Area C West to Yandi
Flora and Vegetation Assessment

November 2018

Prepared for
BHP Western Australian Iron Ore (BHP WAIO)

astron

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Approval

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Abbreviations

Abbreviation	Definition
Astron	Astron Environmental Services
BHP WAIO	BHP Western Australian Iron Ore
BC Act	*Biodiversity Conservation Act 2016*
°C	Degrees Celsius
DBCA	Department of Biodiversity, Conservation and Attractions
ESA	Environmentally Sensitive Area
GDA 94	Geocentric Datum of Australia 1994
GDV	Groundwater dependent vegetation
GPS	Geographical Positioning System
ha	Hectare
IBRA	Interim Biogeographic Regionalisation for Australia
km	Kilometre
m	Metres
mm	Millimetres
MGA	Map Grid of Australia
Mulga	The *Acacia aneura* complex
P	Priority
PEC	Priority Ecological Community
sp.	Species (singular)
spp.	Species (plural)
Study area	Four riparian systems (five creeklines): Marillana Creek, Pebble Mouse Creek, Yandicoogina Creek, Lamb Creekand Area C North Creekline, comprising approximately 3,729 ha.
subsp.	Subspecies
TEC	Threatened Ecological Community
WoNS	Weed of National Significance
var.	variety
*****	Denotes introduced flora (weed species)

Executive Summary

BHP Billiton Western Australian Iron Ore engaged Astron Environmental Services to conduct an assessment of flora and vegetation values along five creeklines in the vicinity of the Area C, Yandi and South Flank mining operations. The Study Area, covering approximately 3,729 hectares, comprises Marillana Creek, Pebble Mouse Creek, Yandicoogina Creek, Lamb Creek and Area C North Creekline.

Verification, extension and extrapolation of surrounding vegetation mapping was undertaken to compile a reconciled map of consolidated vegetation associations across the Study Area. The report therefore comprises a literature and database review of flora and vegetation within the Study Area, details of the field survey, and a map of interpreted vegetation associations across the Study Area.

Approximately 1,584 ha (43%) of the Study Area has been previously vegetation mapped. Thirty eight consolidated vegetation assocations have been mapped within the Study Area during both current and previous surveys. None of the vegetation associations recorded within the Study Area represent a listed Threatened Ecological Community or Priority Ecological Community. Vegetation condition ranged from 'Excellent' to 'Poor', with large tracts of land recently burnt which limited full interpretation of some vegetation communities. Eight vegetation assocations are likely to be groundwater dependent due to the presence of the obligate phreatophytes *Melaleuca argentea and Typha domingensis,* and/or the faculatative phreatophytes *Eucalyptus camaldulensis* and *Eucalyptus victrix*. These vegetation associations account for 1,185.5 hectares (31.8% of the Study Area).

A total of 102 confirmed vascular flora species were recorded from 67 sampling sites (relevés and mapping note locations). No Threatened taxa were recorded nor are expected to occur. One conservation significant flora species, *Eremophila* sp. Hamersley Range (K. Walker KW 136) Priority 3, was recorded on one occasion during the survey, on a hillslope habitat within vegetation association HS TsTwTp EllCh AhiAad. Six additional Priority flora species have been previously recorded withn the Study Area. Three weed species were recorded, none of which represent a declared pest or Weed of National Signficance and all are considered common to the Pilbara region.

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1 Introduction

1.1 Background

BHP Western Australian Iron Ore (BHP WAIO) requires information on riparian vegetation within several creeklines across the central Pilbara. Astron Environmental Services (Astron) was commissioned to undertake desktop and field assessments of flora and vegetation values associated with the creeklines. The Study Area is located approximately 115 km north-west of Newman in Western Australia and totals approximately 3,729 ha. Five creeks within four riparian systems comprise the Study Area: Marillana Creek, Pebble Mouse Creek, Yandicoogina Creek, Lamb Creek and Area C North Creekline (Figure 1).

1.2 Scope

A scope of work, dated 24 August 2018 required the provision of information regarding vegetation that may be susceptible to changes in hydrological regime from groundwater drawdown, reinjection or discharge. Further revisions to the scope were made by BHP WAIO in 2019, which shifted the focus to desktop and field assessments of flora and vegetation of the Study Area. The extent of vegetation mapping at the time of the survey did not cover the entire Study Area. To infill these gaps, a targeted vegetation survey was undertaken as part of this assessment. The report therefore comprises:

- a literature and database review of flora and vegetation within the Study Area
- details and outcomes of the field survey
- a complete map of interpreted vegetation associations across the Study Area.

675000 700000 725000 750000

7500000 7475000 7450000

Karijini Dr

Munjina - Roy Hill Rd

Yandi Haul Rd (IP)

Yandi Mine Access

MARILLANA

Marillana Creekline

Lamb Creekline

MARILLANA CREEK

Lamb Creek Access Rd

Area C North Creekline

YANDICOOGINA CREEK

Yandicoogina Creekline

WEELI WOLLI CREEK

Packsaddle Rd

MOUNT MEHARRY

West Angelas Rd

PEBBLE MOUSE CREEK

Pebble Mouse Creekline

Wilks Spring Rd

Giles Point Rd

Weeli Wolli Rd

Great Northern Hwy

PORT HEDLAND
ROEBOURNE
MARBLE BAR
TELFER MINING CENTRE
WITTENOOM GORGE
TOM PRICE
NEWMAN
PARABURDOO
Map Extent

BHP Operating Mine Sites
Localities
Main Road
Minor Road
Major River
Minor River
Karijini National Park
Study Area

BHP Western Australian Iron Ore (BHP WAIO)
Area C West to Yandi Flora and Vegetation Assessment

Figure 1: Project Area Location

Coordinate System: GDA 1994 MGA Zone 50
Kilometres
0 2 4 6 8 10

N

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Author: J. Atkinson | Drawn: L. Robinson | Date: 26-03-2019 | Figure Ref: 2465-18-ENVDR-1Rev0_190326_Fig01_Locn

2 Environmental context

2.1 Physical Environment

2.1.1 Climate

The climate of the Pilbara region of Western Australia is arid tropical with two distinct seasons: a hot, wet summer (October to April) and a mild, dry winter (May to September) (Bureau of Meteorology 2018). Mean annual rainfall at Wittenoom (Bureau of Meteorology Station 5026), approximately 80 km north-west of the Study Area, is 462 mm (Figure 2). Mean maximum air temperature ranges from 39.7°C in December to 24.3°C in July and exceeds 30°C for much of the year. Temperature and rainfall for the 2017 to 2018 period generally conformed to the long-term trend. Exceptions included higher than average rainfall in January 2018 and June 2018 and a period of very low rainfall between July and November 2018 (Figure 2).

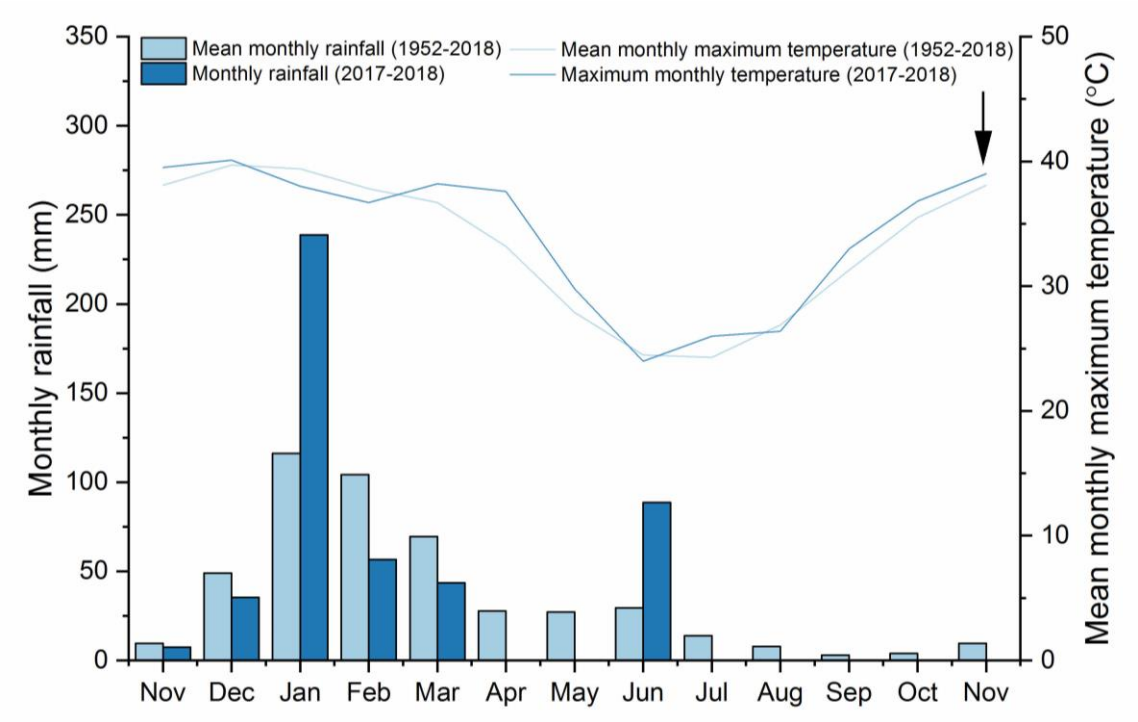

Figure 2: Long-term means and 2017 to 2018 data for monthly rainfall and maximum monthly temperature at Wittenoom (Bureau of Meteorology 2018). The arrow indicates the timing of the vegetation survey in 2018.

2.1.2 Geology and landforms

The Study Area falls within the Hamersley Plateaux soil-landscape zone of the Fortescue Province. The dominant landform features within this zone are rocky ranges/hills and stony plains (Tille 2006). Rugged hills, ridges, dissected plateaux and mountains occur on the basalt, banded iron formation and sandstone of the Hamersley Basin. Long stony footslopes and plains are often associated with these hills, with hardpan wash plains supporting a gravelly or stony surface (Tille 2006). Stony soils dominate the ranges and hills, where red shallow loams and red shallow sands also occur. Hard cracking clays are sometimes found on basaltic plateau surfaces. On the granitic stony plains there are red shallow loams, red deep sandy duplexes and red sandy earths, while red shallow loams and red/brown non-cracking clays are found on the stony footslopes and plains beneath basaltic hills. Stony soils, red deep sandy duplexes and red loamy earths are also associated with the stony plains. The alluvial plains have red loamy earths, red/brown non-cracking clays, hard cracking clays, self-

mulching cracking clays, red deep loamy duplexes and red shallow sandy duplexes. Alluvial deposits of red deep sands are found on river terraces and active floodplains (Tille 2006). Colluvium 3841 is the most dominant of the nine geological units within the Study Area (Stewart et al. 2008) (Table 1).

Table 1: Geological units of the Study Area (Stewart et al. 2008).

Geological name	Label	Area within Study Area (ha)
Fortescue Subregion		
Alluvium 38485: channel and flood plain alluvium; gravel, sand, silt, clay, locally calcreted.ust	Qa	91.9
Weeli Wolli Formation: banded iron-formation (commonly jaspilitic), mudstone, siltstone; common interlayered metadoleritic sills.	Lchw	90.8
Robe Pisolite: pisolitic, oolitic and massive limonite, goethite and hematite deposits containing fossil wood fragments; iron ore.	Czlr	10.5
Hamersley Subregion		
Colluvium 38491: colluvium, sheetwash, talus; gravel piedmonts and aprons over and around bedrock; clay-silt-sand with sheet and nodular kankar; alluvial and aeolian sand-silt-gravel in depressions and broad valleys in Canning Basin; local calcrete, reworked laterite.	Qrc	1,103.1
Weeli Wolli Formation: banded iron-formation (commonly jaspilitic), mudstone, siltstone; common interlayered metadoleritic sills	Lchw	700.6
Brockman Iron Formation: banded iron-formation, chert, mudstone and siltstone.	Lchk	531.1
Alluvium 38485: channel and flood plain alluvium; gravel, sand, silt, clay, locally calcreted.	Qa	383.4
Calcrete 38497: pisolitic, nodular or massive calcrete; ferruginous inclusions; calcareous cementing of bedrock and transported materials; locally with intercalated chalcedony; as low mounds, in playa lakes, or as valley calcrete; locally dissected and karstified.	Czk	377.9
Ferruginous Duricrust 38498: pisolitic, nodular or vuggy ferruginous laterite; some lateritic soils; ferricrete; magnesite; ferruginous and siliceous duricrusts and reworked products, calcrete, kaolinised rock, gossan; residual ferruginous saprolite	Czl	202.3
Robe Pisolite: pisolitic, oolitic and massive limonite, goethite and hematite deposits containing fossil wood fragments; iron ore.	Czlr	165.4
Marra Mamba Iron Formation: chert, ferruginous chert, jaspilite, banded iron formation, minor shale, siltstone, mudstone.	Achm	47.8
Mount McRae Shale and Mount Sylvia Formation: interbedded shale, chert, banded iron-formation.	Ashm	23.9

2.1.3 Surface water and hydrology

Streamflow in the Pilbara is typically a response to large, highly seasonal and variable rainfall events. Most flows occur during summer between January and March. Most watercourses are ephemeral, although in some areas perennial pools are maintained by groundwater. The Study Area encompasses a series of reaches within tributaries of the Fortescue River. Three of the more prominent tributaries in the region are Weeli Wolli, Marillana and Yandicoogina creeks. Although these creeks are ephemeral, discharge of surplus mine water into Weeli Wolli Creek has created

pools or reaches where flows are now permanent. Under natural conditions, runoff is generated from heavy rainfall events, with the magnitude of flow dependent on soil type and land use. In small channels, streamflow is usually of a short duration, but it can persist for weeks or months in larger river channels.

The contribution of groundwater to stream flow and perennial pools in the region is also significant. Groundwater seeps and springs are expressions of this contribution, and may represent an important water source for groundwater dependent ecosystems. No Wetlands of International Importance (i.e. Ramsar wetlands) or Nationally Important Wetlands occur within the Study Area. There are two Nationally Important Wetlands in the wider region: the Fortescue Marshes and Karijini (Hamersley Range) Gorges, located approximately 34 km and 37 km from the Study Area respectively (Department of the Environment and Energy 2018b). The nearest Public Drinking Water Source Area is the Newman Water Reserve, located approximately 72 km south-west of the Study Area at its nearest point (Department of Water 2008).

2.2 Biological Environment

2.2.1 Interim Biogeographic Regionalisation of Australia

The Interim Biogeographic Regionalisation for Australia (IBRA version 7) divides the Australian continent into 89 bioregions and 419 subregions (Department of the Environment and Energy 2012). The IBRA regions represent a landscape-based approach to classifying the land surface, including attributes of climate, geomorphology, landform, lithology, and characteristic flora and fauna. The Study Area occurs in the Pilbara bioregion, of which 8.4% is represented in the national reserve system (Department of the Environment and Energy 2016b).

The biodiversity of the 53 subregions recognised in Western Australia was documented as part of a national audit to provide priorities for conservation action (Department of Conservation and Land Management 2002). The Study Area occurs across two Pilbara subregions: Fortescue and Hamersley:

- Fortescue PIL02 – alluvial plains and river frontage with extensive salt marsh, mulga-bunch grass, and short grass communities on alluvial plains in the east. There are deeply incised gorge systems in the western part of the drainage. River gum woodlands fringe the drainage lines the subregions contains the northern limit of Mulga (*Acacia aneura*). An extensive calcrete aquifer (originating within a paleo-drainage valley) feeds permanent springs in the central Fortescue, supporting large permanent wetlands with extensive stands of *Eucalyptus camaldulensis* and *Melaleuca glomerata* woodlands (Kendrick 2001a).

- Hamersley PIL3 – mountainous area of Proterozoic sedimentary ranges and plateaux, dissected by gorges (basalt, shale and dolerite). Mulga low woodland over bunch grasses on fine textured soils in valley floors, and *Eucalyptus leucophloia* over *Triodia brizoides* on skeletal soils of the ranges (Kendrick 2001b).

2.2.2 Land systems

Land systems of Western Australian rangelands have been mapped and described by the Department of Primary Industries and Regional Development (formerly the Department of Agriculture and Food) outlining the distributions and providing comprehensive descriptions of biophysical resources, including soil and vegetation condition. A total of 102 land systems occur in the Pilbara bioregion covering 181,723 km^2. Ten land systems were identified in the Study Area (van Vreeswyk et al. 2004) (Table 2).

Table 2: Distribution of land systems within the Study Area.

Land system	Total area within bioregion (ha)	Total area within Study Area (ha)	Proportion within Study Area (%)
Fortescue Subregion			
River System: narrow, seasonally active flood plains and major river channels supporting moderately close, tall shrublands or woodlands of acacias, fringing communities of eucalypts sometimes with tussock grasses or spinifex.	25,450.2	176.9	0.7
Newman System: rugged jaspilite plateaux, ridges and mountains with hard spinifex.	93,542.5	7.9	<0.1
Robe System: low limonite mesas and buttes supporting soft spinifex (and occasionally hard spinifex) grasslands.	169.2	4.5	2.7
Rocklea System: basalt hills, plateaux, lower slopes and minor stony plains supporting hard spinifex and occasionally soft spinifex grasslands with scattered shrubs.	1,732.4	3.8	0.2
Hamersley Subregion			
Boolgeeda System: stony lower slopes and plains below hill systems supporting hard/soft spinifex grasslands and mulga.	607,323.0	940.5	1.5
Newman System: rugged jaspilite plateaux, ridges and mountains with hard spinifex.	1,856,685.4	827.4	<0.1
Platform System: dissected slopes and raised plains supporting shrubby hard spinifex grasslands.	217,768.0	791.9	0.4
McKay System: hills, ridges, plateaux remnants and breakaways of meta sedimentary and sedimentary rocks supporting hard spinifex grasslands with acacias and occasional eucalypts.	80,884.9	359.2	0.4
River System: narrow, seasonally active flood plains and major river channels supporting moderately close, tall shrublands or woodlands of acacias, fringing communities of eucalypts sometimes with tussock grasses or spinifex.	72468.1	201.4	0.3
Pindering System: gravelly hardpan plains supporting groved mulga shrublands with hard and soft spinifex.	26,321.9	129.3	0.5
Robe System: low limonite mesas and buttes supporting soft spinifex (and occasionally hard spinifex) grasslands.	102,676.7	120.7	0.1
Calcrete System: low calcrete platforms and plains supporting shrubby hard spinifex grasslands.	11,350.7	93.9	0.8
Oakover System: breakaways, mesas, plateaux and stony plains of calcrete supporting hard spinifex grasslands.	8,103.8	44.2	<0.1
Rocklea System: basalt hills, plateaux, lower slopes and minor stony plains supporting hard spinifex and occasionally soft spinifex grasslands with scattered shrubs.	711,723.9	27.1	<0.1

2.2.3 Pre-European Vegetation

Beard (1975) completed broad-scale (1:1,000,000) pre-European vegetation mapping at an association level. Three pre-European vegetation units, 18.11, 29 and 82.3 are associated with the Study Area (Shepherd, Beeston, and Hopkins 2002).

Table 3 summarises the current and pre-European extent of these vegetation units in the Fortescue and Hamersely subregions of the Pilbara, and the Study Area (Government of Western Australia 2018).

Table 3: Extent of pre-European vegetation in the Study Area (Government of Western Australia 2018).

Vegetation association	Mapping unit (Beard 1975)	Description	Extent in Study Area (ha)	Pre-European extent (ha)	Current extent in bioregion (ha)	Proportion of pre-European extent remaining (%)	Pre-European extent with formal protection (%)
Fortescue Subregion							
29	a1Lp	Mulga (*Acacia aneura*) and associated species.	186.1	872,802.85	872,633.65	99.98	9.64
82.3	e16Lr t3Hi	Hummock grassland with scattered bloodwoods and snappy gum: *Triodia* spp., *Corymbia dichromophloia, Eucalyptus leucophloia.*	7.0	9,064.36	9,063.19	99.99	17.27
Hamersley Subregion							
18.11	a1Li	Mulga (*Acacia aneura*) and associated species.	1,968.9	580,512.26	576,388.86	99.29	29.34
82.3	e16Lr t3Hi	Hummock grassland with scattered bloodwoods and snappy gum: *Triodia* spp., *Corymbia dichromophloia, Eucalyptus leucophloia.*	1,565.6	2,158,861.78	2,146,718.71	99.44	13.62
29	a1Lp	Mulga (*Acacia aneura*) and associated species.	1.1	20,931.79	20,914.79	99.19	1.98

2.3 Land Use and Tenure

The Study Area is located within the Shire of East Pilbara. Land tenure in the Pilbara region includes Aboriginal and leasehold reserves, national parks and reserves, and crown land which consists of pastoral and mining leases. The dominant land uses in the Pilbara are pastoralism and mining, with areas also classified as conservation reserves, unallocated crown land and urban areas (Kendrick 2001b). Specifically, the Study Area is comprised of mining and pastoral land uses.

2.4 State and Commonwealth Conservation Categories and Management

Ecological communities may be subject to processes that threaten to destroy or significantly modify it across much of its range. These communities are identified as Threatened Ecological Communities (TECs) and are listed at both Commonwealth level under the EPBC Act and State level by the Western Australian Minister for Environment (Table A.3, Appendix A). The Department of Biodiversity, Conservation and Attractions (DBCA) maintains a list of Priority Ecological Communities (PECs), which may also be under threat and are assigned one of four Priority rankings according to the criteria outlined in Table A.4 (Appendix A).

Under Western Australian legislation, all native flora is protected and it is an offence to 'take' protected flora. The *Biodiversity Conservation Act 2016* (BC Act) also provides for native species to be gazetted as Threatened, Extinct or Specially Protected (specific to fauna). Under the BC Act threatened species may be listed as one of three categories: Critically Endangered, Endangered or Vulnerable (Table A.5, Appendix A). In addition, due to the diversity of Western Australia's flora, many species are known from only a few collections or locations, but have not been adequately surveyed. Such flora may be threatened, but cannot be considered for declaration as Threatened flora until adequate surveys have been undertaken. These flora species are included on a supplementary conservation list managed by the DBCA called the *Priority Flora List* (Table A.6, Appendix A).

2.5 Introduced Flora (Weeds)

Significant weed species are identified at both the state and national level. The Australian Weeds Strategy (Australian Weeds Committee 2012) identifies Weeds of National Significance (WoNS) which have the potential to impact primary industry and/or environmental and social values. The management of weeds in Western Australia is primarily regulated through the *Biosecurity and Agriculture Management Act 2007*. Species listed under this act are allocated one of three Declared Pest categories which define the required level of management (Department of Primary Industries and Regional Development 2018). Declared Pest categories and listed weed species' priority ratings are presented in Table A.7 (Appendix A).

3 Methods

3.1 Desktop Assessment

3.1.1 Literature Review and Previous Vegetation Mapping

At least 61 related biological surveys have previously been commissioned by BHP WAIO within the vicinity of the Study Area and were supplied to Astron for the desktop assessment. Some reports presented work with limited contextual similarity, or from greater than 10 years prior to this survey. Therefore specific criteria were used to select the most relevant previous flora and vegetation surveys to review:

- recent publication (<10 years)
- of close proximity to the Study Area; either partially overlapping or within 10 km
- riparian vegetation present
- baseline flora and vegetation surveys with similar scope of work to the current project.

Seven of the reports were considered the most appropriate for thorough review and inclusion in the desktop assessment due to their currency, relevancy and proximity to the Study Area. These include:

- *Flora and Vegetation Survey: Area C and Surrounds Flora and Vegetation Survey* (Onshore Environmental Consultants Pty Ltd 2011)
- *Area C to Yandi Flora and Vegetation Survey* (Astron Environmental Services 2011)
- *Area C West to Yandi Level 2 Flora and Vegetation Survey* (Onshore Environmental Consultants Pty Ltd 2014a)
- *Flora and Vegetation Survey: Jinidi to Mainline Flora and Vegetation Survey* (Onshore Environmental Consultants Pty Ltd 2012)
- *Marillana Creek Riparian Flora and Vegetation Survey* (Onshore Environmental Consultants Pty Ltd 2015)
- *Ministers North Detailed Flora and vegetation Survey* (Biota Environmental Sciences 2017)
- *South Flank to Jinidi Level 2 Flora and Vegetation Survey* (Biota Environmental Sciences 2012).

The BHP WAIO consolidated vegetation mapping GIS database (Onshore Environmental Consultants Pty Ltd 2014b) was used to identify previously mapped vegetation within the Study Area.

3.1.2 Database Searches

A search for Environmentally Sensitive Areas (ESAs) in the vicinity of the Study Area was conducted. In addition, various database searches were conducted to identify listed conservation significant ecological communities and flora species present within or in close proximity to the Study Area. Search results are presented in Appendix B and details are summarised in Table 4. Conservation categories for ecological communities and flora are presented in Appendix A. Introduced flora categories are also presented in Appendix A. Introduced flora were compared to State and national databases to determine if any are listed as Declared Pests (Department of Primary Industries and Regional Development 2018) and the WoNS list (Australian Weeds Committee 2012).

Table 4: Database searches undertaken.

Database	Date search results received	Search focus	Search area
NatureMap (Department of Biodiversity, Conservation, and Attractions 2019a)	14/03/2019	Flora of conservation significance	40 km radius from an approximate Study Area centre point defined by the coordinates: 22°51'52" S, 119°04'16" E.
Threatened and Priority Ecological Communities Database (Department of Biodiversity, Conservation, and Attractions 2018)	06/11/2018	Listed Threatened and Priority Ecological Communities	50 km buffer from the Study Area boundary
Threatened and Priority Flora Database (Department of Biodiversity, Conservation, and Attractions 2019b)	30/01/2019	Listed Threatened and Priority flora	50 km radius from the Study Area boundary
Western Australian Herbarium Database (Department of Biodiversity, Conservation, and Attractions 2019c)			
Protected Matters Search Tool (Department of the Environment and Energy 2018c)	14/03/2019	Matters of National Environmental Significance – flora	40 km radius from an approximate Study Area centre point defined by the coordinates: -22.86424, 119.07131 (MGA50, GDA94)

3.1.3 Likelihood of Occurrence Assessment

The likelihood of occurrence of conservation significant flora taxa within the Study Area was assessed. The conservation significant flora taxa identified from the database searches were categorised according to the criteria listed in Table 5 for potential occurrence within the Study Area. Species identified during the desktop assessment as having potential to occur during the desktop exercise were categorised based on the proximity of known populations to the Study Area, the presence and level of inspection of suitable habitats within the Study Area, the life form, preferred habitat and flowering times for each species (Appendix C).

Table 5: Criteria used to assess the likely presence of conservation significant flora in the Study Area.

Likelihood of occurrence	Pre-survey criteria
Likely	Species previously recorded within the Study Area or within 10 km of the Study Area and suitable habitat appears to be present in the Study Area
Potential	Species previously recorded within 10 km to 20 km of the Study Area and/or suitable habitat appears to be present in the Study Area
Unlikely	No known occurrence within 20 km of the Study Area, and/or suitable habitat appears to be absent in the Study Area

3.1.4 Preliminary Vegetation Mapping and Site Selection

Pre-survey planning involved the examination of 1:10,000 scale aerial photography to identify potentially different landforms, habitat and vegetation types. Vegetation mapping was extrapolated

across the Study Area by Astron Principal Botanist Janelle Atkinson, using the Onshore Environmental Consultants Pty Ltd (2014b) vegetation association codes, aerial imagery interpretation and field experience.

Due to the large and remote nature of the Study Area and limited access, it was not possible to ground-truth the entire area. Instead, a number of indicative sites were selected for field verification and assessment. This included sites in previously unmapped areas, and sites where previous vegetation mapping was to be verified for accuracy. Site selection was limited by access constraints.

3.2 Vegetation and Flora Survey

The field survey was conducted from 13 to 22 November 2018 by Astron Environmental Scientists Linda Vaughan (Flora permit SL012518) and Kyle Mart (Flora permit SL012525; Declared Rare Flora permit 19-1819). BHP WAIO provided an escort to assist with locating suitable access to the Study Area.

The vegetation and flora field survey was undertaken in accordance with the requirements outlined in Environmental Protection Authority regulatory guidance documents (Environmental Protection Authority 2002, 2004, 2016b, 2016a) and BHP WAIO standards and procedures (BHP Billiton Iron Ore 2016; BHP 2018). The purpose of the survey was to verify vegetation for mapping purposes, therefore a full inventory of species was not recorded and no systematic targeted survey or vegetation condition mapping was undertaken.

The flora and vegetation survey consisted of two approaches: mapping of previously unmapped vegetation, and verification of existing vegetation mapping within the Study Area. The sites selected during the desktop assessment were visited to assess the vegetation present and refine the desktop mapped or existing vegetation mapping (Onshore Environmental Consultants Pty Ltd 2014b), if required. The surveyors used 1:10,000 colour aerial imagery with existing desktop vegetation mapping (Onshore Environmental Consultants Pty Ltd 2014b) to assist with navigation and refine mapping polygons if required. Priority flora were opportunistically searched for whilst traversing the Study Area for mapping purposes. Data was digitally recorded on GPS enabled devices. Further details on the methods used for both approaches are described below.

3.2.1 Vegetation Mapping

Sixty-seven sites were visited to describe the vegetation present and refine the desktop vegetation mapping. All vegetation types present within walking distance from the vehicle (approximately 1.5 km round-walk) were assessed at each site. Twenty-four relevés were sampled to describe vegetation that had not been previously mapped at each site. Data from relevé locations was sampled from an area of approximately 2,500 m^2 which was visually estimated.

The following information was collected at each relevé:

- Location – coordinates measured using a handheld GPS (MGA50, GDA94). One set of coordinates taken from the north-west corner of each unmarked relevé.
- Recorder and date –personnel involved in sampling that location and the survey date.
- Species – indicative list of vascular plant species present. The species most typical and/or dominant in the vegetation association were recorded. Species that could not be identified in the field were collected for later identification at the Astron herbarium.
- Foliar cover – the percentage cover was estimated for each flora species recorded.

- Vegetation description – vegetation was described according to the Aplin (1979) modification of the vegetation classification system of Specht (1970) (Table D.1, Appendix D) and the National Vegetation Information System, level 5 (Department of the Environment 2015e). At this level, vegetation is described to 'association' where up to three dominant genera for each of the upper, middle and ground strata are categorised based on dominant growth form, cover and height.
- Vegetation condition – assessed according to the vegetation condition classification adapted from Trudgen (1988) (Table D.2, Appendix D).
- Habitat – a broad description of the surrounding landscape based on landform, topography and soil.
- Photographs – a photograph was taken of each pegged quadrat and unmarked relevé.
- Soil – including colour and texture.

3.2.2 Verification of Previous Vegetation Mapping

Forty-three sites were visited to verify existing vegetation mapping. The purpose of the verification was to understand the accuracy of existing mapping.

All vegetation types present within walking distance from the vehicle (approximately 1.5 km round-walk) were assessed at each site. Mapping notes were used to annotate vegetation that did not correspond to the previously mapped vegetation associations (Onshore Environmental Consultants Pty Ltd 2014b). The location, recorder, date, vegetation description and photograph were recorded from each mapping note location. No details were collected from sites where vegetation was assessed to accurately represent the previously mapped vegetation. Relevé and mapping note locations are presented in Appendix E.

3.2.3 Vegetation Description and Mapping

Where necessary, existing and desktop-mapped vegetation polygons were refined in the field to better represent the boundaries observed. Vegetation was described and mapped using the BHP WAIO consolidated vegetation codes (Onshore Environmental Consultants Pty Ltd 2014b; Biota Environmental Sciences 2017). Vegetation codes were generally assigned in the field, however where a vegetation code could not be readily assigned (due to the large number of vegetation associations described) it was completed following the field survey using the information collected at relevé and mapping note locations. Field and desktop vegetation mapping associations were then consolidated (Appendix E).

3.3 Taxonomy and Nomenclature

Plant specimens that were not identified in the field were identified in Perth by Linda Vaughan and Janelle Atkinson, who have each worked extensively in the Pilbara region and are highly familiar with the flora of the region. The assigned nomenclature is consistent with the current listing of scientific names recognised by the Western Australian Herbarium and was used for the species list and associated species information collected. Where specimens had inadequate descriptive material to allow confident identification, they were assigned a 'sp.' (species) epithet, indicating that identification could not be confirmed beyond genus level. Data from each relevé and mapping note were entered into a customised database (Spatial Networks Inc 2000 - 2018).

3.4 Limitations

The survey was conducted in poor seasonal conditions and therefore the floristic diversity of annual and ephemeral species was low and the availability of diagnostic plant material was limited.

Access limited the proportion of the Study Area that was able to be surveyed. The Study Area was considered remote, and for Lamb Creek and Area C North Creekline in particular, there were few tracks that intersected the Study Area.

Portions of all creeklines, except Area C North Creekline, had been burnt within the past two years. The dominance of fire responsive species in these areas limited the surveyors' ability to assess what climax communities may occur and assign them to an existing vegetation description. In addition, there was generally minimal diagnostic material available on regrowth which restricted specimen identification of climax community species.

There was limited confidence in the previous mapping, as vegetation often did not match what it was described as and polygon boundaries needed to be refined in a number of cases. As such the extrapolated vegetation mapping should be considered as indicative only. It had been intended to use the previous vegetation mapping to extrapolate vegetation associations into unmapped areas using remote sensing data and statistical classification techniques, however the low confidence in the previous mapping is likely to have yielded unreliable results.

As the purpose of the survey was to verify vegetation for mapping purposes, a full inventory of species was not recorded, no systematic targeted survey or vegetation condition mapping was undertaken and limited weed data were captured.

4 Results

4.1 Literature Review and Previous Vegetation Mapping

According to the reports reviewed, no Threatened and twenty-six Priority flora have been recorded previously within the vicinity of the Study Area. No TECs have been recorded from previous surveys in the local area. Two PECs have been recorded in the vicinity: Weeli Wolli Spring Community (Priority 1) and Fortescue Valley Sand Dunes (Priority 3). A summary of the key survey findings for the seven previous surveys reviewed as part of this assessment are presented in Table 6.

In 2014, Onshore Environmental consolidated the vegetation associations of 162 previous baseline flora and vegetation surveys from BHP WAIO's central, eastern and mainline rail tenements (Onshore Environmental Consultants Pty Ltd 2014b). The resulting 218 consolidated vegetation associations were then mapped and form the consolidated regional GIS database.

Acording to the BHP WAIO consolidated regional vegetation mapping GIS database, 1,583.6 ha (43% of the Study Area), consisting of 65 consolidated vegetation associations, has been previously mapped in the Study Area. The area previously mapped in each creekline was:

- Lamb Creek: 109.1 ha
- Area C North Creekline: 78.6 ha
- Marillana Creek: 608.6 ha
- Pebble Mouse Creek: 446.5 ha
- Yandicoogina Creek: 340.8 ha.

Thirty-one vegetation associations previously described and mapped by Onshore Environmental Consultants Pty Ltd (2014b) and two by Biota Environmental Sciences (2017) intersect the Study Area. These vegetation associations occur on a variety of landforms, including major, medium and minor drainage lines, floodplains, clay plains, stony plains, hill crests, slopes, footslopes, gorges and gullies. None of the previously recorded vegetation associations represents a Threatened or Priority Ecological Community.

Table 6: Summary of relevant vegetation and flora surveys in the vicinity of the Study Area.

Component	Flora and Vegetation Survey: Area C and Surrounds	Area C to Yandi Flora and Vegetation Survey	Area C West to Yandi Level 2 Flora and Vegetation Survey	Flora and Vegetation Survey: Jinidi to Mainline	Marillana Creek Riparian Flora and Vegetation Survey	Ministers North Detailed Flora and vegetation Survey	South Flank to Jinidi Level 2 Flora and Vegetation Survey
Consultant (dates of survey)	Onshore Environmental (2011) (26 November – 6 December 2009; 9 – 18 February 2010 and 14 – 21 June 2010)	Astron (2011) (6 – 11 September 2010)	Onshore Environmental (2014a) (21 May – 3 June 2011 and 19 July – 1 August 2012)	Onshore Environmental (2012) (resurvey: 21 – 27 February, 24 March – 6 April and 1 – 14 September 2011)	Onshore Environmental (2015) (8 – 19 June 2014)	Biota Environmental Sciences (2017) (20 – 29 September 2016 and 8 – 10 May and 10 – 14 July 2017)	Biota Environmental Sciences (2012) (22 March – 2 April and 22 – 31 August 2011)
Survey focus/techniques and Study Area size	Two phase detailed (formerly Level 2) flora and vegetation survey and review of previous data. (combined Study Area 29,411 ha)	Single season Detailed (formerly Level 2) flora and vegetation survey (2,181 ha)	Two phase detailed (formerly Level 2) flora and vegetation survey and review of previous data (Study Area size not provided)	Detailed (formerly Level 2) flora and vegetation survey and resurvey of existing quadrats	Detailed riparian flora and vegetation survey (32 km section of Marillana Creek)	Two phase detailed (formerly Level 2) flora and vegetation survey (3,029 ha)	Two phase Detailed (formerly Level 2) flora and vegetation survey (8,588 ha)
Seasonal conditions	Suboptimal	Suboptimal	Optimal	Optimal	Optimal	Optimal	Optimal
Techniques; # sampling sites	Quadrats; 221	Quadrats; 20	Quadrats; 170	Quadrats; 395	Quadrats; 40 Relevés; 237	Quadrats; 22 Relevés; 15	Quadrats; 67 Relevés; 8
Species richness	479 taxa	91 taxa	428 taxa	471 taxa	399 taxa	361 taxa	453 taxa
Number of (current) conservation significant flora recorded	14	1	11	6	6	3	8
Current conservation significant flora recorded	• *Euphorbia inappendiculata* var. *queenslandica* P1 • *Vittadinia* sp. Coondewanna Flats (S. van Leeuwen 4684) P1 • *Aristida lazaridis* P2 • *Acacia subtiliformis* P3 • *Aristida jerichoensis* subsp. *subspinulifera* P3 • *Fimbristylis sieberiana* P3 • *Goodenia* sp. East Pilbara (A.A. Mitchell PRP 727) P3 • *Nicotiana umbratica* P3 • *Rhagodia* sp. Hamersley (M. Trudgen 17794) P3 • *Rostellularia adscendens* var. *latifolia* P3 • *Sida* sp. Barlee Range (S. van Leeuwen 1642) P3 • *Stylidium weeliwolli* P3 • *Eremophila magnifica* subsp. *magnifica* P4 • *Goodenia nuda* P4	• *Acacia bromilowiana* P4	• *Synostemon hamersleyensis* P1 • *Vittadinia* sp. Coondewanna Flats (S. van Leeuwen 4684) P1 • *Acacia effusa* P3 • *Acacia subtiliformis* P3 • *Aristida jerichoensis* subsp. *subspinulifera* P3 • *Goodenia* sp. East Pilbara (A.A. Mitchell PRP 727) P3 • *Gymnanthera cunninghamii* P3 • *Rostellularia adscendens* var. *latifolia* P3 • *Sida* sp. Barlee Range (S. van Leeuwen 1642) P3 • *Acacia bromilowiana* P4 • *Goodenia nuda* P4 • *Rhynchosia bungarensis* P4	• *Fimbristylis sieberiana* P3 • *Rostellularia adscendens*^ P3 • *Sida* sp. Barlee Range (S. van Leeuwen 1642) P3 • *Stylidium weeliwolli* P3 • *Lepidium catapycnon* P4 • *Goodenia nuda* P4	• *Aristida lazaridis P2* • *Ipomoea racemigera P2* • *Amaranthus centralis* P3 • *Goodenia* sp. East Pilbara (A.A. Mitchell PRP 727) P3 • *Rostellularia adscendens* var. *latifolia* P3 • *Goodenia nuda* P4	• *Fimbristylis sieberiana* P3 • *Sida* sp. Barlee Range (S. van Leeuwen 1642) P3 • *Acacia bromilowiana* P4	•*Acacia subtiliformis* P3 •*Goodenia lyrata* P3 •*Goodenia* sp. East Pilbara (A.A. Mitchell PRP 727) P3 • *Grevillea* sp. Turee (J. Bull & G. Hopkinson ONS JJ 01.01) P3 •*Rostellularia adscendens* var. *latifolia* P3 •*Eremophila magnifica* subsp. *magnifica* P4 •*Goodenia nuda* P4 •*Ptilotus mollis* P4
Total vegetation associtations mapped	37	13	11	28	22	10	35

Component	Flora and Vegetation Survey: Area C and Surrounds	Area C to Yandi Flora and Vegetation Survey	Area C West to Yandi Level 2 Flora and Vegetation Survey	Flora and Vegetation Survey: Jinidi to Mainline	Marillana Creek Riparian Flora and Vegetation Survey	Ministers North Detailed Flora and vegetation Survey	South Flank to Jinidi Level 2 Flora and Vegetation Survey
Conservation significant communities recorded	One PEC: Weeli Wolli Spring Community (Priority 1)	None	None	Two PECs: Weeli Wolli Spring Community (Priority 1) and Fortescue Valley Sand Dunes (Priority 3)	None	No TECs/PECs, two groundwater dependent units	None
Limitations	• Recent fire • Poor seasonal conditions	• Recent fire • Poor seasonal conditions • Some access constraints	• Local disturbance such as fire mosaic	• Local disturbance such as fire mosaic, weeds and grazing	• Local disturbance such as grazing, fire mosaic, weeds and mine flooding	• Recent fire in approximately 50% of Study Area • Localised clearing	• None identified

- ^*Rostellularia adscendens* is presumed to relate to *Rostellularia adscendens* var. *latifolia* P3
- Consolidation of vegetation associations was undertaken in 2014 (Onshore Environmental Consultants Pty Ltd 2014b); as such the number of vegetation associations mapped within each previous Study Area may have changed since the reports were published.

4.2 Database Search Results

4.2.1 Environmentally Sensitive Areas

No ESAs occur within or directly adjacent to the Study Area. The Fortescue Marsh is listed by the Directory of Important Wetlands in Australia and currently proposed to the Commonwealth Government for nomination as a Ramsar wetland. It is delineated by the 'Australian Wetlands Database: Ramsar Wetlands' as being approximately 32 km north-east of the Study Area (Department of the Environment and Energy 2018a).

4.2.2 Conservation Significant Vegatation

No TECs have been recorded within 50 km of the Study Area. Ten PECs (including two subtypes of the 'Coolibah – Lignum Flats' PEC) have been previously recorded within 50 km of the Study Area (Department of Biodiversity, Conservation, and Attractions 2018). The closest occurrence of each to the Study Area is:

- Coolibah - Lignum Flats sub type 1: Coolibah and mulga woodland over lignum and tussock grasses on clay plains (Coondewanna and Wanamunna flats and Mt Bruce Flats) (Priority 3): 1.8 km west
- Weeli Wolli Spring Community Priority 1: 3.1 km east
- Coolibah - Lignum Flats sub type 2: Coolibah woodlands over lignum (*Duma florulenta*) over swamp wanderrie (Lake Robinson) (Priority 1): 5.6 km south-west
- Vegetation of sand dunes of the Hamersley Range/Fortescue Valley (Priority 3): 10.8 km north
- West Angelas Cracking-Clays Priority 1: 14.9 km south
- Fortescue Marsh (Marsh Land System) (Priority 1): 23.1 km north-east
- Kumina Land System (Priority 3): 27.7 km north-west
- Riparian flora and plant communities of springs and river pools with high water permanence of the Pilbara Region (Priority 2): 30.2 km north-west
- Brockman Iron cracking clay communities of the Hamersley Range (Priority 1): 30.6 km south-west
- Freshwater claypans downstream of the Fortescue Marsh - Goodiadarrie Hills on Mulga Downs Station (Priority 1): 37.9 km north.

The definitions and criteria for PECs are presented in Appendix A. Locations of PECs in the vicinity of the Study Area (Department of Biodiversity, Conservation, and Attractions 2018) are presented in Appendix F.

4.2.3 Conservation Significant Flora

Georeferenced searches of DBCA databases (Appendix B) indicate 77 conservation significant flora, comprising one Threatened (T), 18 Priority one (P1), 14 P2, 37 P3 and seven P4 have been previously recorded within 50 km of the Study Area (Department of Biodiversity, Conservation, and Attractions 2019a, 2018, 2019c). Thirty-six records of six of these Priority flora species have been previously recorded in the Study Area:

- *Ipomoea racemigera* P2 – one record
- *Fimbristylis sieberiana* P3 – three records
- *Goodenia* sp. East Pilbara (A.A. Mitchell PRP 727) P3 – eight records
- *Rhagodia* sp. *H*amersley (M. Trudgen 17794) P3 – six records
- *Rostellularia adscendens* var. *latifolia* P3 – 17 records
- *Sida* sp. Barlee Range (S. van Leeuwen 1642) P3 – one record.

Following an assessment of likelihood of occurrence a further 18 species are considered likely to occur, with an additional 13 considered to have the potential to occur within the Study Area (Appendix C). Descriptions of the Priority flora conservation categories are presented in Appendix A. Descriptions and the preferred habitat of each of the species identified in the database search results is provided in Appendix C and the locations of Priority flora in the vicinity of the Study Area are presented in Appendix F.

4.3 Field Assessment

4.3.1 Vegetation Associations

Thirty-eight vegetation associations were mapped in the Study Area, during both the current and previous surveys (Onshore Environmental Consultants Pty Ltd 2014b; Biota Environmental Sciences 2017) (Table 7). Approximately half of the sites visited for mapping verification were mapped with vegetation associations that poorly represented the vegetation actually present. Vegetation types were therefore extrapolated according to the ground-truthed vegetation mapping and previous mapping which was refined where appropriate. Extensive portions of the Study Area have been recently burnt.

Vegetation association mapping is provided in Appendix E. Information collected from each relevé and mapping note location, including photographs, is presented in Appendix G.

Table 7: Vegetation associations recorded in the Study Area. The area of each association as a percentage of the total Study Area is shown in parentheses.

