Burrup Peninsula Interconnector Pipeline
Flora and Fauna Survey
June 2018

Prepared for
DDG Operations Pty Ltd

Report Reference: 21244-18-BISR-1Rev0_180803

This page has been left blank intentionally.

Burrup Peninsula Interconnector Pipeline
Flora and Fauna Survey

Prepared for
DDG Operations Pty Ltd

Job Number: 21244-18

Reference: 21244-18-BISR-1Rev0_180803

Revision Status

Rev	Date	Description	Author(s)	Reviewer
A	20/07/2018	Draft Issued for Client Review	B. Jeanes H. Warrener J. Johnston	J. Atkinson
0	03/08/2018	Final Issued for Information	B. Jeanes H. Warrener J. Johnston	J. Atkinson

Approval

Rev	Date	Issued to	Authorised by	
			Name	**Signature**
A	20/07/2018	M. Goodwin	R. Archibald	
0	03/08/2018	M. Goodwin	S. Pearse	

Abbreviations

Abbreviation	Definition
Astron	Astron Environmental Services
BAM	*Biosecurity and Agriculture Management Act 2007*
DBNGP	Dampier Bunbury Natural Gas Pipeline
DBCA	Department of Biodiversity, Conservation and Attractions
DEC	Department of Environment and Conservation
DPIRD	Department of Primary Industry and Regional Development
DRF	Declared Rare Flora
EN	Endangered
EPA	Environmental Protection Authority
ESA	Environmentally Sensitive Area
EPBC Act	*Environment Protection and Biodiversity Conservation Act 1999*
GDA	Geocentric Data of Australia
GIS	Geographical Information System
GPS	Global Positioning System
ha	Hectares
IA	International Agreement (Migratory)
IBRA	Interim Biogeographic Regionalisation for Australia
KGP	Karratha Gas Plant
km	Kilometre
LNG	Liquefied Natural Gas
m	Metre
mm	Millimetres
MGA	Map Grid of Australia
MNES	Matters of National Environmental Significance
P	Priority
PEC	Priority ecological community
TEC	Threatened ecological community
VU	Vulnerable
WC Act	*Wildlife Conservation Act 1950*
Woodside	Woodside Energy Limited
WoNS	Weeds of National Significance

Executive Summary

Astron Environmental Services was engaged to undertake a biological survey of a proposed interconnector pipeline corridor, between the Woodside Energy Limited operated Karratha Gas Plant and Pluto Liquefied Natural Gas plants on the Burrup Peninsula in the Pilbara region. The pipeline corridor is approximately 5 kilometres long and 50 metres wide (21.1 hectares). In addition, two sites adjacent to, but outside of the survey corridor, were assessed.

The survey area ('survey corridor' and 'additional survey sites') comprised lower hillslopes, rocky undulating slopes with rockpiles and drainage areas. There were no threatened ecological communities or Environmentally Sensitive Areas located within the survey area. No vegetation or habitat within the survey area matched the descriptions for either of the two Priority 1 priority ecological communities mapped as occurring within or near the survey area.

Nineteen vegetation associations (eight disturbed and 11 undisturbed) were identified across the survey area. All undisturbed vegetation associations located within the survey corridor were comparable to associations previously mapped on the Burrup Peninsula by Trudgen (2002). Of these comparable associations, one (TcBaTe) is considered significant by Trudgen (2002) as it has fewer than 10 known occurrences on the Burrup Peninsula. This association was comparable to the 2b and 7b vegetation associations which comprise approximately 5% and 3% of the survey corridor, respectively.

Approximately 33% of the survey area has been cleared for infrastructure and is therefore rated as 'completely degraded'. The remaining vegetation within the corridor ranged from 'degraded' to 'excellent' in condition with the majority (43%) recorded as 'excellent'. Two weed species, **Aerva javanica* (kapok) and **Cenchrus ciliaris* (buffel grass), were recorded within the survey area. **C. ciliaris* was common in areas of disturbance along the entire survey corridor while **A. javanica* was predominantly restricted to the Karratha Gas Plant and Pluto Liquefied Natural Gas plant sites, road verges and pipeline intersection with Burrup Road.

No threatened flora was located within the survey area. Two priority flora species, *Terminalia supranitifolia* P3 and *Rhynchosia bungarensis* P4, were recorded within the survey area. *T. supranitifolia* P3 was recorded from rockpile vegetation, lower hillslopes and the artificial drainage line created at the base of the Karratha LNG plant batter, in vegetation associations 2b, 4b and 7b respectively. *R. bungarensis* P4 was recorded across a variety of habitats including rocky hillslopes, rockpiles and a drainage gully, in vegetation associations 2b, 3b, 4b and 6b.

The survey area comprises three broad fauna habitats: Grassland, Open Woodland/Shrubland and Eucalypt Woodland. The areas of Eucalypt Woodland are of higher value for fauna, particularly for conservation significant species, than the other recorded habitats due to the diversity of microhabitats present and the diversity and complexity of the vegetation. In particular, to the south of the Karratha Gas Plant there is a drainage zone and associated narrow drainage line located within the survey corridor that supports a *Terminalia canescens, Eucalyptus victrix* and *Corymbia hamersleyana* open low woodland.

No conservation significant species were recorded during the survey. Based on the desktop assessment and following the field survey two conservation significant fauna, the Pilbara olive python (*Liasis olivaceus barroni*) and northern quoll (*Dasyurus hallucatus*) were considered to have a high likelihood of occurring within the survey area. Given the number and proximity of previous records for both these species on the Burrup Peninsula, it was considered likely that the two species will utilise the survey area for foraging or dispersal purposes. However, the field survey confirmed that the habitats within the survey area were not suitable as shelter habitat.

Table of Contents

List of Figures

List of Tables

List of Plates

List of Appendices

1 Introduction

1.1 Project Background

Astron Environmental Services (Astron) was engaged by Dampier Bunbury Natural Gas Pipeline (WA) Nominees Pty Ltd (DGBP) to undertake a biological survey of a proposed interconnector pipeline corridor between the Woodside Energy Limited (Woodside) operated Karratha Gas Plant (KGP) and the Pluto Liquefied Natural Gas (LNG) plant, located on the Burrup Peninsula in the Pilbara region. The pipeline corridor is herein referred to as the 'survey corridor'.

The survey corridor is a linear corridor approximately 5 km in length and 50 m in width with a total area of 21.1 ha (Figure 1). It extends along the eastern side of the KGP, crosses Burrup Road and continues along the west side of Burrup Road before entering the adjacent Pluto LNG plant.

At the time of survey, it was requested that two additional sites (herein referred to as 'additional survey sites') located outside of the survey corridor also be assessed (Figure 1). These included:

- an area 50 m in width extending approximately 500 m from the north east corner of the survey corridor to the end of the fenced DGBP corridor
- the area of vegetation encapsulated by the southern end of the survey corridor as it bends into the adjacent Pluto LNG plant.

Where reference is made to both the 'survey corridor' and 'additional survey sites' together, the term 'survey area' has been used.

1.2 Scope and Objectives

The scope of work was to conduct a biological survey in accordance with relevant Western Australian Environmental Protection Authority (EPA) and Department of Biodiversity, Conservation and Attractions (DBCA) technical and regulatory guidelines (Environmental Protection Authority 2002, 2004a, 2004b, 2016a, 2016a) and in compliance with the federal *Environment Protection and Biodiversity Conservation (EPBC) Act 1999*.

The biological survey comprised:

- a desktop study to collate contextual information pertaining to the study area. Included are database searches and a review of existing surveys and literature.
- a Reconnaissance (formerly known as Level 1) vegetation and flora survey, including:
  - verification of information obtained from the desktop study,
  - characterisation of the flora including species list compilation and recorded locations of threatened (T) (declared rare), priority (P) flora, Weeds of National Significance (WoNS) and Declared Pests,
  - delineation and mapping of vegetation units,
  - assessment and mapping of vegetation condition,
  - identification of any threatened ecological communities (TECs) and/or priority ecological communities (PECs).
- a Level 1 terrestrial fauna survey, including:
  - characterisation and mapping of fauna habitats,

- targeted searches for conservation significant fauna species, and
- recording of any opportunistic sightings of fauna or signs of fauna presence.

476000
477000
478000
7723000
7722000
7721000
7720000
Dampier
Karratha
Roebourne
Onslow
Pannawonica
Withnell Bay Access Rd
Woodside Access Rd (P)
Burrup Peninsula
Burrup Peninsula
Village Rd
Village Rd
Landgate / SLIP
Legend
Survey Area
Additional Survey Area
Survey Corridor
Roads

DDG Operations Pty Ltd
Burrup Interconnector Pipeline Flora, Vegetation and Fauna Survey

Figure 1: Survey area location

astron
delivering environmental intelligence™

Author: M. Stalker	Date: 20-07-2018	Coordinate System: GDA 1994 MGA Zone 50
Drawn: F. Yu	Figure Ref: 21244-18-BIDR-1RevA_180717_Fig01	0 100 200 300 400 500 600 Metres

N

2 Environmental Context

2.1 Physical Environment

2.1.1 Climate

The climate of the Pilbara region of Western Australia is classified as 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).

Based on long-term climatic data from the nearest Bureau of Meteorology weather station at Karratha Airport (Station 004083), approximately 12 km south of the survey area, the mean annual rainfall since 1972 is 292 millimeters (mm). The mean maximum temperatures range between 26.3°C in July and 35.8°C in December, and average above 30°C for much of the year (Bureau of Meteorology 2018).

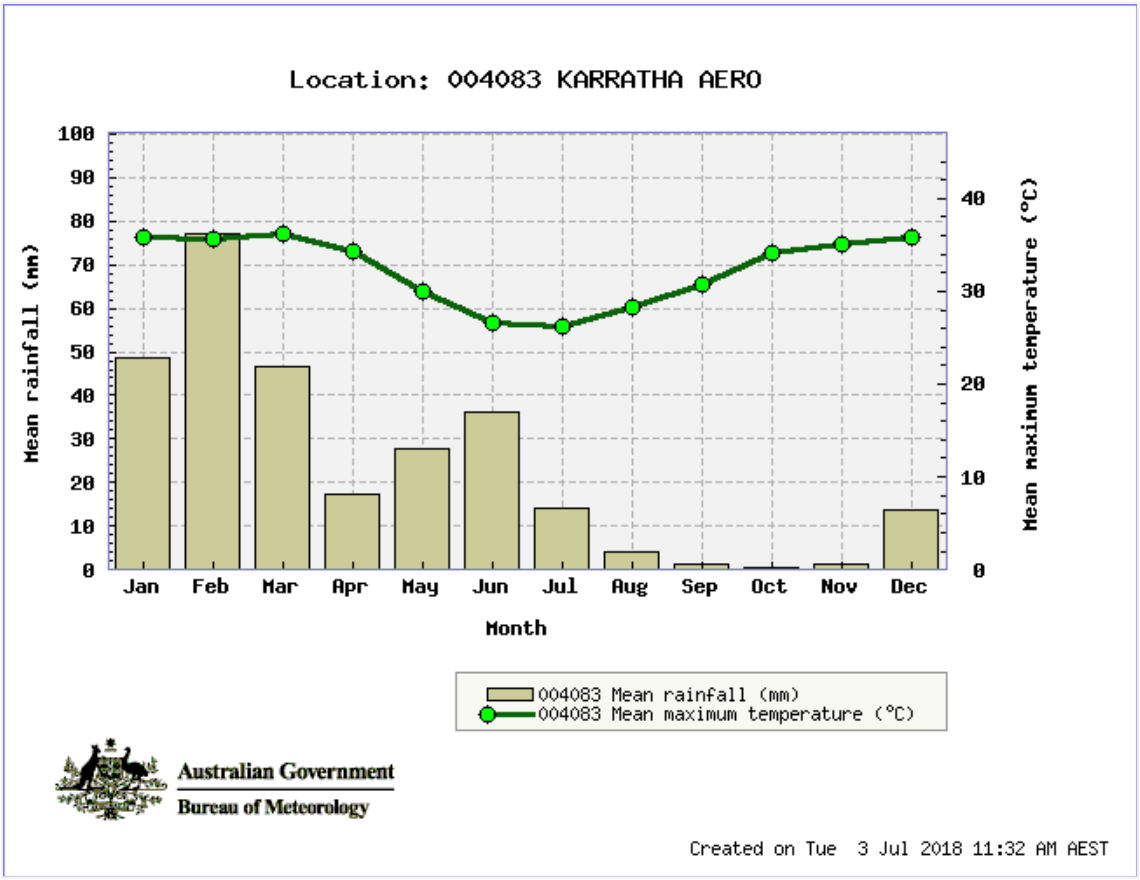


Figure 2: Climate data for Karratha Aero (Station 004083). Mean annual rainfall data has been calculated from 1972 - 2018 and mean maximum temperature has been calculated from 1993-2018 (Bureau of Meteorology 2018).

2.1.2 Geology and Soils

The surface geology of the survey area is comprised of the Gidley Granophyre unit (Stewart et al. 2008) (Table 1).

Table 1: Geological units in the survey area (Stewart et al. 2008)

Geological name	Label	Description
Gidley Granophyre	Aggy	Granophyre, commonly porphyritic; remelted granite.

2.1.3 Land Systems

The Western Australian rangelands have been surveyed by the Department of Primary Industries and Regional Development (previously named Department of Agriculture) with subsequent reports identifying the condition of soils, landforms, vegetation, habitat and the presence of declared plants and animals. Land systems across the surveyed areas were classified according to predominant biophysical features. The Pilbara region was surveyed between 1995 and 1999 with 102 land systems mapped (van Vreeswyk et al. 2004).

The Burrup Peninsula comprises four land systems:

- **Cheerawarra:** sandy coastal plains and saline clay pans supporting soft and hard spinifex grasslands and minor tussock grasslands.
- **Granitic**: rugged granitic hills supporting shrubby hard and soft spinifex grasslands.
- **Littoral:** bare coastal mudflats with mangroves on seaward fringes, samphire flats, sandy islands, coastal dunes and beaches.
- **Rocklea:** basalt hills, plateaux, lower slopes and minor stony plains supporting hard spinifex (and occasionally soft spinifex) grasslands (van Vreeswyk et al. 2004).

The survey area occurs solely within the Granitic land system (Table 2).

Table 2: Distribution of Granitic land system within the Pilbara bioregion and survey corridor (van Vreeswyk et al. 2004)

Land system	Total area within bioregion (ha)	Total area within survey corridor (ha)	Proportion within survey corridor (%)
Granitic	4,020	21.1	0.5

2.1.4 Surface Water and Hydrology

No wetlands of international importance (i.e. Ramsar wetlands) or nationally important wetlands occur within or near the survey area (Department of the Environment and Energy 2017a, 2017b).

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 survey area occur in the Pilbara Bioregion, of which 5% to 10% 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 survey area occurs within the Roebourne subregion of the Pilbara region and is described in the audit as:

- Roebourne PIL 4 – Quaternary alluvial and older colluvial coastal and sub-coastal plains with vegetation described as grass savannah of mixed bunch and hummock grasses, and dwarf shrub steppe of *Acacia* species and ephemeral drainage lines support *Eucalyptus victrix* or *Corymbia hamersleyana* woodlands. Samphire, *Sporobolus* and mangal occur on marine alluvial flats and river deltas (Kendrick and Stanley 2001b).

2.2.2 Pre-European Vegetation

The Pre-European vegetation mapping of Western Australia dataset maps original natural vegetation presumed to have existed prior to European settlement. Beard (1975) completed broad-scale (1:1,000,000) pre-European vegetation mapping at an association level.

Vegetation association, 117 (Abydos Plain – Roebourne), is the only pre-European vegetation unit mapped within the survey area and is described as hummock grassland, grass steppe; soft spinifex *Triodia* species (Shepherd, Beeston, and Hopkins 2002; Department of Biodiversity, Conservation, and Attractions 2017a) (Table 3).

Table 3: Extent of pre-European vegetation in the survey area (Department of Biodiversity, Conservation, and Attractions 2017a).

Vegetation association	Mapping unit (Beard 1975)	Extent in survey area (ha)	Current extent in bioregion (ha)	Pre-European extent (ha)	Proportion of pre-European extent remaining (%)	Pre-European extent with formal protection (%)
Abydos Plain – Roebourne	117	21.1	46,901	50,962	92.0%	32.5%

2.2.3 State and Commonwealth Conservation Categories and Management

Commonwealth and State regulatory authorities maintain databases of the locations and conservation status of significant flora, fauna and ecological communities in Western Australia.

The *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) provides a legal framework to protect and manage Matters of National Environmental Significance (MNES) including listed flora, fauna and ecological communities. These listed flora, fauna and ecological communities are allocated a conservation category, which are outlined in Tables A.1 and A.2 (Appendix A).

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.2, Appendix A). The 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.3 (Appendix A).

Under Western Australian legislation, all native flora are protected and it is an offence to 'take' protected flora. The *Wildlife Conservation Act 1950* (WC Act) also provides for native plant species to be specially protected when they are under identifiable threat of extinction, are rare, or otherwise in need of special protection (Department of Biodiversity, Conservation, and Attractions 2017b). Such specially protected flora is considered under the WC Act to be 'declared rare' (threatened). 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 rare or 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*.

Under Western Australian legislation, all native fauna is protected and it is an offence to 'take' protected fauna. The WC Act also provides for native fauna species to be specially protected when they are considered rare, threatened with extinction, or have a high conservation value (Table A.5, Appendix A). In addition, due to the diversity of Western Australia's fauna, many species are known from only a few collections or locations but have not been adequately surveyed. Such fauna may be rare or threatened but cannot be considered for declaration as threatened fauna until adequate surveys have been undertaken. These fauna species are included on a supplementary conservation list managed by DBCA called the *Priority Fauna List*. Priority fauna are categorised according to level of threat and other information and the conservation categories are described in Table A.6 (Appendix A).

2.2.4 Introduced Flora (Weeds)

Significant weed species are identified at both the Commonwealth and State levels. 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* (BAM Act). 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 rankings are presented in Table A.7 (Appendix A).

2.2.5 Conservation Reserves

The Pilbara bioregion has 7.75% of its land area under some form of conservation tenure. The Roebourne PIL04 subregion in which the survey area is located has 9.56% of its area reserved. The Roebourne subregion contains the Cane River, Mount Minnie and Barlee Range Conservation Parks, a number of island Nature Reserves, a portion of the Millstream – Chichester National Park and Murujuga National Park (Kendrick and Stanley 2001a).

No conservation reserves occur within the survey area. One national park (Murujuga National Park), one unnamed nature reserve and six unnamed Section 5(1)(h) reserves are located within a 20 km radius from the survey area (Table 4) (Department of Biodiversity, Conservation, and Attractions 2017d).

Table 4: Conservation Reserves located within a 20 km radius of the survey area (Department of Biodiversity, Conservation, and Attractions 2017d).

Reserve name	Classification	Distance from survey area (km)
Murujuga National Park	National Park	0.3
Unnamed (R 36915)	Nature Reserve	5.6
Unnamed (R 36907)	Section 5(1)(h) Reserve	9.3
Unnamed (R 36909)	Section 5(1)(h) Reserve	11.5
Unnamed (R 36910)	Section 5(1)(h) Reserve	13.3
Unnamed (R 38287)	Section 5(1)(h) Reserve	18.3
Unnamed (R 32144)	Section 5(1)(h) Reserve	19.2
Unnamed (R 37089)	Section 5(1)(h) Reserve	19.8

3 Methods

3.1 Desktop Survey

3.1.1 Database Searches

Contextual information of the survey area was reviewed within a 20 km radius. A search for Environmentally Sensitive Areas (ESAs) in the vicinity of the survey area was conducted using the DBCA Legislated Lands and Waters, and Lands and Waters of Interest datasets (Department of Biodiversity, Conservation, and Attractions 2017d, 2017c).

State and Commonwealth database searches were conducted to identify listed conservation significant flora, fauna and ecological communities within, or in close proximity to, the survey area. Details of the database searches conducted are summarised in Table 5 and the search results are presented in Appendix B. Conservation categories for ecological communities, flora and fauna are presented in Appendix A.

Introduced flora species were compared to the Department of Primary Industries and Regional Development list, to determine if any have been listed as declared pests (Department of Primary Industries and Regional Development 2017), and the WoNS list (Australian Weeds Committee 2012). Introduced pest fauna were checked against the three categories as Gazetted under the *Biosecurity and Agriculture Management Regulations 2013* (BAM Regulations) (Department of Agriculture and Food Western Australia 2013) and detailed as appropriate. Introduced flora and pest fauna categories are presented in Appendix A.

Table 5: Summary of database searches undertaken.

Database	Date search results received	Search focus	Search result
Department of Environment and Energy Protected Matters Search Tool (Department of the Environment and Energy 2018)	16/07/2018	MNES – flora and fauna	20 km buffer around area defined by coordinates - 116° 46' 48'' E, 20° 35' 46'' S
NatureMap (Department of Biodiversity, Conservation, and Attractions 2018a)	10/07/2018	Flora of conservation significance	20 km buffer around area defined by coordinates - 116° 46' 48'' E, 20° 35' 46'' S
		Fauna of conservation significance	
Threatened and Priority Ecological Communities Database (Department of Biodiversity, Conservation, and Attractions 2018b)	18/06/2018	Listed threatened and priority ecological communities	20 km radius around survey area shapefiles provided
Threatened and Priority Flora Database (TPFL) (Department of Biodiversity, Conservation, and Attractions 2018d)	06/06/2018	Listed threatened and priority flora	20 km radius around survey area shapefiles provided
Western Australian Herbarium Flora (Department of Biodiversity, Conservation, and Attractions 2018e)			

Database	Date search results received	Search focus	Search result
Threatened and Priority Fauna Database (Department of Biodiversity, Conservation, and Attractions 2018c)	12/06/2018	Listed Threatened and Priority fauna	20 km radius around survey area shapefiles provided

3.1.2 Literature Review

The most recent and comprehensive studies of the flora and vegetation of the Burrup Peninsula and adjacent islands was undertaken by Trudgen and Griffin (2001)and Trudgen (2002). These reports included descriptions of the plants surveyed and their habitats, floristic groups and the presence of geographically restricted, rare and newly identified plants in the area. Vegetation mapping of the peninsula (with the exception of immediate coastline vegetation) has also been undertaken at a scale of 1:5 000 (Jackson, Paling, and Stoddart 2006).

A total of 393 vascular plant species were identified as occurring on the Burrup Peninsula and adjacent islands with the area displaying a rich flora for its size, and a high number of geographically restricted or uncommon species (Trudgen 2002). Some 200 vegetation associations were identified on the Burrup Peninsula alone and Trudgen (2002) concluded that vegetation of the Burrup Peninsula is unique from that of the surrounding area due to a combination of geology, microclimates and episodes of isolation from the mainland at times of higher sea level. Trudgen (2002) produced a vegetation map showing the frequency of vegetation types on the Burrup Peninsula. The map has a frequency scale ranging from 1 (a single occurrence) to 100 or more occurrences and is useful in assessing the regional significance of individual vegetation types. Trudgen (2002) suggests that ten or fewer occurrences of any vegetation association should be treated as significant especially if those occurrences are not represented in areas designated for conservation on the Burrup Peninsula.

Welker Environmental Consultancy (Welker) (2002) reviewed the statistical analysis of Trudgen and Griffin (2001) in order to provide advice on areas of the Burrup Peninsula that may require special consideration in development planning (Jackson, Paling, and Stoddart 2006). Welker (2002) concluded that the vegetation of the Burrup Peninsula should be considered a different floristic sub-region of the west Pilbara, with a high level of conservation value at a regional level.

3.1.3 Likelihood of Occurrence Assessment

Potential habitat types were identified prior to conducting the field survey using aerial imagery. The conservation significant flora species listed in the database search results were then categorised according to the criteria in Table 6 to assess potential occurrence within the survey area.

Table 6: Pre-survey and post-survey criteria used to assess the likely presence of conservation significant flora in the survey area.

Likelihood of occurrence	Pre-survey
Likely	Species previously recorded within the survey area or within 10 km of the survey area and suitable habitat appears to be present in the survey area.
Potential	Species previously recorded within 10 km to 40 km of the survey area and/or suitable habitat appears to be present in the survey area.
Unlikely	No suitable habitat appears to be present in the survey area.

Following the field survey, the conservation significant flora species identified during the desktop assessment as having the highest potential to occur within the survey area, but were not recorded during the current survey, were again assessed to determine their likelihood of occurrence within the survey area. Post-field survey likelihood of occurrence was primarily based on validating the presence (and thorough inspection) of suitable habitats within the survey area, combined with life form, habitat and flowering information for each flora species.

Conservation listed vertebrate fauna species returned from the database searches were also categorised for likelihood of occurrence within the survey area according to the criteria listed in Table 7.

Table 7: Criteria used to define likelihood of occurrence of conservation significant fauna species.

Likelihood of occurrence	Criteria
Recorded	Species or evidence of species recorded during current survey.
High	Species has previously been recorded within the survey area or within 20 km of the survey area and preferred habitat appears to be present.
Moderate	Species has not been previously recorded from within the survey area, however species has been recorded within 20 km of the survey area and suitable habitat appears to be present.
Low	Species previously recorded within 20 km of the survey area but suitable habitat does not appear to be present.

3.2 Field Survey

The flora, vegetation and fauna surveys were conducted by Astron Associate Botanist Vicki Long on the 7 and 8 June 2018. The length of the survey corridor was traversed by foot. One area of remnant vegetation within the flare hazard area of the KGP was not able to be accessed on foot due to safety restrictions, and was instead assessed from within a vehicle. The additional survey site located within the southern bend of the survey corridor was also traversed by foot. The second additional site, located to the north east of the survey corridor, contained the fenced DGBP corridor, adjacent batter and vegetation to the east. The fenced corridor was traversed however vegetation below the batter was unable to be safely accessed due to heavy rainfall at the time of survey. This vegetation was therefore assessed from distance.

3.2.1 Weather

Daily weather observations recorded from the Bureau of Meteorology Karratha Aero weather station (004083) were used to describe local rainfall and temperatures in the 12 months preceding

the survey (Figure 3) (Bureau of Meteorology 2018). In the 12 months preceding the survey, 150 mm of rainfall was recorded, 174 mm below the long term average. A significant rainfall amount was recorded two days prior to the field survey (62 mm). The average maximum temperature during the survey was 25°C (Bureau of Meteorology 2018).

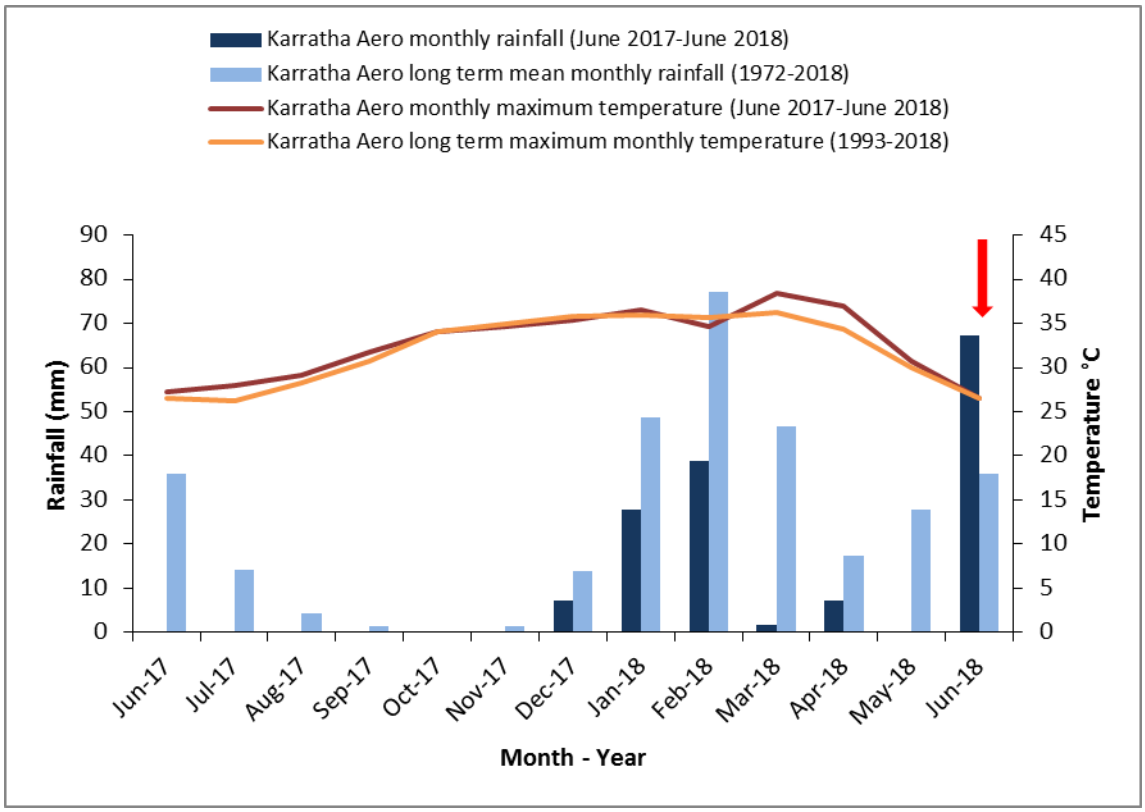


Figure 3: Mean monthly total recorded rainfall (1972-2018) (mm) and mean monthly maximum temperatures (1993-2018) (°C) recorded from Karratha Aero weather station (004083). Daily maximum temperatures and rainfall recorded from June 2017 to June 2018 at Karratha Aero weather station (004083) (Bureau of Meteorology 2018). Red arrow indicates survey timing.

3.2.2 Flora and Vegetation Survey

The methods adopted for the flora and vegetation survey were formulated, as far as practicable, in context with:

- EPA Technical Guidance – Flora and Vegetation Surveys for Environmental Impact Assessment (Environmental Protection Authority 2016a);
- EPA Position Statement 3 (Environmental Protection Authority 2002);
- EPA Guidance Statement 51 (Environmental Protection Authority 2004b)

Ten relevés covering in excess of 65 000 m^2 were assessed within the survey corridor. Site selection was based on the review of aerial photography and ground truthing of habitat and vegetation boundaries in the field. Relevés were generally 50 m in width with length varying according to vegetation boundaries. The following information was collected for each relevé:

- Location – coordinates taken using a handheld GPS (MGA50, GDA94).
- Species - vascular plant species present, including weed species.
- Foliar cover – the estimated percentage cover for each species.

- Vegetation condition – assessed according to the vegetation condition scale adapted from Trudgen (1988) in The Technical Guide – Flora and Vegetation Surveys for Environmental Impact Assessment (Environmental Protection Authority 2016a) (Table C.1, Appendix C).
- Habitat - a broad description of the surrounding landscape based on landform, topography and soil.
- Disturbance - records of any obvious disturbances such as fire, tracks, weed infestation, or grazing.
- Photographs - a photograph was taken of each relevé.

Vegetation was described according to level 5 (association level) of the National Vegetation Information System (Department of Environment and Heritage 2003) and classified according to the Aplin (1979) modification of the vegetation classification system of Specht (1970) (Table C.2, Appendix C). Vegetation type mapping is presented in Appendix D and vegetation condition mapping in Appendix E.

Targeted traverses were conducted in the survey corridor to record the location of conservation significant flora and ecological communities, and the presence of weed species. Conservation significant flora were mapped with vegetation type (Appendix D).

3.2.3 Terrestrial Vertebrate Fauna Survey

The methods adopted for the Level 1 fauna assessment was formulated as far as practicable in context with:

- EPA Technical Guidance – Sampling Methods for Terrestrial Vertebrate Fauna (Environmental Protection Authority 2016c)
- Terrestrial Fauna Surveys (Environmental Protection Authority 2016a)
- Environment Protection and Biodiversity Conservation Act 1999 (EPBC Act) referral guideline for the Endangered Northern Quoll Dasyurus hallucatus (Department of the Environment and Energy 2016a).

The fauna assessment included habitat characterisation, habitat mapping and targeted searches for conservation significant fauna species. The assessment focused on the habitat's potential to support fauna, in particular MNES species, as well as other species of conservation significance. Habitats were assessed on the basis of their complexity, the presence of microhabitats, including significant trees with hollows, loose bark, fallen hollow logs and leaf litter, and other habitat features likely to provide foraging opportunities and/or shelter for fauna, such as water bodies and rocky outcrops. Any habitats considered likely to support conservation significant species were inspected for signs of significant species.

Fauna habitat assessments were conducted at each relevé site within the survey area (Figures F.1 to F.6, Appendix F). The following information was collected at each site:

- Location – coordinates measured using a handheld GPS (MGA50, GDA94).
- Habitat/landform – position in the landscape. Major fauna habitat types were described based on the landform and vegetation.
- Vegetation type – a broad description of the vegetation type and structure.
- Soils – a brief description of soil type.

- Condition – habitat condition was assessed based on the presence of anthropogenic (human-induced) disturbances, and using the condition ratings suggested by Thompson and Thompson (2010) (Table C.3, Appendix C).
- Photographs – a representative photograph was taken at each habitat assessment site.

The information derived from the fauna habitat assessments was used to delineate fauna habitats throughout the survey area, which were then mapped accordingly (Figures F.1 to F.6, Appendix F).

All opportunistic sightings of fauna or signs of fauna presence were recorded. Where a conservation significant species was recorded via primary or secondary evidence, a coordinate location, description of record, habitat type and photograph were recorded.

3.3 Limitations

A review of any limitations that may have affected a complete assessment of the data collected from the desktop assessment and field surveys is presented in Table 8. The limitations listed are based on those suggested as considerations in EPA's Technical Guidance – Flora and Vegetation Surveys for Environmental Impact Assessment (Environmental Protection Authority 2016a) and Technical Guidance – Terrestrial Fauna Surveys (Environmental Protection Authority 2016b).

Table 8: Statement of limitations.

Potential limitation	Statement regarding potential limitation
Sources of information and availability of contextual information Is the region well documented?	Broad-scale information is available from Beard (1975) , Kendrick and McKenzie (2001) and Kendrick and Stanley (2001a). A vegetation and floristic survey of the Burrup Peninsula and adjacent islands was undertaken by Trudgen and Griffin (2001) and Trudgen (2002). Contextual information was not a limiting factor of this assessment.
Scope The level of survey and detail required to undertake the survey. Was there adequate time to complete the survey to the desired standard?	There was adequate time to complete all aspects of the flora, vegetation and fauna surveys as outlined per the scope of works. Time allowance was not a limiting factor of this assessment.
Proportion of flora and fauna identified, recorded and/or collected Was the survey sampling, timing and intensity considered adequate? Was the survey conducted at what was considered an appropriate time of the year for plant identification? Were any taxonomic groups considered to be under-represented?	The survey sampling and intensity was considered adequate however the Western Pilbara region recorded a below average rainfall wet season prior to the June 2018 survey. Between January and March 2018, 68 mm of rain was recorded at the Karratha Airport weather station, compared to the long term average for that period of 172 mm (Bureau of Meteorology 2018). Annual and ephemeral flora species were therefore absent from the survey area. Vegetation was dry and mostly dormant however all flora present were able to be identified to species level. *Vigna triodiophila* P3 has the potential to occur in the survey area, however the dry seasonal conditions are likely to have limited the likelihood of this species being observed, should it occur. The dry season survey timing is therefore considered a potential limitation of the flora and vegetation assessment.
Completeness Is there further work which may be required i.e. was the relevant area fully surveyed?	The survey corridor was adequately surveyed to compile a representative list of flora species present at the time of assessment (including conservation significant and introduced flora species), as well as describe and map vegetation and fauna habitats at a level appropriate for possible future management decisions. An area of the additional survey site located to the north east (and outside) of the survey corridor was unable to be accessed by foot. Assessments of the mangal and *Eucalyptus. victrix* woodland were conducted from distance and these areas are not considered to have been adequately surveyed. This gap in the flora and vegetation survey is considered to be a limiting factor in the assessment of one of the additional survey sites.
Mapping reliability Were the aerial photographs, satellite images and site maps available considered adequate to fully understand the area surveyed? Was the mapping generated considered to have a high degree of reliability?	Available aerial imagery was adequate with the generated vegetation mapping considered to have a high degree of reliability. The mapping reliability was not a limiting factor of the assessment.

