon lepidum	0.4	0.1	*Goodenia microptera*	0.3	0.3
Acacia macraneura	1.5	2	*Goodenia muelleriana*	0.4	0.1
Acacia pteraneura	3	0.2	*Goodenia prostrata*	0.1	0.1
Acacia sclerosperma subsp. *sclerosperma*	2.5	1	*Goodenia vilmoriniae*	0.3	0.3
Acacia tetragonophylla	2.5	0.8	*Hakea lorea* subsp. *lorea*	1	0.1
Aristida contorta	0.2	0.4	*Heliotropium cunninghamii*	0.15	0.1
Aristida holathera var. holathera	0.3	5	*Hibiscus burtonii*	0.5	0.2
Arivela viscosa	0.4	0.1	*Hibiscus sturtii var. platychlamys*	0.4	0.3
Cenchrus ciliaris	0.3	0.2	*Paraneurachne muelleri*	0.4	0.1
Chrysocephalum pterochaetum	0.3	0.1	*Polygala glaucifolia*	0.1	0.1
Digitaria brownii	0.3	0.1	*Portulaca cyclophylla*	0.1	0.1
Enchylaena tomentosa	1	0.1	*Ptilotus exaltatus*	0.4	0.1
Enneapogon cylindricus	0.2	0.2	*Ptilotus helipteroides*	0.2	0.1
Eragrostis eriopoda	0.5	5	*Ptilotus obovatus*	0.2	0.1
Eremophila forrestii	1	0.2	*Senna artemisioides* subsp. *helmsii*	1.2	0.2
Eriachne aristidea	0.2	0.2	*Senna notabilis*	0.2	0.1
Euphorbia australis var. australis	0.1	0.1	*Solanum lasiophyllum*	0.2	0.1
Evolvulus alsinoides var. decumbens	0.2	0.1	*Stylobasium spathulatum*	0.5	0.4
Evolvulus alsinoides var. villosicalyx	0.3	0.1	*Tribulus macrocarpus*	0.1	0.1
Fimbristylis dichotoma	0.4	0.1	*Triodia pungens*	0.4	20
			Yakirra australiensis var. australiensis	0.1	0.1

Site: Q038	Type: Quadrat	Size: 50 x 50	Date: 31/08/2021	Botanist: Susan Murrey
Landform:	Flat, Plain			
Slope, aspect:	<1° - Level None			
Soil:	Sandy clay, Orange/brown			
Rocks:	Ironstone			
Abundance:	<2% Very few			
Size:	<6 mm - Fine gravel			
Fire:	> 5 yrs			
Condition:	Good			
Notes:	Grazing (Medium),Tracks,Weeds (Medium)			
Veg Unit:	A1a			
Location (NW):	-23.108423999999999, 120.13308600000001			



Species	Height	Cover	Species	Height	Cover
Acacia aptaneura	2.5	1	*Euphorbia coghlanii*	0.4	0.1
Acacia paraneura	6	5	*Gomphrena canescens* subsp. *canescens*	0.3	0.2
Acacia synchronicia	2	3	*Heliotropium heteranthum*	0.1	0.1
Acacia tetragonophylla	1.2	0.5	*Hibiscus sturtii var. campylochlamys*	0.3	0.2
Aristida contorta	0.3	15	*Indigofera linifolia*	0.3	1
Boerhavia coccinea	0.2	0.1	*Sclerolaena cornishiana*	0.5	0.1
Chrysopogon fallax	0.8	0.2	*Senna artemisioides* subsp. *helmsii x oligophylla*	0.5	0.2
Dactyloctenium radulans	0.3	10	*Senna artemisioides* subsp. *oligophylla x helmsii*	1.2	1
Enneapogon cylindricus	0.3	15	*Tephrosia rosea var. ?Fortescue Creeks (MIH Brokker 2186)*	0.2	0.1
Eremophila forrestii subsp. *forrestii*	0.8	0.2			

Site: Q039	Type: Quadrat	Size: 50 x 50	Date: 31/08/2021	Botanist: Chris Shaw
Landform:	Flat, Plain			
Slope, aspect:	<1° - Level None			
Soil:	Clay, Orange/brown			
Rocks:				
Abundance:	No rocks			
Size:				
Fire:	> 5 yrs			
Condition:	Good			
Notes:	Grazing (High)			
Veg Unit:	A1a			
Location (NW):	-23.116154000000002, 120.137216			



Species	Height	Cover	Species	Height	Cover
Abutilon lepidum	0.5	0.1	*Iseilema dolichotrichum*	0.1	0.3
Abutilon otocarpum	0.4	0.1	*Leiocarpa semicalva*	0.4	0.1
Acacia aptaneura	7	30	*Maireana ?georgei*	0.3	1
Acacia tetragonophylla	0.3	0.1	*Paspalidium rarum*	0.3	0.2
Alternanthera nodiflora	0.3	0.1	*Perotis rara*	0.1	0.3
Aristida contorta	0.3	0.1	*Pluchea dunlopii*	0.1	0.1
Boerhavia repleta	0.1	0.1	*Polycarpaea corymbosa var. corymbosa*	0.3	0.1
Chloris pectinata	0.3	2	*Portulaca filifolia*	0.1	0.1
Chrysopogon fallax	1	0.5	*Portulaca oleracea*	0.3	0.1
Cucumis variabilis	0.1	0.1	*Psydrax latifolia*	1	0.1
Dactyloctenium radulans	0.2	0.1	*Pterocaulon sphacelatum*	0.5	0.2
Dichanthium sericeum subsp. *humilius*	0.3	10	*Ptilotus gaudichaudii*	0.4	0.1
Digitaria brownii	0.3	0.1	*Ptilotus obovatus*	0.2	0.1
Enneapogon cylindricus	0.5	0.2	*Ptilotus polystachyus*	0.3	0.1
Eragrostis xerophila	0.2	0.1	*Senna artemisioides* subsp. *helmsii*	1	0.5
Euphorbia biconvexa	0.4	0.1	*Senna notabilis*	0.2	0.1
Euphorbia coghlanii	0.3	0.1	*Sida sp. Supplejack Station (T.S. Henshall 2345)*	0.3	0.2
Evolvulus alsinoides var. villosicalyx	0.2	0.5	*Solanum lasiophyllum*	0.5	0.2
Gomphrena canescens subsp. *canescens*	0.3	0.1	*Streptoglossa bubakii*	0.7	0.1
Goodenia prostrata	0.1	0.1	*Tephrosia ?supina*	0.1	0.1
Goodenia tenuiloba	0.4	0.1	*Tephrosia rosea var. ?Fortescue Creeks (MIH Brokker 2186)*	0.3	0.1
Heliotropium cunninghamii	0.3	0.1	*Trichodesma zeylanicum var. zeylanicum*	0.5	0.1
Hibiscus burtonii	0.5	0.1	*Urochloa occidentalis var. occidentalis*	0.1	0.1
Hibiscus sturtii var. campylochlamys	0.4	0.1			
Hibiscus sturtii var. platychlamys	0.4	0.1			
Ipomoea muelleri	0.1	0.1			

Site: Q040	Type: Quadrat	Size: 50 x 50	Date: 31/08/2021	Botanist: Susan Murrey
Landform:	Flat, Plain			
Slope, aspect:	1° - Very Gentle None			
Soil:	Sandy clay, Orange/brown			
Rocks:				
Abundance:	No rocks			
Size:				
Fire:	> 5 yrs			
Condition:	Poor			
Notes:	Grazing (High),Weeds (High),Reduced native understorey			
Veg Unit:	A1b			
Location (NW):	-23.177803999999998, 120.02186399999999			



Species	Height	Cover	Species	Height	Cover
Abutilon lepidum	0.5	0.1	*Evolvulus alsinoides var. villosicalyx*	0.2	0.2
Abutilon otocarpum	0.3	0.1	*Indigofera linnaei*	0.3	0.1
Acacia citrinoviridis	8	15	*Ipomoea calobra*	0.2	0.1
Aristida holathera var. holathera	0.6	0.5	*Perotis rara*	0.2	0.1
Arivela viscosa	0.4	0.1	*Portulaca filifolia*	0.2	0.1
Cenchrus ciliaris	0.6	35	*Rhynchosia minima*	0.2	0.1
Corchorus crozophorifolius	0.3	0.1	*Senna artemisioides* subsp. *oligophylla x helmsii*	0.6	0.1
Enneapogon polyphyllus	0.3	5	*Solanum lasiophyllum*	0.3	0.1
Eragrostis eriopoda	0.6	0.1	*Sporobolus australasicus*	0.2	0.1
Eriachne aristidea	0.4	0.2	*Trianthema pilosum*	0.2	0.1
Euphorbia boophthona	0.5	0.2	*Tribulus cistoides*	0.1	0.1
			Triodia pungens	0.5	1

Site: Q041	Type: Quadrat	Size: 50 x 50	Date: 31/08/2021	Botanist: Chris Shaw
Landform:	Flat, Plain			
Slope, aspect:	<1° - Level None			
Soil:	Sandy clay, Orange			
Rocks:				
Abundance:	No rocks			
Size:				
Fire:	> 5 yrs			
Condition:	Excellent			
Notes:	None,Grazing (Low)			
Veg Unit:	TP1a			
Location (NW):	-23.166308000000001, 120.033249			



Species	Height	Cover	Species	Height	Cover
Acacia citrinoviridis	2.5	1	*Hibiscus sturtii var. platychlamys*	0.3	0.1
Acacia dictyophleba	1.5	5	*Maireana planifolia*	0.6	0.1
Acacia sclerosperma	2.5	0.5	*Paraneurachne muelleri*	0.3	0.1
Aristida contorta	0.3	0.1	*Poaceae sp. 2*	0.2	0.1
Aristida holathera var. holathera	0.3	1	*Portulaca filifolia*	0.1	0.1
Aristida inaequiglumis	0.7	0.3	*Ptilotus astrolasius*	0.4	0.1
Aristida latifolia	0.6	0.2	*Ptilotus exaltatus*	0.6	0.1
Bonamia erecta	0.4	0.2	*Ptilotus helipteroides*	0.2	0.1
Cenchrus ciliaris	0.4	0.1	*Rhynchosia minima*	0.5	0.1
Corchorus sidoides subsp. *sidoides*	0.3	0.1	*Salsola australis*	0.2	0.1
Cynanchum viminale subsp. *australe*	0.4	0.1	*Scaevola parvifolia* subsp. *pilbarae*	0.3	0.1
Dodonaea coriacea	0.3	0.1	*Sclerolaena cornishiana*	0.3	0.1
Duperreya commixta	0.1	0.1	*Senna artemisioides* subsp. *helmsii*	1	2
Enneapogon cylindricus	0.2	0.1	*Senna artemisioides* subsp. *oligophylla*	1.3	4
Eragrostis eriopoda	0.4	3	*Senna notabilis*	0.4	0.1
Eremophila forrestii subsp. *forrestii*	1	0.2	*Sida arenicola*	0.4	0.1
Eriachne aristidea	0.2	0.1	*Sida fibulifera*	0.3	0.1
Eulalia aurea	0.7	0.1	*Streptoglossa sp. Indet*	0.3	0.1
Evolvulus alsinoides var. villosicalyx	0.2	0.1	*Tephrosia ?supina*	0.2	0.1
Fimbristylis dichotoma	0.4	0.1	*Tribulus macrocarpus*	0.1	0.1
Gomphrena canescens subsp. *canescens*	0.2	0.1	*Trichodesma zeylanicum var. zeylanicum*	0.9	0.1
Goodenia microptera	0.3	0.1	*Triodia basedowii*	0.4	2
			Triodia pungens	0.8	20
			Waltheria indica	0.4	0.1

Site: Q042	Type: Quadrat	Size: 50 x 50	Date: 01/09/2021	Botanist: Susan Murrey
Landform:	Drainage, Creek/River			
Slope, aspect:	<1° - Level None			
Soil:	Clay, Orange			
Rocks:	Creek stones			
Abundance:	>90% Continuous			
Size:	20-60 mm - Coarse gravel			
Fire:	> 5 yrs			
Condition:	Good			
Notes:	Weeds (High)			
Veg Unit:	D1b			
Location (NW):	-23.329239000000001, 119.835148			



Species	Height	Cover	Species	Height	Cover
Abutilon sp. Dioicum (A.A. Mitchell PRP 1618)	0.5	0.1	*Isotropis atropurpurea*	0.5	0.1
Acacia citrinoviridis	3	5	*Malvastrum americanum*	0.8	0.2
Acacia pyrifolia var. pyrifolia	1	0.2	*Petalostylis labicheoides*	0.6	0.1
Arivela viscosa	0.5	0.1	*Phyllanthus maderaspatensis*	0.3	0.2
Bothriochloa ewartiana	0.6	0.2	*Pluchea rubelliflora*	0.3	0.1
Cenchrus ciliaris	0.5	10	*Polycarpaea longiflora*	0.2	0.1
Corchorus crozophorifolius	0.5	0.1	*Rhynchosia minima*	0.2	0.1
Cyperus vaginatus	0.5	0.2	*Rostellularia adscendens var. clementii*	0.3	0.1
Enteropogon ramosus	0.5	0.1	*Sporobolus australasicus*	0.2	1
Eriachne pulchella subsp. *dominii*	0.3	0.1	*Tephrosia rosea var. Fortescue creeks (M.I.H. Brooker 2186)*	0.6	0.1
Eucalyptus camaldulensis subsp. *obtusa*	10	10	*Trichodesma zeylanicum var. zeylanicum*	1	0.1
Eucalyptus victrix	6	1	*Triodia longiceps*	0.3	0.5
Euphorbia biconvexa	0.3	0.1	*Abutilon sp. Dioicum (A.A. Mitchell PRP 1618)*	0.5	0.1
Glycine canescens	0.2	0.1			

Site: Q043	Type: Quadrat	Size: 50 x 50	Date: 01/09/2021	Botanist: Chris Shaw
Landform:	Flat, Rocky Outcrop			
Slope, aspect:	3° - Gentle North			
Soil:	Clayey sand, Red/brown			
Rocks:	Ironstone Laterite			
Abundance:	20-50% Many			
Size:	6-20 mm - Medium gravel			
Fire:	> 5 yrs			
Condition:	Excellent			
Notes:	None			
Veg Unit:	TP1b			
Location (NW):	-23.330755, 119.836073			



Species	Height	Cover	Species	Height	Cover
Abutilon lepidum	1	0.1	*Petalostylis labicheoides*	1.5	0.2
Acacia bivenosa	2	4	*Pterocaulon sphacelatum*	0.7	0.1
Acacia inaequilatera	1	0.1	*Ptilotus astrolasius*	0.3	0.1
Acacia pruinocarpa	2.5	0.2	*Ptilotus exaltatus*	0.4	0.1
Androcalva luteiflora	1.2	0.4	*Ptilotus obovatus*	1	0.5
Aristida contorta	0.3	0.1	*Ptilotus polystachyus*	0.4	1.5
Aristida holathera var. holathera	0.3	0.1	*Salsola australis*	0.4	0.2
Cenchrus ciliaris	0.5	5	*Sclerolaena cornishiana*	0.2	0.1
Corchorus sidoides subsp. *sidoides*	0.3	0.1	*Senna artemisioides* subsp. *oligophylla*	0.4	0.1
Corymbia hamersleyana	6	2	*Senna glutinosa* subsp. ×*luerssenii*	0.9	0.1
Duperreya commixta	0.1	0.1	*Senna glutinosa* subsp. *pruinosa*	0.4	0.1
Enchylaena tomentosa var. tomentosa	0.3	0.1	*Sida fibulifera*	0.2	0.1
Enneapogon cylindricus	0.3	0.1	*Solanum horridum*	0.3	0.1
Enneapogon robustissimus	0.3	1	*Solanum lasiophyllum*	0.1	0.1
Eragrostis eriopoda	0.3	0.1	*Sporobolus australasicus*	0.3	0.2
Eucalyptus socialis subsp. *eucentrica*	3	10	*Streptoglossa odora*	1	0.1
Eucalyptus xerothermica	3	4	*Streptoglossa sp. Indet*	0.1	0.1
Euphorbia boophthona	0.4	0.1	*Stylobasium spathulatum*	1.2	0.75
Goodenia microptera	0.3	0.1	*Tribulus hirsutus*	0.1	0.1
Hakea lorea	0.5	0.1	*Tribulus suberosus*	0.3	0.1
Hibiscus coatesii	0.5	0.1	*Trichodesma zeylanicum var. zeylanicum*	0.3	0.1
Hibiscus sturtii var. platychlamys	0.3	0.1	*Triodia pungens*	0.7	55
Paraneurachne muelleri	0.4	3			

Site: Q044	Type: Quadrat	Size: 50 x 50	Date: 01/09/2021	Botanist: Susan Murrey
Landform:	Flat, Plain			
Slope, aspect:	<1° - Level None			
Soil:	Sandy clay, Orange/brown			
Rocks:				
Abundance:	No rocks			
Size:				
Fire:	> 5 yrs			
Condition:	Good			
Notes:	Grazing (Medium),Weeds (Low)			
Veg Unit:	A1a			
Location (NW):	-23.096689000000001, 120.107688			



Species	Height	Cover	Species	Height	Cover
?Ptilotus obovatus	0.2	0.1	*Enneapogon cylindricus*	0.3	5
Abutilon otocarpum	0.2	0.1	*Eragrostis cumingii*	0.3	0.1
Acacia citrinoviridis	5	5	*Euphorbia biconvexa/coghlanii*	0.2	0.1
Acacia macraneura	6	15	*Evolvulus alsinoides var. villosicalyx*	0.2	1
Acacia synchronicia	0.8	1	*Goodenia prostrata*	0.3	0.1
Acacia tetragonophylla	1	0.2	*Heliotropium crispatum*	0.3	0.1
Arivela viscosa	0.6	0.5	*Indigofera linifolia*	0.3	0.1
Boerhavia coccinea	0.2	0.1	*Indigofera linnaei*	0.2	0.1
Cenchrus ciliaris	0.3	2	*Ipomoea calobra*	0.2	0.1
Chloris pectinata	0.3	0.1	*Ipomoea muelleri*	0.2	0.1
Convolvulus ?clementii	0.2	0.1	*Iseilema membranaceum*	0.2	0.1
Dactyloctenium radulans	0.2	0.2	*Portulaca filifolia*	0.2	0.1
			Sclerolaena cornishiana	0.2	0.1
			Senna artemisioides subsp. *?oligophylla*	0.2	0.1
			Sida fibulifera	0.2	0.1

Site: Q045	Type: Quadrat	Size: 40 x 62.5	Date: 01/09/2021	Botanist: Chris Shaw
Landform:	Drainage, Creek/River			
Slope, aspect:	<1° - Level None			
Soil:	Sandy clay loam, Orange			
Rocks:	Ironstone Granite			
Abundance:	20-50% Many			
Size:	20-60 mm - Coarse gravel			
Fire:	> 5 yrs			
Condition:	Very Good			
Notes:	Grazing (Low),Weeds (Low)			
Veg Unit:	D1a			
Location (NW):	-23.096287, 120.102795			



