



# PHOENIX

ENVIRONMENTAL SCIENCES

## Detailed flora and vegetation survey for the Mardie Project

Prepared for BCI Minerals Ltd

June 2020

Final Report



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Prepared for BCI Minerals Ltd

Final Report

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## EXECUTIVE SUMMARY

Mardie Minerals Pty Ltd (Mardie Minerals) is seeking to develop the Mardie Project (the Project) in the Pilbara region of Western Australia. Mardie Minerals is a wholly owned subsidiary of BCI Minerals Ltd (BCI). The Project is a proposed solar salt operation that will utilise seawater and evaporation to produce a concentrated salt product and other associated products. The Project will produce Sulphate of Potash (SoP) products by pumping seawater to unlined evaporation ponds via an inlet pipe located offshore. A series of evaporation and crystallisation ponds will produce a Sodium Chloride (NaCl) salt product, as well as a K<sub>2</sub>SO<sub>4</sub> by-product. The only waste product will be bitterns.

Phoenix Environmental Sciences Pty Ltd (Phoenix) was commissioned by BCI to undertake a detailed flora and vegetation survey for the Project with field surveys conducted from 2017-2020. Phoenix undertook a desktop study and site reconnaissance to inform the MSP Pre-Feasibility Study (PFS) for the Project in 2017. The key findings of the desktop study and site reconnaissance with respect to flora and vegetation were:

- the desktop assessment indicated that
  - the Study Area potentially supports highly diverse flora
  - the Study Area potentially supports a high number of vegetation types
  - 34 significant flora may occur within the Study Area, including one species listed as Vulnerable under the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act), *Eleocharis papillosa*
  - the Priority Ecological Community (PEC; Priority 3), Horseflat Land System of the Roebourne Plain may occur in the Study Area
- the field reconnaissance survey determined that
  - a lower floristic and vegetation type diversity was present in the Study Area than that indicated from the desktop assessment
  - suitable habitat for 14 of the 34 significant flora identified in the desktop assessment may be present in the Study Area
  - no suitable habitat for *Eleocharis papillosa* was present in the Study Area
  - one vegetation type, low mixed grassland, *Eragrostis* spp., may align with the Horseflat Land System of the Roebourne Plains PEC
  - large infestations of the Declared Pest, *\*Prosopis* spp. were present in the Study Area.

Based on these findings, Phoenix was subsequently commissioned by BCI to undertake a detailed survey for the Project. The final Study Area for the detailed flora and vegetation survey was 29,020.4 ha in size and encompassed a 16,023.1 ha Development Envelope (DE) (excluding some of the marine areas).

Survey design, methodology and report-writing adhered to relevant principles and guidelines and was conducted over four seasons Autumn and Spring 2018, Spring 2019 and Autumn 2020. In total, 74 quadrats, 11 transects and 20 relevé surveys were conducted. In addition, searches for significant flora were conducted at previous records for species identified by the desktop review and in suitable habitat encountered while traversing the Study Area. Quadrat and transect data were analysed (separately) and sites grouped by hierarchical cluster analyses (UPGMA). Vegetation types were then defined by clusters of quadrats, supplemented by field observations based on species composition, structure and dominance at the stratum level.

A total of 253 flora taxa representing 44 families and 122 genera identified to species level were recorded in the Study Area during the field surveys. The assemblage comprised 245 native species and eight introduced species, including 177 perennial species, 73 annual or short-lived species and three unknown lifecycles. The most prominent families recorded were Fabaceae (50 species), Poaceae (31 species), Chenopodiaceae (30 species), Amaranthaceae (18 species) and Malvaceae (16 species).

One EPBC Act listed flora species, *Minuria tridens* (listed as Priority (P) 1 flora in Western Australia) and one other Priority flora *Goodenia nuda* (P4) were recorded in the Study Area during the survey. A search was conducted at the location of a record for *Owenia acidula* (P3) in the Study Area but no plants of the species were found. Assessment of the likelihood of occurrence of the remaining 33 significant flora identified from the desktop assessment determined one Priority flora, *Owenia acidula* (P3), was likely to be present in the Study Area, seven Priority flora as possible and 25 unlikely. Despite the presence of suitable habitat in the Study Area for eight of the species identified in the desktop assessment it was considered unlikely that the species occurred due to a lack of records in close proximity and as the Study Area occurred outside of the mapped distribution for the species.

The Study Area represents an extension to the mapped distribution of six species, *Amaranthus clementii*, *Carissa lanceolata*, *Cassutha aurea* var. *aurea*, *Cyperus rigidellus*, *Melaleuca lasiandra* and *Trianthema cusackianum* which are subsequently considered significant records for the species. One samphire taxon identified as *Tecticornia* sp. affinity to *T. halocnemoides* large ovate seed aggregate was considered by taxonomic specialist, Dr Kelly Shepherd, to represent an undescribed species and is therefore considered a significant species. Four other *Tecticornia* specimens could not be identified to species level and may also represent undescribed taxa.

In total, 24 vegetation types were defined for the Study Area and comprised a complex of *Tecticornia* spp. shrublands (comprising eight vegetation types), a mangrove community, five spinifex (*Triodia* spp.) steppe grasslands, four grasslands, a *Melaleuca argentea* and *Sesbania formosa* woodland, a mid to tall *Acacia* spp. shrubland over *Triodia longiceps* hummock grassland, a low *Acacia* spp. Shrubland over *Triodia wiseana* hummock grassland, a low open *Eucalyptus victrix* woodland over *Acacia* spp. shrubland over *Triodia* spp. hummock grassland, a *\*Prosopis* spp. tall shrubland and a low shrubland over *Sporobolus virginicus* grassland. The *Tecticornia* spp. shrublands were the most widespread accounting for 33.4% of vegetation, followed by PgvAsTI (12.6%, a mid isolated *\*Prosopis glandulosa* x *velutina* over isolated low shrubland over *Triodia* spp. grassland).

Areas naturally devoid of vegetation within the Study Area comprised 13,166.9 ha (45.4%) and a further 241.6 ha (0.8%) comprised cleared areas rated as Completely Degraded. Vegetated areas ranged in condition from Excellent to Degraded, with the majority (12,450.8 ha or 79.7% of vegetated areas in the Study Area) recorded to be in Excellent to Very Good condition, largely as a result of the *Tecticornia* spp. shrublands and mangroves on the tidal mudflats being subject to little or no disturbance. Degraded to Good condition was assigned elsewhere primarily due to disturbance in the form of weed infestations, particularly *\*Prosopis* spp. and *\*Cenchrus ciliaris*. Mardie station is recognised as the largest infestation of the Declared Pest *\*Prosopis* spp. in the State, with a large infestation present in the Study Area.

None of the vegetation described in the Study Area was considered representative of a Commonwealth or State-listed Threatened Ecological Community (TEC). Areas of one vegetation type recorded for the Study Area, PgvExCt, in Very Good or Excellent condition were considered to be representative of the Horseflat Land System of the Roebourne Plains PEC. A total of 483 ha was mapped as the PEC.

A total of 11 vegetation types were considered significant as they had restricted distribution in the Study Area and/or represented a refuge for species not recorded elsewhere in the Study Area. Vegetation type AcAjTe was considered significant as it represented habitat for the P1 species *Minuria tridens*; this vegetation was recorded both within and outside of the DE. Similarly, the *Tecticornia* spp.



shrublands recorded both within and outside of the DE were considered significant as they represent habitat for a taxon considered new to science.

# 1 INTRODUCTION

Mardie Minerals Pty Ltd (Mardie Minerals) is seeking to develop the Mardie Project (the Project) in the Pilbara region of Western Australia (Figure 1-1). Mardie Minerals is a wholly owned subsidiary of BCI Minerals Ltd (BCI).

Phoenix Environmental Sciences Pty Ltd (Phoenix) was commissioned by BCI to undertake a detailed flora and vegetation survey for the Project in 2018, following an initial desktop study and reconnaissance survey in 2017. Supplementary survey work was conducted in 2019, following the detailed survey. This report presents the findings of all baseline flora and vegetation surveys conducted for the Project.

## 1.1 BACKGROUND

The Project is a proposed solar salt operation that will utilise seawater and evaporation to produce a concentrated salt product and other associated products. The Project will produce Sulphate of Potash (SoP) products by pumping seawater to unlined evaporation ponds via an inlet pipe located offshore. A series of evaporation and crystallisation ponds will produce a Sodium Chloride (NaCl) salt product, as well as a K<sub>2</sub>SO<sub>4</sub> by-product. The only waste product will be bitterns.

Phoenix undertook a desktop study and site reconnaissance to inform the MSP Pre-Feasibility Study (PFS) for the Project in 2017 (Phoenix 2017a). The key findings of the desktop study and site reconnaissance with respect to flora and vegetation were:

- the desktop assessment indicated that
  - the Study Area potentially supports highly diverse flora
  - the Study Area potentially supports a high number of vegetation types
  - 34 significant flora may occur within the Study Area, including one species listed as Vulnerable under the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act), *Eleocharis papillosa*
  - the Priority Ecological Community (PEC; Priority 3), Horseflat Land System of the Roebourne Plain may occur in the Study Area
  - the scale and nature of potential impacts from the proposed Project on flora and vegetation are likely to be significant
- the field reconnaissance survey determined that
  - a lower floristic and vegetation type diversity was present in the Study Area than that indicated from the desktop assessment
  - suitable habitat for 14 of the 34 significant flora identified in the desktop assessment may be present in the Study Area
  - no suitable habitat *Eleocharis papillosa* was present in the Study Area
  - one vegetation type, low mixed grassland, *Eragrostis* spp., may align with the Horseflat Land System of the Roebourne Plains PEC
  - large infestations of the Declared Pest, *\*Prosopis* spp. were present in the Study Area.

The detailed flora and vegetation survey was commissioned by BCI based on the desktop and reconnaissance findings. The results of the detailed survey were initially reported in April 2019 (Phoenix 2019). Following the finalisation of this report, supplementary surveys were commissioned

to ground truth areas of extrapolated vegetation mapping and undertake targeted searches for a significant flora species, *Minuria tridens* (Vulnerable under the EPBC Act; Priority 1 at State level), recorded in the detailed survey. The areas of extrapolated vegetation mapping resulted from changes to the Project Development Envelope post-survey which consequently extended outside the initial Study Area for the detailed survey. The *M. tridens* record represented an 800 km range extension for the species and required further survey to define and measure the newly discovered population.

## 1.2 SCOPE OF WORK

The detailed flora and vegetation survey was conducted over three seasons. The scope of works for each seasonal survey are described below.

### 1.2.1 Scope 1 – autumn 2018

The scope of work for the autumn flora and vegetation survey was to conduct a detailed flora and vegetation field survey of the Study Area comprising –

- establishment and sampling of permanent quadrats or transects in terrestrial vegetation and, salt flat and coastal samphire vegetation
- targeted searches for significant flora
- mapping of the extent of the Declared Pest, Mesquite (*\*Prosopis* spp.), in the Study Area
- preliminary description of vegetation communities and evaluation of their conservation status
- preliminary mapping of salt flat and coastal samphire communities within the Study Area
- preliminary description and mapping of vegetation condition.

### 1.2.2 Scope 2 – spring 2018

The scope of work for the spring flora and vegetation survey was to:

- conduct a detailed flora and vegetation field survey of the Study Area comprising –
  - re-visit quadrats and transects established in autumn 2018 to search for seasonal annual species not present in spring, recollect specimens of taxa not identifiable to species level from spring collections, review vegetation condition rating
  - establish further quadrats and transects to provide sufficient replication of vegetation types defined from the spring survey
  - further target significant flora recorded in autumn 2018 and as needed if Project plans have changed
  - map, describe and determine regional significance of flora in the Study Area
  - update descriptions of vegetation communities and their conservation status
  - update mapping of salt flat and coastal samphire communities within the Study Area
  - update descriptions and mapping of vegetation condition
- update data sets and identify species collected during the field surveys
- identify key environmental assets
- prepare a comprehensive flora and vegetation technical report and supporting digital data.

### 1.2.3 Scope 3 – spring 2019

The scope of work for the spring 2019 flora and vegetation survey was:

- undertake targeted surveys for *Minuria tridens* (P1)
- conduct a flora and vegetation survey of the extended Study Area including
  - quadrat sampling
  - ground-truthing of previously extrapolated vegetation type and condition mapping
  - ground-truthing of previously extrapolated Horseflats Land System PEC mapping
  - targeted searches for significant flora and vegetation.
- update data sets and identify species collected during the field surveys
- update the flora and vegetation technical report and supporting digital data.

### 1.2.4 Scope 4 – autumn 2020

The scope of work for the autumn 2020 flora and vegetation survey was:

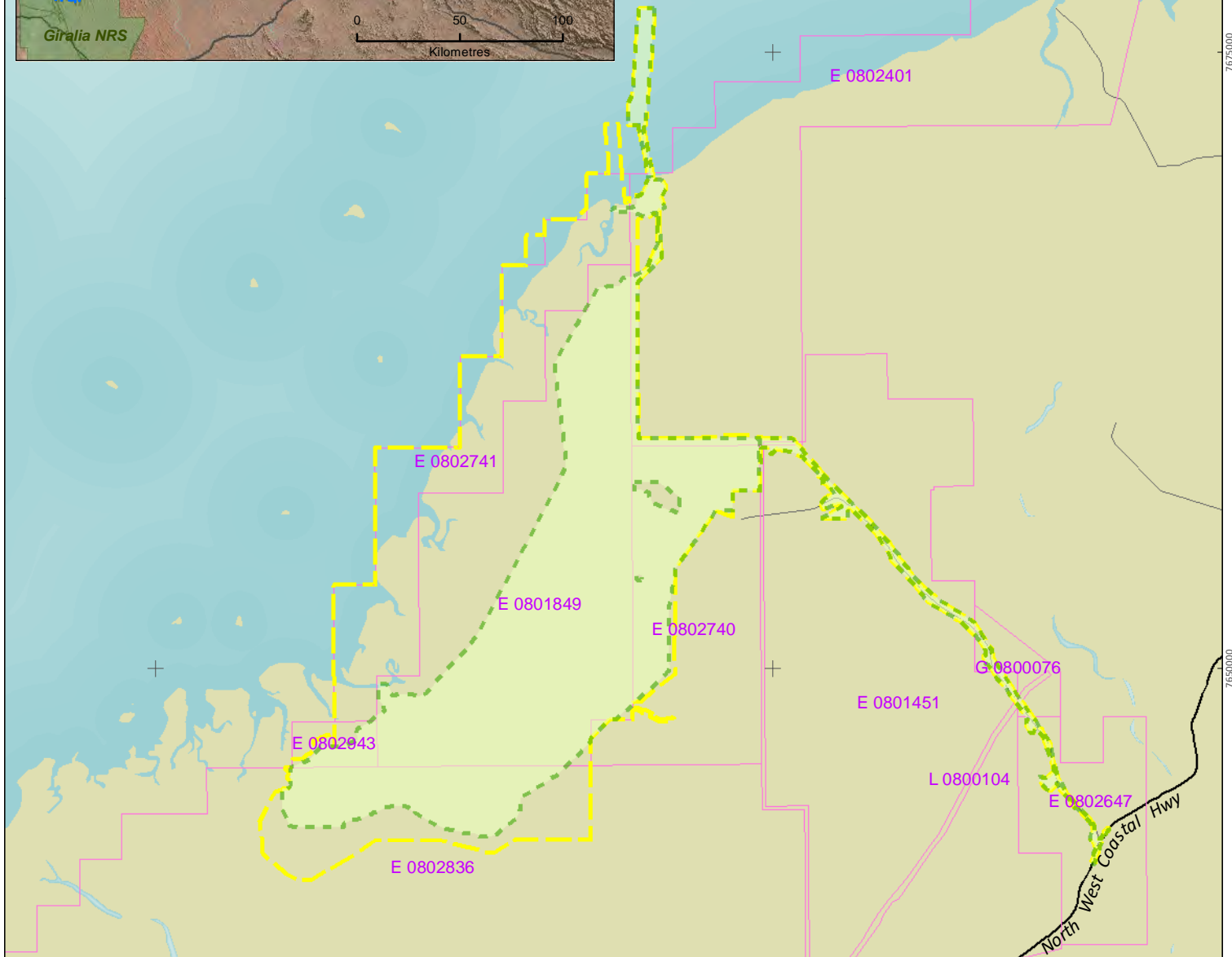
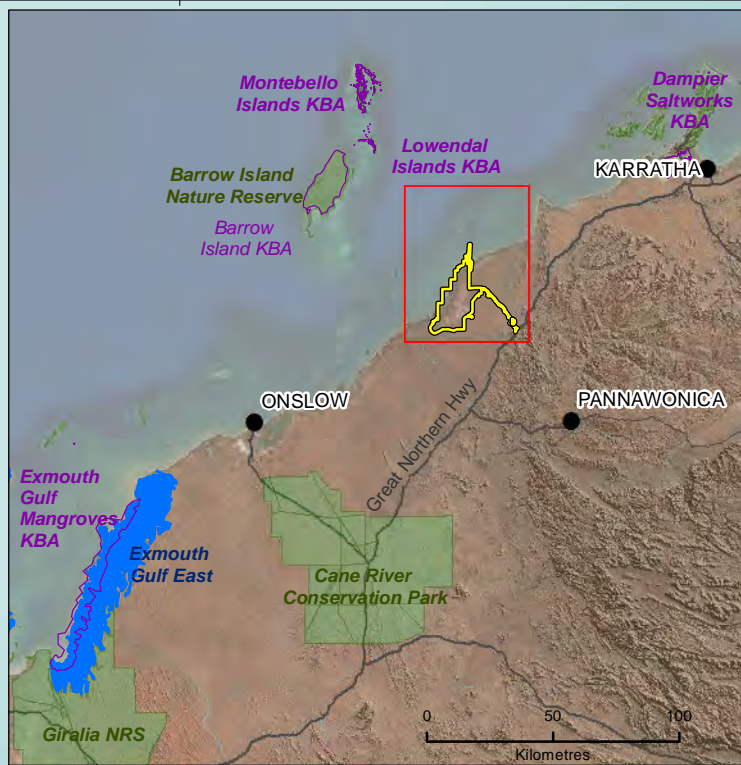
- undertake targeted surveys for *Minuria tridens* (P1)
- flora and vegetation survey including
  - visit all previously unsurveyed areas to ground truth extrapolated vegetation mapping, conduct quadrat surveys or relevé surveys as required to demonstrate the presence of the mapped vegetation
  - install quadrats in extrapolated areas
- *Tecticornia* survey, including
  - undertake targeted searches at previous *Tecticornia* transect and quadrat survey sites where species were unable to be identified to species level as a result of being sterile during previous surveys to attempt to collect fertile material to facilitate positive identification
  - undertake targeted searches of *Tecticornia* vegetation outside of the DE to attempt to locate further occurrences of significant *Tecticornia* species
  - undertake further transect surveys of *Tecticornia* vegetation types focussing on attempting to delineate different vegetation types to at least those present in coastal/tidal areas as opposed to those associated with the landward side of the mudflats.
- update data sets and identify species collected during the survey
- update the flora and vegetation technical report and supporting digital data.


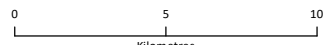
## 1.3 STUDY AREA


The final Study Area for the detailed flora and vegetation survey was 29,020.4 ha in size and occurred within tenements E08/2741, E08/1849, E08/2740, E08/2943, E08/2401, E08/1451, E08/2647, E08/2836, G08/0076 and L08/0104 (Figure 1-1). The Project will be developed within three separate

Development Envelopes (DEs) – Ponds DE, Marine DE and Terrestrial Infrastructure DE, shown collectively as the Development Envelope (DE) in this report which is 16,023.1 ha in total (Figure 1-1).


The Study Area encompasses the land-based components of the DE (Figure 1-1), but partly extends into the marine areas.



BCI Minerals Ltd Biological surveys for the Mardie Salt Project	
Project No	1189/1279/1318
Date	22-Jun-20
Drawn by	AJ
Map author	JC
	
	
1:250,000 (at A4)      GDA 1994 MGA Zone 50	

-  Study Area
-  Development Envelope
-  Tenements
-  Conservation reserves
-  Important Bird Areas
-  Nationally important wetlands

**Figure 1-1**  
**Project location and Study Area**



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## 2 LEGISLATIVE CONTEXT

The protection of flora and vegetation in Western Australia (WA) is principally governed by three acts:

- Commonwealth EPBC Act
- State *Biodiversity Conservation Act 2016* (BC Act)
- State *Environmental Protection Act 1986* (EP Act).

### 2.1 COMMONWEALTH

The EPBC Act is administered by the Federal Department of the Environment and Energy (DoEE). Under the EPBC Act, actions that have, or are likely to have, a significant impact on a Matter of National Environmental Significance (NES), require approval from the Australian Government Minister for the Environment through a formal referral process. The EPBC Act provides for the listing of Threatened native flora and threatened ecological communities (TECs) as matters of NES.

Conservation categories applicable to Threatened Flora species under the EPBC Act are as follows:

- Extinct (EX)<sup>1</sup> – there is no reasonable doubt that the last individual has died
- Extinct in the Wild (EW) – taxa known to survive only in captivity
- Critically Endangered (CR) – taxa facing an extremely high risk of extinction in the wild in the immediate future
- Endangered (EN) – taxa facing a very high risk of extinction in the wild in the near future
- Vulnerable (VU) – taxa facing a high risk of extinction in the wild in the medium-term
- Conservation Dependent (CD)<sup>1</sup> – taxa whose survival depends upon ongoing conservation measures; without these measures, a conservation dependent taxon would be classified as Vulnerable, Endangered or Critically Endangered.

Ecological communities are defined as ‘naturally occurring biological assemblages that occur in a particular type of habitat’ (English & Blyth 1997). There are three categories under which ecological communities can be listed as TECs under the EPBC Act: Critically Endangered, Endangered and Vulnerable.

### 2.2 STATE

#### 2.2.1 Threatened and Priority species

In WA, the BC Act provides for the listing of threatened flora species in the following categories:

- critically endangered – species facing an extremely high risk of extinction in the wild in the immediate future<sup>2</sup>
- endangered – species facing a very high risk of extinction in the wild in the near future<sup>2</sup>
- vulnerable – species facing a high risk of extinction in the wild in the medium-term future<sup>2</sup>.

---

<sup>1</sup> Species listed as Extinct and Conservation Dependent are not matters of NES and therefore do not trigger the EPBC Act.

<sup>2</sup> As determined in accordance with criteria set out in the ministerial guidelines.

Species may also be listed as specially protected under the BC Act in the one or more of the following categories:

- species of special conservation interest – species with a naturally low population, restricted natural range, of special interest to science, or subject to or recovering from a significant population decline or reduction in natural range
- migratory species
- cetaceans
- species subject to international agreement
- the category of species otherwise in need of special protection.

The Department of Biodiversity Conservation and Attractions (DBCA) administers the BC Act and also maintains a non-statutory list of Priority flora. Priority species are still considered to be of conservation significance – that is they may be rare or threatened – but cannot be considered for listing under the WC Act until there is adequate understanding of threat levels imposed on them. Species on the Priority flora list are assigned to one of four Priority (P) categories, P1 (highest) – P4 (lowest), based on level of knowledge/concern.

### **2.2.2 Threatened and Priority Ecological Communities**

The BC Act provides for the listing of TECs in the following categories:

- critically endangered ecological community – facing an extremely high risk of becoming eligible for listing as a collapsed ecological community in the immediate future<sup>2</sup>
- endangered ecological community – facing a very high risk of becoming eligible for listing as a collapsed ecological community in the near future<sup>2</sup>
- vulnerable ecological community – facing a high risk of becoming eligible for listing as a collapsed ecological community in the medium-term future<sup>2</sup>.

An ecological community may be listed as a collapsed ecological community under the BC Act if there is no reasonable doubt that the last occurrence of the ecological community has collapsed or the ecological community has been so extensively modified throughout its range that no occurrence of it is likely to recover its species composition and/or structure.

The DBCA also maintains a non-statutory list of PECs, which may become TECs in the future, however, do not currently meet survey criteria or that are not adequately defined. PECs are assigned to one of five categories depending on their priority for survey or definition, with Priority 1 of highest concern and Priority 5 of lowest concern.

### **2.2.3 Critical habitat**

Under the BC Act, habitat is eligible for listing as critical habitat if it is critical to the survival of a threatened species or a TEC and its listing is otherwise in accordance with the ministerial guidelines.

### **2.2.4 Significant flora and vegetation**

Flora and vegetation may be considered significant for a range of reasons, including, but not limited to the following (EPA 2016b):

- Flora:
  - being identified as Threatened or Priority species



- locally endemic or association with a restricted habitat type (e.g. surface water or groundwater dependent ecosystems)
  - new species or anomalous features that indicate a potential new species
  - representative of the range of a species (particularly, at the extremes of range recently discovered range extensions, or isolated outliers of the main range)
  - unusual species, including restricted subspecies, varieties or naturally occurring hybrids
  - relictual status, being representative of taxonomic groups that no longer occur widely in the broader landscape.
- Vegetation:
    - being identified as TECs or PECs
    - restricted distribution
    - degree of historical impact from threatening processes
    - a role as a refuge
    - providing an important function required to maintain ecological integrity of a significant ecosystem.

### **2.2.5 Environmentally Sensitive Areas**

Under section 51B of the EP Act the Minister for Environment may declare by notice either a specified area of the State or a class of areas of the State to be ESAs. ESAs are declared in the *Environmental Protection (Environmentally Sensitive Areas) Notice 2005*, which was gazetted on 8 April 2005 (DMP 2008). ESAs are areas where the vegetation has high conservation value. Several types of areas are declared ESAs including:

- the area covered by vegetation within 50 m of Threatened Flora, to the extent to which the vegetation is continuous with the vegetation in which the Threatened Flora is located
- the area covered by a TEC
- a defined wetland (Ramsar wetlands, conservation category wetlands and nationally important wetlands) and the area within 50 m of the wetland.

## 2.3 INTRODUCED FLORA

Introduced flora pose threats to biodiversity and natural values by out-competing native species for available nutrients, water, space and sunlight; reducing the natural structural and biological diversity by smothering native plants or preventing them from growing back after clearing, fire or other disturbance; replacing the native plants that animals use for shelter, food and nesting; and altering fire regimes, often making fires hotter and more destructive (AWC 2007).

Management of some weed species is required under Commonwealth or State frameworks. Key classifications for significant introduced flora that are relevant to this report are:

- Declared Pest – the *Biosecurity and Agriculture Management Act 2007* (BAM Act), Section 22 makes provision for a plant taxon to be listed as a Declared Pest organism in parts of, or the entire State. Under the *Biosecurity and Agriculture Management Regulations 2013* Declared Pests are assigned to one of three control categories that dictate level of management required (DPIRD 2018).
- Weed of National Significance (WoNS) – high impact, established introduced flora causing major economic, environmental, social and/or cultural impacts in a number of states/territories, and which have strong potential for further spread (Australian Weeds Committee 2012). Management is required in accordance with Department of Agriculture and Food guidelines for particular WoNS.

Throughout this report, introduced flora species are indicated with an asterisk (\*).

### 3 EXISTING ENVIRONMENT

#### 3.1 INTERIM BIOGEOGRAPHIC REGIONALISATION OF AUSTRALIA

The Study Area is situated primarily (91.7%) within the Roebourne subregion (PIL4) of the Pilbara bioregion. An insignificant proportion (0.2%) falls within the Chichester subregion (PIL1) of the Pilbara bioregion and about 4.5% intersects non-terrestrial areas occupied by marine habitats (Figure 3-1). The Roebourne subregion is described as (Kendrick & Stanley 2001):

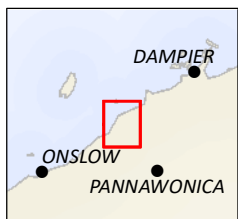
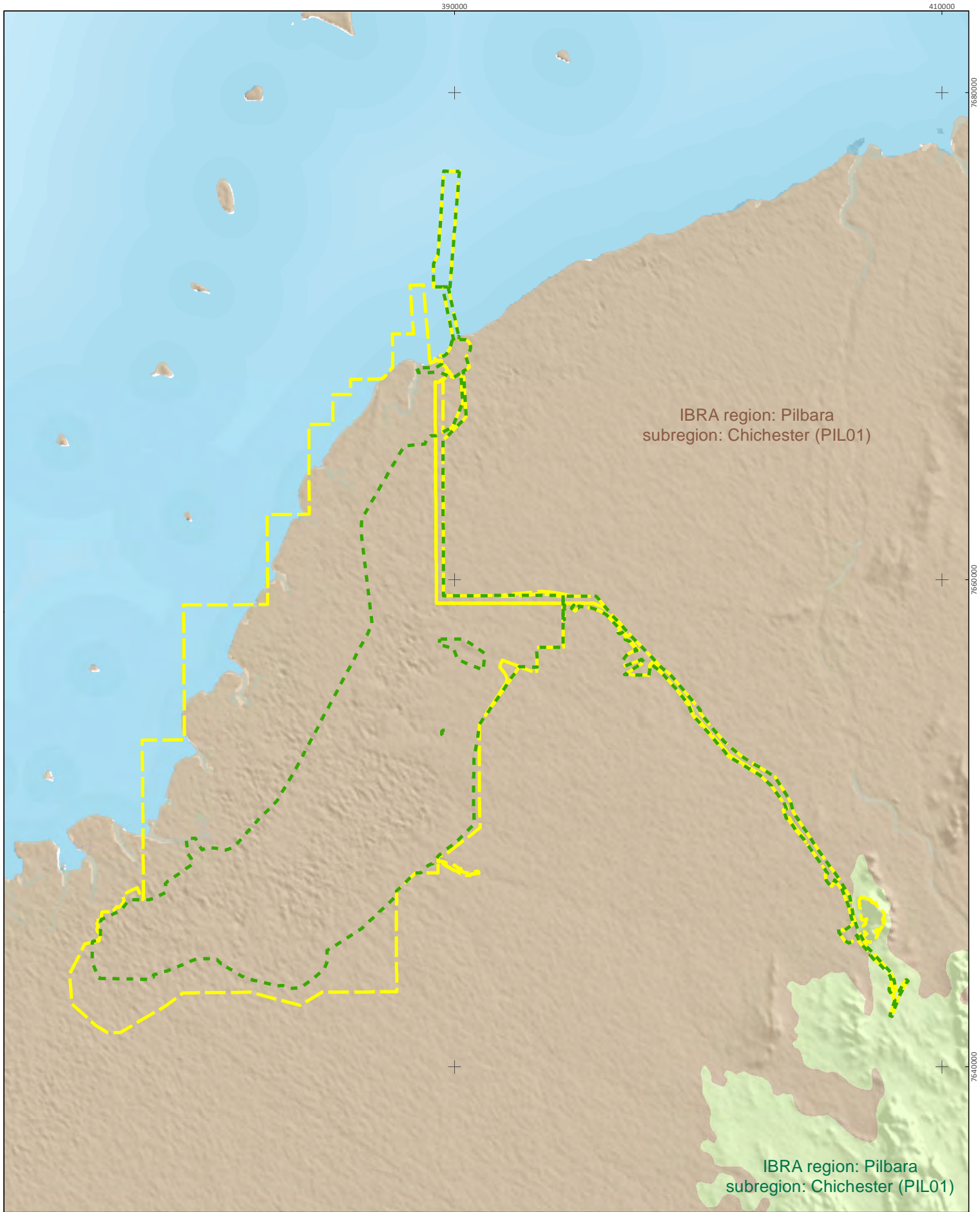
Quaternary alluvial and older colluvial coastal and subcoastal plains with a grass savannah of mixed bunch and hummock grasses, and dwarf shrub-steppe of *Acacia stellaticeps* or *A. pyrifolia* and *A. inaequilatera*. Uplands are dominated by *Triodia* hummock grasslands. Ephemeral drainage lines support *Eucalyptus victrix* or *Corymbia hamersleyana* woodlands. Samphire, *Sporobolus* and mangal occur on marine alluvial flats and river deltas. Resistant linear ranges of basalts occur across the coastal plains, with minor exposures of granite. Islands are either Quaternary sand accumulations, or composed of basalt or limestone, or combinations of any of these three. The subregion experiences an arid (semi-desert) tropical climate with highly variable rainfall, often influenced by cyclonic activity in the northwest of WA and falling during summer.



#### 3.2 LAND SYSTEMS





The Study Area intersects eight land systems, as mapped by the Department of Agriculture and Food Western Australia (Figure 3-2). The Littoral system is the dominant land system of the Study Area occupying approximately 61.4%, followed by the Onslow system (19.0%), with the remaining six systems occupying less than 10% of the Study Area (Table 3-1). Nearly 8% of the Study Area occurs in un-mapped non-terrestrial areas occupied by marine habitats (Table 3-1).

**Table 3-1 Description of land systems intersecting the Study Area**

Land system	Land system description	Area (ha)	% of Study Area
Littoral	Bare coastal mudflats (unvegetated), samphire flats, sandy islands, coastal dunes and beaches, supporting samphire low shrublands, sparse <i>Acacia</i> shrublands and mangrove forests.	17,814.8	61.4
Onslow	Undulating sandplains, dunes and level clay plains supporting soft spinifex grasslands and minor tussock grasslands.	5,518.3	19.0
Un-mapped	Ocean and marine areas.	2,217.9	7.6
Horseflat	Gilgaied clay plains supporting Roebourne Plains grass grasslands and minor grassy snakewood shrublands.	1,838.5	6.3
Yamerina	Flood plains and deltaic deposits supporting tussock grasslands, woodlands with Buffel Grass and minor halophytic low shrublands.	1,463.6	5.0
Rocklea	Basalt hills, plateaux, lower slopes and minor stony plains supporting hard spinifex and occasionally soft spinifex grasslands with scattered shrubs.	81.2	0.3
Ruth	Hills and ridges of volcanic and other rocks supporting shrubby hard spinifex and occasionally soft spinifex grasslands.	49.7	0.2
Peedamulla	Gravelly plains supporting hard spinifex grasslands and minor snakewood shrublands.	33.3	0.1
Boolgeeda	Stony lower slopes and plains below hill systems supporting hard and soft spinifex grasslands or mulga shrublands.	3.2	<0.1
<b>Total</b>		<b>29,020.4</b>	<b>100</b>



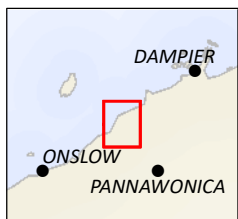
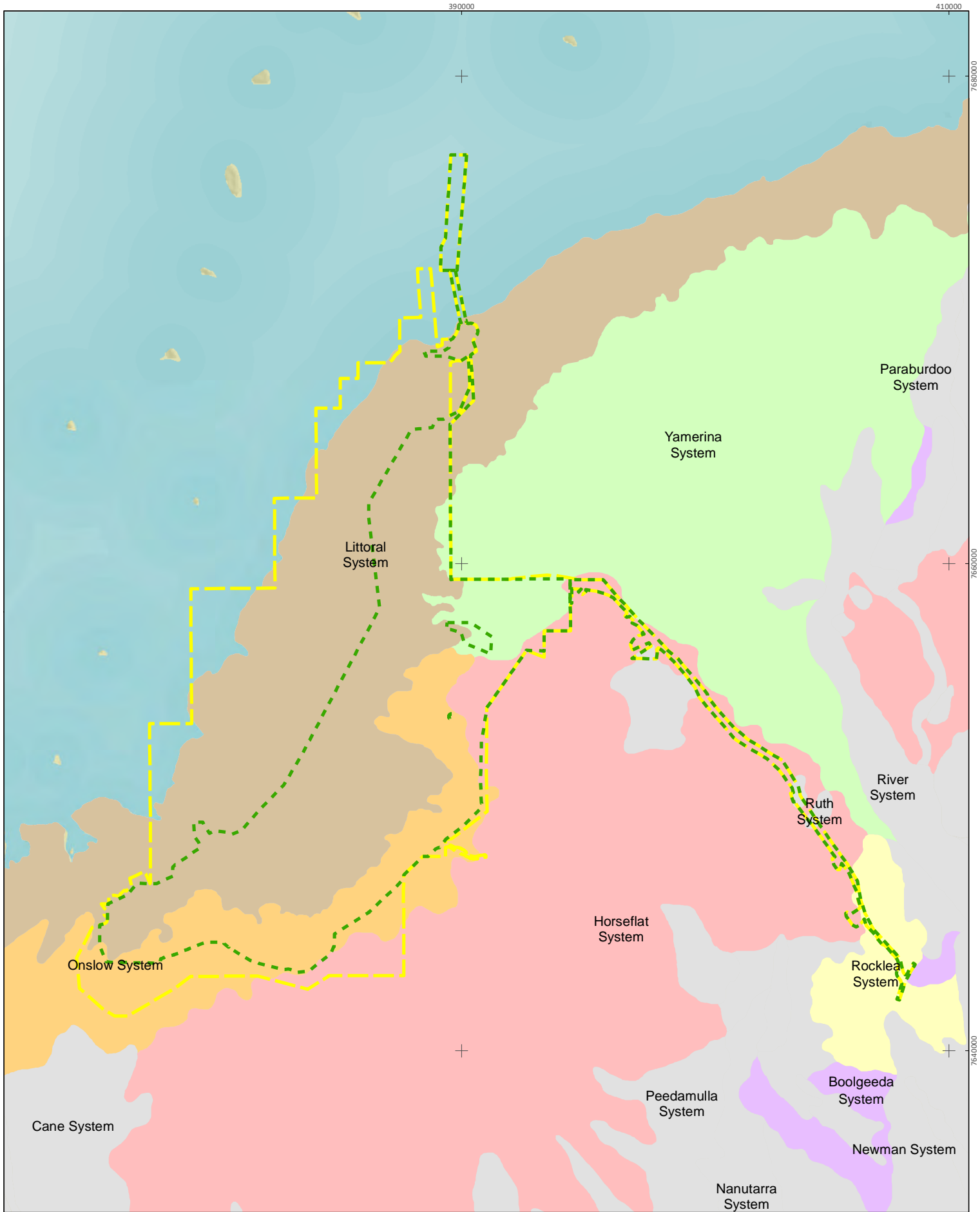
BCI Minerals Ltd Biological surveys for the Mardie Salt Project	
Project No	1189/1279/1318
Date	22-Jun-20
Drawn by	AJ
Map author	JC
	
	
1:200,000 (at A4)	GDA 1994 MGA Zone 50


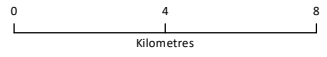
	Study Area
	Development Envelope
<b>IBRA subregion</b>	
	Chichester (PIL01)
	Roebourne (PIL04)



**Figure 3-1**  
**IBRA regions and subregions of the Study Area**










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-  Study Area
-  Development Envelope

- Land system**
-  Boolgeeda System
  -  Horseflat System
  -  Littoral System
  -  Onslow System
  -  Rocklea System
  -  Yamerina System
  -  Other land systems

**Figure 3-2**  
**Land systems of the Study Area**



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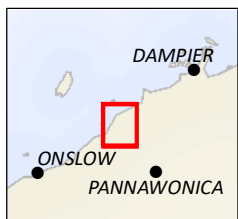
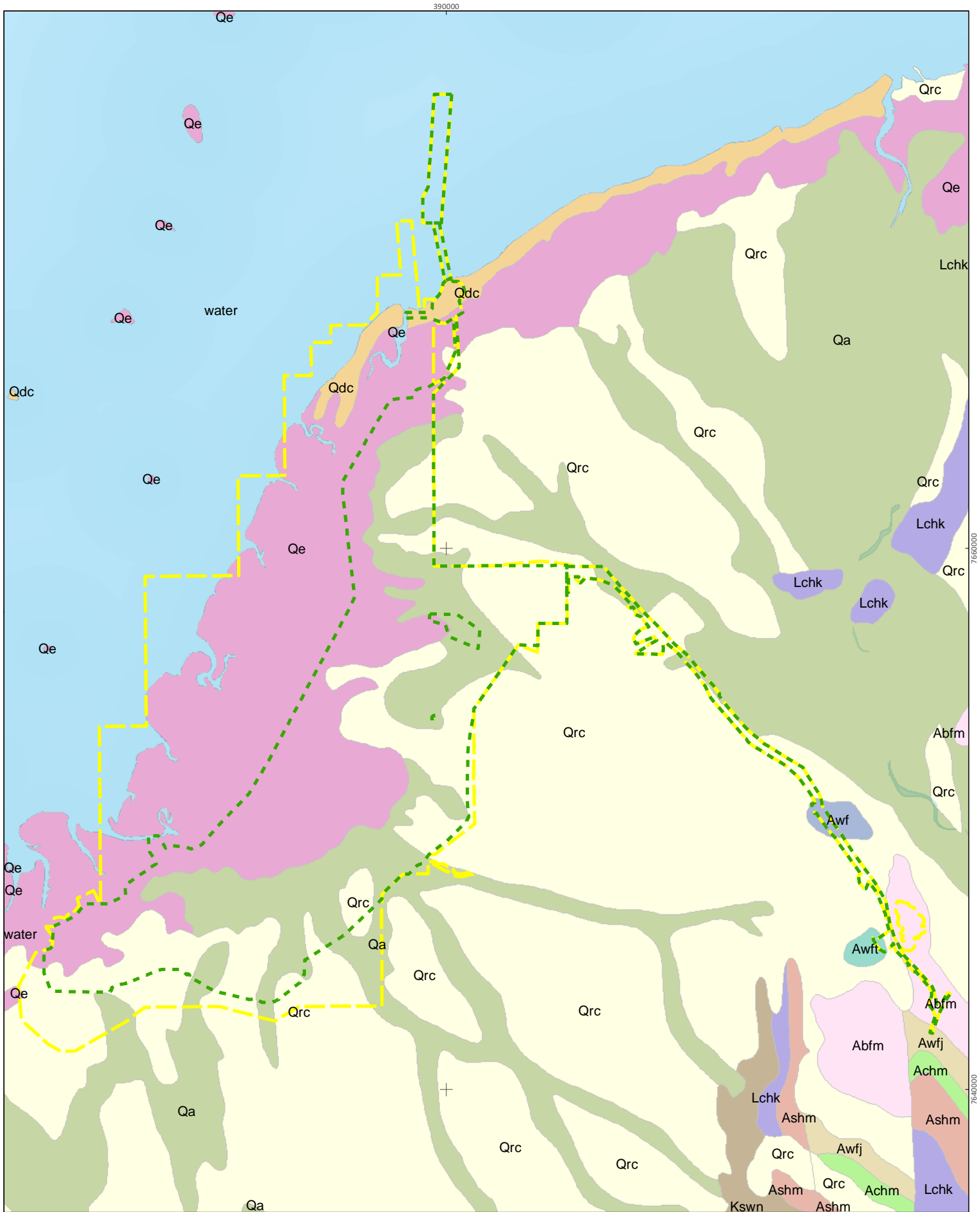
### 3.3 GEOLOGY

The surface geology of the Study Area is dominated by Quaternary deposits formed during the Cainozoic to late Mesozoic era, namely estuarine and delta deposits – coastal silt and evaporite deposits; estuarine, lagoonal, and lacustrine deposits (Qe), alluvium – channel and flood plain alluvium; gravel, sand, silt, clay, locally calcreted (Qa), and colluvium – sheetwash, talus; gravel piedmonts and aprons over and around bedrock; clay-silt-sand with sheet and nodular kankar; alluvial and aeolian sand-silt-gravel in depressions and broad valleys in Canning Basin; local calcrete, reworked laterite (Qrc) (Table 3-2; Figure 3-3) (CQ Group 2014).