Broad floristic description	Vegetation Code	Vegetation association	Area (ha)
Acacia High Shrubland	MA AtpApypAse Ecr ThmbTtCyp	High Shrubland of *Acacia tumida* var. *pilbarensis*, *Acacia pyrifolia* var. *pyrifolia* and *Acacia sericophylla* with Scattered Trees of *Eucalyptus camaldulensis* subsp. *refulgens* over Open Tussock Grassland of *Themeda* sp. Mt Barricade (M.E. Trudgen 2471), *Themeda triandra* and *Cymbopogon procerus* on brown loam and gravels on major drainage channels	49.8 (1.3%)
Acacia Low Open Forest	MA AaAciApr CcTtChf EvEcr	Low Open Forest of *Acacia aptaneura*, *Acacia citrinoviridis* and *Acacia pruinocarpa* very Open Tussock Grassland of **Cenchrus ciliaris*, *Themeda triandra* and *Chrysopogon fallax* with Open Woodland of *Eucalyptus victrix* and *Eucalyptus camaldulensis* subsp. *refulgens* on brown loamy sand on major drainage lines with broad and deeply incised drainage channels	95.9 (2.6%)
Acacia Low Open Forest	SP AaApr TmTwTp TtChfAri	Low Open Forest of *Acacia aptaneura* and Acacia *pruinocarpa* over Open Hummock Grassland of *Triodia melvillei*, *Triodia wiseana* and *Triodia pungens* over Tussock Grassland of *Themeda triandra*, *Chrysopogon fallax* and *Aristida inaequiglumis* on red brown loam on plains	122.8 (3.3%)
Acacia Low Open Forest	SP AcaoAa ArobDiaChf	Low Open Forest of *Acacia catenulata* subsp. *occidentalis* and *Acacia aptaneura* over Very Open Tussock Grassland of *Aristida obscura*, *Digitaria ammophila* and *Chrysopogon fallax* on red brown clay loam on stony lower plains	18.5 (0.5%)
Acacia Open Scrub	GG AtpGrwhGoro ErmuTt Ch	Open scrub of *Acacia tumida* var. *pilbarensis*, *Grevillea wickhamii* subsp. *hispidula*, *Gossypium robinsonii* over very open tussock grassland of *Eriachne mucronata*, *Themeda triandra* with very open hummock grassland of *Triodia pungens* and scattered low trees of *Corymbia hamersleyana* on dark reddish brown sandy clay loam in gullies and gorges	1.5 (<0.1%)
Acacia Open Heath	MI AadsAnlDop Tp EllCh	Open Heath of *Acacia adsurgens*, *Androcalva luteiflora* and *Dodonaea pachyneura* over Open Hummock Grassland of *Triodia pungens* with Low Open Woodland of *Eucalyptus leucophloia* subsp. *leucophloia* and *Corymbia hamersleyana* on brown loamy sand on minor drainage lines	0.3 (<0.1%)

Broad floristic description	Vegetation Code	Vegetation association	Area (ha)
Acacia Open Scrub	MI AtpGwApy TpTb CcCs	Open Scrub of *Acacia tumida* var. *pilbarensis*, *Grevillea wickhamii* subsp. *hispidula* and *Acacia pyrifolia* var. *pyrifolia* over Hummock Grassland of *Triodia pungens* and *Triodia basedowii* over Open Tussock Grassland of **Cenchrus ciliaris* and **Cenchrus setiger* on brown sandy loam on minor drainage lines and floodplains	21.8 (0.6%)
Acacia Open Scrub	MI AtpPlAm TpTs ChEll	Open Scrub of *Acacia tumida* var. *pilbarensis*, *Petalostylis labicheoides* and *Acacia monticola* over Open Hummock Grassland of *Triodia pungens* and *Triodia* sp. Shovelanna Hill (S.van Leeuwen 3835) with Low Open Woodland of *Corymbia hamersleyana* and *Eucalyptus leucophloia* subsp. *leucophloia* on red brown sandy loam on minor drainage lines	88.3 (2.4%)
Corymbia Low Woodland	GG CfEllFib AhDovmAsha CyaErmuThmb	Low Woodland of *Corymbia ferriticola*, *Eucalyptus leucophloia* subsp. *leucophloia* and *Ficus brachypoda* over Open Shrubland of *Acacia hamersleyensis*, *Dodonaea viscosa* subsp. *mucronata* and *Astrotricha hamptonii* over Open Tussock Grassland of *Cymbopogon ambiguus*, *Eriachne mucronata* and *Themeda* sp. Mt Barricade on red brown loam along clifflines and gorges	0.3 (<0.1%)
Eucalyptus Low Open Forest	MA EcrEvEx ApypAtpGoro TtEuaCyp	Low Open Forest of *Eucalyptus camaldulensis* subsp. *refulgens*, *Eucalyptus victrix* and *Eucalyptus xerothermica* over High Shrubland of *Acacia pyrifolia* var. *pyrifolia*, *Acacia tumida* var. *pilbarensis* and *Gossypium robinsonii* over Open Tussock Grassland of *Themeda triandra*, *Eulalia aurea* and *Cymbopogon procerus* on red brown clay loam on major drainage lines	349.4 (9.4%)
Themeda Tussock Grassland	ME TtEuaEte ApypAtpPl EvCh	Tussock Grassland of *Themeda triandra*, *Eulalia aurea* and *Eriachne tenuiculmis* with High Shrubland of *Acacia pyrifolia* var. *pyrifolia*, *Acacia tumida* var. *pilbarensis* and *Petalostylis labicheoides* and Open Woodland of *Eucalyptus victrix* and *Corymbia hamersleyana* on red brown silty loam on medium drainage lines and flood plains	133 (3.6%)
Eucalyptus Open Forest	MA EcrEvMa AcpAamAh TydCyv	Open Forest of *Eucalyptus camaldulensis* var. *refulgens*, *Eucalyptus victrix* and *Melaleuca argentea* over Low Open Forest of *Acacia coriacea* subsp. *pendens*, *Acacia ampliceps* and *Atalaya hemiglauca* over Open Sedges of *Typha domingensis* and *Cyperus vaginatus*	163.1 (4.4%)

Broad floristic description	Vegetation Code	Vegetation association	Area (ha)
Eucalyptus Woodland	MA EcrEv AciApypMg CcEuaTt	Woodland of *Eucalyptus camaldulensis* subsp. *refulgens* and *Eucalyptus victrix* over High Open Shrubland of *Acacia citrinoviridis*, *Acacia pyrifolia* var. *pyrifolia* and *Melaleuca glomerata* over Tussock Grassland of **Cenchrus ciliaris*, *Eulalia aurea* and *Themeda triandra* on brown clay loam on banks of major drainage lines	487.9 (13.1%)
Eucalyptus Woodland	MA EvAciEcr TercCocrApyp CcEuaTt	Woodland of *Eucalyptus victrix*, *Acacia citrinoviridis* and *Eucalyptus camaldulensis* subsp. *refulgens* over Low Open Shrubland of *Tephrosia rosea* var. *clementii*, *Corchorus crozophorifolius* and *Acacia pyrifolia* var. *pyrifolia* over Very Open Tussock Grassland of **Cenchrus ciliaris*, *Eulalia aurea* and *Themeda triandra* on brown loamy sand on channels of major drainage lines	34.7 (0.9%)
Melaleuca High Open Forest	MA MaEcrEv MgAcpAtr Cyv	High Open Forest of *Melaleuca argentea*, *Eucalyptus camaldulensis* var. *refulgens* and *Eucalyptus victrix* over High Open Shrubland of *Melaleuca glomerata*, *Acacia coriacea* subsp. *pendens* and *Acacia trachycarpa* over Very Open Sedges of *Cyperus vaginatus* on alluvial gravelly soils on major drainage channels with seasonal pools	3.3 (0.1%)
Petalostylis Shrubland	MI PlAtpAm ChEll TwTp	Shrubland of *Petalostylis labicheoides*, *Acacia tumida* var. *pilbarensis* and *Acacia monticola* with Low Open Woodland of *Corymbia hamersleyana* and *Eucalyptus leucophloia* subsp. *leucophloia* over Open Hummock Grassland of *Triodia wiseana* and *Triodia pungens* on red brown loam on minor drainage lines	0.2 (<0.1%)
Themeda Closed Tussock Grassland	ME Tt ExChAa ApaAaAci	Closed Tussock Grassland of *Themeda triandra* with Low Woodland of *Eucalyptus xerothermica*, *Corymbia hamersleyana* and *Acacia aptaneura* over High Open Shrubland of *Acacia pachyacra*, *Acacia aptaneura* and *Acacia citrinoviridis* on red brown clay loam along unincised medium drainage lines	7.3 (0.2%)
Themeda Open Tussock Grassland	ME TtAriCya ChEll AmPlAnl	Open Tussock Grassland of *Themeda triandra*, *Aristida inaequiglumis* and *Cymbopogon ambiguus* with Low Open Woodland of *Corymbia hamersleyana* and *Eucalyptus leucophloia* subsp. *leucophloia* over Open Shrubland of *Acacia monticola*, *Petalostylis labicheoides* and *Androcalva luteiflora* on red brown alluvium on minor and medium drainage lines	0.7 (<0.1%)

Broad floristic description	Vegetation Code	Vegetation association	Area (ha)
Themeda Tussock Grassland	FP TtEua ExAa AprAtpErlo	Tussock Grassland of *Themeda triandra* and *Eulalia aurea* with Low Woodland of *Eucalyptus xerothermica* and *Acacia aptaneura* over Open Shrubland of *Acacia pruinocarpa*, *Acacia tumida* var. *pilbarensis* and *Eremophila longifolia* on red brown clay loam on unincised drainage lines	50.3 (1.3%)
Themeda Tussock Grassland	FP TtEuaCc ChEx AdAacAmc	Tussock Grassland of *Themeda triandra*, *Eulalia aurea* and **Cenchrus ciliaris* with Low Open Woodland of *Corymbia hamersleyana* and *Eucalyptus xerothermica* over High Open Shrubland of *Acacia dictyophleba*, *Acacia ancistrocarpa* and *Acacia macraneura* on brown silty clay loam on floodplains	46.4 (1.2%)
Themeda Tussock Grassland	MA TtCc PlAbAnl EllCh	Tussock Grassland of *Themeda triandra* and **Cenchrus ciliaris* with Shrubland of *Petalostylis labicheoides*, *Acacia bivenosa* and *Androcalva luteiflora* and Low Open Woodland of *Eucalyptus leucophloia* subsp. *leucophloia* and *Corymbia hamersleyana* on red brown loam on drainage levees	13.1 (0.4%)
Themeda Tussock Grassland	ME TtChfEua ExEvCh PlApaApyp	Tussock Grassland of *Themeda triandra*, *Chrysopogon fallax* and *Eulalia aurea* with Low Open Woodland of *Eucalyptus xerothermica*, *Eucalyptus victrix* and *Corymbia hamersleyana* and Shrubland of *Petalostylis labicheoides*, *Acacia pachyacra* and *Acacia pyrifolia* var. *pyrifolia* on red sandy loam on medium drainage lines	270.2 (7.2%)
Triodia Hummock Grassland	CP TwTa Ese AbPlApyp	Hummock Grassland of *Triodia wiseana* and *Triodia angusta* with Open Mallee of *Eucalyptus socialis* subsp. *eucentrica* and Open Shrubland of *Acacia bivenosa*, *Petalostylis labicheoides* and *Acacia pyrifolia* var. *pyrifolia* on light brown clay loam on calcrete plains and rises	67.8 (1.8%)
Triodia Hummock Grassland	FP Tp ChApr GrwhApypAb	Hummock Grassland of *Triodia pungens* with Scattered Low Trees of *Corymbia hamersleyana* and *Acacia pruinocarpa* over Open Shrubland of *Grevillea wickhamii* subsp. *hispidula*, *Acacia pyrifolia* var. *pyrifolia* and *Acacia bivenosa* on brown loamy sand on floodplains	209.9 (5.6%)
Triodia Hummock Grassland	FS Ts CdHc AancAiGrwh	Hummock Grassland of *Triodia* sp. Shovelanna Hill (S. van Leeuwen 3835) with Low Open Woodland of *Corymbia deserticola* subsp. *deserticola* and *Hakea chordophylla* over Open Shrubland of *Acacia ancistrocarpa*, *Acacia inaequilatera* and *Grevillea wickhamii* subsp. *hispidula* on red brown sandy loam on foot slopes and stony plains	135.2 (3.6%)

Broad floristic description	Vegetation Code	Vegetation association	Area (ha)
Triodia Hummock Grassland	FS TsTpTw Ell AbApaAanc	Hummock Grassland of *Triodia* sp. Shovelanna Hill (S. van Leeuwen 3835), *Triodia pungens* and *Triodia wiseana* with Low Open Woodland of *Eucalyptus leucophloia* subsp. *leucophloia* and Open Shrubland of *Acacia bivenosa*, *Acacia pachyachra* and *Acacia ancistrocarpa* on red brown loam on footslopes and low undulating hills	1.9 (<0.1%)
Triodia Hummock Grassland	HC Tw AiAb InrSeao	Hummock Grassland of *Triodia wiseana* with High Open Shrubland of *Acacia inaequilatera* and *Acacia bivenosa* over Low Open Shrubland of I*ndigofera rugosa* and *Senna artemisioides* subsp. *oligophylla* on red silty loam on dolerite hill crests	194.5 (5.2%)
Triodia Hummock Grassland	HS TbrTw Ell AbPoSegg	Hummock Grassland of *Triodia brizoides* and *Triodia wiseana* with Scattered Low Trees of *Eucalyptus leucophloia* subsp. *leucophloia* over Scattered Low Shrubs of *Acacia bivenosa*, *Ptilotus obovatus* and *Senna glutinosa* subsp. *glutinosa* on brown silty loam on scree slopes	30.8 (0.8%)
Triodia Hummock Grassland	HS TeTw Ch AiAan	Hummock Grassland of *Triodia epactia* and *Triodia wiseana* with Low Open Woodland of *Corymbia hamersleyana* over High Open Shrubland of *Acacia inaequilatera* and *Acacia ancistrocarpa* on red brown sandy loam on granite and quartz hill slopes and footslopes	1.8 (<0.1%)
Triodia Hummock Grassland	HS TsTwTp EllCh AhiAaa	Hummock Grassland of *Triodia* sp. Shovelanna Hill (S. van Leeuwen 3835), *Triodia wiseana* and *Triodia pungens* with Low Open Woodland of *Eucalyptus leucophloia* subsp. *leucophloia* and *Corymbia hamersleyana* over Low Open Shrubland of *Acacia hilliana* and *Acacia adoxa* var. *adoxa* on red brown sandy loam on hill slopes	321.5 (8.6%)
Triodia Hummock Grassland	HS TwTpTs Ell AprAaAanc	Hummock Grassland of *Triodia wiseana*, *Triodia pungens* and *Triodia* sp. Shovelanna Hill (S. van Leeuwen 3835) with Low Open Woodland of *Eucalyptus leucophloia* subsp. *leucophloia* over Open Shrubland of *Acacia pruinocarpa*, *Acacia aptaneura* and *Acacia ancistrocarpa* on red brown loam on plains and low hills	270.3 (7.2%)
Triodia Hummock Grassland	ME TpTlo ExAciCh PlApypGoro	Hummock Grassland of *Triodia pungens* and *Triodia longiceps* with Low Woodland of *Eucalyptus xerothermica*, *Acacia citrinoviridis* and *Corymbia hamersleyana* over High Shrubland of *Petalostylis labicheoides*, *Acacia pyrifolia* var. *pyrifolia* and *Gossypium robinsonii* on red brown clay loam on medium drainage lines and surrounding floodplains	199.7 (5.4%)

Broad floristic description	Vegetation Code	Vegetation association	Area (ha)
Triodia Hummock Grassland	SP TpTb Eg PlAbAan	Hummock Grassland of *Triodia pungens* and *Triodia basedowii* with Open Mallee of *Eucalyptus gamophylla* and Shrubland of *Petalostylis labicheoides*, *Acacia bivenosa* and *Acacia ancistrocarpa* on red brown loamy sand on stony plains and footslopes	12.7 (0.3%)
Triodia Hummock Grassland	SP TsTwTp EgEt AbApaApr	Hummock Grassland of *Triodia* sp. Shovelanna Hill (S. van Leeuwen 3835), *Triodia wiseana* and *Triodia pungens* with Very Open Mallee of *Eucalyptus gamophylla* and *Eucalyptus trivalva* over Open Shrubland of *Acacia bivenosa*, *Acacia pachyacra* and *Acacia pruinocarpa* on red brown sandy loam and clay loam on stony plains	117.2 (3.1%)
Triodia Open Hummock Grassland	FS Ts EllCh Hc	Open hummock grassland of *Triodia s*p. Shovelanna Hill (S. van Leeuwen 3835) with low open woodland of *Eucalyptus leucophloia* subsp. *leucophloia*, *Corymbia hamersleyana* over scattered tall shrubs of *Hakea chordophylla* over low open shrubland of *Acacia hilliana* on dark reddish brown sandy clay loam on footslopes	40.5 (1.1%)
Triodia Hummock Grassland	HS TsTw Eg GrwhSeggAb	Hummock Grassland of *Triodia* sp. Shovelanna Hill (S. van Leeuwen 3835) and *Triodia wiseana* with Very Open Mallee of *Eucalyptus gamophylla* over Open Shrubland of *Grevillea wickhamii* subsp. *hispidula*, *Senna glutinosa* subsp. *glutinosa* and *Acacia bivenosa* on red brown sandy clay loam on hill slopes	48.5 (1.3%)
Triodia Open Hummock Grassland	SP TpTm AaExAcao ApaErffAads	Hummock Grassland of *Triodia pungens* and *Triodia melvillei* with Low Open Woodland of *Acacia aptaneura*, *Eucalyptus xerothermica* and *Acacia catenulata* subsp. *occidentalis* and Open Shrubland of *Acacia pachyacra*, *Eremophila forrestii* subsp. *forrestii* and *Acacia adsurgens* on red brown clay loam or silty loam on stony plains and floodplains	98.5 (2.6%)
Typha Sedges	MA TydCyv EcrEv AciAcp	Sedges of *Typha domingensis* and *Cyperus vaginatus* with Open Woodland of *Eucalyptus camaldulensis* subsp. *refulgens* and *Eucalyptus victrix* over Low Open Woodland of *Acacia citrinoviridis* and *Acacia coriacea* subsp. *pendens* on brown clayey sand on permanent pools along major drainage lines	1.5 (<0.1%)
Disturbed	Disturbed	Highly degraded vegetation: Open Tussock Grassland of **Cenchrus ciliaris* with Scattered Tall Shrubs of *Acacia bivenosa* and *Petalostylis labicheoides* over Scattered Low Shrubs of *Ptilotus nobilis*	11.3 (0.3%)
Cleared			6.3 (0.2%)

4.3.2 Vegetation Condition

Vegetation condition in the Study Area ranged from 'Excellent' to 'Poor' (Trudgen 1988). A number of infrastructure areas devoid of vegetation (e.g. tracks and railways) occurred in the Study Area and were classified as 'cleared'.

Approximately 22% of Yandicoogina Creek was burnt in 2018, and 55% of Pebble Mouse Creek, 30% of Area C Creekline and 2% of Marillana Creek were burnt in 2017 (Darwin Centre for Bushfire Research 2018).

Weed species, particularly from the Poaceae (grasses) family, are likely to characterise the understorey of drainage line vegetation throughout the Study Area. Poor seasonal conditions and grazing reduced both the occurrence and ability to identify grass species.

4.3.3 Conservation Significant Vegetation

4.3.3.1 Threatened and Priority Ecological Communities

None of the vegetation associations recorded within the Study Area represent a listed TEC or PEC.

4.3.3.2 Groundwater Dependent Vegetation

Eight vegetation assocations recorded or extrapolated in the Study Area are characterised by *Melaleuca argentea* and/or *Eucalyptus camaldulensis* and/or *E. victrix* and/or *Typha domingensis* therefore may represent groundwater dependent vegetation (GDV).

Melaleuca argentea and *T. domingensis* are considered to be obligate phreatophytes, and are restricted to areas where there is permanent surface water or shallow groundwater (O'Grady et al. 2005). *Eucalyptus camaldulensis* and *E. victrix* are considered to be facultative phreatophytes. *Eucalyptus camaldulensis* commonly occurs in areas that flood periodically or where roots can access groundwater, with water requirements exceeding those provided by rainfall alone (Doody et al. 2009; Catelotti et al. 2015). Depending on the setting, *E. victrix* may either use groundwater opportunistically or rely soley on stored soil moisture.

The eight vegetation assocations that may represent GDV account for 1,185.5 ha (31.8%)%) of the Study Area and are summarised in Table 8.

Table 8: Representation of potential groundwater dependent vegetation in the Study Area.

Vegetation type	Vegetation code	Ecohydrological classification	Area (ha) (proportion of Study Area)
Acacia High Shrubland	MA AtpApypAse Ecr ThmbTtCyp	Facultative phreatophyte	49.8 (1.3%)
Acacia Low Open Forest	MA AaAciApr CcTtChf EvEcr	Facultative phreatophyte	95.9 (2.6%)
Eucalyptus Low Open Forest	MA EcrEvEx ApypAtpGoro TtEuaCyp	Facultative phreatophyte	349.4 (9.4%)
Eucalyptus Open Forest	MA EcrEvMa AcpAamAh TydCyv	Obligate phreatophyte	163.1 (4.4%)
Eucalyptus Woodland	MA EcrEv AciApyMg CcEuaTt	Facultative phreatophyte	487.9 (13.1%)
Eucalyptus Woodland	MA EvAciEcr TrcCocrApyp CcEuaTt	Facultative phreatophyte	34.7 (0.9%)
Melaleuca High Open Forest	MA MaEcrEv MgAcpAtr Cyv	Obligate phreatophyte	3.3 (0.1%)
Typha Sedges	MA TydCyv EcrEv AciAcp	Obligate phreatophyte	1.5 (<0.1%)

4.3.4 Flora

There were 102 confirmed vascular flora taxa, from 21 families and 54 genera, recorded during the survey. Of the 21 families Fabaceae, Poaceae and Myrtaceae were the most represented (Table 9). This is typical of what may be expected from botanical surveys focusing on Pilbara creekline vegetation. Of the 54 genera, *Acacia* was the most common genus (Table 9). An additional five specimens could not be identified beyond genus due to insufficient diagnostic material, and may represent additional taxon. A species list summarising the taxa recorded from the current survey is presented in Table H.1 (Appendix H). A site by species matrix is presented in Table H.2 (Appendix H).

Table 9: Taxa most frequently recorded in the Study Area.

Family	Number of taxa
Fabaceae	31
Poaceae	22
Myrtaceae	13
Genus	**Number of taxa**
Acacia	19
Eucalyptus	6
Senna	6

4.3.4.1 *Conservation Significant Flora*

No Threatened flora species were recorded during the survey. One Priority 3 species *Eremophila* sp. Hamersley Range (K. Walker KW 136) was recorded at relevé site ACNC2RV04. This location is mapped in Figure E.2 (Appendix E) and details are presented in Table 10.

Table 10: Conservation significant flora recorded in the Study Area (GDA94 MGA50).

Conservation significant taxa	Abundance	Vegetation association code and description	Easting (mE)	Northing mN)
Eremophila sp. Hamersley Range (K. Walker KW 136) P3	1	HS TsTwTp ElCh AhiAad: Hummock Grassland of *Triodia* sp. *Shovelanna* Hill (S. van Leeuwen 3835), *Triodia wiseana* and *Triodia pungens* with Low Open Woodland of *Eucalyptus leucophloia* subsp. *leucophloia* and *Corymbia hamersleyana* over Low Open Shrubland of *Acacia hilliana* and *Acacia adoxa* var. *adoxa* on red brown sandy loam on hill slopes	714703	714703

4.3.4.2 *Introduced Flora*

No species that represent a WoNS or declared pest were observed. Of the 102 confirmed flora taxa, three represent introduced species (weeds): **Cenchrus ciliaris*, **Cenchrus setiger* and **Vachellia farnesiana* (Table 11).

Table 11: Introduced flora recorded in the Study Area.

Weed species (common name)	Family	Number of records	Estimated abundance
**Cenchrus ciliaris* (buffel grass)	Poaceae	5	370
**Cenchrus setiger* (birdwood grass)	Poaceae	2	250
**Vachellia farnesiana* (mimosa bush)	Fabaceae	1	1

5 Discussion and Conclusions

The Study Area includes five creeklines encompassed within the Yandi, Area C and South Flank localities. Aside from mining operations, typically in the north of the Study Area, these creeks are very remote and there is limited vehicle access available. Verification and mapping of vegetation at stragetic locations along each creek confirmed that vegetation represents what would be expected from creeklines and surrounding landforms in the Hamersley Range. The vegetation mapping is considered indicative only as recent fire (<2 years) limited interpretation in the Area C North, Lamb Creek, Marillana Creek, Pebble Mouse Creek and Yandicoogina Creek, and restricted access limited ability to groundtruth large parts of the Study Area.

No TECs or PECs were recorded in the Study Area. It is considered unlikely that any TECs would occur as suitable habitat does not occur. Four PECs have been previously mapped within approximately 10 km of the Study Area (Department of Biodiversity, Conservation, and Attractions 2018). It is unlikely that these PECs occur in the Study Area, although ground-truthing needs to be conducted to confirm this. The nearest PEC occurrence 'Coolibah - Lignum Flats sub type 1: Coolibah and mulga woodland over lignum and tussock grasses on clay plains (Coondewanna and Wanamunna flats and Mt Bruce Flats)' (Priority 3) is approximately 1.8 km west (upstream) of the Pebble Mouse Creek (Department of Biodiversity, Conservation, and Attractions 2018).

Eight vegetation assocations may represent GDV and account for 1,185.5 ha (31.8%)of the Study Area. These vegetation associations may be sensitive to hydrological changes, particularly groundwater drawdown. They are characterised by the phreatophytic species *M. argentea, E. camaldulensis, T. domingensis* and *E. victrix*.

A full inventory of species was not recorded and no systematic targeted survey was undertaken. Therefore a larger suite of species would be expected from a more comprehensive field survey, undertaken in appropriate seasonal conditions for the Eremaean botanical province.

One conservation significant flora species, *Eremophila* sp. Hamersley Range (K. Walker KW 136) P3, was recorded at one relevé during the survey, in association with a hillslope habitat and within vegetation association HS TsTwTp ElCh AhiAad. *Eremophila* sp. Hamersley Range (K. Walker KW 136) P3 is yet to be formally described as a species; there have been 14 specimens lodged with the Western Australian Herbarium, predominantly from an area across the southern Pilbara (Western Australian Herbarium 1998-2019). Six additional Priority flora species have been previously recorded within the Study Area; *Ipomoea racemigera* P2, *Fimbristylis sieberiana* P3, *Goodenia* sp. East Pilbara (A.A. Mitchell PRP 727) P3, *Rhagodia* sp. Hamersley (M. Trudgen 17794) P3, *Rostellularia adscendens* var. *latifolia* P3 and *Sida* sp. Barlee Range (S. van Leeuwen 1642) P3 (Department of Biodiversity, Conservation, and Attractions 2019b, 2019c). It is considered likely that more Priority flora species occur within various habitats in the Study Area and would be observed in targeted searches of suitable habitats conducted during appropriate seasonal conditions.

The three weed species recorded during the survey are considered common and widespread, particularly in Pilbara riparian landforms. Given the very dry conditions preceding the survey, grazing impacts and limited access and coverage of the Study Area, the diversity and abundance of weed species recorded is considered to significantly under represent what would be expected during better seasonal conditions.

6 References

Aplin, TEH 1979, 'The flora', in B. J. O'Brien (ed), *Environment and Science*, University of Western Australia Press, Perth.

Astron Environmental Services 2011, *Area C to Yandi Flora and Vegetation Survey, September 2010*, unpublished report for BHP Billiton Iron Ore Pty Ltd.

Australian Weeds Committee 2012, *Weeds of National Significance 2012*, Dept. of Agriculture, Fisheries and Forestry, Canberra, ACT.

Beard, JS 1975, *Vegetation Survey of Western Australia, Pilbara. 1:1 000 000 Vegetation Series. Explanatory Notes to Sheet 5*, University of Western Australia Press, Nedlands, Western Australia.

BHP 2018, *Vegetation and Flora Survey Procedure*, 0124627, Perth.

BHP Billiton Iron Ore 2016, *Biodiversity Survey Spatial Data Requirements*, SPR-IEN-EMS-015.

Biota Environmental Sciences 2012, *South Flank to Jinidi Level 2 Flora and Vegetation Survey*, unpublished report to BHP Billiton Iron Ore.

Biota Environmental Sciences 2017, *Ministers North Detailed Flora and Vegetation Survey*, unpublished report to BHP Billiton Iron Ore.

Bureau of Meteorology 2018, *Climate Data Online*, <http://www.bom.gov.au/climate/data/index.shtml>.

Catelotti, K, Kingsford, RT, Bino, G & Bacon, P 2015, 'Inundation requirements for persistence and recovery of river red gums (*Eucalyptus camaldulensis*) in semi-arid Australia', *Biological Conservation*, vol. 184, pp. 346-56.

Darwin Centre for Bushfire Research 2018, 'North Australian and WA MODIS burnt area mapping by month (2000-2018) – shapefile', Charles Darwin University, digital spatial datasets downloaded from http://www.firenorth.org.au/nafi3/

Department of Biodiversity, Conservation & Attractions 2018, 'Threatened and Priority Ecological Communities Database', Dept. of Biodiversity, Conservation & Attractions, Perth WA.

Department of Biodiversity, Conservation & Attractions 2019a, 'NatureMap Database Search', Dept. of Biodiversity, Conservation & Attractions, Perth WA.

Department of Biodiversity, Conservation & Attractions 2019b, 'Threatened and Priority Flora Database', Dept. of Biodiversity, Conservation & Attractions, Perth WA.

Department of Biodiversity, Conservation & Attractions 2019c, 'Western Australian Herbarium database ', Department of Biodiversity, Conservation and Attractions.

Department of Conservation and Land Management 2002, *Bioregional Summary of the 2002 Biodiversity Audit for Western Australia*, Department of Conservation and Land Management, Perth.

Department of Primary Industries & Regional Development 2018, *Western Australian Organisms List*, Dept. Primary Industries and Regional Development, Perth, WA, <https://www.agric.wa.gov.au/bam/western-australian-organism-list-waol>.

Department of the Environment 2015e, *Australian Vegetation Attribute Manual, National Vegetation Information System Version 6*, <http://www.environment.gov.au/erin/nvis/publications/avam/section-2-1.html#table1>.

Department of the Environment and Energy 2012, *Interim Biogeographic Regionalisation for Australia (IBRA), Version 7*, Dept. of the Environment and Energy, Canberra, ACT, viewed 2018, <http://www.environment.gov.au/metadataexplorer/explorer.jsp>.

Department of the Environment and Energy 2016b, *National Reserve System*, <http://www.environment.gov.au/topics/land/national-reserve-system>.

Department of the Environment and Energy 2018a, 'Australian Wetlands Database: Ramsar Wetlands', Dept. of the Environment and Energy, Canberra ACT.

Department of the Environment and Energy 2018b, 'Directory of Important Wetlands in Australia', Commonwealth of Australia.

Department of the Environment and Energy 2018c, *Protected Matters Search Tool*, <www.environment.gov.au/epbc/pmst/index.html>.

Department of Water 2008, *Public Drinking Water Source Areas of Western Australia: A Register of Drinking Water Catchments Within Each Local Government*, Department of Water, Water Source Management Division, Perth.

Doody, TM, Holland, KL, Benyon, RG & Jolly, ID 2009, 'Effect of groundwater freshening on riparian vegetation water balance', *Hydrological Processes*, vol. 23, pp. 3485-99.

Environmental Protection Authority 2002, *Terrestrial Biological Surveys as an Element of Biodiversity Protection, Position Statement 3*, Environmental Protection Authority, Perth.

Environmental Protection Authority 2004, *Terrestrial Flora and Vegetation Surveys for Environmental Impact Assessment in Western Australia, Guidance Statement 51*, Environmental Protection Authority, Perth.

Environmental Protection Authority 2016a, *Environmental Factor Guideline: Flora and Vegetation*, Environmental Protection Authority, Perth.

Environmental Protection Authority 2016b, *Technical Guidance - Flora and Vegetation Surveys for Environmental Impact Assessment*, Environmental Protection Authority, Perth.

Government of Western Australia 2018, *2017 Statewide Vegetation Statistics incorporating the CAR Reserve Analysis (Full Report)*, Department of Biodiversity, Conservation and Attractions, Perth, WA.

Kendrick, P 2001a, *Pilbara 2 (PIL2 - Fortescue Plains Subregion)*, (M. Cowan, chairman), *A Biodiversity Audit of Western Australia's 53 Biogeographical Subregions in 2002*, Department of Conservation and Land Management, Perth.

Kendrick, P 2001b, *Pilbara 3 (PIL3 - Hamersley Subregion)*, (M. Cowan, chairman), *A Biodiversity Audit of Western Australia's 53 Biogeographical Subregions in 2002*, Department of Conservation and Land Management, Perth.

O'Grady, AP, Eamus, D, Cook, PG & Lamontagne, S 2005, 'Comparative water use by the riparian trees *Melaleuca argentea* and *Corymbia bella* in the wet dry tropics of northern Australia', *Tree Physiology*, vol. 26, pp. 219-28.

Onshore Environmental Consultants Pty Ltd 2011, *Flora and Vegetation Survey: Area C and Surrounds*, unpublished report to BHP Billiton Iron Ore Pty Ltd, Perth WA,.

Onshore Environmental Consultants Pty Ltd 2012, *Flora and Vegetation Survey, Jinidi to Mainline Study Area*, unpublished report to BHP Billiton Iron Ore.

Onshore Environmental Consultants Pty Ltd 2014a, *Area C West to Yandi Level 2 Flora and Vegetation Survey*, unpublished report prepared for BHP Billiton Iron Ore Pty Ltd

Onshore Environmental Consultants Pty Ltd 2014b, *Consolidation of Regional Vegetation Mapping, BHP Billiton Iron Ore Pilbara Tenure*, unpublished report for BHP Billiton Iron Ore, Perth.

Onshore Environmental Consultants Pty Ltd 2015, *Marillana Creek Riparian Flora and Vegetation Survey*, unpublished report to BHP Billiton Iron Ore Pty Ltd.

Shepherd, DP, Beeston, GR & Hopkins, AJM 2002, 'Native Vegetation in Western Australia: Extent, Type and Status', *Resource Management Technical Report 249*, Department of Agriculture, Western Australia.

Spatial Networks Inc 2000 - 2018, *Fulcrum App*, 2018, <https://www.fulcrumapp.com/>.

Specht, RL 1970, 'Vegetation', in G. W. Leeper (ed), *The Australian Environment*, CSIRO - Melbourne University Press, Melbourne.

Stewart, AJ, Sweet, IP, Needham, RS, Raymond, OL, Whitaker, AJ, Liu, SF, Phillips, D, Retter, AJ, Connolly, DP & Stewart, GR 2008, 'Surface Geology of Australia 1: 1 000 000 Scale, Western Australia [Digital Dataset]', The Commonwealth of Australia, Geoscience Australia (http://www.ga.gov.au), Canberra.

Tille, P 2006, *Soil-landscapes of Western Australia's rangelands and arid interior*, Department of Agriculture and Food, Perth.

Trudgen, ME 1988, *A Report of the Flora and Vegetation of the Port Kennedy Area*, unpublished report to Bowman Bishaw and Associates.

van Vreeswyk, AME, Payne, AL, Leighton, KA & Hennig, P 2004, *An inventory and condition survey of the Pilbara region, Western Australia. Technical Bulletin No. 92*, Department of Agriculture and Food, Perth.

Western Australian Herbarium 1998-2019, 'Florabase - The Western Australian Flora', Parks and Wildlife, Department of Biodiveristy, Conservation and Attractions. http://florabase.dpaw.wa.gov.au.

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Appendix A: Conservation Categories for Flora and Ecological Communities and Categories for Introduced Flora

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Table A.1: Categories and definitions for Threatened flora and fauna species listed under the *Environment Protection and Biodiversity Conservation Act 1999.*

Conservation category	Definition
Extinct	Taxa with no reasonable doubt that the last member of the species has died.
Extinct in the wild	Taxa known to survive only in cultivation, in captivity or as a naturalised population well outside its past range; or it has not been recorded in its known and/or expected habitat, at appropriated seasons, anywhere in its past range, despite exhaustive surveys over a time frame appropriate to its life cycle and form.
Critically endangered (CR)	Taxa facing an extremely high risk of extinction in the wild in the immediate future, as determined in accordance with the prescribed criteria.
Endangered (EN)	Taxa are not critically endangered; and are facing a very high risk of extinction in the wild in the near future, as determined in accordance with the prescribed criteria.
Vulnerable (VU)	Taxa are not critically endangered or endangered; and are facing a high risk of extinction in the wild in the medium-term future, as determined in accordance with the prescribed criteria.
Conservation dependent (CD)	Taxa are the focus of a specific conservation program the cessation of which would result in the species becoming vulnerable, endangered or critically endangered; or the following subparagraphs are satisfied: • the taxa is a species of fish; • the taxa is the focus of a management plan that provides management actions necessary to stop the decline of, and support the recovery of, the taxa so that its chances of long term survival in nature are maximized; • the management plan is in force under a law of the Commonwealth or of a State or Territory; • cessation of the management plan would adversely affect the conservation status of the taxa • fish includes all taxa of bony fish, sharks, rays, crustaceans, molluscs and other marine organisms, but does not include marine mammals/reptiles.

Table A.2: Definitions and criteria for Threatened Ecological Communities under the *Environment Protection and Biodiversity Conservation Act 1999* (Department of Environment and Conservation 2013).

Categories of ecological communities	
Critically endangered (CR)	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 (EN)	If, at that time, it is not critically endangered and is facing a very high risk of extinction in the wild in the near future, as determined in accordance with the prescribed criteria.
Vulnerable (VU)	If, at that time, it is not critically endangered or endangered, and is facing a high risk of extinction in the wild in the medium-term future, as determined in accordance with the prescribed criteria.

Table A.3: Categories of Threatened Ecological Communities (Department of Environment and Conservation 2013).

PD: Presumed Totally Destroyed
An ecological community that has been adequately searched for but for which no representative occurrences have been located. The community has been found to be totally destroyed or so extensively modified throughout its range that no occurrence of it is likely to recover its species composition and/or structure in the foreseeable future. An ecological community will be listed as presumed totally destroyed if there are no recent records of the community being extant and either of the following applies (A or B): A) Records within the last 50 years have not been confirmed despite thorough searches of known or likely habitats or B) All occurrences recorded within the last 50 years have since been destroyed.
CR : Critically Endangered
An ecological community that has been adequately surveyed and found to have been subject to a major contraction in area and/or that was originally of limited distribution and is facing severe modification or destruction throughout its range in the immediate future, or is already severely degraded throughout its range but capable of being substantially restored or rehabilitated. An ecological community will be listed as Critically Endangered when it has been adequately surveyed and is found to be facing an extremely high risk of total destruction in the immediate future. This will be determined on the basis of the best available information, by it meeting any one or more of the following criteria (A, B or C): A) The estimated geographic range, and/or total area occupied, and/or number of discrete occurrences since European settlement have been reduced by at least 90% and either or both of the following apply (i or ii): i) geographic range, and/or total area occupied and/or number of discrete occurrences are continuing to decline such that total destruction of the community is imminent (within approximately 10 years); ii) modification throughout its range is continuing such that in the immediate future (within approximately 10 years) the community is unlikely to be capable of being substantially rehabilitated. B) Current distribution is limited, and one or more of the following apply (i, ii or iii): i) geographic range and/or number of discrete occurrences, and/or area occupied is highly restricted and the community is currently subject to known threatening processes which are likely to result in total destruction throughout its range in the immediate future (within approximately 10 years); ii) there are very few occurrences, each of which is small and/or isolated and extremely vulnerable to known threatening processes; iii) there may be many occurrences but total area is very small and each occurrence is small and/or isolated and extremely vulnerable to known threatening processes. C) The ecological community exists only as highly modified occurrences that may be capable of being rehabilitated if such work begins in the immediate future (within approximately 10 years).

EN: Endangered
An ecological community that has been adequately surveyed and found to have been subject to a major contraction in area and/or was originally of limited distribution and is in danger of significant modification throughout its range or severe modification or destruction over most of its range in the near future. An ecological community will be listed as **Endangered** when it has been adequately surveyed and is not Critically Endangered but is facing a very high risk of total destruction in the near future. This will be determined on the basis of the best available information by it meeting **any one or more** of the following criteria (A, B, or C): A) The geographic range, and/or total area occupied, and/or number of discrete occurrences have been reduced by at least 70% since European settlement **and either or both** of the following apply (i or ii): i) the estimated geographic range, and/or total area occupied and/or number of discrete occurrences are continuing to decline such that total destruction of the community is likely in the short term future (within approximately 20 years); ii) modification throughout its range is continuing such that in the short term future (within approximately 20 years) the community is unlikely to be capable of being substantially restored or rehabilitated. B) Current distribution is limited, **and one or more** of the following apply (i, ii or iii): i) geographic range and/or number of discrete occurrences, and/or area occupied is highly restricted and the community is currently subject to known threatening processes which are likely to result in total destruction throughout its range in the short term future (within approximately 20 years); ii) there are few occurrences, each of which is small and/or isolated and all or most occurrences are very vulnerable to known threatening processes; iii) there may be many occurrences but total area is small and all or most occurrences are small and/or isolated and very vulnerable to known threatening processes. C) The ecological community exists only as very modified occurrences that may be capable of being substantially restored or rehabilitated if such work begins in the short-term future (within approximately 20 years).
VU: Vulnerable
An ecological community that has been adequately surveyed and is found to be declining and/or has declined in distribution and/or condition and whose ultimate security has not yet been assured and/or a community that is still widespread but is believed likely to move into a category of higher threat in the near future if threatening processes continue or begin operating throughout its range. An ecological community will be listed as **Vulnerable** when it has been adequately surveyed and is not Critically Endangered or Endangered but is facing a high risk of total destruction or significant modification in the medium to long-term future. This will be determined on the basis of the best available information by it meeting **any one or more of** the following criteria (A, B or C): A) The ecological community exists largely as modified occurrences that are likely to be capable of being substantially restored or rehabilitated. B) The ecological community may already be modified and would be vulnerable to threatening processes, is restricted in area and/or range and/or is only found at a few locations. C) The ecological community may be still widespread but is believed likely to move into a category of higher threat in the medium to long term future because of existing or impending threatening processes.

Possible Threatened Ecological Communities that do not meet survey criteria or that are not adequately defined are added to the Priority Ecological Community Lists under Priorities 1, 2 and 3. Ecological communities that are adequately known, and are Rare but not Threatened or meet criteria for Near Threatened, or that have been recently removed from the Threatened list, are placed in Priority 4. These ecological communities require regular monitoring. Conservation Dependent ecological communities are placed in Priority 5 (Table A.4).

Table A.4: Definitions and criteria for Priority Ecological Communities (Department of Environment and Conservation 2013).

P1: Priority One – Poorly-known ecological communities
Ecological communities that are known from very few occurrences with a very restricted distribution (generally ≤5 occurrences or a total area of ≤ 100ha). Occurrences are believed to be under threat either due to limited extent, or being on lands under immediate threat (e.g. within agricultural or pastoral lands, urban areas, active mineral leases) or for which current threats exist. May include communities with occurrences on protected lands. Communities may be included if they are comparatively well-known from one or more localities but do not meet adequacy of survey requirements, and/or are not well defined, and appear to be under immediate threat from known threatening processes across their range.
P2: Priority Two – Poorly-known ecological communities
Communities that are known from few occurrences with a restricted distribution (generally ≤10 occurrences or a total area of ≤200ha). At least some occurrences are not believed to be under immediate threat of destruction or degradation. Communities may be included if they are comparatively well known from one or more localities but do not meet adequacy of survey requirements, and/or are not well defined, and appear to be under threat from known threatening processes.
P3: Priority Three – Poorly-known ecological communities
(i) Communities that are known from several to many occurrences, a significant number or area of which are not under threat of habitat destruction or degradation or: (ii) communities known from a few widespread occurrences, which are either large or within significant remaining areas of habitat in which other occurrences may occur, much of it not under imminent threat, or; (iii) communities made up of large, and/or widespread occurrences, that may or not be represented in the reserve system, but are under threat of modification across much of their range from processes such as grazing by domestic and/or feral stock, and inappropriate fire regimes. Communities may be included if they are comparatively well known from several localities but do not meet adequacy of survey requirements and/or are not well defined, and known threatening processes exist that could affect them.
P4: Priority Four
Ecological communities that are adequately known, Rare but not Threatened or meet criteria for Near Threatened, or that have been recently removed from the Threatened list. These communities require regular monitoring. (i) Rare. Ecological communities known from few occurrences that are considered to have been adequately surveyed, or for which sufficient knowledge is available, and that are considered not currently threatened or in need of special protection, but could be if present circumstances change. These communities are usually represented on conservation lands. (ii) Near Threatened. Ecological communities that are considered to have been adequately surveyed and that do not qualify for Conservation Dependent, but that are close to qualifying for Vulnerable. (iii) Ecological communities that have been removed from the list of Threatened communities during the past five years.
P5: Priority Five – Conservation dependent ecological communities
Ecological communities that are not threatened but are subject to a specific conservation program, the cessation of which would result in the community becoming threatened within five years.

Table A.5: Conservation codes for gazetted Western Australian flora and fauna under the *Biodiversity Conservation Act 2016* (Department of Biodiversity, Conservation and Attractions 2019).

Conservation code	Definition
Threatened species	
Critically endangered (CR)	Taxa 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.
Endangered (EN)	Taxa 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.
Vulnerable (VU)	Taxa 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.
Extinct species	
Extinct (EX)	Species where there is no reasonable doubt that the last member of the species has died.
Extinct in the wild (EW)	Species that is known only to survive in cultivation, in captivity or as a naturalised population well outside its past range; and 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. Currently there are no Threatened fauna or Threatened flora species listed as EW. If listing of a species as EW occurs, then a schedule will be added to the applicable notice.
Specially Protected species (fauna only)	
Migratory (MI)	Fauna that periodically or occasionally visit Australia or an external Territory or the exclusive economic zone; or the species is subject of an international agreement that relates to the protection of migratory species and that binds the Commonwealth (JAMBA, CAMBA, ROKAMBA, Bonn Convention); and listing is otherwise in accordance with the ministerial guidelines.
Special conservation interest (conservation dependent fauna) (CD)	Fauna of special conservation need being species dependent on ongoing conservation intervention to prevent it becoming eligible for listing as Threatened.
Other specially protected (OS)	Fauna otherwise in need of special protection to ensure their conservation.

Note: From 1 January 2019, the *Wildlife Conservation Act 1950* (WC Act) has been replaced by the *Biodiversity Conservation Act 2016* and its regulations. This study was completed in 2018 under the WC Act

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

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

Table A.6: Priority species categories and definitions (Department of Biodiversity, Conservation and Attractions 2019)

P1: Priority One – Poorly known taxa
Species that are known from one or a few locations (generally less than five), 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 from 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 Two – Poorly known taxa
Species that are known from one or a few locations (generally five or less), some of which are on lands managed primarily for nature conservation, e.g. national parks, conservation parks, nature reserves, and other lands with secure tenure being managed for conservation. Species may be included if they are comparatively well known from one or more locations but do not meet adequacy of survey requirements and appear to be under threat from known threatening processes. Such species are in urgent need of further survey.
P3: Priority Three – Poorly known taxa
Species that are known from several locations, and the species does not appear to be under imminent threat, or from few but widespread locations with either large population size or significant remaining areas of apparently suitable habitat, much of it not under imminent threat. Species may be included if they are comparatively well known from several localities but do not meet adequacy of survey requirements and known threatening processes exist that could affect them. Such species are in urgent need of further survey.
P4: Priority Four: Rare, Near Threatened and other taxa 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.

The management of introduced flora species in Western Australia is now regulated through the *Biosecurity and Agriculture Management Act 2007* (BAM Act). A list of declared pests, including 'pest' plants is provided under the BAM Act, which has been updated to incorporate a number of other Acts that are administered by the Department of Agriculture and Food Western Australia. Declared pests can fall into two categories: one that relates to the prevention of introducing the species or eradicating it; and the other relates to managing the species and whether it can be kept (i.e. for scientific purposes, education or other purpose).

The threat and risk posed to site-specific biodiversity values, influences to rehabilitation success, primary production, infrastructure assets or human health will differ depending on the unique characteristics of each site and the associated land management practice or operation. Therefore site or project specific weed assessments and priorities should be reviewed for each project.

As per introduced flora species, the BAM Act seeks to establish a modern biosecurity regulatory scheme to prevent serious animal pests from entering the State and becoming established, and to minimise the spread and impact of any that are already present within the State. Declared animal pests fall into three categories as Gazetted under the *Biosecurity and Agriculture Management Regulations 2013*. These categories are outlined in Table A.7.

Table A.7: Declared pests control categories as gazetted under the *Biosecurity and Agriculture Management Regulations 2013*.

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

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Appendix B: Database Searches

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GOVERNMENT OF WESTERN AUSTRALIA

Department of **Biodiversity, Conservation and Attractions**

Your Ref: **2465-18**
Our Ref: **25-0119FL**
Enquiries: Steve Martin
Phone: (08) 9219 9522
Email: flora.data@dbca.wa.gov.au

Species and Communities Program

Astron Environmental Services
129 Royal Street
East Perth WA 6004

Attention: Janelle Atkinson

Dear Janelle Atkinson,

REQUEST FOR THREATENED AND PRIORITY FLORA INFORMATION

I refer to your request of 22 January 2019 for Threatened and Priority Flora information in the Newman area. The search was conducted within the area of the shapefile you submitted with an additional 50km buffer.

A search was undertaken for this area of **(1)** the Department's *Threatened and Priority Flora* database (for results, see "TPFL" – coordinates are GDA94) and **(2)** the *Western Australian Herbarium Specimen* database for Threatened and Priority flora species opportunistically collected in the area of interest (for results, see "WAHERB"- coordinates are GDA94 – see condition number 4 in the attached 'Conditions in Respect of Supply'). The results are attached electronically to this email.

Attached also are the conditions under which this information has been supplied. Your attention is specifically drawn to the ninth point, which refers to the requirement to undertake field investigations for the accurate determination of Threatened and Priority flora occurrence at a site. *The information supplied should be regarded as an indication only of the Threatened and Priority flora that may be present and may be used as a target list in any surveys undertaken.*

The information provided does not preclude you from obtaining and complying with, where necessary, land clearing approvals from other agencies.

An invoice for $300 (plus GST) to supply this information will be forwarded.

It would be appreciated if any populations of Threatened and Priority flora you encounter in the area could be reported to this department, the Department of Biodiversity, Conservation and Attractions (DBCA), to ensure their ongoing management. Please note that sections 43 and 49 of the *Biodiversity Conservation Act 2016* (BC Act) compel any person carrying out field work for the purposes of an assessment under Part IV of the Environmental Protection Act 1986 (EP Act), or complying with an EP Act s.51E(1)(d) application for a clearing permit, to report the presence of a threatened species or a threatened ecological community (TEC) to the CEO (of DBCA).

If you require any further details, or wish to discuss Threatened and Priority flora management, please contact Dr Ken Atkins, Manager, Species and Communities program, on (08) 9219 9511.

Yours faithfully,

Steve Martin
.....
THREATENED FLORA DATABASE OFFICER
for the Director General

30 January 2019

Department of **Biodiversity, Conservation and Attractions**

GOVERNMENT OF WESTERN AUSTRALIA

THREATENED AND PRIORITY FLORA INFORMATION

Conditions with Respect to the Supply of Information

- The data supplied may not be provided to any other organisations, nor be used for any purpose other than for the project for which it has been originally provided for; without the prior consent of the Executive Director, Department of Biodiversity, Conservation and Attractions.
- Specific locality information for threatened flora is regarded as confidential, and should be treated as such by receiving organisations. Specific locality information for threatened flora may not be used in reports without the written permission of the Executive Director, Department of Biodiversity, Conservation and Attractions. Reports may only show generalised locations at a low resolution or, where necessary, show specific locations without identifying species. Species and Communities Branch is to be contacted for guidance on the presentation of threatened flora information.
- The Department of Biodiversity, Conservation and Attractions respects the privacy of private landowners who may have threatened and priority flora on their property. Threatened and priority flora locations identified in the data as being on private property should be treated in confidence, and contact with property owners must only be made through the Department of Biodiversity, Conservation and Attractions.
- The development of the Perth Herbarium database was not originally intended for electronic mapping (eg. GIS ArcView). The latitude and longitude coordinates for each entry are not verified prior to being data based. It is only in recent times that collections have been submitted with GPS coordinates. Therefore, be aware when using this data in GIS software that some records may not plot to the locality description given with each collection.
- Acknowledgment of the Department Biodiversity, Conservation and Attractions as the source of data is to be made in any published material and cited as Biodiversity, Conservation and Attractions (2018) Threatened and Priority Flora Database Search for [search area] accessed on the [date of search]. Prepared by the Species and Communities program for [Requesters name and company] for [purpose of search].
- Copies of all such publications are to be forwarded to the Department of Biodiversity, Conservation and Attractions, Attention; the Manager, Species and Communities program.