Species	Height	Cover	Species	Height	Cover
Acacia citrinoviridis	6	5	*Euphorbia australis var. subtomentosa*	0.2	0.1
Acacia coriacea subsp. *pendens*	3	0.3	*Euphorbia coghlanii*	0.3	0.1
Acacia pyrifolia var. pyrifolia	2	0.5	*Evolvulus alsinoides var. decumbens*	0.3	0.1
Arivela viscosa	0.3	0.1	*Goodenia lamprosperma*	0.6	0.2
Atalaya hemiglauca	3	0.3	*Indigofera sp. Bungaroo Creek (S. van Leeuwen 4301)*	1	1
Cenchrus ciliaris	0.3	0.1	*Melaleuca glomerata*	1	0.1
Corchorus incanus subsp. *incanus*	1.2	3	*Stemodia grossa*	0.3	0.1
Cyperus vaginatus	1	0.5	*Stemodia viscosa*	0.2	0.1
Eragrostis tenellula	0.1	0.1	*Tephrosia rosea var. Fortescue creeks (M.I.H. Brooker 2186)*	0.6	0.1
Eucalyptus camaldulensis subsp. *obtusa*	15	20	*Wahlenbergia tumidifructa*	0.4	0.1
Eucalyptus victrix	10	1	*Waltheria indica*	1	0.1
Eulalia aurea	0.5	0.1			

Site: Q046	Type: Quadrat	Size: 50 x 50	Date: 02/09/2021	Botanist: Susan Murrey
Landform:	Flat, Plain			
Slope, aspect:	<1° - Level None			
Soil:	Sandy clay, Orange/brown			
Rocks:	Ironstone			
Abundance:	<2% Very few			
Size:	6-20 mm - Medium gravel			
Fire:	> 5 yrs			
Condition:	Good			
Notes:	Grazing (High)			
Veg Unit:	A1a			
Location (NW):	-23.017818999999999, 120.198864			



Species	Height	Cover	Species	Height	Cover
Acacia aptaneura	4	0.5	*Rhynchosia minima*	0.2	0.1
Acacia synchronicia	1	1	*Salsola australis*	0.3	0.1
Cenchrus ciliaris	0.5	0.5	*Sclerolaena cornishiana*	0.4	0.2
Eragrostis xerophila	0.3	0.3	*Senna artemisioides* subsp. *oligophylla*	0.8	2
Ipomoea calobra	0.2	0.1	*Senna symonii*	0.6	3
Portulaca filifolia	0.3	0.1	*Sida fibulifera*	0.2	0.1
Ptilotus gomphrenoides	0.2	0.2	*Zaleya galericulata*	0.2	0.1
Rhagodia eremaea	0.6	0.5			

Site: Q047	Type: Quadrat	Size: 50 x 50	Date: 02/09/2021	Botanist: Chris Shaw
Landform:	Drainage, Creek/River			
Slope, aspect:	<1° - Level None			
Soil:	Sandy clay loam, Orange			
Rocks:				
Abundance:	No rocks			
Size:				
Fire:	2-5 yrs			
Condition:	Poor			
Notes:	Grazing (High),Weeds (High)			
Veg Unit:	D2			
Location (NW):	-23.024294999999999, 120.20593100000001			



Species	Height	Cover	Species	Height	Cover
Abutilon amplum	1.3	0.3	*Glycine canescens*	0.1	0.1
Acacia citrinoviridis	10	30	*Goodenia lamprosperma*	0.5	0.4
Acacia coriacea subsp. *pendens*	5	1.5	*Ipomoea muelleri*	0.1	0.1
Alternanthera nana	0.4	0.2	*Malvastrum americanum*	1	3
Arivela viscosa	0.4	0.2	*Marsilea exarata*	0.3	0.2
Blumea tenella	0.3	0.1	*Pluchea dentex*	0.5	0.1
Cenchrus ciliaris	1	20	*Pluchea dunlopii*	0.5	0.1
Centipeda minima	0.1	0.1	*Pterocaulon sphacelatum*	1.3	3
Chrysopogon fallax	1	1	*Ptilotus gomphrenoides*	0.1	0.2
Cucumis variabilis	0.1	0.1	*Rhynchosia minima*	0.1	0.1
Cullen cinereum	0.4	0.1	*Rostellularia adscendens var. clementii*	0.1	0.1
Cullen leucanthum	2	4	*Sclerolaena convexula*	0.4	0.1
Duperreya commixta	0.1	0.1	*Senna artemisioides* subsp. *oligophylla*	0.3	0.1
Eragrostis cumingii	0.6	0.5	*Senna notabilis*	1	0.1
Eragrostis tenellula	0.2	0.1	*Stemodia grossa*	0.5	0.1
Eriachne tenuiculmis	0.5	0.3	*Stemodia viscosa*	0.2	0.1
Eriochloa pseudoacrotricha	0.3	0.5	*Streptoglossa sp. Indet*	0.3	0.1
Eucalyptus victrix	6	3	*Synaptantha tillaeacea var. tillaeacea*	0.1	0.1
Evolvulus alsinoides var. villosicalyx	0.2	0.1	*Vachellia farnesiana*	1	0.1
Glinus lotoides	0.1	0.1			

Site: Q048	Type: Quadrat	Size: 50 x 50	Date: 02/09/2021	Botanist: Susan Murrey
Landform:	Drainage, Depression			
Slope, aspect:	<1° - Level None			
Soil:	Sandy clay, Orange/brown			
Rocks:				
Abundance:	No rocks			
Size:				
Fire:	> 5 yrs			
Condition:	Very Good			
Notes:	Grazing (Low),Weeds (Low)			
Veg Unit:	A1b			
Location (NW):	-23.14875, 120.091629			



Species	Height	Cover	Species	Height	Cover
?Citrullus amarus	0.1	0.1	*Euphorbia coghlanii*	0.3	0.1
Abutilon lepidum	0.6	0.1	*Euphorbia ferdinandi var. ferdinandi*	0.1	0.1
Abutilon otocarpum	0.4	0.2	*Evolvulus alsinoides var. villosicalyx*	0.3	0.3
Acacia citrinoviridis	6	10	*Glycine canescens*	0.2	0.1
Acacia dictyophleba	1.2	1	*Gomphrena canescens* subsp. *canescens*	0.3	0.1
Acacia macraneura	3	0.5	*Heliotropium crispatum*	0.5	0.1
Acacia synchronicia	0.3	0.1	*Indigofera linifolia*	0.3	0.1
Acacia tetragonophylla	2	0.2	*Indigofera linnaei*	0.3	0.1
Alternanthera angustifolia	0.3	0.1	*Ipomoea muelleri*	0.3	0.1
Aristida contorta	0.3	0.1	*Peplidium muelleri*	0.1	0.1
Aristida holathera	0.6	0.5	*Polymeria calycina*	0.3	0.1
Aristida pruinosa	0.6	2	*Portulaca filifolia*	0.2	0.1
Bonamia media	0.3	0.1	*Pterocaulon sphacelatum*	0.5	1
Bothriochloa ewartiana	0.5	1	*Rhynchosia minima*	0.2	0.1
Cenchrus ciliaris	0.5	0.5	*Rutidosis helichrysoides* subsp. *helichrysoides*	0.3	0.1
Chloris pectinata	0.3	0.1	*Senna artemisioides* subsp. *oligophylla*	0.3	0.2
Convolvulus remotus	0.2	0.1	*Senna artemisioides* subsp. *oligophylla x helmsii*	0.6	0.1
Corymbia hamersleyana	7	2	*Senna notabilis*	0.8	0.5
Crotalaria smithiana	0.3	0.3	*Sida fibulifera*	0.3	0.1
Cucumis variabilis	0.5	0.2	*Solanum lasiophyllum*	0.5	0.1
Cullen leucochaites	1.2	0.1	*Sporobolus australasicus*	0.2	0.2
Enneapogon cylindricus	0.3	0.5	*Streptoglossa bubakii*	0.5	0.1
Eragrostis cumingii	0.3	0.1	*Synaptantha tillaeacea var. tillaeacea*	0.1	0.1
			Triodia pungens	0.6	20
			Triumfetta chaetocarpa	0.8	0.1

Site: Q049	Type: Quadrat	Size: 50 x 50	Date: 02/09/2021	Botanist: Chris Shaw
Landform:	Flat, Plain			
Slope, aspect:	<1° - Level None			
Soil:	Clayey sand, Orange			
Rocks:				
Abundance:	No rocks			
Size:				
Fire:	2-5 yrs			
Condition:	Excellent			
Notes:	None			
Veg Unit:	TP1a			
Location (NW):	-23.148807999999999, 120.08043499999999			



Species	Height	Cover	Species	Height	Cover
Abutilon otocarpum	0.4	0.1	*Paraneurachne muelleri*	0.4	1
Acacia ?citrinoviridis	1	0.1	*Ptilotus axillaris*	0.1	0.1
Acacia dictyophleba	2	4	*Ptilotus exaltatus*	1	0.1
Acacia tetragonophylla	1.5	0.1	*Ptilotus obovatus*	0.75	0.5
Aristida contorta	0.3	0.6	*Salsola australis*	0.5	0.1
Aristida holathera var. holathera	0.4	2	*Sclerolaena cornishiana*	0.1	0.1
Aristida inaequiglumis	0.6	0.1	*Senna artemisioides* subsp. *helmsii*	1.3	6
Bonamia erecta	0.5	0.1	*Senna artemisioides* subsp. *oligophylla*	1	3
Cenchrus ciliaris	0.4	0.3	*Sida cardiophylla*	0.5	0.1
Cullen leucochaites	1.3	0.5	*Sida echinocarpa*	1	0.2
Enneapogon cylindricus	0.3	0.2	*Sida fibulifera*	0.3	0.2
Eragrostis eriopoda	0.3	0.5	*Solanum lasiophyllum*	0.5	0.1
Eriachne aristidea	0.4	0.1	*Streptoglossa macrocephala*	0.75	0.2
Evolvulus alsinoides var. villosicalyx	0.3	0.1	*Tephrosia rosea var. Fortescue creeks (M.I.H. Brooker 2186)*	0.3	0.1
Gomphrena canescens subsp. *canescens*	0.3	0.1	*Tribulus macrocarpus*	0.1	0.1
Goodenia microptera	0.3	0.1	*Trichodesma zeylanicum var. zeylanicum*	1.5	0.1
Hakea lorea	0.1	0.1	*Triodia pungens*	0.4	60
Hibiscus sturtii var. platychlamys	0.4	0.1	*Yakirra australiensis var. australiensis*	0.2	0.1
Maireana villosa	0.4	0.1			

Site: Q050	Type: Quadrat	Size: 50 x 50	Date: 03/09/2021	Botanist: Chris Shaw
Landform:	Flat, Plain			
Slope, aspect:	<1° - Level None			
Soil:	Sandy clay, Orange			
Rocks:				
Abundance:	No rocks			
Size:				
Fire:	2-5 yrs			
Condition:	Excellent			
Notes:	None			
Veg Unit:	TP1a			
Location (NW):	-23.212439, 119.92428700000001			



Species	Height	Cover	Species	Height	Cover
Abutilon lepidum	0.5	0.1	*Evolvulus alsinoides var. villosicalyx*	0.2	0.1
Abutilon otocarpum	0.4	0.1	*Gomphrena cunninghamii*	0.2	0.1
Abutilon sp.	0.75	0.1	*Goodenia microptera*	0.2	0.1
Acacia aptaneura	5	1	*Hakea lorea*	2	0.3
Acacia sclerosperma subsp. *sclerosperma*	2.5	10	*Haloragis gossei var. gossei*	0.15	0.1
Acacia synchronicia	0.5	0.3	*Hibiscus ?burtonii*	0.5	0.1
Acacia tetragonophylla	0.6	0.1	*Hibiscus sturtii var. platychlamys*	0.5	0.1
Aristida contorta	0.3	0.4	*Lysiana casuarinae*	0.4	0.1
Aristida holathera	0.5	20	*Maireana planifolia*	0.5	0.2
Aristida inaequiglumis	1	0.2	*Malvastrum americanum*	1	0.3
Bulbostylis barbata	0.1	0.1	*Paraneurachne muelleri*	0.4	0.2
Cenchrus ciliaris	0.75	0.3	*Paspalidium rarum*	0.1	0.1
Chrysopogon fallax	1.3	0.2	*Ptilotus astrolasius*	0.5	1
Cynanchum viminale subsp. *australe*	0.4	0.1	*Ptilotus calostachyus*	0.6	0.1
Duperreya commixta	0.1	0.1	*Ptilotus exaltatus*	0.3	0.1
Enneapogon cylindricus	0.5	0.2	*Ptilotus helipteroides*	0.5	0.1
Eragrostis eriopoda	0.4	1.5	*Senna ?symonii*	0.5	0.4
Eremophila cuneifolia	1	0.1	*Senna artemisioides* subsp. *helmsii*	0.4	0.1
Eremophila forrestii subsp. *forrestii*	1	0.2	*Senna artemisioides* subsp. *oligophylla*	0.5	0.3
Eremophila maculata subsp. *brevifolia*	0.3	0.1	*Senna notabilis*	0.4	0.1
Eremophila margarethae	1.5	3	*Senna symonii*	1.5	2
Eriachne aristidea	0.3	0.1	*Sida cardiophylla*	0.3	0.1
Eriachne pulchella subsp. *pulchella*	0.2	0.1	*Sida echinocarpa*	1	0.1
Eucalyptus gamophylla	5	3	*Solanum centrale*	0.4	0.1
Euphorbia boophthona	0.5	0.1	*Solanum elatius*	1	0.1
			Solanum horridum	0.2	0.1
			Solanum lasiophyllum	0.4	0.1
			Sporobolus australasicus	0.3	0.1
			Streptoglossa bubakii	1	0.1
			Stylobasium spathulatum	1	0.2
			Tribulus macrocarpus	0.1	0.1
			Triodia basedowii	0.4	0.1
			Triodia pungens	0.4	25

Site: Q051	Type: Quadrat	Size: 50 x 50	Date: 03/09/2021	Botanist: Chris Shaw

Landform:	Flat, Plain
Slope, aspect:	<1° - Level None
Soil:	Clayey sand, Red/orange
Rocks:	Granite
Abundance:	<2% Very few
Size:	6-20 mm - Medium gravel
Fire:	> 5 yrs
Condition:	Excellent
Notes:	None
Veg Unit:	EP1
Location (NW):	-23.219241, 119.92021200000001



Species	Height	Cover	Species	Height	Cover
Abutilon otocarpum	0.3	0.1	*Pterocaulon sphacelatum*	0.5	0.1
Acacia aptaneura	5	2	*Ptilotus astrolasius*	0.3	0.1
Acacia wanyu	2	10	*Ptilotus calostachyus*	1	0.1
Aristida contorta	0.25	0.5	*Ptilotus exaltatus*	0.5	0.5
Aristida holathera	0.3	0.3	*Ptilotus helipteroides*	0.2	0.1
Aristida inaequiglumis	1	0.2	*Ptilotus polystachyus*	0.3	0.1
Bulbostylis barbata	0.1	0.1	*Santalum spicatum*	2	1
Calandrinia stagnensis	0.1	0.1	*Sclerolaena eriacantha*	0.3	0.1
Cheilanthes sieberi	0.3	0.1	*Senna ?symonii*	1	0.5
Enneapogon caerulescens	0.2	0.1	*Senna artemisioides* subsp. *oligophylla*	0.3	0.1
Enneapogon cylindricus	0.3	0.1	*Senna glutinosa* subsp. *×luerssenii*	1.5	2
Eremophila cuneifolia	1.3	5	*Senna symonii*	0.3	0.1
Eremophila forrestii subsp. *forrestii*	0.4	0.1	*Solanum lasiophyllum*	0.2	0.1
Eremophila latrobei subsp. *filiformis*	1.5	1	*Sporobolus australasicus*	0.2	0.1
Euphorbia boophthona	0.4	0.1	*Streptoglossa bubakii*	1	0.3
Evolvulus alsinoides var. villosicalyx	0.2	0.1	*Streptoglossa macrocephala*	0.4	0.1
Fimbristylis dichotoma	0.5	0.1	*Stylobasium spathulatum*	1.2	1.5
Goodenia microptera	0.25	0.1	*Tribulus macrocarpus*	0.1	0.1
Grevillea pyramidalis subsp. *leucadendron*	1	0.1	*Triodia pungens*	0.4	50
Haloragis gossei var. gossei	0.2	0.1			
Hibiscus ?burtonii	1	0.1			
Hibiscus burtonii	1	0.2			
Hibiscus coatesii	1	0.1			
Maireana melanocoma	0.3	0.2			
Maireana thesioides	0.4	0.1			
Maireana triptera	0.4	0.2			
Paraneurachne muelleri	0.4	0.2			
Paspalidium rarum	0.3	0.1			
Pluchea rubelliflora	0.5	0.1			
Portulaca oleracea	0.1	0.1			

Site: R001	Type: Releve	Size: -	Date: 04/03/2021	Botanist: Chris Shaw, Melissa Hay, Susan Murrey

Landform:	Drainage, Creek/River
Slope, aspect:	<1° - Level None
Soil:	Sandy clay, Dark red/brown
Rocks:	Creek stones
Abundance:	2-10% Few
Size:	20-60 mm - Coarse gravel
Fire:	> 5 yrs
Condition:	Good
Notes:	Weeds (High)
Veg Unit:	A1b
Location (NW):	-23.331426037475399, 119.852865971624



Species	Height	Cover	Species	Height	Cover
Acacia citrinoviridis	6	10			
Cenchrus ciliaris	0.5	70			
Eucalyptus camaldulensis	13	35			

Site: R002	Type: Releve	Size: -	Date: 04/03/2021	Botanist: Melissa Hay

Landform:	Drainage, Floodplain
Slope, aspect:	<1° - Level None
Soil:	Sandy clay, Sand, Red/brown
Rocks:	Ironstone
Abundance:	>90% Continuous
Size:	20-60 mm - Coarse gravel
Fire:	> 5 yrs
Condition:	Good
Notes:	Clearing,Grazing (High)
Veg Unit:	D1b
Location (NW):	-23.3050490263849, 119.864834994077



Species	Height	Cover	Species	Height	Cover
Acacia citrinoviridis	8	5			
Cenchrus ciliaris	0.5	60			
Eucalyptus camaldulensis	15	35			
Rhynchosia minima	0.4	5			