Smaller parts of the Study Area are covered by coastal sand dunes (Qdc) and Archaean Maddina Formation – massive, vesicular and amygdaloidal basalt, basaltic andesite, and andesite, minor dacite, dolerite sills; bedded lapilli, vitric, crystal and lithic tuff, volcanoclastic siltstone, shale, chert, sandstone, dolomite (Abfm) (Table 3-2; Figure 3-3) (see also Williams 1968).

**Table 3-2 Surface geology of the Study Area, extent by deposit type**

Surface geology	Abbreviation	Description	Area (ha)
Colluvium	Qrc	Colluvium, sheetwash, talus; gravel piedmonts and aprons over and around bedrock; clay-silt-sand with sheet and nodular kankar; alluvial and aeolian sand-silt-gravel in depressions and broad valleys in Canning Basin; local calcrete, reworked laterite.	6,770.1
Alluvium	Qa	Channel and flood plain alluvium; gravel, sand, silt, clay, locally calcreted.	5,516.2
Estuarine and delta deposits	Qe	Coastal silt and evaporite deposits; estuarine, lagoonal, and lacustrine deposits.	13,242.0
Maddina Formation	Abfm	Massive, vesicular and amygdaloidal basalt, basaltic andesite, and andesite, minor dacite, dolerite sills; bedded lapilli, vitric, crystal and lithic tuff, volcanoclastic siltstone, shale, chert, sandstone, dolomite.	74.9
Coastal sand dunes	Qdc	Beach sand, sand dunes, coastal dunes, beaches, and beach ridges; calcareous and siliceous, locally shelly and/or cemented (beach rock); locally reworked.	549.9
Neoarchean	Awf	Massive, vesicular and amygdaloidal basalt, basaltic andesite, and andesite, minor dacite, dolerite sills; bedded lapilli, vitric, crystal and lithic tuff, volcanoclastic siltstone, shale, chert, sandstone, dolomite.	52.7
Neoarchean	Awft	Pisolitic tuff, siliceous limestone and dolomite, mudstone, tuffaceous shale, siltstone, sandstone, volcanoclastic sandstone and siltstone, calcareous sandstone, local basalt and basaltic breccia, chert, local conglomerate, shale, jasper.	16.1
Jeerinah Formation	Awftj	Shale, sandstone, siltstone, mudstone, dolomite, local microbanded chert, jaspilite, conglomerate; fine-grained massive rhyolite; mafic tuff with local accretionary lapilli and agglomerate; thin basalt/dolerite and andesitic basalt flows	2.8
Water	water	water	2,795.7
<b>Total</b>			<b>29,020.4</b>



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Biological surveys for the Mardie Salt Project

Project No 1189/1279/1318  
Date 23-Jun-20  
Drawn by AJ  
Map author JC

0 3 6  
Kilometres

1:180,000 (at A4) GDA 1994 MGA Zone 50

Study Area  
 Development Envelope

**Surface geology**

Abfm	Kswm
Achm	Lchk
Ashm	Qa
Awf	Qdc
Awfj	Qe
Awft	Qrc
	water

**Figure 3-3**  
**Surface geology of the Study Area**

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## **3.4 HYDROLOGY**

### **3.4.1 Groundwater**

Hydrological studies of relevance to the Study Area have been conducted for both the Robe River and Fortescue River alluvials to the north-east and south-west of the Study Area (Commander 1994a, b). The lower Fortescue alluvial aquifer intersects the northern section of the Study Area (CGG Consulting 2014). More recently, groundwater models have been compiled for the Balmoral South and Sino Iron Ore Projects to the north-east of the Study Area in the Fortescue River estuary (Bennelongia 2008; CloudGMS 2017).

Depth to groundwater at the Fortescue River mouth is 5–15 m; depth to groundwater within the Balmoral South Project is about 20–35 m. Groundwater is mostly fresh (1,500–7,000 mg/L TDS), although more saline water has also been recorded (Bennelongia 2008). This is consistent with results from other studies in the Fortescue River aquifer, that show salinity in the aquifer rises from 345 mg/L TDS close to the river to more than 1,000 mg/L near the tidal flats where there is a saltwater interface (Commander 1994a).

The majority of the Mardie tenement is mapped as Acid Sulphate Soil (ASS) risk Class 1 (CGG Consulting 2014). The tenement sits atop the Pilbara groundwater resource allocation area, which is divided into the Ashburton and East Pilbara Groundwater sub-areas (CGG Consulting 2014).

### **3.4.2 Surface water**

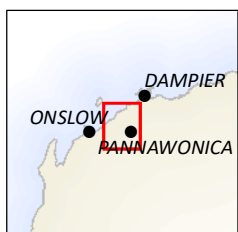
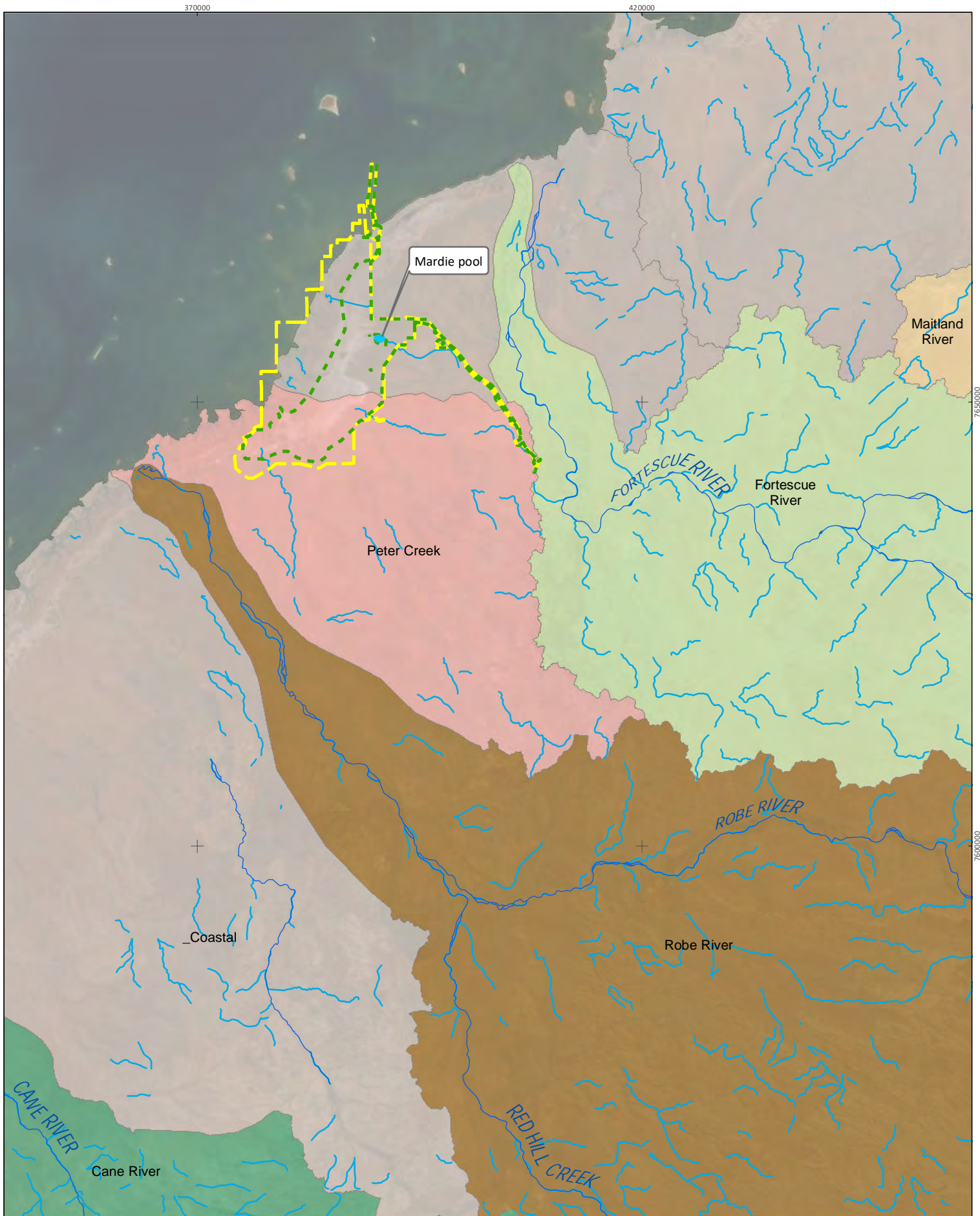
The Study Area is situated between the Robe River in the south and Fortescue River in the north (Figure 3-4). The Fortescue River in the West Pilbara has a catchment area of 20,000 km<sup>2</sup> and is a major drainage system of the region (Figure 3-4). Flow in the lower Fortescue River is seasonal and generated primarily by rainfall runoff from the river catchment, with the highest flows occurring between December and March. Low or no flow is typically experienced from July through to November (CloudGMS 2017).

A number of smaller ephemeral wetlands (e.g. Six Mile Creek, Seven Mile Creek) drain from the Hamersley Ranges into the tidal flats of the Study Area (Williams 1968). Similar to the Fortescue River, the hydrological regime is likely characterised by seasonal rainfalls. One permanent freshwater pool, Mardie Pool, is present in the Study Area.

## **3.5 CONSERVATION RESERVES AND ENVIRONMENTALLY SENSITIVE AREAS**

There are no nature conservation reserves or ESAs on the mainland within or immediately adjacent to the Study Area. The nearest reserves are the numerous offshore islands associated with the Great Sandy Island Nature Reserve (Class B), within the Passage Island Archipelago (Figure 1-1); several of these are also mapped as ESAs. These are managed by DBCA for the conservation of flora and fauna and are vested with the Conservation Commission of WA. Two of these, Cowle Island and Solitary Island are located within 10 km west of the Study Area (Figure 1-1).

The closest mainland reserve is Cane River Conservation Park (Class B), located 77 km south of the Study Area (Figure 1-1).



BCI Minerals Ltd  
Biological surveys for the Mardie Project

Project No	1189/1279/1318
Date	22-Jun-20
Drawn by	AJ
Map author	JC

0 10 20  
Kilometres

1:550,000 (at A4) GDA 1994 MGA Zone 50

- Study Area
- Development Envelope
- Major watercourses
- Minor watercourses

- River catchments**
- Cane River
  - Fortescue River
  - Maitland River
  - Peter Creek
  - Robe River
  - Coastal (non-river catchments)

**Figure 3-4**

**Surface water systems in vicinity of Study Area**

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### 3.6 CLIMATE AND WEATHER

The Pilbara bioregion has an arid to tropical climate with average maximum temperatures over 40°C from November to February and an average maximum of 25°C during the winter months (Leighton 2004; McKenzie *et al.* 2009). Annual rainfall across the broader Pilbara region averages approximately 290 mm and is most prevalent over the summer months in association with cyclonic activity to the north and northwest, though annual rainfall is highly variable (McKenzie *et al.* 2009). The climate of the Roebourne subregion is defined as arid (semi-desert) tropical with highly variable rainfall and cyclonic activity, primarily over summer (Kendrick & Stanley 2001).

The nearest Bureau of Meteorology (BOM) weather station is located at Mardie (Site number 005008) (Latitude: 21.19°S Longitude: 115.98°E), within 1 km east of the Project. Mardie records the highest maximum mean monthly temperature (37.9°C) in January and lowest (25.3°C) in February and highest minimum mean (27.7°C) and lowest (11.8°C) in July. Average annual rainfall is 278.7, with highest average rainfall recorded in February (62.7 mm) and March (49.0 mm) (BoM 2018) (Figure 3-5).

During the period August 2017–July 2018, mean daily maximum and mean daily minimum temperatures were close to long term averages aside from in March and April, which had higher than average maximum and minimum temperatures (Figure 3-5). Rainfall was well below the long-term average with only 39% of the average annual rainfall recorded in the 12 months preceding the 2018 field survey. In the three months before the May detailed field survey rainfall was below average in the summer wet season and the first two months of autumn. The second detailed field survey was undertaken in August, six weeks following above average rainfall June which received a total of 41 mm.

During the period September 2018–August 2019, mean daily maximum temperatures were close to long term averages (Figure 3-6). Rainfall was well below the long-term average with only 27% of the average annual rainfall recorded in the 12 months preceding the 2019 field survey. Overall, the study area has been subject to high temperatures and well below average rainfall over the period of the surveys conducted by Phoenix.

Weather preceding the Autumn 2020 survey showed slightly higher than average temperatures, and while Cyclone Damien had brought some rain to Mardie in February 2020 rainfall was still well below average and had been for over 12 months (Figure 3-7).

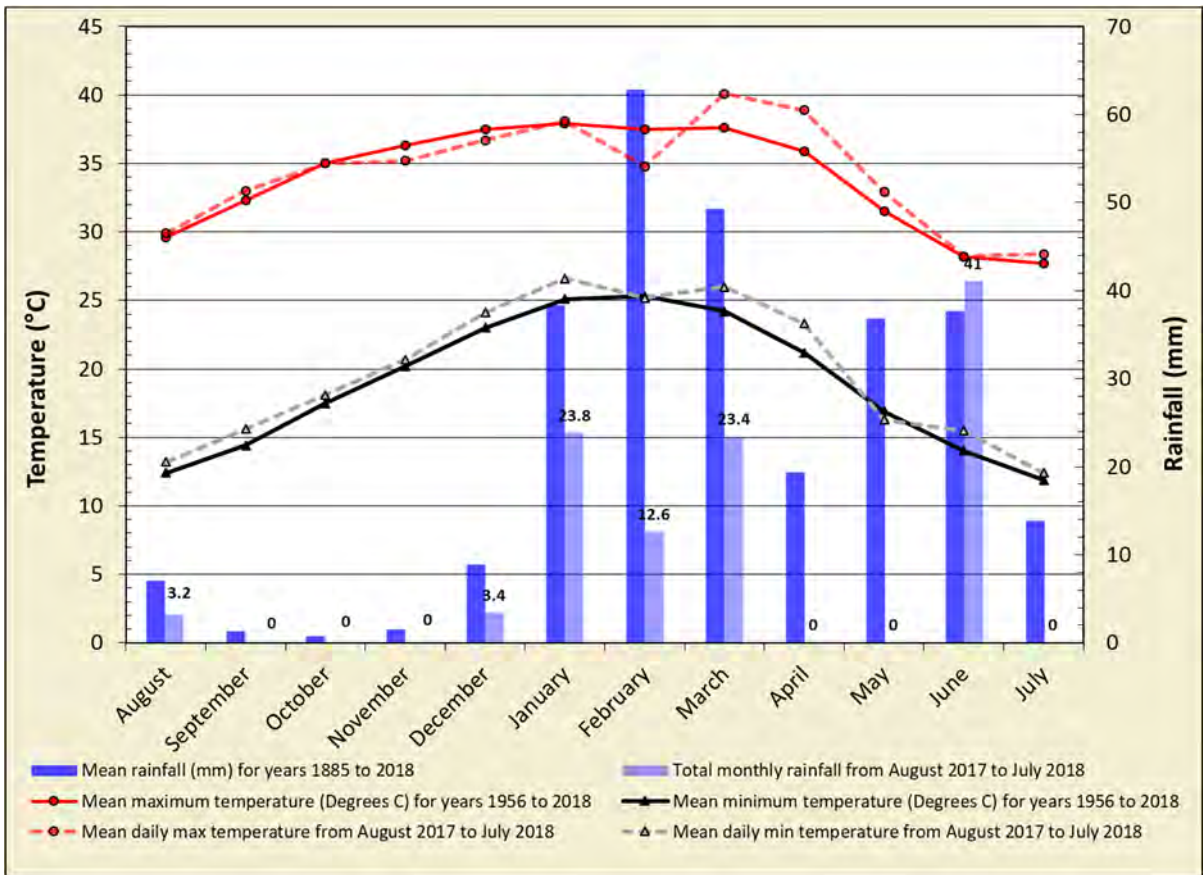


Figure 3-5 2018 climate data (average monthly temperatures and rainfall records) and weather (temperature and rainfall) preceding the survey for Mardie (BoM 2018)

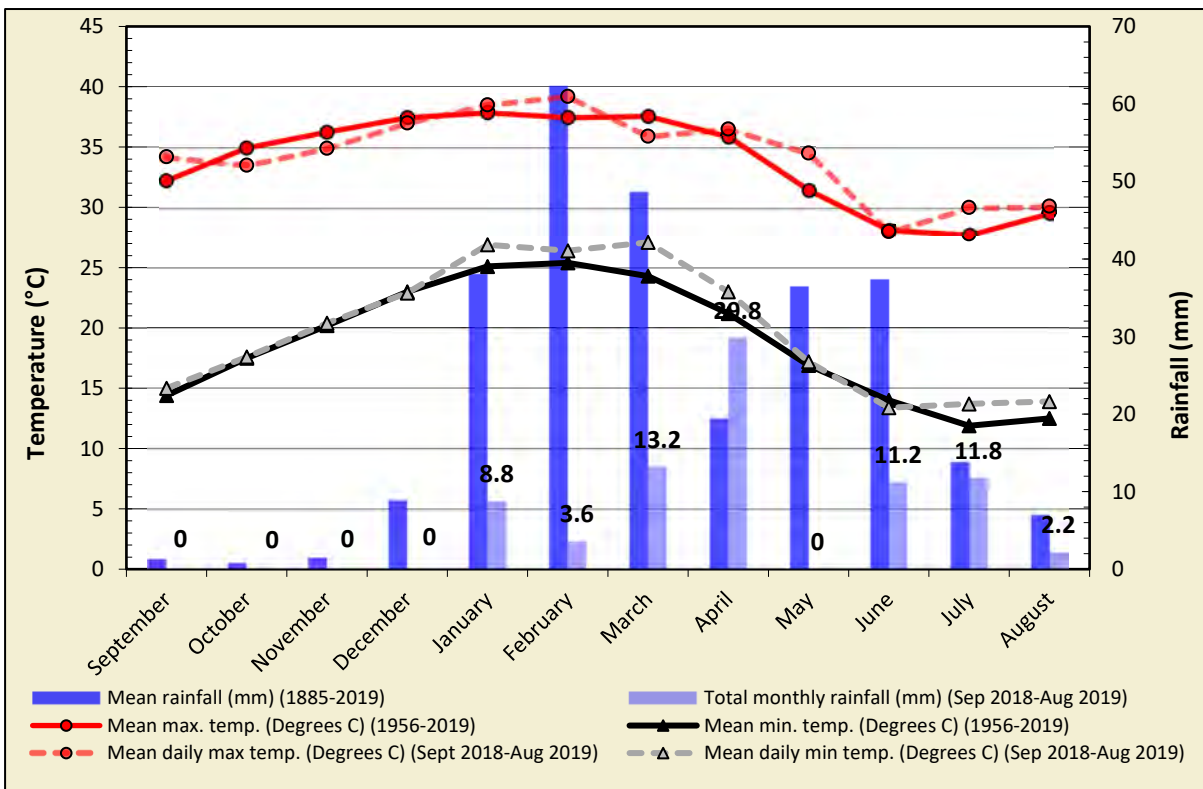


Figure 3-6 2019 climate data (average monthly temperatures and rainfall records) and weather (temperature and rainfall) preceding the survey for Mardie (BoM 2020)

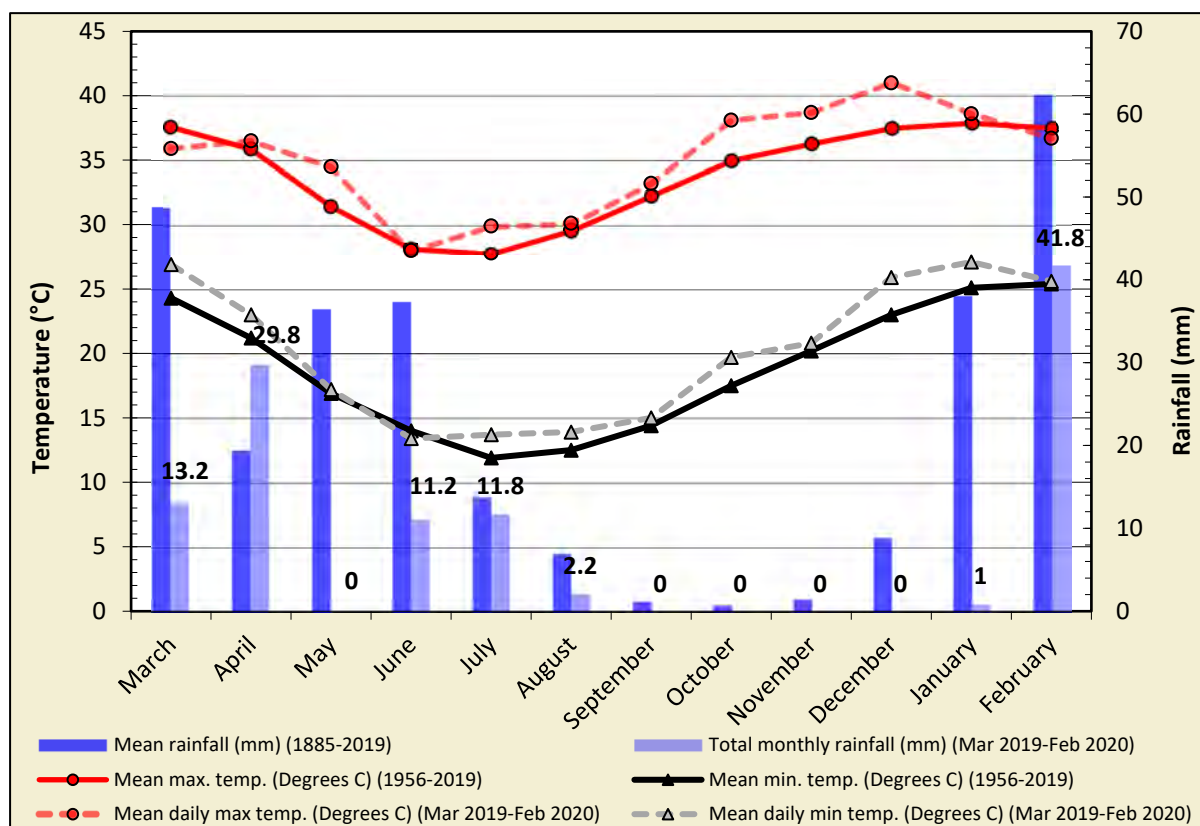


Figure 3-7 2020 climate data (average monthly temperature and rainfall records) and weather (temperature and rainfall) preceding Autumn 2020 survey for Mardie (BoM 2020)

## 4 METHODS

### 4.1 DESKTOP REVIEW

For the purposes of EIA, flora is defined as *native vascular plants* and vegetation is defined as *groupings of different flora patterned across the landscape that occur in response to environmental conditions* (EPA 2016a). The EPA's objective for the factor flora and vegetation is: *to protect flora and vegetation so that biological diversity and ecological integrity are maintained* (EPA 2016a).

A desktop review was undertaken previously in September 2017 (Phoenix 2017a). There are several considerations for EIA for the factor flora and vegetation (EPA 2016a); however, the focus of this desktop study was on identifying significant flora and vegetation that may be present in the Study Area, in particular:

- Threatened Flora listed as matters of NES under the EPBC Act
- Threatened Flora listed under the BC Act
- Priority flora listed by DBCA
- TECs listed as matters of NES under the EPBC Act
- TECs listed under the BC Act
- PECs listed by DBCA.

The following database searches were undertaken for the Study Area:

- EPBC Act Protected Matters Search Tool for Threatened Flora and TECs listed as MNES

- DBCA/WA Museum NatureMap for Threatened and Priority flora records
- DBCA and WA Herbarium Threatened and Priority flora Databases
- DBCA Threatened and Priority Ecological Communities Database for TECs and PECs.

The search extent for the database searches was the Study Area plus a 40 km buffer.

The following technical reports from surveys undertaken in the vicinity of the Study Area were reviewed:

- Cape Preston Mining Estate consolidated vegetation, flora and fauna assessment (Maunsell AECOM 2008b)
- Balmoral South. Consolidated vegetation, flora and fauna assessment (Maunsell AECOM 2008a)
- Balmoral North and Balmoral South Stage 2 flora and vegetation assessment (AECOM 2009)
- Austeel biological survey. Phase I (Biota & Trudgen & Associates 2001)
- Draft environmental impact statement/environmental review and management programme for the proposed Wheatstone Project. Volume 1 (Chapters 1 to 6) (Chevron 2010)
- Cape Preston East Environmental Studies. Flora and fauna review (GHD 2013)
- Literature and desktop review flora and vegetation. Proposed Cape Preston Transport Corridor (Onshore Environmental 2013)
- Targeted flora survey and Vegetation Management Plan for the Buckland Project: Stage 2 Haul Road (Phoenix 2017b)

Initial vegetation characterisation was undertaken using various remote geographical tools, including aerial photography (incl. Google Earth®), land system maps and topographic maps. Initial survey sites were then selected to record apparent changes in the vegetation.

The potential for occurrence in the Study Area of the significant flora and vegetation identified in the database searches was assessed based on reviewed information relating to habitat preference (soils, landforms, elevation and vegetation associations) and locality records from the database searches. This assessment informed the targeted searches during the field surveys.

## 4.2 FIELD SURVEY

A total of six field surveys were conducted over the Study Area comprising:

- a single day site reconnaissance by helicopter, 17 August 2017
- three-day site reconnaissance by helicopter, 8-10 December 2017
- six-day first phase detailed flora survey, 14-19 May 2018
- nine-day second phase detailed flora survey, 15-23 August 2018
- four-day survey of extended survey areas 10-13 September 2019.
- five-day survey of extended survey area, *Minuria tridens* (P1) targeted searches, *Tecticornia* survey 25-29 March 2020.

The initial reconnaissance survey was conducted by Jarrad Clark to broadly define habitats within the Study Area and determine site access requirements. This survey identified three broad vegetation types, mangroves, samphire shrublands on tidal mudflats and 'terrestrial' vegetation (grasslands, woodlands and shrublands) on sand dunes, sand islands, plains and riparian (creek) areas. The initial

survey identified that a large portion of the Study Area would only be readily accessible by helicopter and all subsequent surveys utilised a helicopter to ensure access to the entire Study Area.

The second reconnaissance survey was conducted by Dr Grant Wells and Alice Watt. The survey was conducted to determine the broad 'terrestrial' vegetation types and samphire communities on tidal mudflats from relevé surveys to facilitate site selection for the detailed flora survey and to ground-truth pre-selected survey locations undertaken in the desktop review. In addition, collection of specimens of *Tecticornia* species observed to be fruiting and/or flowering was undertaken. The survey identified that numerous apparent changes in vegetation on aerial imagery actually represented changes in soil colour of large areas of mudflats virtually devoid of any vegetation.

A detailed survey of the Study Area was conducted over two seasons in accordance with the recommendations in the Technical Guidance (EPA 2016b) for the Eremaean botanical province. The initial detailed survey was conducted in May 2018 by Dr Grant Wells and Alice Watt in May, six weeks post-wet season, with the second survey conducted in August 2018 by Dr Grant Wells, Alice Watt and Laurinda Timmins approximately six weeks following the highest winter rainfall in June. The supplementary survey of the extended Study Area and targeted searches for *Minuria tridens* was conducted by Martin Henson and Alice Watt in September 2019. A further supplementary survey of the extended Study Area including targeted survey for *Minuria tridens* (P1) and unidentified *Tecticornia* survey was conducted by Martin Henson and Dr. Andrew Perkins in March 2020.

Field methods for the detailed flora and vegetation survey included:

- surveying of quadrats, relevés and transects (see 4.2.1)
- focused flora searches (see 4.2.2)
- vegetation type mapping (see 4.2.3)
- vegetation condition mapping (see 4.2.5).

### 4.2.1 Quadrats, relevés and transects

Survey site locations were selected to ensure that the vegetation types within the Study Area were sampled adequately as per EPA technical guidance (EPA 2016b). Preliminary survey locations were pre-selected using high-quality aerial photography; with selection based on apparent changes in the vegetation visible in the aerial imagery. The preliminary survey locations were re-assessed during the second reconnaissance survey. Some preliminary locations were moved to locations which better represented vegetation types. Quadrats (50 m x 50 m) and transect surveys were used to record data to define the vegetation types present in the Study Area. These surveys were supplemented with unbounded relevé surveys, where dominant species from each canopy stratum was recorded, to provide further records to facilitate accurate vegetation mapping

In accordance with EPA (2016b) transect surveys utilising 3 x 3 m (9 m<sup>2</sup>) quadrats spaced evenly along linear transects were used to sample the riparian vegetation of tidal creeks and samphire communities that occurred around the 'shores' of islands and sand dunes arising from the tidal mudflats (Figure 4-1). At some location's samphire communities occurred across a large area of tidal mudflat, at these locations a 50 m x 50 m quadrat was used to define the vegetation.

In total, 74 quadrats, 11 *Tecticornia* transects (incorporating 30 quadrats) and 20 relevés were surveyed across the Study Area (Figure 4-1) providing a total of 124 survey locations (Appendix 1).

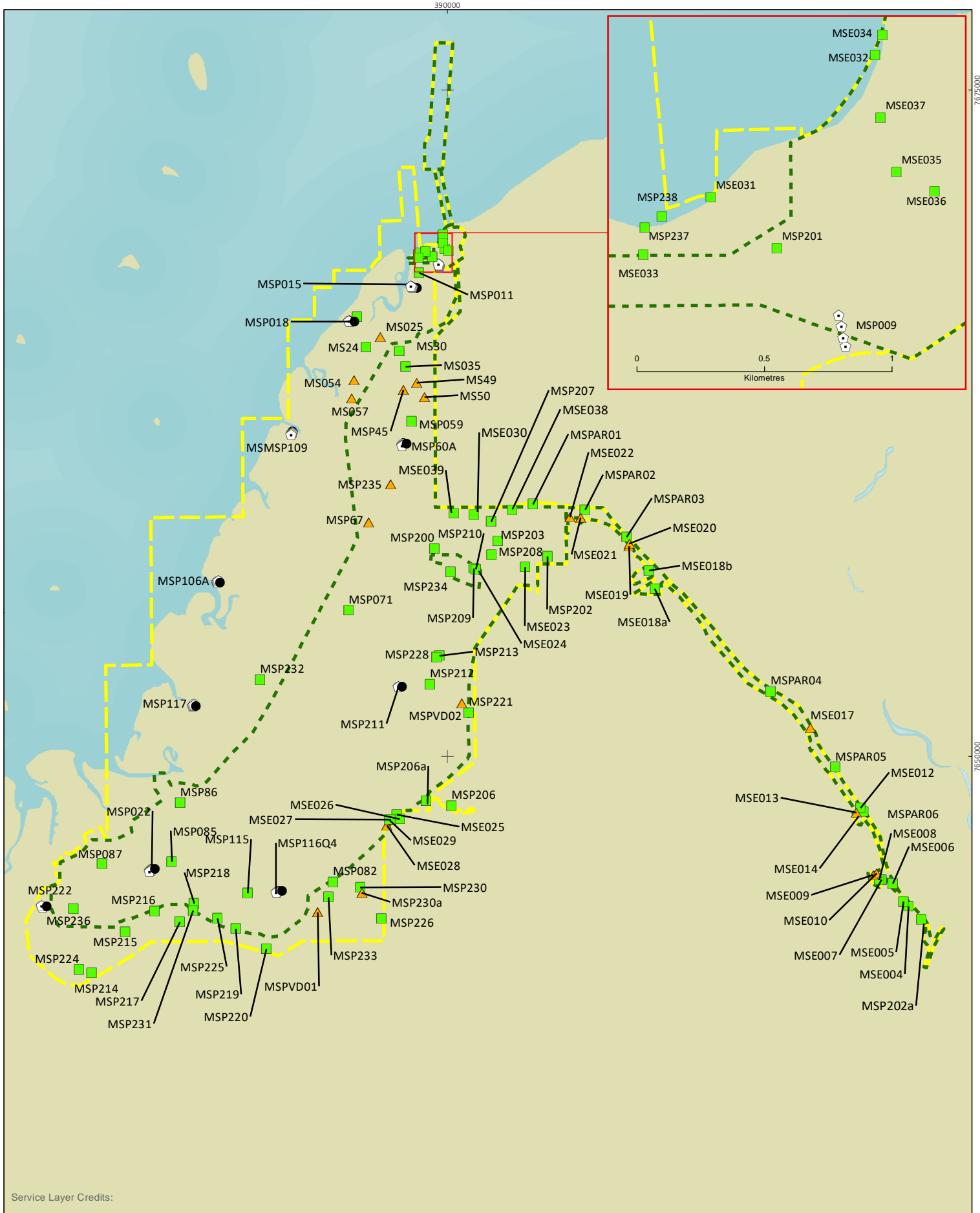
The following information was recorded for each quadrat<sup>3</sup> (Appendix 2):

- location – the geographic coordinates of all four corners of each quadrat and single point for relevé in WGS84 projection
- description of vegetation – a broad description utilising the structural formation and height classes based on National Vegetation Information System (ESCAVI 2003) and in accordance with EPA (2016b)
- habitat – a brief description of landform and habitat
- geology – a broad description of surface soil type and rock type
- disturbance history – a description of any observed disturbance including an estimate of time since last fire, weed invasions, soil disturbance, human activity and fauna activity
- vegetation condition – the condition of the vegetation was recorded utilising the appropriate condition scale for the Eremaean botanical province in EPA (2016b) (Table 4-1)
- height and percentage foliage cover (PFC) – a visual estimate of the canopy cover of each species present within the quadrat was recorded as a percentage, as was the total vegetation cover, cover of shrubs and trees >2 m tall, cover of shrubs <2 m, total grass cover and total herb cover
- photograph – a colour photograph of the vegetation within each quadrat in a south-easterly direction from the north-west corner of the quadrat
- flora species list – a list including the name of every flora species present within the quadrat; to ensure accurate taxonomic identification of flora species present within the Study Area, collections were made of each specimen at least once and each collection was pressed and documented for identification using the WA Herbarium resources.

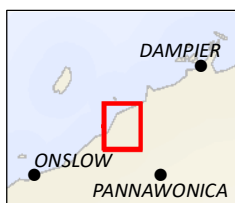
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<sup>3</sup> For both 50 x 50 m quadrats and 3 x 3 m quadrats along transects.





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BCI Minerals Ltd Biological surveys for the Mardie Salt Project	
Project No	1189/1279/1318
Date	23-Jun-20
Drawn by	AJ
Map author	GW
1:183,307 (at A4)	GDA 1994 MGA Zone 50

- Study Area
- Development Envelope
- SiteType**
- Quadrat
- Relevé
- Transect
- Transect quadrat

**Figure 4-1**  
**Survey sites**



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The following information was recorded for each relevé:

- location – the geographic coordinates of a single point in WGS84 projection
- description of vegetation – a broad description utilising the structural formation and height classes based on National Vegetation Information System (ESCAVI 2003) and in accordance with EPA (2016b)
- habitat – a brief description of landform and habitat
- geology – a broad description of surface soil type and rock type
- disturbance history – a description of any observed disturbance including an estimate of time since last fire, weed invasions, soil disturbance, human activity and fauna activity
- vegetation condition – the condition of the vegetation was recorded utilising the appropriate condition scale for the Eremaean botanical province in EPA (2016b) (Table 4-1)
- flora species list – list of dominant species for each canopy stratum
- photograph – a colour photograph of the vegetation within each quadrat in a south-easterly direction from the north-west corner of the quadrat.

#### 4.2.2 Significant flora searches

Targeted searches were undertaken for significant species identified in the desktop review. The searches focused on habitats considered likely to support significant flora, in addition to previously recorded locations of significant plants or populations in close proximity to the Study Area. Following the second phase survey conducted in spring 2018, a specimen was identified to be *Minuria tridens* (VU EPBC Act; P1 at State level). This species was not included in the desktop assessment as the only previous record of the species in Western Australia occurred well outside the desktop search area. Targeted searches for this species were subsequently undertaken in the 2019 spring survey.

A helicopter was used to access areas for targeted searches that could not be accessed by vehicle. The targeted searches comprised foot searches of suitable habitat by personnel spaced approximately 20 m apart in meandering transects.

If a flora species was considered to potentially be a significant species (i.e. similar floristic characteristics and occurring within suitable habitat) the following information was collected:

- GPS coordinates, including population boundary where applicable
- description of the habitat and floristic community in which the potential significant species was located
- population size estimate (i.e. estimated number of individual plants) where applicable
- specimen collection for taxonomic identification and lodgement at the WA Herbarium
- photograph of live plant in situ and description of important details, such as flower colour, height of individual or average height of population.

Following the survey, a likelihood of occurrence rating was assigned to each significant species, as follows:

- definite – species recorded within the Study Area by previous or current survey
- likely – Study Area within known range of species; suitable habitat within the Study Area and/or records within 5 km of Study Area

- possible – Study Area within known range of species; optimal or potential habitat within the Study Area, no records within 5 km of Study Area
- unlikely – Study Area outside known range of species, no records within 5 km and/or no suitable habitat present in Study Area.

Targeted searches for *Minuria tridens* (P1) were conducted following a revisit to the site of the initial collection to assess the condition of plants and count population numbers. Following this the local area was searched and sites showing similar characteristics from aerial photography and areas of the same mapped vegetation were visited to search for the species.

#### **4.2.3 PEC assessment**

Assessment of presence of any of the PECs identified in the desktop review was undertaken in the field based on general community descriptions.

#### **4.2.4 Vegetation mapping**

The vegetation descriptions from quadrats and transects from the survey were grouped according to similarity of community structure (i.e. canopy levels), species composition and combination of species and the prevalent community type (i.e. woodland, shrubland, etc.). To support delineation of vegetation types, cluster analyses were conducted based on species composition in each quadrat. As quadrats were sampled over several seasons and quadrats were scored by different survey personnel, the analyses were conducted for species presence-absence and annual and short-lived species were excluded from the dataset along with any taxon that could not be definitively identified to species level. Separate analyses were conducted for the 50 m x 50 m quadrats and the 3 m x 3 m quadrats scored for the transect surveys.

The fusion strategy for the site classification was flexible UPGMA with a beta value of -0.1 and Bray Curtis association measure in the software package PATN (Belbin 2003). A dendrogram was produced to illustrate the similarities between the vegetation units identified. Statistically distinct vegetation units (the floristic group) classified the vegetation at a local scale. Local scale vegetation units were described at NVIS Level V – Association (ESCAVI 2003). The term ‘vegetation type’ was used for local scale vegetation units in accordance with EPA (2016b).

The vegetation types thereby defined were then compared to relevé survey descriptions and the relevé assigned to the appropriate vegetation type.

The vegetation boundaries were mapped utilising high-quality colour aerial photography and from vegetation boundaries recorded on GPS during the field survey. Mapping of the boundary of chenopod (*Tecticornia*) shrublands with the areas of tidal mudflats devoid of the flora and vegetation that were the subject of this survey was achieved by flying along the boundary in a helicopter at low altitude and tracking the flight path on a hand held GPS unit.

#### **4.2.5 Condition mapping**

The condition of vegetation was mapped across the Study Area based on the appropriate condition rating scale for the Eremaean Province where the Study Area is located (EPA 2016b). The vegetation condition ratings relate to vegetation structure, the level of disturbance and weed cover at each structural layer and the ability of the vegetation unit to regenerate. Vegetation condition ranges from Excellent being the highest rating to Completely Degraded as the lowest (Table 4-1).

**Table 4-1 Vegetation condition rating scale for Eremaean and Northern Botanical Provinces (EPA 2016b)**

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

#### 4.2.6 Mapping of *\*Prosopis* spp. infestations

The cover values of *\*Prosopis* spp. recorded at quadrats in conjunction with the vegetation types delineated for the Study Area were used to map the intensity of *\*Prosopis* spp. infestation in the Study Area. The *\*Prosopis* spp. boundaries were mapped utilising high-quality colour aerial photography and from mapped vegetation type boundaries.

#### 4.2.7 Targeted surveys for *Minuria tridens* (P1)

As the specimen of this species was identified post-field following the 2018 detailed survey, targeted searches were not conducted to determine the distribution or population size of the species at the time. Subsequently, aerial photography was used to map areas of vegetation with a similar appearance and texture to that in which the *Minuria tridens* was collected. These areas were visited during the targeted surveys in 2019 and 2020 to search for further individuals and populations of the species.

### 4.3 REVIEW OF SURVEY METHODS AGAINST EPA GUIDELINES

Comment on alignment of the survey with EPA technical guidance (EPA 2016b) is provided in Table 4-2.