Potential limitation	Statement regarding potential limitation
Timing When was the survey conducted in terms of season, rainfall, severe weather events etc.? Was the survey conducted at an appropriate time for access, observation of the optimal suite of species and for identification of flowering and fruiting species?	Below average rainfall during the wet season (January – March) preceding the June 2018 survey resulted in the absence of annual and ephemeral flora species. On the day of survey, heavy rainfall prevented the safe descent of a steep rocky batter to access an additional survey area to the north east of the survey corridor. However, the survey corridor was accessible in its entirety.
Disturbance Had the survey area been impacted by any disturbance which may have limited the survey, i.e. fire, flood, accidental human intervention etc.?	Infrastructure and roads comprise approximately one third of the survey corridor. In addition, approximately 19% of the survey corridor supports vegetation that has been disturbed within the last 30 years during the construction and maintenance of the original DGBP pipeline and associated infrastructure. Species composition and vegetation structure has changed in these disturbed areas. The remaining vegetation of the survey corridor was relatively undisturbed and in dry but healthy condition. Disturbance is therefore considered a minor limitation of this survey but is unlikely to have affected the results for the purpose of this survey.
Intensity In retrospect, was the intensity considered to be adequate?	The intensity of the flora and vegetation survey was considered adequate to compile a representative species list and map the vegetation of the survey area. The intensity of the Level 1 fauna survey was considered adequate to map the fauna habitats of the survey area. Survey intensity was not considered to be a limiting factor of the assessment.
Resources Were the appropriate tools and materials available to complete the task effectively?	Resources were adequate to complete the survey and all appropriate tools and materials required to complete the task were available. Resources were not considered a limiting factor of the assessment.
Access Were there any factors limiting access to the survey area?	The survey corridor was accessible by vehicle and the majority was traversed by foot. Due to safety restrictions the flare restriction area within the KGP necessitated that the remnant vegetation in this area be assessed from within a vehicle. Of the two additional survey sites, one area was unable to be accessed by foot in its entirety. Vegetation to the north east of the survey corridor located at the base of a very steep rocky batter was assessed from distance as heavy rainfall at the time of assessment prohibited the safe descent of the batter. While vegetation closer to the batter was able to be sighted and recorded, the *E. victrix* woodland associated within the drainage line was unable to be assessed beyond upper storey species structure. A condition assessment was not completed as the presence of weeds was indistinguishable. In addition, the health of the adjacent mangrove was assessed from distance only. Access was therefore considered a limiting factor of the assessment.

Potential limitation	Statement regarding potential limitation
Experience Were personnel undertaking the field survey and plant identification trained and/or experienced in undertaking the required tasks?	The scientist responsible for undertaking the field survey is highly experienced in the survey of flora, vegetation and fauna of the Pilbara region, including the Burrup Peninsula. As such, personnel experience was not considered a limiting factor in the assessment.

4 Results

4.1 Desktop Assessment

4.1.1 Environmentally Sensitive Areas

The nearest ESA is the Dampier Archipelago, located approximately 5 km at its nearest point from the survey area (Department of the Environment and Energy 2008).

4.1.2 Flora and Vegetation

No State or Commonwealth listed TECs are known to occur within the vicinity of the survey area. The survey area occurs within, or immediately adjacent to, the buffer of two Priority 1 PECs:

- *Burrup Peninsula rock pile communities:* pockets of vegetation in rock piles, rock pockets and outcrops. Comprises a mixture of Pilbara and Kimberley species, communities are different from those of the Hamersley and Chichester Ranges. Includes short-range endemic land snails.
- *Burrup Peninsula Rock pool communities:* calcareous tufa deposits. Habitat for interesting aquatic snails.

The buffer of one location of the *Burrup Peninsula rock pile community* is mapped over approximately 0.09 ha (0.41%) of the survey area, and a number of other locations of this PEC occur between 400 m to 2 km from the southern and south-western edges of the survey area (Appendix D).The buffer of the *Burrup Peninsula Rock pool community* is within 14 m of the survey area at its nearest point.

Database searches listed eight Priority 3 species and one Priority 4 species within a 20 km buffer of the survey area. There were no threatened flora species or species listed as MNES under the EPBC Act reported within 20 km. The locations of previously recorded threatened and priority flora are listed in the database search results, Appendix B. The pre-survey desktop assessment indicated that three of the listed priority flora species were considered likely to occur within the survey area (Table G.1, Appendix G).

4.1.3 Terrestrial Vertebrate Fauna

Database search results listed 94 conservation significant fauna species within 20 km of the survey area, including 25 reptiles, 52 birds and 17 mammals. Thirty-five of these species (22 reptiles, four birds and nine mammals) were considered to occur exclusively within the marine environment (e.g. marine turtles, sea snakes and cetaceans) or are mainly pelagic and not reliant on terrestrial habitats (e.g. some seabird species) and were not included in the desktop assessment.

Of the remaining 59 species, two species, northern quoll (*Dasyurus hallucatus*) and Pilbara olive python (*Liasis olivaceus barroni*), were considered to have a 'high' likelihood of occurrence within the survey area. Three species were considered to have a 'moderate' likelihood and 54 species were considered to have a 'low' likelihood of occurrence in the survey area (Table G.2, Appendix G). This is based on their respective ecology, habitats considered likely to be present and any previous records from historic survey and database records.

4.2 Field Survey

4.2.1 Flora and Vegetation

4.2.1.1 Flora

A total of 64 plant taxa (including subspecies and varieties), comprising 28 families and 51 genera were identified within the survey area. The Fabaceae, Malvaceae and Poaceae families had the highest levels of species richness (Table 9). Of the 51 genera present, *Acacia* and *Triodia* were the most represented genera surveyed, with six and four species recorded respectively (Table 10). Two mangrove species, *Avicennia marina* and *Rhizophora stylosa* were only recorded in the additional survey area (Site 12). At the time of survey, most species were dormant and there was an absence of annual or ephemeral species. A flora species list and site by species matrix are provided in Table H.1 and Table H.2 (Appendix H) and detailed relevé, including site photographs, data are presented in Appendix I.

Table 9: Frequently recorded families.

Family	Number of taxa
Fabaceae	16
Malvaceae	8
Poaceae	8

Table 10: Frequently recorded genera.

Genus	Number of taxa
Acacia	6
Triodia	4
Abutilon	2
Corchorus	2
Rhynchosia	2
Senna	2
Terminalia	2
Triumfetta	2

4.2.1.2 Conservation Significant Flora

No State or Commonwealth listed Threatened flora were recorded within the survey area. Two State listed priority (P) flora species were located; *Terminalia supranitifolia* P3 and *Rhynchosia bungarensis* P4 (Table J.3, Appendix J). Five records of *T. supranitifolia* P3 were located at four locations within the 2b, 4b and 7b vegetation associations. In addition, a further two plants were located growing on rockpiles within the KGP. Eleven *R. bungarensis* P4 were recorded from five locations within the 2b, 3b, 4b and 6b vegetation associations. (Table J.3, Appendix J).

Following the survey, and with greater understanding of the landforms, soils and habitats of the survey area, one priority flora species listed in the database search results, *Vigna triodiophila* (P3), was considered to have potential to occur but was not recorded.

4.2.1.3 Introduced Flora

Two introduced species were recorded within the survey area: **Aerva javanica* (kapok) and **Cenchrus ciliaris* (buffel grass) (Table J.2, Appendix J). Neither species is listed as a Weed of National Significance (Australian Weeds Committee 2012) or a declared pest plant in Western Australian under the BAM Act (Department of Primary Industries and Regional Development 2017).

Due to dormancy, an accurate estimation of cover was difficult for both species with only grass butts of **C. ciliaris* present. This species was recorded at 15 locations within the survey area (Table J.2, Appendix J) and was widespread within previously disturbed areas along the length of the survey corridor, however it appeared limited within the surrounding undisturbed vegetation. **A. javanica* was restricted to the KGP (in particular along the previously fenced DGBP corridor), the edge of the Pluto LNG plant site and the verges of road and pipeline intersections.

4.2.1.4 Vegetation

All vegetation types identified across the survey corridor and within the two additional survey sites are presented in Table 11. Area and proportion calculations are for the survey corridor only. Approximately 33% of the survey corridor contained infrastructure and roads and was devoid of vegetation. The remaining disturbed and undisturbed vegetation types were delineated. Disturbed vegetation comprised approximately 19% of the survey corridor and was classified into eight vegetation associations, the majority of which featured **C. ciliaris* as a key species (Table 11). Eleven undisturbed vegetation associations, comprising 48% of the corridor, were identified. Dominant vegetation included the 1b and 4b associations, which accounted for 18% and 12% of the survey area, respectively. Vegetation mapping is presented in (Appendix D).

The area immediately surrounding the KGP and Burrup Road was marked as an area of disturbance and no vegetation was mapped by Trudgen (2002). The majority of the survey corridor was located in this previously unmapped area. However, all undisturbed vegetation associations identified within the survey corridor were able to be correlated with Trudgen (2002) associations mapped in surrounding areas on the Burrup Peninsula. A comparison of the vegetation associations between the current survey and Trudgen (2002) is provided in Appendix K and includes the number of known occurrences for the analogous Trudgen (2002) associations.

Table 11: Vegetation types recorded in the survey corridor and additional survey sites. Area calculations are for vegetation within the survey corridor only.

Vegetation type description	Vegetation mapping code	Relevé number	Vegetation condition	Total area (ha) (proportion of survey corridor %)
Undisturbed vegetation				
Undulating low rocky slopes with outcropping and rockpiles				
Corymbia hamersleyana scattered to open low woodland over *Dichrostachys spicata* open shrubland over *Indigofera monophylla* open low shrubland over *Triodia epactia* hummock grassland. Scattered *Brachychiton acuminatus*, *Terminalia canescens* on numerous small rockpiles and outcrops. **Associated Species**: *Abutilon lepidum, Acacia bivenosa, Acacia colei, Boerhavia coccinea, Cleome viscosa, Corchorus crozophorifolius, Corchorus walcottii, Cymbopogon ambiguus, Cullen lachnostachys, Euphorbia tannensis, Flueggea virosa, Grevillea pyramidalis* subsp. *pyramidalis, Rhagodia eremaea, Rhynchosia minima, Tephrosia rosea* var. *clementii, Terminalia canescens, Trachymene oleracea, Trichodesma zeylanicum* and *Triumfetta appendiculata.*	1b	1b, 11b	Excellent	3.73 (18%)
Triodia epactia hummock grassland with scattered *Grevillea pyramidalis* subsp. *pyramidalis* tall shrubs to open tall shrubland. Scattered *Brachychiton acuminatus* low trees and open *Ipomoea costata* tall shrubs on rockpiles. **Associated Species:** *Abutilon lepidum, Acacia colei, Acacia coriacea, Bonamia media, Corchorus walcottii, Cucumis variabilis, Cullen lachnostachys, Cymbopogon ambiguus, Dichrostachys spicata, Eriachne obtusa, Hakea lorea, Indigofera monophylla, Pittosporum phillyreoides, Polycarpaea longiflora, Pterocaulon sphaeranthoides, Rhagodia eremaea, Rhynchosia bungarensis* P4, *Tinospora smilacina, Trachymene oleracea, Trichodesma zeylanicum.*	6b	6b	Excellent	0.54 (3%)

Vegetation type description	Vegetation mapping code	Relevé number	Vegetation condition	Total area (ha) (proportion of survey corridor %)
Undulating lower hillslope with rocky mantle				
Triodia epactia hummock grassland with scattered *Dichrostachys spicata*, *Acacia orthocarpa* and *Grevillea pyramidalis* subsp. *pyramidalis* tall shrub. **Associated Species:** **Cenchrus ciliaris, Abutilon lepidum, Acacia inaequilatera, Adriana tomentosa, Boerhavia coccinea, Corchorus walcottii, Cucumis variabilis, Dichrostachys spicata, Indigofera monophylla, Rhynchosia bungarensis* P4, *Solanum cleistogamum, Trichodesma zeylanicum, Triumfetta appendiculata, Triumfetta clementii.*	4b	4b	Excellent	2.47 (12%)
Acacia bivenosa scattered to open tall shrubland over mixed *Triodia angusta* and *Triodia epactia* open hummock grassland. **Associated Species:** *Acacia inaequilatera, Acacia orthocarpa, Brachychiton acuminatus, Corchorus walcottii, Dichrostachys spicata, Grevillea pyramidalis* subsp. *pyramidalis, Indigofera monophylla, Ipomoea costata, Senna hamersleyensis, Ficus aculeata, Tephrosia rosea* var. *clementii, Trichodesma zeylanicum.*	9b	9b	Excellent	0.92 (4%)
Rockpile				
Terminalia canescens scattered to open low woodland with *Brachychiton acuminatus*, *Grevillea pyramidalis* subsp. *pyramidalis* and *Dichrostachys spicata* over open *Triodia epactia*, **Cenchrus ciliaris* and *Cymbopogon ambiguus* grassland. **Associated Species:** *Acacia colei, Acacia coriacea, Cajanus cinereus, Corchorus walcottii, Euphorbia tannensis, Ipomoea costata, Jasminum didymum* subsp. *lineare, Pittosporum phillyreoides, Plumbago zeylanica, Rhynchosia bungarensis* P4, *Terminalia supranitifolia* P3, *Triumfetta appendiculata, Triumfetta clementii.*	2b	2b	Very Good	1.10 (5%)
Drainage zone				
Narrow drainage line				
Terminalia canescens open low woodland over open low shrubland of *Stemodia grossa* over *Triodia epactia* open hummock grass with patchy **Cenchrus ciliaris.* **Associated Species:** *Acacia coriacea, Acacia inaequilatera, Cyperus vaginatus, Dichrostachys spicata, Flueggea virosa, Rhagodia eremaea, Rhynchosia bungarensis* P4.	3b	3b	Excellent	0.18 (1%)

Vegetation type description	Vegetation mapping code	Relevé number	Vegetation condition	Total area (ha) (proportion of survey corridor %)
Eucalyptus victrix open low woodland over *Triodia angusta* hummock grassland with some *Triodia epactia*. **Associated Species:** *Abutilon fraseri, Acacia coriacea, *Cenchrus ciliaris, Cymbopogon ambiguus, Phyllanthus maderaspatensis, Terminalia canescens, Waltheria indica.*	5b	5b	Excellent	0.21 (1%)
Mixed tall open to closed woodland and shrubland of *Terminalia canescens*, *Dichrostachys spicata*, *Brachychiton acuminatus*, *Grevillea pyramidalis* subsp. *pyramidalis*, *Ipomoea costata*, *Flueggea virosa* and *Acacia coriacea* over *Triodia epactia* hummock grassland. **Associated Species:** **Cenchrus ciliaris, Acacia bivenosa, Brachychiton acuminatus, Cajanus cinereus, Crotalaria novae-hollandiae, Cucumis variabilis, Cymbopogon ambiguus, Cynanchum floribundum, Flueggea virosa, Senna venusta, Terminalia supranitifolia* P3, *Themeda triandra, Tinospora smilacina.* Although the vegetation was considered undisturbed, this drainage line has been artificially created by the adjacent KGP batter. As a result, the woodland was dense rather than scattered, as is typical in surrounding areas.	7b	7b	Excellent	0.55 (3%)
Low drainage zone				
Eucalyptus victrix woodland over *Acacia ampliceps*, *Acacia coriacea* and *Flueggea virosa* tall closed shrubland with *Dichrostachys spicata*, *Pittosporum phillyreoides*, *Brachychiton acuminatus* and *Ehretia saligna*.	8	No relevé surveyed	Visible vegetation appears very healthy.	Located outside of survey corridor.
Terminalia canescens, *Eucalyptus victrix* and *Corymbia hamersleyana* open low woodland over *Dichrostachys spicata* open shrubland over *Triodia angusta* hummock grassland. **Associated Species:** *Acacia coriacea, Cucumis variabilis, Ehretia saligna, Flueggea virosa, Stemodia grossa, Triumfetta clementii*. Area contains a narrow drainage line.	10	10	Excellent	0.43 (2%)

Vegetation type description	Vegetation mapping code	Relevé number	Vegetation condition	Total area (ha) (proportion of survey corridor %)
Mangal				
Rhizophora stylosa, Avicennia marina closed woodland.	12	No relevé surveyed.	Visible vegetation appears very healthy.	Located outside of survey corridor.
Disturbed vegetation				
Undulating low rocky slopes with outcropping and rockpiles				
Triodia epactia scattered to open hummock grassland with scattered to open **Cenchrus ciliaris* and *Cymbopogon ambiguus* tussocks and *Corchorus walcottii* low shrubs. Scattered tall *Acacia bivenosa* **Associated Species:** *Boerhavia coccinea, Corchorus walcottii, Euphorbia tannensis, Trichodesma zeylanicum, Triodia angusta.*	1a	1a, 11a	Good	0.82 (4%)
Mixed *Triodia epactia* and **Cenchrus ciliaris* grassland with occasional **Aerva javanica* low shrubs.	6a	6a	Good	0.21 (1%)
Undulating lower hillslope with rocky mantle				
Cenchrus ciliaris* open grassland with patchy *Triodia epactia hummocks*. **Associated Species: *Adriana tomentosa, Boerhavia coccinea, Corchorus walcottii, Grevillea pyramidalis* subsp. *pyramidalis, Trichodesma zeylanicum, Triumfetta appendiculata.*	4a	4a	Good	0.67 (3%)
Scattered **Cenchrus ciliaris* tussocks and *Triodia angusta* hummocks.	9a	9a	Degraded	0.55 (3%)
Rockpile				
Cenchrus ciliaris*, *Triodia epactia*, *Cymbopogon ambiguus* scattered to very open mixed grassland. **Associated Species: *Euphorbia tannensis.*	2a	2a	Degraded	0.07 (<1%)

Vegetation type description	Vegetation mapping code	Relevé number	Vegetation condition	Total area (ha) (proportion of survey corridor %)
Drainage zone				
Narrow drainage line				
Cenchrus ciliaris* open grassland with *Stemodia grossa* scattered low shrubs. **Associated Species: *Triodia epactia.*	3a	3a	Degraded	0.04 (<1%)
Triodia angusta open hummock grassland with occasional *Triodia epactia* and **Cenchrus ciliaris* very open grassland.	5a	5a	Very Good	0.05 (<1%)
Fenced DGBP corridor – levelled with compact soil and rubble				
**Aerva javanica* low open shrubland. Associated Species: This vegetation was also found on road verges.	7a	7a	Degraded	4.55 (7%)

4.2.1.5 *Conservation Significant Vegetation*

No TECs were recorded in the survey area. Although the survey area is within or immediately adjacent to the buffer of two PECs (Department of Biodiversity, Conservation, and Attractions 2018b), no vegetation or habitat matching the descriptions of those PECs was located within the survey area.

A comparison of the vegetation associations of the survey area with those previously mapped by Trudgen (2002) on the Burrup Peninsula indicated that the 2b and 7b vegetation associations of this survey correlated with the TcBaTe vegetation (Appendix K). According to Trudgen (2002) the TcBaTe vegetation association has two to four known occurrences and as such is considered significant. Vegetation association 2b is located on rockpile and comprises approximately 5% of the survey corridor. The 7b vegetation is associated with an artificial drainage line at the base of the KGP batter and comprises 3% of the survey corridor. All other vegetation associations within the survey corridor correlated to Trudgen (2002) associations with greater than ten occurrences on the Burrup Peninsula.

4.2.1.6 *Vegetation Condition*

Vegetation condition within the survey corridor ranged from 'completely degraded' to 'excellent' (Table 12). Areas that were devoid of vegetation (including roads and infrastructure) have been mapped as 'completely degraded' and comprise 33% of the survey corridor. Vegetation disturbed by the construction and maintenance of the original pipeline and adjacent infrastructure was dominated by **C. ciliaris* or **A. javanica* and displayed limited regrowth of native vegetation. The vegetation identified within these areas was rated predominantly as 'degraded' in condition. The undisturbed vegetation associations were rated as 'very good' to 'excellent' in condition with 43% of the survey corridor assessed as the latter.

Vegetation condition mapping is presented in (Appendix E).

The stand of mangroves and adjacent *E. victrix* woodland (drainage area) located within the additional survey site to the north east of the survey corridor were inaccessible at the time of survey. From a distance, the vegetation in this area appeared to be very healthy.

Table 12: Vegetation condition recorded in the survey corridor.

Vegetation Condition	Area (ha)	Percentage of Total Survey Corridor (%)
Excellent	9.03	43
Very Good	0.30	1
Good	1.70	8
Degraded	3.08	15
Completely Degraded	6.97	33

4.2.2 Terrestrial Vertebrate Fauna

4.2.2.1 *Habitat*

Three broad fauna habitats, based upon the vegetation types and landforms present, were recorded within the survey area (Figures F.1 to F.X, Appendix F). The habitats were:

- Grassland – occurred within a variety of landforms including hillslopes (and rocky slopes), and drainage. On the hillslopes, the grassland was mostly dominated by *Triodia epactia*

hummock grassland with scattered *Cymbopogon ambiguus* tussock grassland. The disturbed areas within the drainage lines were dominated by **C. ciliaris* grassland with some patches of *Triodia angusta* hummocks. This habitat was considered of low value to fauna due to a fairly simple vegetation structure and a lack of microhabitats that provide refuge for fauna. Approximately 5.42 ha of this habitat type occurs in the survey area.

- Open Woodland/Shrubland – occurred either on hillslopes or within minor drainage lines. This habitat was either comprised of *C. hamersleyana* or *Terminalia canescens* scattered to open low woodland with a mixed shrubland, generally over *T. epactia* hummock grassland. There were areas of **A. javanica* low open shrubland within the disturbed areas. This habitat was considered of low value to fauna due to a lack of microhabitats. Approximately 11.03 ha of this habitat type occurs in the survey area.
- Eucalypt Woodland – comprised *E. victrix* low woodland to woodland over *T. angusta* hummock grassland was found within drainage lines of the survey area. This habitat was considered of moderate value for fauna due to the presence of microhabitats (e.g. rock piles and tree hollows) and the diversity and complexity of the vegetation present. Approximately 0.64 ha of this habitat type occurs in the survey area.

An area of mangal and adjacent *E. victrix* woodland was located in the additional survey site to the north east (and outside) of the survey corridor.

'Disturbed' fauna habitat was dominated by the weed species **C. ciliaris* or **A. javanica* and typically occurred in the vicinity of the original pipeline and associated infrastructure. The remaining areas of fauna habitat were assessed as 'very good' to 'high quality' habitat condition, with the majority rated as 'high quality' condition.

Plate 1: Grassland fauna habitat at site 6.

Plate 2: Open Woodland/Shrubland fauna habitat at site 3.

Plate 3: Eucalypt Woodland fauna habitat at site 8.

Plate 4: Area completely devoid of vegetation.

4.2.2.2 Fauna Species

During the field survey a total of three vertebrate species were opportunistically recorded in the survey area, comprising the euro (*Osphranter robustus erubescens*), short-beaked echidna (*Tachyglossus aculeatus acanthion*) and corella (*Cacatua sanguinea*).

4.2.2.3 Conservation Significant Fauna Species

No conservation significant species were recorded during the survey. Based on the desktop assessment and following the field survey two conservation significant fauna were considered to have a high likelihood of occurrence within the survey area.

Pilbara Olive Python (*Liasis olivaceus barroni*)

The Pilbara olive python (VU; VU) prefers escarpments, deep gorges, water holes and rock piles associated with permanent pools in rocky areas in the ranges of the Pilbara region (Pearson 1993; Wilson and Swan 2010). Microhabitat preferences of the Pilbara olive python are under rock piles, on top of rocks or under spinifex (Tutt et al. 2004). Individuals spend the cooler winter months within caves and rock crevices away from water sources. In the warmer summer months, the pythons are found to move around widely, usually in close proximity to water and rock outcrops (Wilson and Swan 2010).

There are a number of records (23 records) of the Pilbara olive python within 20 km of the survey area, with one record within 6 m of the northern boundary of the survey area (Department of Biodiversity, Conservation, and Attractions 2018c). Given the number and proximity of previous records, it is considered likely that the Pilbara olive python will utilise the survey area for foraging or dispersal purposes only. The habitats within the survey area were not suitable as shelter habitat.

Northern Quoll (*Dasyurus hallucatus*)

The northern quoll (EN; EN) occurs in a variety of habitats (Oakwood 2008), but is commonly found in open lowland savannah forest and rocky escarpments. Rocky areas are particularly important for quolls in the Pilbara as these areas retain water and provide a diversity of microhabitats. These areas also tend to have greater floristic diversity and productivity resulting in greater prey density compared to non-rocky areas. Rocky areas also provide refuges from feral cats, fire and livestock (Hill and Ward 2010) and provide breeding potential (Department of the Environment 2013).

There are numerous records (357 records) of northern quoll within 20 km of the survey area, with one record within 500 m of the survey area (Department of Biodiversity, Conservation, and Attractions 2018c). Given the number and proximity of previous records, it is considered likely that that northern quoll will utilise the survey area for foraging or dispersal purposes only. The habitats within the survey area were not suitable as denning or shelter habitat.

5 Conclusions

5.1 Flora and Vegetation

The survey area comprises lower hillslopes, rocky undulating slopes with rockpiles and drainage areas. There were no TECs or ESAs located within the survey area. The buffers of two Priority 1 PECs, *Burrup Peninsula rock pool community* and *Burrup Peninsula rock pile community*, are mapped as partly overlapping, or in the immediate vicinity of, the survey area. No areas of vegetation or habitat that matched the description for either of these PECs were recorded within the survey area.

A total of 63 plant taxa were recorded in the survey area. Below average rainfall in the wet season preceding the June survey resulted in the absence of annual and ephemeral flora species. In addition, some perennial species (such as the shrub *Indigofera monophylla*) had lower foliage cover than average due to dry seasonal conditions; therefore, they featured less prominently in vegetation descriptions than they would under more favourable seasonal conditions.

No Threatened flora was located within the survey area. Two Priority flora species: *T. supranitifolia* P3 and *R. bungarensis* P4 were recorded. *T. supranitifolia* P3 was recorded in rockpile lower hillslope and artificial drainage line habitats. Generally only a single plant was recorded from each location. *R. bungarensis* P4 was recorded across a variety of habitats including rocky hillslopes, rockpiles and a drainage gully. Both *T. supranitifolia* P3 and *R. bungarensis* P4 are considered widespread on the Burrup Peninsula and have been recorded in similar habitat to those observed. One priority flora species, *V. triodiophila* P3, was considered to have potential to occur but was not recorded. In dry conditions, such as those experienced prior to survey, *V. triodiophila* P3 is thought to die back to rootstock and would therefore have been undetectable at the time of survey, should it occur. *V. triodiophila* P3 has been previously recorded from rockpiles and lower slopes in the Burrup Peninsula (Western Australian Herbarium 1998-2018).

Detailed mapping of the adjacent coastal vegetation was not undertaken by Trudgen (2002). This included the mangal and adjacent *E. victrix* woodland located in the additional survey site to the north east (and outside) of the survey corridor. The *E. victrix* woodland vegetation association was unusually dense for the Burrup Peninsula however this drainage line is fed from both natural and artificial sources (the KGP batter) which would account for the density and apparent health of the vegetation

The undisturbed vegetation within the survey corridor was comprised of 11 vegetation associations all of which could be correlated to associations previously mapped on the Burrup Peninsula by Trudgen (2002). All but one of the analogous Trudgen (2002) vegetation associations, TcBaTe, has in excess of 10 occurrences on the Burrup Peninsula. The TcBaTe vegetation association was considered significant by Trudgen (2002) as there are less than five known occurrences on the Burrup Peninsula. This association was comparable to the 2b and 7b vegetation associations which comprise 8% of the survey corridor.

Approximately one third of the survey corridor has been cleared for infrastructure and roads, and is therefore rated as 'completely degraded' condition. The condition of remaining vegetation within the corridor ranged from 'degraded' to 'excellent'; nearly half (43%) of the survey corridor is rated as 'excellent' condition. Two weed species were located, **A. javanica* (kapok) and **C. ciliaris* (buffel grass). Due to dormancy, an accurate estimation of cover was difficult for both species however it was noted that **C. ciliaris* was common in areas of disturbance along the entire survey corridor. In contrast, **A. javanica* was predominantly restricted to within the KGP and Pluto LNG plant sites, road verges and pipeline crossing of Burrup Road. Despite the original pipeline construction having occurred almost 30 years ago, in areas of associated disturbance there was limited regrowth of native vegetation indicating the need for active revegetation to avoid weed dominance.

5.2 Terrestrial Vertebrate Fauna

The survey area comprises three broad fauna habitats: Grassland, Open Woodland/Shrubland and Eucalypt Woodland. Approximately 33% of the survey corridor area is infrastructure and roads and considered 'highly degraded'. The condition of remaining vegetation within the corridor ranged from 'disturbed' to 'high quality' with the majority (43%) recorded as 'high quality'.

The areas of Eucalypt Woodland are of higher value for fauna, particularly conservation significant species, than the other recorded habitats due to the diversity of microhabitats present and diversity and complexity of the vegetation; in particular, to the south of the KGP there is a drainage zone and associated narrow drainage line located within the survey corridor that supports a *T. canescens, E. victrix* and *C. hamersleyana* open low woodland.

During the field survey a total of three vertebrate species were opportunistically recorded in the survey area, comprising the euro (*Osphranter robustus erubescens*), short-beaked echidna (*Tachyglossus aculeatus acanthion*) and corella (*Cacatua sanguinea*). No conservation significant species were recorded during the survey. Based on the desktop assessment and following the field survey two conservation significant fauna, Pilbara olive python (*Liasis olivaceus barroni*) and northern quoll (*Dasyurus hallucatus*) were considered to have a high likelihood of occurring within the survey area. Given the number and proximity of previous records for both these species on the Burrup Peninsula, it was considered likely that the two species will utilise the survey area for foraging or dispersal purposes. However, the field survey confirmed that the habitats within the survey area were not suitable as shelter habitat.

6 References

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

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

Beard, JS 1975, 'The Vegetation of the Pilbara Area 1:1 000 000 Vegetation Series', University of Western Australia Press, Nedlands, Western Australia.

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

Department of Agriculture and Food Western Australia 2013, *Biosecurity and Agriculture Management Regulations*, Government of Western Australia, Perth.

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

Department of Biodiversity, Conservation & Attractions 2017b, *Conservation Codes for Western Australia flora and fauna* Goverment of Western Australia, Perth

Department of Biodiversity, Conservation & Attractions 2017c, 'DBCA - Lands and Waters of Interest', Dept. of Biodiversity, Conservation & Attractions, Perth, WA.

Department of Biodiversity, Conservation & Attractions 2017d, 'DBCA - Legislated Lands and Waters', *current as of 30/07/2017*, Dept. of Biodiversity, Conservation and Attractions, Perth WA.

Department of Biodiversity, Conservation & Attractions 2018a, 'NatureMap Database Search 2018', Perth, Western Australia.

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

Department of Biodiversity, Conservation & Attractions 2018c, 'Threatened and Priority Fauna Database'.

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

Department of Biodiversity, Conservation & Attractions 2018e, 'Western Australian Herbarium database', Department of Biodiversity, Conservation & Attractions, Perth WA.

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 Environment and Heritage 2003, *Australian Vegetation Attribute Manual, National Vegetation Information System Version 6*, viewed April 2018, <http://www.environment.gov.au/erin/nvis/publications/avam/section-2-1.html#table1>.

Department of Primary Industries & Regional Development 2017, *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 Primary Industries & Regional Development 2018, *Western Australian Organisms List*, Dept. of Primary Industries & Regional Development, Perth, WA, <https://www.agric.wa.gov.au/bam/western-australian-organism-list-waol>.

Department of the Environment 2013, '*Dasyurus hallucatus* - Northern Quoll, in Species Profile and Threats Database', Department of the Environment, Canberra.

Department of the Environment and Energy 2008, 'Register of the National Estate - Spatial Database (RNESDB)'.

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.

Department of the Environment and Energy 2016a, *EPBC Act referral guideline for the endangered northern quoll Dasyurus hallucatus*, Commonwealth of Australia.

Department of the Environment and Energy 2016b, *National Reserve System*, viewed 2018, <http://www.environment.gov.au/topics/land/national-reserve-system>.

Department of the Environment and Energy 2017a, 'Australian Wetlands Database: Ramsar Wetlands', Dept. of the Environment and Energy, Canberra ACT.

Department of the Environment and Energy 2017b, 'Directory of Important Wetlands in Australia', Commonwealth of Australia.

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

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

Environmental Protection Authority 2004a, *Terrestrial Fauna Surveys for Environmental Impact Assessment in Western Australia, Guidance Statement 56*, Environmental Protection Authority, Perth.

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

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

Environmental Protection Authority 2016b, *Technical Guidance - Terrestrial Fauna Surveys*, Environmental Protection Authority, Perth.

Environmental Protection Authority 2016a, *Technical Guidance - Terrestrial Fauna Surveys*, Environmental Protection Authority, Perth.

Environmental Protection Authority 2016c, *Technical Guidance - Sampling Methods for Terrestrial Vertebrate Fauna*, Environmental Protection Authority, Perth.

Hill, B & Ward, S 2010, *National Recovery Plan for the Northern Quoll Dasyurus hallucatus*, Northern Territory, <http://www.environment.gov.au/biodiversity/threatened/publications/recovery/pubs/northern-quoll.pdf>.

Jackson, KJ, Paling, EL & Stoddart, JA 2006, *Review of Research and Data Relevent To the Marine and Terrestrial Environment of Dampier*, report prepared fro the Dampier Port Authority.

Kendrick, P & McKenzie, N 2001, *Pilbara 1 (PIL1 - Chichester 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 & Stanley, F 2001a, *Pilbara 4 (PIL4 - Roebourne 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 & Stanley, F 2001b, *Pilbara 4 (PIL4 - Roebourne synopsis)*, *A Biodiversity Audit of Western Australia's 53 Biogeographical Subregions in 2002*, Department of Conservation and Land Management, Perth.

Oakwood, M 2008, 'Northern Quoll, *Dasyurus hallucatus*', in S. Van Dyck and R. Strahan (eds), *The Mammals of Australia*, Reed New Holland, Sydney.

Pearson, DJ 1993, 'Distribution, status and conservation status of pythons in Western Australia', in D. Lunney and D. Ayers (eds), *Herpetology in Australia: A Diverse Discipline*, Royal Zoological Society of NSW, Sydney, pp. 383-95.

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.

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.

Thompson, SA & Thompson, GG 2010, *Terrestrial Vertebrate Fauna Assessments for Ecological Impact Assessment*, Terrestrial Ecosystems, Mt Claremont.

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

Trudgen, ME 2002, *A Flora, Vegetation and Floristic Survey of the Burrup Peninsula, Some Adjoining Areas and Part of the Dampier Archipelago With Comparisons to the Floristics of Areas on the Adjoining Mainland*, Vol. 1, Department of Mineral & Petroleum Resources, Volume 1, Perth.

Trudgen, ME & Griffin, EA 2001, *A Flora, Vegetation Floristic Survey of the Burrup Peninsula, some adjoining areas and part of the Dampier Archipelago, with comparisons to the floristics of areas on the adjoining mainland*, Perth WA.

Tutt, MS, Fekete, S, Mitchell, P, Brace, P & Pearson, D 2004, 'Unravelling the mysteries of the Pilbara Olive Python ecology', *Threatened Species Network Community Grants Final Report – Project WA11/101*, Nickol Bay Naturalists' Club and CALM, Karratha.

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.

Welker Environmental Consultancy 2002, *Review of Vegetation Study of Burrup Peninsula by Trudgen and Griffin (2001)*, report prepared for the Department of Mineral Petroleum Resources, Como, WA.

Western Australian Herbarium 1998-2018, 'FloraBase – the Western Australian Flora', Department of Parks and Wildlife. http://florabase.dpaw.wa.gov.au.

Wilson, S & Swan, G 2010, *A Complete Guide to Reptiles of Australia*, 3rd edn., New Holland Publishers, Sydney.