Site: R003	Type: Releve	Size: -	Date: 05/03/2021	Botanist: Chris Shaw

Landform:	Drainage, Creek/River
Slope, aspect:	1° - Very Gentle None
Soil:	Sandy clay, Red
Rocks:	Ironstone
Abundance:	50-90% Abundant
Size:	20-60 mm - Coarse gravel
Fire:	> 5 yrs
Condition:	Good
Notes:	Weeds (Medium)
Veg Unit:	A1b
Location (NW):	-23.322876999154602, 119.75485000759301



Species	Height	Cover	Species	Height	Cover
Acacia citrinoviridis	4	5	*Eucalyptus victrix*	5	5
Amaranthus undulatus	0.4	0.1	*Tephrosia rosea var. Fortescue creeks (M.I.H. Brooker 2186)*	0.5	7
Cenchrus ciliaris	0.5	10	*Trichodesma zeylanicum*	0.5	1
Cymbopogon obtectus	0.6	2			
Cyperus vaginatus	0.5	3			

Site: R004	Type: Releve	Size: -	Date: 05/03/2021	Botanist: Chris Shaw
Landform:	Flat, Plain			
Slope, aspect:	1° - Very Gentle None			
Soil:	Sandy clay, Red			
Rocks:				
Abundance:	No rocks			
Size:				
Fire:	> 5 yrs			
Condition:	Poor			
Notes:	Weeds (High)			
Veg Unit:	FP1			
Location (NW):	-23.3353790268301, 119.823571974411			



Species	Height	Cover	Species	Height	Cover
Acacia citrinoviridis	2.5	2	*Corymbia candida*	8	2
Acacia macraneura	2	5	*Corymbia hamersleyana*	6	4
Acacia pruinocarpa	3	10	*Eucalyptus victrix*	10	5
Cenchrus ciliaris	0.5	50	*Paraneurachne muelleri*	0.5	0.5
Chrysopogon fallax	0.5	1			

Site: R005	Type: Releve	Size: -	Date: 05/03/2021	Botanist: Melissa Hay
Landform:	Flat, Plain			
Slope, aspect:	<1° - Level None			
Soil:	Sandy clay, Red/orange			
Rocks:	Ironstone Quartz			
Abundance:	>90% Continuous			
Size:	20-60 mm - Coarse gravel			
Fire:	> 5 yrs			
Condition:	Excellent			
Notes:	Dust (Low)			
Veg Unit:	MT1			
Location (NW):	-23.315104963257902, 119.756911033764			



Species	Height	Cover	Species	Height	Cover
Abutilon otocarpum	0.4	0.1	*Eremophila forrestii*	1.5	0.1
Acacia aneura	2.2	3	*Hibiscus burtonii*	0.3	0.1
Acacia pteraneura	4	5	*Triodia pungens*	0.5	15
Acacia synchronicia	0.3	0.1			

Site: R006	Type: Releve	Size: -	Date: 05/03/2021	Botanist: Melissa Hay
Landform:	Flat, Plain			
Slope, aspect:	<1° - Level None			
Soil:	Sandy clay, Red/orange			
Rocks:	Ironstone			
Abundance:	2-10% Few			
Size:	20-60 mm - Coarse gravel			
Fire:	> 5 yrs			
Condition:	Excellent			
Notes:	Grazing (Low),Weeds (Low)			
Veg Unit:	FP1			
Location (NW):	-23.319633034989199, 119.75664499215701			



Species	Height	Cover	Species	Height	Cover
Acacia bivenosa	2.1	2	*Perotis rara*	0.1	0.1
Acacia tenuissima	2.2	3	*Ptilotus astrolasius*	0.2	0.1
Bulbostylis barbata	0.1	0.1	*Ptilotus helipteroides*	0.2	0.1
Corymbia candida	7	2	*Senna glutinosa* subsp. *glutinosa*	1	0.1
Corymbia hamersleyana	5	2	*Triodia pungens*	0.4	35
Hibiscus sturtii var. campylochlamys	0.3	0.1			

Site: R007	Type: Releve	Size: -	Date: 05/03/2021	Botanist: Melissa Hay
Landform:	Drainage, Floodplain			
Slope, aspect:	<1° - Level None			
Soil:	Sandy clay, Red/orange			
Rocks:	Ironstone			
Abundance:	>90% Continuous			
Size:	60-200 mm - Cobbles			
Fire:	> 5 yrs			
Condition:	Poor			
Notes:	Dust (Low),Grazing (Low),Weeds (High)			
Veg Unit:	A1b			
Location (NW):	-23.3387600351125, 119.773412989452			



Species	Height	Cover	Species	Height	Cover
Acacia citrinoviridis	8	40	*Cucumis variabilis*	0.5	0.1
Cenchrus ciliaris	0.6	60	*Eucalyptus victrix*	8	3
Corchorus crozophorifolius	0.5	3	*Tephrosia rosea var. clementii*	0.6	1

Site: R008	Type: Releve	Size: -	Date: 05/03/2021	Botanist: Susan Murrey
Landform:	Flat, Plain			
Slope, aspect:	<1° - Level None			
Soil:	Sandy clay, Red/brown			
Rocks:	Ironstone			
Abundance:	2-10% Few			
Size:	60-200 mm - Cobbles			
Fire:	> 5 yrs			
Condition:	Very Good			
Notes:	None,Weeds (Low)			
Veg Unit:	FP1			
Location (NW):	-23.322739033028402, 119.755871007218			



Species	Height	Cover	Species	Height	Cover
Acacia pyrifolia	2	5	*Petalostylis labicheoides*	2	0.5
Cenchrus ciliaris	0.5	1	*Trichodesma zeylanicum*	1	1
Corchorus incanus subsp. *Incanus*	0.3	0.2	*Triodia pungens*	0.8	40

Site: R009	Type: Releve	Size: -	Date: 05/03/2021	Botanist: Susan Murrey
Landform:	Flat, Plain			
Slope, aspect:	<1° - Level None			
Soil:	Sandy clay, Brown			
Rocks:				
Abundance:	No rocks			
Size:				
Fire:	> 5 yrs			
Condition:	Degraded			
Notes:	Tracks,Weeds (High)			
Veg Unit:	FP1			
Location (NW):	-23.335006032138999, 119.82597598805999			



Species	Height	Cover	Species	Height	Cover
Acacia citrinoviridis	5	25	*Corymbia hamersleyana*	7	2
Aristida contorta	0.5	1	*Dichanthium sericeum*	0.6	0.5
Cenchrus ciliaris	0.5	70	*Eucalyptus xerothermica*	5	3
Corymbia aspera	7	5	*Tribulus sp. 2*	0.2	1

Site: R010	Type: Releve	Size: -	Date: 06/03/2021	Botanist: Melissa Hay
Landform:	Flat, Plain			
Slope, aspect:	<1° - Level None			
Soil:	Sandy clay, Red/orange			
Rocks:				
Abundance:	No rocks			
Size:				
Fire:	> 5 yrs			
Condition:	Good			
Notes:	Grazing (High),Weeds (High)			
Veg Unit:	TP1a			
Location (NW):	-22.9945479612797, 120.1980039943			



Species	Height	Cover	Species	Height	Cover
Acacia ?aneura	5	45			
Cenchrus ciliaris	0.3	60			

Site: R011	Type: Releve	Size: -	Date: 06/03/2021	Botanist: Susan Murrey
Landform:	Flat, Plain			
Slope, aspect:	<1° - Level None			
Soil:	Sandy clay, Orange/brown			
Rocks:				
Abundance:	No rocks			
Size:				
Fire:	> 5 yrs			
Condition:	Good			
Notes:	Weeds (High)			
Veg Unit:	TP1a			
Location (NW):	-22.984134033322299, 120.19684201106401			



Species	Height	Cover	Species	Height	Cover
Acacia aptaneura	5	1			
Cenchrus ciliaris	0.5	40			

Site: R012	Type: Releve	Size: -	Date: 07/03/2021	Botanist: Chris Shaw
Landform:	Drainage, Depression			
Slope, aspect:	<1° - Level None			
Soil:	Clay, Red/orange			
Rocks:				
Abundance:	No rocks			
Size:				
Fire:	> 5 yrs			
Condition:	Poor			
Notes:	Grazing (High),Weeds (High)			
Veg Unit:	TP1a			
Location (NW):	-23.0793230328708, 120.13653597794401			



Species	Height	Cover	Species	Height	Cover
Acacia citrinoviridis	4.5	10	*Dactyloctenium radulans*	0.15	1
Acacia macraneura	4	30	*Malvastrum americanum*	0.75	3
Acacia tetragonophylla	2.5	3	*Senna artemisioides* subsp. *helmsii*	1	15
Alternanthera nodiflora	0.2	3	*Senna artemisioides* subsp. *oligophylla*	1.5	1
Cenchrus ciliaris	0.4	0.5			

Site: R013	Type: Releve	Size: -	Date: 07/03/2021	Botanist: Melissa Hay
Landform:	Drainage, Drainage line on flat			
Slope, aspect:	<1° - Level None			
Soil:	Clay loam, Red/brown			
Rocks:				
Abundance:	No rocks			
Size:				
Fire:	> 5 yrs			
Condition:	Poor			
Notes:	Weeds (High)			
Veg Unit:	TP1a			
Location (NW):	-23.0787600204348, 120.12527204118599			

Species	Height	Cover	Species	Height	Cover
Acacia ?aneura	6	60	*Chloris pectinata*	0.3	20
Acacia aptaneura	8	50	*Setaria dielsii*	0.3	1
Bidens bipinnata	0.4	10			

Site: R014	Type: Releve	Size: -	Date: 07/03/2021	Botanist: Melissa Hay
Landform:	Drainage, Creek/River			
Slope, aspect:	<1° - Level None			
Soil:	Clay, Orange/cream			
Rocks:	Ironstone			
Abundance:	2-10% Few			
Size:	200-600 mm - Stones			
Fire:	> 5 yrs			
Condition:	Good			
Notes:	Weeds (Medium)			
Veg Unit:	D1a			
Location (NW):	-23.180909017100898, 120.01134303398401			

Species	Height	Cover	Species	Height	Cover
Acacia citrinoviridis	8	10	*Eucalyptus camaldulensis*	8	5
Cenchrus ciliaris	0.4	20	*Melaleuca glomerata*	2.5	15

Site: R015	Type: Releve	Size: -	Date: 09/03/2021	Botanist: Melissa Hay
Landform:	Drainage, Floodplain			
Slope, aspect:	<1° - Level None			
Soil:	Sandy clay, Sand, Red/orange			
Rocks:				
Abundance:	No rocks			
Size:				
Fire:	> 5 yrs			
Condition:	Good			
Notes:	Weeds (High)			
Veg Unit:	A1b			
Location (NW):	-23.186783976852801, 119.978629974648			

Species	Height	Cover	Species	Height	Cover
Abutilon amplum	0.2	0.1	*Evolvulus alsinoides var. decumbens*	0.2	0.1
Acacia citrinoviridis	7	25	*Evolvulus alsinoides var. villosicalyx*	0.1	0.1
Aerva javanica	0.5	0.1	*Indigofera linnaei*	0.3	0.1
Amaranthus undulatus	0.2	0.1	*Ipomoea muelleri*	0.2	0.1
Arivela viscosa	0.2	0.1	*Rhynchosia minima*	0.3	0.1
Cenchrus ciliaris	0.4	25	*Trichodesma zeylanicum*	0.3	0.1
Cenchrus setiger	0.3	0.1	*Triodia pungens*	0.3	2
Corchorus crozophorifolius	0.2	0.1	*Triumfetta chaetocarpa*	0.3	0.1
Eragrostis eriopoda	0.3	0.1	*Waltheria indica*	0.3	0.1

Site: R016	Type: Releve	Size: -	Date: 09/03/2021	Botanist: Susan Murrey
Landform:	Flat, Plain			
Slope, aspect:	<1° - Level None			
Soil:	Sandy clay, Orange/brown			
Rocks:				
Abundance:	No rocks			
Size:				
Fire:	> 5 yrs			
Condition:	Poor			
Notes:	Weeds (High)			
Veg Unit:	TP1a			
Location (NW):	-23.185868002474301, 119.968354012817			



Species	Height	Cover	Species	Height	Cover
Acacia citrinoviridis	4	2	*Cenchrus ciliaris*	0.5	5
Aristida holathera var. holathera	0.5	1	*Triodia ?pungens*	0.5	1
Arivela viscosa	0.5	40			

Site: R017	Type: Releve	Size: -	Date: 30/08/2021	Botanist: Chris Shaw
Landform:	Flat, Plain			
Slope, aspect:	1° - Very Gentle West			
Soil:	Clayey sand, Orange/brown			
Rocks:				
Abundance:	No rocks			
Size:				
Fire:	2-5 yrs			
Condition:	Poor			
Notes:	Grazing (High),Weeds (Medium)			
Veg Unit:	TP1a			
Location (NW):	-23.286963, 119.87988			



Species	Height	Cover	Species	Height	Cover
Acacia citrinoviridis	2	1	*Eragrostis eriopoda*	0.6	5
Acacia citrinoviridis	5	10	*Eremophila margarethae*	1	1
Cenchrus ciliaris	0.5	2	*Hakea lorea*	0.5	1
Corymbia deserticola subsp. *deserticola*	9	3	*Triodia ?pungens*	0.3	2
Corymbia hamersleyana	2	0.5			

Site: R018	Type: Releve	Size: -	Date: 30/08/2021	Botanist: Susan Murrey
Landform:	Flat, Plain			
Slope, aspect:	<1° - Level None			
Soil:	Sandy clay, Brown			
Rocks:				
Abundance:	No rocks			
Size:				
Fire:	2-5 yrs			
Condition:	Good			
Notes:	Grazing (Low),Weeds (High)			
Veg Unit:	A1b			
Location (NW):	-23.286341, 119.878765			



Species	Height	Cover	Species	Height	Cover
Acacia citrinoviridis	3	5	*Eucalyptus victrix*	10	5
Acacia sclerosperma subsp. *sclerosperma*	2	2	*Gossypium robinsonii*	2	0.1
Cenchrus ciliaris	0.5	15	*Hakea lorea*	2	1
Cenchrus setiger	0.5	10	*Senna notabilis*	0.5	0.2

Site: R019	Type: Releve	Size: -	Date: 30/08/2021	Botanist: Susan Murrey
Landform:	Drainage, Drainage line on flat			
Slope, aspect:	<1° - Level None			
Soil:	Sandy clay, Orange			
Rocks:	Creek stones			
Abundance:	>90% Continuous			
Size:	6-20 mm - Medium gravel			
Fire:	2-5 yrs			
Condition:	Very Good			
Notes:	Weeds (Medium)			
Veg Unit:	D1b			
Location (NW):	-23.285584, 119.877898			



Species	Height	Cover	Species	Height	Cover
Acacia coriacea subsp. *pendens*	2	1	*Cymbopogon ambiguus*	0.6	0.5
Amyema bifurcata	3	0.1	*Eucalyptus camaldulensis* subsp. *obtusa*	12	10
Cenchrus ciliaris	0.5	1	*Melaleuca glomerata*	2	5

Site: R020	Type: Releve	Size: -	Date: 31/08/2021	Botanist: Chris Shaw
Landform:	Drainage, Drainage line on flat			
Slope, aspect:	<1° - Level None			
Soil:	Sandy clay, Orange/brown			
Rocks:				
Abundance:	No rocks			
Size:				
Fire:	> 5 yrs			
Condition:	Good			
Notes:	Grazing (Medium),Weeds (Medium)			
Veg Unit:	D2			
Location (NW):	-23.086881999999999, 120.14065600000001			



Species	Height	Cover	Species	Height	Cover
Acacia aptaneura	6	5	*Cenchrus ciliaris*	0.5	20
Acacia citrinoviridis	10	30	*Cenchrus setiger*	0.5	10
Acacia tetragonophylla	1.5	0.5	*Eucalyptus victrix*	6	0.5

Site: R021	Type: Releve	Size: -	Date: 31/08/2021	Botanist: Susan Murrey
Landform:	Drainage, Depression			
Slope, aspect:	<1° - Level None			
Soil:	Clay, Orange			
Rocks:				
Abundance:	No rocks			
Size:				
Fire:	> 5 yrs			
Condition:	Very Good			
Notes:	Grazing (Medium)			
Veg Unit:	TP1a			
Location (NW):	-23.102080000000001, 120.126108			



Species	Height	Cover	Species	Height	Cover
Acacia aptaneura	5	40	*Crotalaria smithiana*	0.5	0.2
Aristida contorta	0.4	1	*Indigofera linifolia*	0.3	0.5
Aristida pruinosa	1	0.5	*Pterocaulon sphacelatum*	1	2
Corymbia hamersleyana	7	2			

Site: R022	Type: Releve	Size: -	Date: 01/09/2021	Botanist: Chris Shaw
Landform:	Flat, Plain			
Slope, aspect:	3° - Gentle South			
Soil:	Clayey sand, Red/brown			
Rocks:	Ironstone			
Abundance:	10 -20% Common			
Size:	20-60 mm - Coarse gravel			
Fire:	1-2 yrs			
Condition:	Good			
Notes:	Tracks,Weeds (Medium)			
Veg Unit:	S1			
Location (NW):	-23.334340999999998, 119.769311			



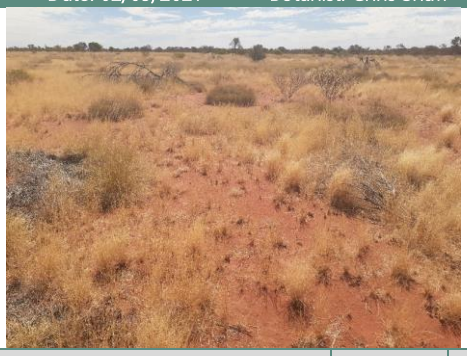
Species	Height	Cover	Species	Height	Cover
Acacia dictyophleba	1	2	*Corymbia hamersleyana*	5	1
Acacia inaequilatera	1	0.5	*Eucalyptus gamophylla*	3	5
Aristida holathera var. holathera	0.5	0.5	*Hakea lorea*	3	3
Aristida inaequiglumis	1	3	*Ptilotus obovatus*	0.8	0.5
Cenchrus ciliaris	0.8	1	*Triodia pungens*	0.3	20
Corymbia candida	5	0.5	*Triodia vanleeuwenii*	0.2	3

Site: R023	Type: Releve	Size: -	Date: 02/09/2021	Botanist: Chris Shaw
Landform:	Flat, Plain			
Slope, aspect:	<1° - Level None			
Soil:	Clay, Red/orange			
Rocks:				
Abundance:	No rocks			
Size:				
Fire:	2-5 yrs			
Condition:	Very Good			
Notes:	Weeds (Low)			
Veg Unit:	TP1a			
Location (NW):	-23.146946, 120.085948			



Species	Height	Cover	Species	Height	Cover
Acacia synchronicia	2.5	3	*Hakea lorea*	2.5	1.5
Aristida contorta	3	0.5	*Senna artemisioides* subsp. *helmsii*	1	10
Cenchrus setiger	0.5	1	*Triodia pungens*	0.6	1
Enneapogon cylindricus	0.2	1			