Disclaimers with Respect to the Supply of Information

- Receiving organisations should note that while every effort has been made to prevent errors and omissions in the data, they may be present. The Department of Biodiversity, Conservation and Attractions accepts no responsibility for this.
- Receiving organisations must also recognise that the database is subject to continual updating and amendment, and such considerations should be taken into account by the user.
- It should be noted that the supplied data does not necessarily represent a comprehensive listing of the threatened flora of the area in question. Its comprehensiveness is dependent on the amount of surveys carried out within a specified area. The receiving organisation should consider engaging a botanist, if required, to undertake a survey of the area under consideration.

Department of **Biodiversity, Conservation and Attractions**

GOVERNMENT OF WESTERN AUSTRALIA

ABBREVIATIONS USED IN THREATENED AND PRIORITY FLORA DATABASE

VESTING

AAP	Aboriginal Planning Authority
AGR	Chief Executive, Dep. of Agriculture
ALT	Aboriginal Land Trust
APB	Agricultural Protection Board of WA
BGP	Botanical Gardens & Parks Authority
BSA	Boy Scouts Association
CC	Conservation Commission – NPNCA - LFC
CGT	Crown Grant in Trust
COM	Commonwealth of Australia
CRO	Crown Freehold-Govt Ownership
CRW	Crown
DAG	Dep. of Agriculture
DOW	Dep. of Water
DPI	Dep. of Planning
EXD	Exec Direc CALM
FES	Fire and Emergency Services Aust.
HOW	Dep. of Housing/State Housing Commission
ILD	Industrial Lands Develop. Auth
LAC	LandCorp
LGA	Shire/LGA
MAG	Minister for Agriculture
MCB	Metropolitan Cemeteries Board
MED	Ministry of Education
MHE	Minister for Health
MIN	Minister for Mines
MPL	Ministry for Planning
MPR	Minister for Prisons
MRD	Main Roads WA
MTR	Minister for Transport
MWA	Minister for Water Resources
MWO	Minister for Works
NAT	Natural Trust of Australia WA
NON	Not Vested
PLB	Pastoral Lands Board
PRI	Private/Freehold
RAI	Public Transport Authority
REL	Religious Organisation
SPC	State Planning Commission
SYN	Synergy (ex Western Power)
SWA	State of Western Australia
TEL	Telstra
UNK	Unknown
WAT	Water Corporation
WEL	Minister Community Welfare
WRC	Water & Rivers Commission
XPL	Ex-Pastoral Lease

PURPOSES

ABR	Aboriginal Reserve
ACC	Access Track
AER	Aerodrome
AIR	Airport
ARS	Agricultural Research Station
BAP	Baptist Union of WA
CAM	Camping
CAR	Caravan park
CEM	Cemetery
CFA	Conservation of Fauna
CFF	Conservation Of Flora & Fauna
CFL	Conservation of Flora
CHU	Church
CMN	Communications
COM	Common
CON	Conservation Park
CPK	Car Park
CRM	Conservation & Resource Management
DEF	Defence
DRA	Drain
EDE	Educational Endowment
EDU	Educational purposes
UWA	
ENE	Enjoyment of Natural Environ.
EPL	Ex-pastoral Lease (Sect 33(2) CALM Act)
EPS	Explosives
EXC	Excepted from sale
EXL	Exploration Lease
EXP	Experimental Farm
FIR	Firing Range
FOR	State Forest
FP	Foreshore Purposes
GE	General Lease
GHA	Grain Handling
GOL	Golf
GRA	Gravel Pit
GVT	Government Requirements
HAR	Harbour Purposes
HEP	Heritage Purposes
HER	Heritage trail
HOS	Hospital
KEN	Kennels
LGA	LGA/Shire Requirements
LPR	Landscape Protection
MIN	Mining lease
MUN	Municipal Purposes
NPK	National Park
NRE	Nature Reserve
OTH	Other
PAR	Parkland (& Recreation)
PAS	Pastoral lease
PCR	Proposed for Conservation
PFF	Protection of Flora & Fauna
PFL	Protection of Flora
PIC	Picnic ground
PLA	Plantation
PMC	Protection of Meteorite Crater
POS	Public Open Space
PPA	Public parkland
PRS	Prison site
PUR	Purchase Lease
PUT	Public Utility
QUA	Quarry
RAC	Racecourse
RAD	Radio Station
REC	Recreation
REH	Rehabilitation/Re-establish Native Plants
RRE	Railway Reserve
RUB	Rubbish
SAL	Saleyards
SAN	Sand
SCH	School-site
SET	Settlers requirements
SHO	Showgrounds
SNN	Sanitary
SOI	Soil Conservation
STO	Stopping place
STK	Stock Route
TIM	Timber
TOU	Tourism
TOW	Town-site
TRA	Training Ground
TRI	Trig station
UCL	Unallocated Crown Land
UNK	Unknown
VER	Road Verge
VPF	Vermin Proof Fence
WAT	Water
WLS	Wildlife Sanctuary
WOO	Firewood

Department of **Biodiversity, Conservation and Attractions**

GOVERNMENT OF WESTERN AUSTRALIA

ABBREVIATIONS USED IN THE WESTERN AUSTRALIAN HERBARIUM DATABASE

Geocode Method - The method that was used to record the latitude and longitude.

Auto - Indicates that the coordinate data in the record was created automatically (i.e. by software), usually by creating a coordinate from information provided in the Nearest Named Place or Locality textual description fields.

GAP - Acronym for "Generalised Arbitrary Point" as used in HISPID. GAP indicates that the coordinate data was obtained manually from the Nearest Named Place or Locality textual description fields.

GPS - Acronym for "Global Positioning System". GPS indicates that the coordinate data in the record was obtained from a GPS unit by the collector of the specimen.

MAN - Shorthand for manual. MAN indicates that the coordinate data was created by hand using some method not allowed for by one of the other manual Geocode Method values, in particular, TOPO, GAP, or GPS.

TOPO - Shorthand for topographic map. TOPO indicates that the coordinate data was obtained by plotting textual locality details against a topographic map.

None - Indicates that no coordinate data has been supplied by the collector.

Unknown - Indicates that there is no known method for determining the coordinate data. Should be used if the collector provided no indication of how they sampled the specimen's coordinate data.

PREC (Precision) - precision ratings for coordinates.

Precision 1: Absolutely precise (to nearest 100m or nearest second) and must be GPS determined. For example 35°26'42"S 123°40'26"E

Precision 2: Falling within a diameter of 3km (ca 2 minutes) or if no GPS mentioned in collecting notes. (The location must be able to be pinpointed on a 1:250 000 map, a spot locality. For example 35°26'42"S 123°40'26"E

Precision 3: Falling within a diameter of 10km (ca 7 minutes) or for degrees and minutes, where seconds have not been given. For example 35°26'_"S 123°40'_"E

Precision 4: Falling within a diameter of ca 50km (30 minutes). For example 35°26'_"S 123°40'_"E

Precision 5: Where a location is a prescribed large geographical area within a state or only the state is given. Diameter is greater than 50km. For example 35°_'_"S 123°_'_"E

Precision 6: used when localities are New Holland, Eastern Australia or Not given. Fields will be left blank.

Department of **Biodiversity, Conservation and Attractions**

GOVERNMENT OF WESTERN AUSTRALIA

CONSERVATION CODES
For Western Australian Flora and Fauna

Threatened, Extinct and Specially Protected fauna or flora[1] are species[2] which have been adequately searched for and are deemed to be, in the wild, threatened, extinct or in need of special protection, and have been gazetted as such.

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

Categories of Threatened, Extinct and Specially Protected fauna and flora are:

T **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 is that subset of 'Specially Protected Fauna' listed under schedules 1 to 3 of the *Wildlife Conservation (Specially Protected Fauna) Notice 2018* for Threatened Fauna.
Threatened flora is that subset of 'Rare Flora' listed under schedules 1 to 3 of the *Wildlife Conservation (Rare Flora) Notice 2018* for Threatened Flora.
The assessment of the conservation status of these species is based on their national extent and ranked according to their level of threat using IUCN Red List categories and criteria as detailed below.

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.

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.

Specially protected species

Listed by order of the Minister as specially protected under section 13(1) of the BC Act. Meeting one or more of the following categories: species of special conservation interest; migratory species; cetaceans; species subject to international agreement; or species otherwise in need of special protection.
Species that are listed as threatened species (critically endangered, endangered or vulnerable) or extinct species under the BC Act cannot also be listed as Specially Protected species.

MI Migratory species

Fauna that periodically or occasionally visit Australia or an external Territory or the exclusive economic zone; or the species is subject of an international agreement that relates to the protection of migratory species and that binds the Commonwealth; and listing is otherwise in accordance with the ministerial guidelines (section 15 of the BC Act).
Includes birds that are subject to an agreement between the government of Australia and the governments of Japan (JAMBA), China (CAMBA) and The Republic of Korea (ROKAMBA), and fauna subject to the *Convention on the Conservation of Migratory Species of Wild Animals* (Bonn Convention), an environmental treaty under the United Nations Environment Program. Migratory species listed under the BC Act are a subset of the migratory animals, that are known to visit Western Australia, protected under the international agreements or treaties, excluding species that are listed as Threatened species.
Published as migratory birds protected under an international agreement under schedule 5 of the *Wildlife Conservation (Specially Protected Fauna) Notice 2018*.

CD Species of special conservation interest (conservation dependent fauna)

Fauna of special conservation need being species dependent on ongoing conservation intervention to prevent it becoming eligible for listing as threatened, and listing is otherwise in accordance with the ministerial guidelines (section 14 of the BC Act).
Published as conservation dependent fauna under schedule 6 of the *Wildlife Conservation (Specially Protected Fauna) Notice 2018*.

OS Other specially protected species

Fauna otherwise in need of special protection to ensure their conservation, and listing is otherwise in accordance with the ministerial guidelines (section 18 of the BC Act).
Published as other specially protected fauna under schedule 7 of the *Wildlife Conservation (Specially Protected Fauna) Notice 2018*.

P 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.

1 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.

2 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.

3 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.

4 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.

[1] The definition of flora includes algae, fungi and lichens
[2]Species includes all taxa (plural of taxon - a classificatory group of any taxonomic rank, e.g. a family, genus, species or any infraspecific category i.e. subspecies or variety, or a distinct population).

GOVERNMENT OF WESTERN AUSTRALIA

Department of **Biodiversity, Conservation and Attractions**

Science and Conservation Service

DEPARTMENT OF BIODIVERSITY, CONSERVATION AND ATTRACTIONS

THREATENED AND PRIORITY ECOLOGICAL COMMUNITIES INFORMATION

CONDITIONS IN RESPECT OF SUPPLY OF INFORMATION

1. All requests for data are to be made in writing to the Department of Biodiversity, Conservation and Attractions. Attention: Species and Communities Branch

2. The data supplied may not be supplied to other organisations, nor be used for any purpose other than for the project for which they have been provided, without the prior written consent of the data custodian (Val English), Species and Communities Branch.

3. Specific locality information for threatened ecological communities (TECs/PECs) is regarded as confidential, and should be treated as such by receiving organisations. Specific locality information for TECs/PECs may not be used in public reports without the written permission of the data custodian (Val English). Acknowledgment of the Department of Biodiversity, Conservation and Attractions as source of the data is to be made in any published material. Copies of all such publications are to be forwarded to the Department of Biodiversity, Conservation and Attractions, Attention: Manager, Species and Communities Branch.

4. Note that the Department of Biodiversity, Conservation and Attractions respects the privacy of private landowners who may have threatened and priority ecological communities on their property. Locations of TECs/PECs identified in the data as being on private property should be treated in confidence, and contact with property owners made through the Department of Biodiversity, Conservation and Attractions.

5. Receiving organisations should note that while every effort has been made to prevent errors and omissions in the data provided, they may be present. The Department of Biodiversity, Conservation and Attractions accepts no responsibility for this.

6. Receiving organisations must also recognise that the Threatened and Priority Ecological Communities database is subject to continual updating and amendment, and such considerations should be taken into account by the user.

7. It should be noted that the supplied data do not necessarily represent a comprehensive listing of the threatened or priority ecological communities of the area in question. Its comprehensiveness is dependant on the amount of survey carried out within the specified area. Private property has been relatively little surveyed. The receiving organisation should employ a consultant, if there is any likelihood of the presence of any threatened or priority ecological community, to undertake a survey of the area under consideration.

Threatened and Priority Ecological Community buffers and boundaries in WA

UNDER NO CIRCUMSTANCES IS THIS DATA TO BE PROVIDED TO ANY THIRD PARTIES, for more details see conditions for the supply of this information.

Citation

Title: Threatened and Priority Ecological Community buffers and boundaries in WA

Custodian: Department of Biodiversity, Conservation and Attractions

Description

Abstract: Ecological communities throughout WA that are "Presumed Totally Destroyed", "Critically Endangered", "Endangered", "Vulnerable", "Priority 1-5", "Lower Risk" and "Not evaluated". Communities are based on various life-forms including plants, invertebrates and micro-organisms.

Geographical Bounding Box

North: -14.788854

South: -35.005719

East: 128.870214

West: 113.765525

Data Currency and Status

Beginning Date: 1/1/94

Ending Date: 30/10/2017

Maintenance/Update: As requested

Access

Stored Data Format: ESRI shapefile

Coordinate System: GCS_GDA_1994

Access Constraints: Digital data is only available with written permission of the custodian.

Data Quality

Positional Accuracy: Point location data within occurrences usually from GPS location, (usually within 100 metres).

Attribute Accuracy: Not documented.

Logical Consistency: Not documented.

Completeness: Information on specific communities was obtained from regional, subregional or specific habitat surveys of floristic communities, invertebrate communities, wetland assemblages and communities of micro-organisms.

Attributes List:

Name	Description
BDY_ID	Associated boundary polygon unique identifier
OCC_UNIQUE	Unique occurrence identifier
COM_ID	Shortened community name identifier
COM_NAME	Community name
STATE_CATE	State listed category of threat
COMM_CATE	Commonwealth listed category of threat
S_ID_COUNT	Number of Site IDs within a buffer
FIRST_S_ID	First site identifier
LAST_S_ID	Last site identifier
BUFFER	Buffer radius from site ID or boundary in metres

General Information:

Buffers

- A buffer is included around each occurrence of a TEC or PEC to help ensure:
  - that nearby developments with potential for impact are taken into account
  - for ecological communities driven by hydrological processes, buffers are applied to ensure essential ecological functions are maintained and/or potential impact of nearby developments is minimised.
  - mapping inaccuracies are accounted for

Contact Information

Contact Organisation: Department of Biodiversity, Conservation and Attractions

Contact Position: TEC Database Ecologist - Species and Communities Branch

Mail Address: Locked Bag 104, Bentley Delivery Centre, Kensington WA 6983

Telephone: (08) 9219 9157

Email: communities.data@dbca.wa.gov.au

NatureMap
Mapping Western Australia's biodiversity

NatureMap Species Report

Created By Guest user on 14/03/2019

Kingdom Plantae
Current Names Only Yes
Core Datasets Only Yes
Species Group Vascular Plants
Method 'By Circle'
Centre 119° 04' 16" E,22° 51' 52" S
Buffer 40km
Group By Family

Family	Species	Records
Acanthaceae	4	18
Aizoaceae	2	4
Amaranthaceae	30	136
Apiaceae	1	1
Apocynaceae	7	12
Araliaceae	3	12
Asphodelaceae	1	1
Asteraceae	60	183
Bignoniaceae	1	1
Boraginaceae	14	36
Brassicaceae	12	77
Campanulaceae	6	20
Capparaceae	3	6
Caryophyllaceae	4	13
Celastraceae	3	9
Chenopodiaceae	23	80
Cleomaceae	2	12
Commelinaceae	1	2
Convolvulaceae	11	37
Cucurbitaceae	3	3
Cyperaceae	15	32
Dilleniaceae	1	11
Elatinaceae	1	1
Euphorbiaceae	19	48
Fabaceae	130	638
Gentianaceae	1	1
Goodeniaceae	25	153
Gyrostemonaceae	1	7
Haloragaceae	6	10
Hemerocallidaceae	1	3
Lamiaceae	9	23
Lauraceae	1	2
Loranthaceae	10	20
Lythraceae	1	1
Malvaceae	66	289
Marsileaceae	2	6
Molluginaceae	1	3
Montiaceae	3	6
Moraceae	3	7
Myrtaceae	26	121
Nyctaginaceae	2	4
Oleaceae	2	8
Ophioglossaceae	1	1
Orobanchaceae	1	2
Oxalidaceae	1	2
Papaveraceae	1	2
Phrymaceae	5	7
Phyllanthaceae	7	12
Plantaginaceae	1	6
Plumbaginaceae	1	1
Poaceae	103	468
Polygalaceae	2	6
Polygonaceae	2	4
Portulacaceae	1	3
Primulaceae	1	1
Proteaceae	10	37
Pteridaceae	9	23
Rhamnaceae	1	3
Rubiaceae	7	18
Santalaceae	4	6
Sapindaceae	8	14
Scrophulariaceae	26	79
Solanaceae	20	65
Stylidiaceae	1	12
Surianaceae	1	7
Thymelaeaceae	2	3
Violaceae	1	7
Zygophyllaceae	8	18
TOTAL	**742**	**2864**

	Name ID	Species Name	Naturalised	Conservation Code	[1]Endemic To Query Area
Acanthaceae					
1.	7164	*Dicladanthera forrestii*			
2.	11320	*Dipteracanthus australasicus subsp. australasicus*			
3.	7174	*Rostellularia adscendens*			
4.	11556	*Rostellularia adscendens var. latifolia*		P3	
Aizoaceae					
5.	44241	*Trianthema glossostigmum*			
6.	44305	*Trianthema pilosum*			
Amaranthaceae					
7.	2646	*Aerva javanica (Kapok Bush)*	Y		
8.	2648	*Alternanthera denticulata (Lesser Joyweed)*			
9.	2651	*Alternanthera nana (Hairy Joyweed)*			
10.	2652	*Alternanthera nodiflora (Common Joyweed)*			
11.	34810	*Amaranthus centralis*		P3	
12.	2660	*Amaranthus cuspidifolius*			
13.	2663	*Amaranthus interruptus (Native Amaranth)*			
14.	20018	*Amaranthus undulatus*			
15.	2676	*Gomphrena canescens (Batchelors Buttons)*			
16.	18363	*Gomphrena canescens subsp. canescens*			
17.	2680	*Gomphrena cunninghamii*			
18.	2690	*Ptilotus aervoides*			
19.	2696	*Ptilotus astrolasius*			
20.	2698	*Ptilotus auriculifolius*			
21.	2704	*Ptilotus calostachyus (Weeping Mulla Mulla)*			
22.	2711	*Ptilotus clementii (Tassel Top)*			
23.	2718	*Ptilotus drummondii (Narrowleaf Mulla Mulla)*			
24.	2721	*Ptilotus exaltatus (Tall Mulla Mulla)*			
25.	2725	*Ptilotus fusiformis*			
26.	2727	*Ptilotus gaudichaudii*			
27.	2728	*Ptilotus gomphrenoides*			
28.	2731	*Ptilotus helipteroides (Hairy Mulla Mulla)*			
29.	2741	*Ptilotus macrocephalus (Featherheads)*			
30.	2744	*Ptilotus mollis*		P4	
31.	2746	*Ptilotus nobilis (Tall Mulla Mulla)*			
32.	2747	*Ptilotus obovatus (Cotton Bush)*			
33.	2751	*Ptilotus polystachyus (Prince of Wales Feather)*			
34.	2754	*Ptilotus roei*			
35.	2755	*Ptilotus rotundifolius (Royal Mulla Mulla)*			
36.	2757	*Ptilotus schwartzii*			
Apiaceae					
37.	6216	*Cyclospermum leptophyllum*	Y		
Apocynaceae					
38.	6584	*Cynanchum floribundum (Dumara Bush, Tjipa)*			
39.	6585	*Cynanchum pedunculatum*			
40.	48279	*Cynanchum viminale*			
41.	12832	*Gymnanthera cunninghamii*		P3	
42.	12949	*Marsdenia australis*			
43.	48987	*Vincetoxicum flexuosum*			
44.	48986	*Vincetoxicum lineare*			
Araliaceae					
45.	6202	*Astrotricha hamptonii (Ironplant)*			
46.	6278	*Trachymene oleracea*			
47.	19043	*Trachymene oleracea subsp. oleracea*			
Asphodelaceae					
48.	14312	*Bulbine pendula*			
Asteraceae					
49.	43104	*Apowollastonia hamersleyensis*			
50.	7854	*Bidens bipinnata (Bipinnate Beggartick)*	Y		
51.	46338	*Bidens subalternans var. simulans*	Y		
52.	7871	*Brachyscome ciliaris*			
53.	14090	*Calocephalus beardii*			
54.	7891	*Calocephalus francisii (Fine-leaf Beauty-heads)*			
55.	7893	*Calocephalus knappii*			
56.	7895	*Calocephalus multiflorus (Yellow-top)*			

	Name ID	Species Name	Naturalised	Conservation Code	[1]Endemic To Query Area
57.	7903	*Calotis hispidula (Bindy Eye)*			
58.	7905	*Calotis multicaulis (Many-stemmed Burr-daisy)*			
59.	7906	*Calotis plumulifera*			
60.	13231	*Calotis squamigera*		P1	
61.	19762	*Centipeda minima subsp. macrocephala*			
62.	7921	*Centipeda thespidioides (Desert Sneezewood)*			
63.	47174	*Chrysocephalum apiculatum subsp. pilbarense*			
64.	33516	*Chrysocephalum gilesii*			
65.	7939	*Conyza bonariensis (Flaxleaf Fleabane)*	Y		
66.	35558	*Flaveria trinervia (Speedy Weed)*	Y		
67.	7988	*Gnephosis arachnoidea (Cobwebby-headed Gnephosis)*			
68.	8088	*Ixiochlamys cuneifolia*			
69.	8095	*Lactuca saligna (Wild Lettuce, Willow-leaf Lettuce)*	Y		
70.	8096	*Lactuca serriola (Prickly Lettuce)*	Y		
71.	29046	*Lactuca serriola forma serriola*	Y		
72.	17925	*Myriocephalus oldfieldii*			
73.	12635	*Olearia fluvialis*			
74.	8151	*Olearia stuartii*			
75.	8153	*Olearia xerophila*			
76.	42160	*Pentalepis trichodesmoides subsp. trichodesmoides*			
77.	34997	*Peripleura arida*			
78.	34998	*Peripleura obovata*			
79.	35001	*Peripleura virgata*			
80.	20311	*Pilbara trudgenii*		P3	
81.	8167	*Pluchea dentex*			
82.	17816	*Pluchea ferdinandi-muelleri*			
83.	45239	*Podolepis eremaea*			
84.	45242	*Podolepis remota*			
85.	8189	*Pseudognaphalium luteoalbum (Jersey Cudweed)*			
86.	8192	*Pterocaulon sphacelatum (Apple Bush, Fruit Salad Plant)*			
87.	8193	*Pterocaulon sphaeranthoides*			
88.	13308	*Rhodanthe charsleyae*			
89.	13301	*Rhodanthe floribunda*			
90.	13246	*Rhodanthe humboldtiana*			
91.	13310	*Rhodanthe margarethae*			
92.	42011	*Rhodanthe polakii*			
93.	13251	*Rhodanthe propinqua*			
94.	45178	*Roebuckiella similis*			
95.	8198	*Rutidosis helichrysoides (Grey Wrinklewort)*			
96.	13285	*Schoenia ayersii*			
97.	8213	*Senecio magnificus (Showy Groundsel)*			
98.	8223	*Sigesbeckia orientalis (Indian Weed)*	Y		
99.	8231	*Sonchus oleraceus (Common Sowthistle)*	Y		
100.	8235	*Streptoglossa bubakii*			
101.	8237	*Streptoglossa decurrens*			
102.	8239	*Streptoglossa macrocephala*			
103.	25902	*Symphyotrichum squamatum (Bushy Starwort)*	Y		
104.	8252	*Tridax procumbens (Tridax, Tridax Daisy)*	Y		
105.	11788	*Vittadinia dissecta var. hirta*			
106.	8265	*Vittadinia eremaea*			
107.	33026	*Vittadinia sp. Coondewanna Flats (S. van Leeuwen 4684)*		P1	
108.	48250	*Xerochrysum interiore*			
Bignoniaceae					
109.	7117	*Pandorea pandorana*			
Boraginaceae					
110.	29840	*Halgania cyanea var. Allambi Stn (B.W. Strong 676)*			
111.	30294	*Halgania gustafsenii var. Mid West (G. Perry 370)*			
112.	17493	*Halgania gustafsenii var. gustafsenii*			
113.	30258	*Halgania solanacea var. Mt Doreen (G.M. Chippendale 4206)*			
114.	17301	*Heliotropium chrysocarpum*			
115.	6706	*Heliotropium cunninghamii*			
116.	10992	*Heliotropium glabellum*			
117.	6712	*Heliotropium heteranthum*			
118.	17307	*Heliotropium inexplicitum*			
119.	6713	*Heliotropium ovalifolium*			
120.	17309	*Heliotropium pachyphyllum*			
121.	17313	*Heliotropium skeleton*			
122.	6718	*Heliotropium tenuifolium (Mamukata)*			
123.	6727	*Trichodesma zeylanicum (Camel Bush, Kumbalin)*			

	Name ID	Species Name	Naturalised	Conservation Code	[1]Endemic To Query Area
Brassicaceae					
124.	3010	*Cuphonotus andraeanus*			
125.	3022	*Lepidium catapycnon (Hamersley Lepidium)*		P4	
126.	3025	*Lepidium echinatum*			
127.	3032	*Lepidium muelleri-ferdinandii*			
128.	3033	*Lepidium oxytrichum*			
129.	3035	*Lepidium pedicellosum*			
130.	3037	*Lepidium phlebopetalum (Veined Peppercress)*			
131.	3038	*Lepidium pholidogynum*			
132.	3054	*Menkea villosula*			
133.	3074	*Stenopetalum anfractum*			
134.	3075	*Stenopetalum decipiens*			
135.	3078	*Stenopetalum nutans*			
Campanulaceae					
136.	7397	*Isotoma petraea (Rock Isotome, Tundiwari)*			
137.	37480	*Lobelia arnhemiaca*			
138.	7403	*Lobelia heterophylla (Wing-seeded Lobelia)*			
139.	36863	*Lobelia heterophylla subsp. heterophylla*			
140.	36880	*Lobelia heterophylla subsp. pilbarensis*			
141.	7393	*Wahlenbergia tumidifructa*			
Capparaceae					
142.	2976	*Capparis lasiantha (Split Jack, Balqarda)*			
143.	2978	*Capparis mitchellii (Wild Orange)*			
144.	2981	*Capparis spinosa*			
Caryophyllaceae					
145.	2898	*Polycarpaea corymbosa*			
146.	2901	*Polycarpaea holtzei*			
147.	2902	*Polycarpaea involucrata*			
148.	2903	*Polycarpaea longiflora*			
Celastraceae					
149.	19500	*Maytenus sp. Mt Windell (S. van Leeuwen 846)*			
150.	19555	*Stackhousia muricata subsp. annual (W.R. Barker 2172)*			
151.	18405	*Stackhousia sp. swollen gynophore (W.R. Barker 2041)*			
Chenopodiaceae					
152.	2485	*Chenopodium auricomum (Queensland Bluebush)*			
153.	2500	*Dysphania glandulosa*			
154.	2502	*Dysphania kalpari (Rat's Tail, Kalpari)*			
155.	33479	*Dysphania melanocarpa (Black Crumbweed)*			
156.	33596	*Dysphania melanocarpa forma leucocarpa*			
157.	33597	*Dysphania melanocarpa forma melanocarpa (Black Goosefoot)*			
158.	2506	*Dysphania rhadinostachya*			
159.	11890	*Dysphania rhadinostachya subsp. rhadinostachya*			
160.	2511	*Enchylaena tomentosa (Barrier Saltbush)*			
161.	12064	*Enchylaena tomentosa var. tomentosa (Barrier Saltbush)*			
162.	2538	*Maireana carnosa (Cottony Bluebush)*			
163.	2544	*Maireana georgei (Satiny Bluebush)*			
164.	2551	*Maireana melanocoma (Pussy Bluebush)*			
165.	2556	*Maireana planifolia (Low Bluebush)*			
166.	2566	*Maireana thesioides (Lax Bluebush)*			
167.	2571	*Maireana villosa*			
168.	2582	*Rhagodia eremaea (Thorny Saltbush)*			
169.	20168	*Rhagodia sp. Hamersley (M. Trudgen 17794)*		P3	
170.	30434	*Salsola australis*			
171.	2602	*Sclerolaena convexula*			
172.	2603	*Sclerolaena cornishiana (Cartwheel Burr)*			
173.	2607	*Sclerolaena densiflora*			
174.	2631	*Sclerolaena tetragona*			
Cleomaceae					
175.	2985	*Cleome oxalidea*			
176.	2988	*Cleome viscosa (Tickweed, Tjinduwadhu)*			
Commelinaceae					
177.	1165	*Commelina ensifolia (Wandering Jew, Buargu)*			
Convolvulaceae					
178.	11167	*Bonamia erecta*			
179.	44782	*Bonamia pilbarensis*			
180.	6612	*Convolvulus clementii*			

	Name ID	Species Name	Naturalised	Conservation Code	[1]Endemic To Query Area
181.	31274	*Duperreya commixta*			
182.	6617	*Evolvulus alsinoides (Tropical Speedwell)*			
183.	11200	*Evolvulus alsinoides var. villosicalyx*			
184.	6633	*Ipomoea muelleri (Poison Morning Glory, Yumbu)*			
185.	6636	*Ipomoea plebeia (Bellvine)*			
186.	6639	*Ipomoea racemigera*		P2	
187.	6653	*Polymeria ambigua (Morning Glory)*			
188.	17513	*Polymeria lanata*			
Cucurbitaceae					
189.	48838	*Citrullus amarus*	Y		
190.	7371	*Cucumis melo (Ulcardo Melon)*			
191.	41721	*Cucumis variabilis*			
Cyperaceae					
192.	750	*Bulbostylis barbata*			
193.	777	*Cyperus bulbosus (Bush Onion, Tjanmata)*			
194.	12811	*Cyperus cunninghamii subsp. cunninghamii*			
195.	12808	*Cyperus hesperius*			
196.	798	*Cyperus iria*			
197.	799	*Cyperus ixiocarpus*			
198.	818	*Cyperus vaginatus (Stiffleaf Sedge)*			
199.	823	*Eleocharis atropurpurea*			
200.	827	*Eleocharis geniculata*			
201.	842	*Fimbristylis cardiocarpa*			
202.	859	*Fimbristylis littoralis*			
203.	862	*Fimbristylis microcarya*			
204.	882	*Fimbristylis sieberiana*		P3	
205.	48355	*Schoenoplectiella dissachantha*			
206.	16257	*Schoenoplectus subulatus*			
Dilleniaceae					
207.	5128	*Hibbertia glaberrima*			
Elatinaceae					
208.	5186	*Bergia trimera*			
Euphorbiaceae					
209.	17454	*Adriana tomentosa var. hookeri*			
210.	17422	*Adriana tomentosa var. tomentosa*			
211.	4617	*Euphorbia australis (Namana)*			
212.	42843	*Euphorbia australis var. glabra*		P2	
213.	42844	*Euphorbia australis var. hispidula*			
214.	35303	*Euphorbia australis var. subtomentosa*			
215.	4619	*Euphorbia biconvexa*			
216.	4620	*Euphorbia boophthona (Gascoyne Spurge)*			
217.	9048	*Euphorbia careyi*			
218.	4623	*Euphorbia coghlanii (Namana)*			
219.	42846	*Euphorbia ferdinandi*			
220.	42847	*Euphorbia ferdinandi var. ferdinandi*			
221.	4635	*Euphorbia myrtoides*			
222.	12097	*Euphorbia tannensis subsp. eremophila (Desert Spurge)*			
223.	42879	*Euphorbia trigonosperma*			
224.	13281	*Euphorbia vaccaria*			
225.	42877	*Euphorbia vaccaria var. erucoides*			
226.	42876	*Euphorbia vaccaria var. vaccaria*			
227.	4650	*Euphorbia wheeleri*			
Fabaceae					
228.	11215	*Acacia adoxa var. adoxa*			
229.	3205	*Acacia adsurgens*			
230.	3209	*Acacia ampliceps*			
231.	3214	*Acacia ancistrocarpa (Fitzroy Wattle)*			
232.	44581	*Acacia ancistrocarpa x citrinoviridis*			Y
233.	3217	*Acacia aneura (Mulga, Wanari)*			
234.	37260	*Acacia aptaneura*			
235.	3223	*Acacia arida*			
236.	3228	*Acacia atkinsiana*			
237.	3232	*Acacia ayersiana*			
238.	3241	*Acacia bivenosa*			
239.	29571	*Acacia bromilowiana*		P4	
240.	19571	*Acacia catenulata*			
241.	23524	*Acacia catenulata subsp. occidentalis*			

	Name ID	Species Name	Naturalised	Conservation Code	[1]Endemic To Query Area
242.	3260	*Acacia citrinoviridis*			
243.	3270	*Acacia coriacea (Wirewood)*			
244.	13502	*Acacia coriacea subsp. pendens*			
245.	3272	*Acacia cowleana (Halls Creek Wattle)*			
246.	3300	*Acacia dictyophleba (Sandhill Wattle, Ngarkalya)*			
247.	3316	*Acacia effusa*		P3	
248.	16174	*Acacia elachantha*			
249.	3360	*Acacia hamersleyensis*			
250.	3370	*Acacia hilliana*			
251.	3377	*Acacia inaequilatera (Baderi)*			
252.	36418	*Acacia incurvaneura*			
253.	3399	*Acacia kempeana (Witchetty Bush, Ilykuwara)*			
254.	37240	*Acacia macraneura*			
255.	3434	*Acacia maitlandii (Maitland's Wattle)*			
256.	3435	*Acacia marramamba*			
257.	19305	*Acacia melleodora*			
258.	12952	*Acacia minyura*			
259.	3447	*Acacia monticola (Gawar, Lilwardi)*			
260.	36416	*Acacia mulganeura*			
261.	3475	*Acacia pachyacra*			
262.	15724	*Acacia paraneura*			
263.	3500	*Acacia pruinocarpa (Gidgee)*			
264.	36800	*Acacia pteraneura*			
265.	3506	*Acacia pyrifolia (Ranji Bush, Kandji)*			
266.	29016	*Acacia pyrifolia var. morrisonii*			
267.	29015	*Acacia pyrifolia var. pyrifolia*			
268.	3519	*Acacia rhodophloia*			
269.	44584	*Acacia rhodophloia x sibirica*			
270.	13078	*Acacia sclerosperma subsp. sclerosperma*			
271.	8949	*Acacia sibirica (Bastard Mulga)*			
272.	3553	*Acacia spondylophylla*			
273.	23526	*Acacia steedmanii subsp. borealis*			
274.	23528	*Acacia subtiliformis*		P3	
275.	13070	*Acacia synchronicia*			
276.	3573	*Acacia tenuissima*			
277.	3577	*Acacia tetragonophylla (Kurara, Wakalpuka)*			
278.	3579	*Acacia trachycarpa (Minni Ritchi, Balgali)*			
279.	23521	*Acacia trudgeniana*			
280.	3585	*Acacia tumida (Pindan Wattle, Walgali)*			
281.	20319	*Acacia tumida var. pilbarensis*			
282.	31511	*Acacia victoriae subsp. victoriae*			
283.	17147	*Alysicarpus muelleri*			
284.	3783	*Crotalaria medicaginea*			
285.	20179	*Crotalaria medicaginea var. neglecta*			
286.	3785	*Crotalaria novae-hollandiae (New Holland Rattlepod)*			
287.	11231	*Crotalaria novae-hollandiae subsp. novae-hollandiae*			
288.	17117	*Cullen cinereum*			
289.	17118	*Cullen leucanthum*			
290.	17119	*Cullen leucochaites*			
291.	17116	*Cullen martinii*			
292.	17120	*Cullen pogonocarpum*			
293.	17140	*Daviesia eremaea*			
294.	3856	*Desmodium muelleri*			
295.	3903	*Gastrolobium grandiflorum (Wallflower Poison)*			
296.	3938	*Glycine canescens (Silky Glycine)*			
297.	41245	*Gompholobium oreophilum*			
298.	10995	*Gompholobium polyzygum*			
299.	3973	*Indigofera colutea (Sticky Indigo)*			
300.	45473	*Indigofera fractiflexa subsp. fractiflexa*			
301.	3974	*Indigofera georgei (Bovine Indigo)*			
302.	17716	*Indigofera gilesii*		P3	
303.	3978	*Indigofera hirsuta (Hairy Indigo)*			
304.	3980	*Indigofera linifolia*			
305.	3982	*Indigofera monophylla*			
306.	3985	*Indigofera rugosa*			
307.	3987	*Indigofera trita*			
308.	3989	*Isotropis atropurpurea (Poison Sage)*			
309.	17790	*Isotropis parviflora*		P2	
310.	48615	*Isotropis sp. Arid zone (G. Byrne 2775)*			
311.	4105	*Mirbelia viminalis*			

	Name ID	Species Name	Naturalised	Conservation Code	[1]Endemic To Query Area
312.	3615	*Neptunia gracilis (Native Sensitive Plant)*			
313.	17906	*Neptunia gracilis forma gracilis*			
314.	3674	*Petalostylis cassioides*			
315.	3675	*Petalostylis labicheoides (Slender Petalostylis)*			
316.	4190	*Rhynchosia australis (Rhynchosia)*			
317.	20862	*Rhynchosia bungarensis*		P4	
318.	4191	*Rhynchosia minima (Rhynchosia)*			
319.	17645	*Senna artemisioides*			
320.	12279	*Senna artemisioides subsp. helmsii*			
321.	12280	*Senna artemisioides subsp. oligophylla*			
322.	12152	*Senna curvistyla*			
323.	18443	*Senna ferraria*			
324.	12305	*Senna glutinosa subsp. chatelainiana*			
325.	12307	*Senna glutinosa subsp. glutinosa*			
326.	12309	*Senna glutinosa subsp. pruinosa*			
327.	12308	*Senna glutinosa subsp. x luerssenii*			
328.	12312	*Senna notabilis*			
329.	12315	*Senna pleurocarpa var. angustifolia*			
330.	19347	*Senna sericea*			
331.	14577	*Senna sp. Meekatharra (E. Bailey 1-26)*			
332.	18445	*Senna stricta*			
333.	18450	*Senna symonii*			
334.	12319	*Senna venusta*			
335.	4196	*Sesbania cannabina (Sesbania Pea)*			
336.	12353	*Stylosanthes hamata (Verano Stylo)*	Y		
337.	4220	*Swainsona canescens (Grey Swainsona)*			
338.	13596	*Swainsona complanata*			
339.	4223	*Swainsona decurrens*			
340.	12356	*Swainsona formosa*			
341.	4231	*Swainsona kingii*			
342.	4233	*Swainsona leeana*			
343.	4238	*Swainsona oroboides (Variable Swainsona)*			
344.	4252	*Templetonia egena (Round Templetonia)*			
345.	4259	*Tephrosia arenicola*			
346.	49016	*Tephrosia densa*			
347.	41986	*Tephrosia oxalidea*			
348.	41825	*Tephrosia rosea var. Fortescue creeks (M.I.H. Brooker 2186)*			
349.	17768	*Tephrosia sp. Bungaroo Creek (M.E. Trudgen 11601)*			
350.	42442	*Tephrosia sp. NW Eremaean (S. van Leeuwen et al. PBS 0356)*			
351.	42225	*Tephrosia sp. Newman (A.A. Mitchell PRP 29)*			
352.	4286	*Tephrosia uniovulata*			
353.	4287	*Tephrosia virens*			
354.	30716	*Vachellia farnesiana (Mimosa Bush)*	Y		
355.	4323	*Vigna lanceolata (Maloga Vigna, Wega)*			
356.	11576	*Vigna lanceolata var. lanceolata*			
357.	31391	*Vigna sp. Hamersley Clay (A.A. Mitchell PRP 113)*			
Gentianaceae					
358.	41660	*Schenkia australis*			
Goodeniaceae					
359.	7413	*Brunonia australis (Native Cornflower)*			
360.	7424	*Dampiera candicans*			
361.	20378	*Dampiera metallorum*		P3	
362.	12517	*Goodenia cusackiana*			
363.	12529	*Goodenia lyrata*		P3	
364.	7526	*Goodenia microptera*			
365.	12552	*Goodenia muelleriana*			
366.	7530	*Goodenia nuda*		P4	
367.	12571	*Goodenia pascua*			
368.	12574	*Goodenia prostrata*			
369.	7545	*Goodenia scaevolina (Ngurubi)*			
370.	29381	*Goodenia sp. East Pilbara (A.A. Mitchell PRP 727) (O'Meara's Goodenia)*		P3	
371.	7550	*Goodenia stellata*			
372.	10982	*Goodenia stobbsiana*			
373.	7557	*Goodenia trichophylla*			
374.	7558	*Goodenia triodiophila*			
375.	12578	*Scaevola acacioides*			
376.	12723	*Scaevola amblyanthera*			
377.	13179	*Scaevola amblyanthera var. amblyanthera*			
378.	13178	*Scaevola amblyanthera var. centralis*			

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379.	12579	*Scaevola browniana*			
380.	13150	*Scaevola browniana subsp. browniana*			
381.	7633	*Scaevola parvifolia (Camel Weed)*			
382.	13172	*Scaevola parvifolia subsp. pilbarae*			
383.	7654	*Velleia connata (Cup Velleia)*			
Gyrostemonaceae					
384.	2778	*Codonocarpus cotinifolius (Native Poplar, Kundurangu)*			
Haloragaceae					
385.	6151	*Gonocarpus ephemerus*			
386.	6174	*Haloragis gossei*			
387.	23465	*Haloragis gossei var. gossei*			
388.	23464	*Haloragis gossei var. inflata*			
389.	20669	*Haloragis maierae*			
390.	6180	*Haloragis trigonocarpa*			
Hemerocallidaceae					
391.	29483	*Tricoryne sp. Hamersley Range (S. van Leeuwen 915)*			
Lamiaceae					
392.	13692	*Clerodendrum floribundum var. angustifolium*			
393.	13689	*Clerodendrum tomentosum var. lanceolatum*			
394.	6754	*Dicrastylis cordifolia*			
395.	20252	*Newcastelia sp. Hamersley Range (S. van Leeuwen 4264)*			
396.	35276	*Plectranthus scutellarioides*			
397.	12707	*Prostanthera albiflora*			
398.	48313	*Teucrium disjunctum*			
399.	19366	*Teucrium pilbaranum*		P2	
400.	48603	*Teucrium teucriiflorum*			
Lauraceae					
401.	2950	*Cassytha filiformis (Love Vine, Jirawan)*			
Loranthaceae					
402.	2372	*Amyema fitzgeraldii (Pincushion Mistletoe)*			
403.	11614	*Amyema gibberula var. gibberula*			
404.	2374	*Amyema hilliana*			
405.	2380	*Amyema miquelii (Stalked Mistletoe)*			
406.	2383	*Amyema preissii (Wireleaf Mistletoe)*			
407.	29080	*Amyema sanguinea var. pulchra*			
408.	11874	*Amyema sanguinea var. sanguinea*			
409.	2395	*Diplatia grandibractea*			
410.	2396	*Lysiana casuarinae*			
411.	2398	*Lysiana murrayi (Mistletoe, Parka-Parka)*			
Lythraceae					
412.	5277	*Ammannia baccifera*			
Malvaceae					
413.	4889	*Abutilon cryptopetalum*			
414.	9080	*Abutilon cunninghamii*			
415.	4891	*Abutilon fraseri (Lantern Bush)*			
416.	18120	*Abutilon fraseri subsp. fraseri*			
417.	4895	*Abutilon lepidum*			
418.	4896	*Abutilon leucopetalum (Desert Chinese Lantern)*			
419.	4898	*Abutilon macrum*			
420.	4899	*Abutilon malvifolium (Bastard Marshmallow)*			
421.	4901	*Abutilon otocarpum (Desert Chinese Lantern)*			
422.		*Abutilon sp.*			
423.	42920	*Abutilon sp. Dioicum (A.A. Mitchell PRP 1618)*			
424.	14113	*Abutilon sp. Pilbara (W.R. Barker 2025)*			
425.	40910	*Androcalva luteiflora (Yellow-flowered Rulingia)*			
426.	12716	*Brachychiton acuminatus*			
427.	13560	*Corchorus crozophorifolius*			
428.	25838	*Corchorus incanus subsp. lithophilus*			
429.	18409	*Corchorus lasiocarpus subsp. lasiocarpus*			
430.	18408	*Corchorus lasiocarpus subsp. parvus*			
431.		*Corchorus sp.*			
432.	17661	*Corchorus tectus*			
433.	4865	*Corchorus tridens*			
434.	4910	*Gossypium australe (Native Cotton)*			
435.	4918	*Gossypium robinsonii (Wild Cotton)*			
436.	4919	*Gossypium sturtianum (Sturt's Desert Rose)*			

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437.	11559	*Gossypium sturtianum var. sturtianum*			
438.	17722	*Hannafordia bissillii subsp. bissillii*			
439.	4922	*Hibiscus brachychlaenus*			
440.	4923	*Hibiscus brachysiphonius*			
441.	4924	*Hibiscus burtonii*			
442.	4925	*Hibiscus coatesii*			
443.	4930	*Hibiscus goldsworthii*			
444.	4931	*Hibiscus haynaldii*			
445.	4933	*Hibiscus leptocladus*			
446.	40560	*Hibiscus sp. Gurinbiddy Range (M.E. Trudgen MET 15708)*		P2	
447.	40640	*Hibiscus sp. Mt Robinson (G. Byrne 3537)*			
448.	4942	*Hibiscus sturtii (Sturt's Hibiscus)*			
449.	11651	*Hibiscus sturtii var. campylochlamys*			
450.	11385	*Hibiscus sturtii var. grandiflorus*			
451.	11477	*Hibiscus sturtii var. platychlamys*			
452.	4962	*Malvastrum americanum (Spiked Malvastrum)*	Y		
453.	5051	*Melhania oblongifolia*			
454.	46816	*Seringia elliptica (Showy fire-bush)*			
455.	46821	*Seringia nephrosperma (Free carpel fire-bush)*			
456.	4966	*Sida arenicola*			
457.	4970	*Sida calyxhymenia (Tall Sida)*			
458.	4971	*Sida cardiophylla*			
459.	4976	*Sida echinocarpa*			
460.	31759	*Sida ectogama*			
461.	4977	*Sida fibulifera (Silver Sida)*			
462.	4986	*Sida platycalyx (Lifesaver Burr)*			
463.	4988	*Sida rohlenae*			
464.	31859	*Sida sp. Articulation below (A.A. Mitchell PRP 1605)*			
465.	16616	*Sida sp. Barlee Range (S. van Leeuwen 1642)*		P3	
466.	31854	*Sida sp. Excedentifolia (J.L. Egan 1925)*			
467.	48867	*Sida sp. L (A.M. Ashby 4202)*			
468.	33698	*Sida sp. Pilbara (A.A. Mitchell PRP 1543)*			
469.	16993	*Sida sp. Rabbit Flat (B.J. Carter 626)*			
470.	20253	*Sida sp. Shovelanna Hill (S. van Leeuwen 3842)*			
471.	31852	*Sida sp. Supplejack Station (T.S. Henshall 2345)*			
472.	19712	*Sida sp. dark green fruits (S. van Leeuwen 2260)*			
473.	16617	*Sida sp. spiciform panicles (E. Leyland s.n. 14/8/90)*			
474.	18144	*Sida sp. tiny glabrous fruit (A.A. Mitchell PRP1152)*			
475.	4879	*Triumfetta leptacantha*			
476.	14942	*Triumfetta maconochieana*			
477.	5106	*Waltheria indica*			
478.	5107	*Waltheria virgata*			
Marsileaceae					
479.	76	*Marsilea hirsuta (Nardoo)*			
480.		*Marsilea sp.*			
Molluginaceae					
481.	48201	*Trigastrotheca molluginea*			
Montiaceae					
482.	2864	*Calandrinia ptychosperma*			
483.	2865	*Calandrinia pumila*			
484.	2868	*Calandrinia reticulata*			
Moraceae					
485.	19648	*Ficus brachypoda*			
486.	1753	*Ficus platypoda (Native Fig, Makartu)*			
487.	12096	*Ficus virens var. virens*			
Myrtaceae					
488.	5446	*Calytrix carinata*			
489.	16783	*Corymbia candida*			
490.	17083	*Corymbia deserticola subsp. deserticola*			
491.	17077	*Corymbia ferriticola*			
492.	17093	*Corymbia hamersleyana*			
493.	5580	*Eucalyptus camaldulensis (River Gum, Yabalinyba)*			
494.	35345	*Eucalyptus camaldulensis subsp. obtusa (Blunt-budded River Red Gum)*			
495.	35343	*Eucalyptus camaldulensis subsp. refulgens*			
496.	5641	*Eucalyptus ewartiana (Ewart's Mallee)*			
497.	5655	*Eucalyptus gamophylla (Twin-leaf Mallee, Warilu)*			
498.	5684	*Eucalyptus kingsmillii (Kingsmill's Mallee)*			
499.	5698	*Eucalyptus leucophloia (Snappy Gum, Migum)*			