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

This page has been left blank intentionally.

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 (E)	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 (V)	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: i) the taxa is a species of fish; ii) 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; iii) the management plan is in force under a law of the Commonwealth or of a State or Territory; iv) 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.*

Categories of ecological communities	
Critically endangered	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	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	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 Parks and Wildlife 2017).

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 ≤ 100 ha). 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 ≤200 ha). 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 Western Australian flora and fauna under the *Wildlife Conservation Act 1950*.

Code	Conservation category	Definition
S1	Schedule 1 of the Wildlife Conservation (Specially Protected Fauna) Notice and Wildlife Conservation (Rare Flora) Notice under the Wildlife Conservation Act 1950.	Taxa that is rare or likely to become extinct, as critically endangered taxa.
S2	Schedule 2 of the Wildlife Conservation (Specially Protected Fauna) Notice and Wildlife Conservation (Rare Flora) Notice under the Wildlife Conservation Act 1950.	Taxa that is rare or likely to become extinct, as endangered taxa.
S3	Schedule 3 of the Wildlife Conservation (Specially Protected Fauna) Notice and Wildlife Conservation (Rare Flora) Notice under the Wildlife Conservation Act 1950.	Taxa that is rare or likely to become extinct, as vulnerable taxa.
S4	Schedule 4 of the Wildlife Conservation (Specially Protected Fauna) Notice and Wildlife Conservation (Rare Flora) Notice under the Wildlife Conservation Act 1950.	Taxa that is presumed to be extinct.
S5	Schedule 5 of the Wildlife Conservation (Specially Protected Fauna) Notice under the Wildlife Conservation Act 1950.	Birds that are subject to international agreements relating to the protection of migratory birds.
S6	Schedule 6 of the Wildlife Conservation (Specially Protected Fauna) Notice under the Wildlife Conservation Act 1950.	Fauna that are of special conservation need being species dependent on ongoing conservation intervention.
S7	Schedule 7 of the Wildlife Conservation (Specially Protected Fauna) Notice under the Wildlife Conservation Act 1950.	Declared to be fauna that is in need of special protection, otherwise than for the reasons mentioned.

Note: Schedules 5, 6, and 7 are only related to conservation significant fauna.

Taxa that have not yet been adequately surveyed to be listed under Schedule 1 or 2 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. Taxa that are adequately known, are rare but not threatened, or meet criteria for Near Threatened, or that have been recently removed from the threatened list for other than taxonomic reasons, are placed in Priority 4. These taxa require regular monitoring. Conservation dependent species are placed in Priority 5.

Table A.6: Priority species under *Western Australian Wildlife Conservation Act 1950.*

P1: Priority One – Poorly known taxa
Taxa that are known from one or a few collections or sight records (generally less than five), all on lands not managed for conservation, e.g. agricultural or pastoral lands, urban areas, Shire, Westrail and Main Roads WA road, gravel and soil reserves, and active mineral leases and under threat of habitat destruction or degradation. Taxa may be included if they are comparatively well known from one or more localities but do not meet adequacy of survey requirements and appear to be under immediate threat from known threatening processes.
P2: Priority Two – Poorly known taxa
Taxa that are known from one or a few collections or sight records, some of which are on lands not under imminent threat of habitat destruction or degradation, e.g. national parks, conservation parks, nature reserves, State forest, vacant Crown land, water reserves, etc. Taxa may be included if they are comparatively well known from one or more localities but do not meet adequacy of survey requirements and appear to be under threat from known threatening processes.
P3: Priority Three – Poorly known taxa
Taxa that are known from collections or sight records from several localities not under imminent threat, or from few but widespread localities with either large population size or significant remaining areas of apparently suitable habitat, much of it not under imminent threat. Taxa 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.
P4: Priority Four: Rare, near threatened and other taxa in need of monitoring
(a)Rare Taxa 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 taxa are usually represented on conservation lands. (b) Near Threatened. Taxa that are considered to have been adequately surveyed and that do not qualify for Conservation Dependent, but that are close to qualifying for Vulnerable. (c) Taxa that have been removed from the list of threatened species during the past five years for reasons other than taxonomy.
P5: Priority Five: Conservation dependent taxa
Taxa that are not threatened but are subject to a specific conservation program, the cessation of which would result in the taxa becoming threatened within five years.

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 Department of Agriculture and Food Western Australia (Department of Agriculture and Food Western Australia 2016). 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.

This page has been left blank intentionally.

Appendix B: Database Search Results

This page has been left blank intentionally.

Australian Government
Department of the Environment and Energy

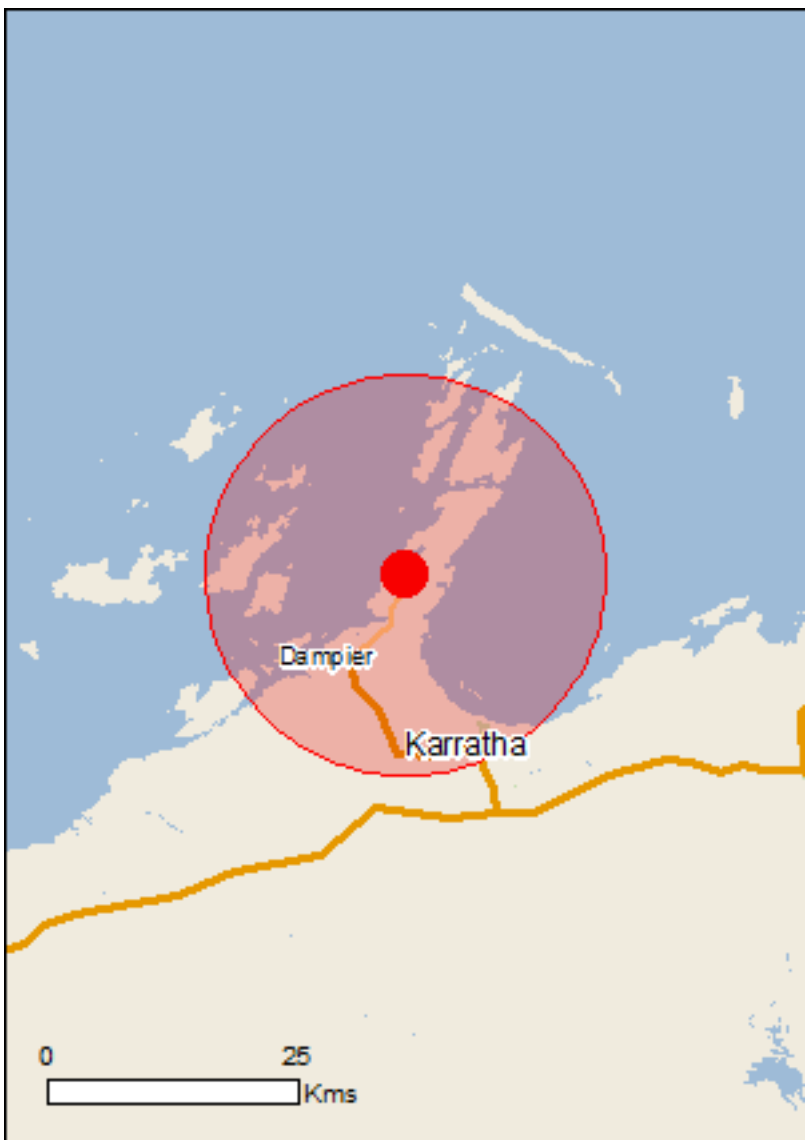
EPBC Act Protected Matters Report

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.

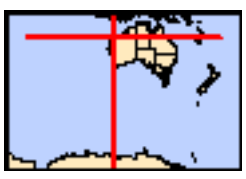
Information on the coverage of this report and qualifications on data supporting this report are contained in the caveat at the end of the report.

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

Report created: 16/07/18 09:20:20



Coordinates
Buffer: 20.0Km



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:	1
Wetlands of International Importance:	None
Great Barrier Reef Marine Park:	None
Commonwealth Marine Area:	None
Listed Threatened Ecological Communities:	None
Listed Threatened Species:	31
Listed Migratory Species:	60

Other Matters Protected by the EPBC Act

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

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

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

Commonwealth Land:	1
Commonwealth Heritage Places:	None
Listed Marine Species:	100
Whales and Other Cetaceans:	12
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:	5
Regional Forest Agreements:	None
Invasive Species:	17
Nationally Important Wetlands:	None
Key Ecological Features (Marine)	None

Details

Matters of National Environmental Significance

National Heritage Properties		[Resource Information]
Name	State	Status
Indigenous		
Dampier Archipelago (including Burrup Peninsula)	WA	Listed place

Listed Threatened Species		[Resource Information]
Name	Status	Type of Presence
Birds		
Calidris canutus Red Knot, Knot [855]	Endangered	Species or species habitat known to occur within area
Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	Species or species habitat known to occur within area
Calidris tenuirostris Great Knot [862]	Critically Endangered	Species or species habitat known to occur within area
Charadrius leschenaultii Greater Sand Plover, Large Sand Plover [877]	Vulnerable	Species or species habitat known to occur within area
Charadrius mongolus Lesser Sand Plover, Mongolian Plover [879]	Endangered	Species or species habitat known to occur within area
Limosa lapponica baueri Bar-tailed Godwit (baueri), Western Alaskan Bar-tailed Godwit [86380]	Vulnerable	Species or species habitat known to occur within area
Limosa lapponica menzbieri Northern Siberian Bar-tailed Godwit, Bar-tailed Godwit (menzbieri) [86432]	Critically Endangered	Species or species habitat may occur within area
Macronectes giganteus Southern Giant-Petrel, Southern Giant Petrel [1060]	Endangered	Species or species habitat may occur within area
Numenius madagascariensis Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat known to occur within area
Pezoporus occidentalis Night Parrot [59350]	Endangered	Species or species habitat may occur within area
Rostratula australis Australian Painted Snipe [77037]	Endangered	Species or species habitat may occur within area
Sternula nereis nereis Australian Fairy Tern [82950]	Vulnerable	Breeding known to occur within area

Name	Status	Type of Presence
Mammals		
Balaenoptera musculus Blue Whale [36]	Endangered	Species or species habitat likely to occur within area
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
Megaptera novaeangliae Humpback Whale [38]	Vulnerable	Species or species habitat known to occur within area
Rhinonicteris aurantia (Pilbara form) Pilbara Leaf-nosed Bat [82790]	Vulnerable	Species or species habitat may occur within area
Reptiles		
Aipysurus apraefrontalis Short-nosed Seasnake [1115]	Critically Endangered	Species or species habitat likely to occur within area
Caretta caretta Loggerhead Turtle [1763]	Endangered	Breeding known to occur within area
Chelonia mydas Green Turtle [1765]	Vulnerable	Breeding known to occur within area
Ctenotus angusticeps Northwestern Coastal Ctenotus, Airlie Island Ctenotus [25937]	Vulnerable	Species or species habitat likely to occur within area
Dermochelys coriacea Leatherback Turtle, Leathery Turtle, Luth [1768]	Endangered	Breeding likely to occur within area
Eretmochelys imbricata Hawksbill Turtle [1766]	Vulnerable	Breeding known to occur within area
Liasis olivaceus barroni Olive Python (Pilbara subspecies) [66699]	Vulnerable	Species or species habitat known to occur within area
Natator depressus Flatback Turtle [59257]	Vulnerable	Breeding known to occur within area
Sharks		
Carcharias taurus (west coast population) Grey Nurse Shark (west coast population) [68752]	Vulnerable	Species or species habitat likely to occur within area
Carcharodon carcharias White Shark, Great White Shark [64470]	Vulnerable	Species or species habitat may occur within area
Pristis clavata Dwarf Sawfish, Queensland Sawfish [68447]	Vulnerable	Species or species habitat known to occur within area
Pristis zijsron Green Sawfish, Dindagubba, Narrowsnout Sawfish [68442]	Vulnerable	Species or species habitat known to occur within area
Rhincodon typus Whale Shark [66680]	Vulnerable	Species or species

Name	Status	Type of Presence
		habitat may 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		
Anous stolidus Common Noddy [825]		Species or species habitat may occur within area
Apus pacificus Fork-tailed Swift [678]		Species or species habitat likely to occur within area
Ardenna pacifica Wedge-tailed Shearwater [84292]		Breeding known to occur within area
Calonectris leucomelas Streaked Shearwater [1077]		Species or species habitat may occur within area
Fregata ariel Lesser Frigatebird, Least Frigatebird [1012]		Species or species habitat known to occur within area
Hydroprogne caspia Caspian Tern [808]		Breeding known to occur within area
Macronectes giganteus Southern Giant-Petrel, Southern Giant Petrel [1060]	Endangered	Species or species habitat may occur within area
Onychoprion anaethetus Bridled Tern [82845]		Breeding known to occur within area
Sterna dougallii Roseate Tern [817]		Breeding likely to occur within area
Migratory Marine Species		
Anoxypristis cuspidata Narrow Sawfish, Knifetooth Sawfish [68448]		Species or species habitat likely to occur within area
Balaenoptera edeni Bryde's Whale [35]		Species or species habitat may occur within area
Balaenoptera musculus Blue Whale [36]	Endangered	Species or species habitat likely to occur within area
Carcharodon carcharias White Shark, Great White Shark [64470]	Vulnerable	Species or species habitat may occur within area
Caretta caretta Loggerhead Turtle [1763]	Endangered	Breeding known to occur within area
Chelonia mydas Green Turtle [1765]	Vulnerable	Breeding known to occur within area
Dermochelys coriacea Leatherback Turtle, Leathery Turtle, Luth [1768]	Endangered	Breeding likely to occur within area
Dugong dugon Dugong [28]		Species or species habitat known to occur within area
Eretmochelys imbricata Hawksbill Turtle [1766]	Vulnerable	Breeding known to occur within area

Name	Threatened	Type of Presence
Manta alfredi Reef Manta Ray, Coastal Manta Ray, Inshore Manta Ray, Prince Alfred's Ray, Resident Manta Ray [84994]		Species or species habitat known to occur within area
Manta birostris Giant Manta Ray, Chevron Manta Ray, Pacific Manta Ray, Pelagic Manta Ray, Oceanic Manta Ray [84995]		Species or species habitat likely to occur within area
Megaptera novaeangliae Humpback Whale [38]	Vulnerable	Species or species habitat known to occur within area
Natator depressus Flatback Turtle [59257]	Vulnerable	Breeding known to occur within area
Orcinus orca Killer Whale, Orca [46]		Species or species habitat may occur within area
Pristis clavata Dwarf Sawfish, Queensland Sawfish [68447]	Vulnerable	Species or species habitat known to occur within area
Pristis zijsron Green Sawfish, Dindagubba, Narrowsnout Sawfish [68442]	Vulnerable	Species or species habitat known to occur within area
Rhincodon typus Whale Shark [66680]	Vulnerable	Species or species habitat may occur within area
Sousa chinensis Indo-Pacific Humpback Dolphin [50]		Species or species habitat known to occur within area
Tursiops aduncus (Arafura/Timor Sea populations) Spotted Bottlenose Dolphin (Arafura/Timor Sea populations) [78900]		Species or species habitat known 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 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 known to occur within area
Arenaria interpres Ruddy Turnstone [872]		Species or species habitat known to occur within area
Calidris acuminata Sharp-tailed Sandpiper [874]		Species or species habitat known to occur within area
Calidris alba Sanderling [875]		Species or species habitat known to occur within area
Calidris canutus Red Knot, Knot [855]	Endangered	Species or species habitat known to occur within area

Name	Threatened	Type of Presence
Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	Species or species habitat known to occur within area
Calidris melanotos Pectoral Sandpiper [858]		Species or species habitat may occur within area
Calidris ruficollis Red-necked Stint [860]		Species or species habitat known to occur within area
Calidris subminuta Long-toed Stint [861]		Species or species habitat known to occur within area
Calidris tenuirostris Great Knot [862]	Critically Endangered	Species or species habitat known to occur within area
Charadrius leschenaultii Greater Sand Plover, Large Sand Plover [877]	Vulnerable	Species or species habitat known to occur within area
Charadrius mongolus Lesser Sand Plover, Mongolian Plover [879]	Endangered	Species or species habitat known to occur within area
Charadrius veredus Oriental Plover, Oriental Dotterel [882]		Species or species habitat known to occur within area
Glareola maldivarum Oriental Pratincole [840]		Species or species habitat known to occur within area
Limicola falcinellus Broad-billed Sandpiper [842]		Species or species habitat known to occur within area
Limosa lapponica Bar-tailed Godwit [844]		Species or species habitat known to occur within area
Limosa limosa Black-tailed Godwit [845]		Species or species habitat known to occur within area
Numenius madagascariensis Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat known to occur within area
Numenius phaeopus Whimbrel [849]		Species or species habitat known to occur within area
Pandion haliaetus Osprey [952]		Breeding known to occur within area
Phalaropus lobatus Red-necked Phalarope [838]		Species or species habitat known to occur within area
Pluvialis fulva Pacific Golden Plover [25545]		Species or species habitat known to occur within area
Pluvialis squatarola Grey Plover [865]		Species or species habitat known to occur within area
Thalasseus bergii Crested Tern [83000]		Breeding known to occur

Name	Threatened	Type of Presence within area
Tringa brevipes Grey-tailed Tattler [851]		Species or species habitat known to occur within area
Tringa nebularia Common Greenshank, Greenshank [832]		Species or species habitat known to occur within area
Tringa stagnatilis Marsh Sandpiper, Little Greenshank [833]		Species or species habitat known to occur within area
Tringa totanus Common Redshank, Redshank [835]		Species or species habitat known to occur within area
Xenus cinereus Terek Sandpiper [59300]		Species or species habitat known to occur within area

Other Matters Protected by the EPBC Act

Commonwealth Land [Resource Information]

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

Name
Commonwealth Land -

Listed Marine Species [Resource Information]

* Species is listed under a different scientific name on the EPBC Act - Threatened Species list.

Name	Threatened	Type of Presence
Birds		
Actitis hypoleucos Common Sandpiper [59309]		Species or species habitat known to occur within area
Anous stolidus Common Noddy [825]		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 known to occur within area
Ardea ibis Cattle Egret [59542]		Species or species habitat may occur within area
Arenaria interpres Ruddy Turnstone [872]		Species or species habitat known to occur within area
Calidris acuminata Sharp-tailed Sandpiper [874]		Species or species habitat known to occur within area
Calidris alba Sanderling [875]		Species or species habitat known to occur within area

Name	Threatened	Type of Presence
Calidris canutus Red Knot, Knot [855]	Endangered	Species or species habitat known to occur within area
Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	Species or species habitat known to occur within area
Calidris melanotos Pectoral Sandpiper [858]		Species or species habitat may occur within area
Calidris ruficollis Red-necked Stint [860]		Species or species habitat known to occur within area
Calidris subminuta Long-toed Stint [861]		Species or species habitat known to occur within area
Calidris tenuirostris Great Knot [862]	Critically Endangered	Species or species habitat known to occur within area
Calonectris leucomelas Streaked Shearwater [1077]		Species or species habitat may occur within area
Charadrius leschenaultii Greater Sand Plover, Large Sand Plover [877]	Vulnerable	Species or species habitat known to occur within area
Charadrius mongolus Lesser Sand Plover, Mongolian Plover [879]	Endangered	Species or species habitat known to occur within area
Charadrius ruficapillus Red-capped Plover [881]		Species or species habitat known to occur within area
Charadrius veredus Oriental Plover, Oriental Dotterel [882]		Species or species habitat known to occur within area
Fregata ariel Lesser Frigatebird, Least Frigatebird [1012]		Species or species habitat known to occur within area
Glareola maldivarum Oriental Pratincole [840]		Species or species habitat known to occur within area
Haliaeetus leucogaster White-bellied Sea-Eagle [943]		Breeding known to occur within area
Heteroscelus brevipes Grey-tailed Tattler [59311]		Species or species habitat known to occur within area
Himantopus himantopus Black-winged Stilt [870]		Species or species habitat known to occur within area
Hirundo rustica Barn Swallow [662]		Species or species habitat may occur within area
Larus novaehollandiae Silver Gull [810]		Breeding known to occur within area
Limicola falcinellus Broad-billed Sandpiper [842]		Species or species habitat known to occur

Name	Threatened	Type of Presence within area
Limosa lapponica Bar-tailed Godwit [844]		Species or species habitat known to occur within area
Limosa limosa Black-tailed Godwit [845]		Species or species habitat known to occur within area
Macronectes giganteus Southern Giant-Petrel, Southern Giant Petrel [1060]	Endangered	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
Numenius madagascariensis Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat known to occur within area
Numenius phaeopus Whimbrel [849]		Species or species habitat known to occur within area
Pandion haliaetus Osprey [952]		Breeding known to occur within area
Phalaropus lobatus Red-necked Phalarope [838]		Species or species habitat known to occur within area
Pluvialis fulva Pacific Golden Plover [25545]		Species or species habitat known to occur within area
Pluvialis squatarola Grey Plover [865]		Species or species habitat known to occur within area
Puffinus pacificus Wedge-tailed Shearwater [1027]		Breeding known to occur within area
Recurvirostra novaehollandiae Red-necked Avocet [871]		Species or species habitat known to occur within area
Rostratula benghalensis (sensu lato) Painted Snipe [889]	Endangered*	Species or species habitat may occur within area
Sterna anaethetus Bridled Tern [814]		Breeding known to occur within area
Sterna bergii Crested Tern [816]		Breeding known to occur within area
Sterna caspia Caspian Tern [59467]		Breeding known to occur within area
Sterna dougallii Roseate Tern [817]		Breeding likely to occur within area
Stiltia isabella Australian Pratincole [818]		Species or species

Name	Threatened	Type of Presence
		habitat known to occur within area
Tringa nebularia Common Greenshank, Greenshank [832]		Species or species habitat known to occur within area
Tringa stagnatilis Marsh Sandpiper, Little Greenshank [833]		Species or species habitat known to occur within area
Tringa totanus Common Redshank, Redshank [835]		Species or species habitat known to occur within area
Xenus cinereus Terek Sandpiper [59300]		Species or species habitat known to occur within area
Fish		
Bulbonaricus brauni Braun's Pughead Pipefish, Pug-headed Pipefish [66189]		Species or species habitat may occur within area
Campichthys tricarinatus Three-keel Pipefish [66192]		Species or species habitat may occur within area
Choeroichthys brachysoma Pacific Short-bodied Pipefish, Short-bodied Pipefish [66194]		Species or species habitat may occur within area
Choeroichthys suillus Pig-snouted Pipefish [66198]		Species or species habitat may occur within area
Doryrhamphus janssi Cleaner Pipefish, Janss' Pipefish [66212]		Species or species habitat may occur within area
Doryrhamphus negrosensis Flagtail Pipefish, Masthead Island Pipefish [66213]		Species or species habitat may occur within area
Festucalex scalaris Ladder Pipefish [66216]		Species or species habitat may occur within area
Filicampus tigris Tiger Pipefish [66217]		Species or species habitat may occur within area
Halicampus brocki Brock's Pipefish [66219]		Species or species habitat may occur within area
Halicampus grayi Mud Pipefish, Gray's Pipefish [66221]		Species or species habitat may occur within area
Halicampus nitidus Glittering Pipefish [66224]		Species or species habitat may occur within area
Halicampus spinirostris Spiny-snout Pipefish [66225]		Species or species habitat may occur within area
Haliichthys taeniophorus Ribboned Pipehorse, Ribboned Seadragon [66226]		Species or species habitat may occur within area
Hippichthys penicillus Beady Pipefish, Steep-nosed Pipefish [66231]		Species or species

Name	Threatened	Type of Presence
		habitat may occur within area
Hippocampus angustus Western Spiny Seahorse, Narrow-bellied Seahorse [66234]		Species or species habitat may occur within area
Hippocampus histrix Spiny Seahorse, Thorny Seahorse [66236]		Species or species habitat may occur within area
Hippocampus kuda Spotted Seahorse, Yellow Seahorse [66237]		Species or species habitat may occur within area
Hippocampus planifrons Flat-face Seahorse [66238]		Species or species habitat may occur within area
Hippocampus trimaculatus Three-spot Seahorse, Low-crowned Seahorse, Flat-faced Seahorse [66720]		Species or species habitat may occur within area
Micrognathus micronotopterus Tidepool Pipefish [66255]		Species or species habitat may occur within area
Solegnathus hardwickii Pallid Pipehorse, Hardwick's Pipehorse [66272]		Species or species habitat may occur within area
Solegnathus lettiensis Gunther's Pipehorse, Indonesian Pipefish [66273]		Species or species habitat may occur within area
Solenostomus cyanopterus Robust Ghostpipefish, Blue-finned Ghost Pipefish, [66183]		Species or species habitat may occur within area
Syngnathoides biaculeatus Double-end Pipehorse, Double-ended Pipehorse, Alligator Pipefish [66279]		Species or species habitat may occur within area
Trachyrhamphus bicoarctatus Bentstick Pipefish, Bend Stick Pipefish, Short-tailed Pipefish [66280]		Species or species habitat may occur within area
Trachyrhamphus longirostris Straightstick Pipefish, Long-nosed Pipefish, Straight Stick Pipefish [66281]		Species or species habitat may occur within area
Mammals		
Dugong dugon Dugong [28]		Species or species habitat known to occur within area
Reptiles		
Acalyptophis peronii Horned Seasnake [1114]		Species or species habitat may occur within area
Aipysurus apraefrontalis Short-nosed Seasnake [1115]	Critically Endangered	Species or species habitat likely to occur within area
Aipysurus duboisii Dubois' Seasnake [1116]		Species or species habitat may occur within area
Aipysurus eydouxii Spine-tailed Seasnake [1117]		Species or species habitat may occur within area

Name	Threatened	Type of Presence
Aipysurus laevis Olive Seasnake [1120]		Species or species habitat may occur within area
Aipysurus tenuis Brown-lined Seasnake [1121]		Species or species habitat may occur within area
Astrotia stokesii Stokes' Seasnake [1122]		Species or species habitat may occur within area
Caretta caretta Loggerhead Turtle [1763]	Endangered	Breeding known to occur within area
Chelonia mydas Green Turtle [1765]	Vulnerable	Breeding known to occur within area
Dermochelys coriacea Leatherback Turtle, Leathery Turtle, Luth [1768]	Endangered	Breeding likely to occur within area
Disteira kingii Spectacled Seasnake [1123]		Species or species habitat may occur within area
Disteira major Olive-headed Seasnake [1124]		Species or species habitat may occur within area
Emydocephalus annulatus Turtle-headed Seasnake [1125]		Species or species habitat may occur within area
Ephalophis greyi North-western Mangrove Seasnake [1127]		Species or species habitat may occur within area
Eretmochelys imbricata Hawksbill Turtle [1766]	Vulnerable	Breeding known to occur within area
Hydrelaps darwiniensis Black-ringed Seasnake [1100]		Species or species habitat may occur within area
Hydrophis czeblukovi Fine-spined Seasnake [59233]		Species or species habitat may occur within area
Hydrophis elegans Elegant Seasnake [1104]		Species or species habitat may occur within area
Hydrophis mcdowelli null [25926]		Species or species habitat may occur within area
Hydrophis ornatus Spotted Seasnake, Ornate Reef Seasnake [1111]		Species or species habitat may occur within area
Natator depressus Flatback Turtle [59257]	Vulnerable	Breeding known to occur within area
Pelamis platurus Yellow-bellied Seasnake [1091]		Species or species habitat may occur within area

Whales and other Cetaceans		[Resource Information]
Name	Status	Type of Presence
Mammals		

Name	Status	Type of Presence
Balaenoptera acutorostrata Minke Whale [33]		Species or species habitat may occur within area
Balaenoptera edeni Bryde's Whale [35]		Species or species habitat may occur within area
Balaenoptera musculus Blue Whale [36]	Endangered	Species or species habitat likely to occur within area
Delphinus delphis Common Dophin, Short-beaked Common Dolphin [60]		Species or species habitat may occur within area
Grampus griseus Risso's Dolphin, Grampus [64]		Species or species habitat may occur within area
Megaptera novaeangliae Humpback Whale [38]	Vulnerable	Species or species habitat known to occur within area
Orcinus orca Killer Whale, Orca [46]		Species or species habitat may occur within area
Sousa chinensis Indo-Pacific Humpback Dolphin [50]		Species or species habitat known to occur within area
Stenella attenuata Spotted Dolphin, Pantropical Spotted Dolphin [51]		Species or species habitat may occur within area
Tursiops aduncus Indian Ocean Bottlenose Dolphin, Spotted Bottlenose Dolphin [68418]		Species or species habitat likely to occur within area
Tursiops aduncus (Arafura/Timor Sea populations) Spotted Bottlenose Dolphin (Arafura/Timor Sea populations) [78900]		Species or species habitat known to occur within area
Tursiops truncatus s. str. Bottlenose Dolphin [68417]		Species or species habitat may occur within area

Extra Information

State and Territory Reserves	[Resource Information]
Name	State
Murujuga	WA
Unnamed WA36907	WA
Unnamed WA36909	WA
Unnamed WA36910	WA
Unnamed WA36915	WA

Invasive Species

[Resource Information]

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

Name	Status	Type of Presence
Birds		
Columba livia Rock Pigeon, Rock Dove, Domestic Pigeon [803]		Species or species habitat likely to occur within area
Passer domesticus House Sparrow [405]		Species or species habitat likely to occur within area
Passer montanus Eurasian Tree Sparrow [406]		Species or species habitat likely to occur within area
Mammals		
Canis lupus familiaris Domestic Dog [82654]		Species or species habitat likely to occur within area
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 within area
Rattus rattus Black Rat, Ship Rat [84]		Species or species habitat likely to occur within area
Vulpes vulpes Red Fox, Fox [18]		Species or species habitat likely to occur within area
Plants		
Cenchrus ciliaris Buffel-grass, Black Buffel-grass [20213]		Species or species habitat likely to occur within area
Jatropha gossypifolia Cotton-leaved Physic-Nut, Bellyache Bush, Cotton-leaf Physic Nut, Cotton-leaf Jatropha, Black Physic Nut [7507]		Species or species habitat likely to occur within area
Opuntia spp. Prickly Pears [82753]		Species or species habitat likely to occur within area
Parkinsonia aculeata Parkinsonia, Jerusalem Thorn, Jelly Bean Tree, Horse Bean [12301]		Species or species habitat likely to occur within area
Prosopis spp. Mesquite, Algaroba [68407]		Species or species habitat likely to occur within area
Reptiles		
Hemidactylus frenatus Asian House Gecko [1708]		Species or species

Name	Status	Type of Presence
		habitat likely to occur within area
Ramphotyphlops braminus Flowerpot Blind Snake, Brahminy Blind Snake, Cacing Besi [1258]		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

-20.59611 116.78

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.

Department of the Environment
GPO Box 787
Canberra ACT 2601 Australia
+61 2 6274 1111

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

Department of **Biodiversity, Conservation and Attractions**

GOVERNMENT OF WESTERN AUSTRALIA

Your Ref: **21244-18**
Our Ref: **39-0518FL**
Enquiries: Steven Martin
Phone: (08) 9219 9522
Email: flora.data@dbca.wa.gov.au

Astron Environmental Services
129 Royal Street
East Perth WA 6004

Attention: Haylea Warrener

Dear Haylea Warrener,

REQUEST FOR THREATENED AND PRIORITY FLORA INFORMATION

I refer to your request of 29 May 2018 for Threatened (Declared Rare) and Priority Flora information in the Dampier 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 (Declared Rare) and Priority Flora* database (for results, see "TPFL" – coordinates are GDA94), **(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') and **(3)**, the Department's *Threatened and Priority Flora List* [this list is searched using 'place names'. This list, which may also be used as a species target list, contains species that are declared rare (Conservation Code R or X for those presumed to be extinct), poorly known (Conservation Codes 1, 2 or 3), or require monitoring (Conservation Code 4) – for results, *if any*, see "TP List"]. 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 to ensure their ongoing management.

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

Yours faithfully

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

5 June 2018

Species and Communities Branch
17 Dick Perry Avenue, Technology Park, Kensington
Phone: (08) 9219 9511
Postal Address: Locked Bag 104, Bentley Delivery Centre, Western Australia 6983
www.dbca.wa.gov.au

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 ArcView 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 Branch 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 Branch.

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 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

T Threatened species

Listed as Specially Protected under the *Wildlife Conservation Act 1950,* published under Schedule 1 of the Wildlife Conservation (Specially Protected Fauna) Notice for Threatened Fauna and Wildlife Conservation (Rare Flora) Notice for Threatened Flora (which may also be referred to as Declared Rare Flora).

- Fauna that is rare or likely to become extinct are declared to be fauna that is in need of special protection
- Flora that are extant and considered likely to become extinct, or rare and therefore in need of special protection, are declared to be rare flora

Species* which have been adequately searched for and are deemed to be, in the wild, either rare, at risk of extinction, or otherwise in need of special protection, and have been gazetted as such.
The assessment of the conservation status of these species is based on their national extent.

X Presumed extinct species

Listed as Specially Protected under the *Wildlife Conservation Act 1950,* published under Schedule 2 of the Wildlife Conservation (Specially Protected Fauna) Notice for Presumed Extinct Fauna and Wildlife Conservation (Rare Flora) Notice for Presumed Extinct Flora (which may also be referred to as Declared Rare Flora).

Species which have been adequately searched for and there is no reasonable doubt that the last individual has died, and have been gazetted as such.

IA Migratory birds protected under an international agreement

Listed as Specially Protected under the *Wildlife Conservation Act 1950,* listed under Schedule 3 of the Wildlife Conservation (Specially Protected Fauna) Notice.

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), relating to the protection of migratory birds.

S Other specially protected fauna

Listed as Specially Protected under the *Wildlife Conservation Act 1950.* Fauna declared to be in need of special protection, otherwise than for the reasons mentioned for Schedules 1, 2 or 3, are published under Schedule 4 of the Wildlife Conservation (Specially Protected Fauna) Notice.

Threatened Fauna and Flora are ranked according to their level of threat using IUCN Red List categories and criteria. *For example:* Carnaby's Cockatoo (*Calyptorynchus latirostris*) is listed as 'Specially Protected' under the *Wildlife Conservation Act 1950,* published under Schedule 1, and referred to as a 'Threatened' species with a ranking of 'Endangered'.

CR Critically Endangered - considered to be facing an extremely high risk of extinction in the wild.

EN Endangered - considered to be facing a very high risk of extinction in the wild.

VU Vulnerable - considered to be facing a high risk of extinction in the wild.

A list of the current rankings can be downloaded from the Parks and Wildlife Threatened Species and Communities webpage at http://dpaw.wa.gov.au/plants-and-animals/threatened-species-and-communities/

Department of **Biodiversity, Conservation and Attractions**

GOVERNMENT OF WESTERN AUSTRALIA

P Priority species

Species that maybe threatened or near threatened but are data deficient, have not yet been adequately surveyed to be listed under the Schedules of the Wildlife Conservation (Specially Protected Fauna) Notice or the Wildlife Conservation (Rare Flora) Notice, 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 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 list for other than taxonomic reasons, are placed in Priority 4. These species require regular monitoring. Conservation dependent species that are subject to a specific conservation program are placed in Priority 5.

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 One: 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 Two: 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 Three: 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 Four: 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 do not qualify for Conservation Dependent, but that are close to qualifying for Vulnerable.
(c) Species that have been removed from the list of threatened species during the past five years for reasons other than taxonomy.

5: Priority Five: Conservation Dependent species

Species that are not threatened but are subject to a specific conservation program, the cessation of which would result in the species becoming threatened within five years.

*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, variety or forma).