Site: R024	Type: Releve	Size: -	Date: 02/09/2021	Botanist: Chris Shaw
Landform:	Flat, Plain			
Slope, aspect:	<1° - Level None			
Soil:	Sandy clay, Orange			
Rocks:				
Abundance:	No rocks			
Size:				
Fire:	2-5 yrs			
Condition:	Very Good			
Notes:	Weeds (Low)			
Veg Unit:	TP1a			
Location (NW):	-23.147391299999999, 120.0823614			



Species	Height	Cover	Species	Height	Cover
Acacia ancistrocarpa	2	1	*Eragrostis eriopoda*	0.4	1
Acacia synchronicia	2	1	*Hakea lorea*	3	1
Aristida contorta	0.3	6	*Senna artemisioides* subsp. *helmsii*	1	1
Aristida holathera var. holathera	0.4	3	*Triodia pungens*	0.4	5

Site: R025	Type: Releve	Size: -	Date: 02/09/2021	Botanist: Chris Shaw
Landform:	Drainage, Drainage line on flat			
Slope, aspect:	<1° - Level None			
Soil:	Clay, Orange/brown			
Rocks:				
Abundance:	No rocks			
Size:				
Fire:	2-5 yrs			
Condition:	Poor			
Notes:	Grazing (High),Weeds (High)			
Veg Unit:	D2			
Location (NW):	-23.021343000000002, 120.206012			



Species	Height	Cover	Species	Height	Cover
Acacia citrinoviridis	7	5	*Chloris pectinata*	0.4	10
Acacia coriacea subsp. *pendens*	6	1	*Eucalyptus victrix*	7	5
Acacia tetragonophylla	2.5	3	*Malvastrum americanum*	0.5	0.3
Cenchrus ciliaris	0.4	0.5	*Senna artemisioides* subsp. *oligophylla*	1	1
			Vachellia farnesiana	1	0.5

Site: R026	Type: Releve	Size: -	Date: 02/09/2021	Botanist: Susan Murrey
Landform:	Flat, Plain			
Slope, aspect:	<1° - Level None			
Soil:	Sandy clay, Orange			
Rocks:				
Abundance:	No rocks			
Size:				
Fire:	> 5 yrs			
Condition:	Excellent			
Notes:	None			
Veg Unit:	TP1a			
Location (NW):	-23.146892999999999, 120.09137699999999			



Species	Height	Cover	Species	Height	Cover
Acacia pruinocarpa	5	2			
Senna symonii	0.8	5			
Triodia pungens	0.5	25			

Site: R027	Type: Releve	Size: -	Date: 03/09/2021	Botanist: Chris Shaw
Landform:	Flat, Plain			
Slope, aspect:	<1° - Level None			
Soil:	Clay, Red			
Rocks:	Granite Ironstone			
Abundance:	50-90% Abundant			
Size:	6-20 mm - Medium gravel			
Fire:	> 5 yrs			
Condition:	Excellent			
Notes:	None			
Veg Unit:	EP1			
Location (NW):	-23.215714999999999, 119.921994			



Species	Height	Cover	Species	Height	Cover
Acacia paraneura	5	2	*Maireana melanocoma*	0.3	0.3
Acacia synchronicia	1	2	*Senna ?symonii*	0.6	3
Eremophila cuneifolia	1	6			

Site: R028	Type: Releve	Size: -	Date: 03/09/2021	Botanist: Chris Shaw
Landform:	Flat, Plain			
Slope, aspect:	<1° - Level None			
Soil:	Clay, Red/brown			
Rocks:	Ironstone			
Abundance:	2-10% Few			
Size:	6-20 mm - Medium gravel			
Fire:	> 5 yrs			
Condition:	Excellent			
Notes:	Weeds (Low)			
Veg Unit:	EP1			
Location (NW):	-23.219394999999999, 119.92456900000001			



Species	Height	Cover	Species	Height	Cover
Acacia aptaneura	3	2	*Eremophila cuneifolia*	1	5
Acacia paraneura	3	1	*Eremophila youngii* subsp. *lepidota*	2.5	3
Acacia synchronicia	2.5	15	*Senna ?symonii*	1	2
Eragrostis xerophila	0.5	10	*Triodia pungens*	0.4	3

Site: R029	Type: Releve	Size: -	Date: 03/09/2021	Botanist: Susan Murrey
Landform:	Drainage, Creek/River			
Slope, aspect:	<1° - Level None			
Soil:	Sandy clay, Orange			
Rocks:	Creek stones			
Abundance:	50-90% Abundant			
Size:	6-20 mm - Medium gravel			
Fire:	> 5 yrs			
Condition:	Very Good			
Notes:	Weeds (Medium)			
Veg Unit:	D1b			
Location (NW):	-23.219023, 119.928037			



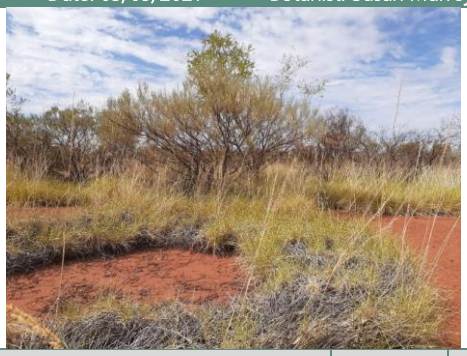
Species	Height	Cover	Species	Height	Cover
Acacia sclerosperma subsp. *sclerosperma*	3	0.5	*Eucalyptus camaldulensis*	12	10
Cenchrus ciliaris	0.6	2	*Gossypium robinsonii*	3	0.2
Cenchrus setiger	0.6	1	*Melaleuca glomerata*	2	2
Cyperus vaginatus	0.8	0.5			

Site: R030	Type: Releve	Size: -	Date: 03/09/2021	Botanist: Susan Murrey
Landform:	Drainage, Creek/River			
Slope, aspect:	<1° - Level None			
Soil:	Sandy clay, Red/brown			
Rocks:	Creek stones			
Abundance:	>90% Continuous			
Size:	60-200 mm - Cobbles			
Fire:	> 5 yrs			
Condition:	Very Good			
Notes:	Weeds (Medium)			
Veg Unit:	D1b			
Location (NW):	-23.222649000000001, 119.916033			



Species	Height	Cover	Species	Height	Cover
Acacia citrinoviridis	6	10	*Eucalyptus camaldulensis*	15	15
Acacia coriacea subsp. *pendens*	3	1	*Melaleuca glomerata*	4	5
Acacia pyrifolia var. pyrifolia	1	0.5	*Tephrosia rosea var. Fortescue creeks (M.I.H. Brooker 2186)*	0.5	1
Cenchrus ciliaris	0.6	2			

Site: R031	Type: Releve	Size: -	Date: 03/09/2021	Botanist: Susan Murrey
Landform:	Flat, Plain			
Slope, aspect:	<1° - Level None			
Soil:	Sandy clay, Orange/brown			
Rocks:	Ironstone			
Abundance:	<2% Very few			
Size:	20-60 mm - Coarse gravel			
Fire:	> 5 yrs			
Condition:	Excellent			
Notes:	None			
Veg Unit:	EP1			
Location (NW):	-23.218242, 119.912063			



Species	Height	Cover	Species	Height	Cover
Acacia synchronicia	4	1			
Eremophila cuneifolia	0.6	0.5			
Senna glutinosa subsp. ×*luerssenii*	1	0.5			
Triodia ?pungens	0.6	15			

Site: R032	Type: Releve	Size: -	Date: 17/02/2022	Botanist: Melissa Hay, Sarah Boys
Landform:	Flat,Plain			
Slope, aspect:	<1Â° - Level			
Soil:	Red,Orange, Sandy clay			
Rocks:	Ironstone			
Abundance:	2-10% Few			
Size:	20-60 mm - Coarse gravel			
Fire:	> 5 yrs			
Condition:	Very Good			
Notes:	Clearing,Tracks,Weeds (Low)			
Veg Unit:	MP1			
Location (NW):	50 777698 mE, 7413963 mS			



Species	Height	Cover	Species	Height	Cover
Acacia aptaneura	0.3	1	*Chrysopogon fallax*	0.5	0.5
Acacia bivenosa	2	0.5	*Corymbia candida*	3	2
Acacia dictyophleba	1	0.1	*Hakea lorea subsp. lorea*	2	0.1
Acacia orthocarpa	2	5	*Triodia pungens*	0.3	15
Cenchrus ciliaris	0.3	2			

Site: R033	Type: Releve	Size: -	Date: 17/02/2022	Botanist: Melissa Hay, Sarah Boys

Landform:	Hill,Crest,Hill
Slope, aspect:	1Â° - Very Gentle None
Soil:	Red,Orange, Sandy clay
Rocks:	Ironstone
Abundance:	>90% Continuous
Size:	60-200 mm - Cobbles
Fire:	> 5 yrs
Condition:	Very Good
Notes:	Clearing,Dust (Low),Tracks
Veg Unit:	S1
Location (NW):	50 783073 mE, 7419490 mS



Species	Height	Cover	Species	Height	Cover
Acacia adoxa var. adoxa	0.5	0.5	*Goodenia stobbsiana*	0.3	0.5
Acacia pruinocarpa	3	3	*Ptilotus calostachyus*	0.6	0.1
Eucalyptus leucophloia subsp. leucophloia	2	1	*Senna glutinosa subsp. ×luerssenii*	1.5	0.5
Gompholobium oreophilum	0.5	0.5	*Triodia vanleeuwenii*	0.5	35

Site: R034	Type: Releve	Size: -	Date: 17/02/2022	Botanist: Melissa Hay, Sarah Boys

Landform:	Drainage,Drainage line on flat
Slope, aspect:	<1Â° - Level
Soil:	Red,Orange, Sandy clay
Rocks:	Ironstone
Abundance:	<2% Very few
Size:	60-200 mm - Cobbles
Fire:	> 5 yrs
Condition:	Very Good
Notes:	Dust (High),Grazing (Low),Weeds (Low)
Veg Unit:	MP1
Location (NW):	50 783226 mE, 7419555 mS



Species	Height	Cover	Species	Height	Cover
Acacia aptaneura	4	40	*Cheilanthes sieberi*	0.1	0.3
Acacia pruinocarpa	4	0.5	*Chrysopogon fallax*	0.5	0.5
Bidens bipinnata	0.2	0.1	*Paraneurachne muelleri*	0.5	0.5
Cenchrus ciliaris	0.3	1	*Triodia pungens*	0.5	0.5

Site: R035	Type: Releve	Size: -	Date: 17/02/2022	Botanist: Melissa Hay, Sarah Boys

Landform:	Drainage,Drainage line on flat
Slope, aspect:	<1Â° - Level
Soil:	Red,Orange, Sandy clay
Rocks:	Ironstone
Abundance:	50-90% Abundant
Size:	60-200 mm - Cobbles
Fire:	> 5 yrs
Condition:	Very Good
Notes:	Dust (High),Grazing (Low),Weeds (Low)
Veg Unit:	MP1
Location (NW):	50 783112 mE, 7419223 mS



Species	Height	Cover	Species	Height	Cover
Acacia aptaneura	5	60	*Senna artemisioides subsp. oligophylla*	1	0.5
Acacia pruinocarpa	4	10	*Themeda triandra*	0.3	0.5
Cenchrus ciliaris	0.5	4	*Triodia pungens*	0.5	5
Paraneurachne muelleri	0.3	3			

Site: R036	Type: Releve	Size: -	Date: 17/02/2022	Botanist: Melissa Hay, Sarah Boys

Landform:	Hill,Slope,Mid
Slope, aspect:	10Â° - Moderate N
Soil:	Red,Orange, Sandy clay
Rocks:	Ironstone
Abundance:	>90% Continuous
Size:	200-600 mm - Stones
Fire:	> 5 yrs
Condition:	Very Good
Notes:	Erosion,Tracks
Veg Unit:	S1
Location (NW):	50 783563 mE, 7419340 mS



Species	Height	Cover	Species	Height	Cover
Acacia adoxa var. adoxa	0.3	0.5	*Goodenia stobbsiana*	0.2	0.1
Acacia pruinocarpa	3	2	*Senna glutinosa subsp. glutinosa*	1	3
Cymbopogon ambiguus	0.2	0.1	*Triodia pungens*	0.5	20
Gompholobium oreophilum	0.3	0.5	*Triodia vanleeuwenii*	0.5	35

Site: R037	Type: Releve	Size: -	Date: 17/02/2022	Botanist: Melissa Hay, Sarah Boys

Landform:	Flat,Plain
Slope, aspect:	<1Â° - Level
Soil:	Red,Orange, Sandy clay
Rocks:	Ironstone
Abundance:	50-90% Abundant
Size:	20-60 mm - Coarse gravel
Fire:	> 5 yrs
Condition:	Very Good
Notes:	Clearing,Dust (High),Tracks,Weeds (Medium)
Veg Unit:	MP1
Location (NW):	50 782700 mE, 7419038 mS



Species	Height	Cover	Species	Height	Cover
Acacia aptaneura	6	15	*Corymbia hamersleyana*	5	2
Aristida inaequiglumis	0.3	0.5	*Sida sp.*	1.2	0.5
Cenchrus ciliaris	0.5	10			

Site: R038	Type: Releve	Size: -	Date: 17/02/2022	Botanist: Melissa Hay, Sarah Boys

Landform:	Hill,Slope,Simple
Slope, aspect:	3Â° - Gentle N
Soil:	Red,Orange, Sandy clay
Rocks:	Ironstone
Abundance:	>90% Continuous
Size:	60-200 mm - Cobbles
Fire:	> 5 yrs
Condition:	Excellent
Notes:	Tracks
Veg Unit:	S1
Location (NW):	50 781658 mE, 7419378 mS



Species	Height	Cover	Species	Height	Cover
Acacia pachyacra	1.2	0.1	*Tribulus suberosus*	0.3	0.1
Cenchrus ciliaris	0.3	0.1	*Triodia basedowii*	0.5	10
Eucalyptus leucophloia subsp. leucophloia	2	1	*Triodia vanleeuwenii*	0.5	15
Senna glutinosa subsp. ×luerssenii	2.2	1	*Triodia wiseana*	0.5	0.5
Senna glutinosa subsp. glutinosa	0.5	2			

Site: R039	Type: Releve	Size: -	Date: 17/02/2022	Botanist: Melissa Hay, Sarah Boys

Landform:	Drainage,Creek/River
Slope, aspect:	<1Â° - Level
Soil:	Red,Orange, Sandy clay
Rocks:	Ironstone
Abundance:	>90% Continuous
Size:	60-200 mm - Cobbles
Fire:	> 5 yrs
Condition:	Good
Notes:	Weeds (High)
Veg Unit:	D1b
Location (NW):	50 780989 mE, 7420477 mS



Species	Height	Cover	Species	Height	Cover
Acacia citrinoviridis	6	5	*Eucalyptus victrix*	10	7
Acacia pyrifolia var. pyrifolia	1.6	3	*Tephrosia rosea var. Fortescue creeks (M.I.H. Brooker 2186)*	1	3
Cenchrus ciliaris	0.5	30			

Site: R040	Type: Releve	Size: -	Date: 17/02/2022	Botanist: Melissa Hay, Sarah Boys

Landform:	Drainage,Depression
Slope, aspect:	<1Â° - Level
Soil:	Red,Orange, Sandy clay
Rocks:	Ironstone
Abundance:	<2% Very few
Size:	20-60 mm - Coarse gravel
Fire:	> 5 yrs
Condition:	Very Good
Notes:	Dust (Low),Grazing (Low),Weeds (Low)
Veg Unit:	MP1
Location (NW):	50 781169 mE, 7420520 mS



Species	Height	Cover	Species	Height	Cover
Acacia aptaneura	5	50	*Cenchrus ciliaris*	0.3	15
Acacia paraneura	5	3	*Solanum lasiophyllum*	0.3	0.2
Acacia pruinocarpa	5	5	*Triodia pungens*	0.5	15
Aristida inaequiglumis	0.5	0.5			

Site: R041	Type: Releve	Size: -	Date: 17/02/2022	Botanist: Melissa Hay, Sarah Boys

Landform:	Flat,Plain
Slope, aspect:	<1Â° - Level
Soil:	Red,Orange, Sandy clay,Sand
Rocks:	Ironstone
Abundance:	<2% Very few
Size:	20-60 mm - Coarse gravel
Fire:	1-2 yrs
Condition:	Very Good
Notes:	Dust (Low),Weeds (Low)
Veg Unit:	
Location (NW):	50 781410 mE, 7420493 mS



Species	Height	Cover	Species	Height	Cover
Acacia bivenosa	2.2	15	*Dicrastylis cordifolia*	0.7	0.1
Aristida holathera var. holathera	0.3	0.5	*Petalostylis labicheoides*	0.2	0.5
Cenchrus ciliaris	0.3	0.5	*Triodia pungens*	0.5	45

Site: R042	Type: Releve	Size: -	Date: 17/02/2022	Botanist: Melissa Hay, Sarah Boys

Landform:	Flat,Plain
Slope, aspect:	<1Â° - Level
Soil:	Red,Orange, Sandy clay
Rocks:	Ironstone
Abundance:	50-90% Abundant
Size:	20-60 mm - Coarse gravel
Fire:	2-5 yrs
Condition:	Excellent
Notes:	None
Veg Unit:	MP1
Location (NW):	50 781295 mE, 7420647 mS



Species	Height	Cover	Species	Height	Cover
Acacia aptaneura	5	15	*Aristida inaequiglumis*	0.5	0.5
Acacia pruinocarpa	5	5	*Duperreya commixta*	0.3	0.2
Aristida contorta	0.2	0.3	*Eremophila forrestii subsp. forrestii*	1.2	0.1

Site: R043	Type: Releve	Size: -	Date: 17/02/2022	Botanist: Melissa Hay, Sarah Boys

Landform:	Hill,Slope,Simple
Slope, aspect:	3Â° - Gentle S
Soil:	Red,Orange, Sandy clay
Rocks:	Ironstone
Abundance:	>90% Continuous
Size:	6-20 mm - Medium gravel
Fire:	2-5 yrs
Condition:	Excellent
Notes:	None
Veg Unit:	S1
Location (NW):	50 781245 mE, 7420814 mS



Species	Height	Cover	Species	Height	Cover
Acacia pruinocarpa	2	3	*Ptilotus calostachyus*	0.3	0.1
Eucalyptus leucophloia subsp. leucophloia	5	3	*Triodia pungens*	0.5	35
Petalostylis labicheoides	2	0.5			

Site: R044	Type: Releve	Size: -	Date: 18/02/2022	Botanist: Melissa Hay, Sarah Boys