**Table 4-2 Alignment of survey with EPA guidelines**

Key points	Compliant?
<p><b>Preparation for survey (section 2.0)</b> Survey led by botanist with at least five years' experience in the bioregion Survey conducted under flora collection licences and landowner permission obtained</p>	Yes, section 4.5
<p><b>Desktop study (3.0)</b> Relevant databases searched at appropriate search extent. Description of regional setting (e.g. vegetation, land systems and soils).</p>	Yes, section 3, 4.1, 5.1
<p><b>Survey (4.0)</b></p>	
<p>Reconnaissance survey (4.1) To verify the information obtained from the desktop study, characterise the flora and delineate the vegetation units present</p>	Yes, section 4.2
<p>Detailed survey (4.3) Survey effort – multiple sampling events</p>	Yes, section 4.2
<p><b>Sampling techniques appropriate (5.0)</b> i.e. site type, quadrat size, vegetation condition rating</p>	Yes, section 4.2
<p><b>Survey design (6.0)</b> Survey area extent appropriate (6.1) Survey effort (6.2) – adequate sampling of vegetation Site selection (6.3) Survey timing appropriate (6.4) Flora population census (6.5)</p>	<p>Yes, regarding survey area extent, site selection, survey timing (section 4.2)</p> <p>Mostly compliant regarding survey effort - number of sites per vegetation type variable due to highly variable extents in Study Area, at least three quadrats sampled in all vegetation types, except those with very limited extent in Study Area.</p> <p>Sites were selected from aerial imagery and from observations by helicopter and on the ground during the reconnaissance and detailed surveys.</p> <p>Surveys were conducted within the timeframes provided in the technical guidance (EPA 2016b) and included collection of <i>Tecticornia</i> specimens during all survey events including the summer reconnaissance survey. However seasonal conditions were not optimal.</p> <p>Significant flora searches not conducted over all suitable habitat due to very large size of Study Area and accessibility. All suitable habitat for <i>Minuria tridens</i> in the Study Area was searched</p> <p>Extent of significant flora was not recorded for all significant species (in particular <i>Tecticornia</i>) as significant taxa were identified after the initial field survey. Difficulties in identifying the species in the field, particularly when sterile in subsequent targeted surveys (despite survey at appropriate time of year) precluded conducting accurate searches.</p>

<b>Flora (7.0)</b> Collection and identification of specimens (7.1) Vouchering (7.2) New species (7.3)	Yes, section 4.2.1, 4.2.2, 4.4
<b>Vegetation (8.0)</b> Structural vegetation description (8.1) Floristic composition vegetation classification (8.2) Vegetation description (8.3) Defining TECs and PECs (8.4)	Yes, section 4.2.1, 4.2.3, 4.2.4
<b>Mapping (9.0)</b>	Yes
<b>Reporting (10.0)</b>	Yes

#### 4.4 TAXONOMY AND NOMENCLATURE

Plant species were identified using local and regional flora keys, online flora keys (e.g. Spikey) and comparisons with named species held at the WA Herbarium. Nomenclature for flora and vegetation used in this report follows that used by FloraBase (DBCA 2020) and the WA Herbarium.

All *Tecticornia* specimens were sent to Dr Kelly Shepherd (WA Herbarium) for identification, as is the requirement by the EPA for this genus. Michael Hislop (WA Herbarium) was consulted for identification of significant flora. Significant flora specimens have been vouchered with the WA Herbarium.

#### 4.5 SURVEY PERSONNEL

The personnel involved in the survey are presented in Table 4-3.

**Table 4-3 Project team**

Name	Qualifications	Role/s
Alice Watt	BSc. (Cons. Bio. & Botany) (Hons) SL012089	Field survey, taxonomy, reporting
Frank Obbens	BSc. Hons. (Env. Biol.)	Taxonomy
Dr Grace Wells	PhD (Plant Cons.)	Survey design, GIS, data analysis, mapping
Dr Grant Wells	PhD (Botany) SL012222	Field survey, taxonomy, data analysis, reporting
Dr David Leach	PhD (Plant Biology)	GIS, mapping, map digitising, taxonomy
Dr. Andrew Perkins	PhD (Botany) FB62000181	Field survey, taxonomy
Ian Hay	B App Science (Surveying and mapping)	GIS
Anna Jacks	BSc. (Env. Sci.) (Hons)	Reporting, figure production
Martin Henson	BEnvSc. (Hons) FB62000110	Field survey, taxonomy, reporting
Jarrad Clark	BSc. (Env. Mgt.)	Field survey
Karen Crews	BSc. (Env. Biol.) (Hons)	Report design, report review
Laurinda Timmins	BSc. (Env. Sci.) SL012075	Field survey

## 5 RESULTS

### 5.1 DESKTOP REVIEW

The database searches identified a high species diversity, with 414 flora taxa recorded within 40 km radius of the Study Area (Figure 5-1; Appendix 3). The list comprised species from 66 families and 187 genera.

#### 5.1.1 Significant flora

The results of the combined database searches and review of flora reports identified records of 34 significant flora that may potentially occur within the Study Area (Table 5-1). A single Threatened Flora species listed under the EPBC Act was identified – *Eleocharis papillosa* (listed as P3 Priority flora in Western Australia), and a further 33 State listed Priority flora:

- eight Priority 1 species
- three Priority 2 species
- 20 Priority 3 species
- two Priority 4 species.

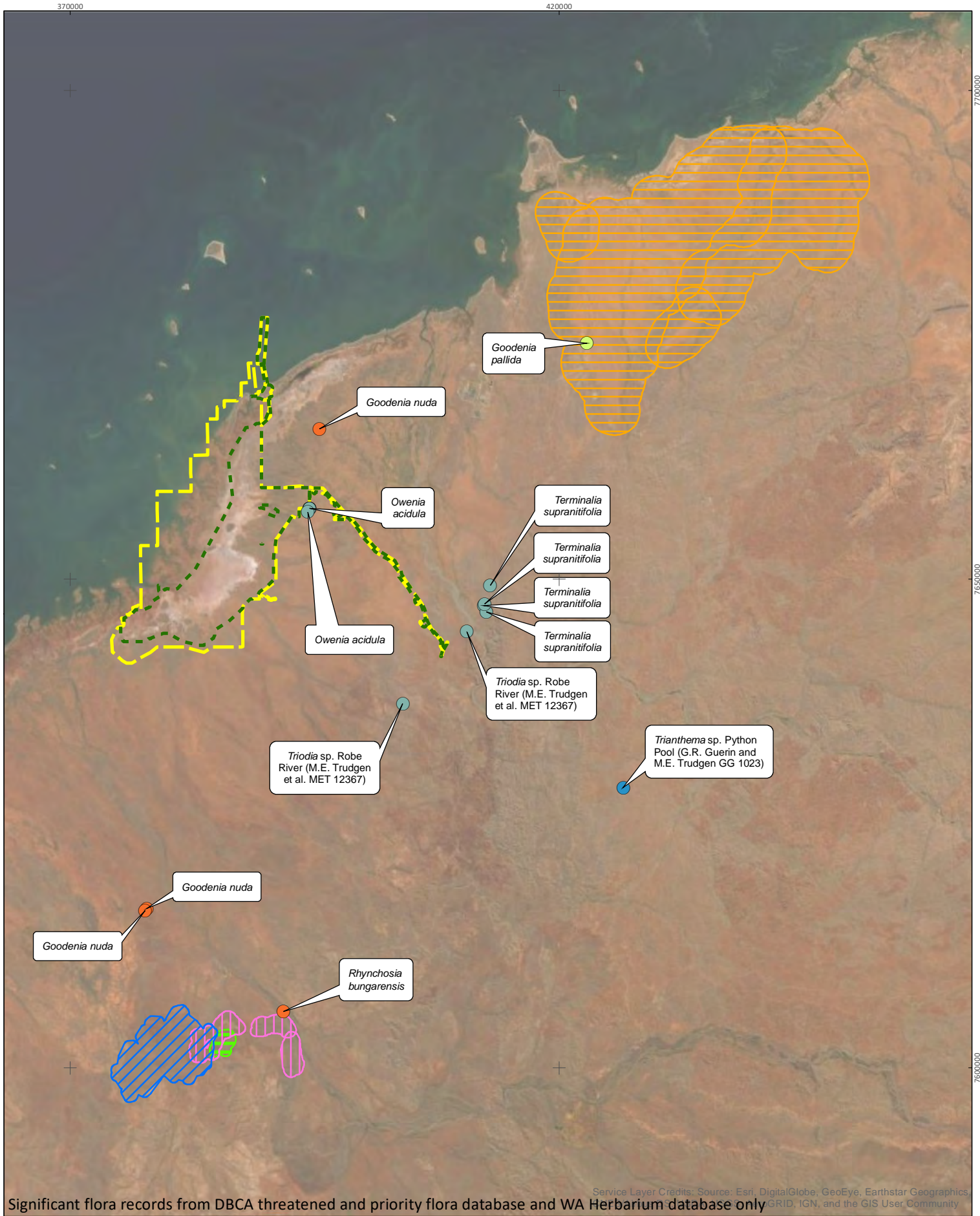
**Table 5-1 Significant flora records from the area of the database searches**

Species	Cons. status	Description and habitat
<i>Abutilon</i> sp. Onslow	P1	Semi-prostrate shrub to 2 m in diameter with yellow flowers, August to October. Red sand on sandplain, cracking clay loam on flat plain.
<i>Atriplex flabelliformis</i>	P3	Monoecious, erect, rounded perennial, herb, to 0.35 m high. Clay loam, loam, saline flats or marshes.
<i>Bonamia brevifolia</i>	P1	Prostrate herb, to 0.4 m wide, flowers purple and white recorded in December. Black cracking clay on plains.
<i>Bothriochloa decipiens</i> var. <i>cloncurrans</i>	P1	Perennial, grass-like or herb, to 1.4 m high. Flowers green yellow. Small, seasonally damp depression, on a stoney clay plain.
<i>Carpobrotus</i> sp. Thevenard Island (M. White 050)	P3	Prostrate, succulent perennial, herb, leaves sessile, triangular in cross-section; fruit turbinate. Flowers cream, August. Coarse white sand. Dune tops, disturbed areas.
<i>Corchorus congener</i>	P3	Spreading shrub, to 0.6 m high. Flowers yellow, April to June or August to November. Sand and red sandy loam with limestone in sand dunes or plains.
<i>Cucumis</i> sp. Barrow Island (D.W. Goodall 1264)	P2	Very sticky creeper. Stems and leaves hirsute. One leaf and flower at each node. Flower approximately 0.5 cm diameter. Gentle calcrete slope, red, sandy loam.
<i>Eleocharis papillosa</i>	Vu, P3	Annual, herb. Flower brown, November. Red clay over granite, open clay flats, claypans.
<i>Eragrostis surreyana</i>	P3	Annual, prostrate grass to 5 cm high. Soak areas with surface water, soil red-brown sandy clay, water holes.
<i>Eremophila forrestii</i> subsp. <i>viridis</i>	P3	Much-branched shrub, ca 1 m high. Flowers pink-cream, August. Generally, occurs on the flats where a hardpan develops in between inland dunes.
<i>Gomphrena pusilla</i>	P2	Slender branching annual, herb, to 0.2 m high. Flowers white, March to April or June. Fine beach sand. Behind foredune, on limestone.

Species	Cons. status	Description and habitat
<i>Goodenia nuda</i>	P4	Erect to ascending herb, to 0.5 m high. Flowers yellow, April to August. Red-brown sandy loam on floodplains.
<i>Goodenia pallida</i>	P1	Erect herb, to 0.5 m high. Flowers purple, August. Red soils.
<i>Goodenia</i> sp. East Pilbara	P3	Open, erect annual or biennial, herb, to 0.2 m high. Flowers yellow. Red-brown clay soil, calcrete pebbles. Low undulating plain, swampy plains.
<i>Gymnanthera cunninghamii</i>	P3	Erect shrub, 1-2 m high. Flowers cream-yellow-green, January to December. Sandy soils.
<i>Helichrysum oligochaetum</i>	P1	Erect annual, herb, to ca 0.25 m high. Flowers yellow, August to November. Red clay on alluvial plains.
<i>Indigofera</i> sp. Bungaroo Creek	P3	Erect shrub, 1.5 m high and 1.0 m wide, dark pink flower with white centre. Drainage lines and creeks in red sandy loams.
<i>Lepidobolus quadratus</i>	P3	Rhizomatous, caespitose perennial, herb (sedge-like), 0.15-0.3 m high. Flowers brown/red, August to September. Lateritic gravel, grey/white sand.
<i>Owenia acidula</i>	P3	Tree, 3-8 m high. Flowers white brown/cream. Drainage lines, floodplains and creeks, clay, sandy clay and silty loam soils.
<i>Rhynchosia bungarensis</i>	P4	Compact, prostrate shrub, to 0.5 m high. Flowers yellow. Pebbly, shingly coarse sand amongst boulders. Banks of flow line in the mouth of a gully in a valley wall.
<i>Solanum albotellatum</i>	P3	Annual or perennial herb up to 15 cm high with pale mauve flowers. Floodplains, crabhole, cracking clay soils.
<i>Solanum cataphractum</i>	P3	Erect or sprawling shrub. Flowers blue-purple, May to June. Sand, sandstone rock, undulating plateau, hummock grassland on sandstone clifftops.
<i>Stackhousia clementii</i>	P3	Dense broom-like perennial, herb, to 0.45 m high. Flowers green/yellow/brown. Skeletal soils, sandstone hills.
<i>Stackhousia umbellata</i>	P3	Spreading perennial, herb, to 0.7 m high. Flowers yellow, May to August. Sandy soils on limestone.
<i>Stylidium weeliwollii</i>	P3	Annual, herb, 0.1-0.25 m high, throat appendages 4, rod-shaped. Flowers pink and red, August to September. Gritty sand soil, sandy clay. Edge of watercourses.
<i>Swainsona thompsoniana</i>	P3	Annual or perennial prostrate herb up to 20 cm high with blue/purple flowers. Cracking clay floodplain, dark reddish brown silty cracking clay.
<i>Tecticornia globulifera</i>	P1	Low spreading shrub up to 50 cm tall, articles bright red. Lakebed with sandy clay loam soil, salt lake playa, floodplain with red sandy clay soils.
<i>Tecticornia medusa</i>	P3	Erect shrub to 0.8 m. Articles bright green. Flat floodplain, red clayey-sand, northern edge of large salt lake.
<i>Tecticornia</i> sp. Christmas Creek	P1	A low spreading shrub, 25 cm high, 50 cm across with articles varying in colour from a dull green to a purple red. Hill slopes in brown loam, saline flats, and flat floodplain in red clayey sand.
<i>Tephrosia rosea</i> var. Port Hedland (A.S. George 1114)	P1	Erect, spreading shrub 120 cm tall x 120 cm wide with flowers deep pink in September. Coastal and near-coastal locations in sandy and sandy loam soils often tan, deep sands in coastal dunes.
<i>Terminalia supranitifolia</i>	P3	Spreading, tangled shrub or tree, 1.5-3 m high. Flowers green-yellow, May or July or December. Sand, among basalt rocks.



Species	Cons. status	Description and habitat
<i>Trianthema</i> sp. Python Pool (G.R. Guerin & M.E. Trudgen GG 1023)	P2	Annual, prostrate and open herb: 0.02 m high and 0.20 m wide. Pink flower, March – May, July, September. Low undulating hills, plain in brown clayey-sand, rocky soil on flat plain.
<i>Triodia</i> sp. Robe River	P3	Perennial grass 0.3 m high x 0.2 m wide, white flowers, hill tops and plateau.
<i>Triumfetta echinata</i>	P3	Prostrate shrub, to 0.3 m high. Flowers August. Red sandy soils, sand dunes.



Significant flora records from DBCA threatened and priority flora database and WA Herbarium database only

	<p>BCI Minerals Ltd Biological surveys for the Mardie Salt Project</p> <p>Project No 1189/1279/1318 Date 22-Jun-20 Drawn by AJ Map author GW</p> <p>0 10 20 Kilometres</p> <p>1:500,000 (at A4) GCS GDA 1994</p>	<p> Study Area</p> <p> Development Envelope</p> <p><b>Conservation status of significant flora</b></p> <p> P1</p> <p> P2</p> <p> P3</p> <p> P4</p>	<p><b>TEC/PEC</b></p> <p> Horseflat Land System of the Roebourne Plains (P3)</p> <p> Sand Sheet vegetation (Robe Valley) (P1)</p> <p> Subterranean invertebrate communities of mesas in the Robe Valley region (EN)</p> <p> Subterranean invertebrate community of pisolitic hills in the Pilbara (P1)</p>	<p><b>Figure 5-1</b></p> <p><b>Desktop records of significant flora and ecological communities</b></p>
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### 5.1.2 Introduced flora

The desktop assessment identified records of 40 introduced species within the 40 km radius of the Study Area, of which four are a Declared Pest and WoNS (Table 5-2).

### 5.1.3 Vegetation associations

Regional scale vegetation mapping by Shepherd *et al.* (2002) mapped five vegetation associations in the Study Area (Table 5-3; Figure 5-2):

- Association 82: Hummock grasslands, low tree steppe; snappy gum over *Triodia wiseana*
- Association 117: Hummock grasslands, grass steppe; soft spinifex
- Association 127: Bare areas; mud flats
- Association 600: Sedgeland; sedges with open low tree savannah; *Eucalyptus sp. aff. aspera* over various sedges
- Association 601: Mosaic: Sedgeland; various sedges with very sparse snakewood / Hummock grasslands, shrub-steppe; kanji over soft spinifex.

The Study Area is predominantly mapped as association 127 *Bare areas; mud flats*, occupying approximately 63.3% of the Study Area and association 601 *Mosaic sedgeland* at 33.8% (Table 5-3).

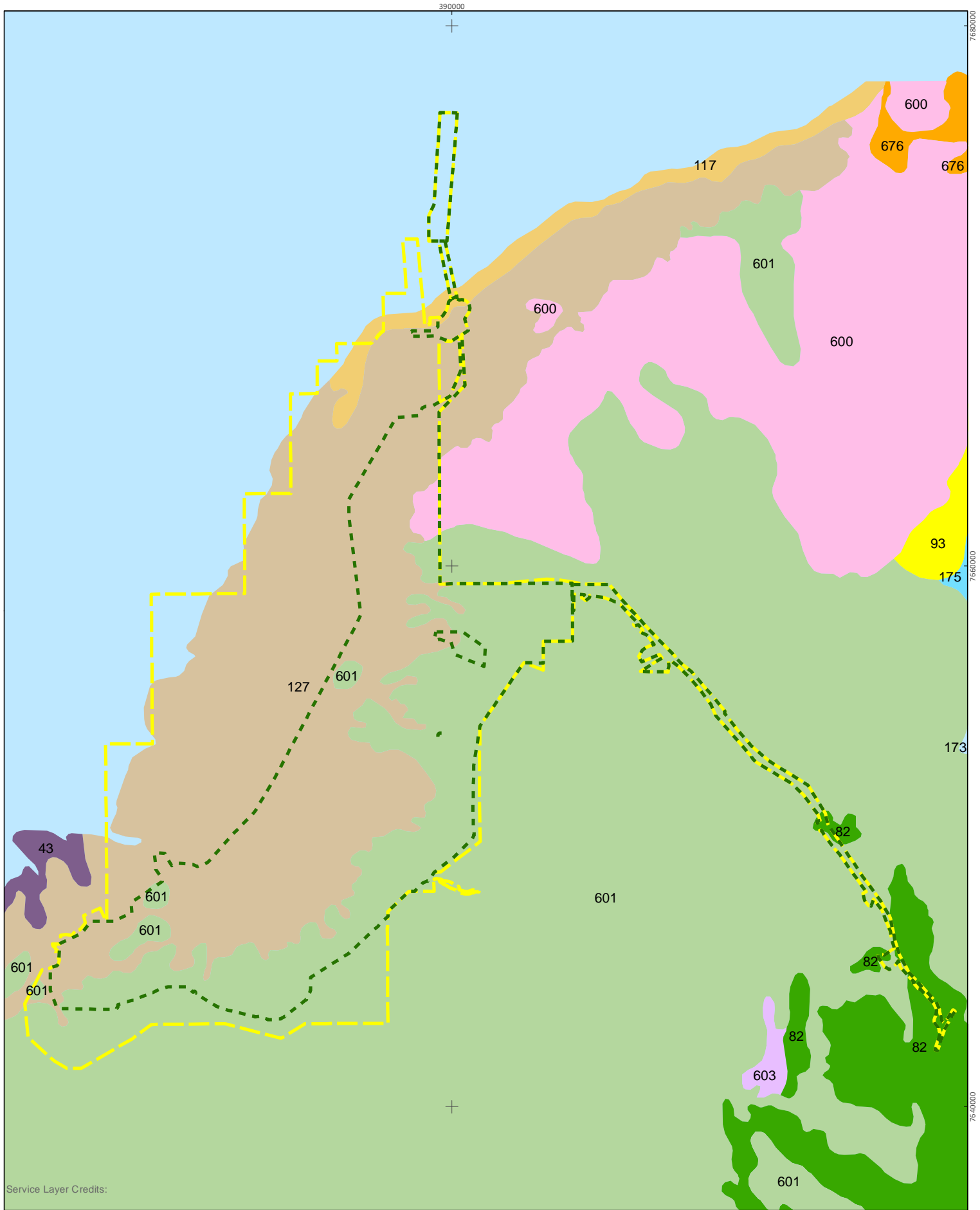
All vegetation associations are extensively represented in the Roebourne and Chichester subregions and have over 89% pre-European extent remaining and are therefore assigned the status of Least Concern (Table 5-3). Associations 82 and 117, the two hummock grasslands have the highest proportion in DBCA lands at 11.6% and 22.5% respectively, while the other associations have either below 3% or none of that association present in DBCA managed lands.

**Table 5-2 Introduced flora records from the area of the database searches**

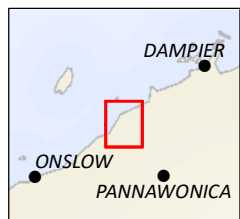
Species name	Declared Pest	WoNS
* <i>Aerva javanica</i>		
* <i>Amaranthus viridis</i>		
* <i>Arctotheca calendula</i>		
* <i>Argemone ochroleuca</i> subsp. <i>ochroleuca</i>		
* <i>Bidens bipinnata</i>		
* <i>Casuarina equisetifolia</i>		
* <i>Cenchrus ciliaris</i>		
* <i>Cenchrus setaceus</i>		
* <i>Cenchrus setiger</i>		
* <i>Centaurium erythraea</i>		
* <i>Chloris virgate</i>		
* <i>Citrullus colocynthis</i>		
* <i>Citrullus lanatus</i>		
* <i>Conyza bonariensis</i>		
* <i>Cucumis melo</i>		
* <i>Cynodon dactylon</i>		
* <i>Datura leichhardtii</i>		
* <i>Eragrostis minor</i>		
* <i>Flaveria trinervia</i>		
* <i>Ipomoea cairica</i>		
* <i>Malvastrum americanum</i>		
* <i>Melochia pyramidata</i>		
* <i>Papaver somniferum</i>		
* <i>Parkinsonia aculeata</i>	s22(2) (C1, C3)	Y
* <i>Passiflora foetida</i>		
* <i>Passiflora foetida</i> var. <i>hispida</i>		
* <i>Polycarpon tetraphyllum</i>		
* <i>Portulaca oleracea</i>		
* <i>Prosopis glandulosa</i> x <i>velutina</i>	s22(2) (C2, C3)	Y
* <i>Prosopis pallida</i>	S12 (C2)	Y
* <i>Senna occidentalis</i>		
* <i>Setaria verticillata</i>		
* <i>Solanum nigrum</i>		
* <i>Sonchus oleraceus</i>		
* <i>Stylosanthes hamata</i>		
* <i>Tamarindus indica</i>		
* <i>Tamarix aphylla</i>	s22(2) (C3)	Y
* <i>Tribulus terrestris</i>		
* <i>Vachellia farnesiana</i>		
* <i>Washingtonia filifera</i>		

**Table 5-3 Extent of Pre-European vegetation associations present in the Study Area (DBCA 2018a)**

Vegetation association	Description	Pre-European extent (ha)	Current extent (ha)	Remaining (%)	Current extent in DBCA managed lands (%)	% of Study Area
82	Hummock grasslands, low tree steppe; snappy gum over <i>Triodia wiseana</i>	2,563,583.23	2,550,898.98	99.51	11.59	0.8
117	Hummock grasslands, grass steppe; soft spinifex	82,705.78	78,096.64	94.43	22.54	1.4
127	Bare areas; mud flats	177,749.75	159,595.04	89.79	2.32	63.3
600	Sedgeland; sedges with open low tree savannah; <i>Eucalyptus</i> sp. aff. <i>aspera</i> over various sedges	67,036.26	66,954.63	99.88	0	0.7
601	Mosaic: Sedgeland; various sedges with very sparse snakewood / Hummock grasslands, shrub-steppe; kanji over soft spinifex	109,686.98	109,618.49	99.94	0	33.8
Un-mapped	Ocean and marine areas					5.6
Total						100



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Project No	1189/1279/1318
Date	22-Jun-20
Drawn by	AJ
Map author	JC

0 2.5 5  
Kilometres

1:180,000 (at A4) GDA 1994 MGA Zone 50

- Study Area
  - Development Envelope
  - Ocean
- Vegetation association**
- 43
  - 601
  - 603
  - 93
  - 117
  - 127
  - 175
  - 600
  - 601
  - 603
  - 676

**Figure 5-2**  
**Shepherd *et al.* (2002)**  
**vegetation associations**  
**of the Study Area**



## 5.1.4 Threatened and Priority Ecological Communities

One Endangered TEC listed under the EPBC Act or BC Act (Robe Valley Mesas – Subterranean invertebrate communities of mesas in the Robe Valley region) and three PECs were identified within 50 km of the Study Area (Table 5-4; Figure 5-1).

**Table 5-4 Threatened and Priority Ecological Communities from desktop review**

Community ID	Community name	Conservation status	Buffer (km)	Proximity to Study Area
Robe Valley Mesas	Subterranean invertebrate communities of mesas in the Robe Valley region	Endangered	0.5	41 km S of Study Area
Sand Sheet vegetation	Sand Sheet vegetation (Robe Valley)	Priority 1	0.5	43 km S of Study Area
Robe Valley Pisolitic Hills	Subterranean invertebrate communities of pisolitic hills in the Pilbara	Priority 1	0.5	40 km S of Study Area
Horseflat Land System	Horseflat Land System of the Roebourne Plains	Priority 3	2.0	32 km E of Study Area 8.8 km E of the Study Area (Phoenix 2017b)

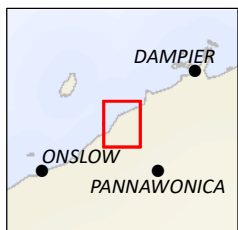
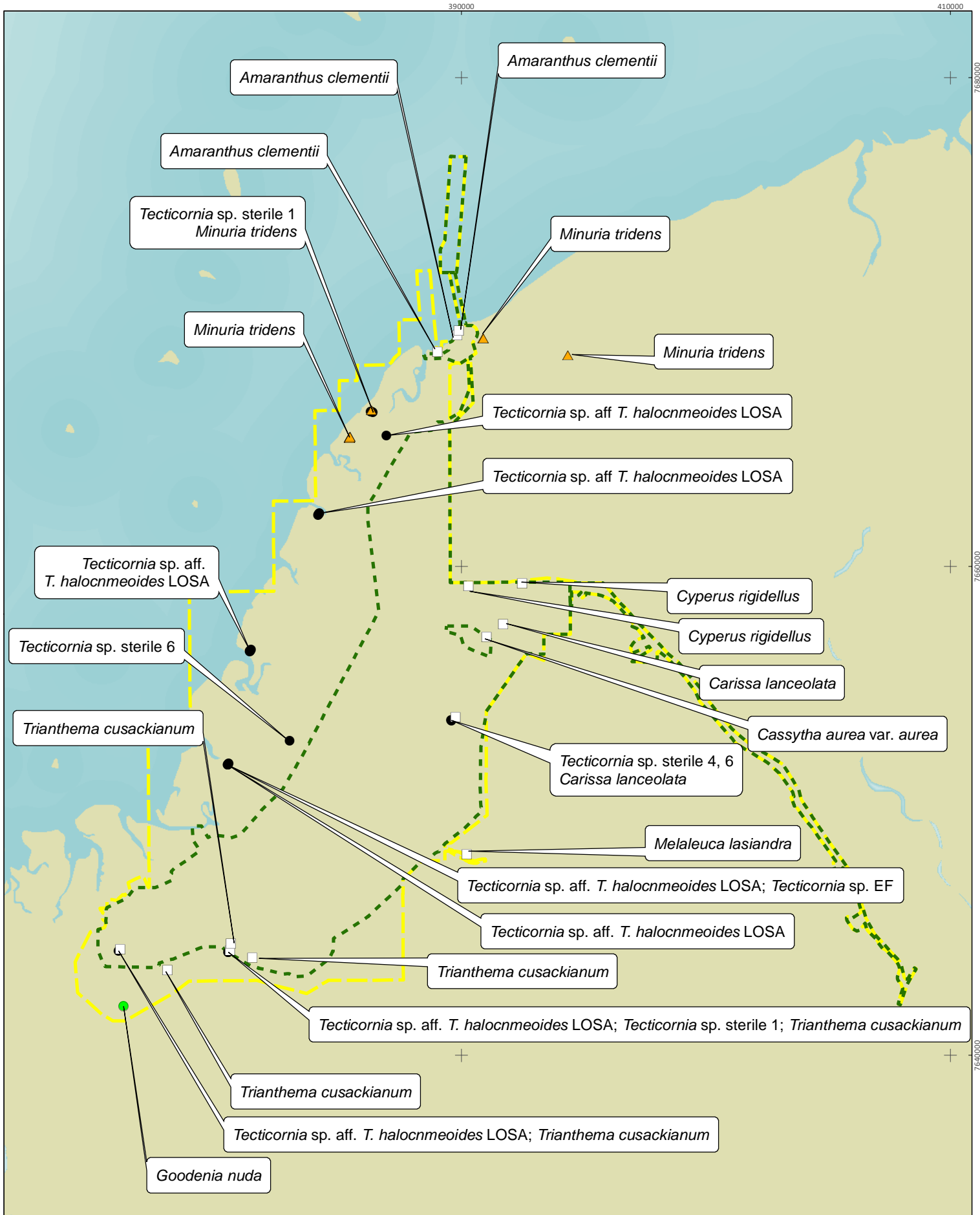
## 5.2 FIELD SURVEY

A total of 253 flora taxa representing 44 families and 122 genera identified to species level were recorded in the Study Area during the field surveys (Appendix 4). Species richness ranged from 1 – 46 species between quadrats (Appendix 2). The assemblage included 245 native species and eight introduced species, including 177 perennial species, 73 annual or short-lived species and three unknown lifecycles. The most prominent families recorded were Fabaceae (50 species), Poaceae (31 species), Chenopodiaceae (30 species), Amaranthaceae (18 species) and Malvaceae (16 species).

### 5.2.1 Significant flora records

One Commonwealth listed Threatened flora species, *Minuria tridens* (listed as P1 Priority flora in Western Australia; see section 5.2.1.1) and one other DBCA Priority flora *Goodenia nuda* (P4; section 5.2.1.2) were recorded in the Study Area during the survey (Figure 5-3). *Minuria tridens* was not identified through the desktop review as the only other previous record of this species in Western Australia was from near Cue, over 700 km south of the Study Area. Six other species, *Amaranthus clementii*, *Carissa lanceolata*, *Cassutha aurea* var. *aurea*, *Cyperus rigidellus*, *Melaleuca lasiandra* and *Trianthema cusackianum* are recorded as range extensions for this project. One samphire taxon identified as *Tecticornia* sp. affinity to *T. halocnemoides* large ovate seed aggregate (LOSA) was considered by taxonomic specialist, Dr Kelly Shepherd, to represent an undescribed species and is therefore considered a significant species; it was recorded at seven locations in the Study Area (Figure 5-3). Four other *Tecticornia* specimens could not be identified to species level and may also represent undescribed taxa. The species, *Tecticornia* sp. in early flower, *Tecticornia* sp. sterile 1, *Tecticornia* sp. sterile 4 and *Tecticornia* sp. sterile 6 are considered significant as they may represent new species.

A record for the P3 species *Owenia acidula* was found within the Study Area during the Desktop review. A foot search was conducted for the species in the vicinity of the record following which a broader area was searched by helicopter flying at low altitude. No plants of the species were located.



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Project No 1189/1279/1318  
Date 23-Jun-20  
Drawn by AJ  
Map author GW

0 3 6  
Kilometres

1:200,000 (at A4) GDA 1994 MGA Zone 50

- Study Area
- Development Envelope
- Significant flora**
- ▲ Priority 1
- Priority 4
- Range extension
- Other significant species

Abbreviations:  
aff. = affinity to  
EF = in early flower  
LOSA = large ovate  
seed aggregate  
var. = variety

**Figure 5-3**  
**Records of significant flora from field survey**

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### 5.2.1.1 *Minuria tridens*

Status: VU (EPBC), P1 (DBCA)

Description: Dwarf virgate shrub, 0.25-0.35 m high (Figure 5-4). White-blue flowers September.



**Figure 5-4** *Minuria tridens* (specimen from field survey)

Distribution and ecology: There is only one record of *Minuria tridens* in Western Australia, located on the roadside of the Great Northern Highway near Cue in the Eastern Murchison subregion; habitat is not described for this record. In the Northern Territory, it typically occurs on the south side of ranges and rises in low shrubland and is closely associated with high pH soils derived from dolomite, limestone and calcrete parent materials (Kerrigan & Albrecht 2006, in Nano & Pavey 2008). Associated species in the NT populations include *Acacia kempeana*, *Senna artemisioides* and *Indigofera leucotricha*; alkaline-tolerant hummock grasses (e.g. *Triodia longiceps* and *T. brizoides*) may be present in the wider-habitat area but are generally absent from the immediate population site (Kerrigan & Albrecht 2006, in Nano & Pavey 2008).

Records and distribution in Study Area: During the initial detailed survey a single plant was located on a coastal sand dune in *Triodia epactia* and *Cenchrus ciliaris* grassland (Figure 5-3), habitat that is not consistent with the NT records.

The Autumn 2020 survey revisited the site of the original collection of the species at Mardie. It was found that the species was in full flower following the rain from Cyclone Damien in February. Four populations of the species were recorded (including the original site), totalling 75 individuals both adult and juvenile (Table 5-5).

**Table 5-5 *Minuria tridens* (P1) records**

Location (WGS datum, Decimal Degrees)	Number
115.897, -21.110	29 Adults
115.906, -21.100	18 Adults
115.950, -21.073	7Adults, 15 Juveniles
115.983, -21.080	6 Adults

### 5.2.1.2 *Goodenia nuda*

Status: P4

Description: Erect to ascending herb, to 0.5 m high (Figure 5-5). Yellow flowers April to August.



**Figure 5-5** *Goodenia nuda* (specimen from field survey)

Distribution and ecology: Occurs in the Gascoyne, Little Sandy Desert and Pilbara bioregions (DBCA 2018b). This species is known from 117 records (ALA 2018), with habitat descriptions including:

- tussock grassland of *Eriachne benthamii*, low woodland of *Eucalyptus victrix* and *Acacia distans*. Mixed *Acacia* sparse mid shrubland (*Acacia tetragonophylla*, *A. synchronicia* and *A. sclerosperma* subsp. *sclerosperma*) in drainage line with red-brown sandy loam over ironstone
- low woodland of *Acacia aptaneura* and *Corymbia aspera* over open tussock grassland of *Aristida inaequilatera*, *Enneapogon polyphyllus* and *Aristida contorta* with low open shrubland of *Ptilotus obovatus*, *Mariana villosa* and *Eremophila lanceolata* on edge of drainage line in loam soil
- *Eucalyptus leucophloia*, *Corymbia hamersleyana* and *C. deserticola* low open woodland over *Hakea lorea* subsp. *lorea*, *Acacia elachantha* and *A. tumida* var. *pilbarensis* scattered tall shrubs over *A. atkinsiana*, *Senna glutinosa* open shrubland over *Isotropis atropurpurea* scattered low shrub over *Triodia* sp. Millstream and *T. wiseana* hummock grassland on floodplain with red-brown light clay
- low open woodland of *Acacia xiphophylla*, *A. victoriae*, *A. aneura* var. *aneura* over *A. tetragonophylla*, *Ptilotus obovatus*, *Senna* spp., and mixed species of *Maireana* and *Sclerolaena* in orange-brown alluvial sand over ironstone.

Population sizes provided in records for the species (DBCA 2018b) range from one to 200 plants.

Records and distribution in Study Area: Two individuals were located in a low *Eucalyptus victrix* woodland over tall open *Acacia coriacea* subsp. *pendens* shrubland over low *Eragrostis brownii*, *Eulalia aurea* and *Triodia wiseana* grassland (Figure 5-3).

### 5.2.1.3 *Amaranthus clementii*

*Amaranthus clementii* (Figure 5-6) an annual herb, known from 13 records in the Carnarvon, Gascoyne, Yalgoo and Murchison regions (DBCA 2020). The Study Area represents a range extension of approximately 200 km NNW of the closest record in the Gascoyne.



Figure 5-6 *Amaranthus clementii* (DBCA 2020)

### 5.2.1.4 *Carissa lanceolata*

*Carissa lanceolata* is an erect open spiny shrub to 3m (Figure 5-7) tall known from 85 records in the Central Kimberley, Dampierland, Great Sandy Desert, Northern Kimberley, Ord Victoria Plain, Pilbara, Tanami and Victoria Bonaparte regions (DBCA 2020). The Study Area represents an approximate 80km western extension of the recorded range for the species.



Figure 5-7 *Carissa lanceolata* (DBCA 2020)

### 5.2.1.5 *Cassytha aurea* var. *aurea*

*Cassytha aurea* var. *aurea* (Figure 5-8) is a parasitic climbing plant known from 41 records from the Carnarvon, Geraldton Sandplains, Swan Coastal Plain and Yalgoo regions (DBCA 2020). The Study Area represents an approximate 80 km, NE extension to the mapped distribution.



Figure 5-8 *Cassytha aurea* var. *aurea* (DBCA 2020)

### 5.2.1.6 *Cyperus rigidellus*

*Cyperus rigidellus* is an annual or short-lived perennial sedge (Figure 5-9), known from 61 records from the Avon Wheatbelt, Carnarvon, Central Ranges, Coolgardie, Gascoyne, Geraldton Sandplains, Great Sandy Desert, Little Sandy Desert, Murchison, Nullarbor, Pilbara and Yalgoo regions (DBCA 2020). The Study Area represents a range extension of approximately 120 km to the NNE of the closest record in the Ashburton bioregion.



Figure 5-9 *Cyperus rigidellus* (DBCA 2020)

#### 5.2.1.7 *Melaleuca lasiandra*

*Melaleuca lasiandra* is a shrub or tree up to 5m tall (Figure 5-10) recorded in the Central Kimberley, Central Ranges, Dampierland, Gascoyne, Gibson Desert, Great Sandy Desert, Little Sandy Desert, Ord Victoria Plain, Pilbara and Tanami regions (DBCA 2020). The Study Area represents an approximate 125km western extension to the mapped distribution for the species.



Figure 5-10 *Melaleuca lasiandra* (DBCA 2020)

#### 5.2.1.8 *Trianthema cusackianum*

*Trianthema cusackianum* is a prostrate annual herb (Figure 5-11) recorded in the Dampierland, Gascoyne, Great Sandy Desert, Ord Victoria Plain and Pilbara regions (DBCA 2020). The Study Area represents an approximate 115km western extension to the mapped distribution for the species.



Figure 5-11 *Trianthena cusackianum* (DBCA 2020)

## 5.2.2 Likelihood of occurrence assessment for significant flora

Assessment of the likelihood of occurrence of the remaining 33 significant flora identified from the desktop assessment determined one, *Owenia acidula* P3, was likely to be present in the Study Area, seven as possible and 25 unlikely (Table 5-6). Of those considered likely or possible, three were Priority 1, one was Priority 2 and four were Priority 3.

Table 5-6 Likelihood of occurrence for conservation significant flora in the Study Area

Species	Cons. status	Likelihood of occurrence
<i>Abutilon</i> sp. Onslow	P1	Unlikely Study Area outside of known range, no records within 5 km
<i>Atriplex flabelliformis</i>	P3	Unlikely Study Area outside of known range, no records within 5 km
<i>Bonamia brevifolia</i>	P1	Unlikely no suitable soil type in Study Area
<i>Bothriochloa decipiens</i> var. <i>cloncurrensis</i>	P1	Unlikely Study Area outside of known range, no records within 5 km
<i>Carpobrotus</i> sp. Thevenard Island (M. White 050)	P3	Unlikely Study Area outside of known range, no records within 5 km
<i>Corchorus congener</i>	P3	Possible suitable habitat in Study area but no records within 5 km
<i>Cucumis</i> sp. Barrow Island (D.W. Goodall 1264)	P2	Unlikely Study Area outside of known range, no records within 5 km
<i>Eleocharis papillosa</i>	Vu, P3	Unlikely Study Area outside of known range, no records within 5 km and no suitable habitat
<i>Eragrostis surreyana</i>	P3	Unlikely no records within 5 km and no suitable habitat
<i>Eremophila forrestii</i> subsp. <i>viridis</i>	P3	Unlikely Study Area outside of known range, no records within 5 km and no suitable habitat
<i>Gomphrena pusilla</i>	P2	Unlikely Study Area outside of known range, no records within 5 km
<i>Goodenia nuda</i>	P4	Definite, recorded in current survey

Species	Cons. status	Likelihood of occurrence
<i>Goodenia pallida</i>	P1	Possible suitable habitat in Study Area but no records within 5 km
<i>Goodenia</i> sp. East Pilbara	P3	Unlikely Study Area outside of known range, no records within 5 km and no suitable habitat
<i>Gymnanthera cunninghamii</i>	P3	Possible suitable habitat in Study Area but no records within 5 km
<i>Helichrysum oligochaetum</i>	P1	Possible suitable habitat in Study Area but no records within 5 km
<i>Indigofera</i> sp. Bungaroo Creek	P3	Unlikely Study Area outside of known range, no records within 5 km
<i>Lepidobolus quadratus</i>	P3	Unlikely Study Area outside of known range, no records within 5 km
<i>Owenia acidula</i>	P3	Likely, prior record of the species in the Study Area and large areas of suitable habitat
<i>Rhynchosia bungarensis</i>	P4	Unlikely, lack of suitable habitat and no record within 5 km
<i>Solanum albostellatum</i>	P3	Possible suitable habitat in Study Area but no records within 5 km
<i>Solanum cataphractum</i>	P3	Unlikely, lack of suitable habitat and no record within 5 km
<i>Stackhousia clementii</i>	P3	Unlikely, lack of suitable habitat and no record within 5 km
<i>Stackhousia umbellata</i>	P3	Unlikely Study Area outside of known range, no records within 5 km
<i>Stylidium weeliwollii</i>	P3	Unlikely Study Area outside of known range, no records within 5 km
<i>Swainsona thompsoniana</i>	P3	Unlikely Study Area outside of known range, no records within 5 km
<i>Tecticornia globulifera</i>	P1	Unlikely, lack of suitable habitat and no record within 5 km
<i>Tecticornia medusa</i>	P3	Unlikely, lack of suitable habitat and no record within 5 km
<i>Tecticornia</i> sp. Christmas Creek	P1	Unlikely, lack of suitable habitat and no record within 5 km
<i>Tephrosia rosea</i> var. Port Hedland (A.S. George 1114)	P1	Possible suitable habitat in Study Area but no records within 5 km
<i>Terminalia supranitifolia</i>	P3	Unlikely, lack of suitable habitat in Study Area
<i>Trianthema</i> sp. Python Pool (G.R. Guerin & M.E. Trudgen GG 1023)	P2	Possible suitable habitat in Study Area but no records within 5 km
<i>Triodia</i> sp. Robe River	P3	Unlikely, lack of suitable habitat in Study Area
<i>Triumfetta echinata</i>	P3	Unlikely Study Area outside of known range, no records within 5 km

### 5.2.3 Introduced flora

A total of eight introduced flora species were recorded in the Study Area, including two WoNS and Declared Pests *\*Prosopis glandulosa x velutina* and *\*Prosopis pallida* (Table 5-7).