NatureMap
Mapping Western Australia's biodiversity

NatureMap Species FLORA

Created By Guest user on 10/07/2018

Kingdom Plantae
Current Names Only Yes
Core Datasets Only Yes
Method 'By Circle'
Centre 116° 46' 48" E,20° 35' 46" S
Buffer 20km
Group By Family

Family	Species	Records
Acanthaceae	3	59
Aizoaceae	6	29
Amaranthaceae	29	268
Anadyomenaceae	1	7
Apocynaceae	5	38
Araliaceae	4	25
Arecaceae	1	1
Areschougiaceae	1	1
Asteraceae	32	130
Bignoniaceae	1	1
Bonnemaisoniaceae	1	9
Boodleaceae	1	1
Boraginaceae	11	84
Brassicaceae	5	15
Cactaceae	1	65
Capparaceae	2	20
Caryophyllaceae	2	15
Caulerpaceae	19	145
Celastraceae	2	5
Ceramiaceae	3	13
Champiaceae	1	5
Chenopodiaceae	35	240
Cladophoraceae	3	5
Cleomaceae	2	40
Codiaceae	3	5
Combretaceae	4	61
Commelinaceae	1	6
Convolvulaceae	22	118
Corallinaceae	2	3
Corynomorphaceae	1	1
Cucurbitaceae	4	25
Cymodoceaceae	2	29
Cyperaceae	16	52
Cystocloniaceae	1	1
Dasyaceae	2	6
Dasycladaceae	4	11
Delesseriaceae	1	1
Dichotomosiphonaceae	2	5
Euphorbiaceae	16	194
Fabaceae	102	814
Frankeniaceae	2	6
Galaxauraceae	2	11
Gelidiaceae	2	8
Gentianaceae	2	2
Goodeniaceae	12	126
Gracilariaceae	1	6
Gyrostemonaceae	1	1
Halimedaceae	7	46
Halymeniaceae	4	9
Hydrocharitaceae	7	39
Hymenocladiaceae	1	2
Lamiaceae	2	10
Lauraceae	1	7
Liagoraceae	2	4
Lomentariaceae	1	5
Loranthaceae	1	1
Lythraceae	4	9
Malvaceae	41	298
Menispermaceae	1	11
Molluginaceae	1	4
Moraceae	7	65
Mychodeaceae	1	1
Myrtaceae	6	21
Nemastomataceae	1	1
Nyctaginaceae	9	37
Oleaceae	2	11
Orobanchaceae	1	5
Passifloraceae	1	10
Phrymaceae	2	2
Phyllanthaceae	6	29
Pittosporaceae	1	24
Plantaginaceae	3	17
Plumbaginaceae	3	22
Poaceae	62	472
Polygalaceae	1	1

Polygonaceae	1	1
Polyphysaceae	1	2
Portulacaceae	5	22
Primulaceae	1	4
Proteaceae	7	28
Pteridaceae	2	10
Rhamnaceae	2	6
Rhizophoraceae	3	59
Rhizophyllidaceae	1	4
Rhodomelaceae	10	42
Rhodymeniaceae	3	6
Ricciaceae	1	1
Rubiaceae	6	25
Santalaceae	2	5
Sapindaceae	3	28
Scrophulariaceae	3	27
Siphonocladaceae	2	16
Solanaceae	15	69
Solieriaceae	1	5
Stylidiaceae	1	4
Surianaceae	1	17
Thymelaeaceae	1	1
Udoteaceae	4	43
Valoniaceae	2	5
Violaceae	2	36
Zygophyllaceae	6	35
TOTAL	**641**	**4377**

	Name ID	Species Name	Naturalised	Conservation Code	[1]Endemic To Query Area
Acanthaceae					
1.	6828	*Avicennia marina (White Mangrove)*			
2.	14555	*Avicennia marina subsp. marina*			
3.	7166	*Dicliptera armata*			
Aizoaceae					
4.	2818	*Sesuvium portulacastrum*			
5.	2830	*Trianthema portulacastrum (Giant Pigweed)*	Y		
6.	44362	*Trianthema triquetrum*			
7.	44360	*Trianthema turgidifolium*			
8.	2834	*Zaleya galericulata (Hogweed)*			
9.	29095	*Zaleya galericulata subsp. galericulata*			
Amaranthaceae					
10.	2645	*Achyranthes aspera (Chaff Flower)*			
11.	2646	*Aerva javanica (Kapok Bush)*	Y		
12.	2651	*Alternanthera nana (Hairy Joyweed)*			
13.	2652	*Alternanthera nodiflora (Common Joyweed)*			
14.	20018	*Amaranthus undulatus*			
15.	2674	*Gomphrena affinis*			
16.	2676	*Gomphrena canescens (Batchelors Buttons)*			
17.	18363	*Gomphrena canescens subsp. canescens*			
18.	2680	*Gomphrena cunninghamii*			
19.	2682	*Gomphrena flaccida (Gomphrena Weed)*			
20.	11131	*Gomphrena sordida*			
21.	31074	*Gomphrena sp. Martins Well (K.F. Kenneally 6116)*			Y
22.	2690	*Ptilotus aervoides*			
23.	2696	*Ptilotus astrolasius*			
24.	2698	*Ptilotus auriculifolius*			
25.	2699	*Ptilotus axillaris (Mat Mulla Mulla)*			
26.	2711	*Ptilotus clementii (Tassel Top)*			
27.	2717	*Ptilotus divaricatus (Climbing Mulla Mulla)*			
28.	2725	*Ptilotus fusiformis*			
29.	2728	*Ptilotus gomphrenoides*			
30.	2731	*Ptilotus helipteroides (Hairy Mulla Mulla)*			
31.	2741	*Ptilotus macrocephalus (Featherheads)*			
32.	2745	*Ptilotus murrayi*			
33.	2746	*Ptilotus nobilis (Tall Mulla Mulla)*			
34.	41001	*Ptilotus nobilis subsp. nobilis (Yellow Tails)*			
35.	2747	*Ptilotus obovatus (Cotton Bush)*			
36.	2751	*Ptilotus polystachyus (Prince of Wales Feather)*			
37.	2766	*Ptilotus villosiflorus*			
38.	43203	*Surreya diandra*			
Anadyomenaceae					
39.	35872	*Anadyomene plicata*			
Apocynaceae					
40.	6580	*Asclepias curassavica (Redhead Cottonbush)*	Y		
41.	6584	*Cynanchum floribundum (Dumara Bush, Tjipa)*			
42.	48280	*Cynanchum viminale subsp. australe*			
43.	12832	*Gymnanthera cunninghamii*		P3	
44.	6578	*Wrightia saligna*			
Araliaceae					
45.	6270	*Trachymene didiscoides*			
46.	6273	*Trachymene glaucifolia (Wild Carrot)*			
47.	6278	*Trachymene oleracea*			
48.	19043	*Trachymene oleracea subsp. oleracea*			
Arecaceae					
49.	17910	*Washingtonia filifera*	Y		
Areschougiaceae					
50.	26823	*Erythroclonium sonderi*			
Asteraceae					
51.	7827	*Angianthus cunninghamii (Coast Angianthus)*			
52.	7832	*Angianthus milnei (Cone-spike Angianthus)*			
53.		*Baccharis sp*			Y
54.	7854	*Bidens bipinnata (Bipinnate Beggartick)*	Y		

	Name ID	Species Name	Naturalised	Conservation Code	[1]Endemic To Query Area
55.	7905	*Calotis multicaulis (Many-stemmed Burr-daisy)*			
56.	33516	*Chrysocephalum gilesii*			
57.	7939	*Conyza bonariensis (Flaxleaf Fleabane)*	Y		
58.	35558	*Flaveria trinervia (Speedy Weed)*	Y		
59.	8088	*Ixiochlamys cuneifolia*			
60.	8095	*Lactuca saligna (Wild Lettuce, Willow-leaf Lettuce)*	Y		
61.		*Launaea sarmenstosa*			
62.	8109	*Minuria integerrima (Smooth Minuria)*			
63.	8110	*Minuria leptophylla (Minnie Daisy)*			
64.	13494	*Pentalepis trichodesmoides*			
65.	42160	*Pentalepis trichodesmoides subsp. trichodesmoides*			
66.	8167	*Pluchea dentex*			
67.	43944	*Pluchea longiseta*			
68.	8168	*Pluchea rubelliflora*			
69.	8189	*Pseudognaphalium luteoalbum (Jersey Cudweed)*			
70.		*Pterocaulon sp.*			
71.	8192	*Pterocaulon sphacelatum (Apple Bush, Fruit Salad Plant)*			
72.	8193	*Pterocaulon sphaeranthoides*			
73.	13246	*Rhodanthe humboldtiana*			
74.	13310	*Rhodanthe margarethae*			
75.	8231	*Sonchus oleraceus (Common Sowthistle)*	Y		
76.	8234	*Streptoglossa adscendens*			
77.	8235	*Streptoglossa bubakii*			
78.	8237	*Streptoglossa decurrens*			
79.	8238	*Streptoglossa liatroides*			
80.	8240	*Streptoglossa odora*			
81.	8241	*Streptoglossa tenuiflora*			
82.	8252	*Tridax procumbens (Tridax, Tridax Daisy)*	Y		
Bignoniaceae					
83.	48390	*Dolichandrone occidentalis*			
Bonnemaisoniaceae					
84.	26486	*Asparagopsis taxiformis*			
Boodleaceae					
85.	26508	*Boodlea composita*			
Boraginaceae					
86.	6682	*Ehretia saligna (False Cedar)*			
87.	14301	*Ehretia saligna var. saligna*			
88.	17301	*Heliotropium chrysocarpum*			
89.	6704	*Heliotropium conocarpum*			
90.	6706	*Heliotropium cunninghamii*			
91.	6707	*Heliotropium curassavicum (Smooth Heliotrope)*			
92.	17307	*Heliotropium inexplicitum*			
93.	6714	*Heliotropium paniculatum*			
94.	6718	*Heliotropium tenuifolium (Mamukata)*			
95.	6727	*Trichodesma zeylanicum (Camel Bush, Kumbalin)*			
96.	11750	*Trichodesma zeylanicum var. zeylanicum*			
Brassicaceae					
97.	2995	*Brassica x napus*	Y		
98.	3029	*Lepidium linifolium*			
99.	3035	*Lepidium pedicellosum*			
100.	3038	*Lepidium pholidogynum*			
101.	3039	*Lepidium platypetalum (Slender Peppercress)*			
Cactaceae					
102.	5227	*Opuntia stricta (Common Prickly Pear)*	Y		
Capparaceae					
103.	2981	*Capparis spinosa*			
104.	48291	*Capparis spinosa subsp. nummularia*			
Caryophyllaceae					
105.	2901	*Polycarpaea holtzei*			
106.	2903	*Polycarpaea longiflora*			
Caulerpaceae					
107.	26554	*Caulerpa brachypus*			
108.	42620	*Caulerpa chemnitzia*			
109.	26558	*Caulerpa constricta*			
110.	35158	*Caulerpa corynephora*			
111.	26559	*Caulerpa cupressoides*			

	Name ID	Species Name	Naturalised	Conservation Code	[1]Endemic To Query Area
112.	47053	*Caulerpa cupressoides var. cupressoides*			
113.	47054	*Caulerpa cupressoides var. elegans*			
114.	27378	*Caulerpa cupressoides var. lycopodium*			
115.	36368	*Caulerpa cupressoides var. mamillosa*			
116.	44539	*Caulerpa cylindracea*			
117.	44547	*Caulerpa lamourouxii*			
118.	26568	*Caulerpa lentillifera*			
119.	37643	*Caulerpa parvifolia*			
120.	26573	*Caulerpa racemosa*			
121.	35122	*Caulerpa racemosa var. racemosa*			
122.	26576	*Caulerpa serrulata*			
123.	26577	*Caulerpa sertularioides*			
124.	26579	*Caulerpa taxifolia*			
125.	26582	*Caulerpa verticillata*			
Celastraceae					
126.	4729	*Stackhousia clementii*		P3	
127.	19555	*Stackhousia muricata subsp. annual (W.R. Barker 2172)*			
Ceramiaceae					
128.	26450	*Aglaothamnion cordatum*			
129.	26587	*Centroceras clavulatum*			
130.	27310	*Spyridia filamentosa*			
Champiaceae					
131.	26619	*Champia stipitata*			
Chenopodiaceae					
132.	2450	*Atriplex amnicola (Swamp Saltbush)*			
133.	2451	*Atriplex bunburyana (Silver Saltbush)*			
134.	2453	*Atriplex codonocarpa (Flat-topped Saltbush)*			
135.	2463	*Atriplex isatidea (Coast Saltbush)*			
136.	2476	*Atriplex semilunaris (Annual Saltbush)*			
137.	2504	*Dysphania plantaginella*			
138.	2506	*Dysphania rhadinostachya*			
139.	11890	*Dysphania rhadinostachya subsp. rhadinostachya*			
140.	2511	*Enchylaena tomentosa (Barrier Saltbush)*			
141.	12064	*Enchylaena tomentosa var. tomentosa (Barrier Saltbush)*			
142.	2544	*Maireana georgei (Satiny Bluebush)*			
143.	2564	*Maireana stipitata*			
144.	11662	*Maireana tomentosa subsp. tomentosa*			
145.	2573	*Neobassia astrocarpa*			
146.	2582	*Rhagodia eremaea (Thorny Saltbush)*			
147.	2584	*Rhagodia preissii*			
148.	11240	*Rhagodia preissii subsp. obovata*			
149.	30434	*Salsola australis*			
150.	2609	*Sclerolaena diacantha (Grey Copperburr)*			
151.	8877	*Sclerolaena gardneri*			
152.	2633	*Sclerolaena uniflora (Two-spined Saltbush)*			
153.	2638	*Suaeda arbusculoides*			
154.	31616	*Tecticornia auriculata*			
155.	33236	*Tecticornia halocnemoides (Shrubby Samphire)*			
156.	33240	*Tecticornia halocnemoides subsp. longispicata*			
157.	33238	*Tecticornia halocnemoides subsp. tenuis*			
158.	33317	*Tecticornia indica*			
159.	33319	*Tecticornia indica subsp. bidens*			
160.	33356	*Tecticornia indica subsp. indica*			
161.	33357	*Tecticornia indica subsp. julacea*			
162.	33318	*Tecticornia indica subsp. leiostachya (Samphire)*			
163.	33299	*Tecticornia pergranulata subsp. elongata*			
164.	31618	*Tecticornia pruinosa*			
165.	33220	*Tecticornia pterygosperma subsp. denticulata*			
166.	2644	*Threlkeldia diffusa (Coast Bonefruit)*			
Cladophoraceae					
167.	26612	*Chaetomorpha melagonium*			
168.	35865	*Cladophora catenata*			
169.	36316	*Cladophora herpestica*			
Cleomaceae					
170.	2987	*Cleome uncifera*			
171.	2988	*Cleome viscosa (Tickweed, Tjinduwadhu)*			

	Name ID	Species Name	Naturalised	Conservation Code	[1]Endemic To Query Area
Codiaceae					
172.	35917	*Codium arabicum*			
173.	26673	*Codium geppiorum*			
174.		*Codium platyclados*			Y
Combretaceae					
175.	5300	*Terminalia canescens (Joolal)*			
176.	45698	*Terminalia circumalata*			
177.	5310	*Terminalia platyphylla (Wild Plum, Durin)*			
178.	5313	*Terminalia supranitifolia*		P3	
Commelinaceae					
179.	1165	*Commelina ensifolia (Wandering Jew, Buargu)*			
Convolvulaceae					
180.	6606	*Bonamia media*			
181.	6608	*Bonamia pannosa*			
182.	44782	*Bonamia pilbarensis*			
183.	6609	*Bonamia rosea (Felty Bellflower)*			
184.	19880	*Convolvulus angustissimus*			
185.	6612	*Convolvulus clementii*			
186.	6662	*Cuscuta australis (Australian Dodder)*			
187.	13733	*Cuscuta victoriana*			
188.	6617	*Evolvulus alsinoides (Tropical Speedwell)*			
189.	11200	*Evolvulus alsinoides var. villosicalyx*			
190.	6623	*Ipomoea coptica*			
191.	6624	*Ipomoea costata (Rock Morning Glory, Kanti)*			
192.	6633	*Ipomoea muelleri (Poison Morning Glory, Yumbu)*			
193.	6635	*Ipomoea pes-caprae*			
194.	11312	*Ipomoea pes-caprae subsp. brasiliensis*			
195.	6637	*Ipomoea polymorpha*			
196.	39840	*Merremia dissecta var. dissecta*	Y		
197.	6651	*Operculina aequisepala*			
198.	6652	*Operculina brownii (Potato Vine, Bara)*			
199.	6655	*Polymeria calycina*			
200.	17513	*Polymeria lanata*			
201.		*Polymeria sp.*			
Corallinaceae					
202.	26461	*Amphiroa foliacea*			
203.	26462	*Amphiroa fragilissima*			
Corynomorphaceae					
204.	26698	*Corynomorpha prismatica*			
Cucurbitaceae					
205.	41720	*Cucumis argenteus*			
206.	41721	*Cucumis variabilis*			
207.	7381	*Trichosanthes cucumerina*			
208.	12032	*Trichosanthes cucumerina var. cucumerina*			
Cymodoceaceae					
209.	131	*Halodule uninervis*			
210.	132	*Syringodium isoetifolium*			
Cyperaceae					
211.	750	*Bulbostylis barbata*			
212.	774	*Cyperus bifax (Downs Nutgrass)*			
213.	12801	*Cyperus blakeanus*			
214.	777	*Cyperus bulbosus (Bush Onion, Tjanmata)*			
215.	786	*Cyperus cunninghamii*			
216.	12811	*Cyperus cunninghamii subsp. cunninghamii*			
217.		*Cyperus sp.*			
218.	814	*Cyperus squarrosus*			
219.	818	*Cyperus vaginatus (Stiffleaf Sedge)*			
220.	827	*Eleocharis geniculata*			
221.	851	*Fimbristylis dichotoma (Eight Day Grass)*			
222.	853	*Fimbristylis elegans*			
223.	880	*Fimbristylis schultzii*			
224.	16257	*Schoenoplectus subulatus*			
225.	1006	*Schoenus odontocarpus*			
226.	1010	*Schoenus punctatus*		P3	
Cystocloniaceae					
227.	35922	*Hypnea cornuta*			

	Name ID	Species Name	Naturalised	Conservation Code	[1]Endemic To Query Area
Dasyaceae					
228.	26740	*Dasya frutescens*			
229.	26930	*Heterosiphonia crassipes*			
Dasycladaceae					
230.	26509	*Bornetella oligospora*			
231.	26510	*Bornetella sphaerica*			
232.	44548	*Neomeris bilimbata*			
233.	27099	*Neomeris van-bosseae*			
Delesseriaceae					
234.	27056	*Martensia elegans*			
Dichotomosiphonaceae					
235.	36362	*Avrainvillea erecta*			
236.	26498	*Avrainvillea obscura*			
Euphorbiaceae					
237.	4583	*Adriana tomentosa*			
238.	17422	*Adriana tomentosa var. tomentosa*			
239.	4617	*Euphorbia australis (Namana)*			
240.	35307	*Euphorbia australis var. australis*			
241.	35303	*Euphorbia australis var. subtomentosa*			
242.	4619	*Euphorbia biconvexa*			
243.	9048	*Euphorbia careyi*			
244.	4623	*Euphorbia coghlanii (Namana)*			
245.	4626	*Euphorbia drummondii (Caustic Weed, Piwi)*			
246.	4629	*Euphorbia hirta (Asthma Plant)*	Y		
247.	4635	*Euphorbia myrtoides*			
248.		*Euphorbia sp.*			
249.	4647	*Euphorbia tannensis*			
250.	12097	*Euphorbia tannensis subsp. eremophila (Desert Spurge)*			
251.	42879	*Euphorbia trigonosperma*			
252.	13281	*Euphorbia vaccaria*			
Fabaceae					
253.	3209	*Acacia ampliceps*			
254.	44580	*Acacia ampliceps x bivenosa*			
255.	44586	*Acacia ampliceps x sclerosperma subsp. sclerosperma*			
256.	3214	*Acacia ancistrocarpa (Fitzroy Wattle)*			
257.	3223	*Acacia arida*			
258.	3241	*Acacia bivenosa*			
259.	44588	*Acacia bivenosa x sclerosperma subsp. sclerosperma*			
260.	13403	*Acacia colei*			
261.	17013	*Acacia colei var. colei*			
262.	3270	*Acacia coriacea (Wirewood)*			
263.	13500	*Acacia coriacea subsp. coriacea*			
264.	13502	*Acacia coriacea subsp. pendens*			
265.	12673	*Acacia glaucocaesia*			
266.	3356	*Acacia gregorii (Gregory's Wattle)*			
267.	3372	*Acacia holosericea (Candelbra Wattle, Liringgin)*			
268.	3377	*Acacia inaequilatera (Baderi)*			
269.	3434	*Acacia maitlandii (Maitland's Wattle)*			
270.	3471	*Acacia orthocarpa (Needleleaf Wattle)*			
271.	3506	*Acacia pyrifolia (Ranji Bush, Kandji)*			
272.	29016	*Acacia pyrifolia var. morrisonii*			
273.	29015	*Acacia pyrifolia var. pyrifolia*			
274.	13078	*Acacia sclerosperma subsp. sclerosperma*			
275.	29135	*Acacia sericophylla*			
276.	3551	*Acacia sphaerostachya*			
277.	19456	*Acacia stellaticeps*			
278.	13070	*Acacia synchronicia*			
279.	3573	*Acacia tenuissima*			
280.	3579	*Acacia trachycarpa (Minni Ritchi, Balgali)*			
281.	3606	*Acacia xiphophylla*			
282.	3609	*Albizia lebbeck*			
283.	17147	*Alysicarpus muelleri*			
284.	11055	*Cajanus cinereus*			
285.	10972	*Cajanus marmoratus*			
286.	11150	*Cajanus pubescens*			
287.	3749	*Canavalia rosea (Wild Jack Bean)*			
288.	3769	*Clitoria ternatea*	Y		

	Name ID	Species Name	Naturalised	Conservation Code	[1]Endemic To Query Area
289.	3774	*Crotalaria cunninghamii (Green Birdflower, Bilbun)*			
290.	19378	*Crotalaria dissitiflora subsp. benthamiana*			
291.	3783	*Crotalaria medicaginea*			
292.	20179	*Crotalaria medicaginea var. neglecta*			
293.	3785	*Crotalaria novae-hollandiae (New Holland Rattlepod)*			
294.	11231	*Crotalaria novae-hollandiae subsp. novae-hollandiae*			
295.	17439	*Cullen lachnostachys*			
296.	17118	*Cullen leucanthum*			
297.	17119	*Cullen leucochaites*			
298.	17120	*Cullen pogonocarpum*			
299.	3853	*Desmodium filiforme*			
300.	3612	*Dichrostachys spicata (Pied Piper Bush)*			
301.	3871	*Erythrina vespertilio (Yulbah)*			
302.	3938	*Glycine canescens (Silky Glycine)*			
303.	3973	*Indigofera colutea (Sticky Indigo)*			
304.	3980	*Indigofera linifolia*			
305.	3981	*Indigofera linnaei (Birdsville Indigo)*			
306.	3982	*Indigofera monophylla*			
307.	3987	*Indigofera trita*			
308.	31035	*Indigofera trita subsp. trita*			
309.	3613	*Leucaena leucocephala (Leucaena)*	Y		
310.	4060	*Lotus australis (Austral Trefoil)*			
311.	4061	*Lotus cruentus (Redflower Lotus)*			
312.	3614	*Neptunia dimorphantha (Sensitive Plant)*			
313.	3675	*Petalostylis labicheoides (Slender Petalostylis)*			
314.	4190	*Rhynchosia australis (Rhynchosia)*			
315.	20862	*Rhynchosia bungarensis*		P4	
316.	4191	*Rhynchosia minima (Rhynchosia)*			
317.	12279	*Senna artemisioides subsp. helmsii*			
318.	12280	*Senna artemisioides subsp. oligophylla*			
319.	18444	*Senna charlesiana*			
320.	12303	*Senna costata*			
321.	18443	*Senna ferraria*			
322.	18346	*Senna glutinosa*			
323.	12305	*Senna glutinosa subsp. chatelainiana*			
324.	12307	*Senna glutinosa subsp. glutinosa*			
325.	12309	*Senna glutinosa subsp. pruinosa*			
326.	12308	*Senna glutinosa subsp. x luerssenii*			
327.	18451	*Senna hamersleyensis*			
328.	12312	*Senna notabilis*			
329.	12319	*Senna venusta*			
330.	4196	*Sesbania cannabina (Sesbania Pea)*			
331.	12353	*Stylosanthes hamata (Verano Stylo)*	Y		
332.	12356	*Swainsona formosa*			
333.	4231	*Swainsona kingii*			
334.	4233	*Swainsona leeana*			
335.	4242	*Swainsona pterostylis*			
336.		*Tephrosia Fortescue (A.A. Mitchell 606)*			Y
337.	4263	*Tephrosia clementii*			
338.	4269	*Tephrosia flammea*			
339.	4272	*Tephrosia leptoclada*			
340.	4280	*Tephrosia rosea (Flinders River Poison, Bungoo'dah)*			
341.	19531	*Tephrosia rosea var. clementii*			
342.		*Tephrosia rosea var. fortescue creeks (M.I.H. Brooker 2186)*			
343.	15947	*Tephrosia sp. B Kimberley Flora (C.A. Gardner 7300)*			
344.	17768	*Tephrosia sp. Bungaroo Creek (M.E. Trudgen 11601)*			
345.	15949	*Tephrosia sp. D Kimberley Flora (R.D. Royce 1848)*			
346.	41811	*Tephrosia sp. Fortescue (A.A. Mitchell 606)*			
347.	42442	*Tephrosia sp. NW Eremaean (S. van Leeuwen et al. PBS 0356)*			
348.	4285	*Tephrosia supina*			
349.	30716	*Vachellia farnesiana (Mimosa Bush)*	Y		
350.	4323	*Vigna lanceolata (Maloga Vigna, Wega)*			
351.		*Vigna lanceolata subsp. latifolia*			Y
352.	31391	*Vigna sp. Hamersley Clay (A.A. Mitchell PRP 113)*			
353.	46577	*Vigna triodiophila*		P3	
354.	12679	*Zornia muelleriana subsp. congesta*			

Frankeniaceae

355.	5188	*Frankenia ambita*			
356.	5209	*Frankenia pauciflora (Seaheath)*			

	Name ID	Species Name	Naturalised	Conservation Code	[1]Endemic To Query Area
Galaxauraceae					
357.	26835	*Galaxaura rugosa*			
358.	27340	*Tricleocarpa cylindrica*			
Gelidiaceae					
359.	26842	*Gelidiella acerosa*			
360.	26848	*Gelidium crinale*			
Gentianaceae					
361.	6539	*Centaurium erythraea (Common Centaury)*	Y		
362.	41660	*Schenkia australis*			
Goodeniaceae					
363.	7509	*Goodenia forrestii*			
364.	7515	*Goodenia heterochila*			
365.	7521	*Goodenia lamprosperma*			
366.	7526	*Goodenia microptera*			
367.	7556	*Goodenia tenuiloba*			
368.	12578	*Scaevola acacioides*			
369.	12723	*Scaevola amblyanthera*			
370.	7595	*Scaevola anchusifolia*			
371.	7606	*Scaevola crassifolia (Thick-leaved Fan-flower)*			
372.	7608	*Scaevola cunninghamii*			
373.	7614	*Scaevola globulifera*			
374.	7644	*Scaevola spinescens (Currant Bush, Maroon)*			
Gracilariaceae					
375.	26873	*Gracilaria salicornia*			
Gyrostemonaceae					
376.	2778	*Codonocarpus cotinifolius (Native Poplar, Kundurangu)*			
Halimedaceae					
377.	47313	*Halimeda borneensis*			
378.	26891	*Halimeda cylindracea*			
379.	26892	*Halimeda discoidea*			
380.	26894	*Halimeda macroloba*			
381.	26896	*Halimeda simulans*			
382.	26898	*Halimeda velasquezii*			
383.	47213	*Halimeda versatilis*			
Halymeniaceae					
384.	26708	*Cryptonemia kallymenioides*			
385.	37642	*Halymenia durvillei*			
386.	37640	*Halymenia floresii*			
387.	44523	*Spongophloea tissotii*			
Hydrocharitaceae					
388.	160	*Enhalus acoroides*			
389.	162	*Halophila decipiens*			
390.	163	*Halophila minor*			
391.	164	*Halophila ovalis (Sea Wrack)*			
392.	165	*Halophila spinulosa*			
393.	139	*Najas tenuifolia (Water Nymph)*			
394.	169	*Thalassia hemprichii*			
Hymenocladiaceae					
395.	36140	*Asteromenia exanimans*			
Lamiaceae					
396.	6732	*Clerodendrum tomentosum*			
397.	13689	*Clerodendrum tomentosum var. lanceolatum*			
Lauraceae					
398.	2949	*Cassytha capillaris*			
Liagoraceae					
399.	26837	*Ganonema farinosum*			
400.	35120	*Patenocarpus paraphysiferus*			
Lomentariaceae					
401.	26606	*Ceratodictyon spongiosum*			
Loranthaceae					
402.	2381	*Amyema miraculosa*			
Lythraceae					
403.	5276	*Ammannia auriculata*			

	Name ID	Species Name	Naturalised	Conservation Code	[1]Endemic To Query Area
404.	5277	*Ammannia baccifera*			
405.	5278	*Ammannia multiflora*			
406.		*Lawsonia inermis*			
Malvaceae					
407.	4886	*Abutilon amplum*			
408.	9080	*Abutilon cunninghamii*			
409.	4891	*Abutilon fraseri (Lantern Bush)*			
410.	4894	*Abutilon indicum (Indian Lantern Flower)*			
411.	11325	*Abutilon indicum var. australiense*			
412.	4895	*Abutilon lepidum*			
413.	4899	*Abutilon malvifolium (Bastard Marshmallow)*			
414.	4902	*Abutilon oxycarpum (Flannel Weed)*			
415.	12716	*Brachychiton acuminatus*			
416.		*Brachychiton australe*			Y
417.	18411	*Corchorus congener*		P3	
418.	4857	*Corchorus elachocarpus*			
419.	25847	*Corchorus incanus subsp. incanus*			
420.	13659	*Corchorus laniflorus*			
421.	4862	*Corchorus parviflorus*			
422.	4865	*Corchorus tridens*			
423.	13467	*Corchorus trilocularis*			
424.	4867	*Corchorus walcottii (Woolly Corchorus)*			
425.	4910	*Gossypium australe (Native Cotton)*			
426.	4913	*Gossypium hirsutum (Upland Cotton)*	Y		
427.	4918	*Gossypium robinsonii (Wild Cotton)*			
428.	29316	*Hibiscus austrinus*			
429.	29317	*Hibiscus austrinus var. austrinus*			
430.	4933	*Hibiscus leptocladus*			
431.	4942	*Hibiscus sturtii (Sturt's Hibiscus)*			
432.	11651	*Hibiscus sturtii var. campylochlamys*			
433.	11477	*Hibiscus sturtii var. platychlamys*			
434.	4960	*Lawrencia viridigrisea*			
435.	4962	*Malvastrum americanum (Spiked Malvastrum)*	Y		
436.	5051	*Melhania oblongifolia*			
437.		*Sida Excedentifolia (J.L. Egan 1925)*			
438.	4971	*Sida cardiophylla*			
439.	4976	*Sida echinocarpa*			
440.	4977	*Sida fibulifera (Silver Sida)*			
441.	33698	*Sida sp. Pilbara (A.A. Mitchell PRP 1543)*			
442.	4989	*Sida spinosa (Spiny Sida)*			
443.	4873	*Triumfetta appendiculata*			
444.	4875	*Triumfetta chaetocarpa (Urchins)*			
445.	14694	*Triumfetta clementii*			
446.	14942	*Triumfetta maconochieana*			
447.	5106	*Waltheria indica*			
Menispermaceae					
448.	2942	*Tinospora smilacina (Snakevine, Oondala)*			
Molluginaceae					
449.	48201	*Trigastrotheca molluginea*			
Moraceae					
450.	25811	*Ficus aculeata*			
451.	31578	*Ficus aculeata var. indecora (Ranji)*			
452.	19648	*Ficus brachypoda*			
453.	1753	*Ficus platypoda (Native Fig, Makartu)*			
454.		*Ficus sp.*			
455.	1759	*Ficus virens (Albayi)*			
456.	11572	*Ficus virens var. sublanceolata*			
Mychodeaceae					
457.	27079	*Mychodea carnosa*			
Myrtaceae					
458.	19125	*Corymbia dichromophloia*			
459.	17093	*Corymbia hamersleyana*			
460.	17092	*Corymbia opaca*			
461.	5714	*Eucalyptus microtheca (Coolibah)*			
462.	5752	*Eucalyptus prominens*			
463.	14548	*Eucalyptus victrix*			

	Name ID	Species Name	Naturalised	Conservation Code	[1]Endemic To Query Area
Nemastomataceae					
464.	27189	*Predaea weldii*			
Nyctaginaceae					
465.	2769	*Boerhavia burbidgeana*			
466.	2770	*Boerhavia coccinea (Tar Vine, Wituka)*			
467.	8357	*Boerhavia diffusa*			
468.	2772	*Boerhavia gardneri*			
469.	2773	*Boerhavia paludosa*			
470.	2774	*Boerhavia repleta*			
471.	2775	*Boerhavia schomburgkiana*			
472.		*Boerhavia sp*			
473.	2776	*Commicarpus australis (Perennial Tar Vine)*			
Oleaceae					
474.	6501	*Jasminum didymum*			
475.	12059	*Jasminum didymum subsp. lineare (Desert Jasmine)*			
Orobanchaceae					
476.	7103	*Striga curviflora*			
Passifloraceae					
477.	5226	*Passiflora foetida (Stinking Passion Flower)*	Y		
Phrymaceae					
478.	7082	*Mimulus gracilis*			
479.	18462	*Peplidium sp. E Evol. Fl. Fauna Arid Aust. (A.S. Weston 12768)*			
Phyllanthaceae					
480.	4603	*Bridelia tomentosa*			
481.	4654	*Flueggea virosa*			
482.	12013	*Flueggea virosa subsp. melanthesoides (Dogwood, Guwal)*			
483.	38421	*Notoleptopus decaisnei*			
484.	4680	*Phyllanthus maderaspatensis*			
485.	17794	*Phyllanthus tenellus*	Y		
Pittosporaceae					
486.	41300	*Pittosporum phillyreoides (Weeping Pittosporum, Yaliti)*			
Plantaginaceae					
487.	7098	*Stemodia grossa (Marsh Stemodia, Mindjaara)*			
488.	7099	*Stemodia kingii*			
489.	7102	*Stemodia viscosa (Pagurda)*			
Plumbaginaceae					
490.	6486	*Aegialitis annulata (Club Mangrove)*			
491.	6490	*Muellerolimon salicorniaceum*			
492.	6491	*Plumbago zeylanica (Native Plumbago)*			
Poaceae					
493.	172	*Acrachne racemosa*			
494.	207	*Aristida contorta (Bunched Kerosene Grass)*			
495.	12063	*Aristida holathera var. holathera*			
496.	215	*Aristida latifolia (Feathertop Wiregrass)*			
497.	217	*Aristida nitidula (Flat-awned Threeawn)*			
498.	226	*Arundo donax (Giant Reed)*	Y		
499.	229	*Astrebla pectinata (Barley Mitchell Grass)*			
500.	258	*Cenchrus ciliaris (Buffel Grass)*	Y		
501.	41568	*Cenchrus setaceus (Fountain Grass)*	Y		
502.	29721	*Cenchrus setiger (Birdwood Grass)*	Y		
503.	266	*Chloris barbata (Purpletop Chloris)*	Y		
504.	270	*Chloris pumilio*			
505.	273	*Chrysopogon fallax (Golden Beard Grass)*			
506.	279	*Cymbopogon ambiguus (Scentgrass)*			
507.	46558	*Cynodon convergens*			
508.	290	*Dactyloctenium radulans (Button Grass)*			
509.	303	*Dichanthium fecundum (Curly Bluegrass)*			
510.	13741	*Dichanthium sericeum subsp. humilius*			
511.	11964	*Dichanthium sericeum subsp. sericeum*			
512.	310	*Digitaria brownii (Cotton Panic Grass)*			
513.	313	*Digitaria ctenantha (Comb Finger Grass)*			
514.	343	*Ectrosia leporina (Hare's-foot Grass)*			
515.	357	*Enneapogon caerulescens (Limestone Grass)*			
516.	360	*Enneapogon lindleyanus (Wiry Nineawn, Purple-head Nineawn)*			
517.	363	*Enneapogon pallidus (Conetop Nineawn)*			