Landform:	Hill,Slope,Simple
Slope, aspect:	<1Â° - Level
Soil:	Red,Orange, Sandy clay
Rocks:	Ironstone
Abundance:	>90% Continuous
Size:	60-200 mm - Cobbles
Fire:	> 5 yrs
Condition:	Very Good
Notes:	Dust (Low)
Veg Unit:	S1
Location (NW):	50 783744 mE, 7418932 mS



Species	Height	Cover	Species	Height	Cover
Acacia aptaneura	4	2	*Gompholobium oreophilum*	0.3	0.5
Acacia bivenosa	2.1	10	*Gossypium robinsonii*	1	0.1
Acacia hilliana	0.3	2	*Senna glutinosa subsp. ×luerssenii*	1	0.5
Eucalyptus gamophylla	2	0.5	*Triodia vanleeuwenii*	0.5	45

Site: R045	Type: Releve	Size: -	Date: 18/02/2022	Botanist: Melissa Hay, Sarah Boys

Landform:	Hill,Crest,Hill
Slope, aspect:	3Â° - Gentle S
Soil:	Red,Orange, Sandy clay
Rocks:	Ironstone
Abundance:	>90% Continuous
Size:	200-600 mm - Stones
Fire:	> 5 yrs
Condition:	Excellent
Notes:	None
Veg Unit:	S1
Location (NW):	50 782092 mE, 7417886 mS



Species	Height	Cover	Species	Height	Cover
Acacia hilliana	0.3	2	*Ptilotus calostachyus*	0.5	0.2
Acacia pruinocarpa	3	0.5	*Senna glutinosa subsp. glutinosa*	1.2	1
Corymbia hamersleyana	3	0.5	*Senna glutinosa subsp. pruinosa*	1	0.5
Gompholobium oreophilum	0.5	1	*Triodia vanleeuwenii*	0.5	35
Hakea chordophylla	3	1			

Site: R046	Type: Releve	Size: -	Date: 18/02/2022	Botanist: Melissa Hay, Sarah Boys

Landform:	Drainage,Drainage line on flat
Slope, aspect:	<1Â° - Level
Soil:	Red,Orange, Sandy clay
Rocks:	Ironstone
Abundance:	10 -20% Common
Size:	20-60 mm - Coarse gravel
Fire:	1-2 yrs
Condition:	Good
Notes:	Weeds (High)
Veg Unit:	S1
Location (NW):	50 783443 mE, 7416951 mS



Species	Height	Cover	Species	Height	Cover
Acacia monticola	1.2	5	*Paraneurachne muelleri*	0.4	2
Acacia pyrifolia var. pyrifolia	2	5	*Petalostylis labicheoides*	2.2	40
Aerva javanica	0.3	0.1	*Senna artemisioides subsp. oligophylla*	0.3	0.2
Cenchrus ciliaris	0.4	45	*Triodia pungens*	0.3	1
Eucalyptus gamophylla	3	3			

Site: R047	Type: Releve	Size: -	Date: 18/02/2022	Botanist: Melissa Hay, Sarah Boys

Landform:	Hill,Slope,Mid
Slope, aspect:	3Â° - Gentle S
Soil:	Red,Orange, Sandy clay
Rocks:	Ironstone
Abundance:	50-90% Abundant
Size:	60-200 mm - Cobbles
Fire:	< 1 yr
Condition:	Excellent
Notes:	None
Veg Unit:	S1
Location (NW):	50 783036 mE, 7417096 mS



Species	Height	Cover	Species	Height	Cover
Acacia inaequilatera	2	1	*Hakea chordophylla*	0.3	0.5
Acacia pruinocarpa	3	0.5	*Indigofera monophylla*	0.3	0.1
Acacia pruinocarpa	3	0.2	*Ptilotus rotundifolius*	0.2	0.1
Corymbia hamersleyana	4	1	*Triodia vanleeuwenii*	0.2	15

Site: R048	Type: Releve	Size: -	Date: 18/02/2022	Botanist: Melissa Hay, Sarah Boys

Landform:	Hill,Slope,Mid
Slope, aspect:	10Â° - Moderate S
Soil:	Red,Orange, Sandy clay
Rocks:	Ironstone
Abundance:	>90% Continuous
Size:	200-600 mm - Stones
Fire:	2-5 yrs
Condition:	Excellent
Notes:	None
Veg Unit:	S1
Location (NW):	50 783007 mE, 7417116 mS



Species	Height	Cover	Species	Height	Cover
Acacia bivenosa	1.5	0.5	*Ptilotus obovatus*	0.3	0.1
Eucalyptus leucophloia subsp. leucophloia	4	2	*Senna glutinosa subsp. glutinosa*	1	0.5
Hakea chordophylla	2	0.5	*Triodia pungens*	0.5	35

Site: R049	Type: Releve	Size: -	Date: 18/02/2022	Botanist: Melissa Hay, Sarah Boys

Landform:	Flat,Plain
Slope, aspect:	<1Â° - Level
Soil:	Red,Orange, Sandy clay,Sand
Rocks:	Ironstone
Abundance:	<2% Very few
Size:	20-60 mm - Coarse gravel
Fire:	2-5 yrs
Condition:	Very Good
Notes:	Weeds (Medium)
Veg Unit:	FP1
Location (NW):	50 782143 mE, 7416667 mS



Species	Height	Cover	Species	Height	Cover
Acacia aptaneura	2	3	*Corymbia candida*	2	0.2
Acacia dictyophleba	0.5	0.2	*Corymbia hamersleyana*	5	1
Aristida holathera var. holathera	0.3	2	*Hakea lorea subsp. lorea*	3	2
Cenchrus ciliaris	0.5	2	*Triodia pungens*	0.5	15

Site: R050	Type: Releve	Size: -	Date: 18/02/2022	Botanist: Melissa Hay, Sarah Boys

Landform:	Flat,Plain
Slope, aspect:	<1Â° - Level
Soil:	Red,Orange, Clay,Sandy clay
Rocks:	Ironstone
Abundance:	2-10% Few
Size:	20-60 mm - Coarse gravel
Fire:	> 5 yrs
Condition:	Good
Notes:	Clearing,Litter,Weeds (Low)
Veg Unit:	MP1
Location (NW):	50 782449 mE, 7416189 mS



Species	Height	Cover	Species	Height	Cover
Acacia aptaneura	2	1	*Hakea lorea subsp. lorea*	2	0.5
Aristida contorta	0.3	0.2			

Site: R051	Type: Releve	Size: -	Date: 18/02/2022	Botanist: Melissa Hay, Sarah Boys

Landform:	Flat,Plain
Slope, aspect:	<1Â° - Level
Soil:	Red,Orange, Sandy clay
Rocks:	Ironstone
Abundance:	2-10% Few
Size:	20-60 mm - Coarse gravel
Fire:	> 5 yrs
Condition:	Good
Notes:	Litter,Weeds (Medium)
Veg Unit:	MP1
Location (NW):	50 783084 mE, 7415809 mS



Species	Height	Cover	Species	Height	Cover
Acacia macraneura	2.5	15	*Cenchrus ciliaris*	0.5	15
Acacia paraneura	4	3	*Corymbia candida*	4	2
Acacia pruinocarpa	5	3	*Hakea lorea subsp. lorea*	2	0.3

Site: R052	Type: Releve	Size: -	Date: 18/02/2022	Botanist: Melissa Hay, Sarah Boys

Landform:	Flat,Plain
Slope, aspect:	<1Â° - Level
Soil:	Red,Orange, Sandy clay
Rocks:	Ironstone
Abundance:	<2% Very few
Size:	20-60 mm - Coarse gravel
Fire:	> 5 yrs
Condition:	Very Good
Notes:	Weeds (Medium)
Veg Unit:	MP1
Location (NW):	50 783935 mE, 7415087 mS



Species	Height	Cover	Species	Height	Cover
Acacia macraneura	3	15	*Corymbia hamersleyana*	0.5	1
Acacia pruinocarpa	4	3	*Eucalyptus xerothermica*	4	0.5
Cenchrus ciliaris	0.4	2	*Sida fibulifera*	0.2	0.3
Chrysopogon fallax	0.5	2	*Triodia pungens*	0.5	45
Corymbia candida	4	0.5			

Site: R053	Type: Releve	Size: -	Date: 18/02/2022	Botanist: Melissa Hay, Sarah Boys

Landform:	Hill,Slope,Mid
Slope, aspect:	10Â° - Moderate S
Soil:	Red,Orange, Sandy clay
Rocks:	Ironstone
Abundance:	>90% Continuous
Size:	200-600 mm - Stones
Fire:	> 5 yrs
Condition:	Very Good
Notes:	Clearing
Veg Unit:	S1
Location (NW):	50 784702 mE, 7414944 mS



Species	Height	Cover	Species	Height	Cover
Acacia bivenosa	2	1	*Triodia pungens*	0.5	10
Acacia tetragonophylla	2	0.5	*Triodia vanleeuwenii*	0.3	60
Eucalyptus leucophloia subsp. leucophloia	5	3			

Site: R054	Type: Releve	Size: -	Date: 18/02/2022	Botanist: Melissa Hay, Sarah Boys

Landform:	Hill,Slope,Mid
Slope, aspect:	3Â° - Gentle N,S
Soil:	Red,Orange, Sandy clay
Rocks:	Ironstone
Abundance:	>90% Continuous
Size:	60-200 mm - Cobbles
Fire:	> 5 yrs
Condition:	Excellent
Notes:	None
Veg Unit:	S1
Location (NW):	50 785719 mE, 7415029 mS



Species	Height	Cover	Species	Height	Cover
Acacia bivenosa	1	1	*Hakea lorea subsp. lorea*	0.2	0.1
Eremophila cuneifolia	0.3	0.1	*Triodia pungens*	0.3	0.5
Eucalyptus leucophloia subsp. leucophloia	4	2	*Triodia wiseana*	0.5	60

Site: R055	Type: Releve	Size: -	Date: 18/02/2022	Botanist: Melissa Hay, Sarah Boys

Landform:	Drainage,Floodplain
Slope, aspect:	<1Â° - Level
Soil:	Red,Orange, Sandy clay
Rocks:	Ironstone
Abundance:	<2% Very few
Size:	20-60 mm - Coarse gravel
Fire:	> 5 yrs
Condition:	Excellent
Notes:	None,Weeds (Low)
Veg Unit:	FP1
Location (NW):	50 786293 mE, 7415056 mS



Species	Height	Cover	Species	Height	Cover
Acacia dictyophleba	3	3	*Corymbia candida*	6	3
Acacia macraneura	3	5	*Corymbia hamersleyana*	9	4
Acacia pachyacra	3	3	*Themeda triandra*	0.6	4
Cenchrus ciliaris	0.5	0.3	*Triodia pungens*	0.5	45
Chrysopogon fallax	0.5	5			

ite: R056	Type: Releve	Size: -	Date: 18/02/2022	Botanist: Melissa Hay, Sarah Boys

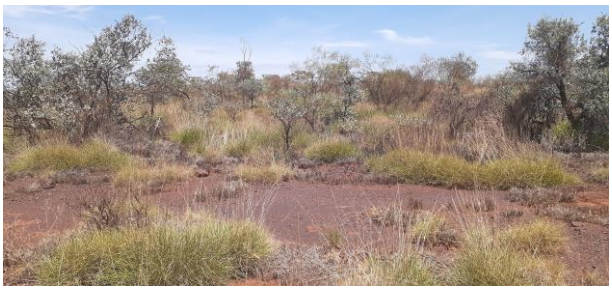
Landform:	Hill,Crest,Hill
Slope, aspect:	1Â° - Very Gentle None
Soil:	Red,Orange, Sandy clay
Rocks:	Ironstone
Abundance:	>90% Continuous
Size:	60-200 mm - Cobbles
Fire:	> 5 yrs
Condition:	Excellent
Notes:	None
Veg Unit:	S1
Location (NW):	50 787211 mE, 7415329 mS



Species	Height	Cover	Species	Height	Cover
Acacia bivenosa	3	5	*Senna glutinosa subsp. pruinosa*	1	0.2
Ptilotus rotundifolius	1	0.2	*Triodia vanleeuwenii*	0.4	35

Site: R057	Type: Releve	Size: -	Date: 18/02/2022	Botanist: Melissa Hay, Sarah Boys

Landform:	Hill,Slope,Lower
Slope, aspect:	1Â° - Very Gentle S
Soil:	Red,Orange, Sandy clay
Rocks:	Ironstone
Abundance:	>90% Continuous
Size:	6-20 mm - Medium gravel
Fire:	> 5 yrs
Condition:	Very Good
Notes:	Weeds (Low)
Veg Unit:	S1
Location (NW):	50 788972 mE, 7415601 mS



Species	Height	Cover	Species	Height	Cover
Acacia bivenosa	1.8	3	*Acacia tetragonophylla*	3	0.3
Acacia inaequilatera	3	4	*Cenchrus ciliaris*	0.5	0.1
Acacia pachyacra	1.8	0.1	*Eucalyptus gamophylla*	3	0.5
Acacia pruinocarpa	4	3	*Triodia pungens*	0.5	45

Site: R058	Type: Releve	Size: -	Date: 18/02/2022	Botanist: Melissa Hay, Sarah Boys

Landform:	Drainage,Depression
Slope, aspect:	<1Â° - Level
Soil:	Red,Orange, Sandy clay,Sand
Rocks:	Ironstone
Abundance:	<2% Very few
Size:	6-20 mm - Medium gravel
Fire:	2-5 yrs
Condition:	Very Good
Notes:	Weeds (Low)
Veg Unit:	FP1
Location (NW):	50 789464 mE, 7415441 mS



Species	Height	Cover	Species	Height	Cover
Acacia bivenosa	2.1	1	*Acacia tetragonophylla*	1	0.5
Acacia citrinoviridis	3	10	*Cenchrus ciliaris*	0.3	5
Acacia sclerosperma subsp. sclerosperma	2.5	25	*Triodia pungens*	0.3	10

Site: R059	Type: Releve	Size: -	Date: 18/02/2022	Botanist: Melissa Hay, Sarah Boys

Landform:	Hill,Crest,Hill
Slope, aspect:	1Â° - Very Gentle None
Soil:	Orange,Brown, Sandy clay
Rocks:	Calcrete
Abundance:	20-50% Many
Size:	60-200 mm - Cobbles
Fire:	2-5 yrs
Condition:	Very Good
Notes:	Weeds (Low)
Veg Unit:	TP1b
Location (NW):	50 789723 mE, 7415642 mS



Species	Height	Cover	Species	Height	Cover
Acacia pruinocarpa	2	0.5	*Petalostylis labicheoides*	1.2	5
Codonocarpus cotinifolius	2	0.1	*Senna artemisioides subsp. oligophylla*	1	0.2
Eucalyptus xerothermica	5	4	*Triodia pungens*	0.5	20
Hakea lorea subsp. lorea	2	0.2			

Appendix D: Flora Species List

Family	*Taxa*	Comment
Acanthaceae	*Rostellularia adscendens* var. *clementii*	-
Aizoaceae	*Trianthema pilosum*	-
Aizoaceae	*Trianthema triquetrum*	-
Aizoaceae	*Zaleya galericulata*	-
Amaranthaceae	*?Amaranthus* sp.	-
Amaranthaceae	*?Ptilotus obovatus*	-
Amaranthaceae	**Aerva javanica*	Weed
Amaranthaceae	*Alternanthera angustifolia*	-
Amaranthaceae	*Alternanthera denticulata*	-
Amaranthaceae	*Alternanthera nana*	-
Amaranthaceae	*Alternanthera nodiflora*	-
Amaranthaceae	*Alternanthera* sp.	-
Amaranthaceae	*Amaranthus cuspidifolius*	-
Amaranthaceae	*Amaranthus* sp.	-
Amaranthaceae	*Amaranthus undulatus*	-
Amaranthaceae	*Gomphrena canescens* subsp. *canescens*	-
Amaranthaceae	*Gomphrena cunninghamii*	-
Amaranthaceae	*Gomphrena kanisii*	-
Amaranthaceae	*Ptilotus astrolasius*	-
Amaranthaceae	*Ptilotus axillaris*	-
Amaranthaceae	*Ptilotus calostachyus*	-
Amaranthaceae	*Ptilotus clementii*	-
Amaranthaceae	*Ptilotus exaltatus*	-
Amaranthaceae	*Ptilotus gaudichaudii*	-
Amaranthaceae	*Ptilotus gomphrenoides*	-
Amaranthaceae	*Ptilotus helipteroides*	-
Amaranthaceae	*Ptilotus obovatus*	-
Amaranthaceae	*Ptilotus polystachyus*	-
Amaranthaceae	*Ptilotus rotundifolius*	-
Apocynaceae	**Calotropis procera*	Weed
Apocynaceae	*Cynanchum viminale* subsp. *australe*	-
Apocynaceae	*Gymnanthera cunninghamii*	Priority 3
Araliaceae	*Trachymene oleracea*	-
Asteraceae	*?Pluchea rubelliflora*	-
Asteraceae	**Bidens bipinnata*	Weed
Asteraceae	**Bidens subalternans* var. *araneosa*	Weed
Asteraceae	*Blumea tenella*	-
Asteraceae	*Centipeda minima*	-
Asteraceae	*Chrysocephalum pterochaetum*	-
Asteraceae	*Leiocarpa semicalva*	-
Asteraceae	*Pluchea dentex*	-
Asteraceae	*Pluchea dunlopii*	-
Asteraceae	*Pluchea rubelliflora*	-
Asteraceae	*Pterocaulon sphacelatum*	-
Asteraceae	*Pterocaulon sphaeranthoides*	-
Asteraceae	*Rutidosis helichrysoides* subsp. *helichrysoides*	-