**Table 5-7 Introduced flora species recorded during the field survey**

Species	Status
<i>*Aerva javanica</i>	
<i>*Cenchrus ciliaris</i>	
<i>*Cenchrus setiger</i>	
<i>*Malvastrum americanum</i>	
<i>*Phoenix dactylifera</i>	
<i>*Prosopis glandulosa x velutina</i>	s22(2) (C3 for Mardie and Karratha Stations, C2 elsewhere) and WoNS
<i>*Prosopis pallida</i>	S12 (C2) and WoNS
<i>*Vachellia farnesiana</i>	

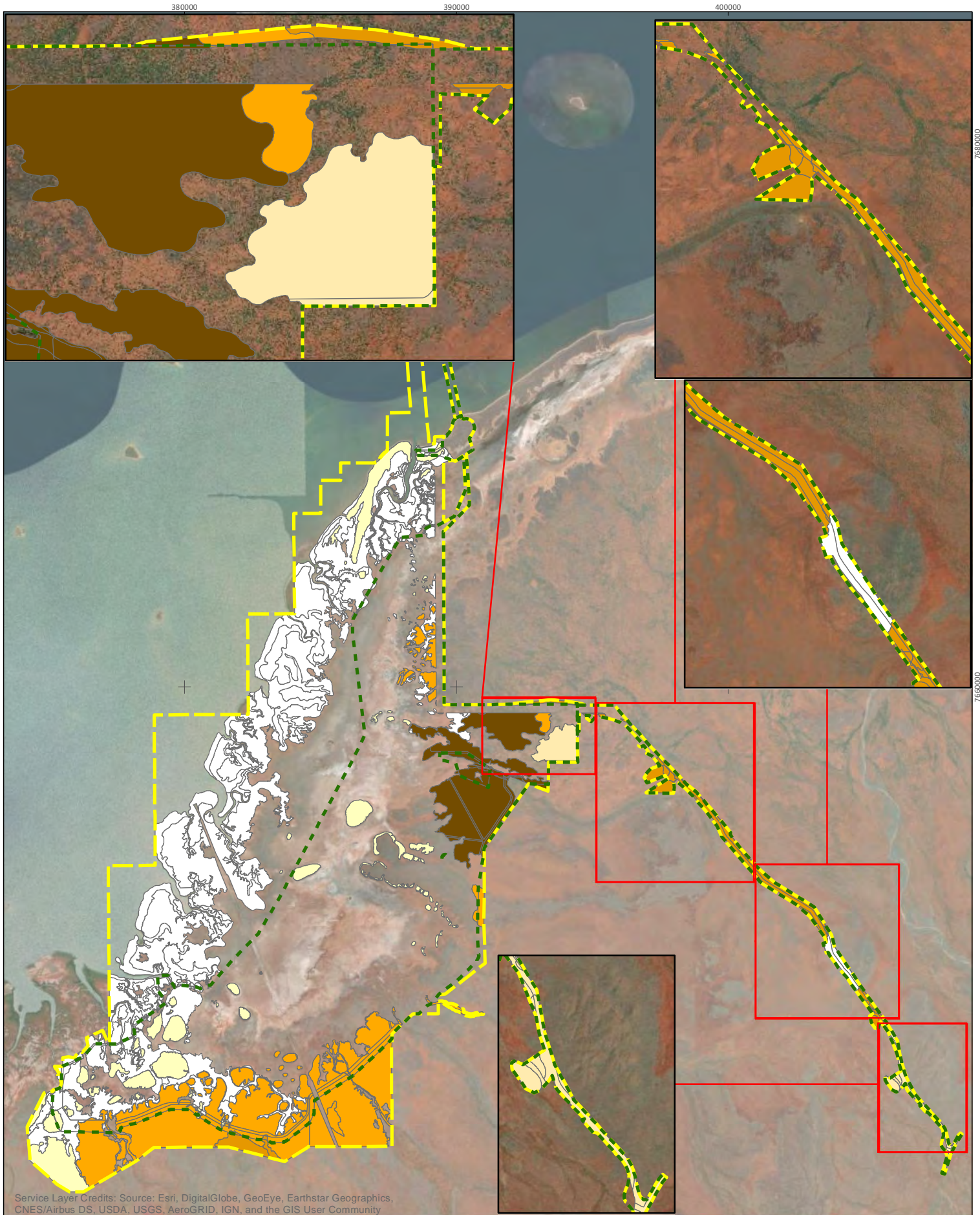
The Declared Pest *\*Prosopis* spp. was widespread across the study area (Figure 5-12) ranging from isolated shrubs to tall closed shrublands (Figure 5-13). With the exception of the tidal mudflats and tidal creeks, the species occurred in all habitats within the study area including flat/undulating sandy plains, coastal sand dunes, sandy islands on the tidal mudflats, sandy rises on the tidal mudflats, riparian vegetation of creeks and drainage lines and low lying clay plains. The majority of the plants sighted during the survey were in a sterile condition precluding the capacity to map the distribution of the two species recorded individually.

### 5.2.4 Unidentified flora

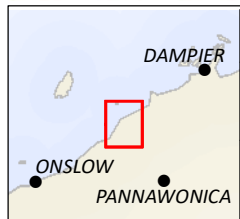
A total of 27 taxa recorded in the Study Area could not be identified to species level, in most instances due to insufficient taxonomic characters as plants were sterile (lacking reproductive structures; Table 5-8). A further five taxa were identified to species level but lacked sufficient taxonomic characters to determine the sub-species or variety (Appendix 4).

The unidentified species included four *Tecticornia* taxa which are therefore considered potentially new species (see 5.2.1). Despite multiple visits to the quadrats of these unidentified species over different seasons no fertile material of the species could be collected.





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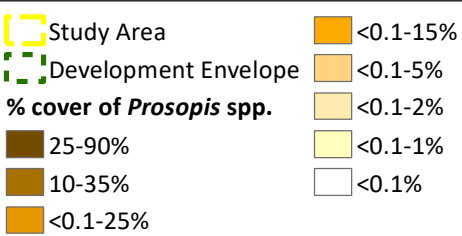


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 Date 22-Jun-20  
 Drawn by AJ  
 Map author GW

0 2.5 5  
 Kilometres

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**Figure 5-12**  
**Location of *Prosopis* spp. (Mesquite) infestations in the Study Area**

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Figure 5-13 \**Prosopis* spp. within the Study Area – (top) tall closed shrubland on flat plain, (bottom) isolated tall shrubs on coastal dune

**Table 5-8 Unidentified flora taxa recorded during the field survey**

Unidentified taxon	Comments
<i>Abutilon</i> ? <i>fraseri</i>	sterile
<i>Abutilon</i> sp.	sterile
<i>Aristida</i> ? <i>holathera</i>	sterile
<i>Atriplex</i> ? <i>bunburyana</i>	sterile
<i>Atriplex</i> ? <i>codonocarpa</i>	sterile
<i>Eragrostis</i> sp.	sterile
<i>Eriachne</i> ? <i>helmsii</i>	incomplete inflorescence
<i>Eucalyptus</i> sp.	sterile seedling
<i>Frankenia</i> ? <i>ambita</i>	sterile
<i>Frankenia</i> ? <i>pauciflora</i>	sterile
<i>Gomphrena</i> ? <i>canescens</i>	old dry inflorescence
<i>Goodenia</i> ? <i>armitiana</i>	old dry fruit
<i>Ipomoea</i> sp.	sterile
<i>Pterocaulon</i> ? <i>sphacelatum</i>	dry desiccated specimen
<i>Sida</i> ? <i>arenicola</i>	sterile
<i>Sida</i> ?sp. Pilbara	sterile
<i>Solanum</i> ? <i>horridum</i>	sterile
<i>Streptoglossa</i> ? <i>adscendens</i>	sterile
<i>Streptoglossa</i> ? <i>bubakii</i>	sterile
<i>Streptoglossa</i> ? <i>odora</i>	sterile
<i>Swainsona</i> sp.	small seedling
<i>Tecticornia</i> sp. affinity to <i>T. halocnemoides</i> large ovate seed aggregate	sterile
<i>Tecticornia</i> sp. in early flower	insufficient taxonomic characters
<i>Tecticornia</i> sp. sterile 1	sterile
<i>Tecticornia</i> sp. sterile 4	sterile
<i>Tecticornia</i> sp. sterile 6	sterile
<i>Whiteochloa</i> ? <i>airoides</i>	sterile

### 5.2.5 Vegetation types

In total, 24 vegetation types were defined for the Study Area (Figure 5-14; Table 5-9) and include:

- five *Triodia* spp. hummock grasslands,
- four grasslands
  - *Spinifex longifolia*
  - *Eragrostis xerophila*

- *Sporobolus mitchellii*/*\*Cenchrus ciliaris*
- *Triodia epactia*/*Whiteochloa airoides*,
- a *Melaleuca argentea* and *Sesbania formosa* woodland,
- an open *Eucalyptus victrix* woodland over *Acacia* spp. shrubland over *Triodia* spp. hummock grassland,
- mid to tall *Acacia* spp. shrubland over *Triodia longiceps* hummock grassland,
- low *Acacia* spp. shrubland over *Triodia wiseana* hummock grassland,
- a *\*Prosopis* spp. tall shrubland,
- one low open samphire (*Tecticornia* spp.) shrublands complex on tidal mudflats and sandy rises on tidal mudflats comprised of eight defined vegetation types,
- a mangrove community on tidal mudflats and tidal creeks, and
- a low shrubland over *Sporobolus virginicus* grassland.

The vegetation types delineated by the statistical analysis are illustrated in dendrogram (Figure 5-15; Figure 5-16).

The analysis of the 50 m x 50 m quadrats clearly delineated some of the vegetation types defined but sites from some vegetation types were interspersed within the dendrogram. This has occurred largely as a result of the similarity of the suite of species across a large number of sites, including the infestations of the weed species, *\*Prosopis* spp. and *\*Cenchrus ciliaris*. Sites that were not grouped within the dendrogram were allocated to a vegetation type where the vegetation was dominated by a particular species. For example, sites allocated to PgvExCt occurred in different groups within the dendrogram but were allocated to this vegetation type as the vegetation comprised predominantly an *Eragrostis xerophila* grassland.

The analysis of the 3 m x 3 m quadrats from the transect surveys of samphire shrublands on mudflats clearly defined different vegetation types with one exception, site MSP222Q4. This quadrat occurred within the *Triodia epactia* grassland on a sand island that bordered with a *Tecticornia* spp. shrubland on a mudflat. Despite being dominated by the *Triodia* spp. the site has aligned with the *Tecticornia* spp. shrubland as some species were common to both. The site was subsequently grouped with other quadrats that were dominated by the *Triodia* spp. grassland.

The *Tecticornia* spp. shrublands were mapped as a single complex (T spp; Figure 5-14) as it was not possible to discern community type boundaries accurately from aerial imagery. Vegetation type codes are provided at the survey site location to indicate the spread of the different vegetation types defined. Revisits to the survey sites in 2020 were unable to further delineate the shrublands as the majority of plants present at the survey locations were sterile. In addition, the lack of fruiting material on the species present precluded the capacity to undertake further transect surveys due to the incapacity to identify the species.

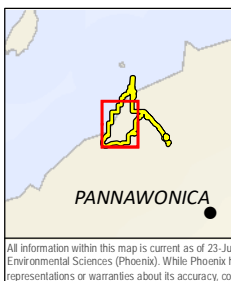
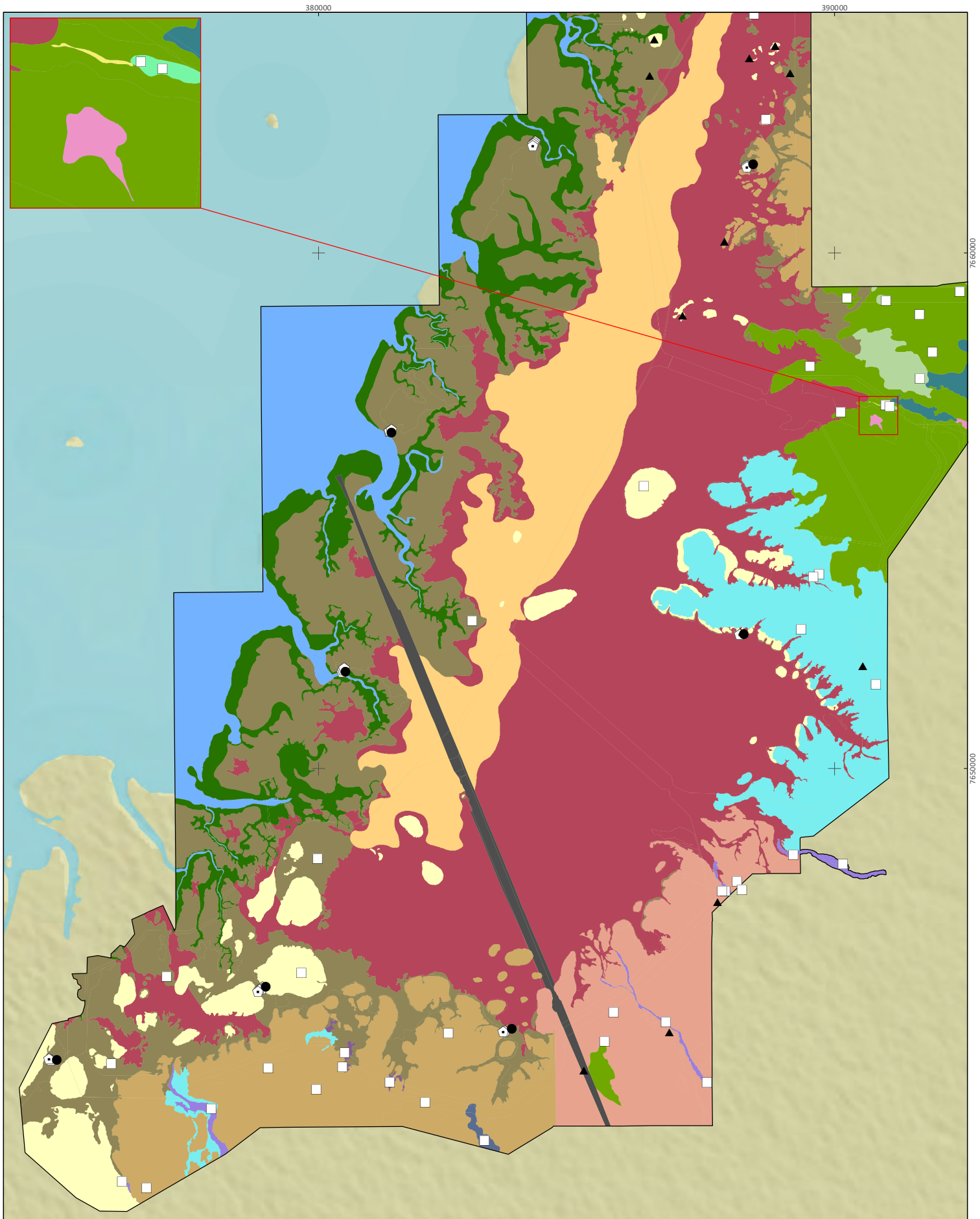
A large proportion of the Study Area (13,408.5ha, 46.2%) was devoid of the flora and vegetation that were the subject of the current survey. These areas comprised coastal beaches, tidal mudflats, tidal creeks, ocean and algal mat that were naturally devoid of vegetation (45.4%) and completely degraded/cleared areas including a gas pipeline corridor, pastoral tracks and infrastructure areas of Mardie station (0.8%) (Table 5-10).

Vegetation covered 15,612ha of the Study Area. *Tecticornia* spp. shrublands were the most widespread accounting for 33.4% of vegetation, followed by PgvAsTl (12.6%, a mid isolated *\*Prosopis glandulosa* x *velutina* over isolated low shrubland over *Triodia* spp. grassland).

Seven vegetation types, SmCc, AjSIte, AtAjTe, AbTw, EvAcpCc, MaPgvTd and TtSvTc combined comprised just 1.2% of the Study Area. Vegetation type PgvExCt considered representative of the Horseflat land system Priority 3 PEC (see section 5.1.4) covered 1.8% of the study area.

Other than the mangroves which occurred on the tidal mudflats and tidal creeks, two vegetation types are considered riparian vegetation as they are associated with either creeks or waterholes:

- MaPgvTd, associated with Mardie Pool, *Melaleuca argentea* and *Sesbania formosa* are recognised groundwater dependent species.
- EvAcpCc, riparian vegetation on creeklines, *Eucalyptus victrix* may be considered groundwater dependent but does also occur outside of riparian areas.



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Project No	1189/1279/1318
Date	23-Jun-20
Drawn by	AJ
Map author	GW

0 2 4  
Kilometres

1:95,000 (at A4) GDA 1994 MGA Zone 50

Study Area  
SiteType

- Quadrat
- ▲ Relevé
- Transect
- ⊞ Transect quadrat

Vegetation type

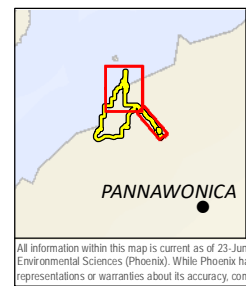
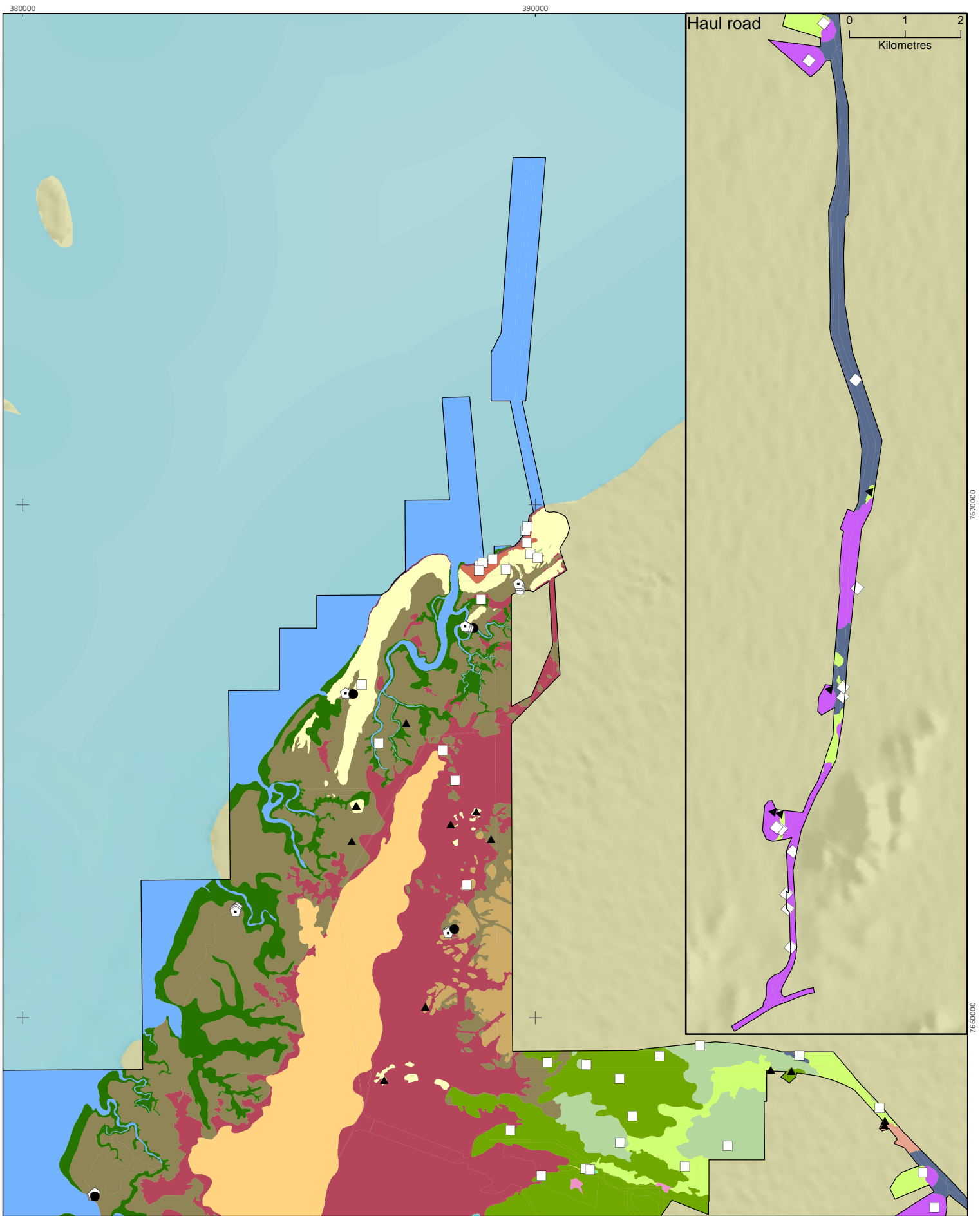
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Cleared	PgvExCt
EvAcPcc	PgvTI
FW	TI
MaPgvTd	Tspp
O	TtSvTc
P	

**Figure 5-14a**  
**Vegetation types in the study area (south west)**

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Biological surveys for the Mardie Salt Project

Project No	1189/1279/1318
Date	23-Jun-20
Drawn by	AJ
Map author	GW

1:95,000 (at A4) GDA 1994 MGA Zone 50

Study Area	AbTw	MaPgvTd
Quadrat	AcAjTe	O
Relevé	AjSlTe	PgvAbTw
Transect	AmMs	PgvAsTl
Transect quadrat	AtAjTe	PgvAxTw
	Beach/dune	PgvExCt
	C	PgvTI
	Cleared	SmCc
	FW	TI
		Tspp

**Figure 5-14b**

**Vegetation types in the study area (north and haul road)**

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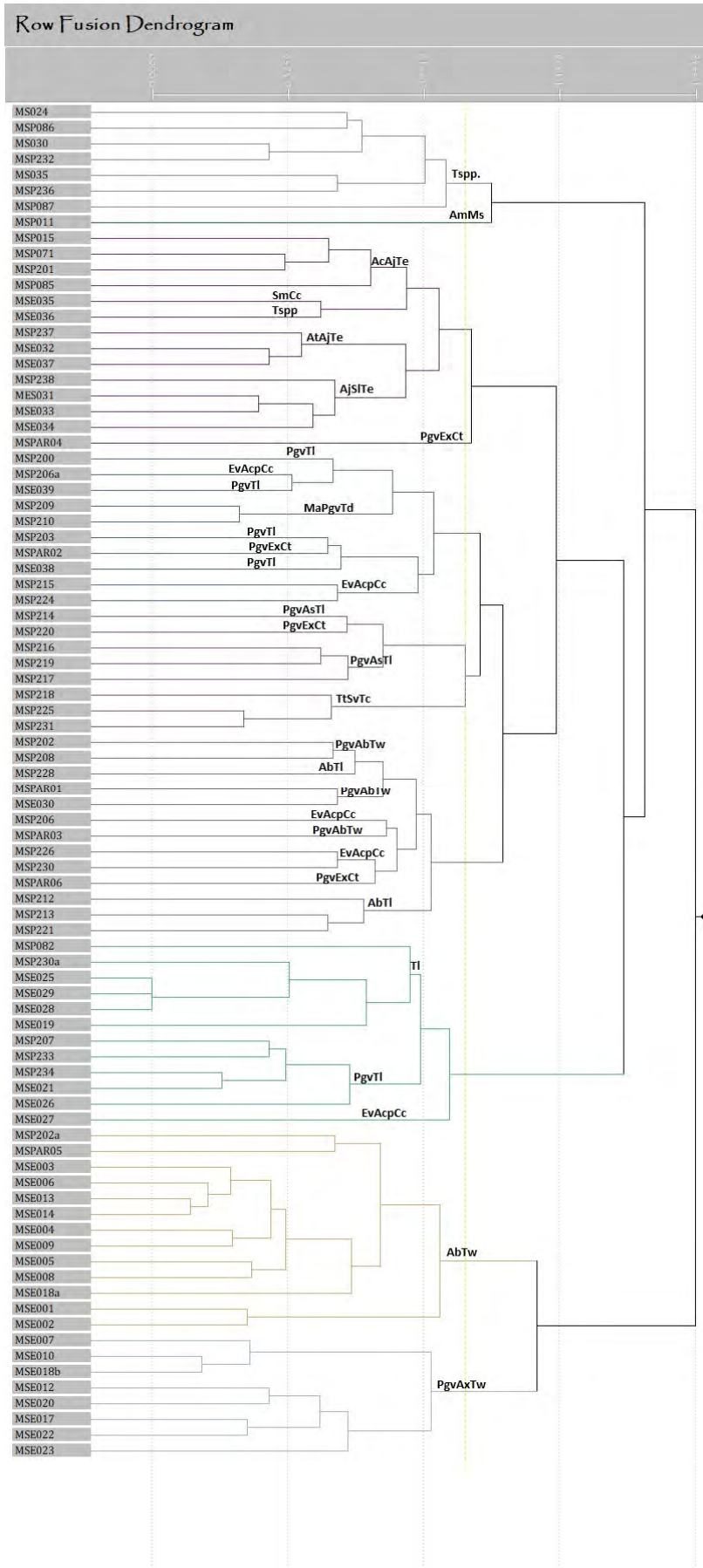


Figure 5-15 Dendrogram generated from the 50 m x 50 m quadrats



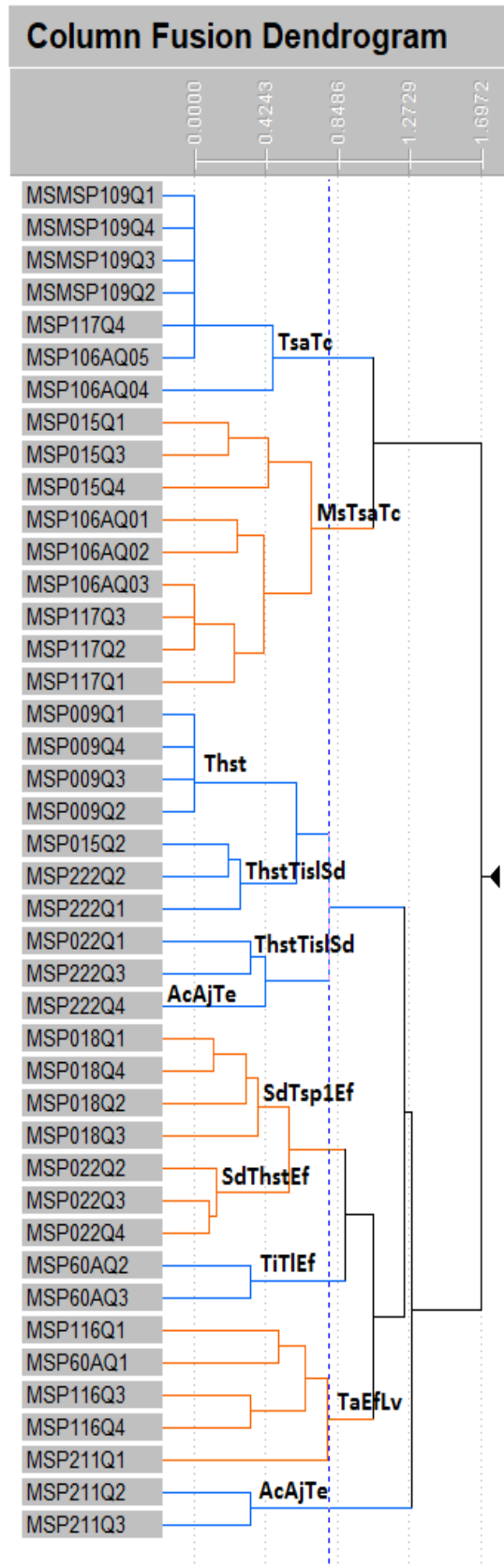
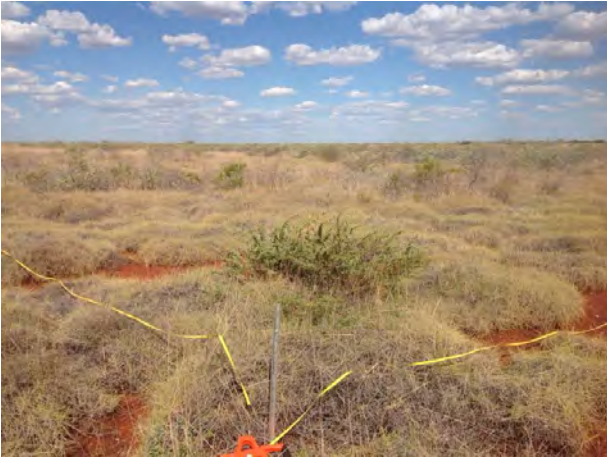







Figure 5-16 Vegetation types delineated from the dendrogram generated from the 3 m x 3 m quadrats along transects



Table 5-9 Vegetation types recorded in the Study Area



Vegetation type	Survey sites (quadrats, relevés and vegetation descriptions)	Vegetation description	Photograph
AbTI	MSP212, MSP213, MSP221, MSP228, MSPVD02	Mid to tall mixed <i>Acacia</i> shrubland, frequently <i>A. bivenosa</i> and infestations of <i>*Prosopis glandulosa x velutina</i> over <i>Triodia</i> hummock grassland, <i>T. longiceps</i> with infestations of <i>*Cenchrus ciliaris</i>	
AcAjTe	MSP015, MSP067, MSP071, MSP085, MSP201, MS018Q1, MS211Q2, MS211Q3, MS222Q4, MSIS001, MSIS002, MSIS003, MSIS004, MSIS005	Isolated tall shrubs to open shrubland, frequently <i>Acacia coriacea</i> , <i>*Prosopis glandulosa x velutina</i> and <i>Myoporum montanum</i> over isolated low shrubs to open shrubland of <i>*Aerva javanica</i> over low closed <i>Triodia epactia</i> hummock grassland on sand dunes and sandy plains.	

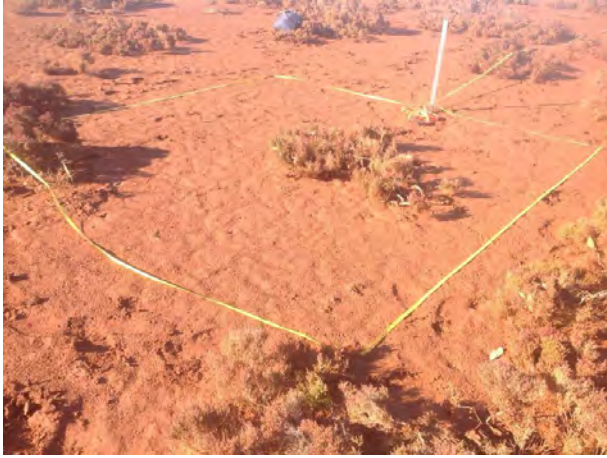
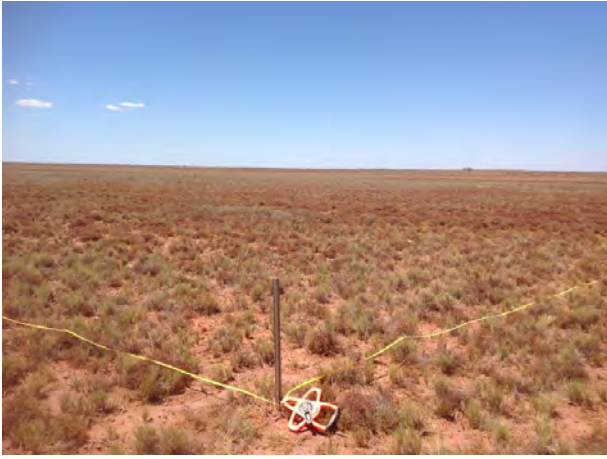
SmCc	MSE035	<p>Tussock grassland of <i>Sporobolus mitchellii</i>, *<i>Cenchrus ciliaris</i>, and intruding <i>Triodia epactia</i> with scattered forbs <i>Amaranthus clementii</i>, <i>Indigofera linifolia</i>, and <i>Rhynchosia minima</i>.</p>	
AjSITE	MSE031, MSE033, MSE034, MSP238	<p>Isolated low *<i>Aerva javanica</i>, <i>Atriplex bunburyana</i> and <i>Rhagodia preissii</i> subsp. <i>obovata</i> shrubs over tall <i>Spinifex longifolius</i> grassland over low <i>Triodia epactia</i>, *<i>Cenchrus ciliaris</i> and <i>Whiteochloa airoides</i> grassland on beach foredune.</p>	

AmMs <sup>1</sup>	MSP011	Mid open <i>Avicennia marina</i> and <i>Rhizophora stylosa</i> shrubland over low closed <i>Muellerolimon salicorniaceum</i> shrubland surrounding tidal creek.	
AtAjTe	MSE032, MSE037, MSP237	Isolated mid <i>Adriana tomentosa</i> var. <i>tomentosa</i> , <i>Trichodesma zeylanicum</i> var. <i>zeylanicum</i> and <i>Rhagodia preissii</i> subsp. <i>obovata</i> shrubs over isolated low <i>Aerva javanica</i> , <i>Corchorus walcottii</i> and <i>Indigofera linifolia</i> shrubs over mid closed <i>Triodia epactia</i> and <i>Whiteochloa airoides</i> hummock grassland on coastal sand dune.	



<p>AbTw</p>	<p>MSE001, MSE002, MSE003, MSE004, MSE005, MSE006, MSE008, MSE009, MSE013, MSE014, MSE018a, MSP202a, MSPAR05</p>	<p>Occasionally isolated low <i>Corymbia hamersleyana</i> and <i>C. candida</i> trees over mid to tall shrubs to open shrubland of <i>Acacia</i> spp., frequently <i>A. bivenosa</i>, <i>A. ancistrocarpa</i> and <i>A. pyriformis</i> var. <i>pyriformis</i> over low to mid <i>Triodia wiseana</i> hummock grassland on flat and undulating plains.</p>	
<p>EvAcpCc</p>	<p>MSE027, MSP206, MSP206(a), MSP215, MSP224, MSP226, MSP230</p>	<p>Isolated low trees to low open <i>Eucalyptus victrix</i> woodland occasionally with <i>Corymbia candida</i> trees over mid to tall open shrubland with <i>Acacia</i> spp., frequently <i>Acacia coriacea</i> subsp. <i>pendens</i> and <i>A. pyriformis</i> var. <i>pyriformis</i>, <i>Ehretia saligna</i> and occasionally <i>Melaleuca lasiandra</i> over sparse low to open low <i>*Cenchrus ciliaris</i>, <i>Triodia epactia</i> and <i>T. longiceps</i> grassland riparian vegetation of creeks.</p>	

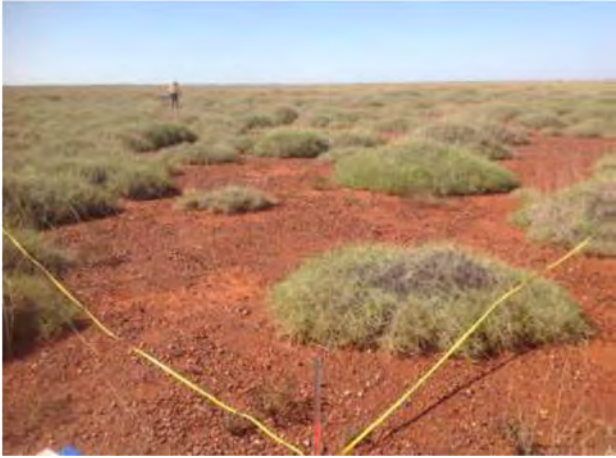
<p>MaPgvTd</p>	<p>MS209, MS210</p>	<p>Mid <i>Melaleuca argentea</i>,              *<i>Phoenix dactylifera</i> and <i>Sesbania formosa</i> woodland over tall open              *<i>Prosopis glandulosa</i> x <i>velutina</i> woodland over isolated tall <i>Typha domingensis</i>, <i>Schoenoplectus subulatus</i> and <i>Cyperus vaginatus</i> sedges in creeks.</p>	 <p>A photograph showing a woodland area with several tall palm trees (Phoenix dactylifera) and other vegetation. The ground is reddish-brown soil. A yellow measuring tape is visible on the ground in the foreground.</p>
<p>PgvAsTI</p>	<p>MSP059, MSP115, MSP214,              MSP216, MSP217, MSP219</p>	<p>Isolated mid *<i>Prosopis glandulosa</i> x <i>velutina</i> over isolated low shrubs frequently <i>Acacia synchronicia</i> and <i>Trianthema turgidifolium</i> over low to mid <i>Triodia longiceps</i> and <i>T. epactia</i> hummock grassland on plains.</p>	 <p>A photograph showing a grassland area with low shrubs and grasses. The ground is reddish-brown soil. The vegetation is sparse and low-growing.</p>

<p>PgvTI</p>	<p>MSE021, MSE026, MSE027, MSE038, MSE039, MSP200, MSP203, MSP207, MSP233, MSP234,</p>	<p>Tall *<i>Prosopis glandulosa</i> x <i>velutina</i> shrubland over mid *<i>Cenchrus ciliaris</i>, <i>Triodia longiceps</i> hummock grassland.</p>	
<p>PgvExCt</p>	<p>MSP220, MSPAR02, MSPAR04, MSPAR06</p>	<p>Isolated mid shrubs, *<i>Prosopis glandulosa</i> x <i>velutina</i>, <i>Acacia xiphophylla</i> and <i>A. inaequilatera</i> over low <i>Eragrostis xerophila</i> tussock grassland with occasional *<i>Cenchrus ciliaris</i> and <i>Triodia</i> spp. grasses over isolated low <i>Corchorus tridens</i> and Asteraceae forbs on flat plain.</p>	

<p>Tspp</p>	<p>MS024, MS025, MS030, MS035, MS050, MS057, MS211, MSE036, MSP086, MSP087, MSP232, MSP236, 106AQ04, 106AQ05, 117Q4, MS009Q1, MS009Q2, MS009Q3, MS009Q4, MS015Q2, MS018Q2, MS018Q3, MS018Q4, MS025, MS035, MS109Q1, MS109Q2, MS109Q3, MS109Q4, MS116Q1, MS116Q3, MS116Q4, MS211, MS222Q1, MS222Q2, MS222Q3, MS222Q4, MS22Q1, MS22Q2, MS22Q3, MS22Q4, MS60aQ1, MS60aQ3, 106AQ01, 106AQ02, 106AQ03, 117Q1, 117Q2, 117Q3, MS015Q1, MS015Q3, MS015Q4</p>	<p>Low mixed <i>Tecticornia</i> species sparse samphire shrubland to samphire shrubland on mudflats and low sandy rises.</p>	
<p>TtSvTc</p>	<p>MS218, MSP225, MSP231</p>	<p>Low <i>Trianthema turgidifolium</i>, <i>Neobassia astrocarpa</i> and <i>Pluchea rubelliflora</i> shrubland over low <i>Sporobolus virginicus</i> grassland over isolated low <i>Trianthema cusackianum</i> forbs on low lying plains.</p>	



<p>PgvAxTw</p>	<p>MSE007, MSE010, MSE012, MSE017, MSE018B, MSE020, MSE022, MSE023</p>	<p>Isolated mid shrubs to open shrubland of <i>*Prosopis glandulosa x velutina</i> and <i>Hakea chordophylla</i> shrubland over low open shrubland of <i>Acacia xiphophylla</i>, <i>A. synchronicia</i> and <i>A. inaequilatera</i> over hummock grassland of <i>Triodia wiseana</i>.</p>	
<p>PgvAbTw</p>	<p>MSE030, MSPAR03, MSP202, MSP208, MSPAR01</p>	<p>Isolated mid to tall shrubs to open shrubland of <i>*Prosopis glandulosa x velutina</i>, over isolated low shrubs to open shrubland of <i>Acacia bivenosa</i>, <i>Senna glutinosa</i> subsp. <i>glutinosa</i>, and patches of <i>Acacia sclerosperma</i>, over variable density hummock grassland of <i>Triodia wiseana</i> and <i>Triodia epactia</i> with <i>*Cenchrus ciliaris</i>.</p>	

TI	MSE019, MSE025, MSE028, MSE029, MSP082, MSP230a	<i>Triodia longiceps</i> hummock grassland, occasionally inconsistent presence of <i>Acacia</i> spp. and forbs.	 A photograph showing a landscape of red soil with scattered green hummock grasses. Yellow survey tape is stretched across the ground in the foreground, forming a rectangular area. A person is visible in the distance on the horizon under a clear blue sky.
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**Table 5-10 Extent of each vegetation type/feature**

Vegetation type/feature	Extent in Study Area (ha)	% of Study Area	% of native vegetation extent in Study Area	Within DE (ha)	Within DE (%)
AbTl	1386.8	4.8	8.9	1236.7	7.7
AbTw	228.0	0.8	1.5	225.6	1.4
AcAjTe	1305.5	4.5	8.4	746.3	4.7
AjSlTe	6.5	0.0	0.0	4.5	0.0
AmMs	1673.1	5.8	10.7	26.3	5.8
AtAjTe	25.1	0.1	0.2	13.1	0.2
EvAcpCc	71.9	0.2	0.5	15.9	0.1
MaPgvTd	1.6	0.0	0.0	0.0	0.1
PgvAbTw	412.4	1.4	2.6	387.9	0.0
PgvAsTl	1963.2	6.8	12.6	1098.5	2.4
PgvAxTw	316.0	1.1	2.0	314.8	6.9
PgvExCt	287.2	1.0	1.8	269.2	2.0
PgvTl	1360.0	4.7	8.7	1233.3	1.7
SmCc	0.8	0.0	0.0	0.6	7.7
Tl	1339.6	4.6	8.6	600.4	0.0
Tspp	5220.6	18.0	33.4	1366.9	3.7
TtSvTc	13.7	0.0	0.1	12.5	8.5
AM (Algal mat)	2559.5	8.8		929.3	0.1
O (Ocean or tidal creek)	2780.7	9.6		356.2	2.2
FW (Permanent freshwater pool)	0.4	<0.1			
Beach/dune	10.6	<0.1		1.6	0.0
C (Mudflat or salt flat area)	7815.6	26.9		7055.1	44.0
P (Cleared for gas pipeline)	234.6	0.8		125.5	0.8
Cleared	7.0	<0.1		2.7	0.0
<b>Grand Total</b>	<b>29020.4</b>	<b>100.0</b>		<b>16023.1</b>	<b>100.0</b>

## 5.2.6 Vegetation condition

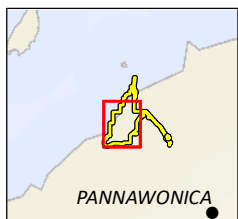
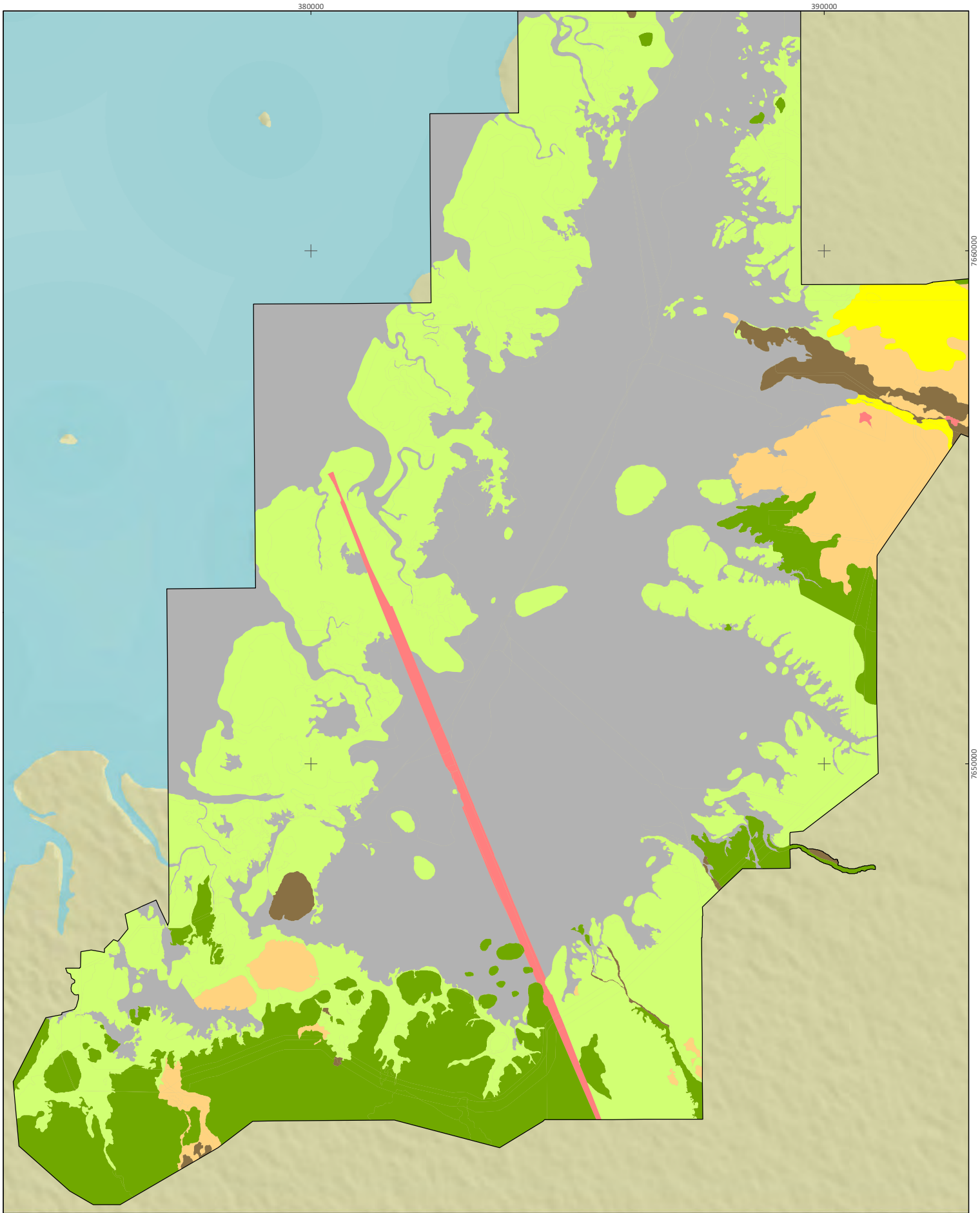
The condition of remnant vegetation in the Study Area ranged from Degraded to Excellent (Table 5-11, Figure 5-17). Areas naturally devoid of vegetation in the Study Area and vegetation mapped in the extrapolated area were assigned Not Applicable (N/A) condition rating (45.4%).