	Name ID	Species Name	Naturalised	Conservation Code	[1]Endemic To Query Area
518.	365	*Enneapogon polyphyllus (Leafy Nineawn)*			
519.	378	*Eragrostis dielsii (Mallee Lovegrass)*			
520.	380	*Eragrostis eriopoda (Woollybutt Grass, Wangurnu)*			
521.	381	*Eragrostis falcata (Sickle Lovegrass)*			
522.	393	*Eragrostis setifolia (Neverfail Grass)*			
523.	38505	*Eragrostis surreyana*		P3	
524.	400	*Eriachne aristidea*			
525.	403	*Eriachne benthamii (Swamp Wanderrie)*			
526.	413	*Eriachne mucronata (Mountain Wanderrie Grass)*			
527.	414	*Eriachne obtusa (Northern Wandarrie Grass)*			
528.		*Eriachne sp.*			
529.	421	*Eriachne tenuiculmis*			
530.	425	*Eriochloa procera (Cupgrass)*			
531.	11011	*Eulalia aurea*			
532.	503	*Panicum decompositum (Native Millet, Kaltu-kaltu)*			
533.	518	*Paspalidium clementii (Clements Paspalidium)*			
534.	525	*Paspalidium tabulatum*			
535.	606	*Setaria dielsii (Diels' Pigeon Grass)*			
536.	613	*Setaria verticillata (Whorled Pigeon Grass)*	Y		
537.	619	*Sorghum plumosum (Plume Canegrass)*			
538.	622	*Sorghum timorense*			
539.	625	*Spinifex longifolius (Beach Spinifex)*			
540.	629	*Sporobolus australasicus (Fairy Grass)*			
541.	635	*Sporobolus virginicus (Marine Couch)*			
542.		*Themeda Mt Barricade (M.E. Trudgen 2471)*			
543.	672	*Themeda avenacea (Native Oatgrass)*			
544.	17820	*Themeda sp. Hamersley Station (M.E. Trudgen 11431)*		P3	
545.	17819	*Themeda sp. Mt Barricade (M.E. Trudgen 2471)*			
546.	673	*Themeda triandra*			
547.	679	*Triodia angusta*			
548.	13131	*Triodia epactia*			
549.	696	*Triodia pungens (Soft Spinifex)*			
550.	704	*Triodia wiseana (Limestone Spinifex)*			
551.	706	*Triraphis mollis (Needle Grass)*			
552.	725	*Whiteochloa airoides*			
553.	728	*Whiteochloa cymbiformis*			
554.	729	*Xerochloa barbata (Rice Grass)*			
Polygalaceae					
555.	41365	*Polygala glaucifolia*			
Polygonaceae					
556.	2443	*Rumex vesicarius (Ruby Dock)*	Y		
Polyphysaceae					
557.	48409	*Acetabularia caliculus*			
Portulacaceae					
558.	2878	*Portulaca conspicua*			
559.	2882	*Portulaca intraterranea*			
560.	2884	*Portulaca oleracea (Purslane, Wakati)*			
561.	2886	*Portulaca pilosa (Djanggara)*	Y		
562.		*Portulaca sp.*			
Primulaceae					
563.	6478	*Aegiceras corniculatum (River Mangrove)*			
Proteaceae					
564.	2079	*Grevillea pyramidalis (Caustic Bush, Tjungu)*			
565.	19570	*Grevillea pyramidalis subsp. leucadendron*			
566.	15975	*Grevillea pyramidalis subsp. pyramidalis*			
567.	13440	*Grevillea wickhamii subsp. aprica*			
568.	2138	*Hakea chordophylla*			
569.	2177	*Hakea lorea (Witinti)*			
570.	19137	*Hakea lorea subsp. lorea*			
Pteridaceae					
571.	33	*Cheilanthes contigua*			
572.	8462	*Cheilanthes tenuifolia (Rock Fern)*			
Rhamnaceae					
573.	4809	*Cryptandra pungens*			
574.	4846	*Ventilago viminalis (Supplejack, Barndaragu)*			

	Name ID	Species Name	Naturalised	Conservation Code	[1]Endemic To Query Area
Rhizophoraceae					
575.	5291	*Bruguiera exaristata (Ribbed Mangrove)*			
576.	39680	*Ceriops australis*			
577.	5295	*Rhizophora stylosa (Spotted-leaved Red Mangrove)*			
Rhizophyllidaceae					
578.	27186	*Portieria hornemannii*			
Rhodomelaceae					
579.	26440	*Acanthophora dendroides*			
580.	26441	*Acanthophora spicifera*			
581.	26628	*Chondria armata*			
582.	26782	*Digenea simplex*			
583.	26800	*Echinophycus minutus*			Y
584.	48408	*Laurencia dendroidea*			
585.	27018	*Leveillea jungermannioides*			
586.	36400	*Palisada perforata*			
587.	27335	*Tolypiocladia calodictyon*			
588.	27336	*Tolypiocladia glomerulata*			
Rhodymeniaceae					
589.	26516	*Botryocladia leptopoda*			
590.	26685	*Coelarthrum cliftonii*			
591.	26686	*Coelarthrum opuntia*			
Ricciaceae					
592.		*Riccia albida*			
Rubiaceae					
593.	7318	*Dentella minutissima*			
594.	7338	*Oldenlandia crouchiana*			
595.	19640	*Oldenlandia sp. Hamersley Station (A.A. Mitchell PRP 1479)*		P3	
596.		*Pomax Desert (A.S. George 11968)*			Y
597.	7363	*Synaptantha tillaeacea*			
598.	13339	*Synaptantha tillaeacea var. tillaeacea*			
Santalaceae					
599.	10977	*Exocarpos aphyllus (Leafless Ballart)*			
600.	2357	*Santalum lanceolatum (Northern Sandalwood, Yarnguli)*			
Sapindaceae					
601.	4739	*Alectryon oleifolius*			
602.	11487	*Alectryon oleifolius subsp. oleifolius*			
603.	4745	*Diplopeltis eriocarpa (Hairy Pepperflower)*			
Scrophulariaceae					
604.	7234	*Eremophila longifolia (Berrigan, Tulypurpa)*			
605.	16363	*Eremophila maculata subsp. brevifolia (Native Fuchsia)*			
606.	17158	*Myoporum montanum (Native Myrtle)*			
Siphonocladaceae					
607.	26507	*Boergesenia forbesii*			
608.	26769	*Dictyosphaeria cavernosa*			
Solanaceae					
609.	6963	*Datura metel (Downy Thornapple)*	Y		
610.	6971	*Nicotiana benthamiana (Tjuntiwari)*			
611.	6976	*Nicotiana occidentalis (Native Tobacco)*			
612.	11331	*Nicotiana occidentalis subsp. obliqua*			
613.	11856	*Nicotiana occidentalis subsp. occidentalis*			
614.	20652	*Physalis angulata*	Y		
615.	6998	*Solanum cleistogamum*			
616.	7002	*Solanum diversiflorum*			
617.	7007	*Solanum esuriale (Quena)*			
618.	7009	*Solanum gabrielae*			
619.	7014	*Solanum horridum*			
620.	7018	*Solanum lasiophyllum (Flannel Bush, Mindjulu)*			
621.	7022	*Solanum nigrum (Black Berry Nightshade)*	Y		
622.	7029	*Solanum phlomoides*			
623.	7036	*Solanum sturtianum (Thargomindah Nightshade)*			
Solieriaceae					
624.	26827	*Eucheuma denticulatum*			
Stylidiaceae					
625.	7729	*Stylidium fluminense*			

	Name ID	Species Name	Naturalised	Conservation Code	[1]Endemic To Query Area
Surianaceae					
626.	3182	*Stylobasium spathulatum (Pebble Bush)*			
Thymelaeaceae					
627.	5230	*Pimelea ammocharis*			
Udoteaceae					
628.	27121	*Penicillus nodulosus*			
629.	27348	*Udotea argentea*			
630.	27349	*Udotea flabellum*			
631.	35302	*Udotea glaucescens*			
Valoniaceae					
632.	36143	*Valonia fastigiata*			
633.	27357	*Valoniopsis pachynema*			
Violaceae					
634.	5215	*Hybanthus aurantiacus*			
635.	5219	*Hybanthus enneaspermus*			
Zygophyllaceae					
636.	4377	*Tribulus hirsutus*			
637.	4379	*Tribulus macrocarpus*			
638.	4380	*Tribulus occidentalis (Perennial Caltrop)*			
639.	4381	*Tribulus platypterus (Cork Hopbush)*			
640.	4383	*Tribulus terrestris (Caltrop)*	Y		
641.	4395	*Zygophyllum retivalve*			

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.

GOVERNMENT OF WESTERN AUSTRALIA

Department of **Biodiversity, Conservation and Attractions**

Your ref: 21244-18
Our ref: 2018/000514 #5734
Enquiries: Georgina Anderson
Phone: (08) 9219 9516
Email: fauna.data@dbca.wa.gov.au

Attn: Haylea Warrener
Astron
129 Royal Street
East Perth WA 6004

Dear Haylea,

REQUEST FOR THREATENED AND PRIORITY FAUNA INFORMATION

I refer to your request of the 29th of May for information on threatened and priority fauna occurring within the vicinity of Burrup in preparation for a Level 1 fauna survey.

A search was undertaken for this area from the Department's threatened fauna databases, which include species that are declared as '*likely to become extinct* (Schedules 1, 2, and 3)', *'Migratory birds protected under an international agreement* (Schedule 5)', '*Conservation dependent fauna* (Schedule 6)' and '*Other specially protected fauna* (Schedule 7)'.

Attached are the conditions and disclaimers under which this information has been supplied. Your attention is specifically drawn to the second point referring to the confidentiality levels associated with the supply of this information and the seventh point that refers to the requirement to undertake field investigations for an accurate determination of threatened fauna occurrence at a site. The information supplied should be regarded as an indication only of the threatened and priority fauna that may be present.

An invoice for $300.00(plus GST), being the set charge for the supply of this information, will be forwarded.

It would be appreciated if any occurrences of threatened fauna encountered by you in the area could be reported to this Department to ensure their ongoing management.

If you require any further details, or wish to discuss threatened fauna management, please contact our Principal Zoologist on (08) 9219 9515.

Kind regards,

GAnderson

.....

Georgina Anderson
Threatened Fauna Database Officer
for the DIRECTOR GENERAL
Department of Biodiversity, Conservation and Attractions
12 June 2018

Species and Communities Branch
17 Dick Perry Avenue, Technology Park, Kensington
Phone: (08) 9219 9511
Postal Address: Locked Bag 104, Bentley Delivery Centre, WA 6983
www.dbca.wa.gov.au

ATTACHMENT: THREATENED AND PROORITY FAUNA INFORMATION CONDITIONS OF SUPPLY

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 fauna is regarded as confidential, and should be treated as such by receiving organisations. Specific locality information for threatened fauna 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 fauna information.

- The Department of Biodiversity, Conservation and Attractions respects the privacy of private landowners who may have threatened and priority fauna on their property. Threatened and priority fauna 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.

- Acknowledgment of the Department of Biodiversity, Conservation and Attractions as the source of data is to be made in any published material and cited as Department of Biodiversity, Conservation and Attractions (2018) Threatened and Priority Fauna Database Search for [search area] accessed on the [date of search]. Prepared by the Species and Communities Branch 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; Principal Zoologist, Species and Communities Branch.

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 fauna 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 biologist/zoologist, if required, to undertake a survey of the area under consideration.

Species and Communities Branch
17 Dick Perry Avenue, Technology Park, Kensington
Phone: (08) 9219 9511
Postal Address: Locked Bag 104, Bentley Delivery Centre, WA 6983
www.dbca.wa.gov.au

NatureMap
Mapping Western Australia's biodiversity

NatureMap Species Report

Created By Guest user on 16/07/2018

Kingdom	Animalia
Conservation Status	Conservation Taxon (T, X, IA, S, P1-P5)
Current Names Only	Yes
Core Datasets Only	Yes
Species Group	All Animals
Method	'By Circle'
Centre	116° 46' 48" E,20° 35' 46" S
Buffer	20km
Group By	Family

Family	Species	Records
Accipitridae	1	21
Apodidae	1	1
Balaenopteridae	1	2
Boidae	1	23
Charadriidae	6	34
Cheloniidae	4	58
Dasyuridae	1	352
Delphinidae	1	1
Dugongidae	1	1
Falconidae	1	2
Fregatidae	1	16
Glareolidae	1	2
Hydrobatidae	1	7
Laridae	7	80
Megadermatidae	1	1
Muridae	2	4
Procellariidae	2	33
Scincidae	1	8
Scolopacidae	18	268
Sturnidae	1	6
Sulidae	1	11
TOTAL	**54**	**931**

	Name ID	Species Name	Naturalised	Conservation Code	[1]Endemic To Query Area
Accipitridae					
1.	48591	*Pandion cristatus (Osprey, Eastern Osprey)*		IA	
Apodidae					
2.	25554	*Apus pacificus (Fork-tailed Swift, Pacific Swift)*		IA	
Balaenopteridae					
3.	24051	*Megaptera novaeangliae (Humpback Whale)*		S	
Boidae					
4.	25238	*Liasis olivaceus subsp. barroni (Pilbara Olive Python)*		T	
Charadriidae					
5.	25575	*Charadrius leschenaultii (Greater Sand Plover)*		IA	
6.	25576	*Charadrius mongolus (Lesser Sand Plover)*		T	
7.	24375	*Charadrius mongolus subsp. mongolus (Lesser Sand Plover)*		T	
8.	24378	*Charadrius veredus (Oriental Plover)*		IA	
9.	24382	*Pluvialis fulva (Pacific Golden Plover)*		IA	
10.	24383	*Pluvialis squatarola (Grey Plover)*		IA	
Cheloniidae					
11.	25336	*Chelonia mydas (Green Turtle)*		T	
12.	25473	*Eretmochelys imbricata (Hawksbill Turtle)*		T	
13.	25342	*Eretmochelys imbricata subsp. bissa (Hawksbill Turtle)*		T	
14.	25344	*Natator depressus (Flatback Turtle)*		T	
Dasyuridae					
15.	24093	*Dasyurus hallucatus (Northern Quoll)*		T	
Delphinidae					
16.	48114	*Stenella longirostris (Spinner Dolphin)*		P4	

	Name ID	Species Name	Naturalised	Conservation Code	[1]Endemic To Query Area
Dugongidae					
17.	24084	*Dugong dugon (Dugong)*		S	
Falconidae					
18.	25624	*Falco peregrinus (Peregrine Falcon)*		S	
Fregatidae					
19.	24478	*Fregata ariel (Lesser Frigatebird)*		IA	
Glareolidae					
20.	24481	*Glareola maldivarum (Oriental Pratincole)*		IA	
Hydrobatidae					
21.	24497	*Oceanites oceanicus (Wilson's Storm-petrel)*		IA	
Laridae					
22.	24505	*Anous stolidus subsp. pileatus (Common Noddy)*		IA	
23.	48587	*Hydroprogne caspia (Caspian Tern)*		IA	
24.	41347	*Onychoprion anaethetus (Bridled Tern)*		IA	
25.	25640	*Sterna dougallii (Roseate Tern)*		IA	
26.	25642	*Sterna hirundo (Common Tern)*		IA	
27.	48593	*Sternula albifrons (Little Tern)*		IA	
28.	48597	*Thalasseus bergii (Crested Tern)*		IA	
Megadermatidae					
29.	24180	*Macroderma gigas (Ghost Bat)*		T	
Muridae					
30.	24215	*Hydromys chrysogaster (Water-rat, Rakali)*		P4	
31.	24233	*Pseudomys chapmani (Western Pebble-mound Mouse, Ngadji)*		P4	
Procellariidae					
32.	48573	*Ardenna pacifica (Wedge-tailed Shearwater)*		IA	
33.	24716	*Puffinus pacificus (Wedge-tailed Shearwater)*		IA	
Scincidae					
34.	25196	*Notoscincus butleri (lined soil-crevice skink (Dampier))*		P4	
Scolopacidae					
35.	41323	*Actitis hypoleucos (Common Sandpiper)*		IA	
36.	25736	*Arenaria interpres (Ruddy Turnstone)*		IA	
37.	24779	*Calidris acuminata (Sharp-tailed Sandpiper)*		IA	
38.	24780	*Calidris alba (Sanderling)*		IA	
39.	25738	*Calidris canutus (Red Knot, knot)*		IA	
40.	24784	*Calidris ferruginea (Curlew Sandpiper)*		T	
41.	24788	*Calidris ruficollis (Red-necked Stint)*		IA	
42.	24789	*Calidris subminuta (Long-toed Stint)*		IA	
43.	24790	*Calidris tenuirostris (Great Knot)*		T	
44.	30932	*Limosa lapponica (Bar-tailed Godwit)*		IA	
45.	24798	*Numenius madagascariensis (Eastern Curlew)*		T	
46.	24799	*Numenius minutus (Little Curlew, Little Whimbrel)*		IA	
47.	25742	*Numenius phaeopus (Whimbrel)*		IA	
48.	24803	*Tringa brevipes (Grey-tailed Tattler)*		P4	
49.	24806	*Tringa glareola (Wood Sandpiper)*		IA	
50.	24808	*Tringa nebularia (Common Greenshank, greenshank)*		IA	
51.	24809	*Tringa stagnatilis (Marsh Sandpiper, little greenshank)*		IA	
52.	41351	*Xenus cinereus (Terek Sandpiper)*		IA	
Sturnidae					
53.	47954	*Gelochelidon nilotica (Gull-billed Tern)*		IA	
Sulidae					
54.	25754	*Sula leucogaster (Brown Booby)*		IA	

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.

NatureMap
Mapping Western Australia's biodiversity

NatureMap Species FAUNA

Created By Guest user on 10/07/2018

Kingdom	Animalia
Current Names Only	Yes
Core Datasets Only	Yes
Method	'By Circle'
Centre	116° 46' 48" E,20° 35' 46" S
Buffer	20km
Group By	Species Group

Species Group	Species	Records
Amphibian	5	73
Bird	195	2927
Fish	229	388
Invertebrate	112	229
Mammal	41	1058
Reptile	99	1553
TOTAL	**681**	**6228**

	Name ID	Species Name	Naturalised	Conservation Code	[1]Endemic To Query Area
Amphibian					
1.	25371	*Cyclorana australis (Giant Frog)*			
2.	25373	*Cyclorana cultripes (Knife-footed Frog)*			
3.	25375	*Cyclorana maini (Sheep Frog)*			
4.	25392	*Litoria rubella (Little Red Tree Frog)*			
5.	25430	*Notaden nichollsi (Desert Spadefoot)*			
Bird					
6.	25535	*Accipiter cirrocephalus (Collared Sparrowhawk)*			
7.	25536	*Accipiter fasciatus (Brown Goshawk)*			
8.	41323	*Actitis hypoleucos (Common Sandpiper)*		IA	
9.	25544	*Aegotheles cristatus (Australian Owlet-nightjar)*			
10.	24312	*Anas gracilis (Grey Teal)*			
11.	24316	*Anas superciliosa (Pacific Black Duck)*			
12.	47414	*Anhinga novaehollandiae (Australasian Darter)*			
13.	24505	*Anous stolidus subsp. pileatus (Common Noddy)*		IA	
14.	25670	*Anthus australis (Australian Pipit)*			
15.	24599	*Anthus australis subsp. australis (Australian Pipit)*			
16.	25554	*Apus pacificus (Fork-tailed Swift, Pacific Swift)*		IA	
17.	24285	*Aquila audax (Wedge-tailed Eagle)*			
18.	25559	*Ardea intermedia (Intermediate Egret)*			
19.	41324	*Ardea modesta (great egret, white egret)*			
20.	24341	*Ardea pacifica (White-necked Heron)*			
21.	48573	*Ardenna pacifica (Wedge-tailed Shearwater)*		IA	
22.	25736	*Arenaria interpres (Ruddy Turnstone)*		IA	
23.	25566	*Artamus cinereus (Black-faced Woodswallow)*			
24.	25567	*Artamus leucorynchus (White-breasted Woodswallow)*			
25.	24354	*Artamus leucorynchus subsp. leucopygialis (White-breasted Woodswallow)*			
26.	24355	*Artamus minor (Little Woodswallow)*			
27.	24356	*Artamus personatus (Masked Woodswallow)*			
28.	24357	*Artamus superciliosus (White-browed Woodswallow)*			
29.	24318	*Aythya australis (Hardhead)*			
30.		*Barnardius zonarius*			
31.	24359	*Burhinus grallarius (Bush Stone-curlew)*			
32.	47897	*Butorides striata (Striated Heron, Mangrove Heron)*			
33.	25715	*Cacatua roseicapilla (Galah)*			
34.	25716	*Cacatua sanguinea (Little Corella)*			
35.	24727	*Cacatua sanguinea subsp. westralensis (Little Corella)*			
36.	42307	*Cacomantis pallidus (Pallid Cuckoo)*			
37.	24779	*Calidris acuminata (Sharp-tailed Sandpiper)*		IA	
38.	24780	*Calidris alba (Sanderling)*		IA	
39.	25738	*Calidris canutus (Red Knot, knot)*			

	Name ID	Species Name	Naturalised	Conservation Code	[1]Endemic To Query Area
				IA	
40.	24784	*Calidris ferruginea (Curlew Sandpiper)*		T	
41.	24788	*Calidris ruficollis (Red-necked Stint)*		IA	
42.	24789	*Calidris subminuta (Long-toed Stint)*		IA	
43.	24790	*Calidris tenuirostris (Great Knot)*		T	
44.	25600	*Centropus phasianinus (Pheasant Coucal)*			
45.	25575	*Charadrius leschenaultii (Greater Sand Plover)*		IA	
46.	25576	*Charadrius mongolus (Lesser Sand Plover)*		T	
47.	24375	*Charadrius mongolus subsp. mongolus (Lesser Sand Plover)*		T	
48.	24377	*Charadrius ruficapillus (Red-capped Plover)*			
49.	24378	*Charadrius veredus (Oriental Plover)*		IA	
50.	24321	*Chenonetta jubata (Australian Wood Duck, Wood Duck)*			
51.		*Chlamydera guttatus*			Y
52.		*Chroicocephalus novaehollandiae*			
53.	24431	*Chrysococcyx basalis (Horsfield's Bronze Cuckoo)*			
54.	24434	*Chrysococcyx osculans (Black-eared Cuckoo)*			
55.	24289	*Circus assimilis (Spotted Harrier)*			
56.	24774	*Cladorhynchus leucocephalus (Banded Stilt)*			
57.	24399	*Columba livia (Domestic Pigeon)*	Y		
58.	25568	*Coracina novaehollandiae (Black-faced Cuckoo-shrike)*			
59.	24416	*Corvus bennetti (Little Crow)*			
60.	25593	*Corvus orru (Torresian Crow)*			
61.	24419	*Corvus splendens (House Crow)*			
62.	25701	*Coturnix ypsilophora (Brown Quail)*			
63.	24673	*Coturnix ypsilophora subsp. australis (Brown Quail)*			
64.	24672	*Coturnix ypsilophora subsp. cervina (Brown Quail)*			
65.	24420	*Cracticus nigrogularis (Pied Butcherbird)*			
66.	25595	*Cracticus tibicen (Australian Magpie)*			
67.	25596	*Cracticus torquatus (Grey Butcherbird)*			
68.	24322	*Cygnus atratus (Black Swan)*			
69.	24325	*Dendrocygna eytoni (Plumed Whistling Duck)*			
70.	24470	*Dromaius novaehollandiae (Emu)*			
71.		*Egretta garzetta*			
72.		*Egretta novaehollandiae*			
73.		*Elanus axillaris*			
74.	24290	*Elanus caeruleus subsp. axillaris (Australian Black-shouldered Kite)*			
75.	47937	*Elseyornis melanops (Black-fronted Dotterel)*			
76.	24631	*Emblema pictum (Painted Finch)*			
77.		*Eolophus roseicapillus*			
78.	24653	*Eopsaltria pulverulenta (Mangrove Robin)*			
79.	25578	*Ephippiorhynchus asiaticus (Black-necked Stork)*			
80.	24568	*Epthianura aurifrons (Orange Chat)*			
81.	24570	*Epthianura tricolor (Crimson Chat)*			
82.	24837	*Eremiornis carteri (Spinifex-bird)*			
83.	24379	*Erythrogonys cinctus (Red-kneed Dotterel)*			
84.	47938	*Esacus magnirostris (Beach Stone-curlew, Beach Thick-knee)*			
85.	24368	*Eurostopodus argus (Spotted Nightjar)*			
86.	25621	*Falco berigora (Brown Falcon)*			
87.	24471	*Falco berigora subsp. berigora (Brown Falcon)*			
88.	25622	*Falco cenchroides (Australian Kestrel, Nankeen Kestrel)*			
89.	25623	*Falco longipennis (Australian Hobby)*			
90.	25624	*Falco peregrinus (Peregrine Falcon)*		S	
91.	24478	*Fregata ariel (Lesser Frigatebird)*		IA	
92.	25727	*Fulica atra (Eurasian Coot)*			
93.	25730	*Gallirallus philippensis (Buff-banded Rail)*			
94.	24765	*Gallirallus philippensis subsp. mellori (Buff-banded Rail)*			
95.	42314	*Gavicalis virescens (Singing Honeyeater)*			
96.	47954	*Gelochelidon nilotica (Gull-billed Tern)*		IA	
97.	24401	*Geopelia cuneata (Diamond Dove)*			
98.	24402	*Geopelia humeralis (Bar-shouldered Dove)*			
99.	25585	*Geopelia striata (Zebra Dove)*			
100.	24403	*Geopelia striata subsp. placida (Peaceful Dove)*			
101.	24404	*Geophaps plumifera (Spinifex Pigeon)*			
102.		*Gerygone sp.*			
103.	24276	*Gerygone tenebrosa (Dusky Gerygone)*			
104.	24481	*Glareola maldivarum (Oriental Pratincole)*		IA	
105.	24443	*Grallina cyanoleuca (Magpie-lark)*			
106.	24484	*Grus rubicunda (Brolga)*			
107.	25627	*Haematopus fuliginosus (Sooty Oystercatcher)*			
108.	24487	*Haematopus longirostris (Pied Oystercatcher)*			

	Name ID	Species Name	Naturalised	Conservation Code	[1]Endemic To Query Area
109.		*Haematopus ostralegus*			Y
110.	24293	*Haliaeetus leucogaster (White-bellied Sea-Eagle)*			
111.	25541	*Haliastur indus (Brahminy Kite)*			
112.	24294	*Haliastur indus subsp. girrenera (Brahminy Kite)*			
113.	24295	*Haliastur sphenurus (Whistling Kite)*			
114.	47965	*Hieraaetus morphnoides (Little Eagle)*			
115.	25734	*Himantopus himantopus (Black-winged Stilt)*			
116.	24491	*Hirundo neoxena (Welcome Swallow)*			
117.	48587	*Hydroprogne caspia (Caspian Tern)*		IA	
118.	24367	*Lalage tricolor (White-winged Triller)*			
119.	25637	*Larus novaehollandiae (Silver Gull)*			
120.	25661	*Lichmera indistincta (Brown Honeyeater)*			
121.	24582	*Lichmera indistincta subsp. indistincta (Brown Honeyeater)*			
122.	30932	*Limosa lapponica (Bar-tailed Godwit)*		IA	
123.	24326	*Malacorhynchus membranaceus (Pink-eared Duck)*			
124.	25651	*Malurus lamberti (Variegated Fairy-wren)*			
125.	25652	*Malurus leucopterus (White-winged Fairy-wren)*			
126.	24583	*Manorina flavigula (Yellow-throated Miner)*			
127.	24736	*Melopsittacus undulatus (Budgerigar)*			
128.	24598	*Merops ornatus (Rainbow Bee-eater)*			
129.		*Microcarbo melanoleucos*			
130.	25542	*Milvus migrans (Black Kite)*			
131.	25545	*Mirafra javanica (Horsfield's Bushlark, Singing Bushlark)*			
132.	25685	*Neochmia ruficauda (Star Finch)*			
133.		*Neopsephotus bourkii*			
134.	48016	*Ninox boobook (Boobook Owl)*			
135.	24798	*Numenius madagascariensis (Eastern Curlew)*		T	
136.	24799	*Numenius minutus (Little Curlew, Little Whimbrel)*		IA	
137.	25742	*Numenius phaeopus (Whimbrel)*		IA	
138.	24742	*Nymphicus hollandicus (Cockatiel)*			
139.	24497	*Oceanites oceanicus (Wilson's Storm-petrel)*		IA	
140.	24407	*Ocyphaps lophotes (Crested Pigeon)*			
141.	41347	*Onychoprion anaethetus (Bridled Tern)*		IA	
142.	24620	*Pachycephala lanioides (White-breasted Whistler)*			
143.	25678	*Pachycephala melanura (Mangrove Golden Whistler)*			
144.	24621	*Pachycephala melanura subsp. melanura (Mangrove Golden Whistler)*			
145.	25680	*Pachycephala rufiventris (Rufous Whistler)*			
146.	48591	*Pandion cristatus (Osprey, Eastern Osprey)*		IA	
147.	24627	*Pardalotus rubricatus (Red-browed Pardalote)*			
148.	48053	*Pardalotus rubricatus subsp. rubricatus (Red-browed Pardalote)*			Y
149.	25682	*Pardalotus striatus (Striated Pardalote)*			
150.	25687	*Passer domesticus (House Sparrow)*	Y		
151.	24642	*Passer montanus (Eurasian Tree Sparrow)*	Y		
152.	24648	*Pelecanus conspicillatus (Australian Pelican)*			
153.		*Peneoenanthe pulverulenta*			
154.	48060	*Petrochelidon ariel (Fairy Martin)*			
155.	48061	*Petrochelidon nigricans (Tree Martin)*			
156.	25698	*Phalacrocorax melanoleucos (Little Pied Cormorant)*			
157.	24667	*Phalacrocorax sulcirostris (Little Black Cormorant)*			
158.	25699	*Phalacrocorax varius (Pied Cormorant)*			
159.	24409	*Phaps chalcoptera (Common Bronzewing)*			
160.	24677	*Pitta moluccensis (Blue-winged Pitta)*			
161.	24382	*Pluvialis fulva (Pacific Golden Plover)*		IA	
162.	24383	*Pluvialis squatarola (Grey Plover)*		IA	
163.	25703	*Podargus strigoides (Tawny Frogmouth)*			
164.	24679	*Podargus strigoides subsp. brachypterus (Tawny Frogmouth)*			
165.	24681	*Poliocephalus poliocephalus (Hoary-headed Grebe)*			
166.		*Ptilonorhynchus guttatus*			
167.	24716	*Puffinus pacificus (Wedge-tailed Shearwater)*		IA	
168.	24776	*Recurvirostra novaehollandiae (Red-necked Avocet)*			
169.	48096	*Rhipidura albiscapa (Grey Fantail)*			
170.	25614	*Rhipidura leucophrys (Willie Wagtail)*			
171.	24454	*Rhipidura leucophrys subsp. leucophrys (Willie Wagtail)*			
172.	24457	*Rhipidura phasiana (Mangrove Grey Fantail)*			
173.	24521	*Sterna bengalensis (Lesser Crested Tern)*			
174.	25640	*Sterna dougallii (Roseate Tern)*		IA	
175.	25642	*Sterna hirundo (Common Tern)*		IA	
176.	25643	*Sterna hybrida (Whiskered Tern)*			
177.	48593	*Sternula albifrons (Little Tern)*		IA	
178.	48594	*Sternula nereis (Fairy Tern)*			

	Name ID	Species Name	Naturalised	Conservation Code	[1]Endemic To Query Area
179.	25589	*Streptopelia chinensis (Spotted Turtle-Dove)*	Y		
180.	25754	*Sula leucogaster (Brown Booby)*		IA	
181.	25705	*Tachybaptus novaehollandiae (Australasian Grebe, Black-throated Grebe)*			
182.		*Taeniopygia castanotis*			
183.	30870	*Taeniopygia guttata (Zebra Finch)*			
184.		*Thalasseus bengalensis*			
185.	48597	*Thalasseus bergii (Crested Tern)*		IA	
186.	24845	*Threskiornis spinicollis (Straw-necked Ibis)*			
187.	25548	*Todiramphus chloris (Collared Kingfisher)*			
188.	24306	*Todiramphus chloris subsp. pilbara (Pilbara Collared Kingfisher)*			
189.	42351	*Todiramphus pyrrhopygius (Red-backed Kingfisher)*			
190.	25549	*Todiramphus sanctus (Sacred Kingfisher)*			
191.	24309	*Todiramphus sanctus subsp. sanctus (Sacred Kingfisher)*			
192.	24803	*Tringa brevipes (Grey-tailed Tattler)*		P4	
193.	24806	*Tringa glareola (Wood Sandpiper)*		IA	
194.	24808	*Tringa nebularia (Common Greenshank, greenshank)*		IA	
195.	24809	*Tringa stagnatilis (Marsh Sandpiper, little greenshank)*		IA	
196.	24851	*Turnix velox (Little Button-quail)*			
197.		*Tyto delicatula*			
198.	24386	*Vanellus tricolor (Banded Lapwing)*			
199.	41351	*Xenus cinereus (Terek Sandpiper)*		IA	
200.	24857	*Zosterops luteus (Yellow White-eye)*			

Fish

201.		*? ?*			
202.		*Abudefduf bengalensis*			
203.		*Acanthopagrus latus*			
204.		*Acentrogobius gracilis*			
205.		*Acentrogobius sp.*			
206.		*Alepes apercna*			
207.		*Alepes mate*			Y
208.		*Ambassis vachellii*			
209.		*Amblyeleotris gymnocephala*			
210.		*Amblygobius bynoensis*			
211.		*Amniataba caudavittata*			
212.		*Apistus carinatus*			
213.		*Apogon brevicaudatus*			
214.		*Apogon cavitiensis*			
215.		*Apogon cookii*			
216.		*Apogon fasciatus*			
217.		*Apogon nigripinnis*			
218.		*Apogon pallidofasciatus*			
219.		*Apogon rueppellii*			
220.		*Apogon trimaculatus*			
221.		*Arius leptaspis*			Y
222.		*Arnoglossus waitei*			Y
223.		*Asterorhombus intermedius*			
224.		*Asterropteryx semipunctatus*			
225.		*Atherinid sp.*			
226.		*Atherinomorus endrachtensis*			
227.		*Atule mate*			
228.		*Bathygobius cocosensis*			
229.		*Bathygobius fuscus*			
230.		*Bathygobius laddi*			
231.		*Batrachomoeus dahli*			
232.		*Batrachomoeus trispinosus*			
233.		*Blennodesmus scapularis*			
234.		*Bostrychus sinensis*			Y
235.		*Bryaninops loki*			
236.		*Callionymus japonicus*			Y
237.		*Callionymus russelli*			
238.		*Callionymus sp.*			
239.		*Carangoides sp.*			
240.		*Caranx bucculentus*			
241.		*Carcharhinus brachyurus*			
242.		*Centriscus scutatus*			
243.		*Centrogenys vaigiensis*			
244.		*Cephalopholis boenak*			
245.		*Cheilopogon arcticeps*			
246.		*Chelmon marginalis*			
247.		*Chelmon muelleri*			