Family	*Taxa*	Comment
Asteraceae	*Streptoglossa ?decurrens*	-
Asteraceae	*Streptoglossa bubakii*	-
Asteraceae	*Streptoglossa decurrens*	-
Asteraceae	*Streptoglossa macrocephala*	-
Asteraceae	*Streptoglossa odora*	-
Asteraceae	*Streptoglossa* sp.	-
Boraginaceae	*Heliotropium crispatum*	-
Boraginaceae	*Heliotropium cunninghamii*	-
Boraginaceae	*Heliotropium heteranthum*	-
Boraginaceae	*Heliotropium inexplicitum*	-
Boraginaceae	*Heliotropium ovalifolium*	-
Boraginaceae	*Heliotropium* sp.	-
Boraginaceae	*Heliotropium tanythrix*	-
Boraginaceae	*Heliotropium tenuifolium*	-
Boraginaceae	*Trichodesma zeylanicum* var. *zeylanicum*	-
Campanulaceae	*Wahlenbergia tumidifructa*	-
Capparaceae	*Capparis spinosa* subsp. *nummularia*	-
Caryophyllaceae	*Polycarpaea corymbosa* var. *corymbosa*	-
Caryophyllaceae	*Polycarpaea longiflora*	-
Chenopodiaceae	*Dysphania rhadinostachya*	-
Chenopodiaceae	*Enchylaena tomentosa* var. *tomentosa*	-
Chenopodiaceae	*Maireana ?georgei*	-
Chenopodiaceae	*Maireana ?planifolia*	-
Chenopodiaceae	*Maireana ?villosa*	-
Chenopodiaceae	*Maireana melanocoma*	-
Chenopodiaceae	*Maireana planifolia*	-
Chenopodiaceae	*Maireana* sp.	-
Chenopodiaceae	*Maireana thesioides*	-
Chenopodiaceae	*Maireana tomentosa*	-
Chenopodiaceae	*Maireana triptera*	-
Chenopodiaceae	*Maireana villosa*	-
Chenopodiaceae	*Rhagodia eremaea*	-
Chenopodiaceae	*Salsola australis*	-
Chenopodiaceae	*Sclerolaena convexula*	-
Chenopodiaceae	*Sclerolaena cornishiana*	-
Chenopodiaceae	*Sclerolaena costata*	-
Chenopodiaceae	*Sclerolaena densiflora*	-
Chenopodiaceae	*Sclerolaena eriacantha*	-
Cleomaceae	*Arivela viscosa*	-
Convolvulaceae	*Bonamia erecta*	-
Convolvulaceae	*Bonamia media*	-
Convolvulaceae	*Bonamia pilbarensis*	-
Convolvulaceae	*Convolvulus ?clementii*	-
Convolvulaceae	*Convolvulus remotus*	Range Extension
Convolvulaceae	*Duperreya commixta*	-
Convolvulaceae	*Evolvulus alsinoides* var. *decumbens*	-

Family	*Taxa*	Comment
Convolvulaceae	*Evolvulus alsinoides* var. *villosicalyx*	-
Convolvulaceae	*Ipomoea calobra*	-
Convolvulaceae	*Ipomoea coptica*	-
Convolvulaceae	*Ipomoea muelleri*	-
Convolvulaceae	*Polymeria ?ambigua*	-
Convolvulaceae	*Polymeria ambigua*	-
Convolvulaceae	*Polymeria calycina*	-
Cucurbitaceae	**?Citrullus amarus*	Weed
Cucurbitaceae	**Citrullus amarus*	Weed
Cucurbitaceae	*Cucumis melo*	-
Cucurbitaceae	*Cucumis variabilis*	-
Cyperaceae	*Bulbostylis barbata*	-
Cyperaceae	*Cyperus vaginatus*	-
Cyperaceae	*Fimbristylis dichotoma*	-
Cyperaceae	*Fimbristylis microcarya*	-
Cyperaceae	*Fimbristylis simulans*	-
Euphorbiaceae	*Euphorbia ?biconvexa*	-
Euphorbiaceae	*Euphorbia australis*	-
Euphorbiaceae	*Euphorbia australis* var. *australis*	-
Euphorbiaceae	*Euphorbia australis* var. *subtomentosa*	-
Euphorbiaceae	*Euphorbia biconvexa*	-
Euphorbiaceae	*Euphorbia boophthona*	-
Euphorbiaceae	*Euphorbia coghlanii*	-
Euphorbiaceae	*Euphorbia ferdinandi* var. *ferdinandi*	-
Euphorbiaceae	*Euphorbia* sp.	-
Euphorbiaceae	*Euphorbia tannensis* subsp. *eremophila*	-
Fabaceae	*Acacia ?adsurgens*	-
Fabaceae	*Acacia ?aneura*	-
Fabaceae	*Acacia ?aptaneura*	-
Fabaceae	*Acacia ?citrinoviridis*	-
Fabaceae	*Acacia ?macraneura*	-
Fabaceae	*Acacia ?paraneura*	-
Fabaceae	*Acacia ?sclerosperma* subsp. *sclerosperma*	-
Fabaceae	*Acacia adoxa* var. *adoxa*	-
Fabaceae	*Acacia ancistrocarpa*	-
Fabaceae	*Acacia aneura*	-
Fabaceae	*Acacia aptaneura*	-
Fabaceae	*Acacia bivenosa*	-
Fabaceae	*Acacia citrinoviridis*	-
Fabaceae	*Acacia coriacea* subsp. *pendens*	-
Fabaceae	*Acacia dictyophleba*	-
Fabaceae	*Acacia hilliana*	-
Fabaceae	*Acacia inaequilatera*	-
Fabaceae	*Acacia ligulata*	-
Fabaceae	*Acacia macraneura*	-
Fabaceae	*Acacia maitlandii*	-

Family	*Taxa*	Comment
Fabaceae	*Acacia monticola*	-
Fabaceae	*Acacia orthocarpa*	-
Fabaceae	*Acacia pachyacra*	-
Fabaceae	*Acacia paraneura*	-
Fabaceae	*Acacia pruinocarpa*	-
Fabaceae	*Acacia pteraneura*	-
Fabaceae	*Acacia pyrifolia* var. *morrisonii*	-
Fabaceae	*Acacia pyrifolia* var. *pyrifolia*	-
Fabaceae	*Acacia sclerosperma* subsp. *sclerosperma*	-
Fabaceae	*Acacia sericophylla*	-
Fabaceae	*Acacia synchronicia*	-
Fabaceae	*Acacia tenuissima*	-
Fabaceae	*Acacia tetragonophylla*	-
Fabaceae	*Acacia trudgeniana*	-
Fabaceae	*Acacia wanyu*	-
Fabaceae	*Alysicarpus muelleri*	-
Fabaceae	*Crotalaria medicaginea* var. *neglecta*	-
Fabaceae	*Crotalaria smithiana*	Priority 3
Fabaceae	*Cullen ?lachnostachys*	-
Fabaceae	*Cullen ?leucanthum*	-
Fabaceae	*Cullen ?pogonocarpum*	-
Fabaceae	*Cullen cinereum*	-
Fabaceae	*Cullen leucanthum*	-
Fabaceae	*Cullen leucochaites*	-
Fabaceae	*Cullen pogonocarpum*	-
Fabaceae	*Dichrostachys spicata*	Range Extension
Fabaceae	*Glycine canescens*	-
Fabaceae	*Gompholobium oreophilum*	-
Fabaceae	*Indigofera colutea*	-
Fabaceae	*Indigofera linifolia*	-
Fabaceae	*Indigofera linnaei*	-
Fabaceae	*Indigofera monophylla*	-
Fabaceae	*Indigofera* sp.	-
Fabaceae	*Indigofera rivularis*	-
Fabaceae	*Isotropis atropurpurea*	-
Fabaceae	*Neptunia dimorphantha*	-
Fabaceae	*Petalostylis labicheoides*	-
Fabaceae	*Rhynchosia minima*	-
Fabaceae	*Senna ?symonii*	-
Fabaceae	*Senna artemisioides* subsp. *?oligophylla*	-
Fabaceae	*Senna artemisioides* subsp. *filifolia*	-
Fabaceae	*Senna artemisioides* subsp. *helmsii*	-
Fabaceae	*Senna artemisioides* subsp. *helmsii x oligophylla*	-
Fabaceae	*Senna artemisioides* subsp. *oligophylla*	-
Fabaceae	*Senna artemisioides* subsp. *oligophylla x helmsii*	-
Fabaceae	*Senna glutinosa* subsp. *×luerssenii*	-

Family	*Taxa*	Comment
Fabaceae	*Senna glutinosa* subsp. *glutinosa*	-
Fabaceae	*Senna glutinosa* subsp. *pruinosa*	-
Fabaceae	*Senna notabilis*	-
Fabaceae	*Senna symonii*	-
Fabaceae	*Sesbania cannabina*	-
Fabaceae	*Swainsona ?elegantoides*	-
Fabaceae	*Swainsona decurrens*	-
Fabaceae	*Swainsona leeana*	-
Fabaceae	*Tephrosia ?supina*	-
Fabaceae	*Tephrosia rosea* var. *?clementii*	-
Fabaceae	*Tephrosia rosea* var. *?Fortescue Creeks (MIH Brokker 2186)*	-
Fabaceae	*Tephrosia rosea* var. *clementii*	-
Fabaceae	*Tephrosia rosea* var. *Fortescue creeks (M.I.H. Brooker 2186)*	-
Fabaceae	*Tephrosia* sp.	-
Fabaceae	*Tephrosia* sp.	-
Fabaceae	*Tephrosia* sp. *Newman (A.A. Mitchell PRP 29)*	-
Fabaceae	*Tephrosia* sp. *Northern (K.F. Kenneally 11950)*	-
Fabaceae	**Vachellia farnesiana*	Weed
Goodeniaceae	*Dampiera candicans*	-
Goodeniaceae	*Goodenia ?microptera*	-
Goodeniaceae	*Goodenia ?muelleriana*	-
Goodeniaceae	*Goodenia lamprosperma*	-
Goodeniaceae	*Goodenia microptera*	-
Goodeniaceae	*Goodenia muelleriana*	-
Goodeniaceae	*Goodenia nuda*	Priority 4
Goodeniaceae	*Goodenia prostrata*	-
Goodeniaceae	*Goodenia stobbsiana*	-
Goodeniaceae	*Goodenia tenuiloba*	-
Goodeniaceae	*Goodenia vilmoriniae*	-
Goodeniaceae	*Scaevola amblyanthera* var. *centralis*	-
Goodeniaceae	*Scaevola parvifolia* subsp. *pilbarae*	-
Gyrostemonaceae	*Codonocarpus cotinifolius*	-
Haloragaceae	*Haloragis gossei* var. *gossei*	-
Lamiaceae	*Clerodendrum ?floribundum*	-
Lamiaceae	*Dicrastylis cordifolia*	-
Loranthaceae	*?Amyema fitzgeraldii*	-
Loranthaceae	*?Lysiana* sp.	-
Loranthaceae	*Amyema bifurcata*	-
Loranthaceae	*Lysiana casuarinae*	-
Malvaceae	*?Waltheria* sp.	-
Malvaceae	*Abutilon ?otocarpum*	-
Malvaceae	*Abutilon amplum*	-
Malvaceae	*Abutilon lepidum*	-
Malvaceae	*Abutilon macrum*	-
Malvaceae	*Abutilon otocarpum*	-
Malvaceae	*Abutilon oxycarpum* subsp. *Prostrate (A.A. Mitchell PRP 1266)*	-

Family	*Taxa*	Comment
Malvaceae	*Abutilon* sp.	-
Malvaceae	*Abutilon* sp. *Dioicum (A.A. Mitchell PRP 1618)*	-
Malvaceae	*Androcalva luteiflora*	-
Malvaceae	*Corchorus ?crozophorifolius*	-
Malvaceae	*Corchorus crozophorifolius*	-
Malvaceae	*Corchorus incanus* subsp. *incanus*	-
Malvaceae	*Corchorus sidoides* subsp. *sidoides*	-
Malvaceae	*Corchorus* sp.	-
Malvaceae	*Corchorus tridens*	-
Malvaceae	*Gossypium robinsonii*	-
Malvaceae	*Hibiscus ?burtonii*	-
Malvaceae	*Hibiscus burtonii*	-
Malvaceae	*Hibiscus coatesii*	-
Malvaceae	*Hibiscus sturtii*	-
Malvaceae	*Hibiscus sturtii* var. *campylochlamys*	-
Malvaceae	*Hibiscus sturtii* var. *platychlamys*	-
Malvaceae	**Malvastrum americanum*	Weed
Malvaceae	*Melhania oblongifolia*	-
Malvaceae	*Sida arenicola*	-
Malvaceae	*Sida cardiophylla*	-
Malvaceae	*Sida clementii*	-
Malvaceae	*Sida echinocarpa*	-
Malvaceae	*Sida fibulifera*	-
Malvaceae	*Sida platycalyx*	-
Malvaceae	*Sida* sp. Supplejack Station (T.S. Henshall 2345)	-
Malvaceae	*Triumfetta chaetocarpa*	-
Malvaceae	*Waltheria indica*	-
Marsileaceae	*Marsilea exarata*	-
Marsileaceae	*Marsilea hirsuta*	-
Molluginaceae	*Glinus lotoides*	-
Molluginaceae	*Trigastrotheca molluginea*	-
Montiaceae	*Calandrinia stagnensis*	-
Myrtaceae	*Corymbia aspera*	-
Myrtaceae	*Corymbia candida*	-
Myrtaceae	*Corymbia deserticola* subsp. *deserticola*	-
Myrtaceae	*Corymbia hamersleyana*	-
Myrtaceae	*Eucalyptus camaldulensis*	-
Myrtaceae	*Eucalyptus gamophylla*	-
Myrtaceae	*Eucalyptus leucophloia* subsp. *leucophloia*	-
Myrtaceae	*Eucalyptus socialis*	-
Myrtaceae	*Eucalyptus victrix*	-
Myrtaceae	*Eucalyptus xerothermica*	-
Myrtaceae	*Melaleuca glomerata*	-
Nyctaginaceae	*Boerhavia ?coccinea*	-
Nyctaginaceae	*Boerhavia coccinea*	-
Nyctaginaceae	*Boerhavia repleta*	-

Family	*Taxa*	Comment
Nyctaginaceae	*Boerhavia* sp.	-
Oleaceae	*Jasminum didymum* subsp. *lineare*	-
Phrymaceae	*Peplidium muelleri*	-
Phyllanthaceae	*?Phyllanthus maderaspatensis*	-
Phyllanthaceae	*Phyllanthus ?maderaspatensis*	-
Phyllanthaceae	*Phyllanthus maderaspatensis*	-
Phyllanthaceae	*Synostemon rhytidospermus*	-
Plantaginaceae	*Stemodia grossa*	-
Plantaginaceae	*Stemodia viscosa*	-
Poaceae	*Aristida contorta*	-
Poaceae	*Aristida holathera* var. *holathera*	-
Poaceae	*Aristida hygrometrica*	-
Poaceae	*Aristida inaequiglumis*	-
Poaceae	*Aristida latifolia*	-
Poaceae	*Aristida pruinosa*	-
Poaceae	*Bothriochloa ewartiana*	-
Poaceae	*Bothriochloa* sp.	-
Poaceae	**Cenchrus ciliaris*	Weed
Poaceae	**Cenchrus setiger*	Weed
Poaceae	*Chloris pectinata*	-
Poaceae	*Chloris pumilio*	-
Poaceae	*Chrysopogon fallax*	-
Poaceae	*Cymbopogon ambiguus*	-
Poaceae	*Cymbopogon obtectus*	-
Poaceae	*Cynodon convergens*	-
Poaceae	*Cynodon* sp.	-
Poaceae	*Dactyloctenium radulans*	-
Poaceae	*Dichanthium sericeum*	-
Poaceae	*Dichanthium sericeum* subsp. *humilius*	-
Poaceae	*Digitaria brownii*	-
Poaceae	*Digitaria ctenantha*	-
Poaceae	**Echinochloa colona*	Weed
Poaceae	*Enneapogon caerulescens*	-
Poaceae	*Enneapogon cylindricus*	-
Poaceae	*Enneapogon lindleyanus*	-
Poaceae	*Enneapogon polyphyllus*	-
Poaceae	*Enneapogon robustissimus*	-
Poaceae	*Enteropogon ramosus*	-
Poaceae	*Eragrostis cumingii*	-
Poaceae	*Eragrostis desertorum*	Range Extension
Poaceae	*Eragrostis eriopoda*	-
Poaceae	*Eragrostis setifolia*	-
Poaceae	*Eragrostis* sp.	-
Poaceae	*Eragrostis tenellula*	-
Poaceae	*Eragrostis xerophila*	-
Poaceae	*Eriachne aristidea*	-

Family	*Taxa*	Comment
Poaceae	*Eriachne benthamii*	-
Poaceae	*Eriachne pulchella* subsp. *dominii*	-
Poaceae	*Eriachne pulchella* subsp. *pulchella*	-
Poaceae	*Eriachne tenuiculmis*	-
Poaceae	*Eriochloa pseudoacrotricha*	-
Poaceae	*Eulalia aurea*	-
Poaceae	*Iseilema dolichotrichum*	-
Poaceae	*Iseilema membranaceum*	-
Poaceae	*Iseilema vaginiflorum*	-
Poaceae	*Paraneurachne muelleri*	-
Poaceae	*Paspalidium clementii*	-
Poaceae	*Paspalidium rarum*	-
Poaceae	*Paspalidium* sp.	-
Poaceae	*Perotis rara*	-
Poaceae	*Poaceae* sp.	-
Poaceae	*Setaria dielsii*	-
Poaceae	*Sporobolus australasicus*	-
Poaceae	*Themeda triandra*	-
Poaceae	*Tragus australianus*	-
Poaceae	*Triodia ?pungens*	-
Poaceae	*Triodia basedowii*	-
Poaceae	*Triodia longiceps*	-
Poaceae	*Triodia pungens*	-
Poaceae	*Triodia vanleeuwenii*	-
Poaceae	*Triodia wiseana*	-
Poaceae	*Tripogonella loliiformis*	-
Poaceae	*Urochloa occidentalis* var. *occidentalis*	-
Poaceae	*Yakirra australiensis* var. *australiensis*	-
Polygalaceae	*Polygala ?glaucifolia*	-
Polygalaceae	*Polygala glaucifolia*	-
Portulacaceae	*?Portulaca filifolia*	-
Portulacaceae	*Portulaca cyclophylla*	-
Portulacaceae	*Portulaca filifolia*	-
Portulacaceae	*Portulaca oleracea*	-
Portulacaceae	**Portulaca pilosa*	Weed/Range Extension
Proteaceae	*Grevillea pyramidalis* subsp. *leucadendron*	-
Proteaceae	*Hakea chordophylla*	-
Proteaceae	*Hakea lorea* subsp. *lorea*	-
Pteridaceae	*Cheilanthes sieberi*	-
Rubiaceae	*Dolichocarpa crouchiana*	-
Rubiaceae	*Psydrax latifolia*	-
Rubiaceae	*Synaptantha tillaeacea* var. *tillaeacea*	-
Santalaceae	*Anthobolus leptomerioides*	-
Santalaceae	*Santalum spicatum*	-
Sapindaceae	*Atalaya hemiglauca*	-
Sapindaceae	*Dodonaea coriacea*	-