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500.	18088	*Eucalyptus leucophloia subsp. leucophloia*			
501.	5744	*Eucalyptus pilbarensis*			
502.	18058	*Eucalyptus repullulans*			
503.	5773	*Eucalyptus socialis (Red Mallee, Altarpa)*			
504.	19576	*Eucalyptus socialis subsp. eucentrica*			
505.	18219	*Eucalyptus tephrodes*			
506.	29733	*Eucalyptus trivalva (Victoria Spring Mallee)*			
507.	14548	*Eucalyptus victrix*			
508.	15592	*Eucalyptus xerothermica*			
509.	5846	*Lamarchea sulcata*			
510.	5875	*Melaleuca argentea (Silver Cadjeput, Bandaran)*			
511.	5879	*Melaleuca bracteata (River Teatree)*			
512.	5908	*Melaleuca eleuterostachya*			
513.	5915	*Melaleuca glomerata*			
Nyctaginaceae					
514.	2770	*Boerhavia coccinea (Tar Vine, Wituka)*			
515.	2774	*Boerhavia repleta*			
Oleaceae					
516.	6501	*Jasminum didymum*			
517.	12059	*Jasminum didymum subsp. lineare (Desert Jasmine)*			
Ophioglossaceae					
518.	17	*Ophioglossum lusitanicum (Adders Tongue)*			
Orobanchaceae					
519.	12492	*Striga squamigera*			
Oxalidaceae					
520.	30374	*Oxalis sp. Pilbara (M.E. Trudgen 12725)*		P2	
Papaveraceae					
521.	2961	*Argemone ochroleuca (Mexican Poppy)*	Y		
Phrymaceae					
522.	7057	*Elacholoma hornii*			
523.	7060	*Glossostigma diandrum*			
524.	12486	*Peplidium aithocheilum*			
525.	7092	*Peplidium muelleri*			
526.	18462	*Peplidium sp. E Evol. Fl. Fauna Arid Aust. (A.S. Weston 12768)*			
Phyllanthaceae					
527.	38423	*Notoleptopus decaisnei var. Orbicularis (A.B. Craig 428)*			
528.	9056	*Phyllanthus baccatus*			
529.	17626	*Phyllanthus erwinii*			
530.	4680	*Phyllanthus maderaspatensis*			
531.	4687	*Phyllanthus virgatus*			
532.	44786	*Synostemon hamersleyensis*		P1	Y
533.	48206	*Synostemon rhytidospermus*			
Plantaginaceae					
534.	7098	*Stemodia grossa (Marsh Stemodia, Mindjaara)*			
Plumbaginaceae					
535.	6491	*Plumbago zeylanica (Native Plumbago)*			
Poaceae					
536.	172	*Acrachne racemosa*			
537.	19835	*Amphipogon sericeus*			
538.	204	*Aristida burbidgeae*			
539.	207	*Aristida contorta (Bunched Kerosene Grass)*			
540.	12063	*Aristida holathera var. holathera*			
541.	211	*Aristida hygrometrica (Northern Kerosene Grass)*			
542.	212	*Aristida inaequiglumis (Feathertop Threeawn)*			
543.	213	*Aristida ingrata*			
544.	17918	*Aristida jerichoensis var. subspinulifera*		P3	
545.	216	*Aristida lazaridis*		P2	
546.	218	*Aristida obscura (Brush Threeawn)*			
547.	221	*Aristida pruinosa (Gulf Feathertop Wiregrass)*			
548.	240	*Bothriochloa ewartiana (Desert Bluegrass)*			
549.	258	*Cenchrus ciliaris (Buffel Grass)*	Y		
550.	259	*Cenchrus echinatus (Burrgrass)*	Y		
551.	29721	*Cenchrus setiger (Birdwood Grass)*	Y		
552.	266	*Chloris barbata (Purpletop Chloris)*	Y		
553.	269	*Chloris pectinata (Comb Chloris)*			

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554.	272	*Chloris virgata (Feathertop Rhodes Grass)*	Y		
555.	273	*Chrysopogon fallax (Golden Beard Grass)*			
556.	279	*Cymbopogon ambiguus (Scentgrass)*			
557.	281	*Cymbopogon obtectus (Silkyheads)*			
558.	290	*Dactyloctenium radulans (Button Grass)*			
559.	13741	*Dichanthium sericeum subsp. humilius*			
560.	13740	*Dichanthium sericeum subsp. polystachyum*			
561.	308	*Digitaria ammophila (Silky Umbrella Grass)*			
562.	310	*Digitaria brownii (Cotton Panic Grass)*			
563.	311	*Digitaria ciliaris (Summer Grass)*	Y		
564.	313	*Digitaria ctenantha (Comb Finger Grass)*			
565.	48378	*Diplachne fusca subsp. fusca*			
566.	328	*Echinochloa colona (Awnless Barnyard Grass)*	Y		
567.	356	*Enneapogon avenaceus (Bottle Washers)*			
568.	357	*Enneapogon caerulescens (Limestone Grass)*			
569.	360	*Enneapogon lindleyanus (Wiry Nineawn, Purple-head Nineawn)*			
570.	365	*Enneapogon polyphyllus (Leafy Nineawn)*			
571.	20377	*Enneapogon robustissimus*			
572.	368	*Enteropogon ramosus (Windmill Grass, Curly Windmill Grass)*			
573.	375	*Eragrostis cumingii (Cuming's Love Grass)*			
574.	377	*Eragrostis desertorum (Desert Lovegrass)*			
575.	378	*Eragrostis dielsii (Mallee Lovegrass)*			
576.	380	*Eragrostis eriopoda (Woollybutt Grass, Wangurnu)*			
577.	381	*Eragrostis falcata (Sickle Lovegrass)*			
578.	388	*Eragrostis leptocarpa (Drooping Lovegrass)*			
579.	17608	*Eragrostis olida*			
580.	392	*Eragrostis pergracilis*			
581.	393	*Eragrostis setifolia (Neverfail Grass)*			
582.	20243	*Eragrostis sp. Mt Robinson (S. van Leeuwen 4109)*		P1	Y
583.	398	*Eragrostis tenellula (Delicate Lovegrass)*			
584.	399	*Eragrostis xerophila (Knotty-butt Neverfail)*			
585.	400	*Eriachne aristidea*			
586.	403	*Eriachne benthamii (Swamp Wanderrie)*			
587.	408	*Eriachne flaccida (Claypan Grass)*			
588.	409	*Eriachne gardneri*			
589.	411	*Eriachne helmsii (Buck Wanderrie Grass)*			
590.	13660	*Eriachne lanata*			
591.	413	*Eriachne mucronata (Mountain Wanderrie Grass)*			
592.	415	*Eriachne ovata*			
593.	417	*Eriachne pulchella (Pretty Wanderrie)*			
594.	16485	*Eriachne pulchella subsp. dominii*			
595.	16486	*Eriachne pulchella subsp. pulchella*			
596.	421	*Eriachne tenuiculmis*			
597.	11011	*Eulalia aurea*			
598.	458	*Iseilema dolichotrichum*			
599.	461	*Iseilema fragile*			
600.	464	*Iseilema membranaceum (Small Flinders Grass)*			
601.	14985	*Melinis repens*	Y		
602.	503	*Panicum decompositum (Native Millet, Kaltu-kaltu)*			
603.	504	*Panicum effusum (Hairy Panic Grass)*			
604.	505	*Panicum laevinode*			
605.	515	*Paraneurachne muelleri (Northern Mulga Grass)*			
606.	10975	*Paspalidium basicladum*			
607.	518	*Paspalidium clementii (Clements Paspalidium)*			
608.	521	*Paspalidium gracile (Slender Panic)*			
609.	523	*Paspalidium rarum (Rare Paspalidium)*			
610.	524	*Paspalidium reflexum*			
611.	527	*Paspalum dilatatum*	Y		
612.	546	*Perotis rara (Comet Grass)*			
613.	599	*Schizachyrium fragile (Senale Redgrass)*			
614.	606	*Setaria dielsii (Diels' Pigeon Grass)*			
615.	612	*Setaria surgens (Pigeon Grass)*			
616.	613	*Setaria verticillata (Whorled Pigeon Grass)*	Y		
617.	12919	*Sorghum plumosum var. plumosum*			
618.	629	*Sporobolus australasicus (Fairy Grass)*			
619.	17820	*Themeda sp. Hamersley Station (M.E. Trudgen 11431)*		P3	
620.	17819	*Themeda sp. Mt Barricade (M.E. Trudgen 2471)*			
621.	673	*Themeda triandra*			
622.	678	*Tragus australianus (Small Burrgrass)*			
623.	680	*Triodia basedowii (Lobed Spinifex)*			

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624.	17886	*Triodia biflora*			
625.	681	*Triodia brizoides*			
626.	13131	*Triodia epactia*			
627.	690	*Triodia longiceps (Giant Grey Spinifex)*			
628.	17877	*Triodia melvillei*			
629.	696	*Triodia pungens (Soft Spinifex)*			
630.	17873	*Triodia schinzii*			
631.	41101	*Triodia sp. Karijini (S. van Leeuwen 4111)*		P1	
632.	19534	*Triodia sp. Mt Ella (M.E. Trudgen 12739)*		P3	
633.	48463	*Triodia vanleeuwenii*			
634.	704	*Triodia wiseana (Limestone Spinifex)*			
635.	48319	*Tripogonella loliiformis*			
636.	706	*Triraphis mollis (Needle Grass)*			
637.	732	*Yakirra australiensis*			
638.	11894	*Yakirra australiensis var. australiensis*			
Polygalaceae					
639.	41365	*Polygala glaucifolia*			
640.	4572	*Polygala isingii*			
Polygonaceae					
641.	44508	*Duma florulenta*			
642.	2443	*Rumex vesicarius (Ruby Dock)*	Y		
Portulacaceae					
643.	2884	*Portulaca oleracea (Purslane, Wakati)*			
Primulaceae					
644.	14027	*Samolus sp. Millstream (M.I.H. Brooker 2076)*			
Proteaceae					
645.	1963	*Grevillea berryana*			
646.	2047	*Grevillea nematophylla*			
647.	2079	*Grevillea pyramidalis (Caustic Bush, Tjungu)*			
648.	19570	*Grevillea pyramidalis subsp. leucadendron*			
649.	44441	*Grevillea saxicola*		P3	
650.	2099	*Grevillea striata (Beefwood)*			
651.	2121	*Grevillea wickhamii (Wickham's Grevillea)*			
652.	19478	*Grevillea wickhamii subsp. hispidula*			
653.	2138	*Hakea chordophylla*			
654.	2177	*Hakea lorea (Witinti)*			
Pteridaceae					
655.	31	*Cheilanthes austrotenuifolia*			
656.	32	*Cheilanthes brownii*			
657.	33	*Cheilanthes contigua*			
658.	37	*Cheilanthes lasiophylla (Woolly Cloak Fern)*			
659.	41	*Cheilanthes sieberi (Mulga Fern)*			
660.	12815	*Cheilanthes sieberi subsp. pseudovellea*			
661.	12818	*Cheilanthes sieberi subsp. sieberi*			
662.		*Cheilanthes sp.*			
663.	43	*Paraceterach reynoldsii*			
Rhamnaceae					
664.	16189	*Cryptandra monticola*			
Rubiaceae					
665.	12794	*Kohautia australiensis*		P2	
666.	7338	*Oldenlandia crouchiana*			
667.	12964	*Pomax rupestris*			
668.	18154	*Psydrax latifolia*			
669.	18210	*Psydrax rigidula*			
670.	13575	*Spermacoce brachystema*			
671.	7363	*Synaptantha tillaeacea*			
Santalaceae					
672.	2333	*Anthobolus leptomerioides*			
673.	10765	*Exocarpos sparteus (Broom Ballart, Djuk)*			
674.	2356	*Santalum acuminatum (Quandong, Warnga)*			
675.	2357	*Santalum lanceolatum (Northern Sandalwood, Yarnguli)*			
Sapindaceae					
676.	4739	*Alectryon oleifolius*			
677.	4740	*Atalaya hemiglauca (Whitewood)*			
678.	4759	*Dodonaea coriacea*			

	Name ID	Species Name	Naturalised	Conservation Code	[1]Endemic To Query Area
679.	4767	*Dodonaea lanceolata (Pirrungu)*			
680.	11406	*Dodonaea lanceolata var. lanceolata*			
681.	4772	*Dodonaea pachyneura*			
682.	4773	*Dodonaea petiolaris*			
683.	4782	*Dodonaea viscosa (Sticky Hopbush)*			
Scrophulariaceae					
684.	14509	*Eremophila caespitosa*			
685.	15167	*Eremophila canaliculata*			
686.	7189	*Eremophila clarkei (Turpentine Bush)*			
687.	7192	*Eremophila cuneifolia (Pinyuru, T'iranju)*			
688.	7205	*Eremophila exilifolia*			
689.	7208	*Eremophila forrestii (Wilcox Bush)*			
690.	15052	*Eremophila forrestii subsp. forrestii*			
691.	7209	*Eremophila fraseri (Burra)*			
692.	16696	*Eremophila fraseri subsp. fraseri*			
693.	17518	*Eremophila jucunda*			
694.	17519	*Eremophila jucunda subsp. pulcherrima*			
695.	16940	*Eremophila lanceolata*			
696.	7230	*Eremophila latrobei (Warty Fuchsia Bush, Mintjingka)*			
697.	17597	*Eremophila latrobei subsp. filiformis*			
698.	17576	*Eremophila latrobei subsp. latrobei*			
699.	7234	*Eremophila longifolia (Berrigan, Tulypurpa)*			
700.	14893	*Eremophila magnifica subsp. magnifica*		P4	
701.	14894	*Eremophila magnifica subsp. velutina*		P3	
702.	18570	*Eremophila oppositifolia subsp. angustifolia*			
703.	15164	*Eremophila petrophila subsp. petrophila*			
704.	48950	*Eremophila platycalyx subsp. Neds Creek (N.H. Speck 1228)*			
705.	15160	*Eremophila platycalyx subsp. pardalota*			
706.	40643	*Eremophila sp. Hamersley Range (K. Walker KW 136)*		P1	
707.	20256	*Eremophila sp. West Angelas (S. van Leeuwen 4068)*		P1	
708.	17363	*Eremophila spongiocarpa*		P1	
709.	17158	*Myoporum montanum (Native Myrtle)*			
Solanaceae					
710.	47241	*Datura leichhardtii subsp. leichhardtii*	Y		
711.	6976	*Nicotiana occidentalis (Native Tobacco)*			
712.	11331	*Nicotiana occidentalis subsp. obliqua*			
713.	11856	*Nicotiana occidentalis subsp. occidentalis*			
714.	11734	*Nicotiana rosulata subsp. rosulata*			
715.	6979	*Nicotiana simulans*			
716.	6995	*Solanum centrale (Desert Raisin, Kampurarpa)*			
717.	6997	*Solanum chippendalei*			
718.	6998	*Solanum cleistogamum*			
719.	42544	*Solanum elatius*			
720.	7008	*Solanum ferocissimum*			
721.	7009	*Solanum gabrielae*			
722.	7014	*Solanum horridum*			
723.	42542	*Solanum kentrocaule*		P3	
724.	7018	*Solanum lasiophyllum (Flannel Bush, Mindjulu)*			
725.	9258	*Solanum morrisonii*			
726.	7022	*Solanum nigrum (Black Berry Nightshade)*	Y		
727.	7029	*Solanum phlomoides*			
728.	42546	*Solanum piceum*			
729.	7036	*Solanum sturtianum (Thargomindah Nightshade)*			
Stylidiaceae					
730.	18123	*Stylidium weeliwolli*		P3	
Surianaceae					
731.	3182	*Stylobasium spathulatum (Pebble Bush)*			
Thymelaeaceae					
732.	5245	*Pimelea forrestiana*			
733.	11185	*Pimelea microcephala subsp. microcephala*			
Violaceae					
734.	5215	*Hybanthus aurantiacus*			
Zygophyllaceae					
735.	48889	*Roepera eichleri*			
736.	4374	*Tribulus astrocarpus*			
737.	4376	*Tribulus forrestii*			
738.	4377	*Tribulus hirsutus*			

	Name ID	Species Name	Naturalised	Conservation Code	[1]Endemic To Query Area
739.	4379	*Tribulus macrocarpus*			
740.	4380	*Tribulus occidentalis (Perennial Caltrop)*			
741.	18072	*Tribulus suberosus*			
742.	4383	*Tribulus terrestris (Caltrop)*	Y		

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

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

Australian Government
Department of the Environment and Energy

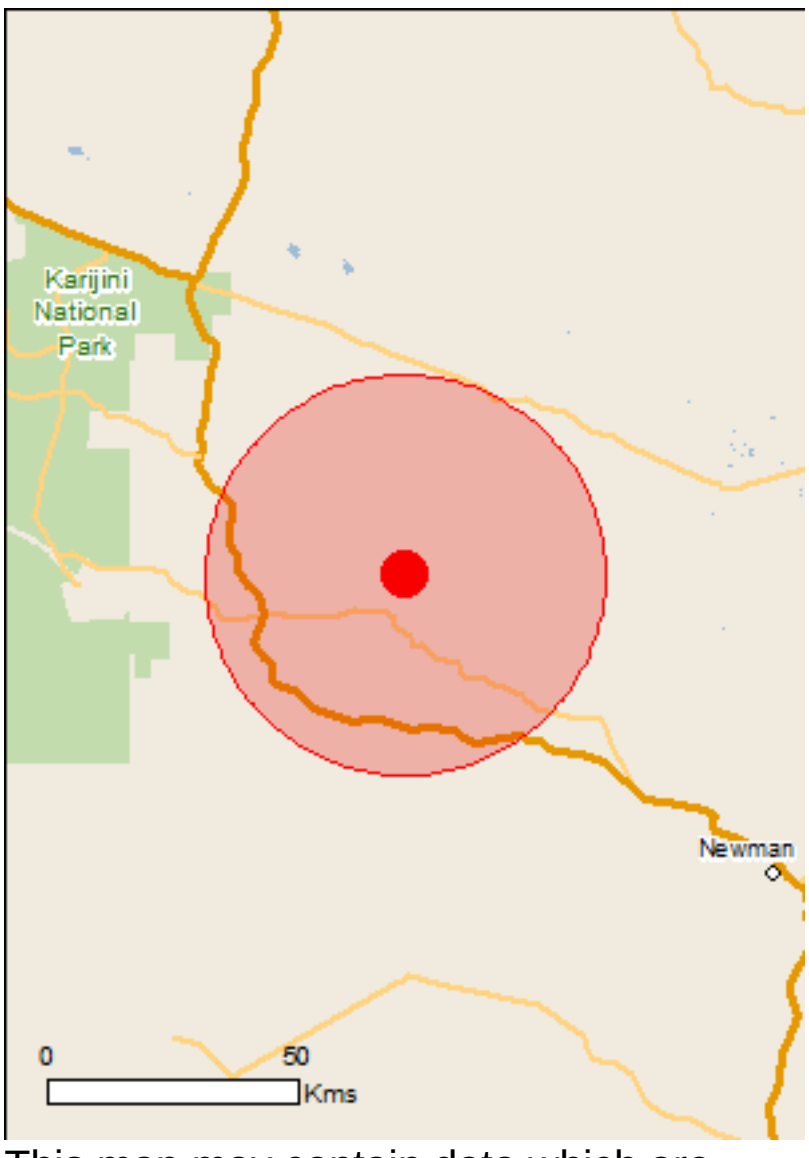
EPBC Act Protected Matters Report

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

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

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

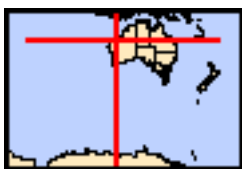
Report created: 14/03/19 17:01:57



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

Coordinates

Buffer: 40.0Km



Summary

Matters of National Environmental Significance

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

World Heritage Properties:	None
National Heritage Places:	None
Wetlands of International Importance:	None
Great Barrier Reef Marine Park:	None
Commonwealth Marine Area:	None
Listed Threatened Ecological Communities:	None
Listed Threatened Species:	8
Listed Migratory Species:	9

Other Matters Protected by the EPBC Act

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

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

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

Commonwealth Land:	None
Commonwealth Heritage Places:	None
Listed Marine Species:	14
Whales and Other Cetaceans:	None
Critical Habitats:	None
Commonwealth Reserves Terrestrial:	None
Australian Marine Parks:	None

Extra Information

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

State and Territory Reserves:	None
Regional Forest Agreements:	None
Invasive Species:	9
Nationally Important Wetlands:	None
Key Ecological Features (Marine)	None

Details

Matters of National Environmental Significance

Listed Threatened Species		[Resource Information]
Name	Status	Type of Presence
Birds		
Calidris ferruginea		
Curlew Sandpiper [856]	Critically Endangered	Species or species habitat may occur within area
Pezoporus occidentalis		
Night Parrot [59350]	Endangered	Species or species habitat likely to occur within area
Rostratula australis		
Australian Painted-snipe, Australian Painted Snipe [77037]	Endangered	Species or species habitat may occur within area
Mammals		
Dasyurus hallucatus		
Northern Quoll, Digul [Gogo-Yimidir], Wijingadda [Dambimangari], Wiminji [Martu] [331]	Endangered	Species or species habitat known to occur within area
Macroderma gigas		
Ghost Bat [174]	Vulnerable	Species or species habitat likely to occur within area
Macrotis lagotis		
Greater Bilby [282]	Vulnerable	Species or species habitat likely to occur within area
Rhinonicteris aurantia (Pilbara form)		
Pilbara Leaf-nosed Bat [82790]	Vulnerable	Roosting known to occur within area
Reptiles		
Liasis olivaceus barroni		
Olive Python (Pilbara subspecies) [66699]	Vulnerable	Species or species habitat known to occur within area

Listed Migratory Species		[Resource Information]
* Species is listed under a different scientific name on the EPBC Act - Threatened Species list.		
Name	Threatened	Type of Presence
Migratory Marine Birds		
Apus pacificus		
Fork-tailed Swift [678]		Species or species habitat likely to occur within area
Migratory Terrestrial Species		
Hirundo rustica		
Barn Swallow [662]		Species or species habitat may occur within area
Motacilla cinerea		
Grey Wagtail [642]		Species or species

Name	Threatened	Type of Presence
		habitat may occur within area
Motacilla flava Yellow Wagtail [644]		Species or species habitat may occur within area
Migratory Wetlands Species		
Actitis hypoleucos Common Sandpiper [59309]		Species or species habitat may occur within area
Calidris acuminata Sharp-tailed Sandpiper [874]		Species or species habitat may occur within area
Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	Species or species habitat may occur within area
Calidris melanotos Pectoral Sandpiper [858]		Species or species habitat may occur within area
Charadrius veredus Oriental Plover, Oriental Dotterel [882]		Species or species habitat may occur within area

Other Matters Protected by the EPBC Act

Listed Marine Species		[Resource Information]
* Species is listed under a different scientific name on the EPBC Act - Threatened Species list.		
Name	Threatened	Type of Presence
Birds		
Actitis hypoleucos Common Sandpiper [59309]		Species or species habitat may occur within area
Apus pacificus Fork-tailed Swift [678]		Species or species habitat likely to occur within area
Ardea alba Great Egret, White Egret [59541]		Species or species habitat likely to occur within area
Ardea ibis Cattle Egret [59542]		Species or species habitat may occur within area
Calidris acuminata Sharp-tailed Sandpiper [874]		Species or species habitat may occur within area
Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	Species or species habitat may occur within area
Calidris melanotos Pectoral Sandpiper [858]		Species or species habitat may occur within area
Charadrius veredus Oriental Plover, Oriental Dotterel [882]		Species or species habitat may occur within area
Chrysococcyx osculans Black-eared Cuckoo [705]		Species or species

Name	Threatened	Type of Presence
		habitat known to occur within area
Hirundo rustica Barn Swallow [662]		Species or species habitat may occur within area
Merops ornatus Rainbow Bee-eater [670]		Species or species habitat may occur within area
Motacilla cinerea Grey Wagtail [642]		Species or species habitat may occur within area
Motacilla flava Yellow Wagtail [644]		Species or species habitat may occur within area
Rostratula benghalensis (sensu lato) Painted Snipe [889]	Endangered*	Species or species habitat may occur within area

Extra Information

Invasive Species	[Resource Information]

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

Name	Status	Type of Presence
Mammals		
Camelus dromedarius Dromedary, Camel [7]		Species or species habitat likely to occur within area
Canis lupus familiaris Domestic Dog [82654]		Species or species habitat likely to occur within area
Equus asinus Donkey, Ass [4]		Species or species habitat likely to occur within area
Equus caballus Horse [5]		Species or species habitat likely to occur within area
Felis catus Cat, House Cat, Domestic Cat [19]		Species or species habitat likely to occur within area
Mus musculus House Mouse [120]		Species or species habitat likely to occur within area
Oryctolagus cuniculus Rabbit, European Rabbit [128]		Species or species habitat likely to occur

Name	Status	Type of Presence
		within area
Vulpes vulpes Red Fox, Fox [18]		Species or species habitat likely to occur within area
Plants		
Cenchrus ciliaris Buffel-grass, Black Buffel-grass [20213]		Species or species habitat likely to occur within area

Caveat

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

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

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

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

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

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

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

- migratory and
- marine

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

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

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

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

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

Coordinates

-22.86424 119.07131

Acknowledgements

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

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

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

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

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Appendix C: Threatened and Priority Flora Species Likelihood of Occurrence within the Survey Area

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Table C.1: Habit and habitat descriptions and likelihood of occurrence assessment for priority flora previously recorded within 50 km of the study area (Department of Biodiversity, Conservation and Attractions 2019a, 2019b, 2019c).

Species	Habit and flowering information	Life form	Habitat	Likelihood of Occurrence
Threatened				
Thryptomene wittweri	Spreading or rounded shrub, 0.5-1.5(-2.1) m high. Flowers white-cream, April, July or August.	Perennial	Skeletal red stony soils. Breakaways, stony creek beds.	Unlikely
Priority 1				
Barbula ehrenbergii	Moss.	Perennial	On iron rich rock, wet gorge walls, weathered conglomerate.	Unlikely
Calotis squamigera	Procumbent annual, herb, to 0.21 m high. Flowers yellow, July.	Annual	Pebbly loam.	Potential
Eragrostis sp. Mt Robinson (S. van Leeuwen 4109)	Tussock-forming grass-like or herb, to 0.3 m high. Flowers in September.	Perennial	Red-brown skeletal soils, ironstone. Steep slopes, summits.	Potential
Eremophila sp. West Angelas (S. van Leeuwen 4068)	Spindly whip shrub to 3 m high. Flowers September to October.	Perennial	High in landscape, summit of hill, gently undulating to steep terrain, skeletal red gritty soil over massive banded iron of the Brockman Iron Formation.	Potential
Eremophila spongiocarpa	Compact, succulent-leaved shrub, to 1 m high. Flowers white, May or September.	Perennial	Weakly saline alluvial plain on margins of marsh.	Unlikely
Euphorbia inappendiculata var. *queenslandica*	Spreading procumbent herb.	Short-lived perennial	Broad clay pan with dark reddish brown heavy clay with deep holes and cracks.	Unlikely
Helichrysum oligochaetum	Erect herb to 0.25 m high. Flowers August to November.	Annual	Depressions, floodplains, creek lines, red-brown clay and loam soils.	Unlikely
Lindernia sp. Pilbara (M.N. Lyons & L. Lewis FV 1069)	No information available.	No information available	No information available.	Unlikely
Myriocephalus scalpellus	Semi-erect herb, 0.03-0.08 m high.	Annual	Depression on flood plain. Clay soils.	Unlikely

Species	Habit and flowering information	Life form	Habitat	Likelihood of Occurrence
Rhodanthe ascendens	Ascending herb, to 0.1 m high. Yellow flowers, August.	Annual	Flat terrain, low in landscape, stoney gibber with red cracking clay soils or sandy soils.	Unlikely
Samolus sp. Fortescue Marsh (A. Markey & R. Coppen FM 9702)	No information available.	No information available	No information available.	Unlikely
Sida sp. Hamersley Range (K. Newbey 10692)	Semi-prostrate to upright shrub to 2 m high. Flowers September to October.	Perennial	Gorges, base of cliffs, rocky outcrops and breakaways, sometimes found in flat areas between hills in shrubby grassland.	Unlikely
Synostemon hamersleyensis	Small divaricate subshrub	Perennial	Slope of rocky gully.	Potential
Tecticornia globulifera	Small spreading shrub to 0.5 m high.	Perennial	Flat floodways, salt lakes. Red clayey sand or loam.	Unlikely
Tecticornia sp. Christmas Creek (K.A. Shepherd & T. Colmer et al. KS 1063)	Shrub to 0.8 m. Flowers August.	Perennial	Occurs on hills, well drained, open depressions and in dry brown loam, moist brown/grey clay.	Unlikely
Tetratheca fordiana	Dwarf shrub to 0.4 m high. Flowers June to July, September.	Perennial	Generally occurs above 750 m, often on predominantly north-facing cliffs and large rock outcrops of the Brockman Iron Formation, some evidence to suggest the nearby evidence of shale formations may play a role in distribution.	Unlikely
Triodia sp. Karijini (S. van Leeuwen 4111)	Hummock grass to 1 m high. Flowers in September	Perennial	Mid to upper slopes, ridgelines, skeletal soils.	Likely
Vittadinia sp. Coondewanna Flats (S. van Leeuwen 4684)	Erect herb to 1 m high. Cream flowers in July.	Short-lived perennial	Flat plain, cracking clay, low in landscape, red sandy clay loam with some stone.	Unlikely
Priority 2				
Adiantum capillus-veneris	Rhizomatous herb (fern), to 0.2 m high.	Perennial	Calcareous soils derived from calcrete, limestone or dolomite, just above the waterline of shaded banks and cliff faces along small, perennial rivers in low-altitude woodland, where there is a marked dry season, also occurs on calcareous cliff faces above the sea surf.	Unlikely

Species	Habit and flowering information	Life form	Habitat	Likelihood of Occurrence
Aristida lazaridis	Tufted grass, 0.4 m to 1.5 m high. Flowers April.	Perennial	Hard spinifex hummock grassland of *Triodia* spp. with a sparse overstorey of *Eucalyptus leucophloia*, apparently confined to sandy or loamy soils but also found on clay soils.	Likely
Arthropodium sp. Ironstone (J. Bull & J. Waters ONS PJ 36.01)	No information available.	No information available	No information available.	Unlikely
Cardamine paucijuga	Slender erect annual, herb, to 0.4 m high. Flowers white, September to October.	Annual	Moist to dry habitats.	Unlikely
Cladium procerum	Densely tufted grass-like or herb (sedge). Flowers November.	Perennial	Coastal swamps or along watercourses, perennial streams and pond edges or along streams in deep gorges of the Hamersley Range, alluvial soils.	Unlikely
Eremophila pusilliflora	Low spreading shrub, flowers purple, July to April.	Perennial	Gibber plains, low scree slopes adjacent to plains, alluvial plains.	Unlikely
Euphorbia australis var. *glabra*	Spreading herb or groundcover.	Annual	Sump, low in the landscape on alluvial cracking clay loamy soil, gritty with ironstone fragments, saline flats.	Potential
Hibiscus sp. Gurinbiddy Range (M.E. Trudgen MET 15708)	Spindly upright shrub to 3 m high. Flowers May to July.	Perennial	Sheltered or rocky drainage lines below associated cliff-lines or rocky ridges, skeletal red-brown stony soil over massive ironstone of the Brockman Iron Formation.	Potential
Ipomoea racemigera	Creeping herb, climber.	Annual	Flat bedded creekline in basalt uplands.	Previously recorded
Isotropis parviflora	Shrub, 0.1 m high. Flowers white/pink, March.	Perennial	Hill slopes with mallee or with hard spinifex on ironstone.	Likely
Kohautia australiensis	Erect sparsely or much-branched annual, herb, 0.1-0.5 m high. Flowers blue.	Annual	No information available.	Potential
Oxalis sp. Pilbara (M. E. Trudgen 12725)	Herb. Flowers May.	Annual/ ephemeral	Shaded areas around rock outcrops and gullies and on gully walls.	Unlikely

Species	Habit and flowering information	Life form	Habitat	Likelihood of Occurrence
Pentalepis trichodesmoides subsp. *hispida*	Multi-stemmed shrub to 0.8 m high. Flowers July to October.	Perennial	Summit of ridge, cobbled slopes, outcrops, high in landscape, steep terrain, skeletal brown gritty soil, banks of creeks and edges of basalt screes.	Unlikely
Teucrium pilbaranum	Upright shrub, 0.2 m high. White flowers in May or September.	Perennial	Crab hole plain in a river floodplain, margin of calcrete table.	Unlikely
Priority 3				
Acacia daweana	Spreading shrub, 0.3 to 1.5(-2) m high. Flowers yellow, July to September.	Perennial	Lower scree slopes and bajada outwash fans of rocky banded ironstone ranges and ridges, often with diffuse but well incised drainage lines, on rocky red skeletal loams.	Likely
Acacia effusa	Low, dense, spreading, somewhat viscid shrub, 0.3 m to 1 m high, bark 'minniritchi'. Flowers yellow, May to August.	Perennial	Lower scree slopes of low rocky ranges, often along diffuse drainage lines, or on the bajada alluvial plain at the base of large banded ironstone mountains and ranges, on rocky red loams with surface strew of rocks in spinifex.	Likely
Acacia subtiliformis	Spindly, slender, erect shrub, to 3.5 m high. Yellow flowers in June.	Perennial	Rocky calcrete plateau.	Likely
Amaranthus centralis	Herb to 0.5 m. Flowers in May	Short-lived perennial	Sand plain, riverbank, Mulga woodland, clay loam.	Likely
Ampelopteris prolifera	Rhizomatous fern, to 4 m high.	Perennial	In water or in wet ground near freshwater swamps, besides rivers, pools and lakes.	Unlikely
Aristida jerichoensis var. *subspinulifera*	A compactly tufted grass-like or herb with lemma groove muricate. It grows 0.30 m to 0.80 m in height.	Perennial	Occurs on hardpan plains.	Likely
Atriplex flabelliformis	Monoecious, erect, rounded perennial herb to 0.35 m.	Perennial	Clay loam. Saline flats or marshes.	Unlikely
Dampiera metallorum	Rounded, multi-stemmed herb, to 0.5 m high. Flowers blue, April or June or October.	Perennial	Hill summits or upper slopes above 1,000 m, on skeletal red-brown gravelly soils over massive banded ironstone of the Brockman Iron Formation.	Likely

Species	Habit and flowering information	Life form	Habitat	Likelihood of Occurrence
Dysphania congestiflora	No information available.	No information available	Saline floodplain and clay soils.	Unlikely
Eragrostis sp. Erect spikelets (P.K. Latz 2122)	No information available.	No information available	Calcrete.	Unlikely
Eremophila magnifica subsp. *velutina*	Shrub, 0.5 m to 1.5 m high. Blue-purple flowers, August to September.	Perennial	Skeletal soils over ironstone. Summits.	Potential
Eremophila sp. Hamersley Range (K. Walker KW 136)	Erect shrub. White-cream-yellow-pink-purple flowers, August to September.	Perennial	Open rocky slopes, gullies and rock faces associated with large hills and cliffs, high in the landscape, skeletal red-brown soils.	Recorded
Euphorbia clementii	Erect herb, to 0.6 m high.	Short-lived perennial	Gravelly hillsides, stony grounds.	Unlikely
Euphorbia stevenii	Somewhat succulent herb, to 0.5 m high.	Annual or perennial	Often found on floodplains on sandy or clay-loam soils.	Unlikely
Fimbristylis sieberiana	Shortly rhizomatous tufted grass like or herb (sedge), 0.25-0.6 m high.	Perennial	Mud, skeletal soil pockets, pool edges, sandstone cliffs.	Previously recorded
Glycine falcata	Mat-forming herb. Flowers May to July.	Perennial	Drainage depressions in crabhole plains on river floodplains. Black clayey sand. Along drainage depressions in crabhole plains on river floodplains.	Unlikely
Goodenia lyrata	Prostrate herb, with lyrate leaves. Yellow flowers in August.	Short-lived perennial	Clay soils, mulga, alluvial plains.	Potential
Goodenia sp. East Pilbara (A.A. Mitchell PRP 727)	Open, erect herb, to 0.2 m high. Flowers yellow, March to September.	Annual or biennial	Low undulating plain, swampy plains, stony plains, hill slopes, on red-brown clay soils, calcrete pebbles.	Previously recorded

Species	Habit and flowering information	Life form	Habitat	Likelihood of Occurrence
Grevillea saxicola	Erect shrub to 2.5 m high. Flowers February, April, November.	Perennial	Upper scree/breakaway slopes and crests often associated with banded iron formation outcropping, often in mulga woodlands on orange-brown to red-brown loams with ironstone pebble cover.	Likely
Gymnanthera cunninghamii	An erect shrub that grows between 1 and 2 m in height. Cream-yellow-green flowers from January to December.	Perennial	Occurs on sandy soils.	Potential
Indigofera gilesii	Shrub to 1.5m high. Flowers Purple-pink, May - August.	Perennial	Rocky slopes, gullies, high in landscape, skeletal soils, red brown loam.	Potential
Iotasperma sessilifolium	Erect herb. Pink flowers, July to September.	Short-lived perennial	Cracking clay, black loam. Edges of waterholes, plains.	Unlikely
Nicotiana heterantha	Herb, to 0.5 m high, forming low, spreading colonies. Flowers white-cream, March to June or September.	Short-lived annual or perennial	Short-lived annual or perennial	Unlikely
Oldenlandia sp. Hamersley Station (A.A. Mitchell PRP 1479)	Spreading herb to 0.1 m high. Flowers March.	Annual	Cracking clay, basalt. Gently undulating plains with large surface rocks, flat crabholed plains.	Unlikely
Olearia mucronata	Densely branched, unpleasantly aromatic shrub, 0.6 m to 1 m high. Flowers white and yellow, August to December or January.	Perennial	Mesic areas amongst ironstone boulders and along creek lines.	Unlikely
Pilbara trudgenii	Gnarled, aromatic shrub, to 1 m high. Flowers September.	Perennial	Cliff faces, steep rocky slopes and rock screes, usually on skeletal, red stony soils over Brockman Iron Formation.	Likely
Rhagodia sp. Hamersley (M. Trudgen 17794)	Shrub to 2 m high. Yellow flowers in May.	Perennial	Alluvial plains. Red brown clay to loamy clay.	Previously recorded
Rostellularia adscendens var. *latifolia*	Herb or shrub, 0.1 m to 0.3 m high. Flowers blue-purple-violet, April to May.	Short-lived perennial	Protected areas near watercourses or along shaded rocky ridges, often in dry gullies and gorges on ironstone soils.	Previously recorded
Sida sp. Barlee Range (S. van Leeuwen 1642)	Spreading shrub to 0.5m high. Flowers yellow, August.	Perennial	Rocky areas, especially scree slopes, rock piles or gullies, on skeletal red soils.	Previously recorded

Species	Habit and flowering information	Life form	Habitat	Likelihood of Occurrence
Solanum kentrocaule	Shrub 0.5 m to 1.5 m high. Flowers mauve or purple.	Perennial	Hillsides and mountain tops between 700 m to 1,250 m altitude or occasionally in creek-beds, on skeletal red-brown soils over ironstone or on basalt scree.	Likely
Stackhousia clementii	Spreading herb, to 0.7 m high. Green-yellow-brown flowers.	Perennial	Sand to cracking clay, gibber plains and Gilgai. Often associated with limestone flats and ridges.	Unlikely
Stylidium weeliwolli	Herb, 0.1-0.25 m high, throat appendages 4, rod-shaped. Pink and red flowers from August to September.	Annual	Gritty sand soil, sandy clay. Edge of watercourses.	Potential
Swainsona thompsoniana	Prostrate herb to 0.1 m. Mauve-cream-yellow flowers, August to September.	Annual	Open flood plains on heavy clay soils.	Unlikely
Tecticornia medusa	Erect shrub to 0.5 m high. Flowers November.	Perennial	Flat floodplain. Red clayey sand.	Unlikely
Themeda sp. Hamersley Station (M.E. Trudgen 11431)	Tussocky grass, 0.9 m to 1.8 m high. Flowers August.	Perennial	Drainage lines, clay flats, crabhole flats and dark, self-mulching clay soils.	Potential
Triodia sp. Mt Ella (M.E. Trudgen 12739)	Hummock grass to 0.4 m high. Flowers in February.	Perennial	Pebbly loam, amongst rocks and outcrops, gully slopes.	Likely
Xerochrysum boreale	Erect shrub to 1 m. Flowers yellow, September.	Annual	Mulga on stony surfaced red-brown, clay-loam.	Unlikely
Priority 4				
Acacia bromilowiana	Tree or shrub, to 12 m high, bark dark grey, fibrous; phyllodes more or less glaucous and slightly pruinose; inflorescence in spikes. Flowers yellow/pink, July to August.	Perennial	High in the landscape on steep slopes, ridge tops and breakaways, often in gullies and sheltered places that comprise a substrate of banded ironstone or massive basalts, on red skeletal stony loams and orange-brown pebbly, gravel loams.	Likely
Eremophila magnifica subsp. *magnifica*	Shrub, 0.5 m to 1.5 m high. Flowers blue, August to November.	Perennial	Rocky slopes in open *Eucalyptus* and *Acacia* shrublands, often associated with species of *Triodia*, *Ptilotus* and *Dodonaea* on skeletal soils over ironstone.	Likely

Species	Habit and flowering information	Life form	Habitat	Likelihood of Occurrence
Eremophila youngii subsp. *lepidota*	Dense, spreading shrub, (0.2-) 1 - 3 m high. Flowers purple-red-pink, January, March, June or August to September.	Perennial	Drainage lines subject to periodic flooding, flood plains or on the margins of clay depressions on red-brown soils, occasionally on stony flats, sometimes on semi-saline, clay flats.	Unlikely
Goodenia nuda	Erect to ascending herb to 0.5 m high. Yellow flowers from April to August.	Short-lived perennial	Alluvial soils over ironstone, floodplains, valleys, watercourses, floodplains and in orange-brown alluvial sand over ironstone.	Likely
Lepidium catapycnon	An open, woody herb or shrub with zigzag stems, 0.2 to 0.3 m in height. Flowers white, October.	Perennial	In open woodland usually in hilly areas, frequently on south-facing slopes on skeletal soils on shales and ironstone, occasionally found on road-verges and road-cuttings.	Likely
Ptilotus mollis	Compact shrub, to 0.5 m high, soft grey foliage. Flowers white/pink, May or September.	Perennial	Steep rocky sites, usually in full sun on massive ironstone formations.	Likely
Rhynchosia bungarensis	Compact, prostrate shrub, to 0.5 m high. Flowers May to November.	Short-lived perennial	Rock piles, gorges, river beds and alluvial soils in shrubland or woodland along river courses, on pebbly, shingly coarse sands amongst boulders.	Unlikely

Appendix D: Vegetation Classification and Condition Scales

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Table D.1: Vegetation Classification System Specht (1970) as modified by Aplin (1979).

Stratum	70-100% cover	30-70% cover	10-30% cover	2-10% cover	<2% cover
Trees > 30 m	Tall closed forest	Tall open Forest	Tall woodland	Tall open woodland	Scattered tall trees
Trees 10-30 m	Closed forest	Open forest	Woodland	Open woodland	Scattered trees
Trees < 10 m	Low closed forest	Low open forest	Low woodland	Low open woodland	Scattered low trees
Shrubs > 2 m	Tall closed scrub	Tall open scrub	Tall shrubland	Tall open shrubland	Scattered tall shrubs
Shrubs 1-2 m	Closed heath	Open heath	Shrubland	Open shrubland	Scattered shrubs
Shrubs < 1 m	Low closed heath	Low open heath	Low shrubland	Low open shrubland	Scattered low shrubs
Hummock grasses	Closed hummock grassland	Hummock grassland	Open hummock grassland	Very open hummock grassland	Scattered hummock grasses
Grasses, sedges, herbs	Closed tussock grassland/ sedgeland/ herbland	Tussock grassland/ sedgeland/ herbland	Open tussock grassland/ sedgeland/ herbland	Very open tussock grassland/ sedgeland/ herbland	Scattered tussock grasses/ sedges/ herbs

Table D.2: Vegetation condition scale as adapted from Trudgen (1988) and presented by the Environmental Protection Authority (2016).

Vegetation condition	Condition description
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 impacts 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.