	Name ID	Species Name	Naturalised	Conservation Code	[1]Endemic To Query Area
248.		*Chelonodon patoca*			
249.		*Chirocentrus dorab*			
250.		*Choerodon cyanodus*			
251.		*Choerodon vitta*			
252.		*Chromileptes altivelis*			
253.		*Chromis fumea*			
254.		*Clupeid sp.*			
255.		*Conger cinereus*			
256.		*Congrogadus subducens*			
257.		*Coris sp.*			
258.		*Cottapistus cottoides*			
259.		*Craterocephalus pauciradiatus*			
260.		*Ctenotrypauchen microcephalus*			
261.		*Cymbacephalus bosschei*			
262.		*Cymbacephalus nematophthalmus*			
263.		*Cynoglossus maculipinnis*			
264.		*Cynoglossus sp.*			
265.		*Dexillus muelleri*			
266.		*Didymothallus mizolepis*			
267.		*Dinematichthys sp.*			
268.		*Dischistodus darwiniensis*			
269.		*Discotrema lineata*			Y
270.		*Drombus sp.*			
271.		*Ecsenius yaeyamaensis*			
272.		*Eleutheronema tetradactylum*			
273.		*Elops hawaiensis*			
274.		*Engyprosopon sp.*			
275.		*Enneapterygius gracilis*			
276.		*Enneapterygius larsonae*			
277.		*Enneapterygius philippinus*			
278.		*Enneapterygius sp.*			
279.		*Enneapterygius tutuilae*			
280.		*Epinephelus bilobatus*			
281.		*Epinephelus coioides*			
282.		*Epinephelus corallicola*			
283.		*Epinephelus fasciatus*			
284.		*Epinephelus malabaricus*			
285.		*Epinephelus quoyanus*			
286.		*Epinephelus sexfasciatus*			
287.		*Euristhmus microceps*			
288.		*Euristhmus sandrae*			Y
289.		*Eviota queenslandica*			
290.		*Eviota zebrina*			
291.		*Favonigobius melanobranchus*			
292.		*Favonigobius sp.*			
293.		*Festucalex sp.*			
294.		*Foa brachygramma*			
295.		*Fowleria aurita*			
296.		*Gerres filamentosus*			
297.		*Gerres subfasciatus*			
298.		*Gnatholepis argus*			
299.		*Gobiodon histrio*			
300.		*Gobiodon quinquestrigatus*			
301.		*Gobiodon rivulatus*			
302.		*Gobiodon sp.*			
303.		*Gymnothorax pseudothrysoideus*			
304.		*Gymnothorax pseudothyrsoideus*			
305.		*Gymnothorax thrysoideus*			
306.		*Gymnothorax undulatus*			
307.		*Halichoeres melanochir*			
308.		*Halichoeres nigrescens*			
309.		*Halichoeres sp.*			
310.		*Halieutaea brevicaudata?*			
311.		*Haliichthys taeniophorus*			
312.		*Halophryne diemensis*			
313.		*Helcogramma striata*			
314.		*Herklotsichthys koningsbergeri*			
315.		*Hippichthys penicillus*			
316.		*Hippocampus sp.*			
317.		*Hypopterus macropterus*			

	Name ID	Species Name	Naturalised	Conservation Code	[1]Endemic To Query Area
318.		*Inegocia japonica*			
319.		*Istiblennius meleagris*			
320.		*Istigobius nigroocellatus*			
321.		*Istigobius ornatus*			
322.		*Labroides dimidiatus*			
323.		*Laiphognathus multimaculatus*			
324.		*Leiognathus sp.*			
325.		*Lepidotrigla sp.*			
326.		*Liocranium praepositum*			
327.		*Liza alata*			
328.		*Liza subviridis*			
329.		*Liza vaigiensis*			
330.		*Lophiocharon trisignatus*			
331.		*Lutjanus argentimaculatus*			
332.		*Lutjanus carponotatus*			
333.		*Lutjanus fulviflamma*			
334.		*Lutjanus malabaricus*			
335.		*Lutjanus russellii*			
336.		*Metavelifer multiradiatus*			
337.		*Micrognathus micronotopterus*			
338.		*Minous versicolor*			
339.		*Monacanthus chinensis*			
340.		*Monodactylus argenteus*			
341.		*Mugil cephalus*			
342.		*Mugilid sp.*			
343.		*Muraenichthys sp.*			
344.		*Nebrius ferrugineus*			Y
345.		*Nemipterus celebicus*			
346.		*Neopomacentrus azysron*			
347.		*Neopomacentrus filamentosus*			
348.		*Netuma proxima*			
349.		*Norfolkia brachylepis*			
350.		*Omobranchus punctatus*			
351.		*Omobranchus rotundiceps*			
352.		*Omobranchus sp.*			
353.		*Onigocia pedimacula*			
354.		*Onigocia pedimacula?*			
355.		*Ophichthus celebicus?*			
356.		*Opistognathus darwiniensis*			
357.		*Oxyurichthys sp.*			
358.		*Pandaka lidwilli*			
359.		*Paracentropogon vespa*			
360.		*Parachaeturichthys sp.*			Y
361.		*Paraexocoetus brachypterus*			Y
362.		*Paramonacanthus choirocephalus*			
363.		*Parapercis diplospilus*			
364.		*Paraplagusia guttata*			Y
365.		*Paraplotosus albilabris*			
366.		*Paraplotosus butleri*			
367.		*Paraplotosus muelleri*			
368.		*Parascorpaena picta*			
369.		*Pegasus volitans*			
370.		*Pentapodus porosus*			
371.		*Pentapodus sp.*			
372.		*Pentapodus vitta*			
373.		*Periophthalmus argentilineatus*			
374.		*Petroscirtes mitratus*			
375.		*Pisodonophis cancrivorus*			
376.		*Platycephalus endrachtensis*			
377.		*Platycephalus sp.*			
378.		*Pleurosicya sp.*			
379.		*Plotosus lineatus*			
380.		*Polydactylus multiradiatus*			
381.		*Pomacentrus milleri*			
382.		*Pomadasys kaakan*			
383.		*Pomadasys maculatus*			
384.		*Priacanthus hamrur*			
385.		*Priolepis nuchifasciata*			
386.		*Pristotis obtusirostris*			
387.		*Psammoperca waigiensis*			

	Name ID	Species Name	Naturalised	Conservation Code	[1]Endemic To Query Area
388.		*Psettodes erumei*			
389.		*Pseudochromis wilsoni*			
390.		*Pseudorhombus argus*			
391.		*Pseudorhombus arsius*			
392.		*Pseudorhombus elevatus*			
393.		*Pseudorhombus sp.*			
394.		*Pterapogon mirifica*			
395.		*Pterois volitans*			
396.		*Rastrelliger kanagurta*			
397.		*Repomucenus calcaratus*			
398.		*Salarias sexfilum*			
399.		*Sargocentron rubrum*			
400.		*Scarus ghobban*			
401.		*Scatophagus argus*			
402.		*Scolecenchelys macroptera*			
403.		*Scolopsis bilineatus*			
404.		*Scolopsis taenioptera*			
405.		*Secutor insidiator*			
406.		*Selaroides leptolepis*			
407.		*Sillago burrus*			
408.		*Sillago lutea*			
409.		*Siphamia majimae*			
410.		*Soleichthys heterorhinos*			
411.		*Sorsogona tuberculata*			
412.		*Sphyraena barracuda*			
413.		*Sphyraena sp.*			
414.		*Spratelloides delicatulus*			
415.		*Stethojulis interrupta*			
416.		*Suggrundus macracanthus*			
417.		*Synanceia horrida*			
418.		*Terapon jarbua*			
419.		*Triacanthus sp.*			
420.		*Trichonotus setiger*			
421.		*Tylosurus crocodilus*			
422.		*Upeneus sulphureus*			
423.		*Valamugil buchanani*			
424.		*Valamugil seheli*			
425.		*Valenciennea muralis*			
426.		*Yirrkala lumbricoides*			
427.		*Yirrkala sp.*			
428.		*Yongeichthys nebulosus*			
429.		*Zebrias quagga*			

Invertebrate

430.		*Ablabesmyia hilli*			
431.		*Actacarus pacificus*			
432.		*Agauopsis arborea*			Y
433.		*Agauopsis dasyderma*			Y
434.		*Agauopsis moorea*			Y
435.		*Agauopsis obtusa*			Y
436.		*Agraptocorixa parvipunctata*			
437.		*Allodessus bistrigatus*			
438.		*Amblyomma triguttatum*			
439.		*Aname mainae*			
440.		*Anisops hackeri*			
441.		*Anomalohalacarus dampierensis*			Y
442.		*Anopheles annulipes s.l.*			
443.		*Antipodectes bituberculatus*			Y
444.		*Austrostrophus stictopygus*			
445.		*Bdelloidea sp. 2:2*			
446.		*Centropyxis sp.*			
447.		*Ceriodaphnia n. sp. a (Berner sp.#3) (SAP)*			
448.		*Chironomus aff. alternans (V24) (CB)*			
449.		*Copidognathus lutarius*			Y
450.		*Copidognathus meridianus*			
451.		*Copidognathus piger*			Y
452.		*Culex crinicauda*			
453.		*Culex palpalis*			
454.		*Culicoides sp. P1 (PSW)*			
455.		*Cypricercus sp. 422 (CB)*			
456.		*Dasyheleinae sp. P2 (PSW)*			

	Name ID	Species Name	Naturalised	Conservation Code	[1]Endemic To Query Area
457.		*Dicrotendipes 'CA1' Pilbara type 3 (= 'K4', P3)) (PSW)*			
458.		*Diplacodes bipunctata*			
459.		*Diplacodes haematodes*			
460.		*Ecnomus pilbarensis*			
461.		*Encentridophorus sarasini*			
462.		*Enchytraeidae sp.*			
463.		*Eosphora ehrenbergi*			
464.		*Ephydridae sp. 12 (PSW)*			
465.		*Eretes australis*			
466.		*Euchlanis lyra*			
467.		*Euglypha sp.*			
468.		*Glyptophysa sp*			
469.		*Hemianax papuensis*			
470.		*Heterocypris tatei*			
471.		*Hydraena sp.*			
472.		*Hydroglyphus leai*			
473.		*Hydroglyphus orthogrammus*			
474.		*Hyphydrus lyratus*			
475.		*Ilyocypris australiensis*			
476.		*Ilyodromus sp BOS25*			
477.		*Indolpium sp.*			
478.		*Isobactrus australiensis*			Y
479.		*Isobactrus obesus*			Y
480.		*Isopedella gibsandi*			
481.		*Keratella procurva*			
482.		*Lampona cylindrata*			
483.		*Latonopsis australis*			
484.		*Latrodectus geometricus*			
485.		*Leberis cf. diaphanus*			
486.		*Lecane closterocerca*			
487.		*Lecane hastata*			
488.		*Lecane signifera*			
489.		*Lecane thalera*			
490.		*Lecane ungulata*			
491.		*Lepadella patella*			
492.		*Limnadopsis "pilbarensis" (ex P2)(PSW)*			
493.		*Litarachna bartschae*			Y
494.		*Macrochaetus sp.*			
495.		*Metacyclops sp. P2 (PSW)*			
496.		*Microturbellaria sp.*			
497.		*Monommata sp.*			
498.		*Muscidae sp. P1*			
499.		*Naididae (ex Tubificidae)*			
500.		*Nematoda sp. P2/P4 (PSW)*			
501.		*Nephila edulis*			
502.		*Neumania sp.*			
503.		*Opisthopora sp.*			
504.		*Orthetrum caledonicum*			
505.		*Orthomorpha coarctata*			
506.		*Oxyopes variabilis*			
507.		*Pantala flavescens*			
508.		*Paracymus sp.*			
509.		*Paramerina sp.A (parva?) (SAP)*			
510.		*Pediana horni*			
511.		*Pediana tenuis*			
512.		*Pilbarophreatoicus platyarthricus*			
513.		*Polypedilum nubifer*			
514.		*Pontarachne australis*			Y
515.		*Procladius paludicola*			
516.		*Psychodinae sp. 3 (SAP)*			
517.		*Quistrachia legendrei*			
518.		*Rhagada angulata*			
519.		*Rhagada convicta*			
520.		*Rhagada dampierana*			
521.		*Rhagada minima*			
522.		*Rhagada perprima*			
523.		*Rhombognathus dispar*			Y
524.		*Rhombognathus ocularis*			Y
525.		*Rhombognathus scutulatus*			
526.		*Scaptognathides hawaiiensis*			Y

	Name ID	Species Name	Naturalised	Conservation Code	[1]Endemic To Query Area
527.		*Scaptognathides ornatus*			Y
528.		*Scirtidae sp.*			
529.		*Scolopendra morsitans*			
530.		*Simaetha tenuior*			
531.		*Simognathus platyaspis*			Y
532.		*Simognathus salebrosus*			Y
533.		*Simognathus tener*			Y
534.		*Strandesia sp 466 (PSW)*			
535.		*Stratiomyidae sp.*			
536.		*Tanytarsus sp. P5 (PSW)*			
537.		*Tanytarsus sp. P9 (PSW)*			
538.		*Testudinella patina*			
539.		*Tipulidae type A (SAP)*			
540.		*Urodacus armatus*			
541.		*Venatrix arenaris*			
Mammal					
542.		*Canis familiaris*			
543.	30883	*Canis lupus subsp. familiaris (Dog)*	Y		
544.	24253	*Capra hircus (Goat)*	Y		
545.	24181	*Chaerephon jobensis (Greater Northern Freetail-bat, Northern Mastiff Bat)*			
546.	24091	*Dasykaluta rosamondae (Little Red Kaluta)*			
547.	24093	*Dasyurus hallucatus (Northern Quoll)*		T	
548.	24084	*Dugong dugon (Dugong)*		S	
549.	24041	*Felis catus (Cat)*	Y		
550.	24215	*Hydromys chrysogaster (Water-rat, Rakali)*		P4	
551.	24180	*Macroderma gigas (Ghost Bat)*		T	
552.	25489	*Macropus robustus (Euro, Biggada)*			
553.	24135	*Macropus robustus subsp. erubescens (Euro, Biggada)*			
554.	24136	*Macropus rufus (Red Kangaroo, Marlu)*			
555.	24051	*Megaptera novaeangliae (Humpback Whale)*		S	
556.		*Mormopterus (Ozimops) cobourgianus*			
557.	24223	*Mus musculus (House Mouse)*	Y		
558.	24095	*Ningaui timealeyi (Pilbara Ningaui)*			
559.	24224	*Notomys alexis (Spinifex Hopping-mouse)*			
560.	24194	*Nyctophilus geoffroyi (Lesser Long-eared Bat)*			
561.		*Nyctophilus geoffroyi subsp. pallescens*			
562.	24085	*Oryctolagus cuniculus (Rabbit)*	Y		
563.	48034	*Osphranter robustus (Euro, Biggada)*			
564.	34016	*Ovis aries (Sheep)*			
565.	24144	*Petrogale rothschildi (Rothschild's Rock-wallaby)*			
566.		*Planigale sp. nov.*			
567.	24105	*Pseudantechinus roryi (Rory's Pseudantechinus)*			
568.	24106	*Pseudantechinus woolleyae (Woolley's Pseudantechinus)*			
569.	24233	*Pseudomys chapmani (Western Pebble-mound Mouse, Ngadji)*		P4	
570.	24234	*Pseudomys delicatulus (Delicate Mouse)*			
571.	24237	*Pseudomys hermannsburgensis (Sandy Inland Mouse)*			
572.	24172	*Pteropus alecto (Black Flying-fox)*			
573.	24173	*Pteropus scapulatus (Little Red Flying-fox)*			
574.	24245	*Rattus rattus (Black Rat)*	Y		
575.	24246	*Rattus tunneyi (Pale Field-rat)*			
576.	48114	*Stenella longirostris (Spinner Dolphin)*		P4	
577.	24207	*Tachyglossus aculeatus (Short-beaked Echidna)*			
578.	24175	*Taphozous georgianus (Common Sheath-tailed Bat)*			
579.	30954	*Tursiops aduncus (Indo-Pacific Bottlenose Dolphin)*			
580.	24205	*Vespadelus finlaysoni (Finlayson's Cave Bat)*			
581.	24040	*Vulpes vulpes (Red Fox)*	Y		
582.	24248	*Zyzomys argurus (Common Rock-rat)*			
Reptile					
583.		*Acanthophis wellsei*			
584.	25332	*Acanthophis wellsi (Pilbara Death Adder)*			
585.	25355	*Aipysurus laevis (Olive Seasnake)*			
586.	30831	*Amphibolurus gilberti (Ta-ta, Gilbert's Dragon)*			
587.	30833	*Amphibolurus longirostris (Long-nosed Dragon)*			
588.	25317	*Antaresia childreni (Children's Python)*			
589.	25318	*Antaresia perthensis (Pygmy Python)*			
590.	25448	*Antaresia stimsoni (Stimson's Python)*			
591.	25241	*Antaresia stimsoni subsp. stimsoni (Stimson's Python)*			
592.	25320	*Aspidites melanocephalus (Black-headed Python)*			
593.	25236	*Aspidites ramsayi (Woma)*			

	Name ID	Species Name	Naturalised	Conservation Code	[1]Endemic To Query Area
594.	25331	*Brachyurophis approximans (North-western Shovel-nosed Snake)*			
595.	25015	*Carlia munda (Shaded-litter Rainbow Skink)*			
596.	25017	*Carlia triacantha (Desert Rainbow Skink)*			
597.	25336	*Chelonia mydas (Green Turtle)*		T	
598.	25456	*Crenadactylus ocellatus (Clawless Gecko)*			
599.	24919	*Crenadactylus ocellatus subsp. horni (Clawless Gecko)*			
600.	30893	*Cryptoblepharus buchananii*			
601.	25020	*Cryptoblepharus plagiocephalus*			
602.	30892	*Cryptoblepharus ustulatus*			
603.	25458	*Ctenophorus caudicinctus (Ring-tailed Dragon)*			
604.	24865	*Ctenophorus caudicinctus subsp. caudicinctus (Ring-tailed Dragon)*			
605.	25459	*Ctenophorus isolepis (Crested Dragon, Military Dragon)*			
606.	24876	*Ctenophorus isolepis subsp. isolepis (Crested Dragon, Military Dragon)*			
607.	24882	*Ctenophorus nuchalis (Central Netted Dragon)*			
608.	25027	*Ctenotus australis*			
609.	25039	*Ctenotus fallens*			
610.	25043	*Ctenotus grandis subsp. titan*			
611.	25052	*Ctenotus leonhardii*			
612.	25060	*Ctenotus pantherinus subsp. acripes (Leopard Ctenotus)*			
613.	25064	*Ctenotus pantherinus subsp. ocellifer (Leopard Ctenotus)*			
614.	25072	*Ctenotus rubicundus*			
615.	25073	*Ctenotus saxatilis (Rock Ctenotus)*			
616.	25077	*Ctenotus serventyi*			
617.	25466	*Cyclodomorphus melanops (Slender Blue-tongue)*			
618.	25090	*Cyclodomorphus melanops subsp. melanops (Slender Blue-tongue)*			
619.	24996	*Delma borea*			
620.	25002	*Delma pax*			
621.	25004	*Delma tincta*			
622.	25468	*Demansia psammophis (Yellow-faced Whipsnake)*			
623.	25295	*Demansia psammophis subsp. cupreiceps (Yellow-faced Whipsnake)*			
624.	25296	*Demansia psammophis subsp. reticulata (Yellow-faced Whipsnake)*			
625.	25297	*Demansia rufescens (Rufous Whipsnake)*			
626.	24926	*Diplodactylus conspicillatus (Fat-tailed Gecko)*			
627.	41404	*Diplodactylus galaxias (Northern Pilbara Beak-faced Gecko)*			
628.	24937	*Diplodactylus mitchelli*			
629.	24944	*Diplodactylus savagei (Southern Pilbara Beak-faced Gecko)*			
630.	25092	*Egernia depressa (Southern Pygmy Spiny-tailed Skink)*			
631.	25101	*Egernia pilbarensis (Pilbara Skink)*			
632.	25362	*Ephalophis greyae*			
633.	42404	*Eremiascincus isolepis*			
634.	25473	*Eretmochelys imbricata (Hawksbill Turtle)*		T	
635.	25342	*Eretmochelys imbricata subsp. bissa (Hawksbill Turtle)*		T	
636.	25327	*Fordonia leucobalia (White-bellied Mangrove Snake)*			
637.	25301	*Furina ornata (Moon Snake)*			
638.	24956	*Gehyra pilbara*			
639.	24958	*Gehyra punctata*			
640.	24959	*Gehyra variegata*			
641.	25232	*Hemidactylus frenatus (Asian House Gecko)*	Y		
642.	24961	*Heteronotia binoei (Bynoe's Gecko)*			
643.	25363	*Hydrelaps darwiniensis*			
644.	25125	*Lerista bipes*			
645.	30928	*Lerista clara*			
646.	30929	*Lerista jacksoni*			
647.	25155	*Lerista muelleri*			
648.	25005	*Lialis burtonis*			
649.	25238	*Liasis olivaceus subsp. barroni (Pilbara Olive Python)*		T	
650.	25239	*Liasis olivaceus subsp. olivaceus (Olive Python)*			
651.	30933	*Lucasium stenodactylum*			
652.	25184	*Menetia greyii*			
653.	25491	*Menetia surda*			
654.	25187	*Menetia surda subsp. surda*			
655.	25495	*Morethia ruficauda*			
656.	25193	*Morethia ruficauda subsp. exquisita*			
657.	25344	*Natator depressus (Flatback Turtle)*		T	
658.	25196	*Notoscincus butleri (lined soil-crevice skink (Dampier))*		P4	
659.	25197	*Notoscincus ornatus subsp. ornatus*			
660.	24976	*Oedura marmorata (Marbled Velvet Gecko)*			
661.	24907	*Pogona minor subsp. minor (Dwarf Bearded Dragon)*			
662.	25261	*Pseudechis australis (Mulga Snake)*			
663.	42416	*Pseudonaja mengdeni (Western Brown Snake)*			

	Name ID	Species Name	Naturalised	Conservation Code	[1]Endemic To Query Area
664.	25263	*Pseudonaja modesta (Ringed Brown Snake)*			
665.	25264	*Pseudonaja nuchalis (Gwardar, Northern Brown Snake)*			
666.	24924	*Strophurus ciliaris subsp. aberrans*			
667.	24927	*Strophurus elderi*			
668.	24932	*Strophurus jeanae*			
669.	24949	*Strophurus wellingtonae*			
670.	25307	*Suta punctata (Spotted Snake)*			
671.	25202	*Tiliqua multifasciata (Central Blue-tongue)*			
672.	25209	*Varanus acanthurus (Spiny-tailed Monitor)*			
673.	25210	*Varanus brevicauda (Short-tailed Pygmy Monitor)*			
674.	25212	*Varanus eremius (Pygmy Desert Monitor)*			
675.	25216	*Varanus giganteus (Perentie)*			
676.	25218	*Varanus gouldii (Bungarra or Sand Monitor)*			
677.	25524	*Varanus panoptes (Yellow-spotted Monitor)*			
678.	25223	*Varanus panoptes subsp. rubidus*			
679.	25224	*Varanus pilbarensis (Pilbara Rock Monitor, Northern Pilbara Rock Goanna)*			
680.	25526	*Varanus tristis (Racehorse Monitor)*			
681.	25227	*Varanus tristis subsp. tristis (Racehorse Monitor)*			

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.

Appendix C: Vegetation Classification and Condition Scales, and Fauna Habitat Condition Scale

This page has been left blank intentionally.

Table C.1: Vegetation condition scale as adapted from Trudgen (1988) (Environmental Protection Authority 2016a).

Condition	Description
Pristine	Pristine or nearly so, no obvious signs of disturbance or damage caused by human activities since European settlement.
Excellent	Vegetation structure intact, disturbance affecting individual species and weeds are non-aggressive species. Damage to trees caused by fire, the presence of non-aggressive weeds and occasional vehicle tracks.
Very Good	Vegetation structure altered obvious signs of disturbance. Disturbance to vegetation structure covers repeated fire, aggressive weeds, dieback, logging, grazing.
Good	Vegetation structure significantly altered by very obvious signs of multiple disturbances. Retains basic vegetation structure or ability to regenerate it. Disturbance to vegetation structure covers frequent fires, aggressive weeds, partial clearing, dieback and grazing.
Degraded	Basic vegetation structure severely impacted by disturbance. Scope for regeneration but not to a state approaching good condition without intensive management. Disturbance to vegetation structure includes frequent fires, presence of very aggressive weeds at high density, partial clearing, dieback and grazing.
Completely Degraded	The structure of the vegetation is no longer intact and the area is completely or almost completely without native species. These areas often described as “parkland cleared” with the flora comprising weed or crop species with isolated native trees or shrubs.

Table C.2: 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 C.1: Fauna habitat condition scale (Thompson and Thompson 2010).

Habitat condition	Condition description
High Quality Fauna Habitat	These areas closely approximate the vegetation mix and quality that would have been in the area prior to any human induced disturbance. The habitat has connectivity with other habitats and is likely to support the most natural vertebrate fauna assemblage.
Very Good Fauna Habitat	These areas show minimal signs of human induced disturbance (e.g. grazing, clearing, fragmentation, weeds) and retain almost all of the characteristics of the habitat had it not been disturbed. The habitat has connectivity with other habitats, and fauna assemblages in these areas are likely to be minimally effected by disturbance.
Good Fauna Habitat	These areas show signs of human induced disturbance (e.g. grazing, clearing, fragmentation, weeds) but generally retain many of the characteristics of the habitat had it not been disturbed. The habitat still retains some connectivity with other habitats but fauna assemblages in these areas are likely to be affected by disturbance. Fauna assemblages in these areas are likely to be similar to what might be expected in this habitat.
Disturbed Fauna Habitat	These areas show signs of human induced significant disturbance (e.g. mining, clearing, tracks and roads). Many of the trees, shrubs and undergrowth have died or have been cleared. These areas may be in the early succession and regeneration stages. Areas may show signs of significant grazing, contain an abundance of weeds or have been damaged by vehicles or machinery. Habitats are fragmented or have limited connectivity with other fauna habitats. Fauna assemblages in these areas are likely to differ significantly from what might be expected in the area had the disturbance not occurred.
Highly Degraded Fauna Habitat	These areas often have a significant human induced loss of vegetation, and / or a large number of vehicle tracks and / or have been completely cleared, and / or areas have been heavily grazed or farmed. There is limited or no fauna habitat connectivity. Fauna assemblages in these areas are likely to differ significantly from what existed prior to the disturbance, and are often depleted compared to what existed prior to the disturbance.

This page has been left blank intentionally.

Appendix D: Vegetation Type Mapping

This page has been left blank intentionally.

477000

7723000

CD
7a
7b
1b
12
2b
8

Legend

Survey Area
- Additional Survey Area
- Survey Corridor
- Relevé

Vegetation Type
- 12
- 2b
- 7a
- 7b
- 8
- Completely Degraded (CD)

DDG Operations Pty Ltd
Burrup Interconnector Pipeline Flora, Vegetation and Fauna Survey

Figure D.1: Vegetation Type Mapping

astron
delivering environmental intelligence™

Author: M. Stalker	Date: 20-07-2018
Drawn: F. Yu	Figure Ref: 21244-18-BIDR-1Rev_180717_FigD

Coordinate System: GDA 1994 MGA Zone 50

0 100 Metres

N

477000

7722000

CD
1b
7b
7a
9b
9a
10

Legend

Survey Area
- Survey Corridor
- Relevé

Priority Flora Locations
- *Terminalia supranitifolia P3*

PEC Buffer
- Burrup rock pile communities

Vegetation Type
- 10
- 1b
- 7a
- 7b
- 9a
- 9b
- Completely Degraded (CD)

DDG Operations Pty Ltd

Burrup Interconnector Pipeline Flora, Vegetation and Fauna Survey

Figure D.2: Vegetation Type Mapping

astron
delivering environmental intelligence™

Author: M. Stalker	Date: 20-07-2018
Drawn: F. Yu	Figure Ref: 21244-18-BIDR-1Rev_180717_FigD

Coordinate System: GDA 1994 MGA Zone 50

0 100 Metres

N

477000

7722000

9a
9b
10
9b
9b
CD
CD
1b
1a
1b
7a
CD
7a
1b
1a
1b

Legend

Survey Area
- Survey Corridor
- Relevé

PEC Buffer
- Burrup rock pile communities

Vegetation Type
- 10
- 1a
- 1b
- 7a
- 9a
- 9b
- Completely Degraded (CD)

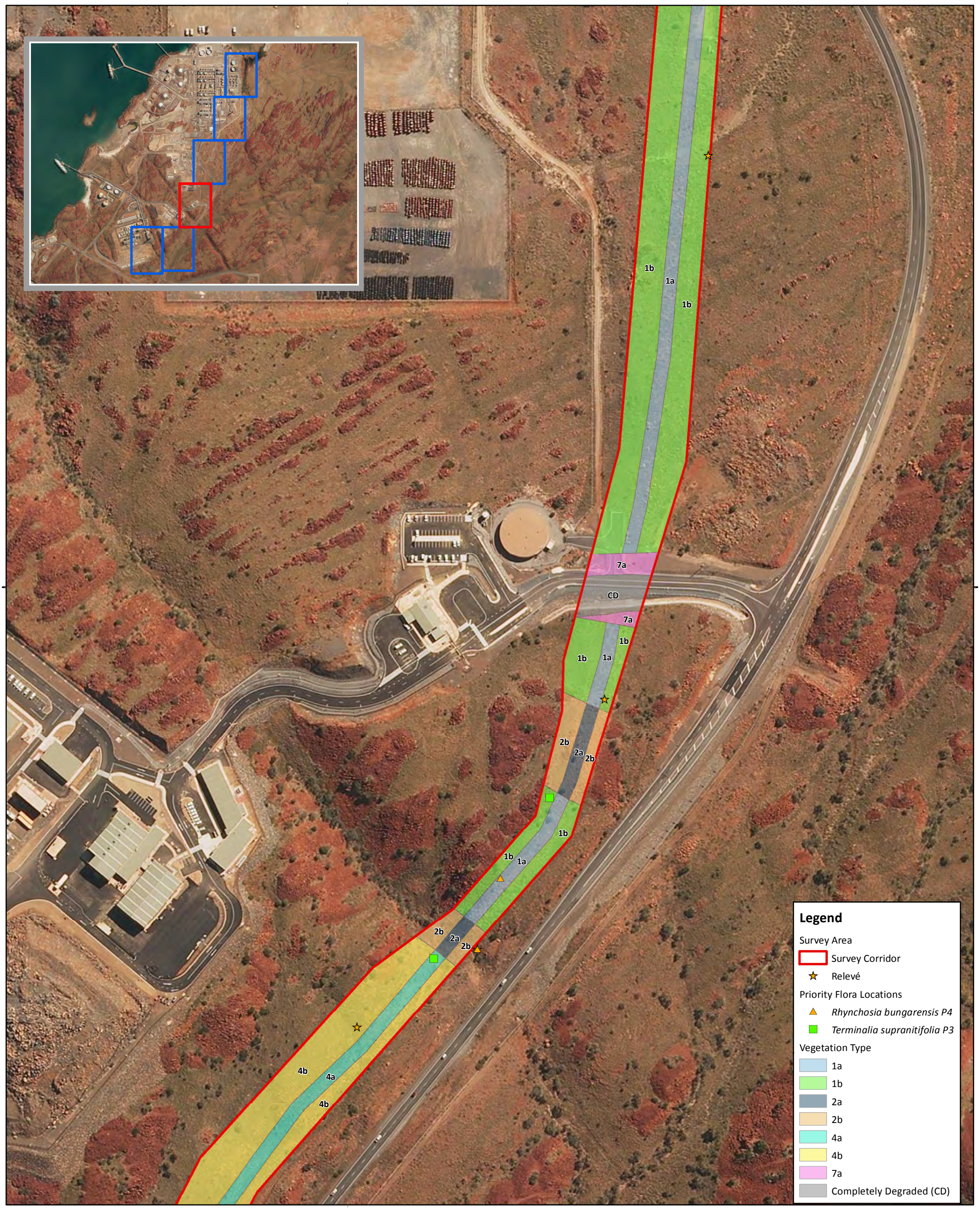
DDG Operations Pty Ltd

Burrup Interconnector Pipeline Flora, Vegetation and Fauna Survey

Figure D.3: Vegetation Type Mapping

astron
delivering environmental intelligence™

Author: M. Stalker	Date: 20-07-2018	Coordinate System: GDA 1994 MGA Zone 50
Drawn: F. Yu	Figure Ref: 21244-18-BIDR-1Rev_180717_FigD	0 — 100 Metres; N



DDG Operations Pty Ltd

Burrup Interconnector Pipeline Flora, Vegetation and Fauna Survey

Figure D.4: Vegetation Type Mapping

astron
delivering environmental intelligence™

Author: M. Stalker	Date: 20-07-2018	Coordinate System: GDA 1994 MGA Zone 50
Drawn: F. Yu	Figure Ref: 21244-18-BIDR-1Rev_180717_FigD	Metres 0 100 N

476000

7720000

2b
4b
4a
4b
3b
3a
3b
4b
4a
4b
5b
5a
5b
6b
6a
6b
3b
3a
3b
6b
6b
7a
6a
7a
7a
CD
7a

Legend

Survey Area
- Additional Survey Area
- Survey Corridor
- Relevé

Priority Flora Locations
- *Rhynchosia bungarensis P4*
- *Terminalia supranitifolia P3*

Vegetation Type
- 2b
- 3a
- 3b
- 4a
- 4b
- 5a
- 5b
- 6a
- 6b
- 7a
- Completely Degraded (CD)

DDG Operations Pty Ltd

Burrup Interconnector Pipeline Flora, Vegetation and Fauna Survey

Figure D.5: Vegetation Type Mapping

astron
delivering environmental intelligence™

Author: M. Stalker	Date: 20-07-2018
Drawn: F. Yu	Figure Ref: 21244-18-BIDR-1Rev_180717_FigD

Coordinate System: GDA 1994 MGA Zone 50

0 100 Metres

N

476000

7720000

CD
CD
7a
6b
3b
3a
3b
6b
6a
7a
7a
4b
4a
4b
5b
5a
5b
6b
6a
6b

Legend

Survey Area
- Additional Survey Area
- Survey Corridor
- Relevé

Priority Flora Locations
- *Rhynchosia bungarensis P4*

Vegetation Type
- 3a
- 3b
- 4a
- 4b
- 5a
- 5b
- 6a
- 6b
- 7a
- Completely Degraded (CD)

DDG Operations Pty Ltd

Burrup Interconnector Pipeline Flora, Vegetation and Fauna Survey

Figure D.6: Vegetation Type Mapping

astron
delivering environmental intelligence™

Author: M. Stalker	Date: 20-07-2018
Drawn: F. Yu	Figure Ref: 21244-18-BIDR-1Rev_180717_FigD

Coordinate System: GDA 1994 MGA Zone 50

0 100 Metres

N

Appendix E: Vegetation Condition Mapping

This page has been left blank intentionally.