The majority of remnant vegetation in the detailed survey portion of Study Area (79.7%) was recorded to be in Very Good to Excellent condition, largely as a result of the *Tecticornia* spp. shrublands and mangroves on the tidal mudflats being subject to little or no disturbance. The remaining 19.4% of remnant vegetation in the detailed survey portion of the Study area was in Degraded to Good condition with disturbance primarily in the form of weed infestations, particularly *Prosopis* spp. and *Cenchrus ciliaris*, but also grazing damage from livestock and vehicle tracks.

A small proportion of the Study Area (0.8%) comprising cleared areas was rated as Completely Degraded.

**Table 5-11**      **Extent of vegetation condition in the Study Area**

Condition rating	Extent in Study Area (ha)	% of Study Area	% of remnant vegetation in Study Area
Excellent	9464.3	32.6	60.6
Very Good	2986.5	10.3	19.1
Good	974.1	3.4	6.2
Poor	1821.5	6.3	11.7
Degraded	365.6	1.3	2.3
Completely Degraded (cleared)	241.6	0.8	-
N/A	13166.9	45.4	-
<b>Total</b>	<b>29020.4</b>	<b>100</b>	<b>100.00</b>



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Biological surveys for the Mardie Salt Project

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Study Area

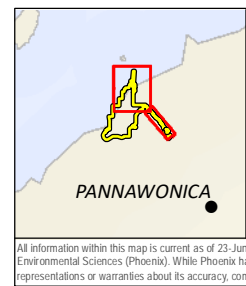
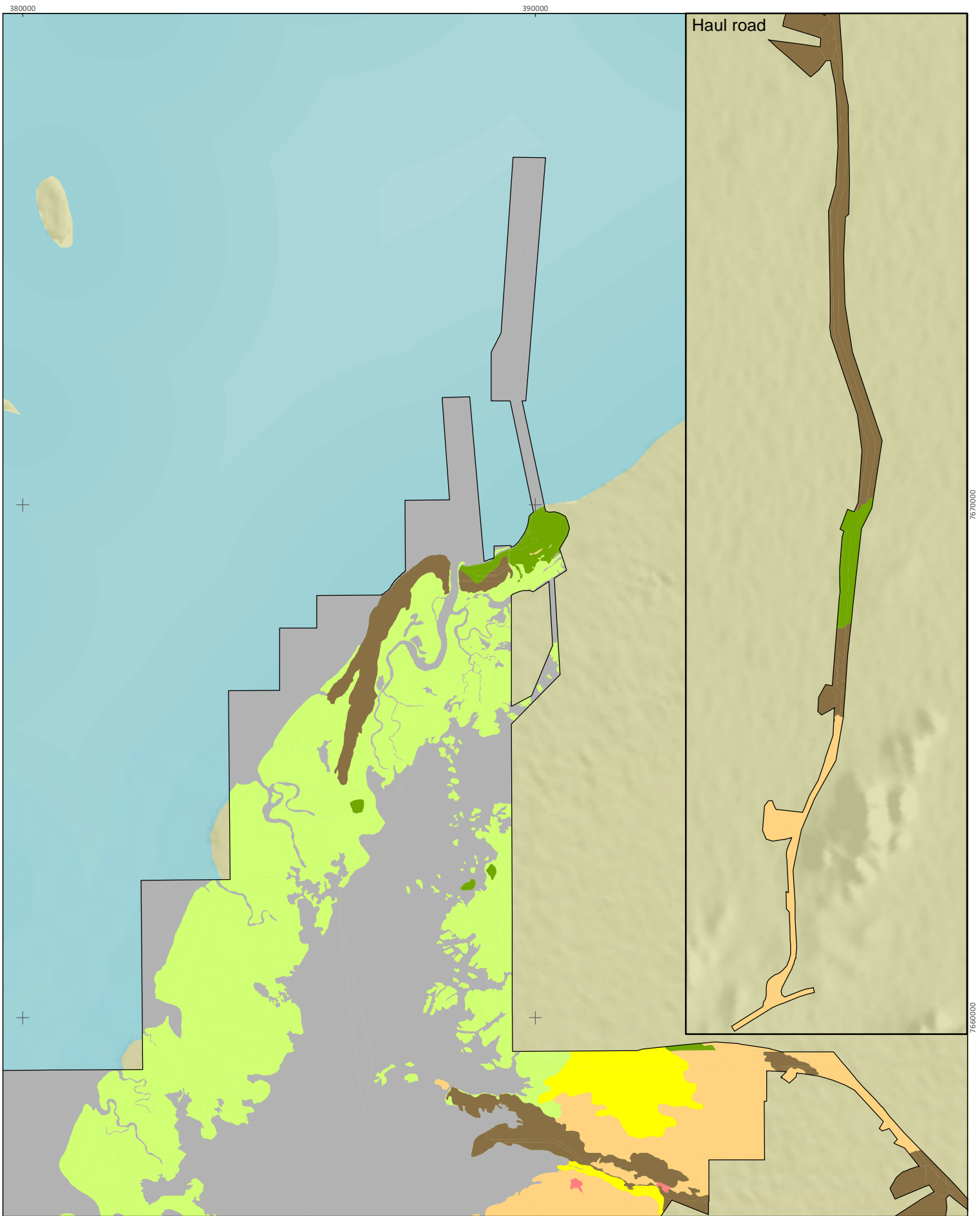
**Vegetation condition**

- Excellent
- Very Good
- Good
- Poor
- Degraded
- Completely Degraded
- N/A

**Figure 5-17**  
**Vegetation condition in the study area (south west)**

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Study Area	<b>Vegetation condition</b>
	Excellent
	Very Good
	Good
	Poor
	Degraded
	Completely Degraded
	N/A

**Figure 5 -17b**

**Vegetation condition in the study area (north and haul road)**

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### 5.2.7 Threatened and Priority Ecological Communities

One vegetation type recorded for the Study Area, PgvExCt, was considered to be representative of the Priority 3 PEC, Horseflat Land System of the Roebourne Plains. The Low mixed *Eragrostis* spp. grassland that dominated this vegetation type resembles the description of the PEC and the occurrence of the vegetation type in the Study Area, for the most part, occurred on areas mapped as the Horseflat Land System (Figure 5-18). A total of 483 ha was mapped as the PEC.

Vegetation type AtAjTe which occurred on the landward side of a coastal dune (Figure 5-14) bore some resemblance to the Priority 3 PEC, Coastal dune native tussock grassland dominated by *Whiteochloa airoides*, due to the prominence of this grass species. However, the dominant grass species in this area was *Triodia epactia* and subsequently this vegetation type was not considered to be representative of the PEC.

### 5.2.8 Local and regional significance of vegetation

Vegetation type AcAjTe was habitat for the Commonwealth listed Vulnerable (State listed P1) species *Minuria tridens* and was considered significant vegetation as a refuge for a significant species.

Vegetation type EvAcpCc was habitat for the P4 species *Goodenia nuda*, habitat for the significant species *Melaleuca lasiandra* and covered a small area (less than 1% of vegetation) in the Study Area and is subsequently considered significant vegetation due to restricted distribution and role as a refuge for significant plant taxa. However, some areas of this vegetation may not be considered significant due to the prominence of the introduced species *\*Cenchrus ciliaris*.

Vegetation type MaPgvTd occupied a very small area, was dominated by two species (*Melaleuca argentea* and *Sesbania formosa*) not recorded elsewhere in the Study Area, was at threat from weed invasion and impacts from grazing and represented habitat for the significant flora *Cassytha aurea* var. *aurea*. This vegetation type is considered significant vegetation due to restricted distribution and role as a refuge for riparian plant taxa not recorded elsewhere in the Study Area. Similarly, vegetation types AjSITe, AtAjTe and TtSvTc occupied small areas and contained plant species not recorded elsewhere in the Study Area and are thereby considered significant as a result of restricted distribution and role as refuge for plant taxa not recorded elsewhere in the Study Area. In addition, the AjSITe and AtAjTe vegetation types were habitat for the significant species *Amaranthus clementii*. However, the AjSITe and AtAjTe vegetation types contain the introduced species *\*Aerva javanica* and subsequently some area of these vegetation types may not be considered significant due to the prominence of this introduced species.

Vegetation types AbTl and PgvAbTw were habitat for the significant species *Carissa lanceolata* and may be considered significant as role as a refuge for significant flora. However, the PgvAbT has varying levels of infestation with the Declared pest *\*Prosopis* spp. and some area may not be considered significant vegetation due to the prominence of this pest. Similarly, the PgvTl vegetation type was habitat for the significant species *Cyperus rigidellus*, but some areas of this vegetation may not be considered significant due to the prominence of the pest species.

The low open *Tecticornia* spp. chenopod shrublands over low open mixed grasslands as well as the low shrubland over *Sporobolus virginicus* grassland (TtSvTc) were habitat for one *Tecticornia* taxon considered representative of an undescribed species and/or the further four *Tecticornia* taxa that could not be described to species level and may potentially represent undescribed species. These shrublands are therefore considered significant as they represent habitat for potentially undescribed species. In addition, the T spp. and TtSvTc vegetation types were habitat for the significant species *Trianthema cusackianum*.

Vegetation type SmCc occupied two small areas and thereby exhibited a restricted distribution. However, the vegetation was recorded to be in poor condition as 50% of plant foliage cover was attributed to the introduced species *\*Cenchrus ciliaris*. Subsequently this vegetation was not considered to be significant due to the highly altered state from weed infestation and subsequent poor condition.

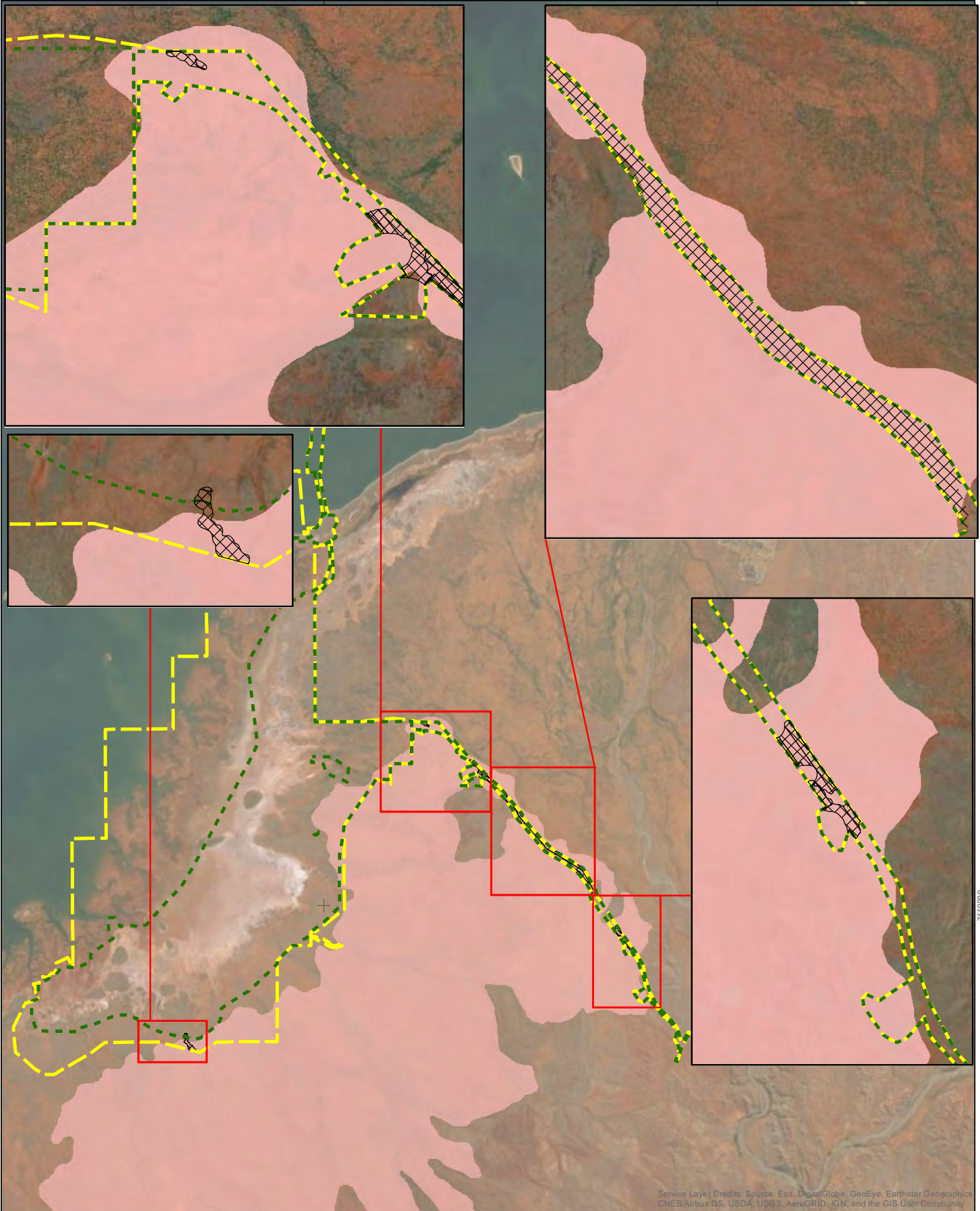
### 5.3 SURVEY LIMITATIONS

The limitations of the survey have been considered (Table 5-12) in accordance with EPA technical guidance (EPA 2016b).

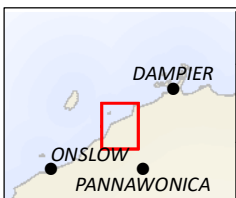
**Table 5-12 Survey limitations**

Limitations	Limitation for this survey?	Comments
Availability of adequate contextual information at a regional and local scale	Yes	There was a limited number of reports available for review and several of those used occurred at some distance from the current Study Area. In addition, there is limited information pertaining to the P3 PEC, Horseflat land system of the Roebourne Plains, to facilitate rigorous statistical determination of whether vegetation types encountered are representative of this community.
Competency/experience of survey personnel, including taxonomy	No	The lead botanists for the survey Dr Grant Wells and Dr Grace Wells have conducted numerous surveys in the Pilbara bioregion over the last 14 years. Frank Obbens who undertook a large proportion of the taxonomy has over 20 years' experience. In addition, assistance from taxonomic specialists from the WA Herbarium, Dr Kelly Shepherd and Michael Hislop, was obtained where required. Dr Shepherd identified all <i>Tecticornia</i> specimens and Mike Hislop identified the Priority flora.
Proportion of flora recorded and/or collected, any identification issues	Yes	Several of the specimens collected could not be identified definitively to species level as a result of being sterile, possibly the result of below average rainfall in the first phase survey period.
Was the appropriate area fully surveyed (effort and extent)	Yes	The use of the helicopter did allow targeted searches for different vegetation types and subsequently it is considered that all broad floristic types were sampled. However, the Study Area was very large and subsequently searches for significant flora were not conducted over all suitable habitat.
Access restrictions	No	The use of a helicopter ensured all areas in the study area were accessible.
Timing, rainfall, season	Yes	Despite timing the detailed survey events to be undertaken six weeks following rainfall, below average falls resulted in notably dry conditions over a large proportion of the Study Area for the majority of the surveys undertaken.
Disturbances which affected the results of the survey	No	The majority of the vegetation in the Study Area was in Very Good to Excellent condition and very little of the Study Area was recently burnt.





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0 5 10  
Kilometres

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- Study Area
- Development Envelope
- Horseflat Land System
- PgvExCt, Low mixed *Eragrostis* spp. grassland, Horseflats PEC 3

**Figure 5 -18**  
**Extent of vegetation type PgvExCt, representing Horseflat Land System of the Roebourne Plains PEC**



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## 6 DISCUSSION

### 6.1 FLORA

The number of species recorded in the current survey was lower than for surveys conducted for Cape Preston approximately 20 km to the north west of the Study Area (Biota & Trudgen & Associates 2001; GHD 2013) (Table 6-1). The lower number of species (per unit area surveyed) likely reflects the large portion of the Study Area being naturally devoid of vegetation (e.g. tidal mudflats), and the fact that Mardie has experienced below average rainfall for a long period of time. Accounting for areas devoid of vegetation, the number of species recorded (per unit area surveyed) in the current Study Area is equivalent to the number recorded in the Biota and Trudgen & Associates (2001) survey. Similarly, the number of vegetation types defined is also lower likely reflecting the large area that was naturally devoid of vegetation in the current Study Area.

**Table 6-1 Comparison of floristic data from the current survey with previous surveys**

Survey	Area (ha)	No. vegetation types	No. of identified species	No. of families	No. of genera	No. of weeds
(Maunsell AECOM 2008b)	-	17	500	64	196	18
AECOM (2009)	-	40	221	43	114	12
GHD (2013)	4502	9	120	28		4
Biota and Trudgen & Associates (2001)	20,880.6	64	426	64	190	12
<b>This study</b>	29,020.4	24	253	44	122	8

The current survey recorded all prominent families identified in previous surveys and these were similar throughout all flora and vegetation assessments (Table 6-2).

**Table 6-2 Dominant plant families recorded in the current survey and previous surveys**

Family	Current survey	(Maunsell AECOM 2008b)	AECOM (2009)	GHD (2013)	Biota and Trudgen & Associates (2001)
Poaceae	31	77	36	19	65
Fabaceae	50	86	44	19	71
Malvaceae	16	64	18	10	53
Amaranthaceae	18	32	20	13	26
Chenopodiaceae	30	33	19	16	26
Asteraceae	10	16	11	3	16
<b>Total number of species</b>	253	500	221	120	476
<b>% dominant families</b>	60.9	61.6	67.0	75.0	54.0

## 6.2 SIGNIFICANT FLORA

Of the 34 significant flora identified from the desktop review as potentially occurring in the study area, only one species, *Goodenia nuda* P4, was recorded during the field survey. Notably, following identification of the habitats in the Study Area from the field surveys, assessment of the likelihood of occurrence of the significant flora determined only seven of the 33 species possibly being present and one species, *Owenia acidula*, likely to be present.

The population of *Goodenia nuda* recorded in the Study Area occurred outside the DE and represents a small proportion (0.8%) of the records for the species (DBCA 2020). The two plants recorded in the Study Area also represent a small proportion of the recorded number of plants for the species with populations of up to 200 plants previously recorded.

The *Minuria tridens* record in the Study Area represents only the second set of records for this species in WA with a further 20 populations restricted to the arid southern region of the NT (Nano & Pavey 2008). The species was recorded to be 'common' at the previous record in WA (DBCA 2020) but subsequent attempts to relocate the population have been unsuccessful and its status is unknown (Nano & Pavey 2008). A total of 75 individuals comprising 60 adults and 15 juveniles were recorded. All plants were located in a single vegetation type (AcAjTe) which occupies sand dunes and contains the introduced flora *Aerva javanica* and *Cenchrus ciliaris*. All plants recorded occur outside the DE, two of the four populations located occurred outside of the Study Area indicating that the species may be further represented outside of the Study Area. In the NT, *M. tridens* potentially has a negative association with hummock grasses and the national recovery plan for the species (Nano & Pavey 2008) suggests that habitat that remains free of *C. ciliaris* may be critical for the long term survival of *M. tridens*. It is not known if this association is applicable to WA populations.

The significant species (range extensions) occurred within and outside of the DE. *Cassythia aurea* var. *aurea* was recorded in degraded riparian woodland; the DE has been modified to exclude the habitat for this species. The record for *Melaleuca lasiandra* occurred outside of the DE. *Amaranthus clementii* was recorded at three locations one outside of the DE the remaining two inside the DE. *Trianthema cusackiana* was recorded at five locations, two outside of the DE. *Carissa lanceolata* and *Cyperus rigidellus* were both recorded at two locations that occurred within the DE. Suitable habitat/vegetation types for each species occurs outside of the DE.

A potentially new species, *Tecticornia* sp. affinity to *T. halocnemoides* large ovate seed aggregate, was recorded at six survey locations in the Study Area; two within the DE, and four outside of the DE. *Tecticornia* sp. sterile 1 and *Tecticornia* sp. sterile 6 were both recorded at two survey locations, one outside and one within the DE. The solitary location for *Tecticornia* sp. in early flower occurred outside of the DE. The DE has also been shifted to avoid the solitary record for *Tecticornia* sp. sterile 4.

The two *Abutilon* specimens not identified to species level were not considered representative of the P1 *Abutilon* sp. Onslow identified in the desktop assessment, as leaf margins were crenate rather than entire and leaf size was larger than that recorded (DBCA 2020) for the Priority flora.

The *Aristida* specimen was not considered likely to represent a listed significant flora as no significant *Aristida* species have been recorded for either the Roebourne or Chichester subregions where the Study Area is located.

The *Atriplex* specimens did not resemble specimens of the Priority flora *Atriplex flabelliformis* identified in the desktop assessment and more closely resembled other *Atriplex* species. In addition, it was considered unlikely that the Priority species would be present in the Study Area as it lies outside of the recorded range of the species (DBCA 2020).

The *Eucalyptus* specimen is unlikely to represent a significant flora as the two Priority *Eucalyptus* species known from the Pilbara bioregion occur several hundred kilometres from the Study Area.

The *Gomphrena* specimen was compared at the WA Herbarium to specimens of *Gomphrena pusilla* identified in the desktop assessment. The old dried flowers of the collected specimen were not commensurate with the inflorescence of the Priority species.

The *Goodenia* specimen was compared to specimens of *Goodenia pallida* identified in the desktop assessment, but the leaves were not commensurate with those of the Priority flora.

The *Ipomoea* specimen was a robust perennial plant and not commensurate with the annual Priority species *Ipomoea racemigera* recorded for the Pilbara bioregion.

The *Pterocaulon* specimens was considered unlikely to represent the Priority 3 species *P. xenicum* recorded for the Pilbara bioregion as the closest record for this species occurs hundreds of kilometres from the Study Area.

There are two Priority flora *Sida* taxa recorded for the Pilbara bioregion both of which inhabit rocky hills and ridges and have distributions located hundreds of kilometres from the Study Area. Subsequently, the *Sida* specimen was considered unlikely to represent either of the Priority species due to the large distance and lack of suitable habitat.

The *Solanum* specimen had stems covered densely with spines which was not commensurate with the near-spineless stems of *Solanum albostellatum* and had a different leaf shape to *Solanum cataphractum* and subsequently was not considered to resemble either of the Priority flora identified in the desktop assessment.

The *Swainsona* seedling was not considered to represent the Priority flora *Swainsona thompsoniana* identified in the desktop assessment as stems were densely hairy rather than glabrous and the flower was a dark purple colour rather than mauve and therefore not commensurate with the Priority flora.

The remaining specimens that could not be identified to species level were all considered unlikely to represent any listed significant flora as no significant flora of the genera are recorded for the Pilbara bioregion (DBCA 2020).

### 6.3 DECLARED PEST \**PROSOPIS* SPP.

Both of the \**Prosopis* species recorded in the Study Area are allocated to the category 2 (C2) - eradication category (organisms which should be eradicated from part or all of Western Australia) at the State wide scale; however, the *P. glandulosa x velutina* infestation on Mardie Station has special classification as C3 management category (organisms that should have some form of management applied that will alleviate the harmful impact of the organism, reduce the numbers or distribution of the organism or prevent or contain the spread of the organism). The requirements for landowners/occupiers with respect to C2 and C3 Declared Pests are described in Table 6-3.

**Table 6-3 Requirements for C2 and C3 organisms in an area (DPIRD 2020)**

Requirement	Recommendations
<b>C2 organisms</b>	
Introduction of the plant or its seeds into, or movement within this area is prohibited.	Mark the location of the pest in such a way that it can be found again.
Report the presence or suspected presence of this pest in this area (08 9368 3083)	C1 and C2 category pests are of high importance to WA and must be reported as a priority.
Supply or advertising supply of this pest into this area is prohibited	
If the Declared Pest is found in this area control measures must be taken to destroy, prevent or eradicate it.	Treat to destroy all plants, prevent seed set and prevent the spread of seed or plant parts within and from the area on or in livestock, fodder, grain,

Requirement	Recommendations
	vehicles and/or machinery. Treat prior to seed set each year.
Ensure that any person conducting an activity on the land is aware that measures are required to be taken to control the Declared Pest	Erect a biosecurity sign for persons conducting an activity on the land.
<b>C3 organisms</b>	
Introduction of the plant or its seeds into this area is prohibited.	-
Supply or advertising supply of this pest into this area is prohibited.	-
The infested area must be managed in such a way that alleviates the impact, reduces the number or distribution or prevents or contains the spread of the declared pest in this area.	Treat to destroy all plants, prevent seed set and prevent the spread of seed or plant parts within and from the area on or in livestock, fodder, grain, vehicles and/or machinery. Treat prior to seed set each year.
Ensure that any person conducting an activity on the land is aware that measures are required to be taken to control the declared pest.	Erect a biosecurity sign for persons conducting an activity on the land.

Accordingly, *\*Prosopis* spp. is likely to demand significant management during all phases of the Project. Discussions with the relevant authorities is recommended to ascertain the management expectations/requirements for these species. It should be noted in these discussions that the *\*Prosopis* infestation at Mardie station has a long history, dating back to the 1930's and is recognised as the largest single core infestation (150,000 ha) in Australia (NHT 2003). The Pilbara Mesquite Management Committee formed in 2000 has acknowledged that eradication of the species at Mardie is unachievable and the priority is to prevent the spread of the pest to neighbouring areas (NHT 2003).

## 6.4 VEGETATION

The vegetation types defined for the Study Area fit the broad description of vegetation units defined for the Roebourne subregion (Kendrick & Stanley 2001):

- the mangrove and chenopod (*Tecticornia* spp.) shrublands of the tidal mudflats and the low shrubland over *Sporobolus virginicus* grassland are representative of the samphire, *Sporobolus*, and mangal communities on marine alluvial flats and river deltas
- the *Triodia* spp. and *Eragrostis* spp. grasslands are representative of the grass savannah of mixed bunch and hummock grasses on colluvial coastal and sub-coastal plains
- the riparian vegetation of most creeks is representative of the *Eucalyptus victrix* woodlands of ephemeral drainage lines.

A large proportion of the Study Area was naturally devoid of vegetation representing association 127, bare areas and mud flats mapped by Shepherd *et al.* (2002). However, association 601 mapped for a substantial portion of the Study Area by Shepherd *et al.* (2002) was conspicuously absent.

The majority of the vegetation types recorded for the current Study Area align with vegetation types defined for Cape Preston by Biota and Trudgen & Associates (2001) indicating a broader distribution outside of the Study Area:

- The low open chenopod (*Tecticornia* spp.) shrublands (Tspp), and the low shrubland over *Sporobolus virginicus* grassland (TtSvTc) vegetation types align with the Ls1 and Ls2 vegetation types.

- The AmMs vegetation type aligns with the Am2 vegetation.
- The AjSITE vegetation type aligns with Ld1 and occurred in a corresponding location, i.e. a narrow band of vegetation on the seaward margin of frontal dunes.
- The AcAjTe and AtAjTe vegetation types align with Ld3, all vegetation types were recorded on dunes and sandy areas.
- The AbTw and PgvAbTw vegetation types align with Roc1 and Nh2. These vegetation types were recorded on flat and undulating plains in the current Study Area but was recorded in minor flowlines in the Cape Preston survey
- The EvAcpCc vegetation type aligns with Pc3 and both vegetation types were recorded as riparian vegetation of creeklines
- The PgvExCt vegetation type aligns with Hpg1 with both vegetation types recorded on clay plains on the Horseflat land system.

The PgvAsTI, PgvAxTw, AbTI and PgvTI vegetation types of the current survey do not align as closely with vegetation types from the Biota and Trudgen & Associates (2001) Cape Preston surveys but are representative of the more generic description hummock grasslands of *Triodia* species on slopes and crests outlined in this survey and show some similarity to the Lp1, ROp1 and Pp2 vegetation types.

The MaPgvTd vegetation type of the current survey did not resemble vegetation types defined for any of the previous flora surveys reviewed in the desktop assessment. This indicates a highly restricted range for this vegetation type. The occurrence of suitable habitat for this vegetation type, banks surrounding semi-permanent water holes in a creek system, immediately adjacent this vegetation was occupied by a thicket of the Declared Pest *Prosopis glandulosa x velutina*. This suggests a relictual status for this vegetation type which was in Degraded to Poor condition due to the abundance of the Declared Pest and disturbance from livestock that utilise the water source. This vegetation was considered to be locally significant due to restricted distribution and presence of several species not recorded elsewhere in the Study Area. Vegetation type MaPgvTd falls partly within the DE.

The vegetation types AjSITE, AtAjTe and TtSvTc were considered significant as they occupied small areas and contained plant species not recorded elsewhere. The limited distribution of AjSITE and AtAjTe was noted during the field survey and subsequently the extent of these vegetation types outside of the DE was mapped. Some 68.5% of AjSITE and 52.4% of AtAjTe occurred inside of the DE. Most (91.7%) of vegetation type TtSvTc occurs within the DE.

The AjSITE vegetation type aligns with the Ld1 vegetation type of Biota and Trudgen & Associates (2001) that considered this vegetation type to have low conservation significance as it comprises common and widespread flora along the coast. The AtAjTe vegetation type aligns with the Ld3 vegetation type of Biota and Trudgen & Associates (2001) that considered this vegetation type to have a high conservation value due to small representation in the area (coastal dunes) despite a wide distribution and as it is susceptible to weed invasion and disturbance.

Vegetation types AcAjTe and EvAcpCc were considered significant as they represent habitat for significant flora *Minuria tridens* (P1) and *Goodenia nuda* (P4) respectively. AcAjTe was recorded both within and outside of the DE with the location of the significant flora population located outside. The AcAjTe vegetation type aligns with the Ld3 vegetation type of Biota and Trudgen & Associates (2001) that considered this vegetation type to have a high conservation value due to small representation in the area (coastal dunes) despite a wide distribution and as it is susceptible to weed invasion and disturbance. EvAcpCc also occurred both within and outside of the DE with the significant flora population occurring within. This vegetation type aligns with Pc3 of Biota and Trudgen & Associates (2001) that considered it to have high to moderate conservation value as this riparian vegetation have a high species richness and supports Priority flora in some areas.

The chenopod (*Tecticornia* spp.) shrublands of the tidal mudflats and sandy rises on tidal mudflats were considered significant as they represent habitat for potentially undescribed species. These vegetation types align with the Ls1 and Ls2 vegetation types of Biota and Trudgen & Associates (2001) that considered them to have moderate conservation value as there is abundant suitable habitat along the coast but susceptible to physical disturbance such as vehicle traffic.

## 6.5 Horseflat land system of the Roebourne Plains PEC

The Horseflat land system of the Roebourne Plains is defined as a P3 (iii) community (DBCA 2017). It is described as:

“extensive, weakly gilgaied clay plains dominated by tussock grasslands on mostly alluvial non-gilgaied, red clay loams or heavy clay loams. Perennial tussock grasses include *Eragrostis xerophila* (Roebourne Plains grass) and other *Eragrostis* spp., *Eriachne* spp. and *Dichanthium* spp. The community also supports a suite of annual grasses including *Sorghum* spp. and rare *Astrebla* spp.”

The description of the Horseflat land system of the Roebourne Plains is considerably broad with no obvious distinguishing features specified. Advice was sought from DBCA Species and Communities Branch concerning the characteristics and a determination of the mapped areas. Quadrat data, species lists, photos and maps were provided.

Jill Pryde confirmed via email on 23 January 2019 that the characteristics of the mapped areas within the study area align with the Horseflat land system of the Roebourne Plains (pers. comm. Jill Pryde, DBCA, 23 January 2019):

“I have reviewed Phoenix Environmental Sciences Mardie Quadrat Data and Figure 5-12 of the study area with an overlay of the Horseflat Land System and mapped vegetation type PgvExCt \**Prosopis glandulosa* x *velutina* shrubs over low *Eragrostis xerophila*, *Dactyloctenium radulans* and *Triodia longiceps* grassland over isolated low *Rhodanthe humboldtiana*, *Streptoglossa liatroides* and *Angianthus acrohyalinus* forbs, considered representative of Priority 3 ecological community Horseflat land system of the Roebourne Plains. Reviewing the site descriptions and combination of data derived from Quadrats MSPAR02, MSPAR04, MSPAR06, MSP220, recording the presence of perennial grass *Eragrostis xerophila* and other grasses, the condition of vegetation within quadrats, the red clay loam substrate and photographs, quadrats MSPAR04, MSPAR06, MSP220 described as vegetation type PgvExCt appear to align with the Horseflat Land System P3 ecological community.”

## 6.6 SUMMARY

The Study Area does not contain any Commonwealth or State listed TEC or is likely to contain any Threatened flora. A total of 239.1 ha of the P3 Horseflat land system PEC occurred in the Study Area, the vast majority of which was located in the DE and proposed haul road.

The Study Area represents a large range extension for the State listed P1 flora *Minuria tridens* recorded outside of the DE. The habitat in which this species was recorded exists both within and outside of the DE and within and outside of the Study Area. Targeted searches of this habitat within the DE did not locate any further populations of the species.

A population (two plants) of the State listed P4 flora *Goodenia nuda* was recorded outside of the DE with habitat for the species occurring both within and outside of the DE. *Cassytha aurea* var. *aurea* was considered a solitary record, and the DE has been modified to exclude this record and the associated significant vegetation type. No records of *Melaleuca lasiandra* occurred within the DE. Records for *Amaranthus clementii* and *Trianthema cusackiana* occurred both within and outside of the DE. All records for *Carissa lanceolata* and *Cyperus rigidellus* occurred within the DE. Suitable habitat/vegetation type for each of these species occurs within and outside of the DE.

Populations of a significant *Tecticornia* species considered to represent a new species to science was recorded within the DE but the majority of the records lie outside of the DE. Populations of four *Tecticornia* species that could not be identified to species level and may represent new species were recorded; the population of two species are located outside the DE, records for the remaining two species occur both within and outside of the DE.

Mardie station is recognised as the largest infestation of the category 2 Declared Pest *Prosopis* spp. with a large infestation present in the DE. Management requirements for the category 2 Declared Pest require eradication of the species (DPIRD 2018); however, it has been acknowledged that this infestation cannot be eradicated (NHT 2003) and subsequently consultation with the relevant authorities is required to determine appropriate management strategies.

The majority of vegetation types defined for the Study Area align with vegetation types defined for other surveys in the region indicating a broader distribution outside of the Study Area and DE. Five vegetation types were considered significant as they had restricted distribution in the Study Area and/or represented habitat for species not recorded elsewhere in the Study Area. Vegetation type AcAjTe was considered significant as it represented habitat for the P1 species *Minuria tridens*; this vegetation was recorded both within and outside of the DE. Similarly, the *Tecticornia* spp. shrublands recorded both within and outside of the DE were considered significant as they represent habitat for a taxon considered new to science.