Appendix E: Vegetation Unit Mapping, Sample Site Locations and Priority Flora Locations

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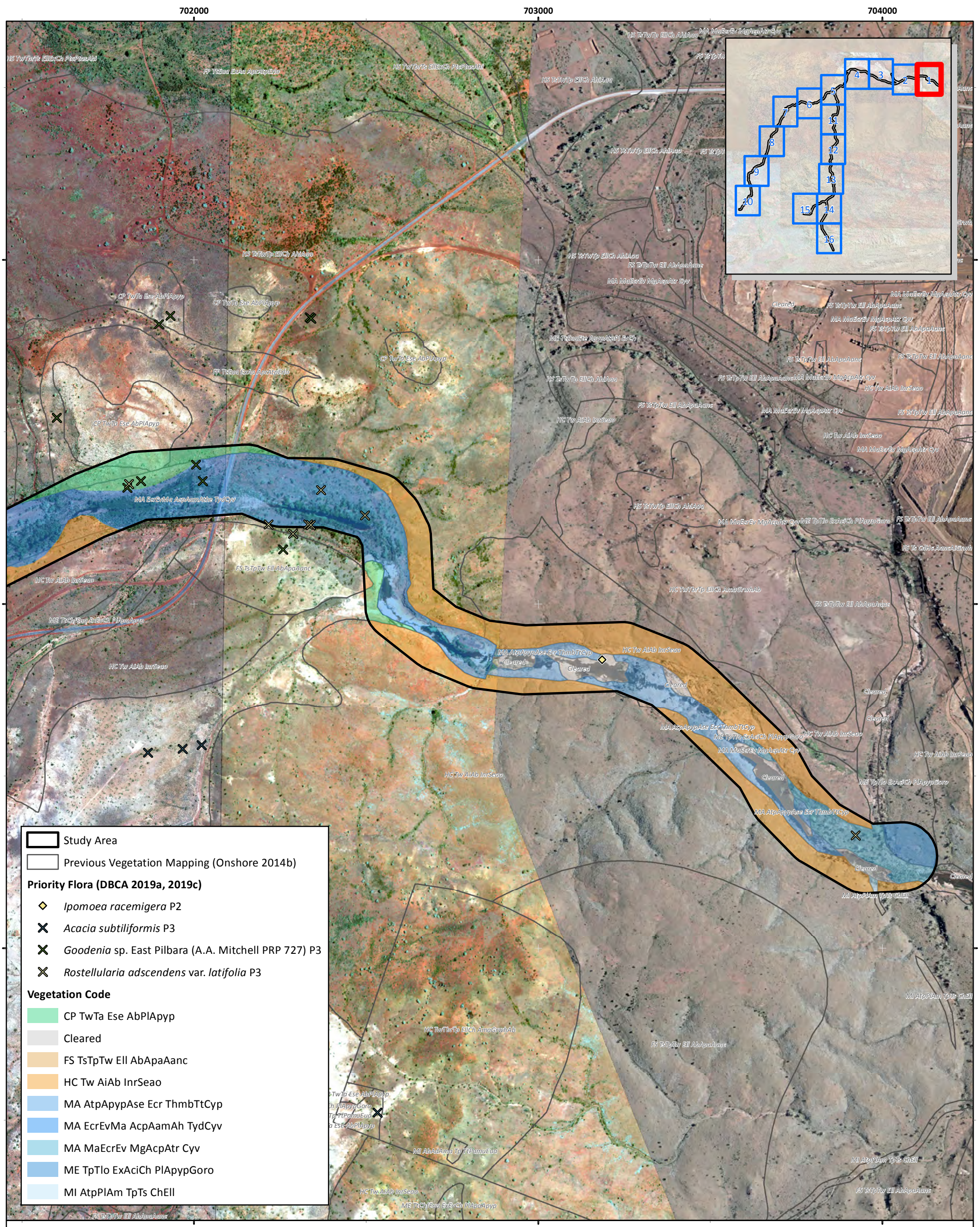

BHP Western Australian Iron Ore (BHP WAIO)
Area C West to Yandi Flora and Vegetation Assessment

Figure E.1a: Vegetation Unit Mapping and Sample Site Locations - Marillana Creekline

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Drawn: L. Robinson	Figure Ref: 2465-18-ENVDR-1Rev0_190326_FigE_VegAssoc_MC

Coordinate System: GDA 1994 MGA Zone 50
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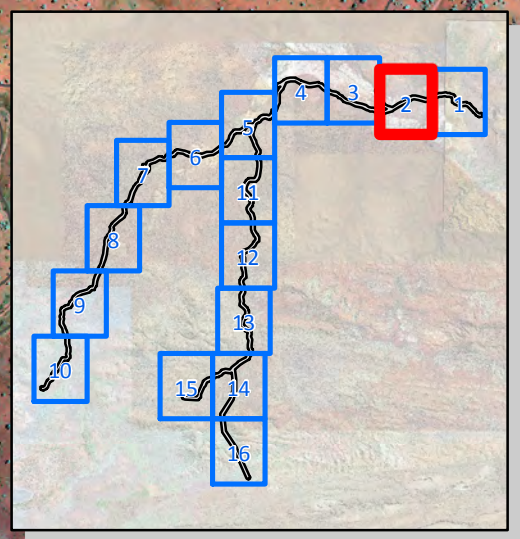
7487000 7486000 7485000



M1MN02

M1MN01

- Mapping Note
- Study Area
- Previous Vegetation Mapping (Onshore 2014b)

Priority Flora (DBCA 2019a, 2019c)

- *Aristida lazaridis* P2
- *Acacia subtiliformis* P3
- *Goodenia* sp. East Pilbara (A.A. Mitchell PRP 727) P3
- *Rostellularia adscendens* var. *latifolia* P3

Vegetation Code

- CP TwTa Ese AbPlApyp
- HC Tw AiAb InrSeao
- HS TsTwTp EllCh AhiAaa
- MA EcrEv AciApypMg CcEuaTt
- MA EcrEvMa AcpAamAh TydCyv
- MA EvAciEcr TercCocrApyp CcEuaTt
- MA TydCyv EcrEv AciAcp
- MI AadsAnlDop Tp EllCh

BHP Western Australian Iron Ore (BHP WAIO)
Area C West to Yandi Flora and Vegetation Assessment

Figure E.2a: Vegetation Unit Mapping and Sample Site Locations - Marillana Creekline

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Coordinate System: GDA 1994 MGA Zone 50

0 100 200 300 400 500 Metres

N

696000 697000 698000

7488000 7487000 7486000 7485000

Relevé
Mapping Note
Study Area
Previous Vegetation Mapping (Onshore 2014b)

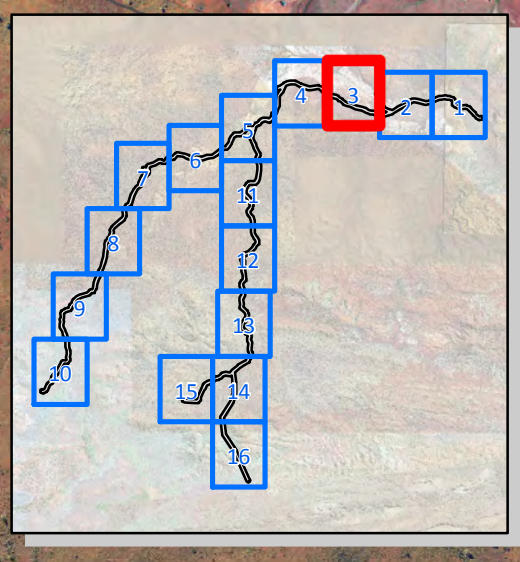
Priority Flora (DBCA 2019a, 2019c)

Acacia subtiliformis P3
Goodenia sp. East Pilbara (A.A. Mitchell PRP 727) P3
Rostellularia adscendens var. *latifolia* P3

Vegetation Code

CP TwTa Ese AbPlApyp
FS TsTpTw Ell AbApaAanc
HC Tw AiAb InrSeao
HS TsTwTp EllCh AhiAaa
MA EcrEv AciApypMg CcEuaTt
MA EcrEvMa AcpAamAh TydCyv
ME TtEuaEte ApypAtpPl EvCh

MCMN17
MCRV10



BHP Western Australian Iron Ore (BHP WAIO)
Area C West to Yandi Flora and Vegetation Assessment

Figure E.3a: Vegetation Unit Mapping and Sample Site Locations - Marillana Creekline

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Coordinate System: GDA 1994 MGA Zone 50
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7488000

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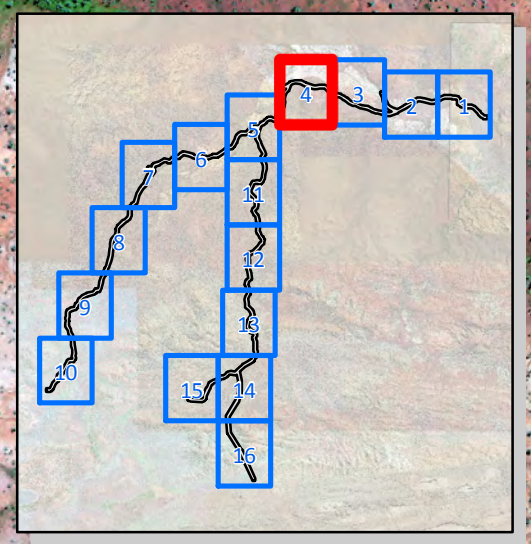
7485000



Study Area

Previous Vegetation Mapping (Onshore 2014b)

Vegetation Code

HC Tw AiAb InrSeao

MA EcrEv AciApypMg CcEuaTt

ME TtChfEua ExEvCh PlApaApyp

BHP Western Australian Iron Ore (BHP WAIO)

Area C West to Yandi Flora and Vegetation Assessment

Figure E.4a: Vegetation Unit Mapping and Sample Site Locations - Marillana Creekline

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Coordinate System: GDA 1994 MGA Zone 50

0 100 200 300 400 500 Metres

N

691000 692000 693000

7486000 7485000 7484000 7483000

Mapping Note

Study Area

Previous Vegetation Mapping (Onshore 2014b)

Priority Flora (DBCA 2019a, 2019c)

Vittadinia sp. Coondewanna Flats (S. van Leeuwen 4684) P1

Goodenia nuda P4

Vegetation Code

CP TwTa Ese AbPlApyp

HC Tw AiAb InrSeao

MA EcrEv AciApypMg CcEuaTt

MA EcrEvEx ApypAtpGoro TtEuaCyp

ME TpTlo ExAciCh PlApypGoro

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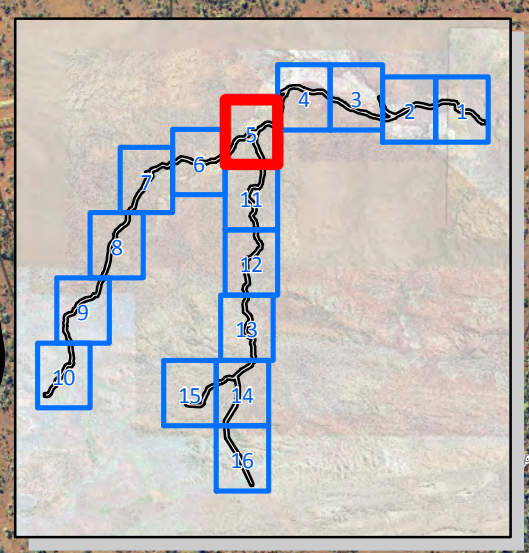
SP TsTwTp EgEt AbApaApr

MCMN14

MCMN16

MCMN15



BHP Western Australian Iron Ore (BHP WAIO)

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Figure E.5a: Vegetation Unit Mapping and Sample Site Locations - Marillana Creekline

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Drawn: L. Robinson	Figure Ref: 2465-18-ENVDR-1Rev0_190326_FigE_VegAssoc_MC	0 100 200 300 400 500 Metres; N

688000

689000

690000

7484000

7483000

7482000

MCMN01

MCMN02

MCRV02

MCRV01

Relevé

Mapping Note

Study Area

Previous Vegetation Mapping (Onshore 2014b)

Priority Flora (DBCA 2019a, 2019c)

Vittadinia sp. Coondewanna Flats (S. van Leeuwen 4684) P1

Aristida jerichoensis var. *subspinulifera* P3

Vegetation Code

CP TwTa Ese AbPlApyp

HC Tw AiAb InrSeao

MA EcrEvEx ApypAtpGoro TtEuaCyp

ME TpTlo ExAciCh PlApypGoro

MI AadsAnlDop Tp EllCh

BHP Western Australian Iron Ore (BHP WAIO)

Area C West to Yandi Flora and Vegetation Assessment

Figure E.6a: Vegetation Unit Mapping and Sample Site Locations - Marillana Creekline

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Coordinate System: GDA 1994 MGA Zone 50

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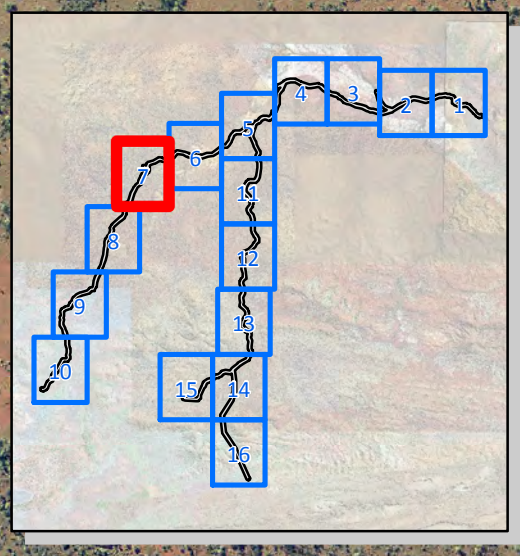

MCRV08

MCRV09

Relevé

Study Area

Previous Vegetation Mapping (Onshore 2014b)

Vegetation Code

CP TwTa Ese AbPlApyp

FP TtEua ExAa AprAtpErlo

MA EcrEvEx ApypAtpGoro TtEuaCyp

ME TpTlo ExAciCh PlApypGoro

ME TtChfEua ExEvCh PlApaApyp

BHP Western Australian Iron Ore (BHP WAIO)

Area C West to Yandi Flora and Vegetation Assessment

Figure E.7a: Vegetation Unit Mapping and Sample Site Locations - Marillana Creekline

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Coordinate System: GDA 1994 MGA Zone 50

0 100 200 300 400 500 Metres

N

684000

685000

7480000

7479000

7478000

7477000

Relevé

Mapping Note

Study Area

Previous Vegetation Mapping (Onshore 2014b)

Priority Flora (DBCA 2019a, 2019c)

Acacia effusa P3

Rostellularia adscendens var. *latifolia* P3

Vegetation Code

CP TwTa Ese AbPlApyp

FP TtEua ExAa AprAtpErlo

FS Ts CdHc AancAiGrwh

MA EcrEvEx ApypAtpGoro TtEuaCyp

ME TpTlo ExAciCh PlApypGoro

ME TtChfEua ExEvCh PlApaApyp

ME TtEuaEte ApypAtpPl EvCh

MI AtpPlAm TpTs ChEll

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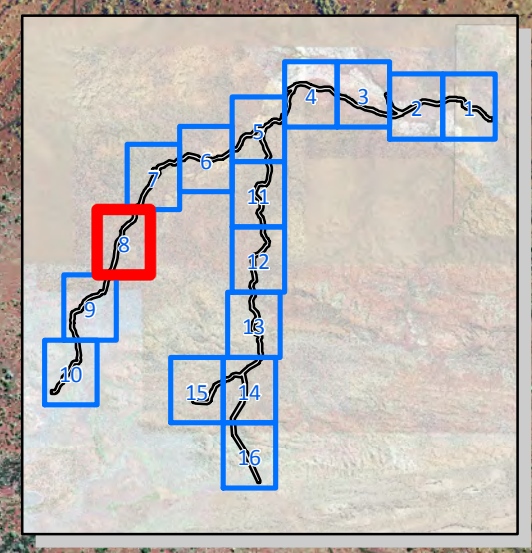
MCMN13

MCRV07

MCRV06



BHP Western Australian Iron Ore (BHP WAIO)

Area C West to Yandi Flora and Vegetation Assessment

Figure E.8a: Vegetation Unit Mapping and Sample Site Locations - Marillana Creekline

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Drawn: L. Robinson	Figure Ref: 2465-18-ENVDR-1Rev0_190326_FigE_VegAssoc_MC	0 100 200 300 400 500 Metres

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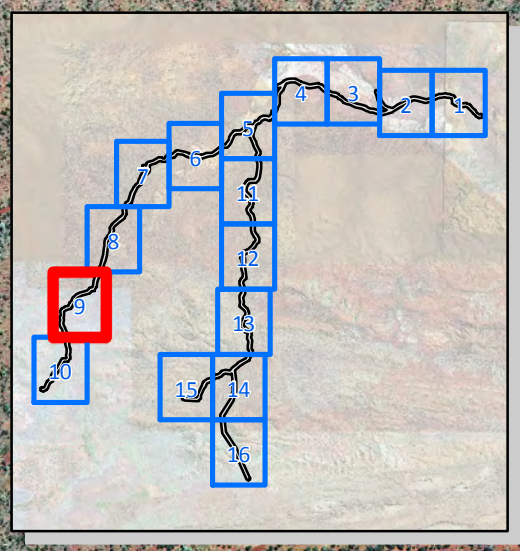

M4MN03

M4MN02

M4MN01

Mapping Note

Study Area

Previous Vegetation Mapping (Onshore 2014b)

Vegetation Code

Cleared

FP TtEuaCc ChEx AdAacAmc

ME TpTlo ExAciCh PlApypGoro

ME TtChfEua ExEvCh PlApaApyp

SP AaApr TmTwTp TtChfAri

SP TpTm AaExAcao ApaErffAads

BHP Western Australian Iron Ore (BHP WAIO)

Area C West to Yandi Flora and Vegetation Assessment

Figure E.9a: Vegetation Unit Mapping and Sample Site Locations - Marillana Creekline

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Coordinate System: GDA 1994 MGA Zone 50

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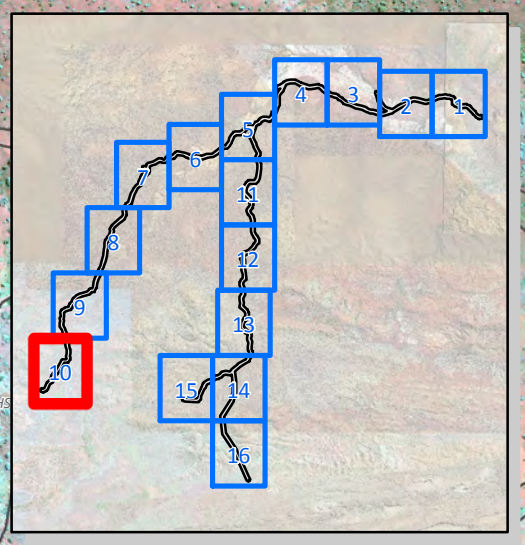

M5MN01 M5MN02

Cleared
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FS Ts CdHc AancAiGrwh
ME TtAriCya ChEll AmPlAnl
HS TsTw Eg GrwhSeggAb
HC TwTsTp EllCh Ah
MA TtCc PlAbAnl EllCh
SP TsTwTp EgErAbApaApr
SP AaApr TmTwTp TtChfAri
HS TbrTw Ell

Mapping Note
Study Area
Previous Vegetation Mapping (Onshore 2014b)

Vegetation Code

- Cleared
- FP TtEuaCc ChEx AdAacAmc
- FS Ts CdHc AancAiGrwh
- HS TsTw Eg GrwhSeggAb
- MA TtCc PlAbAnl EllCh
- ME TtAriCya ChEll AmPlAnl
- SP AaApr TmTwTp TtChfAri

BHP Western Australian Iron Ore (BHP WAIO)
Area C West to Yandi Flora and Vegetation Assessment

Figure E.10a: Vegetation Unit Mapping and Sample Site Locations - Marillana Creekline

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Author: J. Atkinson	Date: 29-03-2019
Drawn: L. Robinson	Figure Ref: 2465-18-ENVDR-1Rev0_190326_FigE_VegAssoc_MC

Coordinate System: GDA 1994 MGA Zone 50

0 100 200 300 400 500 Metres

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M3MN01
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16
Mapping Note
Study Area
Previous Vegetation Mapping (Onshore 2014b)
Vegetation Code
FP TtEua ExAa AprAtpErlo
FS Ts CdHc AancAiGrwh
HC Tw AiAb InrSeao
HS TsTwTp EllCh AhiAaa
MA EcrEvEx ApypAtpGoro TtEuaCyp
ME TpTlo ExAciCh PlApypGoro
ME TtChfEua ExEvCh PlApaApyp
SP TsTwTp EgEt AbApaApr
BHP Western Australian Iron Ore (BHP WAIO)
Area C West to Yandi Flora and Vegetation Assessment
Figure E.11a: Vegetation Unit Mapping and Sample Site Locations - Marillana Creekline
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Author: J. Atkinson
Date: 29-03-2019
Drawn: L. Robinson
Figure Ref: 2465-18-ENVDR-1Rev0_190326_FigE_VegAssoc_MC
Coordinate System: GDA 1994 MGA Zone 50
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MCMN12

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Mapping Note

Study Area

Previous Vegetation Mapping (Onshore 2014b)

Vegetation Code

MA EcrEvEx ApypAtpGoro TtEuaCyp

ME TtChfEua ExEvCh PlApaApyp

ME TtEuaEte ApypAtpPl EvCh

SP AaApr TmTwTp TtChfAri

SP TsTwTp EgEt AbApaApr

BHP Western Australian Iron Ore (BHP WAIO)

Area C West to Yandi Flora and Vegetation Assessment

Figure E.12a: Vegetation Unit Mapping and Sample Site Locations - Marillana Creekline

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Author: J. Atkinson	Date: 29-03-2019
Drawn: L. Robinson	Figure Ref: 2465-18-ENVDR-1Rev0_190326_FigE_VegAssoc_MC

Coordinate System: GDA 1994 MGA Zone 50

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N

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7475000

7474000

7473000

MCRV05

MCRV04

Relevé

Study Area

Vegetation Code

FP Tp ChApr GrwhApypAb

HS TwTpTs Ell AprAaAanc

MA AtpApypAse Ecr ThmbTtCyp

ME TtEuaEte ApypAtpPl EvCh

SP AaApr TmTwTp TtChfAri

BHP Western Australian Iron Ore (BHP WAIO)

Area C West to Yandi Flora and Vegetation Assessment

Figure E.13a: Vegetation Unit Mapping and Sample Site Locations - Marillana Creekline

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Author: J. Atkinson	Date: 29-03-2019
Drawn: L. Robinson	Figure Ref: 2465-18-ENVDR-1Rev0_190326_FigE_VegAssoc_MC

Coordinate System: GDA 1994 MGA Zone 50

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MCMN07
MCMN06
MCMN05
Mapping Note
Study Area
Vegetation Code
FP Tp ChApr GrwhApypAb
MA AtpApypAse Ecr ThmbTtCyp
ME TtEuaEte ApypAtpPl EvCh
SP AaApr TmTwTp TtChfAri
SP TsTwTp EgEt AbApaApr

BHP Western Australian Iron Ore (BHP WAIO)
Area C West to Yandi Flora and Vegetation Assessment

Figure E.14a: Vegetation Unit Mapping and Sample Site Locations - Marillana Creekline

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Author: J. Atkinson	Date: 29-03-2019	Coordinate System: GDA 1994 MGA Zone 50
Drawn: L. Robinson	Figure Ref: 2465-18-ENVDR-1Rev0_190326_FigE_VegAssoc_MC	0 100 200 300 400 500 Metres

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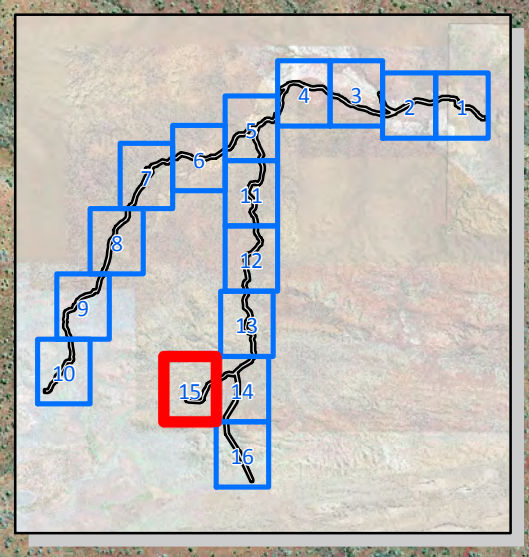

MCMN11

MCMN10

MCMN09

MCRV03

MCMN08

Relevé

Mapping Note

Study Area

Vegetation Code

CP TwTa Ese AbPlApyp

FP Tp ChApr GrwhApypAb

HS TsTw Eg GrwhSeggAb

HS TsTwTp EllCh AhiAaa

ME TtEuaEte ApypAtpPl EvCh

SP AaApr TmTwTp TtChfAri

BHP Western Australian Iron Ore (BHP WAIO)

Area C West to Yandi Flora and Vegetation Assessment

Figure E.15a: Vegetation Unit Mapping and Sample Site Locations - Marillana Creekline

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Author: J. Atkinson	Date: 29-03-2019
Drawn: L. Robinson	Figure Ref: 2465-18-ENVDR-1Rev0_190326_FigE_VegAssoc_MC

Coordinate System: GDA 1994 MGA Zone 50

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Mapping Note
Study Area
Vegetation Code
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MA AtpApypAse Ecr ThmbTtCyp
ME TpTlo ExAciCh PlApypGoro
ME TtEuaEte ApypAtpPl EvCh
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BHP Western Australian Iron Ore (BHP WAIO)
Area C West to Yandi Flora and Vegetation Assessment

Figure E.16a: Vegetation Unit Mapping and Sample Site Locations - Marillana Creekline

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Author: J. Atkinson	Date: 29-03-2019
Drawn: L. Robinson	Figure Ref: 2465-18-ENVDR-1Rev0_190326_FigE_VegAssoc_MC

Coordinate System: GDA 1994 MGA Zone 50
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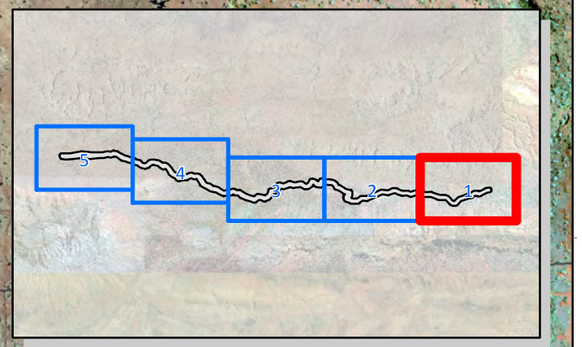

Study Area

Previous Vegetation Mapping (Onshore 2014b)

Priority Flora (DBCA 2019a, 2019c)

Hibiscus sp. Gurinbiddy Range (M.E. Trudgen MET 15708) P2

Vegetation Code

HS TsTw Eg GrwhSeggAb

HS TsTwTp EllCh AhiAaa

MA EcrEvEx ApypAtpGoro TtEuaCyp

ME TpTlo ExAciCh PlApypGoro

BHP Western Australian Iron Ore (BHP WAIO)

Area C West to Yandi Flora and Vegetation Assessment

Figure E.1b: Vegetation Unit Mapping and Sample Site Locations - Pebble Mouse Creek

Coordinate System: GDA 1994 MGA Zone 50

0 100 200 300 400 500 Metres

N

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Author: J. Atkinson Drawn: L. Robinson Date: 29-03-2019 Figure Ref: 2465-18-ENVDR-1Rev0_190326_FigE_VegAssoc_PMC

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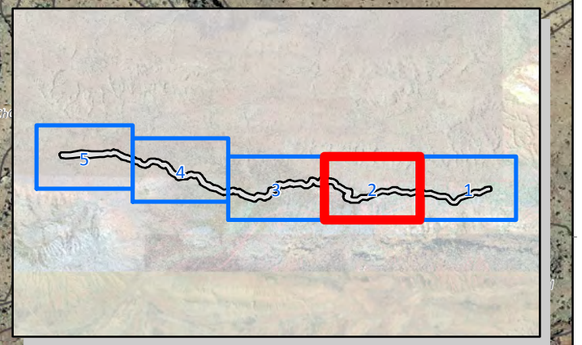
SF2MN01



- Mapping Note
- Study Area
- Previous Vegetation Mapping (Onshore 2014b)

Vegetation Code

- FP TtEua ExAa AprAtpErlo
- FS Ts CdHc AancAiGrwh
- HS TsTw Eg GrwhSeggAb
- HS TsTwTp EllCh AhiAaa
- MA EcrEvEx ApypAtpGoro TtEuaCyp
- ME TpTlo ExAciCh PlApypGoro
- SP AaApr TmTwTp TtChfAri
- SP TpTm AaExAcao ApaErffAads

BHP Western Australian Iron Ore (BHP WAIO)
Area C West to Yandi Flora and Vegetation Assessment

Figure E.2b: Vegetation Unit Mapping and Sample Site Locations - Pebble Mouse Creek

Coordinate System: GDA 1994 MGA Zone 50

0 100 200 300 400 500 Metres

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Author: J. Atkinson | Drawn: L. Robinson | Date: 29-03-2019 | Figure Ref: 2465-18-ENVDR-1Rev0_190326_FigE_VegAssoc_PMC

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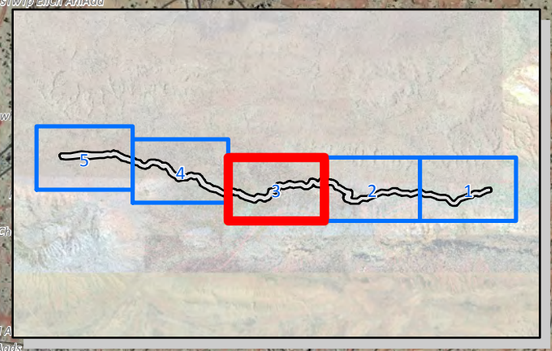

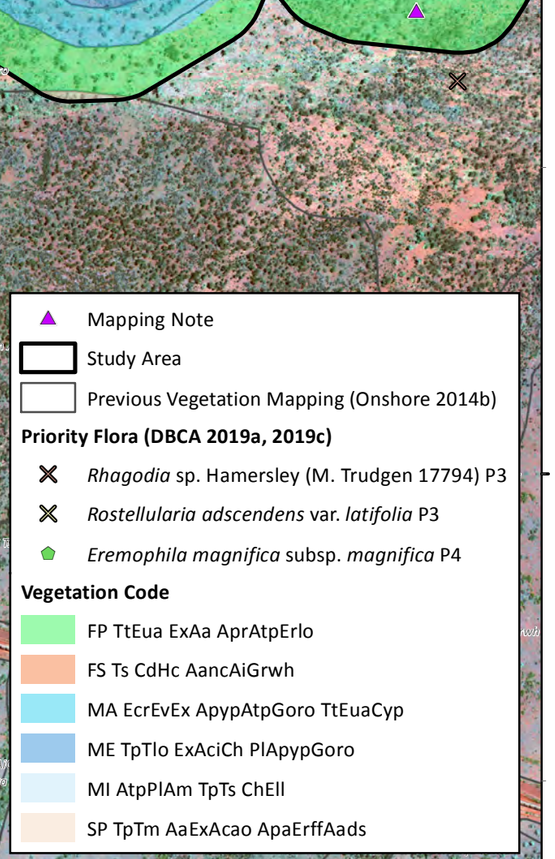

BHP Western Australian Iron Ore (BHP WAIO)

Area C West to Yandi Flora and Vegetation Assessment

Figure E.3b: Vegetation Unit Mapping and Sample Site Locations - Pebble Mouse Creek

Coordinate System: GDA 1994 MGA Zone 50

0 100 200 300 400 500 Metres

N

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Author: J. Atkinson | Drawn: L. Robinson | Date: 29-03-2019 | Figure Ref: 2465-18-ENVDR-1Rev0_190326_FigE_VegAssoc_PMC

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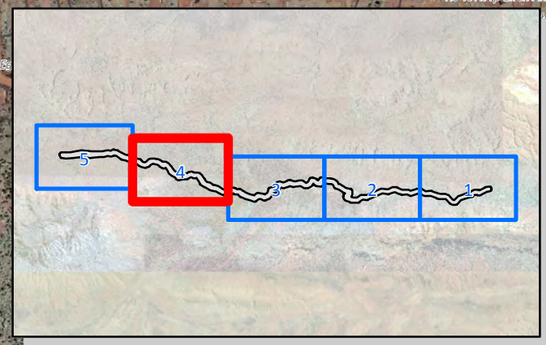

Study Area

Previous Vegetation Mapping (Onshore 2014b)

Priority Flora (DBCA 2019a, 2019c)

Rhagodia sp. Hamersley (M. Trudgen 17794) P3

Vegetation Code

FS Ts CdHc AancAiGrwh

MA EcrEvEx ApypAtpGoro TtEuaCyp

MI AtpPlAm TpTs ChEll

SP AaApr TmTwTp TtChfAri

SP TpTm AaExAcao ApaErffAads

SP TsTwTp EgEt AbApaApr

BHP Western Australian Iron Ore (BHP WAIO)

Area C West to Yandi Flora and Vegetation Assessment

Figure E.4b: Vegetation Unit Mapping and Sample Site Locations - Pebble Mouse Creek

Coordinate System: GDA 1994 MGA Zone 50

0 100 200 300 400 500 Metres

N

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Author: J. Atkinson | Drawn: L. Robinson | Date: 29-03-2019 | Figure Ref: 2465-18-ENVDR-1Rev0_190326_FigE_VegAssoc_PMC

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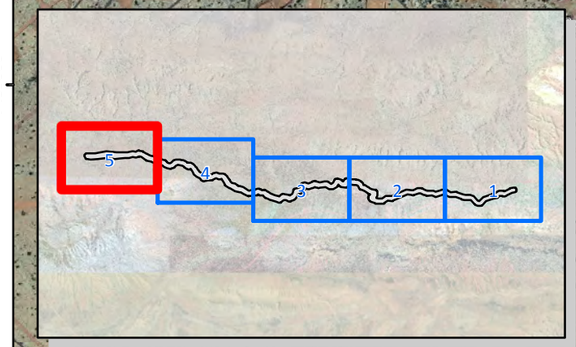

SF3MN01

- Mapping Note
- Study Area
- Previous Vegetation Mapping (Onshore 2014b)

Priority Flora (DBCA 2019a, 2019c)

- *Rhagodia* sp. Hamersley (M. Trudgen 17794) P3
- *Rostellularia adscendens* var. *latifolia* P3
- *Triodia* sp. Mt Ella (M.E. Trudgen 12739) P3

Vegetation Code

- CP TwTa Ese AbPlApyp
- FS Ts CdHc AancAiGrwh
- MA EcrEvEx ApypAtpGoro TtEuaCyp
- ME TpTlo ExAciCh PlApypGoro
- MI AtpPlAm TpTs ChEll
- SP AcaoAa ArobDiaChf
- SP TsTwTp EgEt AbApaApr

BHP Western Australian Iron Ore (BHP WAIO)
Area C West to Yandi Flora and Vegetation Assessment

Figure E.5b: Vegetation Unit Mapping and Sample Site Locations - Pebble Mouse Creek

Coordinate System: GDA 1994 MGA Zone 50

0 100 200 300 400 500 Metres

N

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Author: J. Atkinson | Drawn: L. Robinson | Date: 29-03-2019 | Figure Ref: 2465-18-ENVDR-1Rev0_190326_FigE_VegAssoc_PMC

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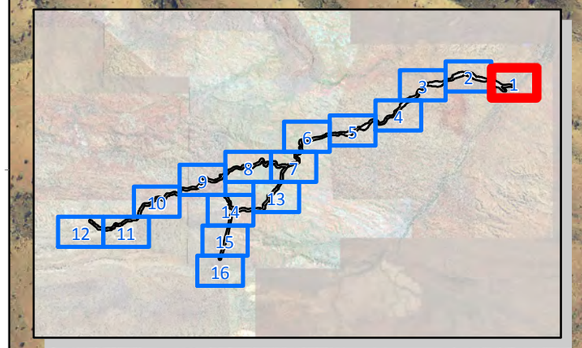

Study Area

Previous Vegetation Mapping (Onshore Environmental Consultants Pty Ltd 2014b)

Vegetation Code

HC Tw AiAb InrSeao

HS TwTpTs Ell AprAaAanc

MA EcrEvEx ApypAtpGoro TtEuaCyp

BHP Western Australian Iron Ore (BHP WAIO)

Area C West to Yandi Flora and Vegetation Assessment

Figure E.1c: Vegetation Unit Mapping and Sample Site Locations - Yandicoogina Creekline

Coordinate System: GDA 1994 MGA Zone 50

0 100 200 300 400 500 Metres

N

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Author: J. Atkinson | Drawn: L. Robinson | Date: 29-03-2019 | Figure Ref: 2465-18-ENVDR-1Rev0_190326_FigE_VegAssoc_YC

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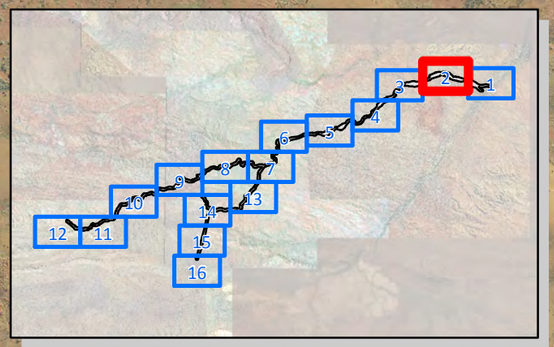

Study Area

Priority Flora (DBCA 2019a, 2019c)

Themeda sp. Hamersley Station (M.E. Trudgen 11431) P3

Vegetation Code

HC Tw AiAb InrSeao

HS TwTpTs Ell AprAaAanc

MA EcrEvEx ApypAtpGoro TtEuaCyp

MA EcrEvMa AcpAamAh TydCyv

MA EvAciEcr TercCocrApyp CcEuaTt

BHP Western Australian Iron Ore (BHP WAIO)

Area C West to Yandi Flora and Vegetation Assessment

Figure E.2c: Vegetation Unit Mapping and Sample Site Locations - Yandicoogina Creekline

Coordinate System: GDA 1994 MGA Zone 50

0 100 200 300 400 500 Metres

N

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Author: J. Atkinson | Drawn: L. Robinson | Date: 29-03-2019 | Figure Ref: 2465-18-ENVDR-1Rev0_190326_FigE_VegAssoc_YC

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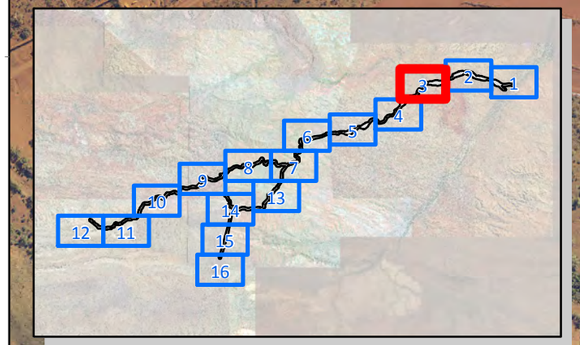

Study Area

Priority Flora (DBCA 2019a, 2019c)

Themeda sp. Hamersley Station (M.E. Trudgen 11431) P3

Lepidium catapycnon P4

Vegetation Code

Disturbed

HC Tw AiAb InrSeao

HS TbrTw Ell AbPoSegg

HS TwTpTs Ell AprAaAanc

MA EcrEv AciApypMg CcEuaTt

MA EcrEvMa AcpAamAh TydCyv

MI AtpGwApy TpTb CcCs

BHP Western Australian Iron Ore (BHP WAIO)

Area C West to Yandi Flora and Vegetation Assessment

Figure E.3c: Vegetation Unit Mapping and Sample Site Locations - Yandicoogina Creekline

Coordinate System: GDA 1994 MGA Zone 50

0 100 200 300 400 500 Metres

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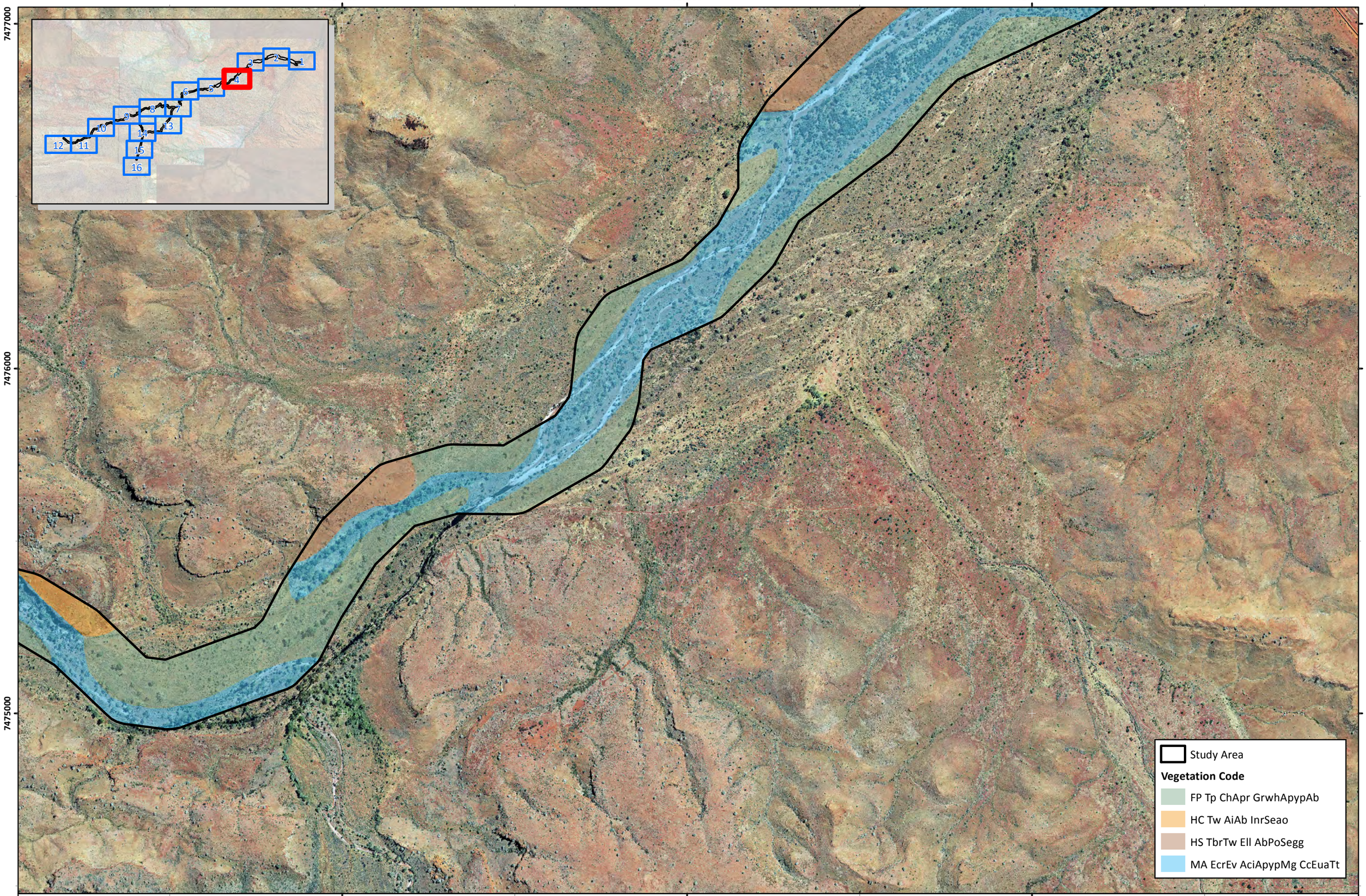
Author: J. Atkinson | Drawn: L. Robinson | Date: 29-03-2019 | Figure Ref: 2465-18-ENVDR-1Rev0_190326_FigE_VegAssoc_YC



BHP Western Australian Iron Ore (BHP WAIO)
Area C West to Yandi Flora and Vegetation Assessment

Figure E.4c: Vegetation Unit Mapping and Sample Site Locations - Yandicoogina Creekline

Coordinate System: GDA 1994 MGA Zone 50

0 100 200 300 400 500 Metres

N

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Author: J. Atkinson | Drawn: L. Robinson | Date: 29-03-2019 | Figure Ref: 2465-18-ENVDR-1Rev0_190326_FigE_VegAssoc_YC

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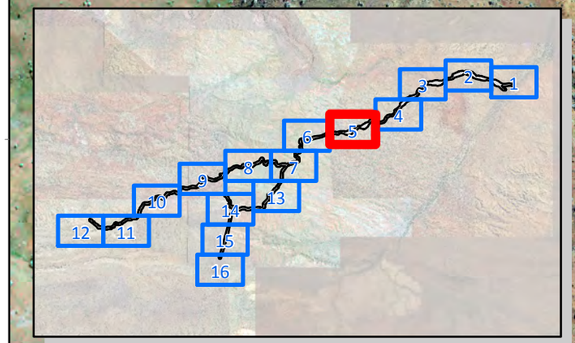

Study Area

Vegetation Code

- FP Tp ChApr GrwhApypAb
- HC Tw AiAb InrSeao
- HS TbrTw Ell AbPoSegg
- HS TwTpTs Ell AprAaAanc
- MA EcrEv AciApypMg CcEuaTt
- MA EcrEvMa AcpAamAh TydCyv

BHP Western Australian Iron Ore (BHP WAIO)

Area C West to Yandi Flora and Vegetation Assessment

Figure E.5c: Vegetation Unit Mapping and Sample Site Locations - Yandicoogina Creekline

Coordinate System: GDA 1994 MGA Zone 50

0 100 200 300 400 500 Metres

N

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Author: J. Atkinson | Drawn: L. Robinson | Date: 29-03-2019 | Figure Ref: 2465-18-ENVDR-1Rev0_190326_FigE_VegAssoc_YC

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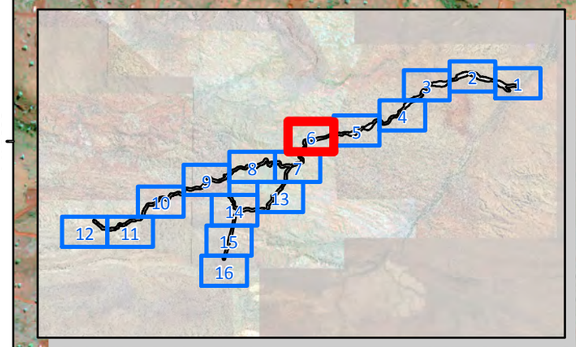

Study Area

Previous Vegetation Mapping (Onshore Environmental Consultants Pty Ltd 2014b)

Priority Flora (DBCA 2019a, 2019c)

- *Fimbristylis sieberiana* P3
- *Sida* sp. Barlee Range (S. van Leeuwen 1642) P3
- *Acacia bromilowiana* P4

Vegetation Code

- Disturbed
- FS Ts EllCh Hc
- GG AtpGrwhGoro ErmuTt Ch
- HS TsTw Eg GrwhSeggAb
- HS TsTwTp EllCh AhiAaa
- HS TwTpTs Ell AprAaAanc
- MA EcrEv AciApypMg CcEuaTt
- MA EcrEvMa AcpAamAh TydCyv

BHP Western Australian Iron Ore (BHP WAIO)
Area C West to Yandi Flora and Vegetation Assessment

Figure E.6c: Vegetation Unit Mapping and Sample Site Locations - Yandicoogina Creekline

Coordinate System: GDA 1994 MGA Zone 50

0 100 200 300 400 500 Metres

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Author: J. Atkinson | Drawn: L. Robinson | Date: 29-03-2019 | Figure Ref: 2465-18-ENVDR-1Rev0_190326_FigE_VegAssoc_YC

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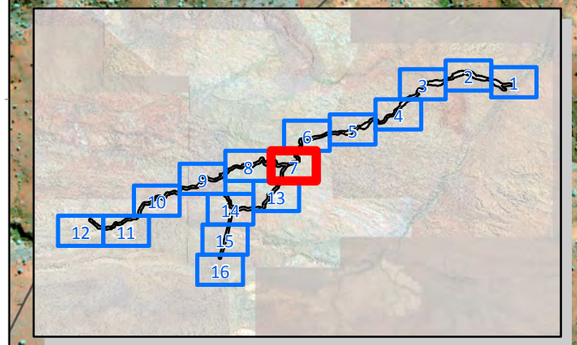

MA EcrEvEx AcypAtpGoro TEuaCyp
AC3MN01

Mapping Note
Study Area
Previous Vegetation Mapping (Onshore Environmental Consultants Pty Ltd 2014b)

Priority Flora (DBCA 2019a, 2019c)

Sida sp. Barlee Range (S. van Leeuwen 1642) P3

Vegetation Code

- FS Ts CdHc AancAiGrwh
- FS Ts EllCh Hc
- GG AtpGrwhGoro ErmuTt Ch
- HS TsTwTp EllCh AhiAaa
- MA AaAciApr CcTtChf EvEcr
- MA EcrEv AciApypMg CcEuaTt
- ME TtChfEua ExEvCh PlApaApyp
- MI AtpPlAm TpTs ChEll

BHP Western Australian Iron Ore (BHP WAIO)
Area C West to Yandi Flora and Vegetation Assessment

Figure E.7c: Vegetation Unit Mapping and Sample Site Locations - Yandicoogina Creekline

Coordinate System: GDA 1994 MGA Zone 50

0 100 200 300 400 500 Metres

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Author: J. Atkinson | Drawn: L. Robinson | Date: 29-03-2019 | Figure Ref: 2465-18-ENVDR-1Rev0_190326_FigE_VegAssoc_YC

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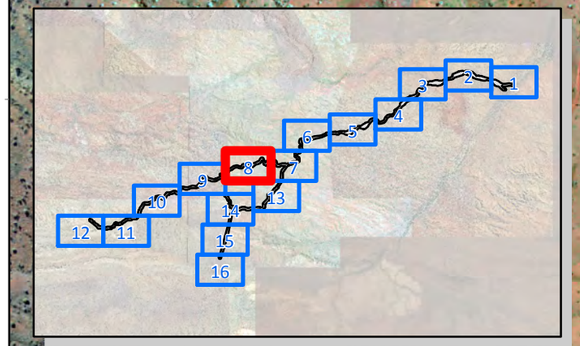

Study Area

Previous Vegetation Mapping (Onshore Environmental Consultants Pty Ltd 2014b)

Vegetation Code

- GG AtpGrwhGoro ErmuTt Ch
- HS TsTwTp EllCh AhiAaa
- HS TwTpTs Ell AprAaAanc
- ME TtChfEua ExEvCh PlApaApyp
- MI AtpPlAm TpTs ChEll

BHP Western Australian Iron Ore (BHP WAIO)

Area C West to Yandi Flora and Vegetation Assessment

Figure E.8c: Vegetation Unit Mapping and Sample Site Locations - Yandicoogina Creekline

Coordinate System: GDA 1994 MGA Zone 50

0 100 200 300 400 500 Metres

N

astron delivering environmental intelligence™

Author: J. Atkinson | Drawn: L. Robinson | Date: 29-03-2019 | Figure Ref: 2465-18-ENVDR-1Rev0_190326_FigE_VegAssoc_YC

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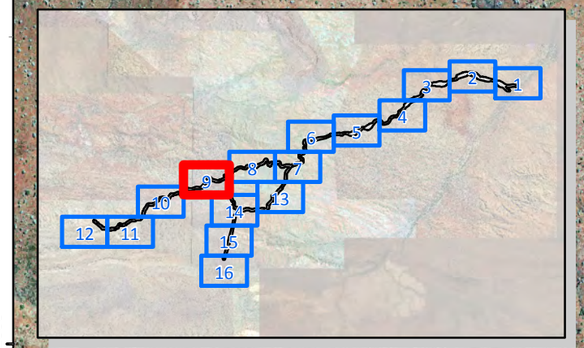

Study Area

Vegetation Code

HS TwTpTs Ell AprAaAanc

ME TtChfEua ExEvCh PlApaApyp

MI AtpPlAm TpTs ChEll

BHP Western Australian Iron Ore (BHP WAIO)

Area C West to Yandi Flora and Vegetation Assessment

Figure E.9c: Vegetation Unit Mapping and Sample Site Locations - Yandicoogina Creekline

Coordinate System: GDA 1994 MGA Zone 50

0 100 200 300 400 500 Metres

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Author: J. Atkinson | Drawn: L. Robinson | Date: 29-03-2019 | Figure Ref: 2465-18-ENVDR-1Rev0_190326_FigE_VegAssoc_YC

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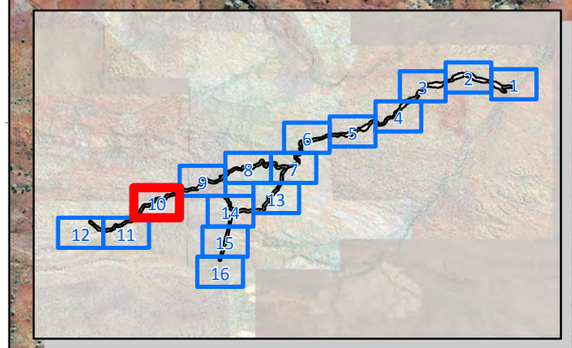

Study Area

Previous Vegetation Mapping (Onshore Environmental Consultants Pty Ltd 2014b)

Vegetation Code

HS TsTwTp EllCh AhiAaa

HS TwTpTs Ell AprAaAanc

ME TtChfEua ExEvCh PlApaApyp

MI AtpPlAm TpTs ChEll

BHP Western Australian Iron Ore (BHP WAIO)

Area C West to Yandi Flora and Vegetation Assessment

Figure E.10c: Vegetation Unit Mapping and Sample Site Locations - Yandicoogina Creekline