477000

7723000

NA

Very Good

Excellent

Degraded

NA

Very Good

Completely Degraded

Completely Degraded

Excellent

Landgate / SLIP

Legend

Survey Area

- Additional Survey Area
- Survey Corridor
- Relevé

Vegetation Condition

- Completely Degraded
- Degraded
- Excellent
- Very Good

DDG Operations Pty Ltd

Burrup Interconnector Pipeline Flora, Vegetation and Fauna Survey

Figure E.1: Vegetation Condition Mapping

astron

delivering environmental intelligence™

Author: M. Stalker	Date: 20-07-2018
Drawn: F. Yu	Figure Ref: 21244-18-BIDR-1Rev_180717_FigE

Coordinate System: GDA 1994 MGA Zone 50

0 100 Metres

N

477000

7722000

Completely Degraded

Excellent

Excellent

Completely Degraded

Excellent

Degraded

Completely Degraded

Excellent

Excellent

Landgate / SLIP

Legend

Survey Area

Survey Corridor

Relevé

Introduced Species Location

**Aerva javanica*

**Cenchrus ciliaris*

PEC Buffer

Burrup rock pile communities

Vegetation Condition

Completely Degraded

Degraded

Excellent

DDG Operations Pty Ltd

Burrup Interconnector Pipeline Flora, Vegetation and Fauna Survey

Figure E.2: Vegetation Condition Mapping

astron

delivering environmental intelligence™

Author: M. Stalker	Date: 19-07-2018	Coordinate System: GDA 1994 MGA Zone 50
Drawn: F. Yu	Figure Ref: 21244-18-BIDR-1Rev_180717_FigE	0 100 Metres

N

477000

7722000

Excellent

Degraded

Excellent

Completely Degraded

Completely Degraded

Excellent

Good

Excellent

Degraded

Completely Degraded

Degraded

Excellent

Good

Landgate / SLIP

Legend

Survey Area

Survey Corridor

Relevé

Introduced Species Location

**Cenchrus ciliaris*

PEC Buffer

Burrup rock pile communities

Vegetation Condition

Completely Degraded

Degraded

Excellent

Good

DDG Operations Pty Ltd

Burrup Interconnector Pipeline Flora, Vegetation and Fauna Survey

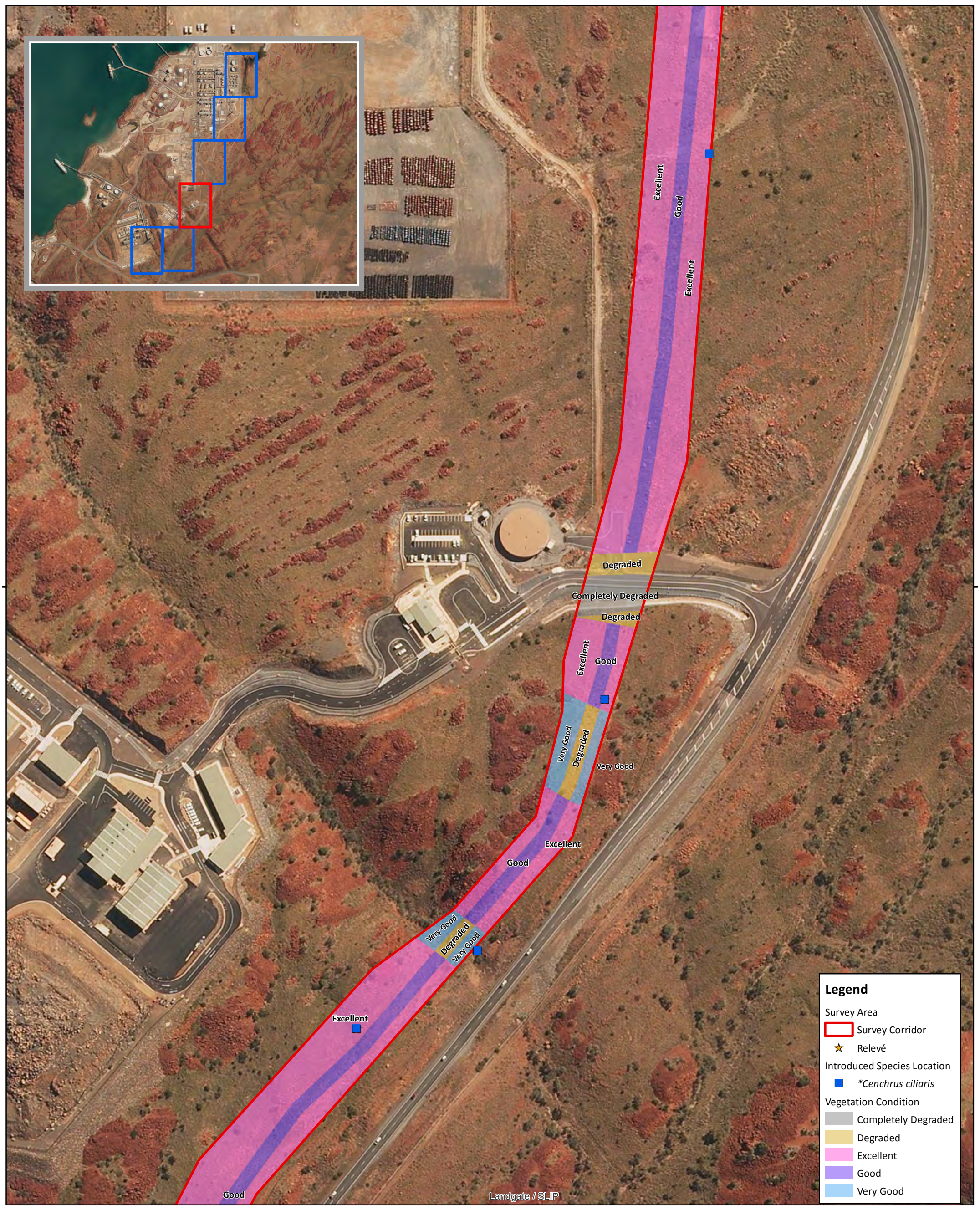
Figure E.3: Vegetation Condition Mapping

astron

delivering environmental intelligence™

Author: M. Stalker	Date: 19-07-2018	Coordinate System: GDA 1994 MGA Zone 50
Drawn: F. Yu	Figure Ref: 21244-18-BIDR-1Rev_180717_FigE	0 Metres 100

N



DDG Operations Pty Ltd

Burrup Interconnector Pipeline Flora, Vegetation and Fauna Survey

Figure E.4: Vegetation Condition Mapping

Author: M. Stalker	Date: 17-07-2018	Coordinate System: GDA 1994 MGA Zone 50
Drawn: F. Yu	Figure Ref: 21244-18-BIDR-1Rev_180717_FigE	Metres 0 100 N

astron delivering environmental intelligence™

476000

7720000

Excellent
Good
Excellent
Degraded
Good
Very Good
Excellent
Excellent
Good
Degraded
Good
Degraded
Degraded
Completely Degraded

Landgate / SLIP

Legend

Survey Area
- Additional Survey Area
- Survey Corridor
- Relevé

Introduced Species Location
- *Aerva javanica*
- *Cenchrus ciliaris*

Vegetation Condition
- Completely Degraded
- Degraded
- Excellent
- Good
- Very Good

DDG Operations Pty Ltd
Burrup Interconnector Pipeline Flora, Vegetation and Fauna Survey

Figure E.5: Vegetation Condition Mapping

astron
delivering environmental intelligence™

Author: M. Stalker	Date: 20-07-2018
Drawn: F. Yu	Figure Ref: 21244-18-BIDR-1Rev_180717_FigE

Coordinate System: GDA 1994 MGA Zone 50

0 100 Metres

N

476000

7720000

Completely Degraded
Degraded
Excellent
Good
Very Good
Excellent
Good
Excellent
Degraded
Good
Degraded
Degraded
Completely Degraded
Degraded

Legend

Survey Area
- Additional Survey Area
- Survey Corridor
- Relevé

Introduced Species Location
- **Aerva javanica*
- **Cenchrus ciliaris*

Vegetation Condition
- Completely Degraded
- Degraded
- Excellent
- Good
- Very Good

Landgate / SLIP

DDG Operations Pty Ltd

Burrup Interconnector Pipeline Flora, Vegetation and Fauna Survey

Figure E.6: Vegetation Condition Mapping

astron
delivering environmental intelligence™

Author: M. Stalker	Date: 20-07-2018
Drawn: F. Yu	Figure Ref: 21244-18-BIDR-1Rev_180717_FigE

Coordinate System: GDA 1994 MGA Zone 50

0 — 100 Metres

N

Appendix F: Fauna Habitat Mapping

This page has been left blank intentionally.

477000

7723000

Mangroves

Open Woodland/Shrubland

Mangroves

Eucalypt Woodland

Completely Degraded

Completely Degraded

Legend

Survey Area

- Additional Survey Area
- Survey Corridor
- Relevé

Fauna Habitat

- Completely Degraded
- Eucalypt Woodland
- Mangroves
- Open Woodland/Shrubland

DDG Operations Pty Ltd

Burrup Interconnector Pipeline Flora, Vegetation and Fauna Survey

Figure F.1: Fauna Habitat Mapping

astron

delivering environmental intelligence™

Author: M. Stalker	Date: 18-07-2018	Coordinate System: GDA 1994 MGA Zone 50
Drawn: F. Yu	Figure Ref: 21244-18-BIDR-1Rev_180717_FigF	0 — 100 Metres; N

477000

7722000

Completely Degraded

Open Woodland/Shrubland

Completely Degraded

Open Woodland/Shrubland

Completely Degraded

Open Woodland/Shrubland

Eucalypt Woodland

Grassland

Open Woodland/Shrubland

Legend

Survey Area

Survey Corridor

Relevé

PEC Buffer

Burrup rock pile communities

Fauna Habitat

Completely Degraded

Eucalypt Woodland

Grassland

Open Woodland/Shrubland

DDG Operations Pty Ltd

Burrup Interconnector Pipeline Flora, Vegetation and Fauna Survey

Figure F.2: Fauna Habitat Mapping

astron

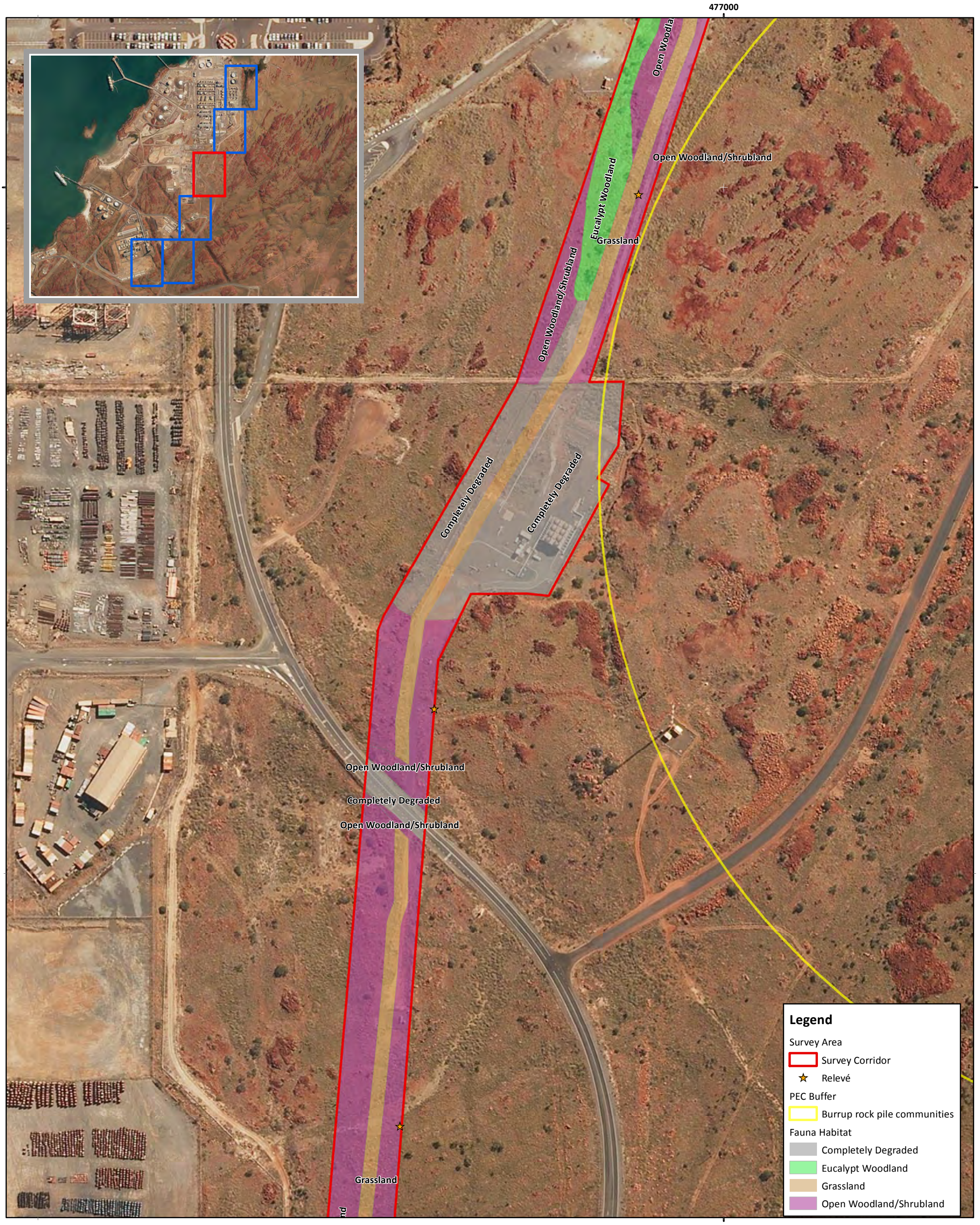
delivering environmental intelligence™

Author: M. Stalker	Date: 19-07-2018
Drawn: F. Yu	Figure Ref: 21244-18-BIDR-1Rev_180717_FigF

Coordinate System: GDA 1994 MGA Zone 50

0 100 Metres

N



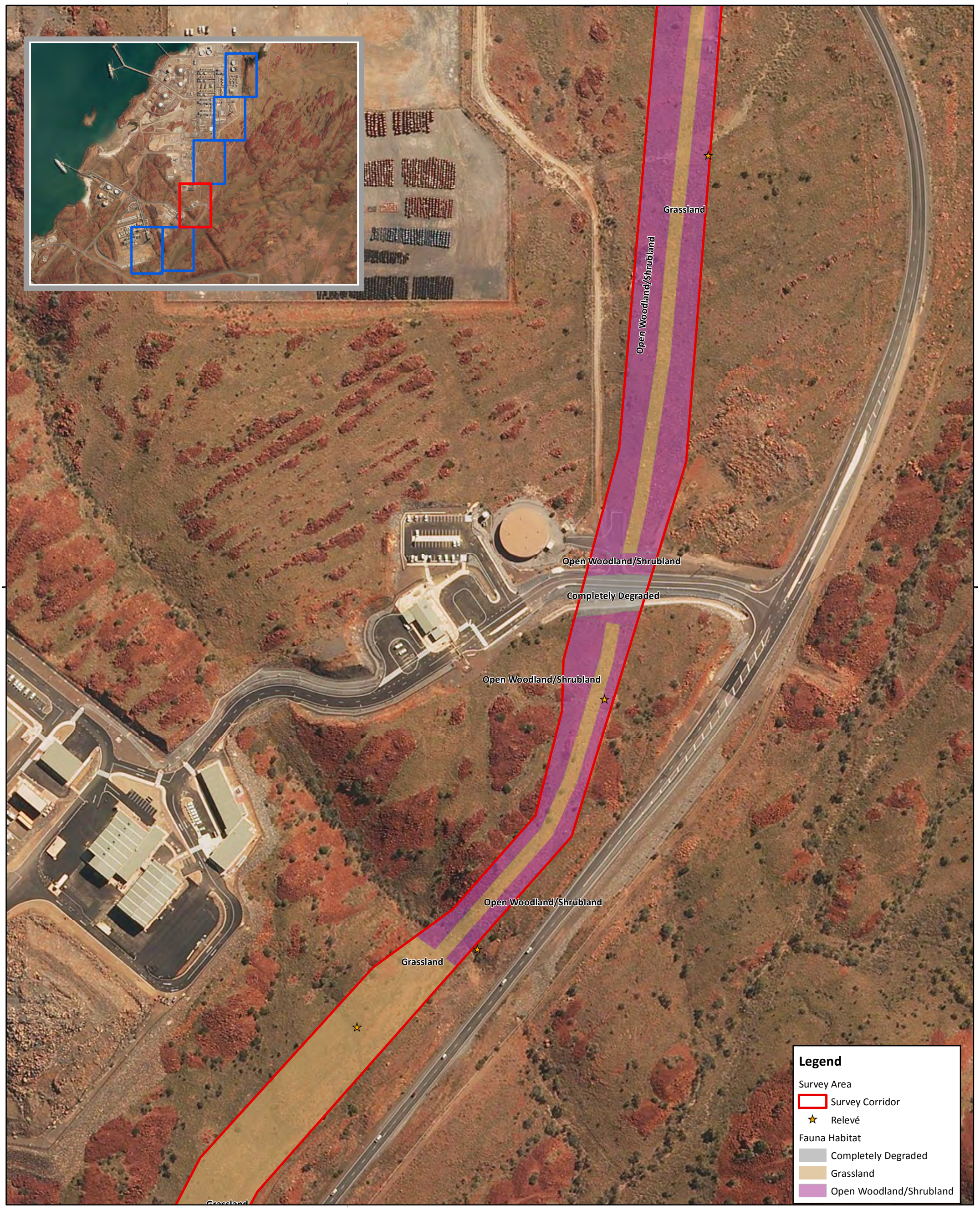
DDG Operations Pty Ltd

Burrup Interconnector Pipeline Flora, Vegetation and Fauna Survey

Figure F.3: Fauna Habitat Mapping

astron delivering environmental intelligence™

Author: M. Stalker	Date: 19-07-2018	Coordinate System: GDA 1994 MGA Zone 50
Drawn: F. Yu	Figure Ref: 21244-18-BIDR-1Rev_180717_FigF	0 — 100 Metres; N



DDG Operations Pty Ltd

Burrup Interconnector Pipeline Flora, Vegetation and Fauna Survey

Figure F.4: Fauna Habitat Mapping

astron
delivering environmental intelligence™

Author: M. Stalker	Date: 18-07-2018
Drawn: F. Yu	Figure Ref: 21244-18-BIDR-1Rev_180717_FigF

Coordinate System: GDA 1994 MGA Zone 50

0 100 Metres

N

476000

7720000

Grassland

Grassland

Open Woodland/Shrubland

Open Woodland/Shrubland

Eucalypt Woodland

Eucalypt Woodland

Grassland

Open Woodland/Shrubland

Open Woodland/Shrubland

Open Woodland/Shrubland

Legend

Survey Area

Additional Survey Area

Survey Corridor

Relevé

Fauna Habitat

Completely Degraded

Eucalypt Woodland

Grassland

Open Woodland/Shrubland

DDG Operations Pty Ltd

Burrup Interconnector Pipeline Flora, Vegetation and Fauna Survey

Figure F.5: Fauna Habitat Mapping

astron

delivering environmental intelligence™

Author: M. Stalker	Date: 18-07-2018
Drawn: F. Yu	Figure Ref: 21244-18-BIDR-1Rev_180717_FigF

Coordinate System: GDA 1994 MGA Zone 50

0 100 Metres

N

476000

7720000

Completely Degraded

Completely Degraded

Open Woodland/Shrubland

Eucalypt Woodland

Eucalypt Woodland

Grassland

Grassland

Open Woodland/Shrubland

Open Woodland/Shrubland

Open Woodland/Shrubland

Open Woodland/Shrubland

Legend

Survey Area

- Additional Survey Area
- Survey Corridor
- Relevé

Fauna Habitat

- Completely Degraded
- Eucalypt Woodland
- Grassland
- Open Woodland/Shrubland

DDG Operations Pty Ltd

Burrup Interconnector Pipeline Flora, Vegetation and Fauna Survey

Figure F.6: Fauna Habitat Mapping

astron delivering environmental intelligence™

Author: M. Stalker	Date: 18-07-2018	Coordinate System: GDA 1994 MGA Zone 50
Drawn: F. Yu	Figure Ref: 21244-18-BIDR-1Rev_180717_FigF	0 100 Metres; N

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

This page has been left blank intentionally.

Table G.1: Likelihood of occurrence of Threatened and Priority flora recorded within 20 km of the survey area (Department of Biodiversity, Conservation, and Attractions 2018c, 2018a, 2018d). The Threatened and Priority Flora List database is searched using place names and as a result some of the records obtained from this database may occur beyond 20 km of the survey area.

Species	Habit and flowering information	Life form	Habitat	Likelihood of occurrence	
				Pre-survey	Post-survey
Priority 3					
Eragrostis surreyana	Grass 1-2 cm high.	Annual	Wetland, waterhole	Unlikely	Unlikely
Gymnanthera cunninghamii	Erect shrub, 1-2 m high. Fl. cream-yellow-green, Jan to Dec.	Perennial	Sandy soils.	Unlikely	Unlikely
Oldenlandia sp. Hamersley Station (A.A. Mitchell PRP 1479)	Spreading annual, herb, 0.05-0.1 m high. Fl. blue, Mar.	Annual	Cracking clay, basalt. Gently undulating plain with large surface rocks, flat crabholed plain.	Unlikely	Unlikely
Schoenus punctatus	Shortly rhizomatous, tufted, grass-like or herb (sedge), ca 0.6 m high. Fl. brown, Aug.	Perennial	Watercourses	Unlikely	Unlikely
Stackhousia clementii	Dense broom-like perennial, herb, to 0.45 m high. Fl. green/yellow/brown.	Perennial	Skeletal soils. Sandstone hills.	Unlikely	Unlikely
Terminalia supranitifolia	Spreading, tangled shrub or tree, 1.5-3 m high. Fl. green-yellow, May or Jul or Dec.	Perennial	Sand. Among basalt rocks.	Likely	Recorded
Themeda sp. Hamersley Station (M.E. Trudgen 11431)	Tussocky perennial, grass-like or herb, 0.9-1.8 m high. Fl. Aug.	Perennial	Red clay. Clay pan, grass plain.	Unlikely	Unlikely

Species	Habit and flowering information	Life form	Habitat	Likelihood of occurrence	
				Pre-survey	Post-survey
Vigna triodiophila	Herb. Slender vine with thickened root. Flowers yellow.	Probably perennial but dying back to rootstock in dry.	Rockpile, rocky hillslopes.	Likely	Unlikely
Priority 4					
Rhynchosia bungarensis	Compact, prostrate shrub, to 0.5 m high. Fl. yellow.	Perennial	Pebbly, shingly coarse sand amongst boulders. Banks of flow line in the mouth of a gully in a valley wall.	Likely	Recorded

Table G.2: Likelihood of occurrence of conservation significant vertebrate fauna species occurring in the vicinity of the survey area (Department of Biodiversity, Conservation, and Attractions 2018a, 2018b; Department of the Environment and Energy 2018).

Scientific name (common name)	Conservation codes			Preferred habitat/distribution	Post-survey likelihood of occurrence in survey area
	EPBC Act	WC Act	Parks and Wildlife		
Reptiles					
Ctenotus angusticeps (Airlie Island Ctenotus)	VU		P3	Patchily distributed along the North West coast between Airlie Island and Broome. It inhabits acacia shrublands, coastal spinifex and particularly tussock grasses on the western end of Airlie Island. On the mainland it occurs in coastal mudflats vegetated with samphire, sometimes sheltering in crab holes in the intertidal zone.	Low
Notoscincus butleri (Lined soil-crevice skink)			P4	Arid, rocky, near coastal Pilbara regions. Associated with spinifex-dominated areas near creeks and river margins.	Moderate
Liasis olivaceus barroni (Pilbara olive python)	VU	VU		Generally rocky habitats in close association to permanent and semi-permanent water sources.	High
Birds					
Ardenna pacifica (Wedge-tailed shearwater)	IA	IA		Predominantly pelagic species that is independent of terrestrial habitats. Breeds on offshore islands on the North West Shelf.	Low
Pandion cristatus (Osprey)	IA	IA		Occurs in littoral and coastal habitats and terrestrial wetlands of tropical and temperate Australia and offshore islands. Also coastal areas, and occasionally travel inland along major rivers.	Low
Charadrius leschenaultii (Greater sand plover)	VU & IA	IA		Mainly sandy beaches and tidal mud, reef and sand flats. Vagrant to Australia.	Low
Charadrius mongolus (Lesser sand plover)	EN & IA	EN & IA		Mainly sandy beaches and tidal estuarine flats.	Low
Charadrius veredus (Oriental plover)	IA	IA		Mainly sparsely vegetated plains, including samphire flats and short grass flats. Also beaches, tidal flats, salt works and sewerage ponds.	Low

Scientific name (common name)	Conservation codes			Preferred habitat/distribution	Post-survey likelihood of occurrence in survey area
	EPBC Act	WC Act	Parks and Wildlife		
Pluvialis fulva (Pacific golden plover)		IA		Mainly salt or brackish marshes about estuaries or near coastal lakes.	Low
Pluvialis squatarola (Grey plover)		IA		Mainly sandy and sea-weedy ocean beaches.	Low
Rostratula australis (Australian panted snipe)	EN	EN		Inhabits shallow terrestrial freshwater wetlands, lakes, swamps and claypans. Also found in waterlogged grassland and saltmarsh. Typical sites include areas with emergent tussocks of grass, sedges or samphire; often scattered with clumps of lignum Muehlenbeckia, or canegrass or sometimes with tea-tree.	Low
Actitis hypoleucos (Common sandpiper)	IA	IA		The edge of sheltered waters fresh or salt including estuaries, mangroves creeks, rocky coasts, near-coastal salt lakes, river pools, lagoons, claypans, swamps, flood waters, dams and sewerage ponds.	Low
Arenaria interpres (Ruddy turnstone)	IA	IA		Tidal mud and reef flats, sheltered rocky coasts, beaches, dry coral ridges and near-coastal salt lakes.	Low
Calidris alba (Sanderling)	IA	IA		Mainly steeply shelving sandy beaches exposed to ocean swells. Also sandy inlets, estuarine sand banks and near-coastal salt lakes.	Low
Calidris acuminata (Sharp-tailed sandpiper)	IA	IA		The muddy edges of shallow fresh or brackish wetlands, with inundated or emergent sedges, grass, saltmarsh or other low vegetation. This includes lagoons, swamps, lakes and pools near the coast, and dams, waterholes, soaks, bore drains and bore swamps, saltpans and hypersaline salt lakes inland.	Low
Calidris canutus (Red knot)	EN & IA	IA		Mud and sand flats in estuaries and on sheltered coasts.	Low
Calidris ferruginea (Curlew sandpiper)	CR & IA	VU & IA		Mainly occur on intertidal mudflats in sheltered coastal areas, such as estuaries, bays, inlets and lagoons, and also around non-tidal swamps, lakes and lagoons near the coast.	Low

Scientific name (common name)	Conservation codes			Preferred habitat/distribution	Post-survey likelihood of occurrence in survey area
	EPBC Act	WC Act	Parks and Wildlife		
Calidris ruficollis (Red-necked stint)	IA	IA		The edge of sheltered waters including estuaries, beaches, near-coastal salt lakes, swamps, lakes, sewerage ponds and bore overflows.	Low
Calidris subminuta (Long-toed stint)	IA	IA		They prefer shallow freshwater or brackish wetlands including lakes, swamps, river floodplains, streams, lagoons and sewage ponds. The species is also fond of areas of muddy shoreline, growths of short grass, weeds, sedges, low or floating aquatic vegetation, reeds, rushes and occasionally stunted samphire.	Low
Calidris tenuirostris (Great knot)	CR & IA	VU & IA		Mud and sand flats in estuaries and on sheltered coasts.	Low
Limicola falcinellus (Broad-billed sandpiper)	IA	IA		Occurs in sheltered parts of the coast, favouring estuarine mudflats but also occasionally occur on saltmarshes, shallow freshwater lagoons, saltworks and sewage farms, and in areas with large soft intertidal mudflats, which may have shell or sandbanks nearby.	Low
Limosa lapponica (Bar-tailed godwit)	IA	IA		Estuarine sand and mudflats, beaches, reef flats and near-coastal salt lakes.	Low
Limosa lapponica baueri (Bar-tailed godwit (western Alaskan))	VU	VU		Estuarine sand and mudflats, beaches, reef flats and near-coastal salt lakes.	Low
Limosa lapponica menzbieri (Bar-tailed godwit (northern Siberian))	CR	VU		Estuarine sand and mudflats, beaches, reef flats and near-coastal salt lakes.	Low
Limosa limosa (Black-tailed godwit)	IA	IA		The shallows of fresh water lakes, swamps, river pools. Also estuarine flats, rocky and muddy coasts and near-coastal salt lakes.	Low
Numenius madagascariensis (Far eastern curlew)	CR & IA	VU & IA		Mainly tidal mud flats, reef flats, sandy beaches and rarely near-coastal salt lakes.	Low

Scientific name (common name)	Conservation codes			Preferred habitat/distribution	Post-survey likelihood of occurrence in survey area
	EPBC Act	WC Act	Parks and Wildlife		
Numenius minutus (Little curlew)	IA	IA		Mainly short grass plains, including sorghum stubble, airfields and sports grounds. Also burnt grasslands dry riverbeds and tidal mudflats.	Low
Numenius phaeopus (Whimbrel)	IA	IA		Mainly tidal mud and reef flats. Occasionally sandy beaches and near-coastal salt lakes.	Low
Tringa brevipes (Grey-tailed tattler)	IA	IA	P4	Mainly tidal mud and reef flats, but also estuarine sand flats, beaches and near-coastal fresh and brackish waters.	Low
Tringa glareola (Wood sandpiper)	IA	IA		Mainly shallow fresh waters including lagoons, swamps, claypans, river pools, dams, bore overflows and sewerage ponds. Occasionally brackish swamps, salt lakes and estuaries.	Low
Tringa nebularia (Common greenshank)	IA	IA		Shallow fresh waters including claypans, lagoons, swamps, river pools, dams and sewerage ponds. Also salt water estuaries, mangrove creeks, lakes, samphire flats, reef flats and salt work ponds.	Low
Tringa stagnatilis (Marsh sandpiper)	IA	IA		Mainly shallow fresh or brackish waters, including swamps, lakes, river pools, soaks, sewerage ponds and bore overflows. Occasionally estuaries, salt ponds and coasts.	Low
Tringa totanus (Common redshank)	IA	IA		Mainly found at sheltered coastal wetlands such as bays, river estuaries, lagoons, inlets and saltmarsh (with bare open flats and banks of mud or sand). They are also found around saltlakes, freshwater lagoons, artificial wetlands and saltworks and sewage farms	Low
Xenus cinerea (Terek sandpiper)	IA	IA		Mainly tidal flats but also salt work ponds.	Low
Phalaropus lobatus (Red-necked phalarope)	IA	IA		In Australia it is recorded at both inland and coastal lakes/swamps, including highly saline waters and artificial wetlands notably saltfields.	Low

Scientific name (common name)	Conservation codes			Preferred habitat/distribution	Post-survey likelihood of occurrence in survey area
	EPBC Act	WC Act	Parks and Wildlife		
Glareola maldivarum (Oriental pratincole)	IA	IA		Feeds in the air and roosts on bare ground besides water.	Low
Hydroprogne (Sterna) caspia (Caspian tern)	IA	IA		Mainly sheltered seas, estuaries and tidal creeks.	Low
Onychoprion anaethetus (Bridled tern)	IA	IA		Blue water seas, generally close to breeding sites.	Low
Sterna dougallii (Roseate tern)	IA	IA		Blue water seas close to land.	Low
Sterna hirundo (Common tern)	IA	IA		Sheltered seas including estuaries, salt works and sewerage ponds.	Low
Sterna leucoptera (White-winged black tern)	IA	IA		The species mostly inhabits fresh, brackish or saline, and coastal or subcoastal wetlands.	Low
Sternula albifrons (Little tern)	IA	IA		Coastal environments, including lagoons, river mouths, deltas, estuaries, lakes, bays and also exposed ocean beaches.	Low
Sternula nereis nereis (Australian fairy tern)	VU	VU		Sheltered blue water seas close to land, estuaries and near coastal lakes.	Low
Thalasseus (Sterna) bergii (Crested tern)	IA	IA		Ocean beaches, estuaries and coastal lagoons. Occasionally on salt lakes.	Low
Gelochelidon nilotica (Gull-billed tern)	IA	IA		Shallow sheltered seas close to land, estuaries, tidal creeks, near-coastal salt lakes, samphire flats, swamps, lagoons, river pools, claypans, dams and over grain crops.	Low
Apus pacificus (Fork-tailed swift)	IA	IA		An aerial species that seldom utilises landforms.	Moderate
Falco peregrinus (Peregrine falcon)		OS		Uses cliffs and rock ledges to roost and nest throughout most habitats in Australia.	Moderate

Scientific name (common name)	Conservation codes			Preferred habitat/distribution	Post-survey likelihood of occurrence in survey area
	EPBC Act	WC Act	Parks and Wildlife		
Pezoporus occidentalis (Night parrot)	EN	CR		Treeless or sparsely wooded spinifex near water.	Low
Hirundo rustica (Barn swallow)	IA	IA		Coastal open country generally, especially near surface water and man-made structures such as bridges and power wires.	Low
Motacilla flava (Yellow wagtail)	IA	IA		Damp short-grass flats, edges of swamps, sewerage ponds, grazed or mowed grass and irrigated areas. Vagrant to Australia.	Low
Motacilla cinerea (Grey wagtail)	IA	IA		Mainly banks and rocks in fast flowing fresh water. Vagrant to Australia.	Low
Mammals					
Dasyurus hallucatus (Northern quoll)	EN	EN		Occurs in a variety of habitats, but commonly found in rocky escarpments and open lowland savanna forest. Also in areas associated with rocky areas, but also along watercourses.	High
Macrotis lagotis (Greater bilby)	VU	VU		Sand or sandy-loam in hummock grassland (Triodia species) and or Acacia shrublands.	Low
Hydromys chrysogaster (Water-rat)			P4	Usually found near permanent bodies of fresh or brackish water along river and lake banks. They prefer areas with riparian vegetation and a degree of habitat complexity.	Low
Leggadina lakedownensis (Short-tailed mouse)			P4	Open tussock and hummock grassland, Acacia shrubland and savanna woodland on alluvial clay / sandy soils.	Low
Pseudomys chapmani (Western pebble-mound mouse)			P4	Gentle rocky slopes, hills and spurs with small pebble surface cover and sparse vegetation. This species distribution has contracted to the inland Pilbara away from the coastal Pilbara, Murchison and Gascoyne.	Low
Macroderma gigas (Ghost bat)	VU	VU		A wide range from rainforest, monsoon and vine scrub in the tropics to open woodlands and arid areas.	Low

Scientific name (common name)	Conservation codes			Preferred habitat/distribution	Post-survey likelihood of occurrence in survey area
	EPBC Act	WC Act	Parks and Wildlife		
Rhinonicteris aurantia (Pilbara form) (Pilbara leaf-nosed bat)	VU	VU		Roosts in deep warm, humid caves or rock crack, especially in proximity to water pools. Forages while flying low along watercourses and gorges and over Triodia grassland.	Low
Ozimops cobourgianus (Northern coastal free-tailed bat)			P1	Mangroves and adjacent vegetation.	Low

References

Department of Biodiversity, Conservation & Attractions 2018a, 'NatureMap Database Search 2018', Perth, Western Australia.

Department of Biodiversity, Conservation & Attractions 2018b, 'Threatened and Priority Fauna Database'.

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

Department of Biodiversity, Conservation & Attractions 2018d, 'Western Australian Herbarium database', Department of Biodiversity, Conservation & Attractions, Perth WA.

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

This page has been left blank intentionally.

Appendix H: Flora Species List and Species by Site Matrix

This page has been left blank intentionally.

Table H.1: Flora species list.

Family	Species	Conservation Code	Naturalised status
Acanthaceae	*Avicennia marina*		
Amaranthaceae	**Aerva javanica*		*
Apocynaceae	*Cynanchum floribundum*		
Araliaceae	*Trachymene oleracea*		
Asteraceae	*Pterocaulon sphaeranthoides*		
Boraginaceae	*Ehretia saligna*		
	Trichodesma zeylanicum		
Caryophyllaceae	*Polycarpaea longiflora*		
Chenopodiaceae	*Rhagodia eremaea*		
Cleomaceae	*Cleome viscosa*		
Combretaceae	*Terminalia canescens*		
	Terminalia supranitifolia	P3	
Convolvulaceae	*Bonamia media*		
	Ipomoea costata		
Cucurbitaceae	*Cucumis variabilis*		
Cyperaceae	*Cyperus vaginatus*		
Euphorbiaceae	*Adriana tomentosa*		
	Euphorbia tannensis		
	Acacia ampliceps		
	Acacia bivenosa		
	Acacia colei		
	Acacia coriacea		
	Acacia inaequilatera		
	Acacia orthocarpa		
	Cajanus cinereus		
	Crotalaria novae-hollandiae		
	Cullen lachnostachys		
	Dichrostachys spicata		
	Indigofera monophylla		
	Rhynchosia bungarensis	P4	
	Rhynchosia minima		
	Senna hamersleyensis		
	Senna venusta		
	Tephrosia rosea var. *clementii*		
Malvaceae	*Abutilon fraseri*		
	Abutilon lepidum		
	Brachychiton acuminatus		
Malvaceae	*Corchorus crozophorifolius*		
	Corchorus walcottii		

Family	Species	Conservation Code	Naturalised status
Malvaceae	*Triumfetta appendiculata*		
	Triumfetta clementii		
	Waltheria indica		
Menispermaceae	*Tinospora smilacina*		
Myrtaceae	*Corymbia hamersleyana*		
	Eucalyptus victrix		
Nyctaginaceae	*Boerhavia coccinea*		
Oleaceae	*Jasminum didymum* subsp. *lineare*		
Phyllanthaceae	*Flueggea virosa*		
	Phyllanthus maderaspatensis		
Pittosporaceae	*Pittosporum phillyreoides*		
Plantaginaceae	*Stemodia grossa*		
Plumbaginaceae	*Plumbago zeylanica*		
Poaceae	**Cenchrus ciliaris*		*
	Cymbopogon ambiguus		
	Eriachne obtusa		
	Themeda triandra		
	Triodia angusta		
	Triodia epactia		
	Triodia lanigera		
	Triodia longiceps		
Proteaceae	*Grevillea pyramidalis*		
	Hakea lorea		
Rhizophoraceae	*Rhizophora stylosa*		
Solanaceae	*Solanum cleistogamum*		

Table H.2: Species by site matrix.