Family	*Taxa*	Comment
Scrophulariaceae	*Eremophila cuneifolia*	-
Scrophulariaceae	*Eremophila forrestii* subsp. *forrestii*	-
Scrophulariaceae	*Eremophila fraseri* subsp. *fraseri*	-
Scrophulariaceae	*Eremophila lanceolata*	-
Scrophulariaceae	*Eremophila latrobei* subsp. *filiformis*	-
Scrophulariaceae	*Eremophila latrobei* subsp. *latrobei*	-
Scrophulariaceae	*Eremophila longifolia*	-
Scrophulariaceae	*Eremophila maculata* subsp. *brevifolia*	-
Scrophulariaceae	*Eremophila margarethae*	-
Scrophulariaceae	*Eremophila youngii* subsp. *lepidota*	Priority 4
Solanaceae	**Datura leichhardtii* subsp. *leichhardtii*	Weed
Solanaceae	*Solanum centrale*	-
Solanaceae	*Solanum elatius*	-
Solanaceae	*Solanum horridum*	-
Solanaceae	*Solanum lasiophyllum*	-
Surianaceae	*Stylobasium spathulatum*	-
Violaceae	*Afrohybanthus aurantiacus*	-
Zygophyllaceae	*Tribulopis angustifolia*	-
Zygophyllaceae	*Tribulus astrocarpus*	-
Zygophyllaceae	*Tribulus cistoides*	-
Zygophyllaceae	*Tribulus hirsutus*	-
Zygophyllaceae	*Tribulus macrocarpus*	-
Zygophyllaceae	*Tribulus occidentalis*	-
Zygophyllaceae	*Tribulus* sp.	-
Zygophyllaceae	*Tribulus suberosus*	-

Appendix E: Site by Species Matrix

Vegetation Type	D2	H1	TP1b	TP1b	TP1b	D1b	D1b	D1b	D1b	D1b	D1b	D1b	D1b	TP1a	TP1a	TP1a	TP1a	TP1a	TP1a	TP1a	TP1a	TP1a	TP1a	TP1a	TP1a	A1b	A1b	A1b	A1b	A1b	A1b	A1a	A1a	A1a	A1a	A1a	A1a	A1a	A1a	A1a	A1a	A1a	A1a	A1a	A1a	A1a	D1a	D1a	D1a	D1a	D1a	D1a	BM1	EP1
Species/Site	Q047	Q029	Q001	Q003	Q043	Q002	Q004	Q005	Q008	Q034	Q035	Q042	Q006	Q022	Q023	Q027	Q031	Q032	Q033	Q036	Q037	Q041	Q049	Q050	Q007	Q021	Q025	Q040	Q048	Q009	Q010	Q013	Q014	Q015	Q017	Q018	Q019	Q020	Q026	Q028	Q038	Q039	Q044	Q046	Q011	Q012	Q016	Q030	Q045	Q024	Q051
?Amaranthus sp.						0.1																																																
?Citrullus amarus																													0.1																							
?Lysiana sp.																																																			0.1	
?Pluchea rubelliflora						0.1																																													
?Portulaca filifolia															0.1		0.1	0.1			0.1					0.1	0.1						0.1	0.2	0.1		0.2	0.1	0.1											
?Ptilotus obovatus																																										0.1								
?Waltheria sp.								0.1																																											
Abutilon ?otocarpum																											0.2																									
Abutilon amplum	0.3						0.5																																												
Abutilon lepidum			0.1		0.1													0.1			0.1			0.1	0.2	0.1		0.1	0.1			0.1	0.5				0.1	0.1			0.1										
Abutilon macrum															0.1						0.1																		0.2													
Abutilon otocarpum													0.1		0.1			0.5	0.5	0.1			0.1	0.1	0.1	0.1		0.1	0.2												0.1	0.1									0.1
Abutilon oxycarpum subsp. Prostrate (A.A. Mitchell PRP 1266)																																																		0.1	
Abutilon sp.																								0.1																													
Abutilon sp. Dioicum (A.A. Mitchell PRP 1618)												0.1																																								
Acacia ?adsurgens													0.1					0.1																																			
Acacia ?aptaneura																														2				3																		
Acacia ?citrinoviridis																							0.1																													
Acacia ?macraneura																																	4																		
Acacia ?paraneura																																			10			3													
Acacia ?sclerosperma subsp. sclerosperma																				0.2																																	
Acacia aneura																																					0.5														
Acacia aptaneura																								1								25			1				7	1	30		0.5						35	2
Acacia bivenosa		0.1		1	4																																													
Acacia citrinoviridis	30	0.1	4	2		5	4	3	2	5	6	5					15	25				1			20	40	12	15	10		2	0.5	25	0.2	0.3		30					5		2	1		1	5		
Acacia coriacea subsp. pendens	1.5								1.2		3																		0.5																	0.5		0.3		
Acacia dictyophleba														1	1	5						5	4						1								2													
Acacia inaequilatera					0.1																																														
Acacia ligulata						0.2																																													
Acacia macraneura																					2								0.5		1					3			3				15							
Acacia pachyacra														0.2						0.5																																
Acacia paraneura																																			1					5											
Acacia pruinocarpa		0.1	0.2	0.5	0.2															0.5																1		0.2													
Acacia pteraneura																					0.2																															
Acacia pyrifolia var. morrisonii						1				0.5	0.1																																					0.2		1	0.5			
Acacia pyrifolia var. pyrifolia							0.5	3				0.2																																				0.1			0.5			
Acacia sclerosperma subsp. sclerosperma			0.3	5		0.5	2						1					0.1			1	0.5		10	1.05																											
Acacia sericophylla							0.5																																											1			
Acacia synchronicia																								0.3					0.1	4	0.5				3	0.1			0.1	0.2	3		1	1							
Acacia tetragonophylla															0.1						0.8		0.1	0.1			0.5		0.2		1	0.5			2	0.1		0.1			0.5	0.1	0.2								
Acacia wanyu																																																			10
Afrohybanthus aurantiacus		0.1																																																
Alternanthera angustifolia																													0.1																							

Vegetation Type	D2	H1	TP1b	TP1b	TP1b	DTb	DTb	DTb	DTb	DTb	DTb	DTb	DTb	TP1a	TP1a	TP1a	TP1a	TP1a	TP1a	TP1a	TP1a	TP1a	TP1a	TP1a	TP1a	TP1a	ATb	ATb	ATb	ATb	ATb	ATa	ATa	ATa	ATa	ATa	ATa	ATa	ATa	ATa	ATa	ATa	ATa	ATa	ATa	ATa	ATa	DTa	DTa	DTa	DTa	DTa	BMf	EP1
Species/Site	Q047	Q029	Q001	Q003	Q043	Q002	Q004	Q005	Q008	Q034	Q035	Q042	Q006	Q022	Q023	Q027	Q031	Q032	Q033	Q036	Q037	Q041	Q049	Q050	Q007	Q021	Q025	Q040	Q048	Q009	Q010	Q013	Q014	Q015	Q017	Q018	Q019	Q020	Q026	Q028	Q038	Q039	Q044	Q046	Q011	Q012	Q016	Q030	Q045	Q024	Q051
Alternanthera denticulata																																																	0.1			
Alternanthera nana	0.2																																																		
Alternanthera nodiflora								0.1																																		0.1								
Alternanthera sp.																															3																			
Alysicarpus muelleri																											0.2										0.2		0.1										
Amaranthus cuspidifolius																										0.1																								
Amaranthus sp.																																							0.1										
Amaranthus undulatus									0.3																				0.1		0.1	0.1																	
Androcalva luteiflora					0.4																																												
Anthobolus leptomerioides																	0.1																																		
Aristida contorta			0.3		0.1		0.1						0.1	0.1	0.1		2		1		0.4	0.1	0.6	0.4					0.1				0.1		0.1			60	4	15	0.1									0.5
Aristida holathera var. holathera		0.2			0.1				0.6				1	0.1	0.5	0.5		0.1	25	25	5	1	2	20				0.5	0.5																					0.3
Aristida hygrometrica														1			12																																		
Aristida inaequiglumis							0.2										0.5					0.3	0.1	0.2																												0.2
Aristida latifolia															0.1							0.2																													
Aristida pruinosa																													2																					
Arivela viscosa	0.2		0.1	0.1		0.1	0.1	0.1	0.1	0.2	0.1	0.1	0.1	0.1			0.5	0.2	5	0.2	0.1				1	0.1	1.5	0.1					0.1	0.1	0.2			0.1	0.1			0.5						0.1	0.1	
Atalaya hemiglauca																		0.5														2															1	0.1		0.1	0.3		
Bidens bipinnata																		0.1																																	
Bidens subalternans var. araneosa			0.1																																														
Blumea tenella	0.1																																															0.1	
Boerhavia ?coccinea																														0.1																			
Boerhavia coccinea			0.1				0.1	0.1	0.1	0.1				0.1	0.1		0.1	0.1		0.1					0.1		1			0.1			0.2	0.1	3	0.1	0.1	0.2	0.1	0.2	0.1		0.1							
Boerhavia repleta																																									0.1								
Boerhavia sp.																															0.1																		
Bonamia erecta																				0.1		0.2	0.1																												
Bonamia media																													0.1																				
Bonamia pilbarensis																	0.1																																	
Bothriochloa ewartiana												0.2																	1																				
Bothriochloa sp.																											0.1																						
Bulbostylis barbata																	0.1							0.1																											0.1
Calandrinia stagnensis																																																		0.1
Calotropis procera																	0.3																																	
Capparis spinosa subsp. nummularia																																								0.1								
Cenchrus ciliaris	20		5	1	5	25	10	5	10	0.1	5	10	5				0.5	55	0.5	0.5	0.2	0.1	0.3	0.3	75	60	18	35	0.5	20	35	55	35	30	12	2	65	20		0.3			2	0.5	1	0.5		1	0.1		
Cenchrus setiger						0.5	0.1		2																	0.1	0.1						2		1	0.1	5	1											
Centipeda minima	0.1																																																
Cheilanthes sieberi																																																	0.1
Chloris pectinata																													0.1											0.1		2	0.1							
Chloris pumilio																																						0.5										5	
Chrysocephalum pterochaetum																					0.1																													
Chrysopogon fallax	1			0.5																				0.2											0.1		0.4	0.5		0.2	0.5							
Citrullus amarus																																		0.1															
Clerodendrum ?floribundum																																					0.1												

Vegetation Type	D2	H1	TP1b	TP1b	TP1b	DTb	DTb	DTb	DTb	DTb	DTb	DTb	DTb	TP1a	TP1a	TP1a	TP1a	TP1a	TP1a	TP1a	TP1a	TP1a	TP1a	TP1a	TP1a	ATb	ATb	ATb	ATb	ATb	ATa	ATa	ATa	ATa	ATa	ATa	ATa	ATa	ATa	ATa	ATa	ATa	ATa	ATa	ATa	DTa	DTa	DTa	DTa	DTa	DTa	BMf	EP1
Species/Site	Q047	Q029	Q001	Q003	Q043	Q002	Q004	Q005	Q008	Q034	Q035	Q042	Q006	Q022	Q023	Q027	Q031	Q032	Q033	Q036	Q037	Q041	Q049	Q050	Q007	Q021	Q025	Q040	Q048	Q009	Q010	Q013	Q014	Q015	Q017	Q018	Q019	Q020	Q026	Q028	Q038	Q039	Q044	Q046	Q011	Q012	Q016	Q030	Q045	Q024	Q051
Convolvulus ?clementii																																										0.1										
Convolvulus remotus																													0.1																						
Corchorus ?crozophorifolius																																														0.1				
Corchorus crozophorifolius						0.1	7	0.5	2	7	0.5	0.1						0.1									0.1																			0.1						
Corchorus incanus subsp. incanus		4	0.3																																												3			
Corchorus sidoides subsp. sidoides					0.1				0.1						0.1							0.1																	0.1												
Corchorus sp.																																																	0.1		
Corchorus tridens			0.1								0.1							0.1								0.1				2	0.1	0.1	0.1	0.1	1			0.1								0.1			0.1		
Corymbia hamersleyana					2								1			0.2		1	2								2			2		0.5		0.2	1			5													
Crotalaria medicaginea var. neglecta							0.1																																												
Crotalaria smithiana																													0.3			0.1			0.2			0.5												
Cucumis melo																																0.2	0.1				0.1														
Cucumis variabilis	0.1		0.1							0.1					0.1			0.1							0.1				0.2								0.5				0.1										
Cullen ?lachnostachys																			0.2																																
Cullen ?leucanthum									0.1																																										
Cullen ?pogonocarpum																																	0.5		0.1			0.1												
Cullen cinereum	0.1																																																	
Cullen leucanthum	4						0.2																																											
Cullen leucochaites																							0.5						0.1																						
Cullen pogonocarpum																														0.1		5																		
Cymbopogon ambiguus								1						0.1																																				
Cymbopogon obtectus							0.2			0.5			0.1																																				
Cynanchum viminale subsp. australe																						0.1		0.1																										
Cynodon sp.						2	0.5																																										
Cyperus vaginatus						5	3		1			0.2																																	0.2	1	2	0.5		
Dactyloctenium radulans			0.1										0.1	0.1			0.1		0.1								0.2			0.1			0.1	0.5	0.1		0.1	0.1	0.5	10	0.1	0.2							
Dampiera candicans		0.1																																															
Dichanthium sericeum																																																0.1	
Dichanthium sericeum subsp. humilius																																																
Dichrostachys spicata						0.1																																										
Digitaria brownii							0.2			0.3								0.1				0.1																											
Digitaria ctenantha											0.1						0.1	0.1																														40	
Dodonaea coriacea																						0.1																											
Dolichocarpa crouchiana		0.1																																														
Duperreya commixta	0.1		0.5	0.1	0.1	0.1											0.1	0.1		0.5		0.1		0.1		0.1	0.1									0.2	0.1												
Dysphania rhadinostachya																										0.1																								
Enchylaena tomentosa var. tomentosa					0.1													0.1				0.1			0.1																								
Enneapogon caerulescens			0.1	0.1													0.2																															0.1	
Enneapogon cylindricus			10		0.1												2				0.2	0.1	0.2	0.2					0.5						0.1			4		2	15	0.2	5							0.1
Enneapogon lindleyanus							0.2		1																																							

Vegetation Type	D2	H1	TP1b	TP1b	TP1b	D1b	D1b	D1b	D1b	D1b	D1b	D1b	D1b	TP1a	TP1a	TP1a	TP1a	TP1a	TP1a	TP1a	TP1a	TP1a	TP1a	TP1a	TP1a	A1b	A1b	A1b	A1b	A1b	A1b	A1a	A1a	A1a	A1a	A1a	A1a	A1a	A1a	A1a	A1a	A1a	A1a	A1a	A1a	D1a	D1a	D1a	D1a	D1a	D1a	BM1	EP1
Species/Site	Q047	Q029	Q001	Q003	Q043	Q002	Q004	Q005	Q008	Q034	Q035	Q042	Q006	Q022	Q023	Q027	Q031	Q032	Q033	Q036	Q037	Q041	Q049	Q050	Q007	Q021	Q025	Q040	Q048	Q009	Q010	Q013	Q014	Q015	Q017	Q018	Q019	Q020	Q026	Q028	Q038	Q039	Q044	Q046	Q011	Q012	Q016	Q030	Q045	Q024	Q051
Enneapogon polyphyllus															0.1	0.1		0.1							0.1	0.1		5		0.1				0.1		35			0.1													
Enneapogon robustissimus					1			0.1																																												
Enteropogon ramosus												0.1																																									
Eragrostis cumingii	0.5																												0.1														0.1								
Eragrostis desertorum				0.1										0.1																																						
Eragrostis eriopoda			0.1		0.1								0.2	0.1	0.1	1	1		1	5	5	3	0.5	1.5				0.1																									
Eragrostis setifolia																																						5													
Eragrostis sp.																																						0.1													
Eragrostis tenellula	0.1																																															0.1			
Eragrostis xerophila													0.1																	0.1			0.1		0.1				5		0.1		0.3								
Eremophila cuneifolia																								0.1																													5
Eremophila forrestii subsp. forrestii																					0.2	0.2		0.2												0.1				0.2										0.5	0.1
Eremophila fraseri subsp. fraseri																				0.2																																
Eremophila lanceolata																																						0.1													
Eremophila latrobei subsp. filiformis																																																			1
Eremophila maculata subsp. brevifolia																								0.1																												
Eremophila margarethae																								3																												
Eriachne aristidea													0.1	0.5			0.3	0.1	0.1		0.2	0.1	0.1	0.1				0.2																									
Eriachne benthamii								0.1																																											
Eriachne pulchella							0.1	0.1		0.2		0.1							0.1																																		
Eriachne pulchella subsp. dominii							0.1	0.1		0.2		0.1							0.1																																		
Eriachne pulchella subsp. pulchella														0.2			0.1							0.1																												
Eriachne tenuiculmis	0.3																																																		
Eriochloa pseudoacrotricha	0.5																																																	
Eucalyptus camaldulensis						40	10		15		8	10																																			25	5	20	10	20		
Eucalyptus gamophylla																								3																												
Eucalyptus leucophloia subsp. leucophloia		3																																																
Eucalyptus socialis				15	10																																													
Eucalyptus victrix	3					5		10		4		1																																					1		
Eucalyptus xerothermica			5	2	4																																													
Eulalia aurea						5	0.1		0.75										0.1			0.1																										0.5	0.5	0.1		
Euphorbia ?biconvexa						0.1	0.1																																											
Euphorbia australis							0.1																																											
Euphorbia australis var. australis																					0.1																														
Euphorbia australis var. subtomentosa			0.1						0.1	0.2					0.1																																	0.1		
Euphorbia biconvexa				0.1				0.1			0.1	0.1																																						
Euphorbia boophthona			0.1		0.1				0.1				0.1											0.1				0.1	0.2																						0.1
Euphorbia coghlanii									0.1						0.1			0.1										0.1		0.1						0.1		0.1	0.1	0.1	0.1	0.1			0.1	0.1			0.1	0.1	
Euphorbia ferdinandi var. ferdinandi																												0.1		0.1									0.1												
Euphorbia sp.																0.1																							0.1										0.1		