Coordinate System: GDA 1994 MGA Zone 50

0 100 200 300 400 500 Metres

N

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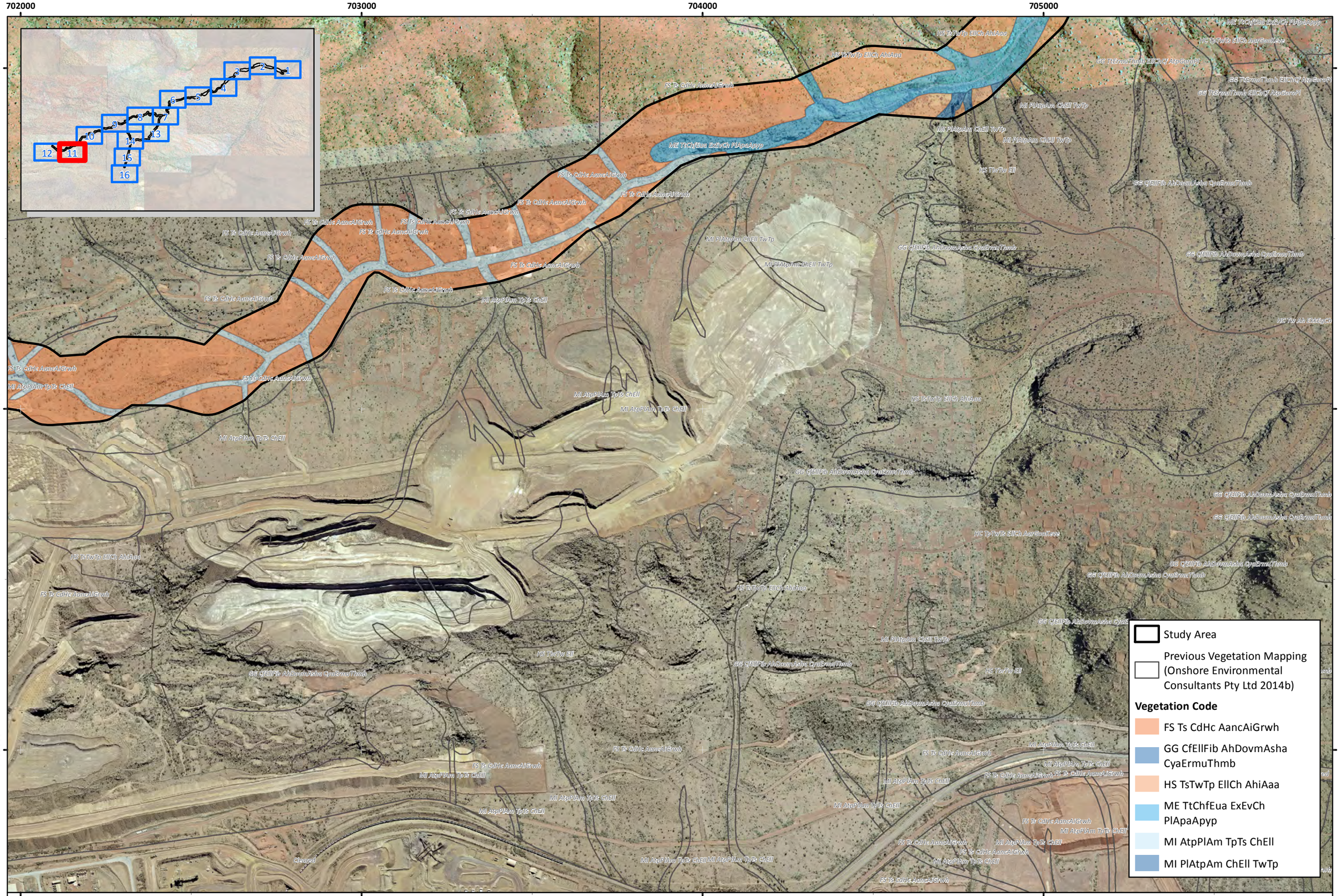
Author: J. Atkinson | Drawn: L. Robinson | Date: 29-03-2019 | Figure Ref: 2465-18-ENVDR-1Rev0_190326_FigE_VegAssoc_YC



BHP Western Australian Iron Ore (BHP WAIO)
Area C West to Yandi Flora and Vegetation Assessment

Figure E.11c: Vegetation Unit Mapping and Sample Site Locations - Yandicoogina Creekline

Coordinate System: GDA 1994 MGA Zone 50

0 100 200 300 400 500 Metres

N

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Author: J. Atkinson | Drawn: L. Robinson | Date: 29-03-2019 | Figure Ref: 2465-18-ENVDR-1Rev0_190326_FigE_VegAssoc_YC

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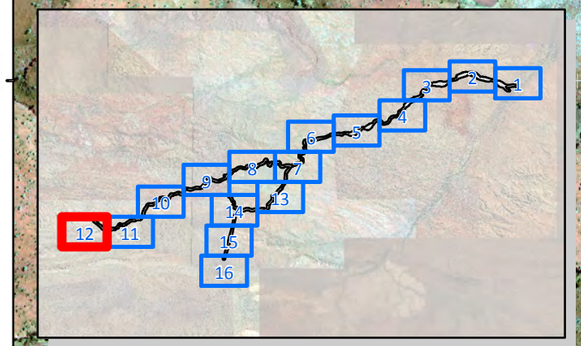
7467000 7466000 7465000



Study Area

Previous Vegetation Mapping (Onshore Environmental Consultants Pty Ltd 2014b)

Vegetation Code

FS Ts CdHc AancAiGrwh

MI AtpPlAm TpTs ChEll

Cleared

BHP Western Australian Iron Ore (BHP WAIO)
Area C West to Yandi Flora and Vegetation Assessment

Figure E.12c: Vegetation Unit Mapping and Sample Site Locations - Yandicoogina Creekline

Coordinate System: GDA 1994 MGA Zone 50

0 100 200 300 400 500 Metres

N

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Author: J. Atkinson | Drawn: L. Robinson | Date: 29-03-2019 | Figure Ref: 2465-18-ENVDR-1Rev0_190326_FigE_VegAssoc_YC

715000 716000 717000 718000

7470000

7469000

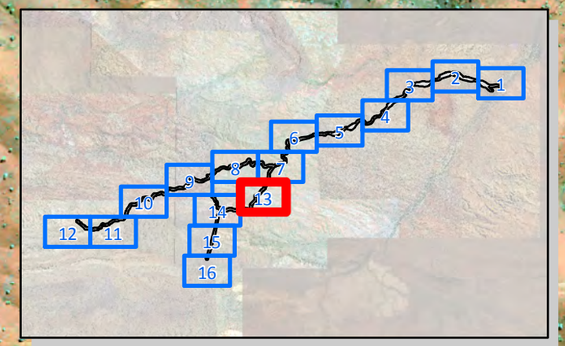
7468000

FS Ts CdHc AancAiGrwh

HS TsTwTp EllCh AhiAaa

MA EcrEv AciApypMg CcEuaTt

SP TsTwTp EgEt AbApaApr



Study Area

Previous Vegetation Mapping (Onshore Environmental Consultants Pty Ltd 2014b)

Priority Flora (DBCA 2019a, 2019c)

Rhagodia sp. Hamersley (M. Trudgen 17794) P3

Vegetation Code

FS Ts CdHc AancAiGrwh

HS TsTwTp EllCh AhiAaa

MA AaAciApr CcTtChf EvEcr

MA EcrEv AciApypMg CcEuaTt

ME TtChfEua ExEvCh PlApaApyp

SP TsTwTp EgEt AbApaApr

BHP Western Australian Iron Ore (BHP WAIO)
Area C West to Yandi Flora and Vegetation Assessment

Figure E.13c: Vegetation Unit Mapping and Sample Site Locations - Yandicoogina Creekline

Coordinate System: GDA 1994 MGA Zone 50

0 100 200 300 400 500 Metres

N

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711000 712000 713000 714000

7468000

7467000

AQ6MIN01

MI AtpPlAm TpTs ChEll

FS Ts CdHc AancAiGrwh

HS TsTwTp EllCh AhiAaa

SP TsTwTp EgEt AbApaApr

ME TpTlo ExAciCh PlApypGoro

HS TbrTw Ell

Cleared

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16

Mapping Note

Study Area

Previous Vegetation Mapping (Onshore Environmental Consultants Pty Ltd 2014b)

Vegetation Code

- Disturbed
- FS Ts CdHc AancAiGrwh
- HS TbrTw Ell AbPoSegg
- HS TsTwTp EllCh AhiAaa
- ME TpTlo ExAciCh PlApypGoro
- ME TtChfEua ExEvCh PlApaApyp
- ME TtEuaEte ApypAtpPl EvCh
- MI AtpPlAm TpTs ChEll
- SP TsTwTp EgEt AbApaApr

BHP Western Australian Iron Ore (BHP WAIO)

Area C West to Yandi Flora and Vegetation Assessment

Figure E.14c: Vegetation Unit Mapping and Sample Site Locations - Yandicoogina Creekline

Coordinate System: GDA 1994 MGA Zone 50

0 100 200 300 400 500 Metres

N

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Author: J. Atkinson | Drawn: L. Robinson | Date: 29-03-2019 | Figure Ref: 2465-18-ENVDR-1Rev0_190326_FigE_VegAssoc_YC

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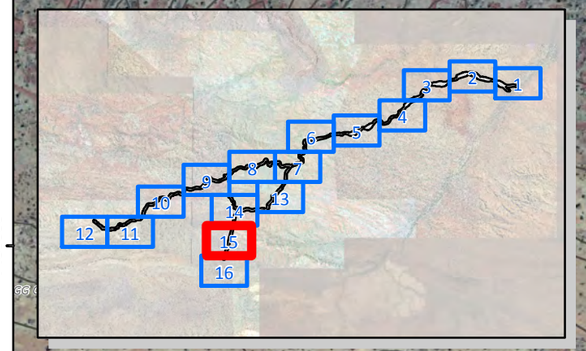

AC3MN01

Cleared

Mapping Note

Study Area

Previous Vegetation Mapping (Onshore Environmental Consultants Pty Ltd 2014b)

Vegetation Code

- Disturbed
- FS Ts CdHc AancAiGrwh
- HS TbrTw Ell AbPoSegg
- HS TwTpTs Ell AprAaAanc
- ME TpTlo ExAciCh PlApypGoro
- ME Tt ExChAa ApaAaAci
- ME TtChfEua ExEvCh PlApaApyp
- MI AtpPlAm TpTs ChEll
- SP TpTb Eg PlAbAan

BHP Western Australian Iron Ore (BHP WAIO)

Area C West to Yandi Flora and Vegetation Assessment

Figure E.15c: Vegetation Unit Mapping and Sample Site Locations - Yandicoogina Creekline

Coordinate System: GDA 1994 MGA Zone 50

0 100 200 300 400 500 Metres

N

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Author: J. Atkinson | Drawn: L. Robinson | Date: 29-03-2019 | Figure Ref: 2465-18-ENVDR-1Rev0_190326_FigE_VegAssoc_YC

710000 711000 712000 713000

7463000

7462000

AC9MN01

Mapping Note
Study Area
Previous Vegetation Mapping (Onshore Environmental Consultants Pty Ltd 2014b)

Priority Flora (DBCA 2019a, 2019c)

Rostellularia adscendens var. *latifolia* P3

Vegetation Code

FS Ts CdHc AancAiGrwh
HS TsTw Eg GrwhSeggAb
ME TpTlo ExAciCh PlApypGoro
ME Tt ExChAa ApaAaAci

BHP Western Australian Iron Ore (BHP WAIO)
Area C West to Yandi Flora and Vegetation Assessment

Figure E.16c: Vegetation Unit Mapping and Sample Site Locations - Yandicoogina Creekline

Coordinate System: GDA 1994 MGA Zone 50

0 100 200 300 400 500 Metres

N

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Author: J. Atkinson | Drawn: L. Robinson | Date: 29-03-2019 | Figure Ref: 2465-18-ENVDR-1Rev0_190326_FigE_VegAssoc_YC

706000 707000 708000

7483000 7482000 7481000

Cleared
MI AtpPlAm TpTs ChEll
HC Tw AlAb InrSeao
MA AtpApypAse Ecr ThmbTtCyp
MA MaEerEv MgAepAtr Cyv
ME TpTlo ExAclCh PlApypGoro
HS TsTwTp ElICh AhlAaa
HC TwTbrTp ElICh AmaGrwhAb
SP TpTm AaExAcaa ApaEnjfAajus

1 2 3 4 5

Study Area

Previous Vegetation Mapping (Onshore Environmental Consultants Pty Ltd 2014b)

Priority Flora (DBCA 2019a, 2019c)

Ipomoea racemigera P2

Vegetation Code

HC Tw AiAb InrSeao

MA EcrEv AciApypMg CcEuaTt

BHP Western Australian Iron Ore (BHP WAIO)

Area C West to Yandi Flora and Vegetation Assessment

Figure E.1d: Vegetation Unit Mapping and Sample Site Locations - Lamb Creekline

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Author: R. Archibald	Date: 29-03-2019
Drawn: L. Robinson	Figure Ref: 2465-18-ENVDR-1Rev0_190326_FigE_VegAssoc_LC

Coordinate System: GDA 1994 MGA Zone 50

0 100 200 300 400 500 Metres

N

704000

705000

7483000

7482000

7481000

1

2

3

4

5

Y2MN01

Y2MN02

Y1MN02

Y1MN01

Mapping Note

Study Area

Previous Vegetation Mapping (Onshore Environmental Consultants Pty Ltd 2014b)

Vegetation Code

- Disturbed
- FP Tp ChApr GrwhApypAb
- HC Tw AiAb InrSeao
- HS TsTwTp EllCh AhiAaa
- MA AaAciApr CcTtChf EvEcr
- MA EcrEv AciApypMg CcEuaTt
- MI AtpPlAm TpTs ChEll

BHP Western Australian Iron Ore (BHP WAIO)

Area C West to Yandi Flora and Vegetation Assessment

Figure E.2d: Vegetation Unit Mapping and Sample Site Locations - Lamb Creekline

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Author: R. Archibald	Date: 29-03-2019
Drawn: L. Robinson	Figure Ref: 2465-18-ENVDR-1Rev0_190326_FigE_VegAssoc_LC

Coordinate System: GDA 1994 MGA Zone 50

0 100 200 300 400 500 Metres

N

701000

702000

703000

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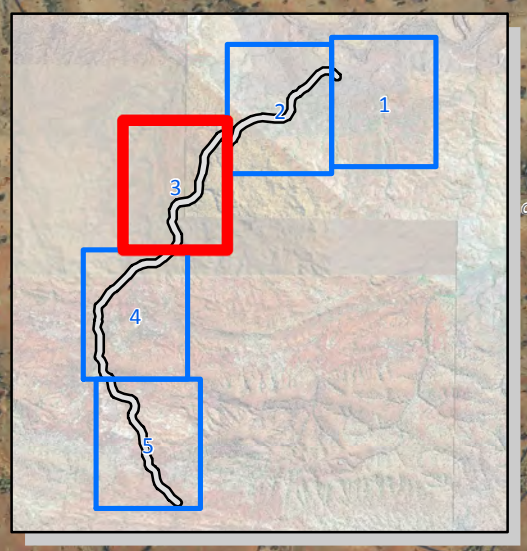

FS TsTpTw Ell AbApaAanc

MI AppPlAm TpTs ChEll

HS TsTwTp EllCh AhiAaa

SP TpTm AaExAcao ApaErffAads

Study Area

Previous Vegetation Mapping (Onshore Environmental Consultants Pty Ltd 2014b)

Vegetation Code

- CP TwTa Ese AbPlApyp
- HS TsTwTp EllCh AhiAaa
- HS TwTpTs Ell AprAaAanc
- MA EcrEv AciApypMg CcEuaTt
- MA EcrEvMa AcpAamAh TydCyv
- SP TpTm AaExAcao ApaErffAads

BHP Western Australian Iron Ore (BHP WAIO)

Area C West to Yandi Flora and Vegetation Assessment

Figure E.3d: Vegetation Unit Mapping and Sample Site Locations - Lamb Creekline

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Author: R. Archibald	Date: 29-03-2019
Drawn: L. Robinson	Figure Ref: 2465-18-ENVDR-1Rev0_190326_FigE_VegAssoc_LC

Coordinate System: GDA 1994 MGA Zone 50

0 100 200 300 400 500 Metres

N

700000
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7476000
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1
2
3
4
5
ACNC1RV08
ACNC1RV07
ACNC1RV06
ACNC1RV05
Relevé
Study Area
Vegetation Code
FP Tp ChApr GrwhApypAb
HC Tw AiAb InrSeao
HS TwTpTs Ell AprAaAanc
MA EcrEv AciApypMg CcEuaTt
MA EcrEvMa AcpAamAh TydCyv
ME TtEuaEte ApypAtpPl EvCh

BHP Western Australian Iron Ore (BHP WAIO)
Area C West to Yandi Flora and Vegetation Assessment

Figure E.4d: Vegetation Unit Mapping and Sample Site Locations - Lamb Creekline

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Drawn: L. Robinson	Figure Ref: 2465-18-ENVDR-1Rev0_190326_FigE_VegAssoc_LC

Coordinate System: GDA 1994 MGA Zone 50
0 100 200 300 400 500 Metres
N

700000
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ACNC1RV02
ACNC1RV01
ACNC1MN03
ACNC1RV03
ACNC1RV04
1
2
3
4
5
Relevé
Mapping Note
Study Area
Vegetation Code
HC Tw AiAb InrSeao
HS TsTw Eg GrwhSeggAb
HS TsTwTp EllCh AhiAaa
HS TwTpTs Ell AprAaAanc
MA EcrEv AciApypMg CcEuaTt
ME TtEuaEte ApypAtpPl EvCh

BHP Western Australian Iron Ore (BHP WAIO)
Area C West to Yandi Flora and Vegetation Assessment

Figure E.5d: Vegetation Unit Mapping and Sample Site Locations - Lamb Creekline

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Drawn: L. Robinson	Figure Ref: 2465-18-ENVDR-1Rev0_190326_FigE_VegAssoc_LC

Coordinate System: GDA 1994 MGA Zone 50
Metres
0 100 200 300 400 500
N

715000 716000 717000 718000

7482000 7481000

- Relevé
- Mapping Note
- Study Area
- Previous Vegetation Mapping (Onshore Environmental Consultants Pty Ltd 2014b)

Priority Flora (DBCA 2019a, 2019c)

- *Aristida lazaridis* P2
- *Rostellularia adscendens* var. *latifolia* P3
- *Goodenia nuda* P4

Vegetation Code

- Disturbed
- FP Tp ChApr GrwhApypAb
- HS TeTw Ch AiAan
- HS TsTwTp EllCh AhiAaa
- MA AaAciApr CcTtChf EvEcr
- MA EcrEv AciApypMg CcEuaTt
- ME TpTlo ExAciCh PlApypGoro

Cleared

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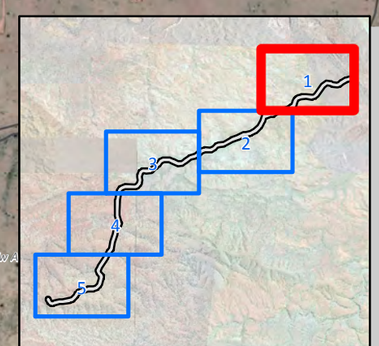
Y4MN02
Y4MN03
ACNC2RV06



BHP Western Australian Iron Ore (BHP WAIO)
Area C West to Yandi Flora and Vegetation Assessment

Figure E.1e: Vegetation Unit Mapping and Sample Site Locations - Area C North Creekline

Coordinate System: GDA 1994 MGA Zone 50

0 100 200 300 400 500 Metres

N

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Author: J. Atkinson | Drawn: L. Robinson | Date: 29-03-2019 | Figure Ref: 2465-18-ENVDR-1Rev0_190326_FigE_VegAssoc_ACNC

712000 713000 714000 715000

7480000

7479000

7478000

Relevé

Study Area

Previous Vegetation Mapping (Onshore Environmental Consultants Pty Ltd 2014b)

Priority Flora (Current Survey)

Eremophila sp. Hamersley Range (K. Walker KW 136) P3

Vegetation Code

- Disturbed
- HC Tw AiAb InrSeao
- HS TeTw Ch AiAan
- HS TsTwTp EllCh AhiAaa
- HS TwTpTs Ell AprAaAanc
- MA AaAciApr CcTtChf EvEcr
- MA EcrEv AciApypMg CcEuaTt

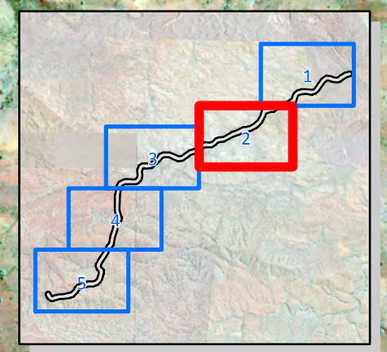
ACNC2RV04

ACNC2RV05

ACNC2RV03

ACNC2RV01

ACNC2RV02



BHP Western Australian Iron Ore (BHP WAIO)

Area C West to Yandi Flora and Vegetation Assessment

Figure E.2e: Vegetation Unit Mapping and Sample Site Locations - Area C North Creekline

Coordinate System: GDA 1994 MGA Zone 50

0 100 200 300 400 500 Metres

N

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Author: J. Atkinson | Drawn: L. Robinson | Date: 29-03-2019 | Figure Ref: 2465-18-ENVDR-1Rev0_190326_FigE_VegAssoc_ACNC

709000 710000 711000

7479000

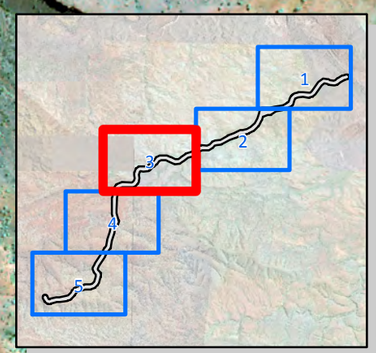
7478000

7477000

Study Area

Vegetation Code

- FP Tp ChApr GrwhApypAb
- HC Tw AiAb InrSeao
- HS TsTwTp EllCh AhiAaa
- MA AaAciApr CcTtChf EvEcr
- MA EcrEv AciApypMg CcEuaTt



BHP Western Australian Iron Ore (BHP WAIO)
Area C West to Yandi Flora and Vegetation Assessment

Figure E.3e: Vegetation Unit Mapping and Sample Site Locations - Area C North Creekline

Coordinate System: GDA 1994 MGA Zone 50

0 100 200 300 400 500 Metres

N

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707000 708000 709000 710000

7476000

7475000

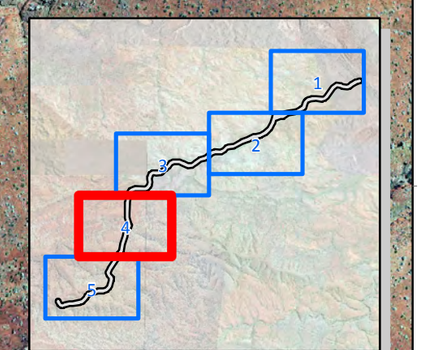
Study Area

Vegetation Code

HC Tw AiAb InrSeao

HS TsTwTp EllCh AhiAaa

MA AaAciApr CcTtChf EvEcr



BHP Western Australian Iron Ore (BHP WAIO)

Area C West to Yandi Flora and Vegetation Assessment

Figure E.4e: Vegetation Unit Mapping and Sample Site Locations - Area C North Creekline

Coordinate System: GDA 1994 MGA Zone 50

0 100 200 300 400 500 Metres

N

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Author: J. Atkinson | Drawn: L. Robinson | Date: 29-03-2019 | Figure Ref: 2465-18-ENVDR-1Rev0_190326_FigE_VegAssoc_ACNC

706000
707000
708000
7474000
7473000
7472000

Study Area

Priority Flora (DBCA 2019a, 2019c)

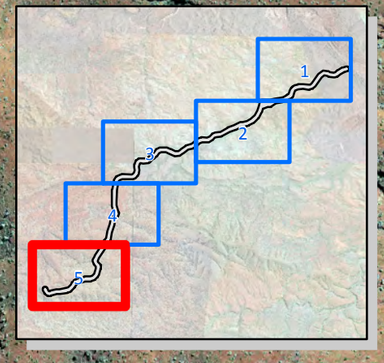
Dampiera metallorum P3

Vegetation Code

HC Tw AiAb InrSeao

HS TsTwTp EllCh AhiAaa

MA AaAciApr CcTtChf EvEcr



BHP Western Australian Iron Ore (BHP WAIO)

Area C West to Yandi Flora and Vegetation Assessment

Figure E.5e: Vegetation Unit Mapping and Sample Site Locations - Area C North Creekline

Coordinate System: GDA 1994 MGA Zone 50

0 100 200 300 400 500 Metres

N

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Author: J. Atkinson | Drawn: L. Robinson | Date: 29-03-2019 | Figure Ref: 2465-18-ENVDR-1Rev0_190326_FigE_VegAssoc_ACNC

Vegetation of hills, slopes and stony plains

FS Ts CdHc AancAiGrwh

Hummock Grassland of *Triodia* sp. Shovelanna Hill (S. van Leeuwen 3835) with Low Open Woodland of *Corymbia deserticola* subsp. *deserticola* and *Hakea chordophylla* over Open Shrubland of *Acacia ancistrocarpa*, *Acacia inaequilatera* and *Grevillea wickhamii* subsp. *hispidula* on red brown sandy loam on foot slopes and stony plains

FS Ts EllCh Hc

Open hummock grassland of *Triodia s*p. Shovelanna Hill (S. van Leeuwen 3835) with low open woodland of *Eucalyptus leucophloia* subsp. *leucophloia*, *Corymbia hamersleyana* over scattered tall shrubs of *Hakea chordophylla* over low open shrubland of *Acacia hilliana* on dark reddish brown sandy clay loam on footslopes

FS TsTpTw Ell AbApaAanc

Hummock Grassland of *Triodia* sp. Shovelanna Hill (S. van Leeuwen 3835), *Triodia pungens* and *Triodia wiseana* with Low Open Woodland of *Eucalyptus leucophloia* subsp. *leucophloia* and Open Shrubland of *Acacia bivenosa*, *Acacia pachyachra* and *Acacia ancistrocarpa* on red brown loam on footslopes and low undulating hills

HC Tw AiAb InrSeao

Hummock Grassland of *Triodia wiseana* with High Open Shrubland of *Acacia inaequilatera* and *Acacia bivenosa* over Low Open Shrubland of I*ndigofera rugosa* and *Senna artemisioides* subsp. *oligophylla* on red silty loam on dolerite hill crests

HS TbrTw Ell AbPoSegg

Hummock Grassland of *Triodia brizoides* and *Triodia wiseana* with Scattered Low Trees of *Eucalyptus leucophloia* subsp. *leucophloia* over Scattered Low Shrubs of *Acacia bivenosa*, *Ptilotus obovatus* and *Senna glutinosa* subsp. *glutinosa* on brown silty loam on scree slopes

HS TeTw Ch AiAan

Hummock Grassland of *Triodia epactia* and *Triodia wiseana* with Low Open Woodland of *Corymbia hamersleyana* over High Open Shrubland of *Acacia inaequilatera* and *Acacia ancistrocarpa* on red brown sandy loam on granite and quartz hill slopes and footslopes

HS TsTw Eg GrwhSeggAb

Hummock Grassland of *Triodia* sp. Shovelanna Hill (S. van Leeuwen 3835) and *Triodia wiseana* with Very Open Mallee of *Eucalyptus gamophylla* over Open Shrubland of *Grevillea wickhamii* subsp. *hispidula*, *Senna glutinosa* subsp. *glutinosa* and *Acacia bivenosa* on red brown sandy clay loam on hill slopes

HS TsTwTp EllCh AhiAaa

Hummock Grassland of *Triodia* sp. Shovelanna Hill (S. van Leeuwen 3835), *Triodia wiseana* and *Triodia pungens* with Low Open Woodland of *Eucalyptus leucophloia* subsp. *leucophloia* and *Corymbia hamersleyana* over Low Open Shrubland of *Acacia hilliana* and *Acacia adoxa* var. *adoxa* on red brown sandy loam on hill slopes

HS TwTpTs Ell AprAaAanc

Hummock Grassland of *Triodia wiseana*, *Triodia pungens* and *Triodia* sp. Shovelanna Hill (S. van Leeuwen 3835) with Low Open Woodland of *Eucalyptus leucophloia* subsp. *leucophloia* over Open Shrubland of *Acacia pruinocarpa*, *Acacia aptaneura* and *Acacia ancistrocarpa* on red brown loam on plains and low hills

SP AaApr TmTwTp TtChfAri

Low Open Forest of *Acacia aptaneura* and Acacia *pruinocarpa* over Open Hummock Grassland of *Triodia melvilei*, *Triodia wiseana* and *Triodia pungens* over Tussock Grassland of *Themeda triandra*, *Chrysopogon fallax* and *Aristida inaequiglumis* on red brown loam on plains

SP AcaoAa ArobDiaChf

Low Open Forest of *Acacia catenulata* subsp. *occidentalis* and *Acacia aptaneura* over Very Open Tussock Grassland of *Aristida obscura*, *Digitaria ammophila* and *Chrysopogon fallax* on red brown clay loam on stony lower plains

SP TpTb Eg PlAbAan

Hummock Grassland of *Triodia pungens* and *Triodia basedowii* with Open Mallee of *Eucalyptus gamophylla* and Shrubland of *Petalostylis labicheoides*, *Acacia bivenosa* and *Acacia ancistrocarpa* on red brown loamy sand on stony plains and footslopes

SP TpTm AaExAcao ApaErffAads

Hummock Grassland of *Triodia pungens* and *Triodia melvillei* with Low Open Woodland of *Acacia aptaneura*, *Eucalyptus xerothermica* and *Acacia catenulata* subsp. *occidentalis* and Open Shrubland of *Acacia pachyacra*, *Eremophila forrestii* subsp. *forrestii* and *Acacia adsurgens* on red brown clay loam or silty loam on stony plains and floodplains

SP TsTwTp EgEt AbApaApr

Hummock Grassland of *Triodia* sp. Shovelanna Hill (S. van Leeuwen 3835), *Triodia wiseana* and *Triodia pungens* with Very Open Mallee of *Eucalyptus gamophylla* and *Eucalyptus trivalva* over Open Shrubland of *Acacia bivenosa*, *Acacia pachyacra* and *Acacia pruinocarpa* on red brown sandy loam and clay loam on stony plains

Vegetation of drainage lines

MA AaAciApr CcTtChf EvEcr

Low Open Forest of *Acacia aptaneura*, *Acacia citrinoviridis* and *Acacia pruinocarpa* very Open Tussock Grassland of **Cenchrus ciliaris*, *Themeda triandra* and *Chrysopogon fallax* with Open Woodland of *Eucalyptus victrix* and *Eucalyptus camaldulensis* subsp. *refulgens* on brown loamy sand on major drainage lines with broad and deeply incised drainage channels

MA AtpApypAse Ecr ThmbTtCyp

High Shrubland of *Acacia tumida* var. *pilbarensis*, *Acacia pyrifolia* var. *pyrifolia* and *Acacia sericophylla* with Scattered Trees of *Eucalyptus camaldulensis* subsp. *refulgens* over Open Tussock Grassland of *Themeda* sp. Mt Barricade (M.E. Trudgen 2471), *Themeda triandra* and *Cymbopogon procerus* on brown loam and gravels on major drainage channels

MA EcrEv AciApypMg CcEuaTt

Woodland of *Eucalyptus camaldulensis* subsp. *refulgens* and *Eucalyptus victrix* over High Open Shrubland of *Acacia citrinoviridis*, *Acacia pyrifolia* var. *pyrifolia* and *Melaleuca glomerata* over Tussock Grassland of **Cenchrus ciliaris*, *Eulalia aurea* and *Themeda triandra* on brown clay loam on banks of major drainage lines

MA EcrEvEx ApypAtpGoro TtEuaCyp

Low Open Forest of *Eucalyptus camaldulensis* subsp. *refulgens*, *Eucalyptus victrix* and *Eucalyptus xerothemica* over High Shrubland of *Acacia pyrifolia* var. *pyrifolia*, *Acacia tumida* var. *pilbarensis* and *Gossypium robinsonii* over Open Tussock Grassland of *Themeda triandra*, *Eulalia aurea* and *Cymbopogon procerus* on red brown clay loam on major drainage lines

MA EcrEvMa AcpAamAh TydCyv

Open Forest of *Eucalyptus camaldulensis* var. *refulgens*, *Eucalyptus victrix* and *Melaleuca argentea* over Low Open Forest of *Acacia coriacea* subsp. *pendens*, *Acacia ampliceps* and *Atalaya hemiglauca* over Open Sedges of *Typha domingensis* and *Cyperus vaginatus*

MA EvAciEcr TercCocrApyp CcEuaTt

Woodland of *Eucalyptus victrix*, *Acacia citrinoviridis* and *Eucalyptus camaldulensis* subsp. *refulgens* over Low Open Shrubland of *Tephrosia rosea* var. *clementii*, *Corchorus crozophorifolius* and *Acacia pyrifolia* var. *pyrifolia* over Very Open Tussock Grassland of **Cenchrus ciliaris*, *Eulalia aurea* and *Themeda triandra* on brown loamy sand on channels of major drainage lines

BHP Western Australian Iron Ore
Area C West to Yandi Flora and Vegetation Assessment

Legend: Vegetation Unit Mapping

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Vegetation of drainage lines

MA MaEcrEv MgAcpAtr Cyv
High Open Forest of *Melaleuca argentea*, *Eucalyptus camaldulensis* var. *refulgens* and *Eucalyptus victrix* over High Open Shrubland of *Melaleuca glomerata*, *Acacia coriacea* subsp. *pendens* and *Acacia trachycarpa* over Very Open Sedges of *Cyperus vaginatus* on alluvial gravelly soils on major drainage channels with seasonal pools

MA TtCc PlAbAnl EllCh
Tussock Grassland of *Themeda triandra* and **Cenchrus ciliaris* with Shrubland of *Petalostylis labicheoides*, *Acacia bivenosa* and *Androcalva luteiflora* and Low Open Woodland of *Eucalyptus leucophloia* subsp. *leucophloia* and *Corymbia hamersleyana* on red brown loam on drainage levees

MA TydCyv EcrEv AciAcp
Sedges of *Typha domingensis* and *Cyperus vaginatus* with Open Woodland of *Eucalyptus camaldulensis* subsp. *refulgens* and *Eucalyptus victrix* over Low Open Woodland of *Acacia citrinoviridis* and *Acacia coriacea* subsp. *pendens* on brown clayey sand on permanent pools along major drainage lines

ME TpTlo ExAciCh PlApypGoro
Hummock Grassland of *Triodia pungens* and *Triodia longiceps* with Low Woodland of *Eucalyptus xerothermica*, *Acacia citrinoviridis* and *Corymbia hamerselyana* over High Shrubland of *Petalostylis labicheoides*, *Acacia pyrifolia* var. *pyrifolia* and *Gossypium robinsonii* on red brown clay loam on medium drainage lines and surrounding floodplains

ME Tt ExChAa ApaAaAci
Closed Tussock Grassland of *Themeda triandra* with Low Woodland of *Eucalyptus xerothermica*, *Corymbia hamersleyana* and *Acacia aptaneura* over High Open Shrubland of *Acacia pachyacra*, *Acacia aptaneura* and *Acacia citrinoviridis* on red brown clay loam along unincised medium drainage lines

ME TtAriCya ChEll AmPlAnl
Open Tussock Grassland of *Themeda triandra*, *Aristida inaequiglumis* and *Cymbopogon ambiguus* with Low Open Woodland of *Corymbia hamerselyana* and *Eucalyptus leucophloia* subsp. *leucophloia* over Open Shrubland of *Acacia monticola*, *Petalostylis labicheoides* and *Androcalva luteiflora* on red brown alluvium on minor and medium drainage lines

ME TtChfEua ExEvCh PlApaApyp
Tussock Grassland of *Themeda triandra*, *Chrysopogon fallax* and *Eulalia aurea* with Low Open Woodland of *Eucalyptus xerothermica*, *Eucalyptus victrix* and *Corymbia hamersleyana* and Shrubland of *Petalostylis labicheoides*, *Acacia pachyacra* and *Acacia pyrifolia* var. *pyrifolia* on red sandy loam on medium drainage lines

ME TtEuaEte ApypAtpPl EvCh
Tussock Grassland of *Themeda triandra*, *Eulalia aurea* and *Eriachne tenuiculmis* with High Shrubland of *Acacia pyrifolia* var. *pyrifolia*, *Acacia tumida* var. *pilbarensis* and *Petalostylis labicheoides* and Open Woodland of *Eucalyptus victrix* and *Corymbia hamersleyana* on red brown silty loam on medium drainage lines and flood plains

MI AadsAnlDop Tp EllCh
Open Heath of *Acacia adsurgens*, *Androcalva luteiflora* and *Dodonaea pachyneura* over Open Hummock Grassland of *Triodia pungens* with Low Open Woodland of *Eucalyptus leucophloia* subsp. *leucophloia* and *Corymbia hamersleyana* on brown loamy sand on minor drainage lines

MI AtpGwApy TpTb CcCs
Open Scrub of *Acacia tumida* var. *pilbarensis*, *Grevillea wickhamii* subsp. *hispidula* and *Acacia pyrifolia* var. *pyrifolia* over Hummock Grassland of *Triodia pungens* and *Triodia basedowii* over Open Tussock Grassland of **Cenchrus ciliaris* and **Cenchrus setiger* on brown sandy loam on minor drainage lines and floodplains

MI AtpPlAm TpTs ChEll
Open Scrub of *Acacia tumida* var. *pilbarensis*, *Petalostylis labicheoides* and *Acacia monticola* over Open Hummock Grassland of *Triodia pungens* and *Triodia* sp. Shovelanna Hill (S.van Leeuwen 3835) with Low Open Woodland of *Corymbia hamerselyana* and *Eucalyptus leucophloia* subsp. *leucophloia* on red brown sandy loam on minor drainage lines

MI PlAtpAm ChEll TwTp
Shrubland of *Petalostylis labicheoides*, *Acacia tumida* var. *pilbarensis* and *Acacia monticola* with Low Open Woodland of *Corymbia hamerselyana* and *Eucalyptus leucophloia* subsp. *leucophloia* over Open Hummock Grassland of *Triodia wiseana* and *Triodia pungens* on red brown loam on minor drainage lines

Vegetation of calcrete plains and flood plains

CP TwTa Ese AbPlApyp
Hummock Grassland of *Triodia wiseana* and *Triodia angusta* with Open Mallee of *Eucalyptus socialis* subsp. *eucentrica* and Open Shrubland of *Acacia bivenosa*, *Petalostylis labicheoides* and *Acacia pyrifolia* var. *pyrifolia* on light brown clay loam on calcrete plains and rises

FP Tp ChApr GrwhApypAb
Hummock Grassland of *Triodia pungens* with Scattered Low Trees of *Corymbia hamersleyana* and *Acacia pruinocarpa* over Open Shrubland of *Grevillea wickhamii* subsp. *hispidula*, *Acacia pyrifolia* var. *pyrifolia* and *Acacia bivenosa* on brown loamy sand on floodplains

FP TtEua ExAa AprAtpErlo
Tussock Grassland of *Themeda triandra* and *Eulalia aurea* with Low Woodland of *Eucalyptus xerothermica* and *Acacia aptaneura* over Open Shrubland of *Acacia pruinocarpa*, *Acacia tumida* var. *pilbarensis* and *Eremophila longifolia* on red brown clay loam on unincised drainage lines

FP TtEuaCc ChEx AdAacAmc
Tussock Grassland of *Themeda triandra*, *Eulalia aurea* and **Cenchrus ciliaris* with Low Open Woodland of *Corymbia hamersleyana* and *Eucalyptus xerothermica* over High Open Shrubland of *Acacia dictyophleba*, *Acacia ancistrocarpa* and *Acacia macraneura* on brown silty clay loam on floodplains

Vegetation of gorges

GG AtpGrwhGoro ErmuTt Ch
Open scrub of *Acacia tumida* var. *pilbarensis*, *Grevillea wickhamii* subsp. *hispidula*, *Gossypium robinsonii* over very open tussock grassland of *Eriachne mucronata*, *Themeda triandra* with very open hummock grassland of *Triodia pungens* and scattered low trees of *Corymbia hamerselyana* on dark reddish brown sandy clay loam in gullies and gorges

GG CfEllFib AhDovmAsha CyaErmuThmb
Low Woodland of *Corymbia ferriticola*, *Eucalyptus leucophloia* subsp. *leucophloia* and *Ficus brachypoda* over Open Shrubland of *Acacia hamersleyensis*, *Dodonaea viscosa* subsp. *mucronata* and *Astrotricha hamptonii* over Open Tussock Grassland of *Cymbopogon ambiguus*, *Eriachne mucronata* and *Themeda* sp. Mt Barricade on red brown loam along clifflines and gorges

Cleared

Disturbed

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Area C West to Yandi Flora and Vegetation Assessment

Legend: Vegetation Unit Mapping

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Appendix F: Overview of Existing Priority Flora and Priority Ecological Community Locations

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650000 685000 720000 755000 790000

7540000 7505000 7470000 7435000

Marillana Creekline

Lamb Creekline

Area C North Creekline

Yandicoogina Creekline

Pebble Mouse Creekline

Study Area

Priority Ecological Community (DBCA 2019b)

Inclusive of 50 km Buffer

- Brockman Iron cracking clay communities
- Coolibah - Lignum Flats, sub type 1
- Coolibah - Lignum Flats, sub type 2
- Fortescue Marsh
- Fortescue Valley Sand Dunes
- Freshwater claypans of the Fortescue Valley
- Kumina LS
- Narbung LS
- Riparian communities of springs and Pools Pilbara
- Weeli Wolli Spring Community
- West Angelas

Relevé

Mapping note

Priority Flora (DBCA 2019a, 2019c)

- Threatened
- Priority 1
- Prioirty 2
- Priority 3
- Priority 4

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Area C West to Yandi Flora and Vegetation Assessment

Figure F: Overview of Existing Priority Flora and Priority Ecological Community Locations

Coordinate System: GDA 1994 MGA Zone 50

0 5 10 15 Kilometres

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Author: J. Atkinson | Drawn: L. Robinson | Date: 26-03-2019 | Figure Ref: 2465-18-ENVDR-1Rev0_190326_FigF_PFlora_PEC_Overview

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Appendix G: Sample Site Data

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Project: 2465-18 **Site:** ACNC1RV01
Type: Relevé
Date: 16/11/2018 **Described by:** LV
MGA Zone: 50 **Easting:** 700716 **Northing:** 7473928
Vegetation: *Corymbia hamersleyana, Eucalyptus xerothermica* low open woodland over *Acacia pyrifolia* var. *pyrifolia* low open shrubland
Veg Condition: Excellent
Seasonal Condition: Average
Fire Age: 0-2 years
Soil: Brown Clay loam
Habitat: Plain

Species List

Name	Cover	Height (m)
Acacia pyrifolia var. *pyrifolia*	3.0	0.3
Corymbia hamersleyana	1.0	5
Eucalyptus xerothermica	1.0	5
Triodia wiseana	1.0	0.2
Corchorus lasiocarpus	0.1	0.3
Eriachne mucronata	0.1	0.35
Goodenia sp.	0.1	0.2
Gossypium australe	0.1	0.5
Gossypium robinsonii	0.1	0.5
Indigofera monophylla	0.1	0.1
Paraneurachne muelleri	0.1	0.2
Ptilotus astrolasius	0.1	0.35
Ptilotus exaltatus	0.1	0.25
Senna artemisioides subsp. *oligophylla*	0.1	0.1
Senna notabilis	0.1	0.1
Stylobasium spathulatum	0.1	1

Project: 2465-18 **Site:** ACNC1RV02
Type: Relevé
Date: 16/11/2018 **Described by:** LV
MGA Zone: 50 **Easting:** 700671 **Northing:** 7474053
Vegetation: *Eucalyptus camaldulensis, Eucalyptus victrix* low open woodland over *Pluchea rubelliflora* scattered herbs over *Eulalia aurea* very open tussock grassland
Veg Condition: Excellent
Seasonal Condition: Average
Fire Age: 0-2 years
Soil: Red brown Sandy clay loam
Habitat: Minor drainage

Species List

Name	Cover	Height (m)
Eulalia aurea	3.0	0.3
Eucalyptus camaldulensis	1.0	7
Eucalyptus victrix	1.0	9
Pluchea rubelliflora	1.0	0.3
Acacia tumida var. *pilbarensis*	0.5	0.2
Alternanthera nana	0.1	0.1
Cleome viscosa	0.1	0.2
Corchorus crozophorifolius	0.1	0.1
Gossypium robinsonii	0.1	0.2
Polycarpaea longiflora	0.1	0.2
Pterocaulon sphaeranthoides	0.1	0.3
Rhynchosia minima	0.1	0.2
Streptoglossa decurrens	0.1	0.2
Tephrosia densa	0.1	0.1

Project: 2465-18 **Site:** ACNC1RV03
Type: Relevé
Date: 16/11/2018 **Described by:** LV
MGA Zone: 50 **Easting:** 701434 **Northing:** 7471749
Vegetation: *Eucalyptus camaldulensis, Corymbia hamersleyana* scattered low trees *Acacia tumida* var. *pilbarensis, Petalostylis labicheoides* open scrub over *Eulalia aurea, Themeda triandra* open tussock grassland
Veg Condition: Excellent
Seasonal Condition: Average
Fire Age: 5-10 years
Soil: Red brown Sandy clay loam
Habitat: Minor drainage

Species List

Name	Cover	Height (m)
Acacia tumida var. *pilbarensis*	40.0	2.5
Eulalia aurea	2.0	0.5
Corymbia hamersleyana	1.0	6
Eucalyptus camaldulensis	1.0	9
Androcalva luteiflora	0.5	1.6
Eriachne sp.	0.5	0.3
Indigofera monophylla	0.5	0.3
Petalostylis labicheoides	0.5	2.5
Themeda triandra	0.5	0.4
Triodia pungens	0.5	0.3
Acacia maitlandii	0.1	1.6
Aristida inaequiglumis	0.1	0.4
Triodia wiseana	0.1	0.3

Project: 2465-18 **Site:** ACNC1RV04
Type: Relevé
Date: 16/11/2018 **Described by:** LV
MGA Zone: 50 **Easting:** 701478 **Northing:** 7471662
Vegetation: *Corymbia hamersleyana* scattered low trees over *Acacia tumida* var. *pilbarensis* scattered shrubs over *Acacia hilliana*, *Acacia adoxa* var. *adoxa* scattered low shrubs over *Triodia vanleeuwenii, T. wiseana, T. epactia* hummock grassland
Veg Condition: Excellent
Seasonal Condition: Average
Fire Age: 5-10 years
Soil: Red brown Sandy clay loam
Habitat: Footslope

Species List

Name	Cover	Height (m)
Triodia vanleeuwenii	30.0	0.2
Acacia tumida var. *pilbarensis*	10.0	2
Corymbia hamersleyana	2.0	5
Triodia wiseana	2.0	0.3
Triodia epactia	1.0	0.35
Acacia adoxa var. *adoxa*	0.5	0.4
Acacia hilliana	0.5	0.4
Acacia monticola	0.5	1.8
Grevillea wickhamii	0.1	1.9
Senna glutinosa subsp. *glutinosa*	0.1	1

Project: 2465-18 **Site:** ACNC1RV05
Type: Relevé
Date: 17/11/2018 **Described by:** LV
MGA Zone: 50 **Easting:** 699644 **Northing:** 7476632
Vegetation: *Eucalyptus camaldulensis*, *Melaleuca argentea* open forest over *Melaleuca glomerata* tall shrubland over *Cyperus vaginatus, Typha domingensis* open sedge land.
Veg Condition: Very Good
Seasonal Condition: Average
Fire Age: >10 years
Soil: Brown Sand
Habitat: Major drainage

Species List

Name	Cover	Height (m)
Eucalyptus camaldulensis	30.0	20
Melaleuca argentea	30.0	11
Cyperus vaginatus	20.0	0.4
Melaleuca glomerata	10.0	5
Typha domingensis	10.0	2
Eulalia aurea	2.0	0.4
Acacia ampliceps	0.5	1.5
Acacia coriacea subsp. *pendens*	0.5	2
Eleocharis atropurpurea	0.5	0.2
Lobelia arnhemiaca	0.5	0.1
Acacia tumida var. *pilbarensis*	0.1	2.1
Gossypium robinsonii	0.1	2.1
Stemodia grossa	0.1	0.3
Stylobasium spathulatum	0.1	1.8

Project: 2465-18 **Site:** ACNC1RV06
Type: Relevé
Date: 17/11/2018 **Described by:** LV
MGA Zone: 50 **Easting:** 699930 **Northing:** 7476923
Vegetation: *Eucalyptus camaldulensis* woodland over *Melaleuca glomerata* tall open scrub over *Pluchea rubelliflora* scattered herbs over *Eulalia aurea* scattered tussocks.
Veg Condition: Very Good
Seasonal Condition: Average
Fire Age: >10 years
Soil: Brown Sand
Habitat: Major drainage

Species List

Name	Cover	Height (m)
Melaleuca glomerata	40.0	2.2
Eucalyptus camaldulensis	35.0	11
Eulalia aurea	1.0	0.4
Pluchea rubelliflora	1.0	0.3
Gossypium robinsonii	0.5	3
Acacia ampliceps	0.1	1.6
Acacia pyrifolia var. *pyrifolia*	0.1	0.6
Acacia tumida var. *pilbarensis*	0.1	2
Corchorus crozophorifolius	0.1	1.5
Cymbopogon procerus	0.1	0.4
Gossypium robinsonii	0.1	2.1
Stemodia grossa	0.1	0.2
Tephrosia densa	0.1	0.3

Project: 2465-18 **Site:** ACNC1RV07
Type: Relevé
Date: 17/11/2018 **Described by:** LV
MGA Zone: 50 **Easting:** 700611 **Northing:** 7477577
Vegetation: *Gossypium robinsonii, Acacia bivenosa* tall shrubland over *Acacia pyrifolia* var. *pyrifolia* shrubland over *Themeda triandra* scattered tussock grasses and *Triodia epactia* scattered hummock grasses
Veg Condition: Very Good
Seasonal Condition: Average
Fire Age: >10 years
Soil: Red brown Sandy clay loam
Habitat: Floodplain

Species List

Name	Cover	Height (m)
Acacia bivenosa	10.0	2.5
Acacia pyrifolia var. *pyrifolia*	10.0	1.8
Gossypium robinsonii	10.0	3
Themeda triandra	1.0	0.4
Triodia epactia	1.0	0.3
Acacia tumida var. *pilbarensis*	0.5	1.9
Myoporum montanum	0.5	1.9
Androcalva luteiflora	0.1	0.8
Atalaya hemiglauca	0.1	1.5
Grevillea pyramidalis	0.1	3
Grevillea wickhamii	0.1	2.5
Stylobasium spathulatum	0.1	1.7