Species Name	Site																				
	1a	1b	2a	2b	3a	3b	4a	4b	5a	5b	6a	6b	7a	7b	8	9a	9b	10	11a	11b	12	OPP
**Aerva javanica*											5		25									
**Cenchrus ciliaris*		<2	15	15	<2	30	35	2	5	<2	10			<2		2	<2		20	<2		
Abutilon fraseri										<2												
Abutilon lepidum								<2				<2								<2		
Acacia ampliceps															25							
Acacia bivenosa														<2			5			<2		
Acacia colei		<2		<2								<2										
Acacia coriacea						<2				<2		<2		<2	5			<2				X
Acacia inaequilatera						2		<2									<2					
Acacia orthocarpa								<2									<2					
Adriana tomentosa																						X
Avicennia marina																					X	
Boerhavia coccinea							<2	<2											<2	<2		X
Bonamia media												<2								<2		
Brachychiton acuminatus		<2										<2		5	<2		<2			<2		
Cajanus cinereus														<2								X
Cleome viscosa																				<2		
Corchorus crozophorifolius		<2																				
Corchorus walcottii	2.5	<2		<2			<2	<2				<2					<2		<2	<2		
Corymbia hamersleyana																		5				
Crotalaria novae-hollandiae														<2								
Cucumis variabilis								<2				<2		<2				<2				X
Cullen lachnostachys		<2										<2										

Species Name	Site																				
	1a	1b	2a	2b	3a	3b	4a	4b	5a	5b	6a	6b	7a	7b	8	9a	9b	10	11a	11b	12	OPP
Cymbopogon ambiguus			2.5	2						<2		<2		<2						<2		X
Cynanchum floribundum														<2								X
Cyperus vaginatus						<2																
Dichrostachys spicata		2		2.5		<2		<2				<2		15	5		<2	2				
Ehretia saligna																		<2				
Eriachne obtusa												<2										
Eucalyptus victrix										15					15			5				
Euphorbia tannensis			2	<2															<2	<2		
Flueggea virosa						<2								<2	5			<2		<2		
Grevillea pyramidalis		<2		2.5								<2		5			<2			<2		X
Hakea lorea												<2										X
Indigofera monophylla		2						<2				<2					<2					
Ipomoea costata				<2								<2		5			<2					
Jasminum didymum subsp. *lineare*																						X
Phyllanthus maderaspatensis										<2												
Pittosporum phillyreoides				<2								<2			2							
Plumbago zeylanica																						X
Polycarpaea longiflora												<2										
Pterocaulon sphaeranthoides												<2										X
Rhagodia eremaea						<2						<2								<2		
Rhynchosia bungarensis P4				<2		<2						<2										X
Rhynchosia minima		<2																		<2		
Rhizophora stylosa																					X	
Senna hamersleyensis																	<2					

Species Name	Site																				
	1a	1b	2a	2b	3a	3b	4a	4b	5a	5b	6a	6b	7a	7b	8	9a	9b	10	11a	11b	12	OPP
Senna venusta														<2								
Solanum cleistogamum								<2														
Stemodia grossa					2	5												<2				
Tephrosia rosea var. *clementii*		<2																				
Terminalia canescens		<2		2.5		10				<2				15			<2	10		<2		
Terminalia supranitifolia P3				<2										<2								
Themeda triandra														<2								
Tinospora smilacina												<2		<2								
Trachymene oleracea		<2										<2										
Trichodesma zeylanicum		<2										<2					<2		<2	<2		X
Triodia angusta									20	25						2	45					
Triodia epactia	20	60	2	15	<2	30	2.5	55	5	15	10	65					20		10	50		
Triodia lanigera																			<2	2		
Triodia longiceps																		80				
Triumfetta appendiculata		<2		<2			<2	<2												<2		
Triumfetta clementii				<2				<2										<2				
Waltheria indica										<2												

This page has been left blank intentionally.

Appendix I: Relevé Data

This page has been left blank intentionally.

Site: 1a
Site Classification: Disturbed
Type: 50 x 100 Relevé
Date: 2018-06-07 **Described by:** VL
MGA Zone: 50 **Easting:** 476764 **Northing:** 7721316

Habitat/Landform: Rocky Slopes
Soil: Red brown, silt
Rock type: Rock piles
Vegetation: *Triodia epactia* scattered to open hummock grassland with scattered *Cymbopogon ambiguus* tussocks and *Corchorus walcottii* low shrubs.
Veg Condition: Excellent
Fire Age: 0-15yrs
Fauna Habitat: Grassland
Fauna Habitat Condition: High Quality
Microhabitats: Rock piles

Species List

Name	Cover (%)	Height (m)
Corchorus walcottii	2.5	0.35
Triodia epactia	20	0.35

* denotes weed species
? denotes unconfirmed ID

Plate 1: Site 1

Site: 1b
Site Classification: Undisturbed
Type: 50 x 100 Relevé
Date: 2018-06-07 **Described by:** VL
MGA Zone: 50 **Easting:** 476764 **Northing:** 7721316

Habitat: Rocky Slopes
Soil: Red brown, silt
Rock type: Rock piles
Vegetation: *Corymbia hamersleyana* scattered to open low woodland over *Dichrostachys spicata* open shrubland over *Indigofera monophylla* open low shrubland over *Triodia epactia* hummock grassland. Scattered *Brachychiton acuminatus* and *Terminalia canescens* on numerous small rockpiles and outcrops
Veg Condition: Excellent
Fire Age: 0-15yrs
Fauna Habitat: Open Woodland/Shrubland
Fauna Habitat Condition: High Quality
Microhabitats: Rock piles

Species List

Name	Cover (%)	Height (m)
**Cenchrus ciliaris*	<2	0.35
Acacia colei	<2	2.5
Brachychiton acuminatus	<2	3
Corchorus crozophorifolius	<2	0.25
Corchorus walcottii	<2	0.35
Cullen lachnostachys	<2	1.25
Dichrostachys spicata	2	2
Grevillea pyramidalis	<2	1.75
Indigofera monophylla	2	0.35
Rhynchosia minima	<2	
Tephrosia rosea var. clementii	<2	0.4
Terminalia canescens	<2	3
Trachymene oleracea	<2	0.8
Trichodesma zeylanicum	<2	1
Triodia epactia	60	0.35
Triumfetta appendiculata	<2	0.35

* denotes weed species
? denotes unconfirmed ID

Site: 2a
Site Classification: Disturbed
Type: 50 x 50 Relevé
Date: 2018-06-07 **Described by:** VL
MGA Zone: 50 **Easting:** 476688 **Northing:** 7220918

Habitat: Rock pile
Rock type: Rock piles
Vegetation: **Cenchrus ciliaris*, *Triodia epactia*, *Cymbopogon ambiguus* scattered to very open mixed grassland.
Veg Condition: Degraded
Fire Age: 0-15yrs
Fauna Habitat: Grassland
Fauna Habitat Condition: Disturbed
Microhabitats: Rock piles

Species List

Name	Cover (%)	Height (m)
**Cenchrus ciliaris*	15	0.5
Cymbopogon ambiguus	2.5	0.4
Euphorbia tannensis	2	0.25
Triodia epactia	2	0.35

* denotes weed species
? denotes unconfirmed ID

Plate 2: Site 2

Site: 2b

Site Classification: Undisturbed
Type: 50 x 50 Relevé
Date: 2018-06-07 **Described by:** VL
MGA Zone: 50 **Easting:** 476688 **Northing:** 7220918

Habitat: Rock pile
Rock type: Rock piles
Vegetation: *Terminalia canescens* scattered to open low woodland with *Brachychiton acuminatus*, *Grevillea pyramidalis* subsp. *pyramidalis and Dichrostachys spicata* over open *Triodia epactia*, **Cenchrus ciliaris and Cymbopogon ambiguus* grassland.
Veg Condition: Very Good
Fire Age: 0-15yrs
Fauna Habitat: Open Woodland/Shrubland
Fauna Habitat Condition: Very Good
Microhabitats: Rock piles

Species List

Name	Cover (%)	Height (m)
**Cenchrus ciliaris*	15	0.5
Acacia colei	<2	2
Corchorus walcottii		0.35
Cymbopogon ambiguus	2	0.4
Dichrostachys spicata	2.5	2
Euphorbia tannensis		0.25
Grevillea pyramidalis	2.5	2.5
Ipomoea costata	<2	1.75
Pittosporum phillyreoides		3
Rhynchosia bungarensis P4	<2	
Terminalia canescens	2.5	3
Terminalia supranitifolia P3	<2	1.75
Triodia epactia	15	0.35
Triumfetta appendiculata		0.35
Triumfetta clementii	<2	0.25

* denotes weed species
? denotes unconfirmed ID

Site: 3a
Site Classification: Disturbed
Type: 40 x 10 Relevé
Date: 2018-06-07 **Described by:** VL
MGA Zone: 50 **Easting:** 476595 **Northing:** 7720735

Habitat: Drainage
Soil: Silt
Rock type: Stony
Vegetation: **Cenchrus ciliaris* open grassland. Scattered low shrubs of *Stemodia grossa*.
Veg Condition: Degraded
Fire Age: 0-15yrs
Fauna Habitat: Grassland
Fauna Habitat Condition: Disturbed
Microhabitats: Some rock piles

Species List

Name	Cover (%)	Height (m)
**Cenchrus ciliaris*	<2	0.35
Stemodia grossa	2	0.2
Triodia epactia	<2	0.35

* denotes weed species
? denotes unconfirmed ID

Plate 3: Site 3

.

Site: 3b
Site Classification: Undisturbed
Type: 40 x 10 Relevé
Date: 2018-06-07 **Described by:** VL
MGA Zone: 50 **Easting:** 476595 **Northing:** 7720735

Habitat: Drainage
Soil: Silt
Rock type: Stony
Vegetation: *Terminalia canescens* open low woodland over open low shrubland of *Stemodia grossa* over *Triodia epactia* open hummock grass with patchy **Cenchrus ciliaris.*
Veg Condition: Excellent
Fire Age: 0-15yrs
Fauna Habitat: Open Woodland/Shrubland
Fauna Habitat Condition: High Quality
Microhabitats: Some rock piles

Species List

Name	Cover (%)	Height (m)
**Cenchrus ciliaris*	30	0.35
Acacia coriacea	<2	2
Acacia inaequilatera	2	2
Cyperus vaginatus	<2	0.65
Dichrostachys spicata	<2	1.5
Flueggea virosa	<2	2
Rhagodia eremaea	<2	1
Rhynchosia bungarensis P4	<2	
Stemodia grossa	5	0.2
Terminalia canescens	10	3
Triodia epactia	30	0.35

* denotes weed species
? denotes unconfirmed ID

Site: 4a
Site Classification: Disturbed
Type: 50 x 100 Relevé
Date: 2018-06-07 **Described by:** VL
MGA Zone: 50 **Easting:** 476507 **Northing:** 7720678

Habitat: Hillslope
Soil: Red brown, silt
Rock type: Rocky Mantle
Vegetation: **Cenchrus ciliaris* open grassland with patchy *Triodia epactia*.
Veg Condition: Good
Fauna Habitat: Grassland
Fauna Habitat Condition: Good
Microhabitats: None

Species List

Name	Cover (%)	Height (m)
**Cenchrus ciliaris*	35	0.35
Boerhavia coccinea	<2	
Corchorus walcottii	<2	0.3
Triodia epactia	2.5	0.35
Triumfetta appendiculata	<2	0.35

* denotes weed species
? denotes unconfirmed ID

Plate 4: Site 4

Site: 4b
Site Classification: Undisturbed
Type: 50 x 100 Relevé
Date: 2018-06-07 **Described by:** VL
MGA Zone: 50 **Easting:** 476507 **Northing:** 7720678

Habitat: Hillslope
Soil: Red brown, silt
Rock type: Rocky Mantle
Vegetation: *Triodia epactia* hummock grassland with scattered *Dichrostachys spicata*, *Acacia orthocarpa* and *Grevillea pyramidalis* subsp. *pyramidalis*.
Veg Condition: Excellent
Fauna Habitat: Grassland
Fauna Habitat Condition: High Quality
Microhabitats: Some rock piles

Species List

Name	Cover (%)	Height (m)
**Cenchrus ciliaris*	2	0.35
Abutilon lepidum	<2	0.35
Acacia inaequilatera	<2	2.5
Acacia orthocarpa	<2	1.5
Boerhavia coccinea	<2	
Corchorus walcottii	<2	0.3
Cucumis variabilis	<2	
Dichrostachys spicata	<2	2.5
Indigofera monophylla	<2	0.45
Solanum cleistogamum	<2	0.2
Triodia epactia	55	0.35
Triumfetta appendiculata	<2	0.35
Triumfetta clementii	<2	0.2

* denotes weed species
? denotes unconfirmed ID

Site: 5a
Site Classification: Disturbed
Type: 50 x 20 Relevé
Date: 2018-06-07 **Described by:** VL
MGA Zone: 50 **Easting:** 476162 **Northing:** 7720131

Habitat: Drainage
Rock type: Stony
Vegetation: *Triodia angusta* open hummock grassland with *Triodia epactia* and **Cenchrus ciliaris* very open grassland.
Veg Condition: Very Good
Fire Age: 0-15yrs
Fauna Habitat: Grassland
Fauna Habitat Condition: Very Good
Microhabitats: Small tree hollows

Species List

Name	Cover (%)	Height (m)
**Cenchrus ciliaris*	5	0.35
Triodia angusta	20	0.4
Triodia epactia	5	0.35

* denotes weed species
? denotes unconfirmed ID

Plate 5: Site 5

Site: 5b
Site Classification: Undisturbed
Type: 50 x 20 Relevé
Date: 2018-06-07 **Described by:** VL
MGA Zone: 50 **Easting:** 476162 **Northing:** 7720131

Habitat: Drainage
Rock type: Stony
Vegetation: *Eucalyptus victrix* open low woodland over *Triodia angusta* hummock grassland with some *T. epactia*.
Veg Condition: Excellent
Fire Age: 0-15yrs
Fauna Habitat: Eucalypt Woodland
Fauna Habitat Condition: High Quality
Microhabitats: Tree hollows

Species List

Name	Cover (%)	Height (m)
**Cenchrus ciliaris*	<2	0.35
Abutilon fraseri	<2	0.1
Acacia coriacea	<2	2.5
Cymbopogon ambiguus	<2	0.6
Eucalyptus victrix	15	4
Phyllanthus maderaspatensis	<2	0.15
Terminalia canescens	<2	4
Triodia angusta	25	0.4
Triodia epactia	15	0.35
Waltheria indica	<2	0.15

* denotes weed species
? denotes unconfirmed ID

Site: 6a
Site Classification: Disturbed
Type: 50 x 50 Relevé
Date: 2018-06-07 **Described by:** VL
MGA Zone: 50 **Easting:** 475993 **Northing:** 7719995

Habitat: Hillslope
Soil: Red brown, silt
Rock type: Stony/Rocky Mantle
Vegetation: Mixed *Triodia epactia*, **Cenchrus ciliaris* grassland with occasional **Aerva javanica*.
Veg Condition: Good
Fire Age:
Fauna Habitat: Grassland
Fauna Habitat Condition: Good
Microhabitats: None

Species List

Name	Cover (%)	Height (m)
**Aerva javanica*	5	
**Cenchrus ciliaris*	10	
Triodia epactia	10	

* denotes weed species
? denotes unconfirmed ID

Plate 6: Site 6

Site: 6b
Site Classification: Undisturbed
Type: 50 x 50 Relevé
Date: 2018-06-07 **Described by:** VL
MGA Zone: 50 **Easting:** 475993 **Northing:** 7719995

Habitat: Hillslope
Soil: Red brown, silt
Rock type: Stony/Rocky Mantle
Vegetation: *Triodia epactia* hummock grassland with scattered *Grevillea pyramidalis* subsp. *pyramidalis* tall shrubs to open tall shrubland. Scattered *Brachychiton acuminatus* low trees and open *Ipomoea costata* tall shrubs on rockpiles.
Veg Condition: Excellent
Fire Age:
Fauna Habitat: Grassland
Fauna Habitat Condition: High Quality
Microhabitats: Few rock piles

Species List

Name	Cover (%)	Height (m)
Abutilon lepidum	<2	
Acacia colei	<2	
Acacia coriacea	<2	
Bonamia media	<2	
Brachychiton acuminatus	<2	
Corchorus walcottii	<2	
Cucumis variabilis	<2	
Cullen lachnostachys	<2	
Cymbopogon ambiguus	<2	
Dichrostachys spicata	<2	
Dichrostachys spicata	<2	
Eriachne obtusa	<2	
Grevillea pyramidalis	<2	
Hakea lorea	<2	
Indigofera monophylla	<2	
Ipomoea costata	<2	
Pittosporum phillyreoides	<2	
Polycarpaea longiflora	<2	
Pterocaulon sphaeranthoides	<2	
Rhagodia eremaea	<2	
Rhynchosia bungarensis P4	<2	
Tinospora smilacina	<2	
Trachymene oleracea	<2	
Trichodesma zeylanicum	<2	
Triodia epactia	65	

* denotes weed species; ? denotes unconfirmed ID

Site: 7a
Site Classification: Disturbed
Type: 50 x 100 Relevé
Date: 2018-06-07 **Described by:** VL
MGA Zone: 50 **Easting:** 477115 **Northing:** 7722335

Habitat: Corridor
Rock type: Rocky
Vegetation: **Aerva javanica* low open shrubland.
Veg Condition: Degraded
Fauna Habitat: Open Woodland/Shrubland
Fauna Habitat Condition: Disturbed
Microhabitats: None

Species List

Name	Cover (%)	Height (m)
**Aerva javanica*	25	

* denotes weed species
? denotes unconfirmed ID

Plate 7: Site 7a

Plate 8: Site 7b

Site: 7b
Site Classification: Undisturbed
Type: 50 x 100 Relevé
Date: 2018-06-07 **Described by:** VL
MGA Zone: 50 **Easting:** 477115 **Northing:** 7722335

Habitat: Corridor
Rock type: Rocky
Vegetation: Mixed tall open sometimes closed woodland and shrubland of *Terminalia canescens*, *Dichrostachys spicata*, *Brachychiton acuminatus*, *Grevillea pyramidalis* subsp. *pyramidalis*, *Ipomoea costata*, *Flueggea virosa* and *Acacia coriacea* over *Triodia epactia* hummock grassland.
Veg Condition: Excellent
Fauna Habitat: Open Woodland/Shrubland
Fauna Habitat Condition: High Quality
Microhabitats: Some rock piles

Species List

Name	Cover (%)	Height (m)
**Cenchrus ciliaris*	<2	
Acacia bivenosa	<2	
Acacia coriacea	<2	
Brachychiton acuminatus	5	
Cajanus cinereus	<2	
Crotalaria novae-hollandiae	<2	
Cucumis variabilis	<2	
Cymbopogon ambiguus	<2	
Cynanchum floribundum	<2	
Dichrostachys spicata	15	
Flueggea virosa	<2	
Grevillea pyramidalis	5	
Ipomoea costata	5	
Senna venusta	<2	
Senna venusta	<2	
Terminalia canescens	15	
Terminalia supranitifolia P3	<2	
Themeda triandra	<2	
Tinospora smilacina	<2	

* denotes weed species
? denotes unconfirmed ID

Site: 8
Site Classification: Undisturbed
Type: 50 x 50 Relevé
Date: 2018-06-07 **Described by:** VL
MGA Zone: 50 **Easting:** 477338 **Northing:** 7722795

Habitat: Drainage
Vegetation: *Eucalyptus victrix* woodland over *Acacia ampliceps*, *Acacia coriacea* and *Flueggea virosa* tall closed shrubland with *Dichrostachys spicata*, *Pittosporum phillyreoides*, *Brachychiton acuminatus* and *Ehretia saligna*.
Veg Condition: Visible vegetation appeared very healthy from distance. No vegetation condition assessment undertaken as understorey not visible
Fauna Habitat: Eucalypt Woodland
Fauna Habitat Condition: High Quality
Microhabitats: Tree hollows, some leaf litter

Species List

Name	Cover (%)	Height (m)
Acacia ampliceps	25	
Acacia coriacea	5	
Brachychiton acuminatus	<2	
Dichrostachys spicata	5	
Eucalyptus victrix	15	
Flueggea virosa	5	
Pittosporum phillyreoides	2	

* denotes weed species
? denotes unconfirmed ID

Plate 9: Site 8

Site: 9a
Site Classification: Disturbed
Type: 50 x 100 Relevé
Date: 2018-06-08 **Described by:** VL
MGA Zone: 50 **Easting:** 477000 **Northing:** 7722167

Habitat: Hillslope
Rock type: Rocky
Vegetation: Scattered **Cenchrus ciliaris* tussocks and *Triodia angusta* hummocks.
Veg Condition: Degraded
Fire Age: 15yrs
Fauna Habitat: Grassland
Fauna Habitat Condition: Disturbed
Microhabitats: None

Species List

Name	Cover (%)	Height (m)
**Cenchrus ciliaris*	2	
Triodia angusta	2	

* denotes weed species
? denotes unconfirmed ID

Plate 10: Site 9

Site: 9b
Site Classification: Undisturbed
Type: 50 x 100 Relevé
Date: 2018-06-08 **Described by:** VL
MGA Zone: 50 **Easting:** 477000 **Northing:** 7722167

Habitat: Hillslope
Rock type: Rocky
Vegetation: *Acacia bivenosa* scattered to open tall shrubland over mixed *Triodia angusta* and *T. epactia* open hummock grassland.
Veg Condition: Excellent
Fire Age: 15yrs
Fauna Habitat: Open Woodland/Shrubland
Fauna Habitat Condition: High Quality
Microhabitats: None

Species List

Name	Cover (%)	Height (m)
**Cenchrus ciliaris*	<2	
Acacia bivenosa	5	
Acacia inaequilatera	<2	
Acacia orthocarpa	<2	
Brachychiton acuminatus	<2	
Corchorus walcottii	<2	
Dichrostachys spicata	<2	
Grevillea pyramidalis	<2	
Indigofera monophylla	<2	
Ipomoea costata	<2	
Senna hamersleyensis	<2	
Terminalia canescens	<2	
Trichodesma zeylanicum	<2	
Triodia angusta	45	
Triodia epactia	20	

* denotes weed species
? denotes unconfirmed ID

Site: 10
Site Classification: Undisturbed
Type: 50 x 10 Relevé
Date: 2018-06-08 **Described by:** VL
MGA Zone: 50 **Easting:** 476938 **Northing:** 7721995

Habitat: Drainage
Rock type: Rocky
Vegetation: *Terminalia canescens*, *Eucalyptus victrix* and *Corymbia hamersleyana* open low woodland over *Dichrostachys spicata* open shrubland over *Triodia angusta* hummock grassland.
Veg Condition: Excellent
Fauna Habitat: Eucalypt Woodland
Fauna Habitat Condition: High Quality
Microhabitats: Tree hollows

Species List

Name	Cover (%)	Height (m)
Acacia coriacea	<2	
Corymbia hamersleyana	5	
Cucumis variabilis	<2	
Dichrostachys spicata	2	
Ehretia saligna	<2	
Eucalyptus victrix	5	
Flueggea virosa	<2	
Stemodia grossa	<2	
Terminalia canescens	10	
Triodia longiceps	80	
Triumfetta clementii	<2	

* denotes weed species
? denotes unconfirmed ID

Site: 11a
Site Classification: Disturbed
Type: 50 x 100 Relevé
Date: 2018-06-08 **Described by:** VL
MGA Zone: 50 **Easting:** 476789 **Northing:** 7721620

Habitat: Hillslope
Rock type: Rock piles
Vegetation: **Cenchrus ciliaris*, *Triodia epactia* scattered to open mixed grassland with scattered tall *Acacia bivenosa*.
Veg Condition: Degraded
Fauna Habitat: Grassland
Fauna Habitat Condition: Disturbed
Microhabitats: Rock piles

Species List

Name	Cover (%)	Height (m)
**Cenchrus ciliaris*	20	
Boerhavia coccinea	<2	
Corchorus walcottii	<2	
Euphorbia tannensis	<2	
Trichodesma zeylanicum	<2	
Triodia epactia	10	
Triodia lanigera	<2	

* denotes weed species
? denotes unconfirmed ID

Site: 11b
Site Classification: Undisturbed
Type: 50 x 100 Relevé
Date: 2018-06-08 **Described by:** VL
MGA Zone: 50 **Easting:** 476789 **Northing:** 7721620

Habitat: Hillslope
Rock type: Rock piles
Vegetation: *Corymbia hamersleyana* scattered to open low woodland over *Dichrostachys spicata* open shrubland over *Indigofera monophylla* open low shrubland over *Triodia epactia* hummock grassland. There are scattered *Brachychiton acuminatus* and *Terminalia canescens* on numerous small rockpiles and outcrops.
Veg Condition: Excellent
Fauna Habitat: Open Woodland/Shrubland
Fauna Habitat Condition: High Quality
Microhabitats: Rock piles

Species List

Name	Cover (%)	Height (m)
**Cenchrus ciliaris*		
Abutilon lepidum	<2	
Acacia bivenosa	<2	3
Acacia bivenosa	<2	
Boerhavia coccinea	<2	
Bonamia media	<2	
Brachychiton acuminatus	<2	
Cleome viscosa	<2	
Corchorus walcottii	<2	
Cymbopogon ambiguus	<2	
Euphorbia tannensis	<2	
Flueggea virosa	<2	
Grevillea pyramidalis	<2	
Rhagodia eremaea	<2	
Rhynchosia minima	<2	
Terminalia canescens	<2	
Trichodesma zeylanicum	<2	
Triodia epactia	50	
Triodia lanigera	2	
Triumfetta appendiculata	<2	

* denotes weed species
? denotes unconfirmed ID

Appendix J: Priority and Introduced Flora Locations and Descriptions

This page has been left blank intentionally.

Table J.1: Descriptions of introduced flora in the survey area.

Species	Description	Habitat
**Aerva javanica* (kapok Bush) 	Erect, perennial herb that is greyish in appearance. Grows between 0.4 to 1.6 m high, with white flowers from January to October (Western Australian Herbarium 1998-2018)	Prefers sandy and calcareous soils. Often found along drainage lines (Western Australian Herbarium 1998-2018)
**Cenchrus ciliaris* (buffel grass) 	Tufted, sometimes stoloniferous, tussocking perennial grass. Grows between 0.2 to 1.5 m high, with purple flowers from February to October (Western Australian Herbarium 1998-2018)	Grows on all types of soils, commonly on sand, stony red loam and black cracking clay. It is a widespread weed of roadsides, creek lines and river edges (Western Australian Herbarium 1998-2018)

Table J.2: Introduced flora locations.

Species Name	Height (m)	Cover (%)	Easting (MGA50, GDA94)	Northing (MGA50, GDA94)
**Aerva javanica*		5	475993	7719995
		25	477115	7722335
**Cenchrus ciliaris*	0.35	<2	476764	7721316
	0.5	15	476688	7220918
	0.5	15	476688	7220918
	0.35	<2	476595	7720735
	0.35	30	476595	7720735
	0.35	35	476507	7720678
	0.35	2	476507	7720678
	0.35	5	476162	7720131
	0.35	<2	476162	7720131
		10	475993	7719995
		<2	477115	7722335
		2	477000	7722167
		<2	477000	7722167
		20	476789	7721620
			476789	7721620

Table J.3: Description of Priority flora in the survey area.

	Description	Habitat
Rhynchosia bungarensis P4	Compact, prostrate shrub, to 0.5 m high. Flowers yellow. Short lived perennial. (Western Australian Herbarium 1998-2018)	Pebbly, shingly coarse sand amongst boulders. Banks of flow line in the mouth of a gully in a valley wall. (Western Australian Herbarium 1998-2018)
Terminalia supranitifolia P3	Spreading tangled tree or shrub, 1.5 to 3 m high. Flower green-yellow, May or July or December. (Western Australian Herbarium 1998-2018)	Sandy soils or among basalt rocks. (Western Australian Herbarium 1998-2018)

Table J.4: Priority flora locations.

Species Name	Abundance	Height (m)	Veg Unit	Cover (%)	Easting (MGA50, GDA94)	Northing (MGA50, GDA94)
Rhynchosia bungarensis P4	1		2b	<2	476648	7220846
	4		3b	<2	476595	7720735
	3		6b	<2	475993	7719995
	1		4b		476193	7720203
	2		2b		476612	7720787

Species Name	Abundance	Height (m)	Veg Unit	Cover (%)	Easting (MGA50, GDA94)	Northing (MGA50, GDA94)
Terminalia supranitifolia P3	1	1.75	2b	<2	476648	7220846
	2		7b		Located within an artificial drain line at the base of the Karratha LNG plant batter. The site was inaccessible and assessed from distance (from the top of the batter). No GPS location was recorded.	
	2				Located within the Karratha LNG plant site inside the flare restriction area therefore no GPS location recorded.	
	1		2b		476563	7720728
	1		4b		476261	7720345

References

Western Australian Herbarium 1998-2018, 'FloraBase – the Western Australian Flora', Department of Parks and Wildlife. http://florabase.dpaw.wa.gov.au.

Appendix K: Comparison of Vegetation Associations with Trudgen (2002) Vegetation Associations

This page has been left blank intentionally.

Table K.1: Comparison of vegetation associations with Trudgen (2002) vegetation associations.

Vegetation Associations		Corresponding Trudgen (2002) Vegetation Associations		
Site No	**Description**	**Code**	**Frequency of Occurrence**	**Description**
1b & 11b	*Corymbia hamersleyana* scattered to open low woodland over *Dichrostachys spicata* open shrubland over *Indigofera monophylla* open low shrubland over *Triodia epactia* hummock grassland. Scattered *Brachychiton acuminatus*, *Terminalia canescens* on numerous small rockpiles and outcrops.	ChCwIm	10 - 24	*Corymbia hamersleyana* scattered low trees to low open woodland over *Grevillea pyramidalis* subsp *pyramidalis* scattered tall shrubs over *Indigofera monophylla* (Burrup form) *Corchorus walcottii* low shrubland over *Triodia epactia* (Burrup form) hummock grassland.
2b	Terminalia canescens scattered to open low woodland with Brachychiton acuminatus, Grevillea pyramidalis subsp. pyramidalis and Dichrostachys spicata over open Triodia epactia, *Cenchrus ciliaris and Cymbopogon ambiguus grassland.	TcBaTe	2 - 4	*Terminalia conescens, Brachychiton acuminatus, Corymbia hamersleyana (Terminalia supranitifolia)* scattered low trees to low open woodland over scattered shrubs of *Acacia bivenosa, A. coriacea, Flueggea virosa* subsp *melanthesoides, Ipomoea costata* over *Indigofera monophylla* low shrubs over *Triodia epactia* (Burrup form) hummock grassland.
3b	*Terminalia canescens* open low woodland over open low shrubland of *Stemodia grossa* over *Triodia epactia* open hummock grass with patchy **Cenchrus ciliaris.*	TcTeSg	10 - 24	*Terminalia cancescens* low open woodland to low woodland over *Stemodia grossa* low open shrubland over *Triodia epactia* (Burrup form) hummock grassland with *Eriachne tenuiculmis* and *Dicliptera armata.*
4b	*Triodia epactia* hummock grassland with scattered *Dichrostachys spicata*, *Acacia orthocarpa* and *Grevillea pyramidalis* subsp. *pyramidalis*.	Te	50 - 99	*Triodia epactia* hummock grassland.
5b	*Eucalyptus victrix* open low woodland over *Triodia angusta* hummock grassland with some *T. epactia*.	EvTa	10 - 24	*Eucalyptus victrix* low open woodland to low woodland over *Acacia coriacea* scattered tall shrubs over *Triodia angusta* (Burrup form) hummock grassland.
6b	*Triodia epactia* hummock grassland with scattered *Grevillea pyramidalis* subsp. *pyramidalis* tall shrubs to open tall shrubland. Scattered *Brachychiton acuminatus* low trees and open *Ipomoea costata* tall shrubs on rockpiles.	GpImTe	10 - 24	*Grevillea pyramidalis* subsp *pyramidalis*, *Acacia colei* open shrubland over *Indigofera monophylla* (Burrup form) low shrubland over *Triodia epactia* hummock grassland.

Vegetation Associations		Corresponding Trudgen (2002) Vegetation Associations		
Site No	**Description**	**Code**	**Frequency of Occurrence**	**Description**
7b	Mixed tall open sometimes closed woodland and shrubland of *Terminalia canescens*, *Dichrostachys spicata*, *Brachychiton acuminatus*, *Grevillea pyramidalis* subsp. *pyramidalis*, *Ipomoea costata*, *Flueggea virosa* and *Acacia coriacea* over *Triodia epactia* hummock grassland. Although the vegetation was considered undisturbed, this drainage line has been artificially created by the adjacent NWS LNG plant batter. As a result, the woodland was dense rather than scattered.	TcBaTe	2 - 4	*Terminalia conescens, Brachychiton acuminatus, Corymbia hamersleyana (Terminalia supranitifolia)* scattered low trees to low open woodland over scattered shrubs of *Acacia bivenosa, A. coriacea, Flueggea virosa* subsp. *melanthesoides, Ipomoea costata* over *Indigofera monophylla* low shrubs over *Triodia epactia* (Burrup form) hummock grassland.
8	*Eucalyptus victrix* woodland over *Acacia ampliceps*, *Acacia coriacea* and *Flueggea virosa* tall closed shrubland with *Dichrostachys spicata*, *Pittosporum phillyreoides*, *Brachychiton acuminatus* and *Ehretia saligna*. This drainage line is fed from both natural and artificial sources (the NWS LNG site batter) which would account for the density of the vegetation.			This vegetation was not mapped by Trudgen (2002).
9b	*Acacia bivenosa* scattered to open tall shrubland over mixed *Triodia angusta* and *T. epactia* open hummock grassland.	TeAb	25 - 49	*Triodia epactia* (Burrup form) hummock grassland with scattered *Acacia bivenosa.*
10	*Terminalia canescens*, *Eucalyptus victrix* and *Corymbia hamersleyana* open low woodland over *Dichrostachys spicata* open shrubland over *Triodia angusta* hummock grassland.	TcTrTa	10 - 24	*Terminalia canescens, Eucalyptus victrix* low open woodland to low woodland over *Acacia coriacea*, *A. pyrifolia* tall scattered shrubs over *Tephrosia rosea* var *clementii* scattered low shrubs over *Triodia angusta* (Burrup form), *T. epactia* (Burrup form) hummock grassland.
	Rhizophora stylosa, Avicennia marina closed woodland.			This vegetation was not mapped by Trudgen (2002).

References

Trudgen, ME 2002, *A Flora, Vegetation and Floristic Survey of the Burrup Peninsula, Some Adjoining Areas and Part of the Dampier Archipelago With Comparisons to the Floristics of Areas on the Adjoining Mainland*, Vol. 1, Department of Mineral & Petroleum Resources, Volume 1, Perth.