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**Appendix 1 Survey site locations**

Site	Site type	Latitude	Longitude
MS035	Quadrat	-21.1161	115.9258
MS24	Quadrat	-21.1095	115.9115
MS30	Quadrat	-21.1108	115.9235
MSE004	Quadrat	-21.3002	116.1062
MSE005	Quadrat	-21.2985	116.1043
MSE006	Quadrat	-21.2925	116.1005
MSE007	Quadrat	-21.291	116.0965
MSE008	Quadrat	-21.2912	116.0956
MSE012	Quadrat	-21.2668	116.089
MSE018a	Quadrat	-21.192	116.0153
MSE018b	Quadrat	-21.1858	116.0131
MSE023	Quadrat	-21.1844	115.9684
MSE025	Quadrat	-21.268	115.9215
MSE026	Quadrat	-21.2695	115.9224
MSE027	Quadrat	-21.2697	115.9193
MSE029	Quadrat	-21.2697	115.9187
MSE030	Quadrat	-21.1664	115.9500
MSE031	Quadrat	-21.0772	115.9331
MSE032	Quadrat	-21.0792	115.9305
MSE033	Quadrat	-21.0732	115.9389
MSE034	Quadrat	-21.0715	115.9396
MSE035	Quadrat	21.0763	115.9401
MSE036	Quadrat	-21.0770	115.9416
MSE037	Quadrat	-21.0744	115.9395
MSE038	Quadrat	-21.1649	115.9639
MSE039	Quadrat	-21.1659	115.9428
MSP011	Quadrat	-21.0843	115.9309
MSP015	Quadrat	-21.0992	115.9083
MSP059	Quadrat	-21.1346	115.9279
MSP071	Quadrat	-21.1986	115.9046
MSP082	Quadrat	-21.2908	115.8983
MSP085	Quadrat	-21.2835	115.84
MSP087	Quadrat	-21.284	115.8148
MSP115	Quadrat	-21.2943	115.8674
MSP200	Quadrat	-21.1779	115.9357
MSP201	Quadrat	-21.079	115.9356
MSP202	Quadrat	-21.1808	115.9766
MSP202a	Quadrat	-21.3047	116.1108
MSP203	Quadrat	-21.1755	115.9587

Site	Site type	Latitude	Longitude
MSP206	Quadrat	-21.2651	115.9413
MSP206a	Quadrat	-21.2634	115.9321
MSP207	Quadrat	-21.169	115.9563
MSP208	Quadrat	-21.1801	115.9563
MSP209	Quadrat	-21.1848	115.9498
MSP210	Quadrat	-21.185	115.9506
MSP212	Quadrat	-21.2239	115.9338
MSP213	Quadrat	-21.2143	115.9372
MSP214	Quadrat	-21.321	115.8108
MSP215	Quadrat	-21.3072	115.823
MSP216	Quadrat	-21.3002	115.8337
MSP217	Quadrat	-21.304	115.8427
MSP218	Quadrat	-21.2976	115.848
MSP219	Quadrat	-21.3064	115.863
MSP220	Quadrat	-21.3132	115.874
MSP221	Quadrat	-21.2337	115.9477
MSP224	Quadrat	-21.3198	115.8062
MSP225	Quadrat	-21.3028	115.8564
MSP226	Quadrat	-21.3033	115.9156
MSP228	Quadrat	-21.2148	115.9361
MSP230	Quadrat	-21.2926	115.908
MSP231	Quadrat	-21.3	115.8476
MSP232	Quadrat	-21.222	115.8724
MSP233	Quadrat	-21.2959	115.8965
MSP234	Quadrat	-21.1859	115.9414
MSP236	Quadrat	-21.2992	115.8044
MSP237	Quadrat	-21.0782	115.9306
MSP238	Quadrat	-21.0778	115.9313
MSP86	Quadrat	-21.2635	115.8433
MSPAR01	Quadrat	-21.1632	115.9714
MSPAR02	Quadrat	-21.165	115.9901
MSPAR03	Quadrat	-21.1744	116.0051
MSPAR04	Quadrat	-21.2271	116.0567
MSPAR05	Quadrat	-21.2529	116.08
MSPAR06	Quadrat	-21.268	116.0901
MS025	Relevé	-21.106	115.9166
MS054	Relevé	-21.1205	115.9071
MS057	Relevé	-21.1268	115.9062
MS49	Relevé	-21.1217	115.9297
MS50	Relevé	-21.1265	115.9325

Site	Site type	Latitude	Longitude
MSE009	Relevé	-21.2894	116.0935
MSE010	Relevé	-21.289	116.0947
MSE013	Relevé	-21.2683	116.0875
MSE017	Relevé	-21.2394	116.0711
MSE019	Relevé	-21.1775	116.006
MSE020	Relevé	-21.1767	116.0061
MSE021	Relevé	-21.1678	115.9886
MSE022	Relevé	-21.1675	115.9847
MSE028	Relevé	-21.2716	115.9178
MSP230a	Relevé	-21.2944	115.9086
MSP235	Relevé	-21.156	115.92
MSP45	Relevé	-21.1239	115.9248
MSP67	Relevé	-21.1689	115.9121
MSPVD01	Relevé	-21.3009	115.8926
MSPVD02	Relevé	-21.2304	115.9452
MSMSP109Q1	Transect	-21.138	115.8847
MSP009Q1	Transect	-21.0825	115.9382
MSP015Q1	Transect	-21.0895	115.9289
MSP018Q2	Transect	-21.1007	115.9058
MSP022Q1	Transect	-21.2858	115.8327
MSP106AQ01	Transect	-21.189	115.857
MSP116Q1	Transect	-21.2936	115.8787
MSP117Q1	Transect	-21.2308	115.848
MSP211	Transect	-21.2247	115.9225
MSP222Q1	Transect	-21.2985	115.7936
MSP60AQ1	Transect	-21.1424	115.9248
MSMSP109Q2	Transect Quadrat	-21.1383	115.8846
MSMSP109Q3	Transect Quadrat	-21.1385	115.8844
MSMSP109Q4	Transect Quadrat	-21.1388	115.8843
MSP009Q2	Transect Quadrat	-21.0822	115.9381
MSP009Q3	Transect Quadrat	-21.0818	115.938
MSP009Q4	Transect Quadrat	-21.0814	115.9379
MSP015Q2	Transect Quadrat	-21.0893	115.9285
MSP015Q3	Transect Quadrat	-21.089	115.9282
MSP015Q4	Transect Quadrat	-21.0888	115.9278
MSP018Q3	Transect Quadrat	-21.1006	115.9056
MSP018Q4	Transect Quadrat	-21.1005	115.9053
MSP022Q2	Transect Quadrat	-21.2862	115.8325
MSP022Q3	Transect Quadrat	-21.2864	115.8322
MSP022Q4	Transect Quadrat	-21.2866	115.8319

Site	Site type	Latitude	Longitude
MSP106AQ02	Transect Quadrat	-21.1888	115.8571
MSP106AQ03	Transect Quadrat	-21.1887	115.8572
MSP106AQ04	Transect Quadrat	-21.1886	115.8572
MSP106AQ05	Transect Quadrat	-21.1884	115.8576
MSP116Q3	Transect Quadrat	-21.2939	115.878
MSP116Q4	Transect Quadrat	-21.294	115.8776
MSP117Q2	Transect Quadrat	-21.2308	115.848
MSP117Q3	Transect Quadrat	-21.2305	115.8482
MSP117Q4	Transect Quadrat	-21.2302	115.8484
MSP211Q2	Transect Quadrat	-21.2247	115.9224
MSP211Q3	Transect Quadrat	-21.2246	115.9224
MSP222Q2	Transect Quadrat	-21.2984	115.7933
MSP222Q3	Transect Quadrat	-21.2983	115.7931
MSP222Q4	Transect Quadrat	-21.2982	115.7928
MSP60AQ2	Transect Quadrat	-21.1426	115.9243
MSP60AQ3	Transect Quadrat	-21.1429	115.9242

**Appendix 2    Flora survey site descriptions**



Site details			
Site	MS024	Position (WGS84)	-21.109498, 115.911476
Slope	negligible	Topography	tidal mudflat
Soil colour	brown,	Soil texture	clay,
Rock cover (%)	0	Rock type	none

Observation details - visit 1 (22 Aug 2018)			
Sample description	Low closed <i>Muellerolimon salicorniaceum</i> , <i>Tecticornia pterygosperma</i> subsp. <i>denticulata</i> and <i>T. sp.</i> shrubland over low isolated clumps of <i>Eragrostis falcata</i> grasses		
Habitat	chenopod shrubland		
Disturbance	none,		
Vegetation condition	Excellent	Fire age	not evident
Total veg. cover (%)	70	Tree cover (%)	0
Shrub cover (%)	70	Grass cover (%)	0.1
Herb cover (%)	0		

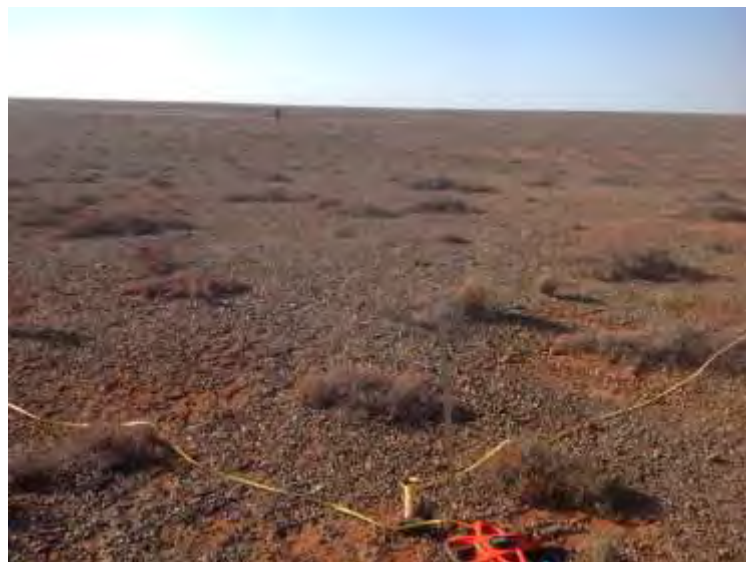


Sample and effort summary				
Sample method	Visit	Sample date	Dimensions	Observer
Quadrat	1	22-Aug-2018	50 m x 50 m	Grant Wells

Species (7)	Status	Cover (%)	Height (m)
<i>Muellerolimon salicorniaceum</i>		35	0.2
<i>Tecticornia</i>		30	0.4
<i>Tecticornia pterygosperma</i> subsp. <i>denticulata</i>		7	0.3
<i>Surreya diandra</i>		5	0.2
<i>Tecticornia indica</i> subsp. <i>leiostachya</i>		5	0.15
<i>Eragrostis falcata</i>		0.1	0.2
<i>Frankenia ?pauciflora</i>		0.1	0.1

Site details			
Site	MS030	Position (WGS84)	-21.11082, 115.923533
Slope	gentle	Topography	sandy rise
Soil colour	red-orange,	Soil texture	sand, sandy loam,
Rock cover (%)	0	Rock type	none

Observation details - visit 1 (22 Aug 2018)			
Sample description	Sparse open <i>Tecticornia auriculata</i> , <i>T. halocnemoides</i> subsp. <i>longispicata</i> and <i>T. indica</i> subsp. <i>leiostachya</i> shrubland over isolated clumps of low <i>Eragrostis</i> ? <i>falcata</i> grasses and isola		
Habitat	chenopod shrubland		
Disturbance	none,		
Vegetation condition	Excellent	Fire age	not evident
Total veg. cover (%)	10	Tree cover (%)	0
Shrub cover (%)	10	Grass cover (%)	0.1
Herb cover (%)	0.1		



Sample and effort summary				
Sample method	Visit	Sample date	Dimensions	Observer
Quadrat	1	22-Aug-2018	50 m x 50 m	Grant Wells

Species (7)	Status	Cover (%)	Height (m)
<i>Tecticornia auriculata</i>		5	0.3
<i>Tecticornia halocnemoides</i> subsp. <i>longispicata</i>		4	0.2
<i>Tecticornia indica</i> subsp. <i>leiostachya</i>		1	0.15
<i>Eragrostis falcata</i>		0.1	0.25
<i>Lawrenzia viridigrisea</i>		0.1	0.15
<i>Muellerolimon salicorniaceum</i>		0.1	0.1
<i>Frankenia ?ambita</i>		0.1	0.1

Site details			
Site	MS035	Position (WGS84)	-21.11614, 115.925751
Slope	gentle	Topography	sandy rise
Soil colour	red-orange,	Soil texture	sand, sandy loam,
Rock cover (%)	0	Rock type	ironstone

Observation details - visit 1 (21 Aug 2018)			
Sample description	Isolated low <i>Tecticornia indica</i> subsp <i>leiostachya</i> , <i>Frankenia ambita</i> and <i>Trianthema turgidifolium</i> shrubs over isolated low <i>Triodia epactia</i> and <i>Eragrostis falcata</i> grasses over isolated clumps of		
Habitat	grassland		
Disturbance	none,		
Vegetation condition	Excellent	Fire age	not evident
Total veg. cover (%)	10	Tree cover (%)	0
Shrub cover (%)	5	Grass cover (%)	6
Herb cover (%)	0.1		



Sample and effort summary				
Sample method	Visit	Sample date	Dimensions	Observer
Quadrat	1	21-Aug-2018	50 m x 50 m	Grant Wells

Species (8)	Status	Cover (%)	Height (m)
<i>Tecticornia indica</i> subsp. <i>leiostachya</i>		3	0.3
<i>Triodia epactia</i>		3	0.25
<i>Eragrostis falcata</i>		3	0.15
<i>Frankenia ambita</i>		2	0.1
<i>Trianthema turgidifolium</i>		1	0.15
<i>Tecticornia halocnemoides</i> subsp. <i>longispicata</i>		0.1	0.2
<i>Sclerolaena costata</i>		0.1	0.15
<i>Lawrenca viridigrisea</i>		0.1	0.1

Site details			
Site	MSE004	Position (WGS84)	-21.300194, 116.106219
Slope	negligible	Topography	undulating plain
Soil colour	red-brown,	Soil texture	sandy clay,
Rock cover (%)	0	Rock type	granite rocks;

Observation details - visit 1 (10 Sep 2019)			
Sample description	Tall <i>Acacia ancistrocarpa</i> , <i>A. bivenosa</i> and <i>Grevillea pyramidalis</i> shrubland over <i>Triodia wiseana</i> hummock grassland		
Habitat	shrubland		
Disturbance	none,		
Vegetation condition	Excellent	Fire age	not evident
Total veg. cover (%)	75	Tree cover (%)	40
Shrub cover (%)	0.1	Grass cover (%)	70
Herb cover (%)	0.1		



Sample and effort summary				
Sample method	Visit	Sample date	Dimensions	Observer
Quadrat	1	10-Sep-2019	50 m x 50 m	Alice Watt

Species (8)	Status	Cover (%)	Height (m)
<i>Triodia wiseana</i>		70	2.5
<i>Acacia bivenosa</i>		5	2
<i>Grevillea wickhamii</i>		2	4
<i>Grevillea pyramidalis</i>		2	4
<i>Acacia ancistrocarpa</i>		1	4
<i>Acacia inaequilatera</i>		1	1
<i>Acacia atkinsiana</i>		0.1	0.8
<i>Cucumis variabilis</i>		0.1	0.5



Site details			
Site	MSE005	Position (WGS84)	-21.298468, 116.104342
Slope	negligible	Topography	undulating plain
Soil colour	red-brown,	Soil texture	sandy clay,
Rock cover (%)	0	Rock type	granite rocks;

Observation details - visit 1 (10 Sep 2019)			
Sample description	Mid <i>Acacia ancistrocarpa</i> , <i>A. synchronicia</i> and <i>A. bivenosa</i> over low <i>Triodia wiseana</i> hummock grassland		
Habitat	spinifex grassland		
Disturbance	none,		
Vegetation condition	Excellent	Fire age	not evident
Total veg. cover (%)	75	Tree cover (%)	5
Shrub cover (%)	0	Grass cover (%)	75
Herb cover (%)	0		



Sample and effort summary				
Sample method	Visit	Sample date	Dimensions	Observer
Quadrat	1	10-Sep-2019	50 m x 50 m	Alice Watt

Species (9)	Status	Cover (%)	Height (m)
<i>Triodia wiseana</i>		75	0.4
<i>Acacia synchronicia</i>		2	4
<i>Acacia ancistrocarpa</i>		2	3
<i>Acacia bivenosa</i>		1	2.5
<i>Acacia inaequilatera</i>		1	1
<i>Indigofera monophylla</i>		0.1	1.5
<i>Corchorus lasiocarpus</i>		0.1	0.5
<i>Trichodesma zeylanicum</i> var. <i>grandiflorum</i>		0.1	0.4
<i>Cucumis variabilis</i>		0.1	0.3

Site details			
Site	MSE006	Position (WGS84)	-21.292516, 116.100528
Slope	negligible	Topography	undulating plain
Soil colour	red-brown,	Soil texture	sandy clay,
Rock cover (%)	0	Rock type	granite rocks;

Observation details - visit 1 (10 Sep 2019)			
Sample description	Isolated low <i>Corymbia hamersleyana</i> trees over mid isolated <i>Acacia ancistrocarpa</i> , <i>A.bivenosa</i> and <i>A. inaequilatera</i> shrubs over low <i>Triodia wiseana</i> hummock grassland		
Habitat	shrubland		
Disturbance	none,		
Vegetation condition	Excellent	Fire age	relatively recent (1-5 years)
Total veg. cover (%)	70	Tree cover (%)	10
Shrub cover (%)	0	Grass cover (%)	70
Herb cover (%)	0		



Sample and effort summary				
Sample method	Visit	Sample date	Dimensions	Observer
Quadrat	1	10-Sep-2019	50 m x 50 m	Martin Henson

Species (5)	Status	Cover (%)	Height (m)
<i>Triodia wiseana</i>		70	0.4
<i>Acacia inaequilatera</i>		2	3
<i>Acacia bivenosa</i>		2	3
<i>Acacia ancistrocarpa</i>		2	3
<i>Corymbia hamersleyana</i>		1	5

Site details			
Site	MSE007	Position (WGS84)	-21.290991, 116.096516
Slope	negligible	Topography	plain
Soil colour	red-brown,	Soil texture	sandy clay,
Rock cover (%)	0	Rock type	granite rocks;

Observation details - visit 1 (10 Sep 2019)			
Sample description	Tall <i>Acacia xiphophylla</i> shrubland over low <i>Triodia wiseana</i> hummock grassland		
Habitat	shrubland		
Disturbance	grazing – medium, none,		
Vegetation condition	Very Good	Fire age	not evident
Total veg. cover (%)	60	Tree cover (%)	40
Shrub cover (%)	0	Grass cover (%)	60
Herb cover (%)	0		



Sample and effort summary				
Sample method	Visit	Sample date	Dimensions	Observer
Quadrat	1	10-Sep-2019	50 m x 50 m	Alice Watt

Species (2)	Status	Cover (%)	Height (m)
<i>Triodia wiseana</i>		60	0.5
<i>Acacia xiphophylla</i>		30	4

Site details			
Site	MSE008	Position (WGS84)	-21.291224, 116.095648
Slope	gentle	Topography	undulating plain
Soil colour	red-brown,	Soil texture	sandy clay,
Rock cover (%)	0	Rock type	granite rocks;

Observation details - visit 1 (10 Sep 2019)			
Sample description	Tall open <i>Acacia ancistrocarpa</i> , <i>A. synchronicia</i> and <i>A. inaequilatera</i> shrubland over low <i>Triodia wiseana</i> hummock grassland		
Habitat	shrubland		
Disturbance	none,		
Vegetation condition	Excellent	Fire age	not evident
Total veg. cover (%)	70	Tree cover (%)	20
Shrub cover (%)	0	Grass cover (%)	70
Herb cover (%)	0		



Sample and effort summary				
Sample method	Visit	Sample date	Dimensions	Observer
Quadrat	1	10-Sep-2019	50 m x 50 m	Martin Henson

Species (6)	Status	Cover (%)	Height (m)
<i>Triodia wiseana</i>		70	0.5
<i>Acacia ancistrocarpa</i>		4	4
<i>Acacia synchronicia</i>		1	3
<i>Acacia inaequilatera</i>		1	3
<i>Acacia bivenosa</i>		1	2.5
<i>Senna artemisioides</i> subsp. <i>oligophylla</i>		0.1	1.2



Site details			
Site	MSE012	Position (WGS84)	-21.266762, 116.089047
Slope	negligible	Topography	plain
Soil colour	red-brown,	Soil texture	sandy clay,
Rock cover (%)	0	Rock type	granite rocks;

Observation details - visit 1 (10 Sep 2019)			
Sample description	Tall open <i>Acacia bivenosa</i> , <i>A. inaequilatera</i> and <i>A. xiphophylla</i> shrubs over open <i>Triodia wiseana</i> grassland and <i>Eragrostis xerophila</i> tussock grassland		
Habitat	shrubland		
Disturbance	vehicle tracks,		
Vegetation condition	Very Good	Fire age	relatively recent (1-5 years)
Total veg. cover (%)	30	Tree cover (%)	20
Shrub cover (%)	0	Grass cover (%)	10
Herb cover (%)	0		



Sample and effort summary				
Sample method	Visit	Sample date	Dimensions	Observer
Quadrat	1	10-Sep-2019	50 m x 50 m	Martin Henson

Species (8)	Status	Cover (%)	Height (m)
<i>Acacia bivenosa</i>		8	4
<i>Acacia inaequilatera</i>		5	3
<i>Triodia wiseana</i>		4	0.3
<i>Acacia xiphophylla</i>		0.5	4
<i>Hakea chordophylla</i>		0.2	4
* <i>Prosopis glandulosa</i> x <i>velutina</i>	Weed (WoNS)	0.1	1.5
<i>Solanum lasiophyllum</i>		0.1	0.3
<i>Eragrostis xerophila</i>		0.1	0.1

Site details			
Site	MSE018a	Position (WGS84)	-21.19196, 116.015255
Slope	negligible	Topography	undulating plain
Soil colour	red-brown,	Soil texture	sandy clay,
Rock cover (%)	0	Rock type	granite rocks;

Observation details - visit 1 (10 Sep 2019)			
Sample description	Mid <i>Acacia bivenosa</i> shrubland over low <i>Triodia wiseana</i> hummock grassland		
Habitat	shrubland		
Disturbance	none,		
Vegetation condition	Excellent	Fire age	moderate (>5 years)
Total veg. cover (%)	60	Tree cover (%)	40
Shrub cover (%)	0	Grass cover (%)	60
Herb cover (%)	0		



Sample and effort summary				
Sample method	Visit	Sample date	Dimensions	Observer
Quadrat	1	10-Sep-2019	50 m x 50 m	Alice Watt

Species (2)	Status	Cover (%)	Height (m)
<i>Triodia wiseana</i>		60	0.4
<i>Acacia bivenosa</i>		40	2

Site details			
Site	MSE018b	Position (WGS84)	-21.185762, 116.013117
Slope	negligible	Topography	plain
Soil colour	red-brown,	Soil texture	sandy clay,
Rock cover (%)	0	Rock type	granite rocks;

Observation details - visit 1 (10 Sep 2019)			
Sample description	Mid open <i>Acacia xiphophylla</i> , <i>A. synchronicia</i> and * <i>Prosopis glandulosa x veluntia</i> shrubland over open <i>Triodia wiseana</i> hummock grassland		
Habitat	shrubland		
Disturbance	none		
Vegetation condition	Excellent	Fire age	not evident
Total veg. cover (%)	30	Tree cover (%)	0
Shrub cover (%)	20	Grass cover (%)	10
Herb cover (%)	0		



Sample and effort summary				
Sample method	Visit	Sample date	Dimensions	Observer
Quadrat	1	10-Sep-2019	50 m x 50 m	Martin Henson

Species (4)	Status	Cover (%)	Height (m)
<i>Triodia wiseana</i>		20	0.5
<i>Acacia xiphophylla</i>		10	1.5
* <i>Prosopis glandulosa</i> x <i>velutina</i>	Weed (WoNS)	0.1	1.5
<i>Acacia synchronicia</i>		0.1	0.3

Site details			
Site	MSE023	Position (WGS84)	-21.184415, 115.96844
Slope	negligible	Topography	plain
Soil colour	red-brown,	Soil texture	sandy clay,
Rock cover (%)	0	Rock type	none

Observation details - visit 1 (10 Sep 2019)			
Sample description	Tall closed * <i>Prosopis glandulosa x velutina</i> , <i>Acacia sclerosperma</i> subsp. <i>sclerosperma</i> and <i>Hakea chordophylla</i> shrubland over isolated <i>Eragrostis xerophila</i> grasses		
Habitat	shrubland		
Disturbance	weed infestation,		
Vegetation condition	Degraded	Fire age	not evident
Total veg. cover (%)	70	Tree cover (%)	70
Shrub cover (%)	0	Grass cover (%)	0
Herb cover (%)	0		



Sample and effort summary				
Sample method	Visit	Sample date	Dimensions	Observer
Quadrat	1	10-Sep-2019	50 m x 50 m	Alice Watt

Species (6)	Status	Cover (%)	Height (m)
<i>*Prosopis glandulosa x velutina</i>	Weed (WoNS)	35	8
<i>Acacia sclerosperma</i> subsp. <i>sclerosperma</i>		35	4
<i>Hakea chordophylla</i>		0.1	3
<i>*Vachellia farnesiana</i>	Weed	0.1	2
<i>Acacia inaequilatera</i>		0.1	1
<i>Acacia coriacea</i> subsp. <i>pendens</i>		0.1	



Site details			
Site	MSE025	Position (WGS84)	-21.267961, 115.921466
Slope	negligible	Topography	undulating plain
Soil colour	red-brown,	Soil texture	sandy clay,
Rock cover (%)	0	Rock type	none

Observation details - visit 1 (12 Sep 2019)			
Sample description	Closed <i>Triodia longiceps</i> hummock grassland.		
Habitat	spinifex grassland		
Disturbance	none		
Vegetation condition	Excellent	Fire age	not evident
Total veg. cover (%)	75	Tree cover (%)	0
Shrub cover (%)	0	Grass cover (%)	75
Herb cover (%)	0		



Sample and effort summary				
Sample method	Visit	Sample date	Dimensions	Observer
Quadrat	1	12-Sep-2019	50 m x 50 m	Martin Henson

Species (1)	Status	Cover (%)	Height (m)
<i>Triodia longiceps</i>		75	0.4

Site details			
Site	MSE026	Position (WGS84)	-21.269494, 115.922413
Slope	negligible	Topography	plain
Soil colour	red-brown,	Soil texture	sandy clay,
Rock cover (%)	0	Rock type	none

Observation details - visit 1 (12 Sep 2019)			
Sample description	Isolated <i>Acacia sclerosperma</i> subsp. <i>sclerosperma</i> and * <i>Prosopis glandulosa x velutina</i> over low <i>Triodia longiceps</i> hummock grassland		
Habitat	spinifex grassland		
Disturbance	none,		
Vegetation condition	Excellent	Fire age	not evident
Total veg. cover (%)	70	Tree cover (%)	10
Shrub cover (%)	0	Grass cover (%)	65
Herb cover (%)	0		



Sample and effort summary				
Sample method	Visit	Sample date	Dimensions	Observer
Quadrat	1	12-Sep-2019	50 m x 50 m	Martin Henson

Species (5)	Status	Cover (%)	Height (m)
<i>Triodia longiceps</i>		65	0.4
<i>Acacia sclerosperma</i> subsp. <i>sclerosperma</i>		10	2.5
* <i>Prosopis glandulosa</i> x <i>velutina</i>	Weed (WoNS)	1	2.5
<i>Acacia bivenosa</i>		0.1	1.5
<i>Scaevola spinescens</i>		0.1	1

Site details			
Site	MSE027	Position (WGS84)	-21.269706, 115.919328
Slope	gentle	Topography	drainage line
Soil colour	red-brown,	Soil texture	gravel / alluvial,
Rock cover (%)	0	Rock type	ironstone

Observation details - visit 1 (12 Sep 2019)			
Sample description	Tall open <i>Acacia ampliceps</i> , <i>A. inaequilatera</i> and <i>A. trachycarpa</i> shrubs over isolated <i>Triodia longiceps</i> hummock grasses		
Habitat	riparian zone		
Disturbance	none		
Vegetation condition	Excellent	Fire age	not evident
Total veg. cover (%)	25	Tree cover (%)	25
Shrub cover (%)	0	Grass cover (%)	0
Herb cover (%)	0		



Sample and effort summary				
Sample method	Visit	Sample date	Dimensions	Observer
Quadrat	1	12-Sep-2019	50 m x 50 m	Alice Watt

Species (7)	Status	Cover (%)	Height (m)
<i>Acacia ampliceps</i>		20	4
<i>Petalostylis labicheoides</i>		0.5	4
<i>Melaleuca globifera</i>		0.5	4
<i>Acacia trachycarpa</i>		0.5	4
<i>Acacia inaequilatera</i>		0.5	2
<i>Triodia longiceps</i>		0.1	0.4
<i>Sporobolus australasicus</i>		0.1	0.1

Site details			
Site	MSE029	Position (WGS84)	-21.269672, 115.918677
Slope	negligible	Topography	plain
Soil colour	red-brown,	Soil texture	sandy clay,
Rock cover (%)	0	Rock type	none

Observation details - visit 1 (12 Sep 2019)			
Sample description	<i>Triodia longiceps</i> hummock grassland		
Habitat	spinifex grassland		
Disturbance	none,		
Vegetation condition	Excellent	Fire age	not evident
Total veg. cover (%)	65	Tree cover (%)	0
Shrub cover (%)	0	Grass cover (%)	65
Herb cover (%)	0		



Sample and effort summary				
Sample method	Visit	Sample date	Dimensions	Observer
Quadrat	1	12-Sep-2019	50 m x 50 m	Martin Henson

Species (1)	Status	Cover (%)	Height (m)
<i>Triodia longiceps</i>		65	0.3



Site details			
Site	MSE030	Position (WGS84)	-21.16638, 115.950051
Slope	negligible	Topography	plain
Soil colour	red-orange,	Soil texture	sandy clay,
Rock cover (%)	0	Rock type	granite - rocks,

Observation details - visit 1 (25 Mar 2020)			
Sample description	* <i>Prosopis glandulosa x velutina</i> tall open shrubland over <i>Acacia coriacea</i> , <i>A. bivenosa</i> , <i>Stylobasium spathulatum</i> mid open shrubland over <i>Trodia wiseana</i> low hummock grassland		
Habitat	shrubland		
Disturbance	Grazing-medium, Weed infestation,		
Vegetation condition	Degraded	Fire age	
Total veg. cover (%)	70	Tree cover (%)	5
Shrub cover (%)	40	Grass cover (%)	60
Herb cover (%)	0.1		



Sample and effort summary				
Sample method	Visit	Sample date	Dimensions	Observer
Quadrat	1	25-Mar-2020		Martin Henson

Species (25)	Status	Cover (%)	Height (m)
<i>Triodia wiseana</i>		60	0.3
* <i>Prosopis glandulosa x velutina</i>	Weed (WoNS)	25	2.5
<i>Acacia bivenosa</i>		5	2
<i>Acacia coriacea</i> subsp. <i>pendens</i>		5	2
<i>Stylobasium spathulatum</i>		5	2
* <i>Cenchrus ciliaris</i>	Weed	1	1
<i>Dactyloctenium radulans</i>		1	0.1
<i>Acacia inaequilatera</i>		0.5	1
<i>Abutilon lepidum</i>		0.5	0.3
<i>Abutilon cryptopetalum</i>		0.5	0.3
<i>Phyllanthus maderaspatensis</i>		0.1	0.3
<i>Alysicarpus muelleri</i>		0.1	0.3
<i>Cleome viscosa</i>		0.1	0.3
<i>Corchorus tridens</i>		0.1	0.3
<i>Euphorbia boophthona</i>		0.1	0.3
<i>Ptilotus exaltatus</i>		0.1	0.3
<i>Solanum lasiophyllum</i>		0.1	0.3
<i>Tephrosia supina</i>		0.1	0.2
<i>Tribulus hirsutus</i>		0.1	0.2
<i>Goodenia prostrata</i>		0.1	0.2
<i>Cucumis variabilis</i>		0.1	0.1
<i>Polygala glaucifolia</i>		0.1	0.1
<i>Bonamia pilbarensis</i>		0.1	0.1
<i>Swainsona kingii</i>		0.1	0.1
<i>Tragus australianus</i>		0.1	0.1

Site details			
Site	MSE031	Position (WGS84)	-21.077747, 115.932013
Slope	gentle	Topography	sand dune
Soil colour	whitish, light-brown,	Soil texture	sand,
Rock cover (%)	0	Rock type	

Observation details - visit 1 (26 Mar 2020)			
Sample description	* <i>Aerva javanica</i> , <i>Rhagodia preissii</i> subsp. <i>obovata</i> low isolated shrubs over <i>Spinifex longifolius</i> tall grassland, <i>Triodia epactia</i> mid open hummock grassland		
Habitat	Grassland		
Disturbance	None Evident,		
Vegetation condition	Excellent	Fire age	
Total veg. cover (%)	70	Tree cover (%)	0
Shrub cover (%)	1	Grass cover (%)	70
Herb cover (%)	0.1		



Sample and effort summary				
Sample method	Visit	Sample date	Dimensions	Observer
Quadrat	1	26-Mar-2020		Martin Henson

Species (13)	Status	Cover (%)	Height (m)
<i>Spinifex longifolius</i>		60	1.2
<i>Triodia epactia</i>		10	0.5
* <i>Aerva javanica</i>	Weed	5	1
<i>Whiteochloa airoides</i>		1	1
<i>Rhagodia preissii</i> subsp. <i>obovata</i>		1	1
<i>Euphorbia myrtoides</i>		1	0.15
<i>Euphorbia biconvexa</i>		0.1	0.3
<i>Cleome viscosa</i>		0.1	0.3
<i>Threlkeldia diffusa</i>		0.1	0.25
<i>Neobassia astrocarpa</i>		0.1	0.2
<i>Amaranthus clementii</i>		0.1	0.15
<i>Rhynchosia minima</i>		0.1	0.1
<i>Cassytha capillaris</i>		0.1	0.1

Site details			
Site	MSE032	Position (WGS84)	-21.079191, 115.93051
Slope	negligible	Topography	sand dune
Soil colour	whitish, orange,	Soil texture	sand, sandy loam,
Rock cover (%)	0	Rock type	limestone, quartz, sandstone,

Observation details - visit 1 (26 Mar 2020)			
Sample description	* <i>Aerva javanica</i> mid isolated shrubs over <i>Triodia epactia</i> low closed hummock grassland		
Habitat	grassland		
Disturbance	None Evident,		
Vegetation condition	Excellent	Fire age	
Total veg. cover (%)	70	Tree cover (%)	0
Shrub cover (%)	3	Grass cover (%)	70
Herb cover (%)	0.1		



Sample and effort summary				
Sample method	Visit	Sample date	Dimensions	Observer
Quadrat	1	26-Mar-2020		Martin Henson

Species (10)	Status	Cover (%)	Height (m)
<i>Triodia epactia</i>		70	0.3
* <i>Aerva javanica</i>	Weed	3	1
<i>Whiteochloa airoides</i>		1	1
<i>Indigofera linifolia</i>		1	0.25
<i>Eragrostis eriopoda</i>		0.1	0.4
<i>Pterocaulon sphacelatum</i>		0.1	0.3
<i>Euphorbia tannensis</i>		0.1	0.3
<i>Adriana tomentosa</i> var. <i>tomentosa</i>		0.1	0.3
<i>Indigofera boviparda</i> subsp. <i>boviparda</i>		0.1	0.15
<i>Rhynchosia minima</i>		0.1	0.1

Site details			
Site	MSE033	Position (WGS84)	-21.073201, 115.938869
Slope	gentle	Topography	sand dune
Soil colour	light-brown,	Soil texture	sand,
Rock cover (%)	0	Rock type	granite - rocks,

Observation details - visit 1 (26 Mar 2020)			
Sample description	<i>Avicennia marina</i> subsp. <i>marina</i> tall shrubland over * <i>Aerva javanica</i> and <i>Rhagodia eremaea</i> mid open shrubland over <i>Spinifex longifolius</i> low grassland		
Habitat	shrubland		
Disturbance	Litter,		
Vegetation condition	Excellent	Fire age	
Total veg. cover (%)	60	Tree cover (%)	20
Shrub cover (%)	0	Grass cover (%)	50
Herb cover (%)	0		



Sample and effort summary				
Sample method	Visit	Sample date	Dimensions	Observer
Quadrat	1	26-Mar-2020		Martin Henson

Species (15)	Status	Cover (%)	Height (m)
<i>Spinifex longifolius</i>		60	1
<i>Avicennia marina</i> subsp. <i>marina</i>		20	2
<i>Triodia epactia</i>		2	0.3
* <i>Aerva javanica</i>	Weed	1	1
<i>Threlkeldia diffusa</i>		0.3	0.4
<i>Acacia bivenosa</i>		0.1	1
<i>Rhagodia eremaea</i>		0.1	0.6
<i>Rhagodia preissii</i> subsp. <i>obovata</i>		0.1	0.5
<i>Solanum cleistogamum</i>		0.1	0.4
<i>Solanum lasiophyllum</i>		0.1	0.3
<i>Neobassia astrocarpa</i>		0.1	0.3
<i>Amaranthus clementii</i>		0.1	0.3
<i>Cleome viscosa</i>		0.1	0.15
<i>Euphorbia myrtoides</i>		0.1	0.1
<i>Cassytha capillaris</i>		0.1	0.1



Site details			
Site	MSE034	Position (WGS84)	-21.071428, 115.939624
Slope	negligible	Topography	sand dune
Soil colour	whitish, light-brown,	Soil texture	sand,
Rock cover (%)	0	Rock type	

Observation details - visit 1 (27 Mar 2020)			
Sample description	<i>Avicennia marina</i> subsp. <i>marina</i> open shrubs over isolated low shrubs of <i>Cleome viscosa</i> and <i>Diplopeltis eriocarpa</i> over low <i>Spinifex longifolius</i> grassland		
Habitat	grassland		
Disturbance	Litter,		
Vegetation condition	Excellent	Fire age	
Total veg. cover (%)	60	Tree cover (%)	0
Shrub cover (%)	20	Grass cover (%)	40
Herb cover (%)	0.1		



Sample and effort summary				
Sample method	Visit	Sample date	Dimensions	Observer
Quadrat	1	27-Mar-2020		Martin Henson

Species (13)	Status	Cover (%)	Height (m)
<i>Spinifex longifolius</i>		40	1
<i>Avicennia marina</i> subsp. <i>marina</i>		20	1.8
* <i>Cenchrus ciliaris</i>	Weed	1	0.3
<i>Cleome viscosa</i>		1	0.3
<i>Diplopeltis eriocarpa</i>		1	0.2
<i>Canavalia rosea</i>		1	0.2
<i>Threlkeldia diffusa</i>		0.3	0.5
* <i>Aerva javanica</i>	Weed	0.2	1
* <i>Vachellia farnesiana</i>	Weed	0.1	2
<i>Solanum lasiophyllum</i>		0.1	0.5
<i>Triodia epactia</i>		0.1	0.3
<i>Euphorbia tannensis</i>		0.1	0.3
<i>Euphorbia myrtoides</i>		0.1	0.1

Site details			
Site	MSE035	Position (WGS84)	-21.076313, 115.940096
Slope		Topography	seasonally wet area
Soil colour	red-brown,	Soil texture	sandy clay, sandy loam,
Rock cover (%)	0	Rock type	None,

Observation details - visit 1 (27 Mar 2020)			
Sample description	mixed grassland of * <i>Cenchrus ciliaris</i> , <i>Sporobolus mitchellii</i> and sparse <i>Triodia epactia</i>		
Habitat	grassland		
Disturbance	None Evident,		
Vegetation condition	Excellent	Fire age	
Total veg. cover (%)	90	Tree cover (%)	0.1
Shrub cover (%)	0	Grass cover (%)	90
Herb cover (%)	0.1		



Sample and effort summary				
Sample method	Visit	Sample date	Dimensions	Observer
Quadrat	1	27-Mar-2020		Martin Henson

Species (20)	Status	Cover (%)	Height (m)
<i>*Cenchrus ciliaris</i>	Weed	50	0.6
<i>Sporobolus mitchellii</i>		50	0.5
<i>Triodia epactia</i>		2	0.3
<i>Indigofera linifolia</i>		1	0.1
<i>Rhynchosia minima</i>		1	0.1
<i>Amaranthus clementii</i>		0.5	0.2
<i>Indigofera colutea</i>		0.3	0.05
<i>*Prosopis glandulosa x velutina</i>	Weed (WoNS)	0.1	2
<i>Acacia bivenosa</i>		0.1	2
<i>Myoporum montanum</i>		0.1	1.5
<i>Melhania oblongifolia</i>		0.1	0.4
<i>Rhagodia baccata</i>		0.1	0.4
<i>Solanum lasiophyllum</i>		0.1	0.3
<i>Tecticornia indica</i> subsp. <i>leiostachya</i>		0.1	0.3
<i>Threlkeldia diffusa</i>		0.1	0.3
<i>Neobassia astrocarpa</i>		0.1	0.3
<i>Indigofera trita</i>		0.1	0.25
<i>Solanum cleistogamum</i>		0.1	0.2
<i>Euphorbia biconvexa</i>		0.1	0.2
<i>Cyperus rigidellus</i>		0.1	0.15

Site details			
Site	MSE036	Position (WGS84)	-21.076258, 115.942595
Slope	negligible	Topography	seasonally wet area
Soil colour	whitish, light-brown,	Soil texture	sandy clay,
Rock cover (%)	0	Rock type	None,

Observation details - visit 1 (27 Mar 2020)			
Sample description	<i>Tecticornia indica</i> subsp. <i>leiostachya</i> low open shrubs over * <i>Cenchrus ciliaris</i> and <i>Triodia epactia</i> grassland		
Habitat	grassland		
Disturbance	None Evident,		
Vegetation condition	Excellent	Fire age	
Total veg. cover (%)	80	Tree cover (%)	0
Shrub cover (%)	40	Grass cover (%)	45
Herb cover (%)			



Sample and effort summary				
Sample method	Visit	Sample date	Dimensions	Observer
Quadrat	1	27-Mar-2020		Martin Henson

Species (16)	Status	Cover (%)	Height (m)
<i>*Cenchrus ciliaris</i>	Weed	40	1
<i>Tecticornia indica</i> subsp. <i>leiostachya</i>		40	0.5
<i>Triodia epactia</i>		5	0.3
<i>Frankenia ambita</i>		1	0.3
<i>Corchorus tridens</i>		1	0.15
<i>Euphorbia biconvexa</i>		0.1	2
<i>Sclerolaena uniflora</i>		0.1	0.5
<i>Rhagodia eremaea</i>		0.1	0.5
<i>Indigofera linifolia</i>		0.1	0.3
<i>Cleome viscosa</i>		0.1	0.25
<i>Euphorbia boophthona</i>		0.1	0.25
<i>Crotalaria medicaginea</i> var. <i>neglecta</i>		0.1	0.25
<i>Indigofera trita</i>		0.1	0.25
<i>Cyperus rigidellus</i>		0.1	0.15
<i>Swainsona pterostylis</i>		0.1	0.15
<i>Portulaca oleracea</i>		0.1	0.1

Site details			
Site	MSE037	Position (WGS84)	-21.074485, 115.939535
Slope	negligible	Topography	plain
Soil colour	red-brown	Soil texture	sandy clay
Rock cover (%)	0	Rock type	None

Observation details - visit 1 (27 Mar 2020)			
Sample description	Low isolated shrubs of <i>Aerva javanica</i> and <i>Indigofera linifolia</i> over <i>Triodia epactia</i> low hummuck grassland		
Habitat	grassland		
Disturbance	Weed infestation		
Vegetation condition	Degraded	Fire age	
Total veg. cover (%)	75	Tree cover (%)	0
Shrub cover (%)	1	Grass cover (%)	75
Herb cover (%)	0.1		



Sample and effort summary				
Sample method	Visit	Sample date	Dimensions	Observer
Quadrat	1	27-Mar-2020		Martin Henson

Species (13)	Status	Cover (%)	Height (m)
<i>Triodia epactia</i>		75	0.3
* <i>Aerva javanica</i>	Weed	1	1.2
<i>Indigofera linifolia</i>		0.5	0.25
<i>Whiteochloa airoides</i>		0.1	1
* <i>Cenchrus ciliaris</i>	Weed	0.1	0.3
<i>Solanum lasiophyllum</i>		0.1	0.3
<i>Amaranthus clementii</i>		0.1	0.3
<i>Euphorbia tannensis</i>		0.1	0.25
<i>Trichodesma zeylanicum</i>		0.1	0.2
<i>Euphorbia biconvexa</i>		0.1	0.2
<i>Indigofera boviparda</i> subsp. <i>boviparda</i>		0.1	0.15
<i>Indigofera colutea</i>		0.1	0.1
<i>Rhynchosia minima</i>		0.1	



Site details			
Site	MSE038	Position (WGS84)	-21.164969, 115.963829
Slope	negligible	Topography	plain
Soil colour	red-orange,	Soil texture	sandy clay,
Rock cover (%)	0	Rock type	None,

Observation details - visit 1 (28 Mar 2020)			
Sample description	Isolated <i>Eucalyptus victrix</i> over <i>*Prosopis glandulosa x velutin</i> , and <i>Acacia coriacea</i> tall shrubland over <i>*Cenchrus ciliaris</i> grasses		
Habitat	shrubland		
Disturbance	Weed infestation,		
Vegetation condition	Degraded	Fire age	
Total veg. cover (%)	90	Tree cover (%)	60
Shrub cover (%)	60	Grass cover (%)	1
Herb cover (%)	0.1		



Sample and effort summary				
Sample method	Visit	Sample date	Dimensions	Observer
Quadrat	1	28-Mar-2020		Martin Henson