Project: 2465-18 **Site:** ACNC1RV08
Type: Relevé
Date: 17/11/2018 **Described by:** LV
MGA Zone: 50 **Easting:** 701091 **Northing:** 7477915
Vegetation: *Corymbia hamersleyana, Eucalyptus leucophloia* subsp. *leucophloia* scattered low trees over *Acacia inaequilatera, Hakea chordophylla* tall open shrubland over *Triodia wiseana* hummock grassland
Veg Condition: Excellent
Seasonal Condition: Average
Fire Age: >10 years
Soil: Red brown Sandy clay loam
Habitat: Footslope

Species List

Name	Cover	Height (m)
Triodia wiseana	50.0	0.4
Acacia inaequilatera	3.0	3
Corymbia hamersleyana	1.0	6
Eucalyptus leucophloia subsp. *leucophloia*	1.0	7
Hakea chordophylla	1.0	4
Acacia ancistrocarpa	0.5	0.5
Acacia bivenosa	0.5	2.5
Petalostylis labicheoides	0.5	2.5

Project: 2465-18 **Site:** ACNC2RV01
Type: Relevé
Date: 21/11/2018 **Described by:** LV
MGA Zone: 50 **Easting:** 714498 **Northing:** 7479593
Vegetation: *Acacia aptaneura* low open woodland over *Senna artemisioides* subsp. *oligophylla* shrubland over *Triodia wiseana* hummock grassland
Veg Condition: Excellent
Seasonal Condition: Average
Fire Age: >10 years
Soil: Reddish brown Sandy clay loam
Habitat: Hillslope

Species List

Name	Cover	Height (m)
Triodia wiseana	40.0	0.4
Senna artemisioides subsp. *oligophylla*	31.0	1.5
Acacia aptaneura	3.0	6
Acacia ancistrocarpa	0.5	1.7
Acacia dictyophleba	0.1	1.5
Acacia inaequilatera	0.1	2.5
Eucalyptus leucophloia subsp. *leucophloia*	0.1	6
Hakea chordophylla	0.1	4

Project: 2465-18 **Site:** ACNC2RV02
Type: Relevé
Date: 21/11/2018 **Described by:** LV
MGA Zone: 50 **Easting:** 714304 **Northing:** 7479462
Vegetation: *Eucalyptus camaldulensis, Eucalyptus victrix* scattered tall trees over **Cenchrus setiger, *Cenchrus ciliaris* open tussock grassland
Veg Condition: Poor
Seasonal Condition: Average
Fire Age: 0-2 years
Soil: Brown Sandy clay loam
Habitat: Major drainage

Species List

Name	Cover	Height (m)
**Cenchrus ciliaris*	6.0	0.4
**Cenchrus setiger*	6.0	0.4
Eucalyptus camaldulensis	2.0	11
Eucalyptus victrix	1.0	11
Atalaya hemiglauca	0.5	0.5
Santalum lanceolatum	0.5	0.5
Seringia nephrosperma	0.5	0.2
Acacia pyrifolia var. *pyrifolia*	0.1	0.4
Tephrosia densa	0.1	0.3

* denotes weed species

Project: 2465-18 **Site:** ACNC2RV03
Type: Relevé
Date: 21/11/2018 **Described by:** LV
MGA Zone: 50 **Easting:** 714600 **Northing:** 7479987
Vegetation: *Eucalyptus victrix* scattered tall trees over *Atalaya hemiglauca* tall open shrubland over *Myoporum montanum* open shrubland over *Themeda triandra, *Cenchrus setiger, *Cenchrus ciliaris* tussock grassland with *Triodia pungens* very open hummock grassland to hummock grassland
Veg Condition: Poor
Seasonal Condition: Average
Fire Age: 5-10 years
Soil: Red brown Loam
Habitat: Floodplain

Species List

Name	Cover	Height (m)
Themeda triandra	15.0	0.4
Atalaya hemiglauca	11.0	2.1
**Cenchrus ciliaris*	5.0	0.3
**Cenchrus setiger*	5.0	0.3
Myoporum montanum	5.0	1.7
Triodia pungens	3.0	0.4
Eucalyptus victrix	1.0	11
Corymbia hamersleyana	0.5	6
Acacia pyrifolia var. *pyrifolia*	0.2	0.5
Enneapogon lindleyanus	0.1	0.35

* denotes weed species

Project: 2465-18 **Site:** ACNC2RV04
Type: Relevé
Date: 21/11/2018 **Described by:** LV
MGA Zone: 50 **Easting:** 714703 **Northing:** 7480147
Vegetation: *Corymbia hamersleyana* scattered low trees over *Acacia inaequilatera* tall open shrubland over *Triodia wiseana* hummock grassland
Veg Condition: Excellent
Seasonal Condition: Average
Fire Age: 5-10 years
Soil: Red brown Sandy clay loam
Habitat: Hillslope

Species List

Name	Cover	Height (m)
Triodia wiseana	45.0	0.4
Acacia inaequilatera	4.0	2.5
Corymbia hamersleyana	1.0	8
Eremophila fraseri subsp. *fraseri*	0.2	0.8
Eremophila sp. Hamersley Range (K. Walker KW 136) P3	0.1	1.8

Project: 2465-18 **Site:** ACNC2RV05
Type: Relevé
Date: 21/11/2018 **Described by:** LV
MGA Zone: 50 **Easting:** 714833 **Northing:** 7480069
Vegetation: *Eucalyptus victrix* open woodland over *Acacia tumida* var. *pilbarensis* open shrubland over *Triodia pungens* hummock grassland
Veg Condition: Good
Seasonal Condition: Average
Fire Age: 5-10 years
Soil: Red brown Sandy clay loam
Habitat: Floodplain

Species List

Name	Cover	Height (m)
Triodia pungens	50.0	0.4
Acacia tumida var. *pilbarensis*	5.0	1.9
Eucalyptus victrix	3.0	11
Acacia pyrifolia var. *pyrifolia*	0.5	1.2
Grevillea wickhamii	0.5	0.7
**Cenchrus ciliaris*	0.1	0.3
Seringia nephrosperma	0.1	0.5

* denotes weed species

Project: 2465-18 **Site:** ACNC2RV06
Type: Relevé
Date: 21/11/2018 **Described by:** LV
MGA Zone: 50 **Easting:** 715406 **Northing:** 7480191
Vegetation: *Eucalyptus camaldulensis, Eucalyptus victrix* low woodland over *Melaleuca glomerata* very scattered tall shrubs with *Acacia tumida* var. *pilbarensis* scattered tall shrubs over *Corchorus crozophorifolius* scattered shrubs over *Tephrosia densa* scattered low shrubs over **Cenchrus ciliaris*, *Eulalia aurea*, *Cymbopogon procerus, Themeda triandra* open tussock grassland with *Triodia pungens* scattered hummock grassland
Veg Condition: Good
Seasonal Condition: Average
Fire Age: >10 years
Soil: Brown Sandy clay loam
Habitat: Major drainage

Species List

Name	Cover	Height (m)
Eucalyptus camaldulensis	20.0	9
Eucalyptus victrix	10.0	9
**Cenchrus ciliaris*	5.0	0.4
Eulalia aurea	5.0	0.5
Corchorus crozophorifolius	4.0	1.4
Cymbopogon procerus	2.0	0.5
Acacia tumida var. *pilbarensis*	1.0	2.1
Tephrosia densa	1.0	0.7
Triodia pungens	1.0	0.3
Cyperus vaginatus	0.5	0.5
Melaleuca glomerata	0.5	2.1
Acacia maitlandii	0.1	1.7
Gossypium robinsonii	0.1	1.5
Indigofera monophylla	0.1	0.5

Name	Cover	Height (m)
Themeda triandra	0.1	0.5
Triodia wiseana	0.1	0.3

* denotes weed species

Project: 2465-18 **Site:** MCRV01
Type: Relevé
Date: 17/11/2018 **Described by:** LV
MGA Zone: 50 **Easting:** 688149 **Northing:** 7483230
Vegetation: *Eucalyptus camaldulensis* tall woodland over *Acacia pyrifolia* var. *pyrifolia* scattered shrubs over *Tephrosia densa* scattered low shrubs over *Cymbopogon procerus, Eulalia aurea* open tussock grassland
Veg Condition: Excellent
Seasonal Condition: Average
Fire Age: >10 years
Soil: Red brown Sandy clay loam
Habitat: Major drainage

Species List

Name	Cover	Height (m)
Cymbopogon procerus	35.0	0.4
Eucalyptus camaldulensis	25.0	12
Eulalia aurea	10.0	0.4
Acacia pyrifolia var. *pyrifolia*	1.0	2.1
Tephrosia densa	1.0	0.4
Acacia maitlandii	0.5	2
Themeda triandra	0.1	0.4

Project: 2465-18 **Site:** MCRV02
Type: Relevé
Date: 17/11/2018 **Described by:** LV
MGA Zone: 50 **Easting:** 688221 **Northing:** 7483291
Vegetation: *Corymbia hamersleyana* scattered low trees over *Acacia tenuissima* scattered tall shrubs over *Triodia wiseana* hummock grassland
Veg Condition: Excellent
Seasonal Condition: Average
Fire Age: >10 years
Soil: Red brown Sandy clay loam
Habitat: Plain

Species List

Name	Cover	Height (m)
Triodia wiseana	40.0	0.4
Acacia tenuissima	1.0	2.1
Corymbia hamersleyana	1.0	8
Acacia inaequilatera	0.5	2.2
Acacia pruinocarpa	0.5	2.1
Eucalyptus gamophylla	0.5	3
Acacia ancistrocarpa	0.1	1.5

Project: 2465-18 **Site:** MCRV03
Type: Relevé
Date: 18/11/2018 **Described by:** LV
MGA Zone: 50 **Easting:** 688797 **Northing:** 7470208
Vegetation: *Acacia aptaneura*, *Corymbia deserticola* subsp. *deserticola* low woodland over *Mariana villosa* scattered low shrubs over *Themeda triandra*, *Chrysopogon fallax* open tussock grassland
Veg Condition: Excellent
Seasonal Condition: Average
Fire Age: 5-10 years
Soil: Red brown Clay loam
Habitat: Floodplain

Species List

Name	Cover	Height (m)
Acacia aptaneura	29.0	7
Corymbia deserticola subsp. *deserticola*	2.0	4
Maireana villosa	1.0	0.4
Chrysopogon fallax	0.5	0.3
Ptilotus astrolasius	0.5	0.4
Themeda triandra	0.5	0.4

Project: 2465-18 **Site:** MCRV04
Type: Relevé
Date: 18/11/2018 **Described by:** LV
MGA Zone: 50 **Easting:** 691568 **Northing:** 7473779
Vegetation: *Acacia tumida* var. *pyrifolia* tall open shrubland over *Tephrosia densa* scattered low shrubs over *Cymbopogon procerus* very open tussock grassland
Veg Condition: Excellent
Seasonal Condition: Average
Fire Age: 0-2 years
Soil: Brown Sandy clay loam
Habitat: Minor drainage

Species List

Name	Cover	Height (m)
Cymbopogon procerus	3.0	0.35
Acacia tumida var. *pilbarensis*	2.0	2.1
Acacia tumida var. *pilbarensis*	1.0	2.1
Tephrosia densa	1.0	0.3
Acacia pyrifolia var. *pyrifolia*	0.5	0.5
Gossypium robinsonii	0.5	1.6
Themeda triandra	0.5	0.35

Project: 2465-18 **Site:** MCRV05
Type: Relevé
Date: 18/11/2018 **Described by:** LV
MGA Zone: 50 **Easting:** 691585 **Northing:** 7473870
Vegetation: *Corymbia hamersleyana* open woodland over *Acacia pyrifolia* scattered low shrubs over *Eriachne* sp. very open tussock grassland and *Triodia pungens* very open hummock grassland
Veg Condition: Excellent
Seasonal Condition: Average
Fire Age: 0-2 years
Soil: Brown Sandy clay loam
Habitat: Floodplain

Species List

Name	Cover	Height (m)
Eriachne sp.	4.0	0.3
Corymbia hamersleyana	2.0	6
Triodia pungens	2.0	0.2
Acacia pyrifolia	1.0	0.5
Ptilotus astrolasius	0.5	0.5
Ptilotus exaltatus	0.1	0.5
Trichodesma zeylanicum	0.1	1.2

Project: 2465-18 **Site:** MCRV06
Type: Relevé
Date: 19/11/2018 **Described by:** LV
MGA Zone: 50 **Easting:** 685105 **Northing:** 7480018
Vegetation: *Acacia pruinocarpa, Acacia inaequilatera, Acacia bivenosa* shrubland over *Triodia wiseana* hummock grassland
Veg Condition: Very Good
Seasonal Condition: Average
Fire Age: >10 years
Soil: Red brown Sandy clay loam
Habitat: Stony plain

Species List

Name	Cover	Height (m)
Triodia wiseana	60.0	0.5
Acacia pruinocarpa	30.0	3
Acacia inaequilatera	10.0	3
Acacia bivenosa	1.0	3.5
Ptilotus astrolasius	0.5	0.3
Eremophila forrestii	0.1	0.3

Project: 2465-18 **Site:** MCRV07
Type: Relevé
Date: 19/11/2018 **Described by:** LV
MGA Zone: 50 **Easting:** 685038 **Northing:** 7480043
Vegetation: *Eucalyptus camaldulensis* scattered trees over *Eucalyptus xerothermica* low open woodland over *Petalostylis labicheoides* tall shrubland over *Tephrosia densa* low shrubs over *Themeda triandra, Eulalia aurea, Cymbopogon procerus* tussock grassland
Veg Condition: Very Good
Seasonal Condition: Average
Fire Age: >10 years
Soil: Brown Loam sand
Habitat: Major drainage

Species List

Name	Cover	Height (m)
Eulalia aurea	20.0	0.4
Petalostylis labicheoides	20.0	3
Cymbopogon procerus	15.0	0.4
Eucalyptus xerothermica	10.0	8
Themeda triandra	10.0	0.4
Eucalyptus camaldulensis	2.0	13
Tephrosia densa	1.0	0.3
Triodia longiceps	0.5	0.5

Project: 2465-18 **Site:** MCRV08
Type: Relevé
Date: 19/11/2018 **Described by:** LV
MGA Zone: 50 **Easting:** 685968 **Northing:** 7481907
Vegetation: *Eucalyptus camaldulensis* scattered tall trees over *Eucalyptus xerothermica* scattered low trees over *Acacia pyrifolia* var. *pyrifolia* scattered tall shrubs over *Tephrosia densa* low open shrubland over *Cymbopogon procerus, Eulalia aurea* very open tussock grassland
Veg Condition: Very Good
Seasonal Condition: Average
Fire Age: >10 years
Soil: Red brown Sandy loam
Habitat: Major drainage

Species List

Name	Cover	Height (m)
Eucalyptus camaldulensis	3.0	12
Tephrosia densa	3.0	0.4
Cymbopogon procerus	2.0	0.4
Eulalia aurea	2.0	0.4
Acacia pyrifolia var. *pyrifolia*	1.0	2.1
Eucalyptus xerothermica	1.0	9
Themeda triandra	0.5	0.4

Project: 2465-18 **Site:** MCRV09
Type: Relevé
Date: 19/11/2018 **Described by:** LV
MGA Zone: 50 **Easting:** 685972 **Northing:** 7481839
Vegetation: *Corymbia hamersleyana* low open woodland over *Petalostylis labicheoides, Acacia bivenosa* tall open shrubland over *Acacia pyrifolia* var. *pyrifolia* scattered shrubs over *Ptilotus astrolasius, Corchorus lasiocarpus* scattered low shrubs over *Triodia longiceps* open hummock grassland
Veg Condition: Very Good
Seasonal Condition: Average
Fire Age: 5-10 years
Soil: Red brown Sandy clay loam
Habitat: Plain

Species List

Name	Cover	Height (m)
Triodia longiceps	25.0	0.3
Petalostylis labicheoides	5.0	2.1
Corymbia hamersleyana	3.0	9
Acacia bivenosa	1.0	2.5
Acacia pyrifolia var. *pyrifolia*	1.0	1.8
Corchorus lasiocarpus	0.5	0.2
Ptilotus astrolasius	0.5	0.3

Project: 2465-18 **Site:** MCRV10
Type: Relevé
Date: 20/11/2018 **Described by:** LV
MGA Zone: 50 **Easting:** 697312 **Northing:** 7485773
Vegetation: *Eucalyptus camaldulensis* tall woodland over *Melaleuca glomerata* tall open shrubland over *Corchorus crozophorifolius* scattered shrubs over *Tephrosia densa, Pluchea rubelliflora* low open shrubland over *Eulalia aurea, Sorghum plumosum, Themeda triandra* open tussock grassland
Veg Condition: Good
Seasonal Condition: Average
Fire Age: >10 years
Soil: Reddish brown Sandy clay loam
Habitat: Major drainage

Species List

Name	Cover	Height (m)
Eucalyptus camaldulensis	29.0	12
Eulalia aurea	12.0	0.5
Sorghum plumosum	8.0	0.5
Melaleuca glomerata	3.0	3
Tephrosia densa	3.0	0.4
Themeda triandra	3.0	0.5
Corchorus crozophorifolius	1.0	1.5
Cyperus vaginatus	1.0	0.5
Pluchea rubelliflora	1.0	0.35
**Vachellia farnesiana*	0.1	1.6
Acacia bivenosa	0.1	2.5
Acacia pyrifolia var. *pyrifolia*	0.1	1.5
Gossypium robinsonii	0.1	2.1
Stemodia grossa	0.1	0.5

Project: 2465-18 **Site:** AC3MN01
Type: Mapping Note
Date: 22/11/2018 **Described by:** LV
MGA Zone: 50 **Easting:** 717461 **Northing:** 7471437
Vegetation: *Eucalyptus camaldulensis, Corymbia ferriticola* scattered low trees over *Eulalia aurea, Cymbopogon ambiguus* scattered tussock
Veg Condition: Good
Seasonal Condition: Average
Fire Age: >10 years
Soil: Red brown Sandy clay loam
Habitat: Gorge

Species List

Name	Cover	Height (m)
Corymbia ferriticola	1.0	3
Eulalia aurea	1.0	0.4
Astrotricha hamptonii	0.5	2.5
Atalaya hemiglauca	0.5	2.5
Corchorus lasiocarpus subsp. *lasiocarpus*	0.5	0.4
Cymbopogon ambiguus	0.5	0.3
Eucalyptus camaldulensis	0.5	8

Project: 2465-18 **Site:** AC6MN01
Type: Mapping Note
Date: 15/11/2018 **Described by:** LV
MGA Zone: 50 **Easting:** 712677 **Northing:** 7467980
Vegetation: *Corymbia hamersleyana* low woodland over *Acacia tumida* var. *pilbarensis, Petalostylis labicheoides* open heath over *Themeda triandra* tussock grassland
Veg Condition: Excellent
Seasonal Condition: Average
Fire Age: >10 years
Soil: Red brown Sandy clay loam
Habitat: Minor drainage

Species List

Name	Cover	Height (m)
Acacia tumida var. *pilbarensis*	40.0	1.6
Themeda triandra	40.0	0.4
Corymbia hamersleyana	29.0	8
Petalostylis labicheoides	1.0	1.7
Androcalva luteiflora	0.5	1.5
Triodia pungens	0.1	0.3

Project: 2465-18 **Site:** AC8MN01
Type: Mapping Note
Date: 15/11/2018 **Described by:** LV
MGA Zone: 50 **Easting:** 712505 **Northing:** 7465526
Vegetation: *Corymbia hamersleyana, Eucalyptus leucophloia* subsp. *leucophloia* scattered low trees over *Eucalyptus gamophylla* low open woodland over *Acacia tenuissima* scattered shrubs over *Corchorus lasiocarpus* subsp. *lasiocarpus, Acacia maitlandii* low shrubland over *Triodia pungens* open hummock grassland.
Veg Condition: Excellent
Seasonal Condition: Average
Fire Age: 2-5 years
Soil: Red brown Sandy clay loam
Habitat: Plain

Species List

Name	Cover	Height (m)
Corchorus lasiocarpus subsp. *lasiocarpus*	35.0	0.4
Triodia pungens	15.0	0.25
Eucalyptus gamophylla	3.0	3
Acacia maitlandii	1.0	0.4
Acacia tenuissima	1.0	1.6
Corymbia hamersleyana	1.0	5
Eriachne mucronata	1.0	0.2
Acacia tumida var. *pilbarensis*	0.5	1.5
Eucalyptus leucophloia subsp. *leucophloia*	0.5	5
Ptilotus astrolasius	0.5	0.4

Project: 2465-18 **Site:** AC9MN01
Type: Mapping Note
Date: 15/11/2018 **Described by:** LV
MGA Zone: 50 **Easting:** 711810 **Northing:** 7463539
Vegetation: *Corymbia hamersleyana*, *Eucalyptus xerothermica* open woodland over *Petalostylis labicheoides, Acacia pyrifolia* var. *pyrifolia* tall shrubland over *Themeda triandra* tussock grassland.
Veg Condition: Excellent
Seasonal Condition: Average
Fire Age: >10 years
Soil: Red brown Sandy clay loam
Habitat: Minor drainage

Species List

Name	Cover	Height (m)
Themeda triandra	50	0.5
Petalostylis labicheoides	20	2.5
Acacia pyrifolia var. *pyrifolia*	3	2.1
Eucalyptus xerothermica	2	11
Corymbia hamersleyana	1	12

Project: 2465-18 **Site:** ACNC1MN01
Type: Mapping Note
Date: 16/11/2018 **Described by:** LV
MGA Zone: 50 **Easting:** 700709 **Northing:** 7474124
Vegetation: *Eucalyptus xerothermica*, *Eucalyptus leucophloia* low open woodland over *Triodia vanleuwennii* very open hummock grassland
Veg Condition: Excellent
Seasonal Condition: Average
Fire Age: 0-2 years
Soil: Red brown Sandy clay loam
Habitat: Plain

Species List

Name	Cover	Height (m)
Triodia vanleeuwenii	3.0	0.2
Eucalyptus leucophloia subsp. *leucophloia*	1.0	8
Eucalyptus xerothermica	1.0	6
Acacia ancistrocarpa	0.5	1.5
Eucalyptus gamophylla	0.5	3
Triodia pungens	0.5	0.2

Project: 2465-18 **Site:** ACNC1MN03
Type: Mapping Note
Date: 16/11/2018 **Described by:** LV
MGA Zone: 50 **Easting:** 700888 **Northing:** 7473272
Vegetation: *Eucalyptus leucophloia* subsp*. leucophloia, Eucalyptus gamophylla* low open woodland over *Triodia vanleeuwenii* very open hummock grassland
Veg Condition: Excellent
Seasonal Condition: Average
Fire Age: 0-2 years
Soil: Red brown Sandy clay loam
Habitat: Plain

Species List

Name	Cover	Height (m)
Triodia vanleeuwenii	2.0	0.5
Eucalyptus gamophylla	1.0	1.5
Eucalyptus leucophloia subsp*. leucophloia*	1.0	4
Acacia bivenosa	0.5	1.6
Ptilotus calostachyus	0.5	0.4
Senna artemisioides subsp. *oligophylla*	0.5	0.9
Senna glutinosa subsp. *pruinosa*	0.5	0.2

Project: 2465-18 **Site:** M1MN01
Type: Mapping Note
Date: 20/11/2018 **Described by:** LV
MGA Zone: 50 **Easting:** 700703 **Northing:** 7486143
Vegetation: *Eucalyptus camaldulensis* tall scattered trees over *Melaleuca glomerata, Atalaya hemiglauca, Acacia coriacea* subsp. *pendens* tall shrubland over *Corchorus crozophorifolius* open heath over *Cymbopogon ambiguus, Cymbopogon procerus* scattered tussocks
Veg Condition: Good
Seasonal Condition: Average
Fire Age: >10 years
Soil: Red brown Sandy clay loam
Habitat: Major drainage

Species List

Name	Cover	Height (m)
Corchorus crozophorifolius	45.0	1.5
Melaleuca glomerata	26.0	5
Atalaya hemiglauca	2.0	5
Acacia coriacea subsp. *pendens*	1.0	3
Cymbopogon ambiguus	1.0	0.35
Eucalyptus camaldulensis	1.0	15
Cymbopogon procerus	0.1	0.4

Project: 2465-18 **Site:** M1MN02
Type: Mapping Note
Date: 20/11/2018 **Described by:** LV
MGA Zone: 50 **Easting:** 700490 **Northing:** 7486233
Vegetation: *Acacia inaequilatera, Acacia bivenosa, Petalostylis labicheoides* tall open shrubland over *Triodia wiseana* hummock grassland
Veg Condition: Very Good
Seasonal Condition: Average
Fire Age: 5-10 years
Soil: Red brown Sandy clay loam
Habitat: Hillslope

Species List

Name	Cover	Height (m)
Triodia wiseana	40	0.4
Acacia inaequilatera	2	3
Acacia bivenosa	1	3.5
Petalostylis labicheoides	1	3

Project: 2465-18 **Site:** M3MN01
Type: Mapping Note
Date: 16/11/2018 **Described by:** LV
MGA Zone: 50 **Easting:** 692239 **Northing:** 7482094
Vegetation: *Corymbia hamersleyana, Eucalyptus xerothermica* scattered trees over *Acacia dictyophleba* and *Acacia bivenosa* tall scattered shrubs over *Triodia wiseana* hummock grassland.
Veg Condition: Excellent
Seasonal Condition: Average
Fire Age: >10 years
Soil: Red brown Sandy clay loam
Habitat: Plain

Species List

Name	Cover	Height (m)
Triodia wiseana	40.0	0.4
Corymbia hamersleyana	2.0	8
Acacia dictyophleba	1.0	2.1
Acacia atkinsiana	0.5	1.9
Acacia bivenosa	0.5	2.1
Eucalyptus xerothermica	0.5	4

Project: 2465-18 **Site:** M4MN01
Type: Mapping Note
Date: 20/11/2018 **Described by:** LV
MGA Zone: 50 **Easting:** 681815 **Northing:** 7473890
Vegetation: *Corymbia hamersleyana, Eucalyptus xerothermica* low woodland over *Myoporum montanum* tall open shrubland over *Acacia pyrifolia* var. *pyrifolia* scattered shrubs over *Themeda triandra, Eulalia aurea* closed tussock grassland
Veg Condition: Good
Seasonal Condition: Average
Fire Age: 5-10 years
Soil: Red brown Sandy clay loam
Habitat: Minor drainage

Species List

Name	Cover	Height (m)
Themeda triandra	50.0	0.5
Eulalia aurea	40.0	0.5
Corymbia hamersleyana	20.0	8
Myoporum montanum	5.0	2.1
Eucalyptus xerothermica	2.0	8
Acacia pyrifolia var. *pyrifolia*	1.0	1.1
Acacia aptaneura	0.5	1.9
Gossypium robinsonii	0.5	1.8

Project: 2465-18 **Site:** M4MN02
Type: Mapping Note
Date: 20/11/2018 **Described by:** LV
MGA Zone: 50 **Easting:** 681861 **Northing:** 7473992
Vegetation: *Acacia aptaneura* low woodland over *Acacia pruinocarpa* tall open shrubland over *Senna artemisioides* subsp. *helmsii* shrubland over *Triodia pungens* very open hummock grassland with *Themeda triandra* scattered tussocks
Veg Condition: Very Good
Seasonal Condition: Average
Fire Age: 5-10 years
Soil: Red brown Sandy clay loam
Habitat: Plain

Species List

Name	Cover	Height (m)
Acacia aptaneura	25.0	7
Senna artemisioides subsp. *helmsii*	25.0	1.5
Acacia pruinocarpa	3.0	5
Triodia pungens	3.0	0.5
Themeda triandra	1.0	0.3
Eulalia aurea	0.5	0.4
Ptilotus obovatus	0.5	0.5

Project: 2465-18 **Site:** M4MN03
Type: Mapping Note
Date: 20/11/2018 **Described by:** LV
MGA Zone: 50 **Easting:** 683714 **Northing:** 7476812
Vegetation: *Acacia pruinocarpa*, *Acacia aptaneura* tall shrubland over *Triodia wiseana* hummock grassland
Veg Condition: Excellent
Seasonal Condition: Average
Fire Age: >10 years
Soil: Red brown Sandy clay loam
Habitat: Plain

Species List

Name	Cover	Height (m)
Triodia wiseana	55	0.4
Acacia pruinocarpa	20	5
Acacia aptaneura	2	5

Project: 2465-18 **Site:** M5MN01
Type: Mapping Note
Date: 20/11/2018 **Described by:** LV
MGA Zone: 50 **Easting:** 681178 **Northing:** 7471478
Vegetation: *Eucalyptus gamophylla* low woodland over *Acacia atkinsiana* tall shrubland over *Triodia pungens*, *Triodia vanleeuwenii* hummock grassland
Veg Condition: Excellent
Seasonal Condition: Average
Fire Age: >10 years
Soil: Red brown Sandy clay loam
Habitat: Plain

Species List

Name	Cover	Height (m)
Triodia vanleeuwenii	35.0	0.4
Eucalyptus gamophylla	20.0	5
Acacia atkinsiana	12.0	2.5
Triodia pungens	3.0	0.5
Eucalyptus leucophloia subsp. *leucophloia*	0.5	5
Hakea chordophylla	0.1	3
Ptilotus rotundifolius	0.1	1.1
Senna artemisioides subsp. *oligophylla*	0.1	0.5

Project: 2465-18 **Site:** M5MN02
Type: Mapping Note
Date: 20/11/2018 **Described by:** LV
MGA Zone: 50 **Easting:** 681235 **Northing:** 7471493
Vegetation: *Eucalyptus gamophylla, Eucalyptus leucophloia* subsp. *leucophloia* and *Corymbia deserticola* low open woodland over *Acacia bivenosa, Acacia atkinsiana* tall open scrub over *Triodia wiseana, Triodia pungens* and *Triodia vanleeuwenii* open hummock grassland with *Acacia tumida* var. *pilbarensis*, *Acacia monticola* tall open shrubland over *Themeda triandra, Eulalia aurea* tussock grassland in minor drainage
Veg Condition: Very Good
Seasonal Condition: Average
Fire Age: >10 years
Soil: Red brown Sandy clay loam
Habitat: Minor drainage

Species List

Name	Cover	Height (m)
Acacia atkinsiana	35.0	2.5
Eulalia aurea	20.0	0.4
Themeda triandra	11.0	0.4
Triodia pungens	10.0	0.5
Acacia bivenosa	6.0	2.1
Acacia tumida var. *pilbarensis*	3.0	2.1
Acacia monticola	1.0	3
Corymbia deserticola	1.0	5
Eucalyptus gamophylla	1.0	5
Eucalyptus leucophloia subsp. *leucophloia*	1.0	8
Triodia wiseana	1.0	0.5
Corymbia hamersleyana	0.5	10
Ptilotus rotundifolius	0.5	0.6
Acacia pruinocarpa	0.1	2.3

Name	Cover	Height (m)
Hakea chordophylla	0.1	3
Petalostylis labicheoides	0.1	2.1
Triodia vanleeuwenii	0.1	0.4

Project: 2465-18 **Site:** MCMN01
Type: Mapping Note
Date: 17/11/2018 **Described by:** LV
MGA Zone: 50 **Easting:** 687853 **Northing:** 7483327
Vegetation: *Eucalyptus xerothermica* low open woodland over *Themeda triandra* closed tussock grassland
Veg Condition: Excellent
Seasonal Condition: Average
Fire Age: >10 years
Soil: Red brown Sandy clay loam
Habitat: Major drainage

Species List

Name	Cover	Height (m)
Themeda triandra	80.0	0.5
Eucalyptus xerothermica	3.0	6
Acacia bivenosa	0.5	1.8
Dodonaea lanceolata	0.5	2
Hakea lorea	0.5	3

Project: 2465-18 **Site:** MCMN02
Type: Mapping Note
Date: 17/11/2018 **Described by:** LV
MGA Zone: 50 **Easting:** 687922 **Northing:** 7483301
Vegetation: *Eucalyptus camaldulensis* tall scattered trees over *Stylobasium spathulatum, Acacia pyrifolia* var. *pyrifolia* and *Petalostylis labicheoides* tall shrubs over *Themeda triandra* open tussock grassland with *Triodia longiceps* scattered hummocks
Veg Condition: Excellent
Seasonal Condition: Average
Fire Age: >10 years
Soil: Red brown Sandy clay loam
Habitat: Floodplain

Species List

Name	Cover	Height (m)
Themeda triandra	20.0	0.4
Stylobasium spathulatum	2.0	1.9
Acacia pyrifolia var. *pyrifolia*	1.0	1.7
Eucalyptus camaldulensis	1.0	12
Triodia longiceps	1.0	1
Atalaya hemiglauca	0.5	4
Eucalyptus xerothermica	0.5	8
Petalostylis labicheoides	0.5	3

Project: 2465-18 **Site:** MCMN03
Type: Mapping Note
Date: 18/11/2018 **Described by:** LV
MGA Zone: 50 **Easting:** 691465 **Northing:** 7466509
Vegetation: *Corymbia hamersleyana, Eucalyptus leucophloia* subsp. *leucophloia* scattered low trees over *Acacia hilliana* scattered low shrubs over *Triodia wiseana* open hummock grassland
Veg Condition: Excellent
Seasonal Condition: Average
Fire Age: 0-2 years
Soil: Red brown Sandy clay loam
Habitat: Hillslope

Species List

Name	Cover	Height (m)
Triodia wiseana	20.0	0.25
Acacia hilliana	2.0	0.3
Corymbia hamersleyana	1.0	3
Eucalyptus leucophloia subsp. *leucophloia*	1.0	3
Schizachyrium fragile	1.0	0.35
Corchorus lasiocarpus	0.5	0.25
Acacia adoxa var. *adoxa*	0.1	0.2
Hakea chordophylla	0.1	3

Project: 2465-18 **Site:** MCMN04
Type: Mapping Note
Date: 18/11/2018 **Described by:** LV
MGA Zone: 50 **Easting:** 691332 **Northing:** 7466628
Vegetation: *Corymbia hamersleyana, Acacia inaequilatera* low open woodland with *Eucalyptus xerothermica* scattered low trees over *Triodia pungens* open hummock grassland with *Acacia pyrifolia* scattered shrubs over *Themeda triandra* scattered tussocks in minor drainage
Veg Condition: Excellent
Seasonal Condition: Average
Fire Age: 0-2 years
Soil: Red brown Sandy clay loam
Habitat: Footslope

Species List

Name	Cover	Height (m)
Triodia pungens	15.0	0.2
Trichodesma zeylanicum	10.0	1.6
Acacia inaequilatera	5.0	4
Acacia pyrifolia var. *pyrifolia*	1.0	1.5
Corymbia hamersleyana	1.0	4
Eucalyptus xerothermica	1.0	5
Themeda triandra	1.0	0.8
Corchorus lasiocarpus	0.5	0.2
Eucalyptus leucophloia subsp. *leucophloia*	0.5	5
Myoporum montanum	0.5	1
Santalum lanceolatum	0.5	1.7
Tephrosia densa	0.5	0.3
Triodia wiseana	0.5	0.2
Gossypium robinsonii	0.1	1.5

Project: 2465-18 **Site:** MCMN05
Type: Mapping Note
Date: 18/11/2018 **Described by:** LV
MGA Zone: 50 **Easting:** 690291 **Northing:** 7469318
Vegetation: *Eucalyptus leucophloia* subsp*. leucophloia, Corymbia hamersleyana* scattered low trees over *Acacia inaequilatera, Hakea chordophylla* scattered shrubs over *Triodia wiseana* open hummock grassland
Veg Condition: Excellent
Seasonal Condition: Average
Fire Age: 0-2 years
Soil: Red brown Sandy clay loam
Habitat: Hillslope

Species List

Name	Cover	Height (m)
Triodia wiseana	29.0	0.2
Corymbia hamersleyana	1.0	3
E Eucalyptus leucophloia subsp. *leucophloia*	1.0	7
Acacia adsurgens	0.5	0.25
Acacia inaequilatera	0.5	2.2
Grevillea wickhamii	0.5	0.3
Hakea chordophylla	0.5	1.8
Acacia adoxa var. *adoxa*	0.1	0.3
Eucalyptus gamophylla	0.1	1.6

Project: 2465-18 **Site:** MCMN06
Type: Mapping Note
Date: 18/11/2018 **Described by:** LV
MGA Zone: 50 **Easting:** 690223 **Northing:** 7469346
Vegetation: *Corymbia hamersleyana* low scattered trees over *Gossypium robinsonii* open shrubland over *Tephrosia densa* low open shrubland
Veg Condition: Excellent
Seasonal Condition: Average
Fire Age: 0-2 years
Soil: Red brown Sandy clay loam
Habitat: Minor drainage

Species List

Name	Cover	Height (m)
Gossypium robinsonii	3.0	1.7
Tephrosia densa	2.0	0.4
Corymbia hamersleyana	1.0	7
Acacia pyrifolia var. *pyrifolia*	0.5	1.3
Abutilon sp. Dioicum (A.A. Mitchell PRP 1618)	0.1	1.5
Cymbopogon ambiguus	0.1	0.4
Cymbopogon procerus	0.1	0.35
Grevillea wickhamii	0.1	1
Santalum lanceolatum	0.1	0.5
Themeda ?sp. Mt Barricade	0.1	0.4
Trichodesma zeylanicum	0.1	1

? denotes unconfirmed ID

Project: 2465-18 **Site:** MCMN07
Type: Mapping Note
Date: 18/11/2018 **Described by:** LV
MGA Zone: 50 **Easting:** 690389 **Northing:** 7469516
Vegetation: *Eucalyptus gamophylla* low open woodland over *Acacia inaequilatera* scattered low shrubs over *Corchorus lasiocarpus* scattered low shrubs over *Triodia pungens, Triodia wiseana* very open hummock grassland
Veg Condition: Excellent
Seasonal Condition: Average
Fire Age: 0-2 years
Soil: Red brown Sandy clay loam
Habitat: Hillslope

Species List

Name	Cover	Height (m)
Eucalyptus gamophylla	5.0	1.2
Corchorus lasiocarpus	1.0	0.3
Triodia pungens	1.0	0.2
Triodia wiseana	1.0	0.2
Acacia inaequilatera	0.5	0.5

Project: 2465-18 **Site:** MCMN08
Type: Mapping Note
Date: 18/11/2018 **Described by:** LV
MGA Zone: 50 **Easting:** 688587 **Northing:** 7470174
Vegetation: *Eucalyptus xerothermica* scattered low trees over *Gossypium robinsonii* scattered shrubs over *Chrysopogon fallax* very open tussock grassland
Veg Condition: Excellent
Seasonal Condition: Average
Fire Age: 0-2 years
Soil: Red brown sandy clay loam
Habitat: Minor drainage

Species List

Name	Cover	Height (m)
Chrysopogon fallax	3.0	0.5
Eucalyptus xerothermica	1.0	9
Eulalia aurea	1.0	0.3
Gossypium robinsonii	1.0	1.6
Corymbia deserticola	0.5	7
Corymbia candida	0.1	1
Tephrosia densa	0.1	0.2
Themeda triandra	0.1	0.3

Project: 2465-18 **Site:** MCMN09
Type: Mapping Note
Date: 18/11/2018 **Described by:** LV
MGA Zone: 50 **Easting:** 688567 **Northing:** 7470212
Vegetation: *Eucalyptus leucophloia* subsp*. leucophloia, Corymbia hamersleyana* and *Eucalyptus gamophylla* low open woodland over *Ptilotus rotundifolius* low scattered shrubs over *Triodia vanleeuwenii* very open hummock grassland
Veg Condition: Excellent
Seasonal Condition: Average
Fire Age: 0-2 years
Soil: Red brown Sandy clay loam
Habitat: Floodplain

Species List

Name	Cover	Height (m)
Eucalyptus gamophylla	8.0	1.6
Triodia vanleeuwenii	3.0	0.05
Ptilotus rotundifolius	1.0	0.4
Corymbia hamersleyana	0.5	7
Eucalyptus leucophloia subsp*. leucophloia*	0.5	5

Project: 2465-18 **Site:** MCMN10
Type: Mapping Note
Date: 18/11/2018 **Described by:** LV
MGA Zone: 50 **Easting:** 689513 **Northing:** 7471107
Vegetation: *Corymbia hamersleyana* low scattered trees over *Gossypium robinsonii* scattered shrubs over *Themeda triandra, Eulalia aurea* open tussock grassland
Veg Condition: Excellent
Seasonal Condition: Average
Fire Age: 0-2 years
Soil: Red brown Sandy clay loam
Habitat: Minor drainage

Species List

Name	Cover	Height (m)
Themeda triandra	3.0	0.5
Corymbia hamersleyana	2.0	6
Eulalia aurea	1.0	0.4
Gossypium robinsonii	1.0	1.3
Acacia tumida var. *pilbarensis*	0.1	0.8

Project: 2465-18 **Site:** MCMN11
Type: Mapping Note
Date: 18/11/2018 **Described by:** LV
MGA Zone: 50 **Easting:** 689515 **Northing:** 7471136
Vegetation: *Corymbia hamersleyana, Eucalyptus gamophylla, Eucalyptus xerothermica* low open woodland over *Triodia pungens* scattered hummocks with *Aristida* sp. scattered tussock
Veg Condition: Excellent
Seasonal Condition: Average
Fire Age: 0-2 years
Soil: Red brown Sandy clay loam
Habitat: Plain

Species List

Name	Cover	Height (m)
Corymbia hamersleyana	1.0	5
Eucalyptus gamophylla	1.0	1.6
Aristida sp.	0.5	0.2
Eucalyptus xerothermica	0.5	5
Seringia nephrosperma	0.5	0.2
Triodia pungens	0.5	0.1

Project: 2465-18 **Site:** MCMN12
Type: Mapping Note
Date: 18/11/2018 **Described by:** LV
MGA Zone: 50 **Easting:** 691387 **Northing:** 7476980
Vegetation: *Corymbia hamersleyana* scattered low trees over *Gossypium robinsonii* scattered shrubs over *Themeda triandra, Eriachne* sp. open tussocks grassland
Veg Condition: Very Good
Seasonal Condition: Average
Fire Age: 0-2 years
Soil: Red brown Sandy clay loam
Habitat: Floodplain

Species List

Name	Cover	Height (m)
Themeda triandra	5.0	0.4
Corymbia hamersleyana	1.0	7
*Eriachne s*p.	1.0	0.3
Gossypium robinsonii	1.0	1.5
Acacia tumida var. *pilbarensis*	0.5	1.3
Acacia pyrifolia var. *pyrifolia*	0.1	1
Grevillea wickhamii	0.1	1.7

Project: 2465-18 **Site:** MCMN13
Type: Mapping Note
Date: 19/11/2018 **Described by:** LV
MGA Zone: 50 **Easting:** 684953 **Northing:** 7480074
Vegetation: *Corymbia hamersleyana* and *Eucalyptus* sp. low open woodland over *Acacia ancistrocarpa* open shrubland over *Triodia wiseana* hummock grassland
Veg Condition: Very Good
Seasonal Condition: Average
Fire Age: >10 years
Soil: Red brown Sandy clay loam
Habitat: Plain

Photograph not available

Species List

Name	Cover	Height (m)
Triodia wiseana	45.0	0.4
Eucalyptus sp.	3.0	3
Acacia ancistrocarpa	2.0	1.9
Corymbia hamersleyana	1.0	9
Themeda triandra	0.5	0.4
Triodia longiceps	0.5	0.3

Project: 2465-18 **Site:** MCMN14
Type: Mapping Note
Date: 19/11/2018 **Described by:** LV
MGA Zone: 50 **Easting:** 691469 **Northing:** 7484728
Vegetation: *Eucalyptus xerothermica* open woodland over *Acacia bivenosa*, *Senna artemisioides* subsp. *oligophylla* open shrubland over *Triodia wiseana* hummock grassland
Veg Condition: Very Good
Seasonal Condition: Average
Fire Age: 2-5 years
Soil: Red brown Sandy clay loam
Habitat: Footslope

Species List

Name	Cover	Height (m)
Triodia wiseana	40	0.4
Eucalyptus xerothermica	2	4
Acacia bivenosa	1	1.7
Senna artemisioides subsp. *oligophylla*	1	0.8

Project: 2465-18 **Site:** MCMN15
Type: Mapping Note
Date: 19/11/2018 **Described by:** LV
MGA Zone: 50 **Easting:** 691598 **Northing:** 7484682
Vegetation: *Corymbia hamersleyana, Eucalyptus xerothermica* scattered low trees over *Petalostylis labicheoides*, *Acacia pyrifolia* var. *pyrifolia* tall open scrub with *Triodia pungens* scattered hummocks
Veg Condition: Very Good
Seasonal Condition: Average
Fire Age: 5-10 years
Soil: Red brown Sandy clay loam
Habitat: Floodplain

Species List

Name	Cover	Height (m)
Themeda triandra	50.0	0.4
Petalostylis labicheoides	40.0	2.1
Acacia pyrifolia var. *pyrifolia*	1.0	2.2
Corymbia hamersleyana	1.0	8
Triodia pungens	1.0	0.3
Androcalva luteiflora	0.5	1.7
Eucalyptus xerothermica	0.5	8
Hakea lorea	0.5	4
Acacia dictyophleba	0.1	2.5
Acacia maitlandii	0.1	3

Project: 2465-18 **Site:** MCMN16
Type: Mapping Note
Date: 19/11/2018 **Described by:** LV
MGA Zone: 50 **Easting:** 691566 **Northing:** 7484693
Vegetation: *Eucalyptus camaldulensis* tall woodland over *Acacia pyrifolia* var. *pyrifolia* scattered shrubs over *Tephrosia densa* scattered low shrubs over *Cymbopogon procerus*, *Themeda triandra, Eulalia aurea* open tussock grassland
Veg Condition: Very Good
Seasonal Condition: Average
Fire Age: 5-10 years
Soil: Red brown Sandy clay loam
Habitat: Major drainage

Species List

Name	Cover	Height (m)
Eucalyptus camaldulensis	25	20
Themeda triandra	4	0.4
Cymbopogon procerus	2	0.3
Acacia pyrifolia var. *pyrifolia*	1	1.5
Eulalia aurea	1	0.4
Tephrosia densa	1	0.3

Project: 2465-18 **Site:** MCMN17
Type: Mapping Note
Date: 20/11/2018 **Described by:** LV
MGA Zone: 50 **Easting:** 697292 **Northing:** 7485910
Vegetation: *Eucalyptus xerothermica, Eucalyptus gamophylla* scattered low trees over *Petalostylis labicheoides*, *Acacia bivenosa* tall open shrubland over *Triodia wiseana* hummock grassland
Veg Condition: Good
Seasonal Condition: Average
Fire Age: 2-5 years
Soil: Red brown Sandy clay loam
Habitat: Footslope

Species List

Name	Cover	Height (m)
Triodia wiseana	40	0.2
Petalostylis labicheoides	5	2.2
Acacia bivenosa	3	2.5
Eucalyptus xerothermica	3	4
Eucalyptus gamophylla	1	1.5

Project: 2465-18 **Site:** SF2MN01
Type: Mapping Note
Date: 14/11/2018 **Described by:** LV
MGA Zone: 50 **Easting:** 705601 **Northing:** 7452842
Vegetation: *Eucalyptus xerothermica* low woodland over *Acacia aptaneura* tall shrubland over *Triodia longiceps* open hummock grassland with *Eulalia aurea* scattered tussocks
Veg Condition: Excellent
Seasonal Condition: Average
Fire Age: >10 years
Soil: Red brown Sandy clay loam
Habitat: Plain

Species List

Name	Cover	Height (m)
Triodia longiceps	20.0	1
Eucalyptus xerothermica	15.0	8
Acacia aptaneura	2.0	4
Eulalia aurea	2.0	0.9
Petalostylis labicheoides	0.5	2
Ptilotus obovatus	0.1	0.3

Project: 2465-18 **Site:** SF2MN02
Type: Mapping Note
Date: 14/11/2018 **Described by:** LV
MGA Zone: 50 **Easting:** 705703 **Northing:** 7452970
Vegetation: *Acacia inaequilatera* scattered tall shrubs over *Triodia vanleeuwenii* hummock grassland
Veg Condition: Excellent
Seasonal Condition: Average
Fire Age: >10 years
Soil: Red brown sandy clay loam
Habitat: Hillslope

Species List

Name	Cover	Height (m)
Triodia vanleeuwenii	40.0	0.3
Acacia inaequilatera	2.0	2.1
Acacia bivenosa	0.5	1.5
Themeda triandra	0.1	0.4

Project: 2465-18 **Site:** SF2MN03
Type: Mapping Note
Date: 14/11/2018 **Described by:** LV
MGA Zone: 50 **Easting:** 705248 **Northing:** 7452756
Vegetation: *Eucalyptus xerothermica, Acacia aptaneura* low open woodland over *Eulalia aurea* very open tussock grassland with *Triodia longiceps* scattered hummocks
Veg Condition: Very Good
Seasonal Condition: Average
Fire Age: >10 years
Soil: Red brown sandy clay loam
Habitat: Plain

Species List

Name	Cover	Height (m)
Acacia aptaneura	5.0	8
Eulalia aurea	3.0	0.4
Eucalyptus xerothermica	1.0	8
Triodia longiceps	1.0	0.4
Ptilotus astrolasius	0.5	0.25
Rhagodia eremaea	0.5	1.6