Vegetation Type	D2	H1	TP1b	TP1b	TP1b	D1b	D1b	D1b	D1b	D1b	D1b	D1b	D1b	TP1a	TP1a	TP1a	TP1a	TP1a	TP1a	TP1a	TP1a	TP1a	TP1a	TP1a	TP1a	A1b	A1b	A1b	A1b	A1b	A1b	A1a	A1a	A1a	A1a	A1a	A1a	A1a	A1a	A1a	A1a	A1a	A1a	A1a	A1a	A1a	D1a	D1a	D1a	D1a	D1a	D1a	BM1	EP1
Species/Site	Q047	Q029	Q001	Q003	Q043	Q002	Q004	Q005	Q008	Q034	Q035	Q042	Q006	Q022	Q023	Q027	Q031	Q032	Q033	Q036	Q037	Q041	Q049	Q050	Q007	Q021	Q025	Q040	Q048	Q009	Q010	Q013	Q014	Q015	Q017	Q018	Q019	Q020	Q026	Q028	Q038	Q039	Q044	Q046	Q011	Q012	Q016	Q030	Q045	Q024	Q051
Euphorbia tannensis subsp. eremophila				0.1										0.1				0.1																																				
Evolvulus alsinoides var. decumbens							0.1		0.5	0.2	0.1						0.1	0.1		0.1	0.1				0.2		0.1							0.5				2								0.1			
Evolvulus alsinoides var. villosicalyx	0.1	0.1		0.1									0.1		0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1		0.1	0.4	0.2	0.3			0.1		0.1	0.1	0.2	0.1	0.1	0.1	0.1		0.5	1						0.1	0.1
Fimbristylis dichotoma														0.5							0.1	0.1																														0.1
Fimbristylis simulans		0.1																																																	
Glinus lotoides	0.1																																																		
Glycine canescens	0.1					0.1			0.1			0.1															0.1		0.1																								
Gomphrena canescens subsp. canescens		0.1	0.1						0.1	0.1			0.1		0.1		0.2	0.1			0.1	0.1	0.1			0.1	0.1		0.1							0.1		0.1	0.1	0.2	0.2	0.1									
Gomphrena cunninghamii							0.1	0.1																0.1																0.1												
Gomphrena kanisii				0.1												0.1																																			
Goodenia ?microptera			0.1																																															
Goodenia ?muelleriana																																								0.1										
Goodenia lamprosperma	0.4							0.1																																					0.1	0.2		0.2			
Goodenia microptera				0.1	0.1								0.1	0.2		0.1		0.1		0.1	0.3	0.1	0.1	0.1																											0.1
Goodenia muelleriana		0.1	0.1	0.1										0.2		0.2	0.2				0.1																		0.1										0.2	
Goodenia nuda															0.1																								0.1										
Goodenia prostrata			0.1												0.1				0.1		0.1						0.2							0.1		0.2		0.2	0.5		0.1	0.1							
Goodenia tenuiloba															0.1																										0.1								
Goodenia vilmoriniae																					0.3																													
Gossypium robinsonii									0.2																																			0.1						
Grevillea pyramidalis subsp. leucadendron																																																	0.1
Hakea chordophylla															0.1																																			
Hakea lorea subsp. lorea		0.1	1	0.2	0.1								0.5		1	1	1	0.2	0.5		0.1		0.1	0.3														0.2											
Haloragis gossei var. gossei																								0.1																										0.1
Heliotropium crispatum																											0.1		0.1														0.1							
Heliotropium cunninghamii																0.1					0.1																		5		0.1										
Heliotropium heteranthum																																							0.1	0.1										
Heliotropium inexplicitum															0.1				0.1																															
Heliotropium ovalifolium		0.1																																																
Heliotropium sp.																																						0.1											1	
Heliotropium tanythrix			0.1																								0.1								0.1		0.5												
Heliotropium tenuifolium								0.1																																										
Hibiscus ?burtonii																				0.1				0.1																										0.1
Hibiscus burtonii			0.1													0.1	0.1				0.2																						0.1						0.1	0.2
Hibiscus coatesii					0.1																																												0.1
Hibiscus sturtii																																						0.1											
Hibiscus sturtii var. campylochlamys														0.1	0.1	0.1	0.2																					0.1	0.1	0.2	0.1							
Hibiscus sturtii var. platychlamys					0.1								0.1					0.1		0.2	0.3	0.1	0.1	0.1																	0.1								
Indigofera colutea																0.1	0.1										0.1							0.2	2.5	5		0.5		0.2									
Indigofera linifolia															0.1														0.1					0.1	1			0.4		0.1	1		0.1							

Vegetation Type	D2	H1	TP1b	TP1b	TP1b	DTb	DTb	DTb	DTb	DTb	DTb	DTb	DTb	TP1a	TP1a	TP1a	TP1a	TP1a	TP1a	TP1a	TP1a	TP1a	TP1a	TP1a	TP1a	TP1a	ATb	ATb	ATb	ATb	ATb	ATb	ATa	ATa	ATa	ATa	ATa	ATa	ATa	ATa	ATa	ATa	ATa	ATa	ATa	ATa	ATa	DTa	DTa	DTa	DTa	DTa	DTa	BM1	EP1
Species/Site	Q047	Q029	Q001	Q003	Q043	Q002	Q004	Q005	Q008	Q034	Q035	Q042	Q006	Q022	Q023	Q027	Q031	Q032	Q033	Q036	Q037	Q041	Q049	Q050	Q007	Q021	Q025	Q040	Q048	Q009	Q010	Q013	Q014	Q015	Q017	Q018	Q019	Q020	Q026	Q028	Q038	Q039	Q044	Q046	Q011	Q012	Q016	Q030	Q045	Q024	Q051
Indigofera linnaei							0.2						0.1		0.1			0.1	1							0.1		0.1	0.1					0.1		0.1				0.2			0.1										
Indigofera monophylla										4							0.1																															1				
Indigofera sp.				0.1																																																
Indigofera rivularis																																																1			
Ipomoea calobra																												0.1															0.1	0.1							
Ipomoea coptica											0.1																																									
Ipomoea muelleri	0.1						0.1		0.1		0.1															0.1	0.1		0.1	0.2		0.2		0.1	0.1	0.1		0.1	0.1			0.1	0.1				0.1				
Iseilema dolichotrichum			0.1																																							0.3								
Iseilema membranaceum																																											0.1							
Iseilema vaginiflorum																																					0.3		0.2											
Isotropis atropurpurea												0.1																																							
Jasminum didymum subsp. lineare																										0.1																							0.1			
Leiocarpa semicalva																																										0.1							
Lysiana casuarinae																								0.1																											
Maireana ?georgei																																										1							
Maireana ?planifolia																											0.1																							
Maireana ?villosa																	0.2																																		
Maireana melanocoma																																																		0.2
Maireana planifolia																		0.1				0.1		0.2										0.1				0.1	0.5											
Maireana thesioides																																																	0.1
Maireana tomentosa																																				0.1													
Maireana triptera																																																	0.2
Maireana villosa																							0.1																												
Malvastrum americanum	3		0.1			0.3	0.1		0.4			0.2												0.3		0.1	0.1			0.1		0.5	1				0.1												
Marsilea exarata	0.2																																																
Melaleuca glomerata						0.5	15		4		15																																					1	5	0.1		
Melhania oblongifolia																									0.1																										
Paraneurachne muelleri		0.1	2	0.1	3								0.1	0.1	1	0.1			0.5		0.1	0.1	1	0.2																										0.2
Paspalidium clementii								0.1																																										
Paspalidium rarum														0.1										0.1																					0.2					3	0.1
Paspalidium sp.																		0.1																																	
Peplidium muelleri																													0.1																					
Perotis rara														0.1			0.4	0.1								0.1		0.1						0.1		0.1				0.1		0.3							1	
Petalostylis labicheoides				2	0.2	2			0.2			0.1								0.5																															
Phyllanthus ?maderaspatensis																																															0.1			
Phyllanthus maderaspatensis			0.3			0.1	0.1	0.1	0.2	0.1	0.1	0.2															0.1																			0.1		0.1			
Pluchea dentex	0.1																																		0.1												0.1			
Pluchea dunlopii	0.1		0.1																																							0.1							
Pluchea rubelliflora								0.1				0.1																																					0.1
Poaceae sp.																						0.1																											0.2	
Polycarpaea corymbosa var. corymbosa																	0.1																											0.1						
Polycarpaea longiflora												0.1																																						
Polygala ?glaucifolia															0.1																																			
Polygala glaucifolia			0.1																		0.1																						0.1							

Vegetation Type	D2	H1	TP1b	TP1b	TP1b	D1b	D1b	D1b	D1b	D1b	D1b	D1b	D1b	TP1a	TP1a	TP1a	TP1a	TP1a	TP1a	TP1a	TP1a	TP1a	TP1a	TP1a	TP1a	A1b	A1b	A1b	A1b	A1b	A1b	A1a	A1a	A1a	A1a	A1a	A1a	A1a	A1a	A1a	A1a	A1a	A1a	A1a	A1a	A1a	D1a	D1a	D1a	D1a	D1a	D1a	BM1	EP1
Species/Site	Q047	Q029	Q001	Q003	Q043	Q002	Q004	Q005	Q008	Q034	Q035	Q042	Q006	Q022	Q023	Q027	Q031	Q032	Q033	Q036	Q037	Q041	Q049	Q050	Q007	Q021	Q025	Q040	Q048	Q009	Q010	Q013	Q014	Q015	Q017	Q018	Q019	Q020	Q026	Q028	Q038	Q039	Q044	Q046	Q011	Q012	Q016	Q030	Q045	Q024	Q051
Polymeria ?ambigua																									0.1																															
Polymeria ambigua						0.1																																																
Polymeria calycina																													0.1																									
Portulaca cyclophylla		0.1																			0.1																	0.2		0.1													
Portulaca filifolia																						0.1						0.1	0.1														0.1	0.1	0.1								
Portulaca oleracea			0.1	0.1										0.1			0.1		0.1						0.1		0.2				0.1		0.2	0.1	0.1		0.1	0.1	0.1	0.1		0.1									0.1
Portulaca pilosa																																																			0.1	
Psydrax latifolia																																										0.1									
Pterocaulon sphacelatum	3				0.1										0.1			0.1											1														0.2									0.1
Pterocaulon sphaeranthoides									0.2																							0.2				0.1														
Ptilotus astrolasius		0.1			0.1										0.1			0.1				0.1		1	0.1																											0.1
Ptilotus axillaris																							0.1																													
Ptilotus calostachyus		0.1																						0.1																												0.1
Ptilotus clementii				0.1																																															
Ptilotus exaltatus		0.1	0.5	1	0.1		0.1						0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2		0.1					0.1																	0.5
Ptilotus gaudichaudii																																										0.1							0.1	
Ptilotus gomphrenoides	0.2																																											0.2						
Ptilotus helipteroides														0.1	0.1				0.1		0.1	0.1		0.1		0.1	0.1										0.2	0.1	0.15											0.1
Ptilotus obovatus			0.1	0.5	0.5									1			0.1	0.1		0.1	0.1		0.5											0.1		0.5		0.1		0.1								
Ptilotus polystachyus			0.1		1.5													0.1																							0.1								0.1
Ptilotus rotundifolius		0.1																																																
Rhagodia eremaea													0.1					0.1												0.1				0.1	0.3	0.2		0.3					0.5							
Rhynchosia minima	0.1		0.1			0.1	0.1		0.1		0.1	0.1			0.1							0.1			0.1		0.1	0.1	0.1			0.1				0.1		0.1	0.1	0.1				0.1							
Rostellularia adscendens var. clementii	0.1											0.1																																								
Rutidosis helichrysoides subsp. helichrysoides																													0.1																							
Salsola australis					0.2		0.1															0.1	0.1							0.1	0.1		0.1		0.5			0.1					0.1								
Santalum spicatum																																																			1
Scaevola amblyanthera var. centralis			0.1																																																
Scaevola parvifolia subsp. pilbarae																				0.1		0.1																														
Sclerolaena convexula	0.1																																																		
Sclerolaena cornishiana					0.1																	0.1	0.1																				0.1		0.1	0.2						
Sclerolaena costata																	0.1										0.1																									
Sclerolaena densiflora																		0.1															0.1		0.1															
Sclerolaena eriacantha																																																		0.1
Senna ?symonii																								0.4																												0.5
Senna artemisioides subsp. ?oligophylla																																												0.1						
Senna artemisioides subsp. helmsii														1	0.3		2	0.1			0.2	2	6	0.1		0.1	0.2						0.3	0.2	0.2		3	0.2	5		0.5								
Senna artemisioides subsp. helmsii x oligophylla																																									0.2									
Senna artemisioides subsp. oligophylla	0.1		0.2	0.5	0.1									4		0.1	2		0.4	5		4	3	0.3			0.5		0.2	2		0.1		0.1		0.1		1	3	1				2				0.1	0.1
Senna artemisioides subsp. oligophylla x helmsii																				1								0.1	0.1											1											

Vegetation Type	D2	H1	TP1b	TP1b	TP1b	Dfb	Dfb	Dfb	Dfb	Dfb	Dfb	Dfb	Dfb	TP1a	TP1a	TP1a	TP1a	TP1a	TP1a	TP1a	TP1a	TP1a	TP1a	TP1a	TP1a	Afb	Afb	Afb	Afb	Afb	Afb	A1a	A1a	A1a	A1a	A1a	A1a	A1a	A1a	A1a	A1a	A1a	A1a	A1a	A1a	A1a	D1a	D1a	D1a	D1a	D1a	D1a	BM1	EP1
Species/Site	Q047	Q029	Q001	Q003	Q043	Q002	Q004	Q005	Q008	Q034	Q035	Q042	Q006	Q022	Q023	Q027	Q031	Q032	Q033	Q036	Q037	Q041	Q049	Q050	Q007	Q021	Q025	Q040	Q048	Q009	Q010	Q013	Q014	Q015	Q017	Q018	Q019	Q020	Q026	Q028	Q038	Q039	Q044	Q046	Q011	Q012	Q016	Q030	Q045	Q024	Q051
Senna glutinosa subsp. ×luerssenii					0.1																																																2
Senna glutinosa subsp. glutinosa		0.3																																																	
Senna glutinosa subsp. pruinosa					0.1																																														
Senna notabilis	0.1								0.1					0.5			0.2	0.1	0.1	2	0.1	0.1		0.1	0.1				0.5	0.1						0.1		0.1				0.1										
Senna symonii																								2																					3								0.1
Sesbania cannabina																																																		0.1			
Sida arenicola		0.1																				0.1																														
Sida cardiophylla													0.1							0.1			0.1	0.1																													
Sida clementii															0.1																																						
Sida echinocarpa																							0.2	0.1																													
Sida fibulifera			0.1	0.1	0.1								0.1		0.1		0.1		0.1	0.1		0.1	0.2							0.1								0.1		0.1			0.1	0.1						0.1	
Sida sp. Supplejack Station (T.S. Henshall 2345)																																										0.2										
Solanum centrale																								0.1																													
Solanum elatius																								0.1																													
Solanum horridum					0.1																			0.1																													
Solanum lasiophyllum		0.1	0.3	0.1	0.1								0.1		0.1			0.1			0.1		0.1	0.1		0.1	0.1	0.1	0.1						0.1			0.1	0.1	0.1		0.2								0.1
Sporobolus australasicus			0.1	0.1	0.2							1	0.1	0.1			0.1							0.1	0.1	0.1	0.2	0.1	0.2																							0.1
Stemodia grossa	0.1																																																0.1			
Stemodia viscosa	0.1										0.1																																0.1						0.1			
Streptoglossa ?decurrens															0.1	0.1																																				
Streptoglossa bubakii																			0.1					0.1					0.1														0.1									0.3
Streptoglossa decurrens		0.1																														0.1																			
Streptoglossa macrocephala																							0.2																														0.1
Streptoglossa odora					0.1								0.1																																							
Streptoglossa sp. Indet	0.1				0.1																	0.1																															
Stylobasium spathulatum		0.1			0.75															1	0.4			0.2																													1.5
Swainsona ?elegantoides																																		0.1																		
Swainsona decurrens																																																				
Swainsona leeana			0.1																																																	
Synaptantha tillaeacea var. tillaeacea	0.1																												0.1																							
Synostemon rhytidospermus			0.1																																																
Tephrosia ?supina																						0.1																						0.1									
Tephrosia rosea var. ?clementii																				0.1																																
Tephrosia rosea var. ?Fortescue Creeks (MIH Brokker 2186)																																																			
Tephrosia rosea var. clementii								1										0.1																																		
Tephrosia rosea var. Fortescue creeks (M.I.H. Brooker 2186)						0.3	0.2			2		0.1	0.1			0.5							0.1																												0.1		
Tephrosia sp.																0.1																					0.1		0.1		0.1		0.1							
Tephrosia sp. Newman (A.A. Mitchell PRP 29)		0.1								0.1				0.1			0.2																			0.1		0.1									0.1			

Vegetation Type	D2	H1	TP1b	TP1b	TP1b	D1b	D1b	D1b	D1b	D1b	D1b	D1b	D1b	TP1a	TP1a	TP1a	TP1a	TP1a	TP1a	TP1a	TP1a	TP1a	TP1a	TP1a	TP1a	A1b	A1b	A1b	A1b	A1b	A1a	A1a	A1a	A1a	A1a	A1a	A1a	A1a	A1a	A1a	A1a	A1a	A1a	A1a	D1a	D1a	D1a	D1a	D1a	BM1	EP1
Species/Site	Q047	Q029	Q001	Q003	Q043	Q002	Q004	Q005	Q008	Q034	Q035	Q042	Q006	Q022	Q023	Q027	Q031	Q032	Q033	Q036	Q037	Q041	Q049	Q050	Q007	Q021	Q025	Q040	Q048	Q009	Q010	Q013	Q014	Q015	Q017	Q018	Q019	Q020	Q026	Q028	Q038	Q039	Q044	Q046	Q011	Q012	Q016	Q030	Q045	Q024	Q051
Tephrosia sp. Northern (K.F. Kenneally 11950)															0.5												0.3							0.1		0.1			0.1	0.2											
Themeda triandra									0.25																																									0.5	
Trachymene oleracea		0.1																																																
Tragus australianus			0.3														0.2	0.1																0.1	0.1	0.1			0.1	0.2											
Trianthema pilosum													0.1	0.2		0.1	0.1	0.1	0.1							0.1	0.1	0.1					0.1																	
Trianthema triquetrum													0.1																																						
Tribulopis angustifolia			0.1																0.1																																
Tribulus astrocarpus																	0.1																																		
Tribulus cistoides																												0.1																							
Tribulus hirsutus			0.01	0.1	0.1																																													
Tribulus macrocarpus													0.3	0.1		1	0.2	0.2	2	5	0.1	0.1	0.1	0.1																											0.1
Tribulus occidentalis																			0.1																																
Tribulus sp.															0.1																																				
Tribulus suberosus		0.1			0.1																																													
Trichodesma zeylanicum var. zeylanicum					0.1	0.1	0.1	0.1	0.2	0.1		0.1		0.1		0.1	0.1	0.1	0.1			0.1	0.1		0.1												0.1					0.1									
Trigastrotheca molluginea		0.1															0.75																																		
Triodia ?pungens																				1							0.2																								
Triodia basedowii																						2		0.1																												
Triodia longiceps											0.5																																								
Triodia pungens		15	40	30	55		0.5	0.5	1	0.1	0.1		45	10	35	50	0.4	15	10	1	20	20	60	25	0.1	0.1		1	20										0.1										50
Tripogonella loliiformis																	0.1																																		
Triumfetta chaetocarpa																	0.5		0.1										0.1							0.1															
Urochloa occidentalis var. occidentalis																		0.1																										0.1								
Vachellia farnesiana	0.1						0.1																							1	10		0.1		0.2		1														
Wahlenbergia tumidifructa							0.1																																										0.1		
Waltheria indica							0.1											0.1				0.1																											0.1		
Yakirra australiensis var. australiensis														0.5			0.3		0.1	0.1	0.1		0.1																												
Zaleya galericulata																											0.1			1			0.2											0.1							