Species (13)	Status	Cover (%)	Height (m)
<i>*Prosopis glandulosa x velutina</i>	Weed (WoNS)	60	3.5
<i>Eucalyptus victrix</i>		1	8
<i>Acacia coriacea</i>		0.1	2.5
<i>Clerodendrum floribundum</i> var. <i>angustifolium</i>		0.1	2
<i>Acacia xiphophylla</i>		0.1	1.8
<i>Acacia sclerosperma</i> subsp. <i>sclerosperma</i>		0.1	1.8
<i>Portulaca oleracea</i>		0.1	0.5
<i>*Cenchrus ciliaris</i>	Weed	0.1	0.3
<i>Solanum lasiophyllum</i>		0.1	0.3
<i>Eragrostis setifolia</i>		0.1	0.3
<i>Cleome viscosa</i>		0.1	0.2
<i>Dactyloctenium radulans</i>		0.1	0.15
<i>Corchorus tridens</i>		0.1	0.1

Site details			
Site	MSE039	Position (WGS84)	-21.165977, 115.942716
Slope	negligible	Topography	plain
Soil colour	red-orange,	Soil texture	clay loam,
Rock cover (%)	0	Rock type	None,

Observation details - visit 1 (28 Mar 2020)			
Sample description	Tall shrubland of <i>*Prosopis glandulosa x velutina</i> over mid isolated shrubs of <i>Acacia bivenosa</i> and <i>A. ampliceps</i> over <i>*Cenchrus ciliaris</i> and <i>Eragrostis setifolia</i> grasses		
Habitat	shrubland		
Disturbance	Weed infestation,		
Vegetation condition	Degraded	Fire age	
Total veg. cover (%)	70	Tree cover (%)	65
Shrub cover (%)	0.1	Grass cover (%)	5
Herb cover (%)	0.1		



Sample and effort summary				
Sample method	Visit	Sample date	Dimensions	Observer
Quadrat	1	28-Mar-2020		Martin Henson

Species (7)	Status	Cover (%)	Height (m)
<i>*Prosopis glandulosa x velutina</i>	Weed (WoNS)	62	2.5
<i>Triodia epactia</i>		5	0.4
<i>Acacia bivenosa</i>		0.1	1
<i>Acacia ampliceps</i>		0.1	1
<i>*Cenchrus ciliaris</i>	Weed	0.1	0.3
<i>Eragrostis setifolia</i>		0.1	0.2
<i>Cynodon convergens</i>		0.1	0.1

Site details			
Site	MSP009Q1	Position (WGS84)	-21.082501, 115.93818
Slope	negligible	Topography	tidal mudflat
Soil colour	red-brown,	Soil texture	clay loam,
Rock cover (%)	0	Rock type	none

Observation details - visit 1 (15 Mar 2018)			
Sample description	Isolated low <i>Tecticornia halocnemoides</i> subsp. <i>tenuis</i> shrubs.		
Habitat	chenopod shrubland		
Disturbance	none,		
Vegetation condition	Excellent	Fire age	not evident
Total veg. cover (%)	5	Tree cover (%)	0
Shrub cover (%)	5	Grass cover (%)	0
Herb cover (%)	0		



Sample and effort summary				
Sample method	Visit	Sample date	Dimensions	Observer
Transect-Quadrat	1	15-Mar-2018	3 m x 3 m	Grant Wells

Species (1)	Status	Cover (%)	Height (m)
<i>Tecticornia halocnemoides</i> subsp. <i>tenuis</i>		5	0.3

Site details			
Site	MSP009Q2	Position (WGS84)	-21.082188, 115.938076
Slope	negligible	Topography	tidal mudflat
Soil colour	brown,	Soil texture	clay loam,
Rock cover (%)	0	Rock type	none

Observation details - visit 1 (15 Mar 2018)			
Sample description	Low <i>Tecticornia halocnemoides</i> subsp. <i>tenuis</i> open shrubland.		
Habitat	shrubland		
Disturbance	none,		
Vegetation condition	Excellent	Fire age	not evident
Total veg. cover (%)	15	Tree cover (%)	0
Shrub cover (%)	15	Grass cover (%)	0
Herb cover (%)	0		



Sample and effort summary				
Sample method	Visit	Sample date	Dimensions	Observer
Transect-Quadrat	1	15-Mar-2018	3 m x 3 m	Grant Wells

Species (1)	Status	Cover (%)	Height (m)
<i>Tecticornia halocnemoides</i> subsp. <i>tenuis</i>		15	0.3



Site details			
Site	MSP009Q3	Position (WGS84)	-21.081778, 115.938018
Slope	negligible	Topography	tidal mudflat
Soil colour	brown,	Soil texture	clay loam,
Rock cover (%)	0	Rock type	none

Observation details - visit 1 (15 Mar 2018)			
Sample description	Low <i>Tecticornia halocnemoides</i> subsp. <i>tenuis</i> shrubland.		
Habitat	shrubland		
Disturbance	none,		
Vegetation condition	Excellent	Fire age	not evident
Total veg. cover (%)	40	Tree cover (%)	0
Shrub cover (%)	40	Grass cover (%)	0
Herb cover (%)	0		

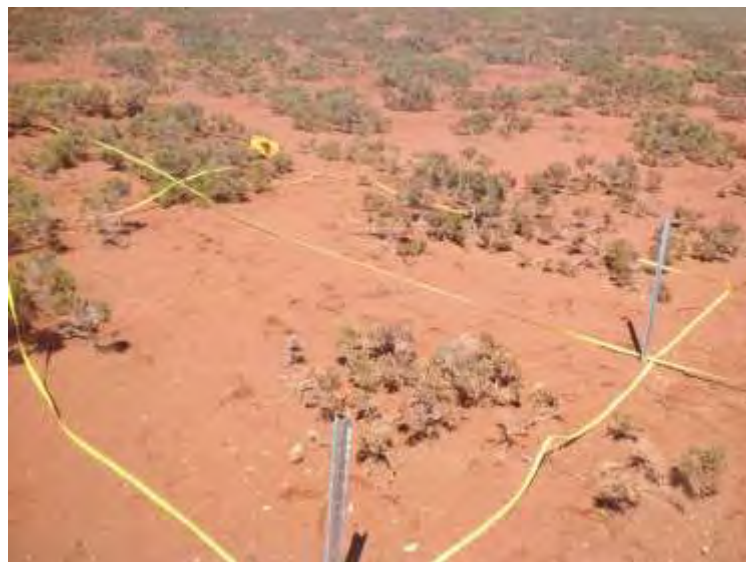


Sample and effort summary				
Sample method	Visit	Sample date	Dimensions	Observer
Transect-Quadrat	1	15-Mar-2018	3 m x 3 m	Grant Wells

Species (1)	Status	Cover (%)	Height (m)
<i>Tecticornia halocnemoides</i> subsp. <i>tenuis</i>		40	0.3

Site details			
Site	MSP009Q4	Position (WGS84)	-21.081394, 115.93791
Slope	negligible	Topography	tidal mudflat
Soil colour	brown,	Soil texture	clay loam,
Rock cover (%)	0	Rock type	none

Observation details - visit 1 (15 Mar 2018)			
Sample description	Low open <i>Tecticornia halocnemoides</i> subsp. <i>tenuis</i> shrubland.		
Habitat	chenopod shrubland		
Disturbance	none,		
Vegetation condition	Excellent	Fire age	not evident
Total veg. cover (%)	30	Tree cover (%)	0
Shrub cover (%)	30	Grass cover (%)	0
Herb cover (%)	0		

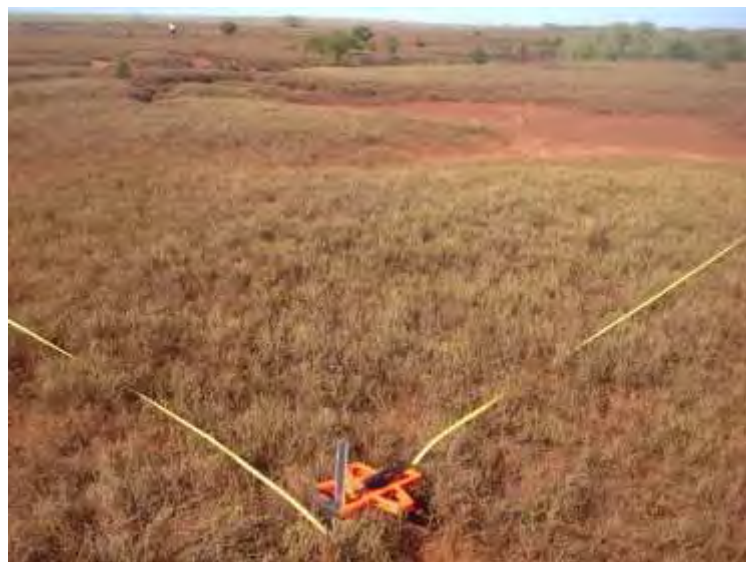


Sample and effort summary				
Sample method	Visit	Sample date	Dimensions	Observer
Transect-Quadrat	1	15-Mar-2018	3 m x 3 m	Grant Wells

Species (1)	Status	Cover (%)	Height (m)
<i>Tecticornia halocnemoides</i> subsp. <i>tenuis</i>		30	0.4

Site details			
Site	MSP011	Position (WGS84)	-21.084284, 115.930921
Slope	gentle	Topography	tidal creek
Soil colour	brown,	Soil texture	clay,
Rock cover (%)	0	Rock type	none

Observation details - visit 1 (15 Mar 2018)			
Sample description	Mid open <i>Avicennia marina</i> and <i>Rhizophora stylosa</i> shrubland over low closed <i>Muellerolimon salicorniaceum</i> shrubland.		
Habitat	shrubland		
Disturbance	none,		
Vegetation condition	Excellent	Fire age	not evident
Total veg. cover (%)	85	Tree cover (%)	0
Shrub cover (%)	85	Grass cover (%)	0
Herb cover (%)	0		



Sample and effort summary				
Sample method	Visit	Sample date	Dimensions	Observer
Quadrat	1	15-Mar-2018	50 m x 50 m	Grant Wells

Species (3)	Status	Cover (%)	Height (m)
<i>Muellerolimon salicorniaceum</i>		80	0.2
<i>Rhizophora stylosa</i>		7	1.5
<i>Avicennia marina</i>		3	1.8

Site details			
Site	MSP015	Position (WGS84)	-21.099161, 115.908342
Slope	moderate	Topography	sand dune
Soil colour	brown,	Soil texture	sandy loam,
Rock cover (%)	0	Rock type	none

Observation details - visit 1 (15 Mar 2018)			
Sample description	Sparse mid <i>Alectryon oleifolius</i> subsp. <i>oleifolius</i> , <i>Eremophila longifolia</i> and <i>Myoporum montanum</i> shrubland over low open * <i>Aerva javanica</i> , <i>Scaevola spinescens</i> and <i>S. acacioides</i> shrubland ove		
Habitat	grassland		
Disturbance	weed infestation,		
Vegetation condition	Good	Fire age	not evident
Total veg. cover (%)	90	Tree cover (%)	0
Shrub cover (%)	15	Grass cover (%)	90
Herb cover (%)	20		



Sample and effort summary				
Sample method	Visit	Sample date	Dimensions	Observer
Quadrat	1	15-Mar-2018	50 m x 50 m	Grant Wells

Species (21)	Status	Cover (%)	Height (m)
<i>Triodia epactia</i>		90	0.4
<i>Cassytha capillaris</i>		20	0.4
* <i>Aerva javanica</i>	Weed	10	0.7
<i>Alectryon oleifolius</i> subsp. <i>oleifolius</i>		4	1.6
<i>Eremophila longifolia</i>		3	1.5
<i>Scaevola spinescens</i>		2	0.6
<i>Myoporum montanum</i>		1	1.7
<i>Trichodesma zeylanicum</i> var. <i>grandiflorum</i>		0.1	1.8
<i>Senna glutinosa</i> subsp. <i>x luerssenii</i>		0.1	1.6
<i>Rhagodia eremaea</i>		0.1	1.2
<i>Solanum cleistogamum</i>		0.1	0.5
<i>Scaevola cunninghamii</i>		0.1	0.5
<i>Frankenia ambita</i>		0.1	0.5
<i>Ptilotus divaricatus</i>		0.1	0.5
<i>Scaevola acacioides</i>		0.1	0.4
<i>Indigofera trita</i>		0.1	0.3
<i>Euphorbia tannensis</i> subsp. <i>eremophila</i>		0.1	0.3
<i>Sida fibulifera</i>		0.1	0.2
<i>Crotalaria medicaginea</i> var. <i>neglecta</i>		0.1	0.15
<i>Rhynchosia minima</i>		0.1	0.15
<i>Surreya diandra</i>			



Site details			
Site	MSP015Q1	Position (WGS84)	-21.089455, 115.928877
Slope	negligible	Topography	tidal creek
Soil colour	red-brown	Soil texture	clay loam
Rock cover (%)	0	Rock type	none

Observation details - visit 1 (15 Mar 2018)			
Sample description	Low <i>Tecticornia halocnemoides</i> subsp. <i>tenuis</i> and <i>Muellerolimon salicorniaceum</i> shrubland.		
Habitat	chenopod shrubland		
Disturbance	none,		
Vegetation condition	Excellent	Fire age	not evident
Total veg. cover (%)	65	Tree cover (%)	0
Shrub cover (%)	65	Grass cover (%)	0
Herb cover (%)	0		



Sample and effort summary				
Sample method	Visit	Sample date	Dimensions	Observer
Transect-Quadrat	1	15-Mar-2018	3 m x 3 m	Grant Wells

Species (2)	Status	Cover (%)	Height (m)
<i>Tecticornia halocnemoides</i> subsp. <i>tenuis</i>		35	0.4
<i>Muellerolimon salicorniaceum</i>		35	0.15

Site details			
Site	MSP015Q2	Position (WGS84)	-21.089272, 115.928451
Slope	negligible	Topography	tidal mudflat
Soil colour	brown,	Soil texture	clay loam,
Rock cover (%)	0	Rock type	none

Observation details - visit 1 (15 Mar 2018)			
Sample description	Low <i>Tecticornia halocnemoides</i> subsp. <i>tenuis</i> , <i>T.indica</i> subsp. <i>leiostachya</i> and <i>Surreya diandra</i> shrubland.		
Habitat	shrubland		
Disturbance	none,		
Vegetation condition	Excellent	Fire age	not evident
Total veg. cover (%)	50	Tree cover (%)	0
Shrub cover (%)	50	Grass cover (%)	0
Herb cover (%)	0		



Sample and effort summary				
Sample method	Visit	Sample date	Dimensions	Observer
Transect-Quadrat	1	15-Mar-2018	3 m x 3 m	Grant Wells

Species (3)	Status	Cover (%)	Height (m)
<i>Muellerolimon salicorniaceum</i>		45	0.2
<i>Tecticornia halocnemoides</i> subsp. <i>tenuis</i>		10	0.3
<i>Tecticornia indica</i> subsp. <i>leiostachya</i>		5	0.15

Site details			
Site	MSP015Q3	Position (WGS84)	-21.089004, 115.928165
Slope	negligible	Topography	tidal mudflat
Soil colour	brown,	Soil texture	clay loam,
Rock cover (%)	0	Rock type	none

Observation details - visit 1 (15 Mar 2018)			
Sample description	Mid open <i>Avicennia marina</i> shrubland over low <i>Tecticornia halocnemoides</i> subsp. <i>tenuis</i> and <i>Surreya diandra</i> shrubland.		
Habitat	shrubland		
Disturbance	none,		
Vegetation condition	Excellent	Fire age	not evident
Total veg. cover (%)	70	Tree cover (%)	0
Shrub cover (%)	70	Grass cover (%)	0
Herb cover (%)	0		



Sample and effort summary				
Sample method	Visit	Sample date	Dimensions	Observer
Transect-Quadrat	1	15-Mar-2018	3 m x 3 m	Grant Wells

Species (3)	Status	Cover (%)	Height (m)
<i>Muellerolimon salicorniaceum</i>		60	0.2
<i>Avicennia marina</i>		25	1.2
<i>Tecticornia halocnemoides</i> subsp. <i>tenuis</i>		15	0.4

Site details			
Site	MSP015Q4	Position (WGS84)	-21.088805, 115.927839
Slope	negligible	Topography	tidal creek
Soil colour	brown,	Soil texture	clay loam,
Rock cover (%)	0	Rock type	none

Observation details - visit 1 (15 Mar 2018)			
Sample description	Low <i>Surreya diandra</i> shrubland.		
Habitat	shrubland		
Disturbance	none		
Vegetation condition	Excellent	Fire age	not evident
Total veg. cover (%)	60	Tree cover (%)	0
Shrub cover (%)	60	Grass cover (%)	0
Herb cover (%)	0		



Sample and effort summary				
Sample method	Visit	Sample date	Dimensions	Observer
Transect-Quadrat	1	15-Mar-2018	3 m x 3 m	Grant Wells

Species (1)	Status	Cover (%)	Height (m)
<i>Muellerolimon salicorniaceum</i>		60	0.2



Site details			
Site	MSP018Q1	Position (WGS84)	-21.100839, 115.906164
Slope	negligible	Topography	tidal mudflat
Soil colour	brown,	Soil texture	sandy clay, sandy loam,
Rock cover (%)	0	Rock type	none

Observation details - visit 1 (15 Mar 2018)			
Sample description	Low <i>Surreya diandra</i> , <i>Tecticornia</i> sp. sterile 1, <i>Tecticornia pterygosperma</i> subsp. <i>denticulata</i> and <i>Frankenia ambita</i> shrubland over low open <i>Eragrostis falcata</i> grassland.		
Habitat	shrubland		
Disturbance	evidence of feral animals,		
Vegetation condition	Excellent	Fire age	not evident
Total veg. cover (%)	45	Tree cover (%)	0
Shrub cover (%)	35	Grass cover (%)	10
Herb cover (%)	0		



Sample and effort summary				
Sample method	Visit	Sample date	Dimensions	Observer
Transect-Quadrat	1	15-Mar-2018	3 m x 3 m	Grant Wells

Species (5)	Status	Cover (%)	Height (m)
<i>Surreya diandra</i>		15	0.2
<i>Eragrostis falcata</i>		10	0.25
<i>Frankenia ambita</i>		10	0.2
<i>Tecticornia pterygosperma</i> subsp. <i>denticulata</i>		5	0.25
<i>Tecticornia</i> sp. sterile 1		5	0.15

Site details			
Site	MSP018Q2	Position (WGS84)	-21.100715, 115.905839
Slope	negligible	Topography	tidal mudflat
Soil colour	brown,	Soil texture	sandy clay, sandy loam,
Rock cover (%)	0	Rock type	none

Observation details - visit 1 (15 Mar 2018)			
Sample description	Low open <i>Muellerolimon salicorniaceum</i> , <i>Surreya diandra</i> and <i>Frankenia ambita</i> shrubland over isolated low <i>Eragrostis falcata</i> grasses.		
Habitat	shrubland		
Disturbance	none,		
Vegetation condition	Excellent	Fire age	not evident
Total veg. cover (%)	25	Tree cover (%)	0
Shrub cover (%)	20	Grass cover (%)	5
Herb cover (%)	0		



Sample and effort summary				
Sample method	Visit	Sample date	Dimensions	Observer
Transect-Quadrat	1	15-Mar-2018	3 m x 3 m	Grant Wells

Species (4)	Status	Cover (%)	Height (m)
<i>Muellerolimon salicorniaceum</i>		10	0.2
<i>Eragrostis falcata</i>		5	0.25
<i>Surreya diandra</i>		5	0.2
<i>Frankenia ambita</i>		5	0.2

Site details			
Site	MSP018Q3	Position (WGS84)	-21.100631, 115.90556
Slope	negligible	Topography	tidal mudflat
Soil colour	brown,	Soil texture	sandy clay, sandy loam,
Rock cover (%)	0	Rock type	none

Observation details - visit 1 (15 Mar 2018)			
Sample description	Low <i>Tecticornia</i> sp. sterile 1, <i>Surreya diandra</i> and <i>Hemichroa pentandra</i> shrubland over low isolated <i>Eragrostis falcata</i> grasses.		
Habitat	shrubland		
Disturbance	none,		
Vegetation condition	Excellent	Fire age	not evident
Total veg. cover (%)	30	Tree cover (%)	0
Shrub cover (%)	28	Grass cover (%)	2
Herb cover (%)	0		



Sample and effort summary				
Sample method	Visit	Sample date	Dimensions	Observer
Transect-Quadrat	1	15-Mar-2018	3 m x 3 m	Grant Wells

Species (5)	Status	Cover (%)	Height (m)
<i>Tecticornia</i> sp. sterile 1		14	0.2
<i>Muellerolimon salicorniaceum</i>		10	0.2
<i>Eragrostis falcata</i>		2	0.25
<i>Tecticornia indica</i> subsp. <i>leiostachya</i>		2	0.15
<i>Surreya diandra</i>		2	0.15

Site details			
Site	MSP018Q4	Position (WGS84)	-21.10052, 115.905286
Slope	negligible	Topography	tidal mudflat
Soil colour	brown,	Soil texture	sandy clay, sandy loam,
Rock cover (%)	0	Rock type	none

Observation details - visit 1 (15 Mar 2018)			
Sample description	Low open <i>Tecticornia</i> sp. sterile 1, <i>Surreya diandra</i> and <i>Frankenia ambita</i> shrubland over low open <i>Eragrostis falcata</i> grassland.		
Habitat	grassland		
Disturbance	none,		
Vegetation condition	Excellent	Fire age	not evident
Total veg. cover (%)	35	Tree cover (%)	0
Shrub cover (%)	15	Grass cover (%)	20
Herb cover (%)	0		



Sample and effort summary				
Sample method	Visit	Sample date	Dimensions	Observer
Transect-Quadrat	1	15-Mar-2018	10 m x 10 m	Grant Wells

Species (4)	Status	Cover (%)	Height (m)
<i>Eragrostis falcata</i>		20	0.3
<i>Frankenia ambita</i>		10	0.15
<i>Surreya diandra</i>		5	0.2
<i>Tecticornia</i> sp. sterile 1		2	0.15



Site details			
Site	MSP022Q1	Position (WGS84)	-21.285846, 115.832731
Slope	negligible	Topography	tidal mudflat
Soil colour	red-brown,	Soil texture	sandy loam,
Rock cover (%)	0	Rock type	none

Observation details - visit 1 (19 Mar 2018)			
Sample description	Low open <i>Tecticornia halocnemoides</i> subsp. <i>tenuis</i> , <i>T. indica</i> subsp. <i>leiostachya</i> and <i>Neobassia astrocarpa</i> shrubland over isolated low <i>Eragrostis falcata</i> grasses.		
Habitat	shrubland		
Disturbance	none,		
Vegetation condition	Excellent	Fire age	not evident
Total veg. cover (%)	30	Tree cover (%)	0
Shrub cover (%)	28	Grass cover (%)	2
Herb cover (%)	0		



Sample and effort summary				
Sample method	Visit	Sample date	Dimensions	Observer
Transect-Quadrat	1	19-Mar-2018	10 m x 10 m	Grant Wells

Species (6)	Status	Cover (%)	Height (m)
<i>Tecticornia halocnemoides</i> subsp. <i>tenuis</i>		25	0.2
<i>Trianthema turgidifolium</i>		2	0.25
<i>Eragrostis falcata</i>		2	0.15
<i>Tecticornia indica</i> subsp. <i>leiostachya</i>		1	0.4
<i>Neobassia astrocarpa</i>		0.1	0.1
<i>Frankenia ambita</i>		0.1	0.05

Site details			
Site	MSP022Q2	Position (WGS84)	-21.286185, 115.832541
Slope	negligible	Topography	tidal mudflat
Soil colour	red-orange,	Soil texture	clay loam,
Rock cover (%)	0	Rock type	none

Observation details - visit 1 (19 Mar 2018)			
Sample description	Low <i>Surreya diandra</i> , <i>Tecticornia halocnemoides</i> subsp. <i>tenuis</i> and <i>Sclerolaena costata</i> shrubland over low open <i>Eragrostis falcata</i> grassland and isolated low <i>Streptoglossa bubakii</i> forbs.		
Habitat	shrubland		
Disturbance	none,		
Vegetation condition	Excellent	Fire age	not evident
Total veg. cover (%)	60	Tree cover (%)	0
Shrub cover (%)	50	Grass cover (%)	15
Herb cover (%)	0		



Sample and effort summary				
Sample method	Visit	Sample date	Dimensions	Observer
Transect-Quadrat	1	19-Mar-2018	10 m x 10 m	Grant Wells

Species (6)	Status	Cover (%)	Height (m)
<i>Eragrostis falcata</i>		30	0.4
<i>Tecticornia halocnemoides</i> subsp. <i>tenuis</i>		30	0.3
<i>Sclerolaena costata</i>		10	0.4
<i>Surreya diandra</i>		7	0.2
<i>Frankenia ambita</i>		1	0.25
<i>Streptoglossa bubakii</i>		0.5	0.15

Site details			
Site	MSP022Q3	Position (WGS84)	-21.286366, 115.832181
Slope	negligible	Topography	tidal mudflat
Soil colour	red-orange,	Soil texture	clay loam,
Rock cover (%)	0	Rock type	none

Observation details - visit 1 (19 Mar 2018)			
Sample description	Low <i>Surreys diandra</i> , <i>Sclerolaena costata</i> and <i>Tecticornia halocnemoides</i> subsp. <i>tenuis</i> shrubland over low open <i>Eragrostis falcata</i> grassland.		
Habitat	shrubland		
Disturbance	none,		
Vegetation condition	Excellent	Fire age	not evident
Total veg. cover (%)	50	Tree cover (%)	0
Shrub cover (%)	35	Grass cover (%)	20
Herb cover (%)	0		



Sample and effort summary				
Sample method	Visit	Sample date	Dimensions	Observer
Transect-Quadrat	1	19-Mar-2018	10 m x 10 m	Grant Wells

Species (5)	Status	Cover (%)	Height (m)
<i>Eragrostis falcata</i>		20	0.3
<i>Tecticornia halocnemoides</i> subsp. <i>tenuis</i>		15	0.25
<i>Surreya diandra</i>		15	0.15
<i>Sclerolaena costata</i>		3	0.4
<i>Frankenia ambita</i>		1	0.15

Site details			
Site	MSP022Q4	Position (WGS84)	-21.286633, 115.831908
Slope	negligible	Topography	tidal mudflat
Soil colour	red-brown,	Soil texture	sandy clay, sandy loam,
Rock cover (%)	0	Rock type	none

Observation details - visit 1 (19 Mar 2018)			
Sample description	Low open <i>Surreya diandra</i> , <i>Sclerolaena costata</i> and <i>Tecticornia halocnemoides</i> subsp. <i>tenuis</i> shrubland over low open <i>Eragrostis falcata</i> grassland.		
Habitat	shrubland		
Disturbance	none,		
Vegetation condition	Excellent	Fire age	not evident
Total veg. cover (%)	40	Tree cover (%)	0
Shrub cover (%)	20	Grass cover (%)	20
Herb cover (%)	0		



Sample and effort summary				
Sample method	Visit	Sample date	Dimensions	Observer
Transect-Quadrat	1	19-Mar-2018	10 m x 10 m	Grant Wells

Species (6)	Status	Cover (%)	Height (m)
<i>Eragrostis falcata</i>		20	0.2
<i>Surreya diandra</i>		10	0.15
<i>Tecticornia halocnemoides</i> subsp. <i>tenuis</i>		5	0.25
<i>Sclerolaena costata</i>		3	0.3
<i>Frankenia ambita</i>		2	0.1
<i>Neobassia astrocarpa</i>		0.1	0.1



Site details			
Site	MSP059	Position (WGS84)	-21.134618, 115.927854
Slope	negligible	Topography	plain
Soil colour	red-orange	Soil texture	sandy clay, sandy loam
Rock cover (%)	0	Rock type	none

Observation details - visit 1 (16 Mar 2018)			
Sample description	Isolated mid * <i>Prosopis glandolusa</i> x <i>velutina</i> shrubs over isolated clumps of low <i>Solanum lasiophyllum</i> , <i>Pterocaulon sphacelatum</i> and <i>Indigofera trita</i> shrubs over low <i>Triodia epactia</i> and <i>T.</i>		
Habitat	spinifex grassland		
Disturbance	weed infestation,		
Vegetation condition	Very Good	Fire age	moderate (>5 years)
Total veg. cover (%)	85	Tree cover (%)	0
Shrub cover (%)	1	Grass cover (%)	85
Herb cover (%)	0		



Sample and effort summary				
Sample method	Visit	Sample date	Dimensions	Observer
Quadrat	1	16-Mar-2018	50 m x 50 m	Grant Wells

Species (14)	Status	Cover (%)	Height (m)
<i>Triodia epactia</i>		50	0.4
<i>Triodia longiceps</i>		35	0.45
* <i>Prosopis glandulosa</i> x <i>velutina</i>	Weed (WoNS)	1	1.7
* <i>Cenchrus ciliaris</i>	Weed	1	0.3
<i>Trianthema turgidifolium</i>		0.5	0.2
<i>Evolvulus alsinoides</i> var. <i>villosicalyx</i>		0.5	0.15
<i>Indigofera trita</i>		0.1	0.35
<i>Solanum lasiophyllum</i>		0.1	0.3
<i>Pterocaulon sphacelatum</i>		0.1	0.3
<i>Lawrenca viridigrisea</i>		0.1	0.25
<i>Eragrostis eriopoda</i>		0.1	0.2
<i>Sclerolaena diacantha</i>		0.1	0.15
<i>Rhynchosia minima</i>		0.1	0.15
<i>Heliotropium cunninghamii</i>		0.1	0.15

Site details			
Site	MSP071	Position (WGS84)	-21.198601, 115.904626
Slope	negligible	Topography	plain
Soil colour	red-orange,	Soil texture	sandy clay, sandy loam,
Rock cover (%)	0	Rock type	none

Observation details - visit 1 (16 Mar 2018)			
Sample description	Mid open <i>Acacia ligulata</i> and <i>A. stellaticeps</i> shrubland over low closed <i>Triodia epactia</i> hummock grassland.		
Habitat	shrubland		
Disturbance	none,		
Vegetation condition	Excellent	Fire age	not evident
Total veg. cover (%)	80	Tree cover (%)	0
Shrub cover (%)	20	Grass cover (%)	75
Herb cover (%)	5		

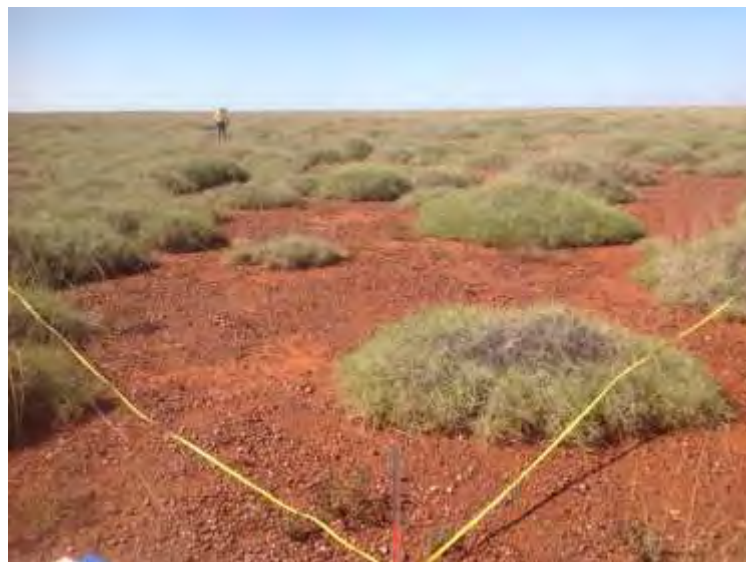


Sample and effort summary				
Sample method	Visit	Sample date	Dimensions	Observer
Quadrat	1	16-Mar-2018	50 m x 50 m	Grant Wells

Species (16)	Status	Cover (%)	Height (m)
<i>Triodia epactia</i>		75	0.4
<i>Acacia ligulata</i>		10	1.8
<i>Acacia stellaticeps</i>		10	1.2
<i>Cassytha capillaris</i>		5	0.4
<i>Scaevola spinescens</i>		1	0.5
<i>Sida fibulifera</i>		0.5	0.3
<i>Acacia coriacea</i>		0.1	1.4
* <i>Prosopis glandulosa</i> x <i>velutina</i>	Weed (WoNS)	0.1	1.3
<i>Whiteochloa airoides</i>		0.1	0.5
<i>Goodenia armitiana</i>		0.1	0.5
<i>Indigofera monophylla</i>		0.1	0.4
<i>Heliotropium chrysocarpum</i>		0.1	0.4
* <i>Cenchrus ciliaris</i>	Weed	0.1	0.4
<i>Euphorbia tannensis</i> subsp. <i>eremophila</i>		0.1	0.2
<i>Solanum lasiophyllum</i>		0.1	0.2
<i>Rhynchosia minima</i>		0.1	0.2

Site details			
Site	MSP082	Position (WGS84)	-21.290757, 115.89825
Slope	negligible	Topography	plain
Soil colour	red-orange,	Soil texture	sandy clay, sandy loam,
Rock cover (%)	0	Rock type	ferrous – ironstone

Observation details - visit 1 (16 Mar 2018)			
Sample description	Mid closed <i>Triodia longiceps</i> hummock grassland over isolated clumps of low <i>Sclerolaena costata</i> , <i>S. densiflora</i> and <i>Pterocaulon sphacelatum</i> forbs.		
Habitat	spinifex grassland		
Disturbance	none,		
Vegetation condition	Excellent	Fire age	moderate (>5 years)
Total veg. cover (%)	75	Tree cover (%)	0
Shrub cover (%)	0	Grass cover (%)	75
Herb cover (%)	0		



Sample and effort summary				
Sample method	Visit	Sample date	Dimensions	Observer
Quadrat	1	16-Mar-2018	50 m x 50 m	Grant Wells

Species (4)	Status	Cover (%)	Height (m)
<i>Triodia longiceps</i>		75	1
<i>Pterocaulon sphacelatum</i>		0.1	0.3
<i>Sclerolaena densiflora</i>		0.1	0.2
<i>Sclerolaena costata</i>		0.1	0.15

Site details			
Site	MSP085	Position (WGS84)	-21.283466, 115.840004
Slope	negligible	Topography	plain
Soil colour	red-brown,	Soil texture	sandy loam,
Rock cover (%)	0	Rock type	none

Observation details - visit 1 (16 Mar 2018)			
Sample description	Isolated tall <i>Acacia ampliceps</i> shrubs over isolated low <i>Acacia bivenosa</i> , <i>Myoporum montanum</i> and <i>Acacia coriacea</i> ?subsp. <i>coriacea</i> shrubs over low closed <i>Triodia epactia</i> and * <i>Cenchrus cilia</i>		
Habitat	spinifex grassland		
Disturbance	evidence of feral animals, grazing – medium, livestock tracks, weed infestation,		
Vegetation condition	Poor	Fire age	not evident
Total veg. cover (%)	80	Tree cover (%)	3
Shrub cover (%)	5	Grass cover (%)	80
Herb cover (%)	0		



Sample and effort summary				
Sample method	Visit	Sample date	Dimensions	Observer
Quadrat	1	16-Mar-2018	50 m x 50 m	Grant Wells

Species (22)	Status	Cover (%)	Height (m)
<i>Triodia epactia</i>		50	0.35
* <i>Cenchrus ciliaris</i>	Weed	30	0.4
<i>Acacia bivenosa</i>		4	1
<i>Acacia ampliceps</i>		2	3
<i>Acacia ampliceps</i> x <i>bivenosa</i>		1	1.5
<i>Cassytha capillaris</i>		1	0.4
* <i>Prosopis pallida</i>	Weed (WoNS)	0.1	3
<i>Acacia coriacea</i>		0.1	1
<i>Myoporum montanum</i>		0.1	0.8
<i>Hakea lorea</i> subsp. <i>lorea</i>		0.1	0.5
<i>Acacia synchronicia</i>		0.1	0.4
<i>Goodenia armitiana</i>		0.1	0.4
<i>Indigofera trita</i>		0.1	0.4
<i>Pterocaulon sphacelatum</i>		0.1	0.4
<i>Aristida holathera</i>		0.1	0.3
<i>Rhagodia eremaea</i>		0.1	0.3
<i>Pluchea rubelliflora</i>		0.1	0.15
<i>Sida fibulifera</i>		0.1	0.15
<i>Goodenia forrestii</i>		0.1	0.1
<i>Rhynchosia minima</i>		0.1	0.1
<i>Senna glutinosa</i> subsp. <i>pruinosa</i>		0.1	0.1
<i>Haloragis gossei</i>		0.1	0.05



Site details			
Site	MSP087	Position (WGS84)	-21.283994, 115.814814
Slope	negligible	Topography	tidal mudflat
Soil colour	brown,	Soil texture	sandy clay,
Rock cover (%)	0	Rock type	none

Observation details - visit 1 (19 Mar 2018)			
Sample description	Low sparse <i>Tecticornia halocnemoides</i> subsp. <i>longispicata</i> and <i>T. halocnemoides</i> subsp. <i>tenuis</i> shrubland.		
Habitat	chenopod shrubland		
Disturbance	none,		
Vegetation condition	Excellent	Fire age	not evident
Total veg. cover (%)	6	Tree cover (%)	0
Shrub cover (%)	6	Grass cover (%)	0
Herb cover (%)	0		

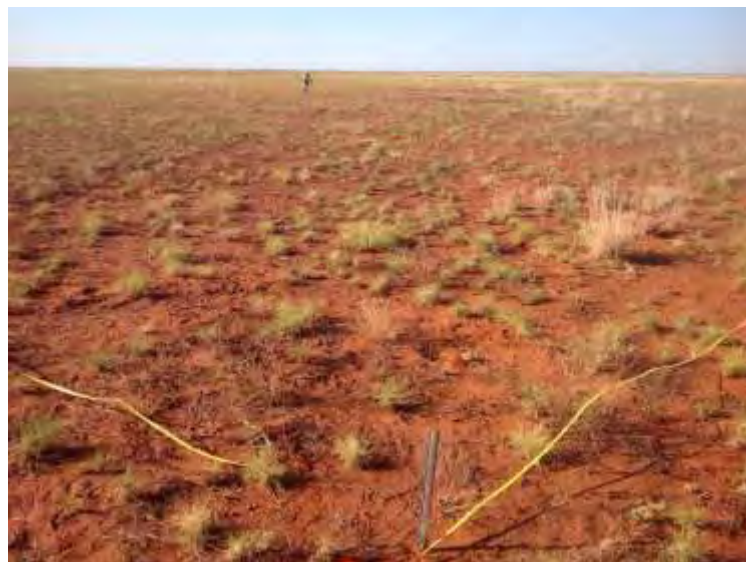


Sample and effort summary				
Sample method	Visit	Sample date	Dimensions	Observer
Quadrat	1	19-Mar-2018	50 m x 50 m	Grant Wells

Species (2)	Status	Cover (%)	Height (m)
<i>Tecticornia halocnemoides</i> subsp. <i>longispicata</i>		6	0.3
<i>Tecticornia halocnemoides</i> subsp. <i>tenuis</i>		0.1	0.15

Site details			
Site	MSP115	Position (WGS84)	-21.294315, 115.867381
Slope	negligible	Topography	plain
Soil colour	red-orange,	Soil texture	sandy clay, sandy loam,
Rock cover (%)	0	Rock type	ferrous – ironstone

Observation details - visit 1 (16 Mar 2018)			
Sample description	Isolated low <i>Acacia synchronicia</i> , <i>Trianthema turgidifolia</i> and <i>Corchorus tridens</i> shrubs over low <i>Triodia</i> sp. grassland over isolated low <i>Pluchea rubelliflora</i> and <i>Streptoglossa adscendens</i> forbs.		
Habitat	spinifex grassland		
Disturbance	evidence of feral animals, livestock tracks,		
Vegetation condition	Very Good	Fire age	recent (<1 year)
Total veg. cover (%)	30	Tree cover (%)	0
Shrub cover (%)	1	Grass cover (%)	30
Herb cover (%)	1		



Sample and effort summary				
Sample method	Visit	Sample date	Dimensions	Observer
Quadrat	1	16-Mar-2018	50 m x 50 m	Grant Wells

Species (17)	Status	Cover (%)	Height (m)
<i>Triodia longiceps</i>		30	0.15
<i>Trianthema turgidifolium</i>		2	0.15
<i>Dactyloctenium radulans</i>		2	0.05
<i>Eulalia aurea</i>		1	0.4
<i>Pluchea rubelliflora</i>		1	0.25
<i>Indigofera trita</i>		1	0.15
* <i>Cenchrus ciliaris</i>	Weed	0.5	0.1
<i>Alysicarpus muelleri</i>		0.5	0.1
<i>Indigofera linifolia</i>		0.5	0.05
<i>Trianthema triquetrum</i>		0.5	0.03
<i>Streptoglossa adscendens</i>		0.1	0.4
<i>Pterocaulon sphacelatum</i>		0.1	0.3
<i>Acacia synchronicia</i>		0.1	0.3
<i>Sida</i>		0.1	0.15
<i>Abutilon</i>		0.1	0.1
<i>Goodenia forrestii</i>		0.1	0.1
<i>Corchorus tridens</i>		0.1	0.05

Site details			
Site	MSP116Q1	Position (WGS84)	-21.293585, 115.878676
Slope	negligible	Topography	sandy rise
Soil colour	red-brown,	Soil texture	sandy clay, sandy loam,
Rock cover (%)	0	Rock type	none

Observation details - visit 1 (19 Mar 2018)			
Sample description	Low sparse <i>Tecticornia auriculata</i> and <i>Sclerolaena costata</i> chenopod shrubland.		
Habitat	chenopod shrubland		
Disturbance	none,		
Vegetation condition	Excellent	Fire age	not evident
Total veg. cover (%)	8	Tree cover (%)	0
Shrub cover (%)	8	Grass cover (%)	0
Herb cover (%)	0		



Sample and effort summary				
Sample method	Visit	Sample date	Dimensions	Observer
Transect-Quadrat	1	19-Mar-2018	3 m x 3 m	Grant Wells

Species (2)	Status	Cover (%)	Height (m)
<i>Tecticornia auriculata</i>		7	0.4
<i>Sclerolaena costata</i>		1	0.25

Site details			
Site	MSP116Q3	Position (WGS84)	-21.293889, 115.877973
Slope	negligible	Topography	tidal mudflat
Soil colour	red-brown,	Soil texture	sandy clay, sandy loam,
Rock cover (%)	0	Rock type	none

Observation details - visit 1 (19 Mar 2018)			
Sample description	Low <i>Tecticornia auriculata</i> and <i>Lawrenca viridigrisea</i> shrubland over isolated low <i>Eragrostis falcata</i> grasses.		
Habitat	chenopod shrubland		
Disturbance	none,		
Vegetation condition	Excellent	Fire age	not evident
Total veg. cover (%)	15	Tree cover (%)	0
Shrub cover (%)	15	Grass cover (%)	0
Herb cover (%)	0		