Project: 2465-18 **Site:** SF2MN04
Type: Mapping Note
Date: 14/11/2018 **Described by:** LV
MGA Zone: 50 **Easting:** 705290 **Northing:** 7452871
Vegetation: *Eucalyptus xerothermica* scattered low trees over *Petalostylis labicheoides* scattered shrubs over *Triodia longiceps* hummock grassland
Veg Condition: Excellent
Seasonal Condition: Average
Fire Age: >10 years
Soil: Red brown sandy clay loam
Habitat: Plain

Species List

Name	Cover	Height (m)
Triodia longiceps	60.0	0.4
Petalostylis labicheoides	2.0	1.9
Eucalyptus xerothermica	1.0	9
Acacia pyrifolia var. *morrisonii*	0.5	1.1
Eulalia aurea	0.5	0.4

Project: 2465-18 **Site:** SF3MN01
Type: Mapping Note
Date: 14/11/2018 **Described by:** LV
MGA Zone: 50 **Easting:** 696882 **Northing:** 7454098
Vegetation: *Eucalyptus leucophloia* subsp. *leucophloia*, *Eucalyptus gamophylla* low open woodland over *Triodia vanleeuwenii* hummock grassland
Veg Condition: Excellent
Seasonal Condition: Average
Fire Age: 2-5 years
Soil: Red brown sandy clay loam
Habitat: Hillslope

Species List

Name	Cover	Height (m)
Triodia vanleeuwenii	32.0	0.2
Eucalyptus gamophylla	1.0	2
Eucalyptus leucophloia subsp. *leucophloia*	1.0	7
Triodia epactia	0.5	0.3
Triodia wiseana	0.5	0.4
Amphipogon sericeus	0.1	0.3
Gastrolobium grandiflorum	0.1	0.3

Project: 2465-18 **Site:** Y1MN01
Type: Mapping Note
Date: 21/11/2018 **Described by:** LV
MGA Zone: 50 **Easting:** 703796 **Northing:** 7481633
Vegetation: *Eucalyptus camaldulensis, Eucalyptus victrix* tall open woodland over *Melaleuca glomerata, Acacia coriacea* subsp. *pendens* tall shrubland over *Eulalia aurea* open tussock grassland with *Cyperus vaginatus* scattered sedges
Veg Condition: Very Good
Seasonal Condition: Average
Fire Age: 5-10 years
Soil: Red brown sandy clay loam
Habitat: Major drainage

Species List

Name	Cover	Height (m)
Melaleuca glomerata	25.0	4
Eulalia aurea	20.0	0.5
Eucalyptus victrix	4.0	11
Acacia coriacea subsp. *pendens*	2.0	6
Cyperus vaginatus	2.0	0.4
Eucalyptus camaldulensis	2.0	12
**Cenchrus ciliaris*	0.1	0.5
Atalaya hemiglauca	0.1	2.5

Project: 2465-18 **Site:** Y1MN02
Type: Mapping Note
Date: 21/11/2018 **Described by:** LV
MGA Zone: 50 **Easting:** 703756 **Northing:** 7481709
Vegetation: *Eucalyptus victrix, Acacia coriacea* subsp. *pendens, Atalaya hemiglauca* low open woodland over *Triodia pungens* hummock grassland
Veg Condition: Excellent
Seasonal Condition: Average
Fire Age: >10 years
Soil: Red brown sandy clay loam
Habitat: Plain

Species List

Name	Cover	Height (m)
Triodia pungens	40.0	0.4
Atalaya hemiglauca	5.0	4
Acacia coriacea subsp. *pendens*	3.0	5
Eucalyptus victrix	1.0	7
Acacia aptaneura	0.5	6
Acacia pyrifolia var. *pyrifolia*	0.3	0.4

Project: 2465-18 **Site:** Y2MN01
Type: Mapping Note
Date: 21/11/2018 **Described by:** LV
MGA Zone: 50 **Easting:** 705445 **Northing:** 7482819
Vegetation: *Corymbia hamersleyana, Hakea chordophylla* scattered low trees over *Acacia ancistrocarpa*, *Petalostylis labicheoides, Acacia bivenosa* tall open scrub over *Triodia pungens* hummock grassland
Veg Condition: Very Good
Seasonal Condition: Average
Fire Age: 5-10 years
Soil: Red brown sandy clay loam
Habitat: Major drainage

Species List

Name	Cover	Height (m)
Triodia pungens	35	0.4
Acacia ancistrocarpa	15	2.1
Petalostylis labicheoides	15	2.2
Acacia bivenosa	5	2.1
Corymbia hamersleyana	1	9
Hakea chordophylla	1	4

Project: 2465-18 **Site:** Y2MN02
Type: Mapping Note
Date: 21/11/2018 **Described by:** LV
MGA Zone: 50 **Easting:** 705509 **Northing:** 7482744
Vegetation: *Corymbia hamersleyana*, *Acacia coriacea* subsp. *pendens* low open woodland over *Acacia pruinocarpa* tall scattered shrubs over *Triodia pungens* open hummock grassland
Veg Condition: Very Good
Seasonal Condition: Average
Fire Age: 5-10 years
Soil: Red brown sandy clay loam
Habitat: Plain

Species List

Name	Cover	Height (m)
Triodia pungens	15.0	0.5
Acacia coriacea subsp. *pendens*	8.0	8
Corymbia hamersleyana	2.0	9
Acacia pruinocarpa	1.0	6
Acacia ancistrocarpa	0.5	3
Corchorus crozophorifolius	0.5	1.2
Grevillea wickhamii	0.5	2.1
Eriachne sp.	0.4	0.4
Petalostylis labicheoides	0.1	1.7
Senna glutinosa	0.1	1.5

Project: 2465-18 **Site:** Y4MN01
Type: Mapping Note
Date: 21/11/2018 **Described by:** LV
MGA Zone: 50 **Easting:** 715995 **Northing:** 7480736
Vegetation: *Eucalyptus victrix, Corymbia hamersleyana* scattered low trees over *Acacia dictyophleba, Atalaya hemiglauca* tall open shrubland over *Triodia pungens* hummock grassland
Veg Condition: Very Good
Seasonal Condition: Average
Fire Age: 5-10 years
Soil: Red brown sandy clay loam
Habitat: Footslope

Species List

Name	Cover	Height (m)
Triodia pungens	65.0	0.3
Acacia dictyophleba	6.0	2.5
Atalaya hemiglauca	2.0	2.1
Eucalyptus victrix	1.0	9
Corymbia hamersleyana	0.5	8

Project: 2465-18 **Site:** Y4MN02
Type: Mapping Note
Date: 21/11/2018 **Described by:** LV
MGA Zone: 50 **Easting:** 716140 **Northing:** 7480686
Vegetation: *Corymbia hamersleyana* low open woodland over *Atalaya hemiglauca* tall open shrubland over *Acacia pyrifolia* var. *pyrifolia* shrubland over *Triodia pungens* hummock grassland
Veg Condition: Very Good
Seasonal Condition: Average
Fire Age: 5-10 years
Soil: Red brown sandy clay loam
Habitat: Plain

Species List

Name	Cover	Height (m)
Triodia pungens	60	0.3
Acacia pyrifolia var. *pyrifolia*	8	1.8
Corymbia hamersleyana	6	9
Atalaya hemiglauca	4	2.1

Project: 2465-18 **Site:** Y4MN03
Type: Mapping Note
Date: 21/11/2018 **Described by:** LV
MGA Zone: 50 **Easting:** 715891 **Northing:** 7480519
Vegetation: *Eucalyptus leucophloia* subsp*. leucophloia* scattered low trees over *Acacia pruinocarpa* tall open shrubland over *Themeda triandra* open tussock grassland and *Triodia pungens* very open hummock grassland
Veg Condition: Very Good
Seasonal Condition: Average
Fire Age: 5-10 years
Soil: Red brown sandy clay loam
Habitat: Hillslope

Species List

Name	Cover	Height (m)
Themeda triandra	11.0	0.4
Triodia pungens	8.0	0.4
Acacia pruinocarpa	2.0	5
Eucalyptus leucophloia subsp*. leucophloia*	1.0	7
Acacia pyrifolia var*. pyrifolia*	0.5	1.9
Senna artemisioides subsp. *oligophylla*	0.5	1.5

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Appendix H: Vascular Flora Species List and Site by Species Matrix

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Table H.1: Vascular flora species list for the Study Area.

Family	Species name	Conservation status	Weed
Amaranthaceae	*Alternanthera nana*		
	Ptilotus astrolasius		
	Ptilotus calostachyus		
	Ptilotus exaltatus		
	Ptilotus obovatus		
	Ptilotus rotundifolius		
Araliaceae	*Astrotricha hamptonii*		
Asteraceae	*Pluchea rubelliflora*		
	Pterocaulon sphaeranthoides		
	Streptoglossa decurrens		
Boraginaceae	*Trichodesma zeylanicum*		
Campanulaceae	*Lobelia arnhemiaca*		
Caryophyllaceae	*Polycarpaea longiflora*		
Chenopodiaceae	*Maireana villosa*		
	Rhagodia eremaea		
Cleomaceae	*Cleome viscosa*		
Cyperaceae	*Cyperus vaginatus*		
	Eleocharis atropurpurea		
Fabaceae	*Acacia adoxa* var. *adoxa*		
	Acacia adsurgens		
	Acacia ampliceps		
	Acacia ancistrocarpa		
	Acacia aptaneura		
	Acacia atkinsiana		
	Acacia bivenosa		
	Acacia coriacea subsp. *pendens*		
	Acacia dictyophleba		
	Acacia hilliana		
	Acacia inaequilatera		
	Acacia maitlandii		

Family	Species name	Conservation status	Weed
Fabaceae	*Acacia monticola*		
	Acacia pruinocarpa		
	Acacia pteraneura		
	Acacia pyrifolia var. *morrisonii*		
	Acacia pyrifolia var. *pyrifolia*		
	Acacia tenuissima		
	Acacia tumida var. *pilbarensis*		
	Gastrolobium grandiflorum		
	Indigofera monophylla		
	Petalostylis labicheoides		
	Rhynchosia minima		
	Senna artemisioides subsp. *helmsii*		
	Senna artemisioides subsp. *oligophylla*		
	Senna glutinosa		
	Senna glutinosa subsp. *glutinosa*		
	Senna glutinosa subsp. *pruinosa*		
	Senna notabilis		
	Tephrosia densa		
	**Vachellia farnesiana*		*
Goodeniaceae	*Goodenia* sp.		
Malvaceae	*Abutilon* sp. Dioicum (A.A. Mitchell PRP 1618)		
	Androcalva luteiflora		
	Corchorus crozophorifolius		
	Corchorus lasiocarpus		
	Corchorus lasiocarpus subsp. *lasiocarpus*		
	Gossypium australe		
	Gossypium robinsonii		
	Seringia nephrosperma		
Myrtaceae	*Corymbia candida*		
	Corymbia deserticola		

Family	Species name	Conservation status	Weed
Myrtaceae	*Corymbia deserticola* subsp. *deserticola*		
	Corymbia ferriticola		
	Corymbia hamersleyana		
	Eucalyptus camaldulensis		
	Eucalyptus gamophylla		
	Eucalyptus leucophloia subsp. *leucophloia*		
	Eucalyptus sp.		
	Eucalyptus victrix		
	Eucalyptus xerothermica		
	Melaleuca argentea		
	Melaleuca glomerata		
Plantaginaceae	*Stemodia grossa*		
Poaceae	*Amphipogon sericeus*		
	Aristida inaequiglumis		
	Aristida sp.		
	**Cenchrus ciliaris*		*
	**Cenchrus setiger*		*
	Chrysopogon fallax		
	Cymbopogon ambiguus		
	Cymbopogon procerus		
	Enneapogon lindleyanus		
	Eriachne mucronata		
	Eriachne sp.		
	Eulalia aurea		
	Paraneurachne muelleri		
	Schizachyrium fragile		
	Sorghum plumosum		
	Themeda ?sp. Mt Barricade		
	Themeda triandra		
	Triodia epactia		

Family	Species name	Conservation status	Weed
Poaceae	*Triodia longiceps*		
	Triodia pungens		
	Triodia vanleeuwenii		
	Triodia wiseana		
Proteaceae	*Grevillea pyramidalis*		
	Grevillea wickhamii		
	Hakea chordophylla		
	Hakea lorea		
Santalaceae	*Santalum lanceolatum*		
Sapindaceae	*Atalaya hemiglauca*		
	Dodonaea lanceolata		
Scrophulariaceae	*Eremophila forrestii*		
	Eremophila fraseri subsp. *fraseri*		
	Eremophila sp. Hamersley Range (K. Walker KW 136) P3	Priority 3	
	Myoporum montanum		
Surianaceae	*Stylobasium spathulatum*		
Typhaceae	*Typha domingensis*		

Table H.2: Site by species matrix.

Species name	AC3MN01	AC6MN01	AC8MN01	AC9MN01	ACNC1MN01	ACNC1MN03	ACNC1RV01	ACNC1RV02	ACNC1RV03	ACNC1RV04	ACNC1RV05	ACNC1RV06	ACNC1RV07	ACNC1RV08
Abutilon sp. *Dioicum (A.A. Mitchell PRP 1618)*	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Acacia adoxa var. *adoxa*	0	0	0	0	0	0	0	0	0	0.5	0	0	0	0
Acacia adsurgens	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Acacia ampliceps	0	0	0	0	0	0	0	0	0	0	0.5	0.1	0	0
Acacia ancistrocarpa	0	0	0	0	0.5	0	0	0	0	0	0	0	0	0.5
Acacia aptaneura	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Acacia atkinsiana	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Acacia bivenosa	0	0	0	0	0	0.5	0	0	0	0	0	0	10	0.5
Acacia coriacea subsp. *pendens*	0	0	0	0	0	0	0	0	0	0	0.5	0	0	0
Acacia dictyophleba	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Acacia hilliana	0	0	0	0	0	0	0	0	0	0.5	0	0	0	0
Acacia inaequilatera	0	0	0	0	0	0	0	0	0	0	0	0	0	3
Acacia maitlandii	0	0	1	0	0	0	0	0	0.1	0	0	0	0	0
Acacia monticola	0	0	0	0	0	0	0	0	0	0.5	0	0	0	0
Acacia pruinocarpa	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Acacia pteraneura	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Acacia pyrifolia var. *morrisonii*	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Acacia pyrifolia var. *pyrifolia*	0	0	0	3	0	0	3	0	0	0	0	0.1	10	0
Acacia tenuissima	0	0	1	0	0	0	0	0	0	0	0	0	0	0

Species name	AC3MN01	AC6MN01	AC8MN01	AC9MN01	ACNC1MN01	ACNC1MN03	ACNC1RV01	ACNC1RV02	ACNC1RV03	ACNC1RV04	ACNC1RV05	ACNC1RV06	ACNC1RV07	ACNC1RV08
Acacia tumida var. *pilbarensis*	0	40	0.5	0	0	0	0	0.5	40	10	0.1	0.1	0.5	0
Alternanthera nana	0	0	0	0	0	0	0	0.1	0	0	0	0	0	0
Amphipogon sericeus	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Androcalva luteiflora	0	0.5	0	0	0	0	0	0	0.5	0	0	0	0.1	0
Aristida inaequiglumis	0	0	0	0	0	0	0	0	0.1	0	0	0	0	0
Aristida sp.	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Astrotricha hamptonii	0.5	0	0	0	0	0	0	0	0	0	0	0	0	0
Atalaya hemiglauca	0.5	0	0	0	0	0	0	0	0	0	0	0	0.1	0
**Cenchrus ciliaris*	0	0	0	0	0	0	0	0	0	0	0	0	0	0
**Cenchrus setiger*	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Chrysopogon fallax	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Cleome viscosa	0	0	0	0	0	0	0	0.1	0	0	0	0	0	0
Corchorus crozophorifolius	0	0	0	0	0	0	0	0.1	0	0	0	0.1	0	0
Corchorus lasiocarpus	0	0	0	0	0	0	0.1	0	0	0	0	0	0	0
Corchorus lasiocarpus subsp. *lasiocarpus*	0.5	0	35	0	0	0	0	0	0	0	0	0	0	0
Corymbia candida	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Corymbia deserticola	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Corymbia deserticola subsp. *deserticola*	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Corymbia ferriticola	1	0	0	0	0	0	0	0	0	0	0	0	0	0
Corymbia hamersleyana	0	29	1	1	0	0	1	0	1	2	0	0	0	1

Species name	AC3MN01	AC6MN01	AC8MN01	AC9MN01	ACNC1MN01	ACNC1MN03	ACNC1RV01	ACNC1RV02	ACNC1RV03	ACNC1RV04	ACNC1RV05	ACNC1RV06	ACNC1RV07	ACNC1RV08
Cymbopogon ambiguus	0.5	0	0	0	0	0	0	0	0	0	0	0	0	0
Cymbopogon procerus	0	0	0	0	0	0	0	0	0	0	0	0.1	0	0
Cyperus vaginatus	0	0	0	0	0	0	0	0	0	0	20	0	0	0
Dodonaea lanceolata	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Eleocharis atropurpurea	0	0	0	0	0	0	0	0	0	0	0.5	0	0	0
Enneapogon lindleyanus	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Eremophila forrestii	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Eremophila fraseri subsp. *fraseri*	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Eremophila sp. Hamersley Range (K. Walker KW 136) P3	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Eriachne mucronata	0	0	1	0	0	0	0.1	0	0	0	0	0	0	0
Eriachne sp.	0	0	0	0	0	0	0	0	0.5	0	0	0	0	0
Eucalyptus camaldulensis	0.5	0	0	0	0	0	0	1	1	0	30	35	0	0
Eucalyptus gamophylla	0	0	3	0	0.5	1	0	0	0	0	0	0	0	0
Eucalyptus leucophloia subsp. *leucophloia*	0	0	0.5	0	1	1	0	0	0	0	0	0	0	1
Eucalyptus sp.	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Eucalyptus victrix	0	0	0	0	0	0	0	1	0	0	0	0	0	0
Eucalyptus xerothermica	0	0	0	2	1	0	1	0	0	0	0	0	0	0
Eulalia aurea	1	0	0	0	0	0	0	3	2	0	2	1	0	0
Gastrolobium grandiflorum	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Goodenia sp.	0	0	0	0	0	0	0.1	0	0	0	0	0	0	0

Species name	AC3MN01	AC6MN01	AC8MN01	AC9MN01	ACNC1MN01	ACNC1MN03	ACNC1RV01	ACNC1RV02	ACNC1RV03	ACNC1RV04	ACNC1RV05	ACNC1RV06	ACNC1RV07	ACNC1RV08
Gossypium australe	0	0	0	0	0	0	0.1	0	0	0	0	0	0	0
Gossypium robinsonii	0	0	0	0	0	0	0.1	0.1	0	0	0.1	0.5	10	0
Grevillea pyramidalis	0	0	0	0	0	0	0	0	0	0	0	0	0.1	0
Grevillea wickhamii	0	0	0	0	0	0	0	0	0	0.1	0	0	0.1	0
Hakea chordophylla	0	0	0	0	0	0	0	0	0	0	0	0	0	1
Hakea lorea	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Indigofera monophylla	0	0	0	0	0	0	0.1	0	0.5	0	0	0	0	0
Lobelia arnhemiaca	0	0	0	0	0	0	0	0	0	0	0.5	0	0	0
Maireana villosa	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Melaleuca argentea	0	0	0	0	0	0	0	0	0	0	30	0	0	0
Melaleuca glomerata	0	0	0	0	0	0	0	0	0	0	10	40	0	0
Myoporum montanum	0	0	0	0	0	0	0	0	0	0	0	0	0.5	0
Paraneurachne muelleri	0	0	0	0	0	0	0.1	0	0	0	0	0	0	0
Petalostylis labicheoides	0	1	0	20	0	0	0	0	0.5	0	0	0	0	0.5
Pluchea rubelliflora	0	0	0	0	0	0	0	1	0	0	0	1	0	0
Polycarpaea longiflora	0	0	0	0	0	0	0	0.1	0	0	0	0	0	0
Pterocaulon sphaeranthoides	0	0	0	0	0	0	0	0.1	0	0	0	0	0	0
Ptilotus astrolasius	0	0	0.5	0	0	0	0.1	0	0	0	0	0	0	0
Ptilotus calostachyus	0	0	0	0	0	0.5	0	0	0	0	0	0	0	0
Ptilotus exaltatus	0	0	0	0	0	0	0.1	0	0	0	0	0	0	0

Species name	AC3MN01	AC6MN01	AC8MN01	AC9MN01	ACNC1MN01	ACNC1MN03	ACNC1RV01	ACNC1RV02	ACNC1RV03	ACNC1RV04	ACNC1RV05	ACNC1RV06	ACNC1RV07	ACNC1RV08
Ptilotus obovatus	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Ptilotus rotundifolius	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Rhagodia eremaea	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Rhynchosia minima	0	0	0	0	0	0	0	0.1	0	0	0	0	0	0
Santalum lanceolatum	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Schizachyrium fragile	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Senna artemisioides subsp. *helmsii*	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Senna artemisioides subsp. *oligophylla*	0	0	0	0	0	0.5	0.1	0	0	0	0	0	0	0
Senna glutinosa	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Senna glutinosa subsp. *glutinosa*	0	0	0	0	0	0	0	0	0	0.1	0	0	0	0
Senna glutinosa subsp. *pruinosa*	0	0	0	0	0	0.5	0	0	0	0	0	0	0	0
Senna notabilis	0	0	0	0	0	0	0.1	0	0	0	0	0	0	0
Seringia nephrosperma	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Sorghum plumosum	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Stemodia grossa	0	0	0	0	0	0	0	0	0	0	0.1	0.1	0	0
Streptoglossa decurrens	0	0	0	0	0	0	0	0.1	0	0	0	0	0	0
Stylobasium spathulatum	0	0	0	0	0	0	0.1	0	0	0	0.1	0	0.1	0
Tephrosia densa	0	0	0	0	0	0	0	0.1	0	0	0	0.1	0	0
Themeda ?sp. Mt Barricade	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Themeda triandra	0	40	0	50	0	0	0	0	0.5	0	0	0	1	0

Species name	AC3MN01	AC6MN01	AC8MN01	AC9MN01	ACNC1MN01	ACNC1MN03	ACNC1RV01	ACNC1RV02	ACNC1RV03	ACNC1RV04	ACNC1RV05	ACNC1RV06	ACNC1RV07	ACNC1RV08
Trichodesma zeylanicum	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Triodia epactia	0	0	0	0	0	0	0	0	0	1	0	0	1	0
Triodia longiceps	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Triodia pungens	0	0.1	15	0	0.5	0	0	0	0.5	0	0	0	0	0
Triodia vanleeuwenii	0	0	0	0	3	2	0	0	0	30	0	0	0	0
Triodia wiseana	0	0	0	0	0	0	1	0	0.1	2	0	0	0	50
Typha domingensis	0	0	0	0	0	0	0	0	0	0	10	0	0	0
**Vachellia farnesiana*	0	0	0	0	0	0	0	0	0	0	0	0	0	0

? denotes unconfirmed ID

* denotes weed species

Species name	ACNC2RV01	ACNC2RV02	ACNC2RV03	ACNC2RV04	ACNC2RV05	ACNC2RV06	M1MN01	M1MN02	M3MN01	M4MN01	M4MN02	M4MN03	M5MN01	M5MN02	MCMN01
Abutilon sp. Dioicum (A.A. Mitchell PRP 1618)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Acacia adoxa var. *adoxa*	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Acacia adsurgens	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Acacia ampliceps	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Acacia ancistrocarpa	0.5	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Acacia aptaneura	3	0	0	0	0	0	0	0	0	0.5	25	2	0	0	0
Acacia atkinsiana	0	0	0	0	0	0	0	0	0.5	0	0	0	12	35	0
Acacia bivenosa	0	0	0	0	0	0	0	1	0.5	0	0	0	0	6	0.5
Acacia coriacea subsp. *pendens*	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0
Acacia dictyophleba	0.1	0	0	0	0	0	0	0	1	0	0	0	0	0	0
Acacia hilliana	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Acacia inaequilatera	0.1	0	0	4	0	0	0	2	0	0	0	0	0	0	0
Acacia maitlandii	0	0	0	0	0	0.1	0	0	0	0	0	0	0	0	0
Acacia monticola	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0
Acacia pruinocarpa	0	0	0	0	0	0	0	0	0	0	3	20	0	0.1	0
Acacia pteraneura	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Acacia pyrifolia var. *morrisonii*	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Acacia pyrifolia var. *pyrifolia*	0	0.1	0.2	0	0.5	0	0	0	0	1	0	0	0	0	0
Acacia tenuissima	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Acacia tumida var. *pilbarensis*	0	0	0	0	5	1	0	0	0	0	0	0	0	3	0
Alternanthera nana	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Species name	ACNC2RV01	ACNC2RV02	ACNC2RV03	ACNC2RV04	ACNC2RV05	ACNC2RV06	M1MN01	M1MN02	M3MN01	M4MN01	M4MN02	M4MN03	M5MN01	M5MN02	MCMN01
Amphipogon sericeus	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Androcalva luteiflora	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Aristida inaequiglumis	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Aristida sp.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Astrotricha hamptonii	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Atalaya hemiglauca	0	0.5	11	0	0	0	2	0	0	0	0	0	0	0	0
**Cenchrus ciliaris*	0	6	5	0	0.1	5	0	0	0	0	0	0	0	0	0
**Cenchrus setiger*	0	6	5	0	0	0	0	0	0	0	0	0	0	0	0
Chrysopogon fallax	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Cleome viscosa	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Corchorus crozophorifolius	0	0	0	0	0	4	45	0	0	0	0	0	0	0	0
Corchorus lasiocarpus	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Corchorus lasiocarpus subsp. *lasiocarpus*	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Corymbia candida	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Corymbia deserticola	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0
Corymbia deserticola subsp. *deserticola*	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Corymbia ferriticola	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Corymbia hamersleyana	0	0	0.5	1	0	0	0	0	2	20	0	0	0	0.5	0
Cymbopogon ambiguus	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0
Cymbopogon procerus	0	0	0	0	0	2	0.1	0	0	0	0	0	0	0	0
Cyperus vaginatus	0	0	0	0	0	0.5	0	0	0	0	0	0	0	0	0

Species name	ACNC2RV01	ACNC2RV02	ACNC2RV03	ACNC2RV04	ACNC2RV05	ACNC2RV06	M1MN01	M1MN02	M3MN01	M4MN01	M4MN02	M4MN03	M5MN01	M5MN02	MCMN01
Dodonaea lanceolata	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.5
Eleocharis atropurpurea	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Enneapogon lindleyanus	0	0	0.1	0	0	0	0	0	0	0	0	0	0	0	0
Eremophila forrestii	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Eremophila fraseri subsp. *fraseri*	0	0	0	0.2	0	0	0	0	0	0	0	0	0	0	0
Eremophila sp. Hamersley Range (K. Walker KW 136) P3	0	0	0	0.1	0	0	0	0	0	0	0	0	0	0	0
Eriachne mucronata	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Eriachne sp.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Eucalyptus camaldulensis	0	2	0	0	0	20	1	0	0	0	0	0	0	0	0
Eucalyptus gamophylla	0	0	0	0	0	0	0	0	0	0	0	0	20	1	0
Eucalyptus leucophloia subsp. *leucophloia*	0.1	0	0	0	0	0	0	0	0	0	0	0	0.5	1	0
Eucalyptus sp.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Eucalyptus victrix	0	1	1	0	3	10	0	0	0	0	0	0	0	0	0
Eucalyptus xerothermica	0	0	0	0	0	0	0	0	0.5	2	0	0	0	0	3
Eulalia aurea	0	0	0	0	0	5	0	0	0	40	0.5	0	0	20	0
Gastrolobium grandiflorum	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Goodenia sp.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Gossypium australe	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Gossypium robinsonii	0	0	0	0	0	0.1	0	0	0	0.5	0	0	0	0	0
Grevillea pyramidalis	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Grevillea wickhamii	0	0	0	0	0.5	0	0	0	0	0	0	0	0	0	0

Species name	ACNC2RV01	ACNC2RV02	ACNC2RV03	ACNC2RV04	ACNC2RV05	ACNC2RV06	M1MN01	M1MN02	M3MN01	M4MN01	M4MN02	M4MN03	M5MN01	M5MN02	MCMN01
Hakea chordophylla	0.1	0	0	0	0	0	0	0	0	0	0	0	0.1	0.1	0
Hakea lorea	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.5
Indigofera monophylla	0	0	0	0	0	0.1	0	0	0	0	0	0	0	0	0
Lobelia arnhemiaca	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Maireana villosa	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Melaleuca argentea	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Melaleuca glomerata	0	0	0	0	0	0.5	26	0	0	0	0	0	0	0	0
Myoporum montanum	0	0	5	0	0	0	0	0	0	5	0	0	0	0	0
Paraneurachne muelleri	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Petalostylis labicheoides	0	0	0	0	0	0	0	1	0	0	0	0	0	0.1	0
Pluchea rubelliflora	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Polycarpaea longiflora	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Pterocaulon sphaeranthoides	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Ptilotus astrolasius	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Ptilotus calostachyus	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Ptilotus exaltatus	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Ptilotus obovatus	0	0	0	0	0	0	0	0	0	0	0.5	0	0	0	0
Ptilotus rotundifolius	0	0	0	0	0	0	0	0	0	0	0	0	0.1	0.5	0
Rhagodia eremaea	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Rhynchosia minima	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Santalum lanceolatum	0	0.5	0	0	0	0	0	0	0	0	0	0	0	0	0

Species name	ACNC2RV01	ACNC2RV02	ACNC2RV03	ACNC2RV04	ACNC2RV05	ACNC2RV06	M1MN01	M1MN02	M3MN01	M4MN01	M4MN02	M4MN03	M5MN01	M5MN02	MCMN01
Schizachyrium fragile	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Senna artemisioides subsp. *helmsii*	0	0	0	0	0	0	0	0	0	0	25	0	0	0	0
Senna artemisioides subsp. *oligophylla*	31	0	0	0	0	0	0	0	0	0	0	0	0.1	0	0
Senna glutinosa	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Senna glutinosa subsp. *glutinosa*	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Senna glutinosa subsp. *pruinosa*	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Senna notabilis	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Seringia nephrosperma	0	0.5	0	0	0.1	0	0	0	0	0	0	0	0	0	0
Sorghum plumosum	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Stemodia grossa	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Streptoglossa decurrens	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Stylobasium spathulatum	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Tephrosia densa	0	0.1	0	0	0	1	0	0	0	0	0	0	0	0	0
Themeda ?sp. Mt Barricade	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Themeda triandra	0	0	15	0	0	0.1	0	0	0	50	1	0	0	11	80
Trichodesma zeylanicum	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Triodia epactia	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Triodia longiceps	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Triodia pungens	0	0	3	0	50	1	0	0	0	0	3	0	3	10	0
Triodia vanleeuwenii	0	0	0	0	0	0	0	0	0	0	0	0	35	0.1	0
Triodia wiseana	40	0	0	45	0	0.1	0	40	40	0	0	55	0	1	0

Species name	ACNC2RV01	ACNC2RV02	ACNC2RV03	ACNC2RV04	ACNC2RV05	ACNC2RV06	M1MN01	M1MN02	M3MN01	M4MN01	M4MN02	M4MN03	M5MN01	M5MN02	MCMN01
Typha domingensis	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
**Vachellia farnesiana*	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

? denotes unconfirmed ID

* denotes weed species

Species name	MCMN02	MCMN03	MCMN04	MCMN05	MCMN06	MCMN07	MCMN08	MCMN09	MCMN10	MCMN11	MCMN12	MCMN13	MCMN14	MCMN15	MCMN16
Abutilon sp. *Dioicum (A.A. Mitchell PRP 1618)*	0	0	0	0	0.1	0	0	0	0	0	0	0	0	0	0
Acacia adoxa var. *adoxa*	0	0.1	0	0.1	0	0	0	0	0	0	0	0	0	0	0
Acacia adsurgens	0	0	0	0.5	0	0	0	0	0	0	0	0	0	0	0
Acacia ampliceps	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Acacia ancistrocarpa	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0
Acacia aptaneura	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Acacia atkinsiana	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Acacia bivenosa	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0
Acacia coriacea subsp. *pendens*	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Acacia dictyophleba	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1	0
Acacia hilliana	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0
Acacia inaequilatera	0	0	5	0.5	0	0.5	0	0	0	0	0	0	0	0	0
Acacia maitlandii	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1	0
Acacia monticola	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Acacia pruinocarpa	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Acacia pteraneura	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Acacia pyrifolia var. *morrisonii*	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Acacia pyrifolia var. *pyrifolia*	1	0	1	0	0.5	0	0	0	0	0	0.1	0	0	1	1
Acacia tenuissima	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Acacia tumida var. *pilbarensis*	0	0	0	0	0	0	0	0	0.1	0	0.5	0	0	0	0
Alternanthera nana	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Species name	MCMN02	MCMN03	MCMN04	MCMN05	MCMN06	MCMN07	MCMN08	MCMN09	MCMN10	MCMN11	MCMN12	MCMN13	MCMN14	MCMN15	MCMN16
Amphipogon sericeus	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Androcalva luteiflora	0	0	0	0	0	0	0	0	0	0	0	0	0	0.5	0
Aristida inaequiglumis	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Aristida sp.	0	0	0	0	0	0	0	0	0	0.5	0	0	0	0	0
Astrotricha hamptonii	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Atalaya hemiglauca	0.5	0	0	0	0	0	0	0	0	0	0	0	0	0	0
**Cenchrus ciliaris*	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
**Cenchrus setiger*	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Chrysopogon fallax	0	0	0	0	0	0	3	0	0	0	0	0	0	0	0
Cleome viscosa	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Corchorus crozophorifolius	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Corchorus lasiocarpus	0	0.5	0.5	0	0	1	0	0	0	0	0	0	0	0	0
Corchorus lasiocarpus subsp. *lasiocarpus*	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Corymbia candida	0	0	0	0	0	0	0.1	0	0	0	0	0	0	0	0
Corymbia deserticola	0	0	0	0	0	0	0.5	0	0	0	0	0	0	0	0
Corymbia deserticola subsp. *deserticola*	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Corymbia ferriticola	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Corymbia hamersleyana	0	1	1	1	1	0	0	0.5	2	1	1	1	0	1	0
Cymbopogon ambiguus	0	0	0	0	0.1	0	0	0	0	0	0	0	0	0	0
Cymbopogon procerus	0	0	0	0	0.1	0	0	0	0	0	0	0	0	0	2
Cyperus vaginatus	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Species name	MCMN02	MCMN03	MCMN04	MCMN05	MCMN06	MCMN07	MCMN08	MCMN09	MCMN10	MCMN11	MCMN12	MCMN13	MCMN14	MCMN15	MCMN16
Dodonaea lanceolata	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Eleocharis atropurpurea	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Enneapogon lindleyanus	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Eremophila forrestii	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Eremophila fraseri subsp. *fraseri*	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Eremophila sp. Hamersley Range (K. Walker KW 136) P3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Eriachne mucronata	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Eriachne sp.	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0
Eucalyptus camaldulensis	1	0	0	0	0	0	0	0	0	0	0	0	0	0	25
Eucalyptus gamophylla	0	0	0	0.1	0	5	0	8	0	1	0	0	0	0	0
Eucalyptus leucophloia subsp. *leucophloia*	0	1	0.5	1	0	0	0	0.5	0	0	0	0	0	0	0
Eucalyptus sp.	0	0	0	0	0	0	0	0	0	0	0	3	0	0	0
Eucalyptus victrix	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Eucalyptus xerothermica	0.5	0	1	0	0	0	1	0	0	0.5	0	0	2	0.5	0
Eulalia aurea	0	0	0	0	0	0	1	0	1	0	0	0	0	0	1
Gastrolobium grandiflorum	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Goodenia sp.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Gossypium australe	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Gossypium robinsonii	0	0	0.1	0	3	0	1	0	1	0	1	0	0	0	0
Grevillea pyramidalis	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Grevillea wickhamii	0	0	0	0.5	0.1	0	0	0	0	0	0.1	0	0	0	0

Species name	MCMN02	MCMN03	MCMN04	MCMN05	MCMN06	MCMN07	MCMN08	MCMN09	MCMN10	MCMN11	MCMN12	MCMN13	MCMN14	MCMN15	MCMN16
Hakea chordophylla	0	0.1	0	0.5	0	0	0	0	0	0	0	0	0	0	0
Hakea lorea	0	0	0	0	0	0	0	0	0	0	0	0	0	0.5	0
Indigofera monophylla	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Lobelia arnhemiaca	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Maireana villosa	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Melaleuca argentea	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Melaleuca glomerata	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Myoporum montanum	0	0	0.5	0	0	0	0	0	0	0	0	0	0	0	0
Paraneurachne muelleri	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Petalostylis labicheoides	0.5	0	0	0	0	0	0	0	0	0	0	0	0	40	0
Pluchea rubelliflora	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Polycarpaea longiflora	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Pterocaulon sphaeranthoides	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Ptilotus astrolasius	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Ptilotus calostachyus	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Ptilotus exaltatus	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Ptilotus obovatus	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Ptilotus rotundifolius	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0
Rhagodia eremaea	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Rhynchosia minima	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Santalum lanceolatum	0	0	0.5	0	0.1	0	0	0	0	0	0	0	0	0	0

Species name	MCMN02	MCMN03	MCMN04	MCMN05	MCMN06	MCMN07	MCMN08	MCMN09	MCMN10	MCMN11	MCMN12	MCMN13	MCMN14	MCMN15	MCMN16
Schizachyrium fragile	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0
Senna artemisioides subsp. *helmsii*	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Senna artemisioides subsp. *oligophylla*	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0
Senna glutinosa	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Senna glutinosa subsp. *glutinosa*	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Senna glutinosa subsp. *pruinosa*	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Senna notabilis	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Seringia nephrosperma	0	0	0	0	0	0	0	0	0	0.5	0	0	0	0	0
Sorghum plumosum	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Stemodia grossa	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Streptoglossa decurrens	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Stylobasium spathulatum	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Tephrosia densa	0	0	0.5	0	2	0	0.1	0	0	0	0	0	0	0	1
Themeda ?sp. Mt Barricade	0	0	0	0	0.1	0	0	0	0	0	0	0	0	0	0
Themeda triandra	20	0	1	0	0	0	0.1	0	3	0	5	0.5	0	50	4
Trichodesma zeylanicum	0	0	10	0	0.1	0	0	0	0	0	0	0	0	0	0
Triodia epactia	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Triodia longiceps	1	0	0	0	0	0	0	0	0	0	0	0.5	0	0	0
Triodia pungens	0	0	15	0	0	1	0	0	0	0.5	0	0	0	1	0
Triodia vanleeuwenii	0	0	0	0	0	0	0	3	0	0	0	0	0	0	0
Triodia wiseana	0	20	0.5	29	0	1	0	0	0	0	0	45	40	0	0

Species name	MCMN02	MCMN03	MCMN04	MCMN05	MCMN06	MCMN07	MCMN08	MCMN09	MCMN10	MCMN11	MCMN12	MCMN13	MCMN14	MCMN15	MCMN16
Typha domingensis	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
**Vachellia farnesiana*	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

? denotes unconfirmed ID

* denotes weed species

Species name	MCMN17	MCRV01	MCRV02	MCRV03	MCRV04	MCRV05	MCRV06	MCRV07	MCRV08	MCRV09	MCRV10	OPPS
Abutilon sp. *Dioicum (A.A. Mitchell PRP 1618)*	0	0	0	0	0	0	0	0	0	0	0	0
Acacia adoxa var. *adoxa*	0	0	0	0	0	0	0	0	0	0	0	0
Acacia adsurgens	0	0	0	0	0	0	0	0	0	0	0	0
Acacia ampliceps	0	0	0	0	0	0	0	0	0	0	0	0
Acacia ancistrocarpa	0	0	0.1	0	0	0	0	0	0	0	0	0
Acacia aptaneura	0	0	0	29	0	0	0	0	0	0	0	0
Acacia atkinsiana	0	0	0	0	0	0	0	0	0	0	0	0
Acacia bivenosa	3	0	0	0	0	0	1	0	0	1	0.1	0
Acacia coriacea subsp. *pendens*	0	0	0	0	0	0	0	0	0	0	0	0
Acacia dictyophleba	0	0	0	0	0	0	0	0	0	0	0	0
Acacia hilliana	0	0	0	0	0	0	0	0	0	0	0	0
Acacia inaequilatera	0	0	0.5	0	0	0	10	0	0	0	0	0
Acacia maitlandii	0	0.5	0	0	0	0	0	0	0	0	0	0
Acacia monticola	0	0	0	0	0	0	0	0	0	0	0	0
Acacia pruinocarpa	0	0	0.5	0	0	0	30	0	0	0	0	0
Acacia pteraneura	0	0	0	0	0	0	0	0	0	0	0	0
Acacia pyrifolia var. *morrisonii*	0	0	0	0	0	0	0	0	0	0	0	0
Acacia pyrifolia var. *pyrifolia*	0	1	0	0	0.5	1	0	0	1	1	0.1	0
Acacia tenuissima	0	0	1	0	0	0	0	0	0	0	0	0
Acacia tumida var. *pilbarensis*	0	0	0	0	2	0	0	0	0	0	0	0
Alternanthera nana	0	0	0	0	0	0	0	0	0	0	0	0

Species name	MCMN17	MCRV01	MCRV02	MCRV03	MCRV04	MCRV05	MCRV06	MCRV07	MCRV08	MCRV09	MCRV10	OPPS
Amphipogon sericeus	0	0	0	0	0	0	0	0	0	0	0	0
Androcalva luteiflora	0	0	0	0	0	0	0	0	0	0	0	0
Aristida inaequiglumis	0	0	0	0	0	0	0	0	0	0	0	0
Aristida sp.	0	0	0	0	0	0	0	0	0	0	0	0
Astrotricha hamptonii	0	0	0	0	0	0	0	0	0	0	0	0
Atalaya hemiglauca	0	0	0	0	0	0	0	0	0	0	0	0
**Cenchrus ciliaris*	0	0	0	0	0	0	0	0	0	0	0	0
**Cenchrus setiger*	0	0	0	0	0	0	0	0	0	0	0	0
Chrysopogon fallax	0	0	0	0.5	0	0	0	0	0	0	0	0
Cleome viscosa	0	0	0	0	0	0	0	0	0	0	0	0
Corchorus crozophorifolius	0	0	0	0	0	0	0	0	0	0	1	0
Corchorus lasiocarpus	0	0	0	0	0	0	0	0	0	0.5	0	0
Corchorus lasiocarpus subsp. *lasiocarpus*	0	0	0	0	0	0	0	0	0	0	0	0
Corymbia candida	0	0	0	0	0	0	0	0	0	0	0	0
Corymbia deserticola	0	0	0	0	0	0	0	0	0	0	0	0
Corymbia deserticola subsp. *deserticola*	0	0	0	2	0	0	0	0	0	0	0	0
Corymbia ferriticola	0	0	0	0	0	0	0	0	0	0	0	0
Corymbia hamersleyana	0	0	1	0	0	2	0	0	0	3	0	0
Cymbopogon ambiguus	0	0	0	0	0	0	0	0	0	0	0	0
Cymbopogon procerus	0	35	0	0	3	0	0	15	2	0	0	0
Cyperus vaginatus	0	0	0	0	0	0	0	0	0	0	1	0

Species name	MCMN17	MCRV01	MCRV02	MCRV03	MCRV04	MCRV05	MCRV06	MCRV07	MCRV08	MCRV09	MCRV10	OPPS
Dodonaea lanceolata	0	0	0	0	0	0	0	0	0	0	0	0
Eleocharis atropurpurea	0	0	0	0	0	0	0	0	0	0	0	0
Enneapogon lindleyanus	0	0	0	0	0	0	0	0	0	0	0	0
Eremophila forrestii	0	0	0	0	0	0	0.1	0	0	0	0	0
Eremophila fraseri subsp. *fraseri*	0	0	0	0	0	0	0	0	0	0	0	0
Eremophila sp. Hamersley Range (K. Walker KW 136) P3	0	0	0	0	0	0	0	0	0	0	0	0
Eriachne mucronata	0	0	0	0	0	0	0	0	0	0	0	0
Eriachne sp.	0	0	0	0	0	4	0	0	0	0	0	0
Eucalyptus camaldulensis	0	25	0	0	0	0	0	2	3	0	29	0
Eucalyptus gamophylla	1	0	0.5	0	0	0	0	0	0	0	0	0
Eucalyptus leucophloia subsp. *leucophloia*	0	0	0	0	0	0	0	0	0	0	0	0
Eucalyptus sp.	0	0	0	0	0	0	0	0	0	0	0	0
Eucalyptus victrix	0	0	0	0	0	0	0	0	0	0	0	0
Eucalyptus xerothermica	3	0	0	0	0	0	0	10	1	0	0	0
Eulalia aurea	0	10	0	0	0	0	0	20	2	0	12	0
Gastrolobium grandiflorum	0	0	0	0	0	0	0	0	0	0	0	0
Goodenia sp.	0	0	0	0	0	0	0	0	0	0	0	0
Gossypium australe	0	0	0	0	0	0	0	0	0	0	0	0
Gossypium robinsonii	0	0	0	0	0.5	0	0	0	0	0	0.1	0
Grevillea pyramidalis	0	0	0	0	0	0	0	0	0	0	0	0
Grevillea wickhamii	0	0	0	0	0	0	0	0	0	0	0	0

Species name	MCMN17	MCRV01	MCRV02	MCRV03	MCRV04	MCRV05	MCRV06	MCRV07	MCRV08	MCRV09	MCRV10	OPPS
Hakea chordophylla	0	0	0	0	0	0	0	0	0	0	0	0
Hakea lorea	0	0	0	0	0	0	0	0	0	0	0	0
Indigofera monophylla	0	0	0	0	0	0	0	0	0	0	0	0
Lobelia arnhemiaca	0	0	0	0	0	0	0	0	0	0	0	0
Maireana villosa	0	0	0	1	0	0	0	0	0	0	0	0
Melaleuca argentea	0	0	0	0	0	0	0	0	0	0	0	0
Melaleuca glomerata	0	0	0	0	0	0	0	0	0	0	3	0
Myoporum montanum	0	0	0	0	0	0	0	0	0	0	0	0
Paraneurachne muelleri	0	0	0	0	0	0	0	0	0	0	0	0
Petalostylis labicheoides	5	0	0	0	0	0	0	20	0	5	0	0
Pluchea rubelliflora	0	0	0	0	0	0	0	0	0	0	1	0
Polycarpaea longiflora	0	0	0	0	0	0	0	0	0	0	0	0
Pterocaulon sphaeranthoides	0	0	0	0	0	0	0	0	0	0	0	0
Ptilotus astrolasius	0	0	0	0.5	0	0.5	0.5	0	0	0.5	0	0
Ptilotus calostachyus	0	0	0	0	0	0	0	0	0	0	0	0
Ptilotus exaltatus	0	0	0	0	0	0.1	0	0	0	0	0	0
Ptilotus obovatus	0	0	0	0	0	0	0	0	0	0	0	0
Ptilotus rotundifolius	0	0	0	0	0	0	0	0	0	0	0	0
Rhagodia eremaea	0	0	0	0	0	0	0	0	0	0	0	0
Rhynchosia minima	0	0	0	0	0	0	0	0	0	0	0	0
Santalum lanceolatum	0	0	0	0	0	0	0	0	0	0	0	0

Species name	MCMN17	MCRV01	MCRV02	MCRV03	MCRV04	MCRV05	MCRV06	MCRV07	MCRV08	MCRV09	MCRV10	OPPS
Schizachyrium fragile	0	0	0	0	0	0	0	0	0	0	0	0
Senna artemisioides subsp. *helmsii*	0	0	0	0	0	0	0	0	0	0	0	0
Senna artemisioides subsp. *oligophylla*	0	0	0	0	0	0	0	0	0	0	0	0
Senna glutinosa	0	0	0	0	0	0	0	0	0	0	0	0
Senna glutinosa subsp. *glutinosa*	0	0	0	0	0	0	0	0	0	0	0	0
Senna glutinosa subsp. *pruinosa*	0	0	0	0	0	0	0	0	0	0	0	0
Senna notabilis	0	0	0	0	0	0	0	0	0	0	0	0
Seringia nephrosperma	0	0	0	0	0	0	0	0	0	0	0	0
Sorghum plumosum	0	0	0	0	0	0	0	0	0	0	8	0
Stemodia grossa	0	0	0	0	0	0	0	0	0	0	0.1	0
Streptoglossa decurrens	0	0	0	0	0	0	0	0	0	0	0	0
Stylobasium spathulatum	0	0	0	0	0	0	0	0	0	0	0	0
Tephrosia densa	0	1	0	0	1	0	0	1	3	0	3	0
Themeda ?sp. Mt Barricade	0	0	0	0	0	0	0	0	0	0	0	0
Themeda triandra	0	0.1	0	0.5	0.5	0	0	10	0.5	0	3	0
Trichodesma zeylanicum	0	0	0	0	0	0.1	0	0	0	0	0	0
Triodia epactia	0	0	0	0	0	0	0	0	0	0	0	0
Triodia longiceps	0	0	0	0	0	0	0	0.5	0	25	0	0
Triodia pungens	0	0	0	0	0	2	0	0	0	0	0	0
Triodia vanleeuwenii	0	0	0	0	0	0	0	0	0	0	0	0.1
Triodia wiseana	40	0	40	0	0	0	60	0	0	0	0	0

Species name	MCMN17	MCRV01	MCRV02	MCRV03	MCRV04	MCRV05	MCRV06	MCRV07	MCRV08	MCRV09	MCRV10	OPPS
Typha domingensis	0	0	0	0	0	0	0	0	0	0	0	0
**Vachellia farnesiana*	0	0	0	0	0	0	0	0	0	0	0.1	0

? denotes unconfirmed ID

* denotes weed species