Sample and effort summary				
Sample method	Visit	Sample date	Dimensions	Observer
Transect-Quadrat	1	19-Mar-2018	5 m x 5 m	Grant Wells

Species (3)	Status	Cover (%)	Height (m)
<i>Tecticornia auriculata</i>		13	0.45
<i>Lawrenca viridigrisea</i>		2	0.2
<i>Eragrostis falcata</i>		0.1	0.15



Site details			
Site	MSP116Q4	Position (WGS84)	-21.294031, 115.877638
Slope	gentle	Topography	sand dune
Soil colour	red-brown,	Soil texture	sand,
Rock cover (%)	0	Rock type	none

Observation details - visit 1 (19 Mar 2018)			
Sample description	Isolated low <i>Frankenia ambita</i> and <i>Lawrenzia viridigrisea</i> shrubs over isolated low <i>Eragrostis falcata</i> grasses.		
Habitat	grassland		
Disturbance	none,		
Vegetation condition	Excellent	Fire age	not evident
Total veg. cover (%)	3	Tree cover (%)	0
Shrub cover (%)	1	Grass cover (%)	2
Herb cover (%)	0		



Sample and effort summary				
Sample method	Visit	Sample date	Dimensions	Observer
Transect-Quadrat	1	19-Mar-2018	3 m x 3 m	Grant Wells

Species (6)	Status	Cover (%)	Height (m)
<i>Eragrostis falcata</i>		2	0.2
<i>Lawrenca viridigrisea</i>		0.5	0.2
<i>Frankenia ambita</i>		0.5	0.15
<i>Tecticornia auriculata</i>		0.1	0.6
<i>Tecticornia halocnemoides</i> subsp. <i>tenuis</i>		0.1	0.25
<i>Sclerolaena costata</i>		0.1	0.2

Site details			
Site	MSP200	Position (WGS84)	-21.177904, 115.935745
Slope	gentle	Topography	undulating plain
Soil colour	red-brown,	Soil texture	sandy clay, sandy loam,
Rock cover (%)	0	Rock type	none

Observation details - visit 1 (16 Mar 2018)			
Sample description	Mid * <i>Prosopis pallida</i> shrubland over isolated low <i>Acacia bivenosa</i> shrubs over low closed <i>Triodia longiceps</i> and * <i>Cenchrus ciliaris</i> grassland.		
Habitat	shrubland		
Disturbance	evidence of feral animals, grazing – medium, livestock tracks, weed infestation,		
Vegetation condition	Degraded	Fire age	not evident
Total veg. cover (%)	90	Tree cover (%)	2
Shrub cover (%)	50	Grass cover (%)	75
Herb cover (%)	0		



Sample and effort summary				
Sample method	Visit	Sample date	Dimensions	Observer
Quadrat	1	16-Mar-2018	50 m x 50 m	Grant Wells

Species (5)	Status	Cover (%)	Height (m)
<i>*Prosopis pallida</i>	Weed (WoNS)	50	1.8
<i>Triodia longiceps</i>		45	0.4
<i>*Cenchrus ciliaris</i>	Weed	30	0.25
<i>Acacia bivenosa</i>		0.1	0.5
<i>Eragrostis setifolia</i>			

Site details			
Site	MSP201	Position (WGS84)	-21.079004, 115.935603
Slope	gentle	Topography	sand dune
Soil colour	brown,	Soil texture	sandy loam,
Rock cover (%)	0	Rock type	none

Observation details - visit 1 (15 Mar 2018)			
Sample description	Isolated tall <i>Prosopis glandulosa</i> x <i>velutina</i> and <i>Acacia coriacea</i> subsp. <i>pendens</i> shrubs over low open <i>Indigofera trita</i> , <i>Aerva javanica</i> and <i>Maireana planifolia</i> shrubland over		
Habitat	grassland		
Disturbance	weed infestation,		
Vegetation condition	Good	Fire age	not evident
Total veg. cover (%)	85	Tree cover (%)	1
Shrub cover (%)	10	Grass cover (%)	80
Herb cover (%)	20		



Sample and effort summary				
Sample method	Visit	Sample date	Dimensions	Observer
Quadrat	1	15-Mar-2018	50 m x 50 m	Grant Wells

Species (17)	Status	Cover (%)	Height (m)
<i>Triodia epactia</i>		55	0.4
* <i>Cenchrus ciliaris</i>	Weed	25	0.4
<i>Cassytha capillaris</i>		25	0.4
* <i>Aerva javanica</i>	Weed	5	0.6
<i>Indigofera trita</i>		5	0.4
* <i>Prosopis glandulosa x velutina</i>	Weed (WoNS)	1	4
<i>Maireana planifolia</i>		1	0.4
<i>Sida fibulifera</i>		1	0.25
<i>Solanum lasiophyllum</i>		0.5	0.7
<i>Pterocaulon sphacelatum</i>		0.5	0.5
<i>Acacia coriacea</i> subsp. <i>pendens</i>		0.1	4
<i>Acacia sericophylla</i>		0.1	1
<i>Scaevola spinescens</i>		0.1	0.8
<i>Rhagodia eremaea</i>		0.1	0.6
<i>Corchorus walcottii</i>		0.1	0.3
<i>Euphorbia tannensis</i> subsp. <i>eremophila</i>		0.1	0.25
<i>Rhynchosia minima</i>		0.1	0.1

Site details			
Site	MSP202	Position (WGS84)	-21.180844, 115.976567
Slope	negligible	Topography	plain
Soil colour	red-brown,	Soil texture	sandy clay, sandy loam,
Rock cover (%)	0	Rock type	ferrous – ironstone

Observation details - visit 1 (17 Mar 2018)			
Sample description	Isolated low <i>Corymbia hamersleyana</i> and <i>C. candida</i> subsp. <i>dipsodes</i> trees over tall open <i>Acacia bivenosa</i> , <i>A. pyrifolia</i> var. <i>pyrifolia</i> and <i>Prosopis glandulosa</i>		
Habitat	shrubland		
Disturbance	grazing – low, livestock tracks, vehicle tracks, weed infestation,		
Vegetation condition	Poor	Fire age	not evident
Total veg. cover (%)	60	Tree cover (%)	20
Shrub cover (%)	2	Grass cover (%)	50
Herb cover (%)	0		



Sample and effort summary				
Sample method	Visit	Sample date	Dimensions	Observer
Quadrat	1	17-Mar-2018	50 m x 50 m	Grant Wells

Species (16)	Status	Cover (%)	Height (m)
<i>Triodia wiseana</i>		45	0.4
<i>Acacia bivenosa</i>		12	4
* <i>Cenchrus ciliaris</i>	Weed	5	0.3
* <i>Prosopis glandulosa x velutina</i>	Weed (WoNS)	2	4
<i>Corymbia hamersleyana</i>		1	5
<i>Acacia pyrifolia</i> var. <i>pyrifolia</i>		1	3
<i>Senna glutinosa</i> subsp. <i>glutinosa</i>		1	1
<i>Solanum ?horridum</i>		0.5	0.3
<i>Corymbia candida</i> subsp. <i>dipsodes</i>		0.1	8
* <i>Vachellia farnesiana</i>	Weed	0.1	1.2
<i>Acacia inaequilatera</i>		0.1	
<i>Acacia sclerosperma</i>		0.1	
<i>Bonamia media</i>		0.1	
<i>Dichrostachys spicata</i>		0.1	
<i>Trichodesma zeylanicum</i> var. <i>grandiflorum</i>		0.1	
<i>Ptilotus obovatus</i>			



Site details			
Site	MSP202a	Position (WGS84)	-21.304698, 116.110814
Slope	gentle	Topography	undulating plain
Soil colour	red-brown,	Soil texture	rocks,
Rock cover (%)	0	Rock type	basalt;
Observation details - visit 2 (15 Aug 2018)			
Sample description	Isolated mid <i>Acacia ancistrocarpa</i> , <i>A. synchronicia</i> and <i>A. pyrifolia</i> var. <i>pyrifolia</i> shrubs over isolated low <i>Corchorus laniflorus</i> , <i>Indigofera monphylla</i> and <i>Senna ferraria</i> shrubs over		

Sample and effort summary				
Sample method	Visit	Sample date	Dimensions	Observer
Quadrat	2	15-Aug-2018	50 m x 50 m	Laurinda Timmins

Species (17)	Status	Cover (%)	Height (m)
<i>Indigofera monophylla</i>			
<i>Acacia bivenosa</i>			
<i>Acacia inaequilatera</i>			
<i>Acacia synchronicia</i>			
<i>Bonamia pilbarensis</i>			
<i>Corchorus laniflorus</i>			
<i>Crotalaria medicaginea</i> var. <i>neglecta</i>			
<i>Acacia ancistrocarpa</i>			
<i>Hibiscus coatesii</i>			
<i>Triumfetta clementii</i>			
<i>Pterocaulon ?sphacelatum</i>			
<i>Senna ferraria</i>			
<i>Senna glutinosa</i> subsp. <i>glutinosa</i>			
<i>Senna glutinosa</i> subsp. <i>pruinosa</i>			
<i>Tephrosia clementii</i>			
<i>Triodia wiseana</i>			
<i>Gomphrena cunninghamii</i>			

Site details			
Site	MSP203	Position (WGS84)	-21.175523, 115.958665
Slope	negligible	Topography	plain
Soil colour	red-brown,	Soil texture	sandy clay, sandy loam,
Rock cover (%)	0	Rock type	none

Observation details - visit 1 (17 Mar 2018)			
Sample description	Tall closed <i>Prosopis glandulosa</i> x <i>velutina</i> shrubland over isolated low <i>Solanum lasiophyllum</i> shrubs over mid open <i>Triodia angusta</i> and * <i>Cenchrus ciliaris</i> grassland.		
Habitat	shrubland		
Disturbance	grazing – low, livestock tracks, weed infestation,		
Vegetation condition	Degraded	Fire age	not evident
Total veg. cover (%)	90	Tree cover (%)	85
Shrub cover (%)	0	Grass cover (%)	10
Herb cover (%)	0		



Sample and effort summary				
Sample method	Visit	Sample date	Dimensions	Observer
Quadrat	1	17-Mar-2018	50 m x 50 m	Grant Wells

Species (6)	Status	Cover (%)	Height (m)
<i>*Prosopis glandulosa x velutina</i>	Weed (WoNS)	90	2.2
<i>Triodia angusta</i>		6	0.6
<i>*Cenchrus ciliaris</i>	Weed	5	0.4
<i>Eucalyptus</i> sp.		0.1	4
<i>Solanum lasiophyllum</i>		0.1	0.3
<i>Ptilotus exaltatus</i>		0.1	0.3

Site details			
Site	MSP206	Position (WGS84)	-21.265117, 115.941254
Slope	gentle	Topography	creek
Soil colour	red-orange,	Soil texture	sandy clay, sandy loam,
Rock cover (%)	0	Rock type	none

Observation details - visit 1 (16 Mar 2018)			
Sample description	Isolated low <i>Eucalyptus victrix</i> trees over tall open <i>Melaleuca lasiandra</i> , <i>Acacia coriacea</i> subsp. <i>coriacea</i> and <i>A. pyrifolia</i> var. <i>pyrifolia</i> shrubland over low open <i>Triodia epactia</i>		
Habitat	shrubland		
Disturbance	evidence of feral animals, grazing – low, livestock tracks, weed infestation,		
Vegetation condition	Good	Fire age	not evident
Total veg. cover (%)	40	Tree cover (%)	22
Shrub cover (%)	20	Grass cover (%)	27
Herb cover (%)	0.1		



Sample and effort summary				
Sample method	Visit	Sample date	Dimensions	Observer
Quadrat	1	16-Mar-2018	50 m x 50 m	Grant Wells

Species (25)	Status	Cover (%)	Height (m)
<i>*Cenchrus ciliaris</i>	Weed	15	0.2
<i>Melaleuca lasiandra</i>		10	2.5
<i>Triodia longiceps</i>		10	0.4
<i>Eucalyptus victrix</i>		5	8
<i>Acacia bivenosa</i>		5	2
<i>Acacia trachycarpa</i>		5	1.5
<i>Acacia ligulata</i>		3	1.8
<i>Acacia coriacea</i> subsp. <i>coriacea</i>		2	4
<i>Acacia synchronicia</i>		2	1
<i>Triodia epactia</i>		2	0.4
<i>Acacia pyrifolia</i> var. <i>pyrifolia</i>		0.1	2.5
<i>Petalostylis labicheoides</i>		0.1	1.5
<i>Acacia atkinsiana</i>		0.1	1.5
<i>*Prosopis glandulosa</i> x <i>velutina</i>	Weed (WoNS)	0.1	1
<i>Senna notabilis</i>		0.1	0.3
<i>Solanum diversiflorum</i>		0.1	0.25
<i>Solanum lasiophyllum</i>		0.1	0.2
<i>Cleome viscosa</i>		0.1	0.2
<i>Sida fibulifera</i>		0.1	0.15
<i>Goodenia muelleriana</i>		0.1	0.15
<i>Hybanthus aurantiacus</i>		0.1	0.1
<i>Goodenia forrestii</i>		0.1	0.1
<i>Bonamia media</i>		0.1	0.05
<i>Ipomoea muelleri</i>		0.1	0.05
<i>Euphorbia australis</i>		0.1	0.01

Site details			
Site	MSP206a	Position (WGS84)	-21.263371, 115.93208
Slope	negligible	Topography	creek
Soil colour	red-brown,	Soil texture	gravel / alluvial, sandy clay, clay loam,
Rock cover (%)	0	Rock type	ferrous – ironstone;
Observation details - visit 2 (18 Aug 2018)			
Sample description	Mid <i>Acacia ampliceps</i> and <i>A. bivenosa</i> shrubland over isolated clumps of low <i>Frankenia ambita</i> shrubs over isolated clumps of low * <i>Cenchrus ciliaris</i> and <i>Eriachne mucronata</i> grasses.		

Sample and effort summary				
Sample method	Visit	Sample date	Dimensions	Observer
Quadrat	2	18-Aug-2018	50 m x 50 m	Laurinda Timmins

Species (6)	Status	Cover (%)	Height (m)
<i>*Cenchrus ciliaris</i>	Weed		
<i>Melaleuca glomerata</i>			
<i>Frankenia ambita</i>			
<i>Eriachne mucronata</i>			
<i>Acacia bivenosa</i>			
<i>Acacia ampliceps</i>			



Site details			
Site	MSP207	Position (WGS84)	-21.168955, 115.956321
Slope	negligible	Topography	plain
Soil colour	red-brown	Soil texture	sandy clay, sandy loam
Rock cover (%)	0	Rock type	ferrous - ironstone

Observation details - visit 1 (17 Mar 2018)			
Sample description	Tall closed <i>Prosopis glandulosa</i> x <i>velutina</i> and * <i>Vachellia farnesiana</i> shrubland over isolated mid <i>Acacia coriacea</i> subsp. <i>?pendens</i> shrubs over low open * <i>Cenchrus ciliaris</i> and <i>Trio</i>		
Habitat	shrubland		
Disturbance	grazing – medium, livestock tracks, weed infestation,		
Vegetation condition	Degraded	Fire age	not evident
Total veg. cover (%)	80	Tree cover (%)	80
Shrub cover (%)	0	Grass cover (%)	20
Herb cover (%)	0		



Sample and effort summary				
Sample method	Visit	Sample date	Dimensions	Observer
Quadrat	1	17-Mar-2018	50 m x 50 m	Grant Wells

Species (5)	Status	Cover (%)	Height (m)
<i>*Prosopis glandulosa x velutina</i>	Weed (WoNS)	75	3.5
<i>*Cenchrus ciliaris</i>	Weed	20	0.4
<i>*Vachellia farnesiana</i>	Weed	5	2.5
<i>Acacia coriacea</i> subsp. <i>?pendens</i>		1	1.5
<i>Triodia longiceps</i>		1	0.4

Site details			
Site	MSP208	Position (WGS84)	-21.1801, 115.956279
Slope	negligible	Topography	plain
Soil colour	brown,	Soil texture	sandy clay, sandy loam,
Rock cover (%)	0	Rock type	none

Observation details - visit 1 (17 Mar 2018)			
Sample description	Tall <i>Acacia sclerosperma</i> , <i>A. bivenosa</i> and * <i>Prosopis glandulosa x velutina</i> shrubland over mid open <i>Stylobasium spathulatum</i> , <i>Carissa lanceolata</i> and <i>Senna glutinosa</i>		
Habitat	shrubland		
Disturbance	grazing – high, livestock tracks, weed infestation,		
Vegetation condition	Poor	Fire age	not evident
Total veg. cover (%)	45	Tree cover (%)	30
Shrub cover (%)	10	Grass cover (%)	15
Herb cover (%)	0		



Sample and effort summary				
Sample method	Visit	Sample date	Dimensions	Observer
Quadrat	1	17-Mar-2018	50 m x 50 m	Grant Wells

Species (19)	Status	Cover (%)	Height (m)
<i>Acacia sclerosperma</i>		20	5
<i>Stylobasium spathulatum</i>		10	1.5
* <i>Cenchrus ciliaris</i>	Weed	10	0.3
<i>Acacia bivenosa</i>		5	4
* <i>Prosopis glandulosa</i> x <i>velutina</i>	Weed (WoNS)	5	3
<i>Triodia wiseana</i>		5	0.4
<i>Acacia coriacea</i> subsp. <i>coriacea</i>		1	2
<i>Carissa lanceolata</i>		1	1.2
<i>Acacia pyrifolia</i> var. <i>pyrifolia</i>		0.5	2
<i>Hakea lorea</i> subsp. <i>lorea</i>		0.1	4
<i>Acacia glaucocaesia</i>	P3 (DBCA list)	0.1	3.5
<i>Acacia ligulata</i>		0.1	2.5
* <i>Vachellia farnesiana</i>	Weed	0.1	2.5
<i>Senna ferraria</i>		0.1	1.2
<i>Senna notabilis</i>		0.1	0.6
<i>Solanum lasiophyllum</i>		0.1	0.25
<i>Senna glutinosa</i> subsp. <i>glutinosa</i>		0.1	0.2
<i>Senna artemisioides</i> subsp. <i>oligophylla</i>		0.1	0.15
<i>Acacia coriacea</i> subsp. <i>pendens</i>			

Site details			
Site	MSP209	Position (WGS84)	-21.184751, 115.949797
Slope	moderate	Topography	creek
Soil colour	brown,	Soil texture	sandy loam,
Rock cover (%)	0	Rock type	none

Observation details - visit 1 (17 Mar 2018)			
Sample description	Mid <i>Melaleuca argentea</i> and <i>Phoenix dactylifera</i> woodland over isolated mid <i>Acacia coriacea</i> and <i>A. ampliceps</i> shrubs over isolated tall <i>Typha domingensis</i> , <i>Schoenoplectus subulatus</i> and <i>Cyper</i>		
Habitat	woodland		
Disturbance	erosion channels, evidence of feral animals, grazing – high, historic clearing, livestock tracks, vehicle tracks, weed infestation,		
Vegetation condition	Degraded	Fire age	not evident
Total veg. cover (%)	15	Tree cover (%)	13
Shrub cover (%)	0	Grass cover (%)	2
Herb cover (%)	0		



Sample and effort summary				
Sample method	Visit	Sample date	Dimensions	Observer
Quadrat	1	17-Mar-2018	50 m x 50 m	Grant Wells

Species (13)	Status	Cover (%)	Height (m)
<i>*Phoenix dactylifera</i>	Weed	9	20
<i>Melaleuca argentea</i>		6	20
<i>Typha domingensis</i>		1	1.5
<i>Acacia coriacea</i>		1	1.4
<i>Schoenoplectus subulatus</i>		1	1.2
<i>Acacia ampliceps</i>		1	1
<i>Acacia bivenosa</i>		1	0.8
<i>Cyperus vaginatus</i>		0.5	1
<i>*Prosopis glandulosa x velutina</i>	Weed (WoNS)	0.1	0.8
<i>Cassya aurea var. aurea</i>		0.1	0.5
<i>Stylobasium spathulatum</i>		0.1	0.4
<i>Acacia synchronicia</i>		0.1	0.4
<i>*Cenchrus ciliaris</i>	Weed	0.1	0.1

Site details			
Site	MSP210	Position (WGS84)	-21.184999, 115.950619
Slope	moderate	Topography	creek
Soil colour	brown,	Soil texture	sandy loam,
Rock cover (%)	0	Rock type	none

Observation details - visit 1 (17 Mar 2018)			
Sample description	Mid <i>Melaleuca argentea</i> and <i>Sesbania formosa</i> woodland over tall open <i>Prosopis glandulosa x velutina</i> shrubland over isolated mid <i>Cyperus vaginatus</i> sedges.		
Habitat	woodland		
Disturbance	erosion channels, evidence of feral animals, grazing – high, livestock tracks, weed infestation,		
Vegetation condition	Poor	Fire age	not evident
Total veg. cover (%)	65	Tree cover (%)	65
Shrub cover (%)	1	Grass cover (%)	2
Herb cover (%)	0		



Sample and effort summary				
Sample method	Visit	Sample date	Dimensions	Observer
Quadrat	1	17-Mar-2018	50 m x 50 m	Grant Wells

Species (8)	Status	Cover (%)	Height (m)
<i>Melaleuca argentea</i>		45	20
* <i>Prosopis glandulosa x velutina</i>	Weed (WoNS)	35	4
<i>Sesbania formosa</i>		20	20
<i>Cyperus vaginatus</i>		2	1.2
<i>Acacia bivenosa</i>		2	0.6
<i>Eucalyptus victrix</i>		0.5	8
<i>Acacia ampliceps</i>		0.1	2.2
<i>Acacia synchronicia</i>		0.1	0.5



Site details			
Site	MSP211Q2	Position (WGS84)	-21.224685, 115.922394
Slope	moderate	Topography	sand dune
Soil colour	red-brown,	Soil texture	sand,
Rock cover (%)	0	Rock type	none

Observation details - visit 1 (17 Mar 2018)			
Sample description	Low <i>Triodia epactia</i> and * <i>Cenchrus ciliaris</i> grassland.		
Habitat	spinifex grassland		
Disturbance	weed infestation,		
Vegetation condition	Very Good	Fire age	not evident
Total veg. cover (%)	40	Tree cover (%)	0
Shrub cover (%)	0	Grass cover (%)	40
Herb cover (%)	0		



Sample and effort summary				
Sample method	Visit	Sample date	Dimensions	Observer
Transect-Quadrat	1	17-Mar-2018	10 m x 10 m	Grant Wells

Species (2)	Status	Cover (%)	Height (m)
<i>Triodia epactia</i>		40	0.4
* <i>Cenchrus ciliaris</i>	Weed	1	0.25

Site details			
Site	MSP211Q3	Position (WGS84)	-21.224648, 115.922371
Slope	gentle	Topography	sand dune
Soil colour	red-brown,	Soil texture	sandy clay, sandy loam,
Rock cover (%)	0	Rock type	none

Observation details - visit 1 (17 Mar 2018)			
Sample description	Low <i>Triodia epactia</i> hummock grassland.		
Habitat	spinifex grassland		
Disturbance	none		
Vegetation condition	Excellent	Fire age	not evident
Total veg. cover (%)	50	Tree cover (%)	0
Shrub cover (%)	0	Grass cover (%)	50
Herb cover (%)	0		



Sample and effort summary				
Sample method	Visit	Sample date	Dimensions	Observer
Transect-Quadrat	1	17-Mar-2018	10 m x 10 m	Grant Wells

Species (1)	Status	Cover (%)	Height (m)
<i>Triodia epactia</i>		50	0.4

Site details			
Site	MSP212	Position (WGS84)	-21.223949, 115.933803
Slope	gentle	Topography	undulating plain
Soil colour	red-brown,	Soil texture	sandy loam,
Rock cover (%)	0	Rock type	ferrous – ironstone

Observation details - visit 1 (17 Mar 2018)			
Sample description	Mid <i>Acacia bivenosa</i> , <i>A. synchronicia</i> and <i>Myoporum montanum</i> shrubland over isolated low <i>Indigofera trita</i> , <i>Acacia ligulata</i> and <i>Solanum lasiophyllum</i> shrubs over mid closed <i>Triodia</i>		
Habitat	shrubland		
Disturbance	none,		
Vegetation condition	Excellent	Fire age	not evident
Total veg. cover (%)	90	Tree cover (%)	0
Shrub cover (%)	35	Grass cover (%)	90
Herb cover (%)	0		



Sample and effort summary				
Sample method	Visit	Sample date	Dimensions	Observer
Quadrat	1	17-Mar-2018	50 m x 50 m	Grant Wells

Species (13)	Status	Cover (%)	Height (m)
<i>Triodia longiceps</i>		90	0.7
<i>Acacia bivenosa</i>		30	1.8
<i>Indigofera trita</i>		2	0.5
<i>Myoporum montanum</i>		1	1.2
<i>Acacia synchronicia</i>		1	1.2
<i>Ehretia saligna</i>		0.5	2.5
<i>Senna glutinosa</i> subsp. <i>glutinosa</i>		0.1	1.6
<i>Senna artemisioides</i> subsp. <i>oligophylla</i>		0.1	1
<i>Acacia ligulata</i>		0.1	1
<i>Solanum lasiophyllum</i>		0.1	0.45
<i>Sida fibulifera</i>		0.1	0.3
<i>Rhynchosia minima</i>		0.1	0.2
<i>Stemodia kingii</i>		0.1	0.15

Site details			
Site	MSP213	Position (WGS84)	-21.214296, 115.937241
Slope	gentle	Topography	undulating plain
Soil colour	red-brown,	Soil texture	sandy clay, sandy loam,
Rock cover (%)	0	Rock type	none

Observation details - visit 1 (17 Mar 2018)			
Sample description	Mid <i>Acacia bivenosa</i> , <i>Myoporum montanum</i> and <i>Prosopis glandulosa</i> x <i>velutina</i> shrubland over isolated low <i>Eremophila forrestii</i> subsp. <i>forrestii</i> , <i>Euphorbia tannensis</i> and <i>Car</i>		
Habitat	shrubland		
Disturbance	weed infestation,		
Vegetation condition	Very Good	Fire age	moderate (>5 years)
Total veg. cover (%)	90	Tree cover (%)	0
Shrub cover (%)	30	Grass cover (%)	90
Herb cover (%)	0		



Sample and effort summary				
Sample method	Visit	Sample date	Dimensions	Observer
Quadrat	1	17-Mar-2018	50 m x 50 m	Grant Wells

Species (10)	Status	Cover (%)	Height (m)
<i>Triodia longiceps</i>		90	0.6
<i>Acacia bivenosa</i>		28	1.6
<i>Myoporum montanum</i>		2	1.3
<i>Eremophila forrestii</i> subsp. <i>forrestii</i>		0.5	0.5
<i>Euphorbia tannensis</i> subsp. <i>eremophila</i>		0.5	0.4
* <i>Prosopis glandulosa</i> x <i>velutina</i>	Weed (WoNS)	0.1	2.2
<i>Capparis lasiantha</i>		0.1	1.2
<i>Carissa lanceolata</i>		0.1	1
<i>Indigofera trita</i>		0.1	0.5
<i>Solanum lasiophyllum</i>		0.1	0.4



Site details			
Site	MSP214	Position (WGS84)	-21.321015, 115.810802
Slope	gentle	Topography	undulating plain
Soil colour	red-orange,	Soil texture	sandy clay,
Rock cover (%)	0	Rock type	ferrous – ironstone

Observation details - visit 1 (18 Mar 2018)			
Sample description	Isolated clumps of mid * <i>Prosopis glandulosa</i> x <i>velutina</i> shrubs over isolated low <i>Atriplex ?codonocarpa</i> , <i>Sclerolaena bicornis</i> and <i>Sesbania cannabina</i> shrubs over mid <i>Triodia longiceps</i> and		
Habitat	spinifex grassland		
Disturbance	livestock tracks, weed infestation,		
Vegetation condition	Very Good	Fire age	moderate (>5 years)
Total veg. cover (%)	50	Tree cover (%)	0
Shrub cover (%)	1	Grass cover (%)	50
Herb cover (%)	0		



Sample and effort summary				
Sample method	Visit	Sample date	Dimensions	Observer
Quadrat	1	18-Mar-2018	50 m x 50 m	Grant Wells

Species (12)	Status	Cover (%)	Height (m)
<i>Triodia longiceps</i>		50	0.9
* <i>Prosopis glandulosa x velutina</i>	Weed (WoNS)	0.5	1.5
<i>Sclerolaena bicornis</i>		0.5	0.4
<i>Eragrostis xerophila</i>		0.5	0.1
<i>Atriplex ?codonocarpa</i>		0.5	0.05
* <i>Cenchrus ciliaris</i>	Weed	0.1	0.5
<i>Commelina ensifolia</i>		0.1	0.4
<i>Sesbania cannabina</i>		0.1	0.15
<i>Enchylaena tomentosa</i>		0.1	0.15
<i>Triodia epactia</i>		0.1	0.1
<i>Dactyloctenium radulans</i>		0.1	0.1
<i>Ptilotus murrayi</i>		0.1	0.02

Site details			
Site	MSP215	Position (WGS84)	-21.307191, 115.823007
Slope	gentle	Topography	creek
Soil colour	red-brown,	Soil texture	sand,
Rock cover (%)	0	Rock type	ferrous – ironstone

Observation details - visit 1 (18 Mar 2018)			
Sample description	Low <i>Eucalyptus victrix</i> woodland over tall <i>Acacia ampliceps</i> , <i>Acacia coriacea</i> subsp. <i>pendens</i> and * <i>Prosopis glandulosa</i> x <i>velutina</i> shrubland over low open * <i>Cenchrus ciliaris</i> , <i>Triodia long</i>		
Habitat	woodland		
Disturbance	grazing – medium, livestock tracks, weed infestation,		
Vegetation condition	Poor	Fire age	not evident
Total veg. cover (%)	60	Tree cover (%)	50
Shrub cover (%)	2	Grass cover (%)	15
Herb cover (%)	1		



Sample and effort summary				
Sample method	Visit	Sample date	Dimensions	Observer
Quadrat	1	18-Mar-2018	50 m x 50 m	Grant Wells

Species (27)	Status	Cover (%)	Height (m)
<i>Eucalyptus victrix</i>		15	6
* <i>Prosopis glandulosa</i> x <i>velutina</i>	Weed (WoNS)	15	4
* <i>Cenchrus ciliaris</i>	Weed	13	0.3
<i>Acacia ampliceps</i>		10	4
<i>Acacia coriacea</i> subsp. <i>pendens</i>		5	5
<i>Triodia wiseana</i>		3	0.4
<i>Sesbania cannabina</i>		1	1.2
<i>Triodia longiceps</i>		1	1.2
<i>Stemodia grossa</i>		1	0.4
<i>Trianthema turgidifolium</i>		0.5	0.3
<i>Acacia synchronicia</i>		0.1	2
<i>Acacia ampliceps</i> x <i>bivenosa</i>		0.1	2
taxonid= -290094		0.1	0.6
<i>Pluchea rubelliflora</i>		0.1	0.25
<i>Trianthema cusackianum</i>		0.1	0.15
<i>Enchylaena tomentosa</i>		0.1	0.15
<i>Eragrostis leptocarpa</i>		0.1	0.15
<i>Goodenia forrestii</i>		0.1	0.1
<i>Indigofera linifolia</i>		0.1	0.1
<i>Ipomoea muelleri</i>		0.1	0.1
<i>Phyllanthus maderaspatensis</i>		0.1	0.1
<i>Trianthema triquetrum</i>		0.1	0.1
<i>Striga curviflora</i>		0.1	0.08
<i>Portulaca oleracea</i>		0.1	0.05
<i>Lotus australis</i>		0.1	0.05
<i>Corchorus tridens</i>		0.1	0.03
<i>Ipomoea optica</i>		0.1	0.02

Site details			
Site	MSP216	Position (WGS84)	-21.300177, 115.833721
Slope	negligible	Topography	plain
Soil colour	red-orange,	Soil texture	sandy clay,
Rock cover (%)	0	Rock type	ferrous – ironstone

Observation details - visit 1 (18 Mar 2018)			
Sample description	Isolated clumps of mid * <i>Prosopis glandulosa</i> x <i>velutina</i> shrubs over isolated low <i>Trianthema turgidifolia</i> , <i>Acacia synchronicia</i> and <i>Atriplex vesicaria</i> shrubs over low <i>Triodia longiceps</i>		
Habitat	spinifex grassland		
Disturbance	livestock tracks, weed infestation,		
Vegetation condition	Very Good	Fire age	relatively recent (1-5 years)
Total veg. cover (%)	40	Tree cover (%)	0
Shrub cover (%)	2	Grass cover (%)	40
Herb cover (%)	0		



Sample and effort summary				
Sample method	Visit	Sample date	Dimensions	Observer
Quadrat	1	18-Mar-2018	50 m x 50 m	Grant Wells

Species (24)	Status	Cover (%)	Height (m)
<i>Triodia longiceps</i>		40	0.4
<i>Acacia synchronicia</i>		1	0.4
<i>Trianthema turgidifolium</i>		1	0.3
<i>Angianthus acrohyalinus</i>		0.5	0.1
* <i>Prosopis glandulosa</i> x <i>velutina</i>	Weed (WoNS)	0.1	1.4
<i>Atriplex bunburyana</i>		0.1	0.4
<i>Atriplex codonocarpa</i>		0.1	0.3
<i>Enchylaena tomentosa</i>		0.1	0.3
<i>Maireana tomentosa</i>		0.1	0.25
<i>Pluchea rubelliflora</i>		0.1	0.2
<i>Sclerolaena diacantha</i>		0.1	0.2
* <i>Cenchrus ciliaris</i>	Weed	0.1	0.15
<i>Gomphrena ?canescens</i>		0.1	0.1
<i>Dactyloctenium radulans</i>		0.1	0.1
<i>Swainsona kingii</i>		0.1	0.1
<i>Sporobolus australasicus</i>		0.1	0.1
<i>Dysphania rhadinostachya</i> subsp. <i>rhadinostachya</i>		0.1	0.05
<i>Neptunia dimorphantha</i>		0.1	0.05
<i>Ptilotus murrayi</i>		0.1	0.05
<i>Streptoglossa liatroides</i>		0.1	0.05
<i>Streptoglossa ?bubakii</i>		0.1	0.05
<i>Swainsona</i>		0.1	0.05
<i>Trianthema triquetrum</i>		0.1	0.05
<i>Ptilotus aervoides</i>		0.1	0.02

Site details			
Site	MSP217	Position (WGS84)	-21.303961, 115.842695
Slope	negligible	Topography	plain
Soil colour	red-orange,	Soil texture	sandy clay,
Rock cover (%)	0	Rock type	ferrous – ironstone

Observation details - visit 1 (18 Mar 2018)			
Sample description	Isolated tall <i>Acacia synchronicia</i> and * <i>Prosopis glandulosa</i> x <i>velutina</i> shrubs over isolated mid <i>Acacia ampliceps</i> and <i>A. ligulata</i> shrubs over mid <i>Triodia longiceps</i> hummock grassland.		
Habitat	spinifex grassland		
Disturbance	weed infestation,		
Vegetation condition	Very Good	Fire age	moderate (>5 years)
Total veg. cover (%)	50	Tree cover (%)	5
Shrub cover (%)	2	Grass cover (%)	50
Herb cover (%)	0		



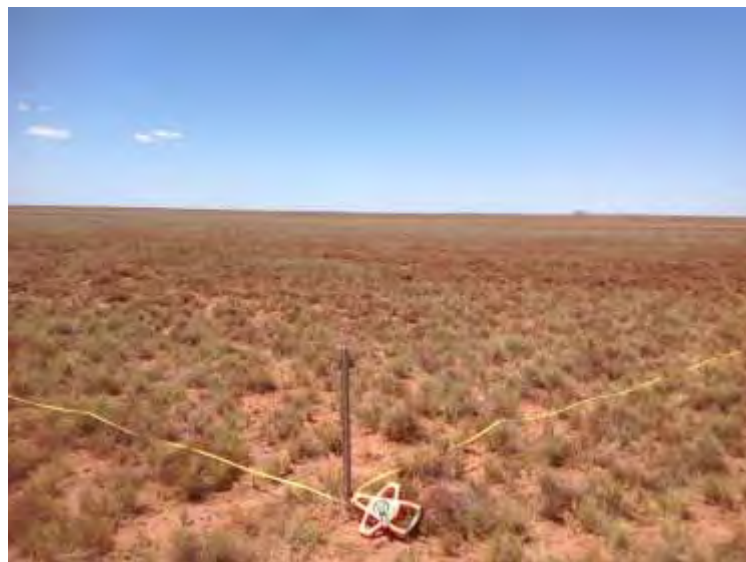
Sample and effort summary				
Sample method	Visit	Sample date	Dimensions	Observer
Quadrat	1	18-Mar-2018	50 m x 50 m	Grant Wells

Species (15)	Status	Cover (%)	Height (m)
<i>Triodia longiceps</i>		50	0.8
<i>Acacia synchronicia</i>		4	3
* <i>Prosopis glandulosa</i> x <i>velutina</i>	Weed (WoNS)	1	2.5
<i>Acacia ampliceps</i>		1	1.5
<i>Atriplex codonocarpa</i>		1	0.3
<i>Sclerolaena densiflora</i>		1	0.2
<i>Chrysopogon fallax</i>		0.5	1
<i>Sclerolaena diacantha</i>		0.5	0.15
<i>Acacia ligulata</i>		0.1	2
<i>Pterocaulon ?sphacelatum</i>		0.1	0.5
<i>Maireana tomentosa</i>		0.1	0.25
<i>Commelina ensifolia</i>		0.1	0.15
<i>Ptilotus murrayi</i>		0.1	0.05
<i>Dactyloctenium radulans</i>		0.1	0.05
<i>Sporobolus australasicus</i>			



Site details			
Site	MSP218	Position (WGS84)	-21.297586, 115.847971
Slope	negligible	Topography	plain
Soil colour	red-brown,	Soil texture	clay loam,
Rock cover (%)	0	Rock type	ferrous – ironstone

Observation details - visit 1 (18 Mar 2018)			
Sample description	Low <i>Tecticornia halocnemoides</i> subsp. <i>tenuis</i> , <i>T. halocnemoides</i> 'ovate seed aggregate' and <i>Trianthema turgidifolium</i> shrubland over low open <i>Sporobolus virginicus</i> grassland over isolated clumps of lo		
Habitat	chenopod shrubland		
Disturbance	grazing – low, livestock tracks,		
Vegetation condition	Excellent	Fire age	not evident
Total veg. cover (%)	60	Tree cover (%)	0
Shrub cover (%)	35	Grass cover (%)	25
Herb cover (%)	1		



Sample and effort summary				
Sample method	Visit	Sample date	Dimensions	Observer
Quadrat	1	18-Mar-2018	50 m x 50 m	Grant Wells

Species (14)	Status	Cover (%)	Height (m)
<i>Tecticornia halocnemoides</i> subsp. <i>tenuis</i>		35	0.2
<i>Sporobolus virginicus</i>		25	0.15
<i>Pterocaulon sphacelatum</i>		0.1	0.4
* <i>Vachellia farnesiana</i>	Weed	0.1	0.3
<i>Streptoglossa ?adscendens</i>		0.1	0.3
<i>Trianthema turgidifolium</i>		0.1	0.2
<i>Trianthema cusackianum</i>		0.1	0.2
<i>Pluchea rubelliflora</i>		0.1	0.2
<i>Neobassia astrocarpa</i>		0.1	0.2
<i>Tecticornia halocnemoides</i> 'ovate seed aggregate'		0.1	0.15
<i>Streptoglossa bubakii</i>		0.1	0.15
<i>Muellerolimon salicorniaceum</i>		0.1	0.15
<i>Frankenia ambita</i>		0.1	0.15
<i>Surreya diandra</i>		0.1	0.1

Site details			
Site	MSP219	Position (WGS84)	-21.306361, 115.862956
Slope	negligible	Topography	plain
Soil colour	red-brown,	Soil texture	clay loam,
Rock cover (%)	0	Rock type	ferrous – ironstone

Observation details - visit 1 (18 Mar 2018)			
Sample description	Isolated mid * <i>Prosopis glandulos</i> x <i>velutina</i> shrubs over isolated low <i>Acacia synchronica</i> , <i>Trianthema turgidifolia</i> and <i>Senna notabilis</i> shrubs over low open <i>Triodia longiceps</i>		
Habitat	spinifex grassland		
Disturbance	grazing – low, livestock tracks, weed infestation,		
Vegetation condition	Very Good	Fire age	relatively recent (1-5 years)
Total veg. cover (%)	20	Tree cover (%)	0
Shrub cover (%)	1	Grass cover (%)	19
Herb cover (%)	0		



Sample and effort summary				
Sample method	Visit	Sample date	Dimensions	Observer
Quadrat	1	18-Mar-2018	50 m x 50 m	Grant Wells

Species (19)	Status	Cover (%)	Height (m)
<i>Triodia longiceps</i>		19	0.25
* <i>Prosopis glandulosa</i> x <i>velutina</i>	Weed (WoNS)	1	1.5
<i>Trianthema turgidifolium</i>		1	0.25
<i>Xerachloa laniflora</i>		1	0.05
<i>Ptilotus exaltatus</i>		0.5	0.15
<i>Dactyloctenium radulans</i>		0.5	0.05
<i>Dichanthium sericeum</i> subsp. <i>humilius</i>		0.5	0.05
<i>Ptilotus aervoides</i>		0.5	0.05
<i>Sporobolus australasicus</i>		0.5	0.05
<i>Acacia synchronicia</i>		0.1	0.5
<i>Pterocaulon sphacelatum</i>		0.1	0.3
<i>Senna notabilis</i>		0.1	0.15
* <i>Cenchrus ciliaris</i>	Weed	0.1	0.15
<i>Streptoglossa odora</i>		0.1	0.08
<i>Neptunia dimorphantha</i>		0.1	0.05
<i>Dysphania rhadinostachya</i> subsp. <i>rhadinostachya</i>		0.1	0.05
<i>Atriplex ?codonocarpa</i>		0.1	0.05
<i>Angianthus acrohyalinus</i>		0.1	0.05
<i>Rhagodia eremaea</i>			

Site details			
Site	MSP220	Position (WGS84)	-21.313189, 115.873977
Slope	negligible	Topography	plain
Soil colour	red-orange,	Soil texture	clay loam,
Rock cover (%)	0	Rock type	none

Observation details - visit 1 (18 Mar 2018)			
Sample description	Isolated mid * <i>Prosopis glandulosa</i> x <i>velutina</i> shrubs over low <i>Eragrostis xerophila</i> , <i>Dactyloctenium radulans</i> and <i>Triodia longiceps</i> grassland over isolated low <i>Rhodanthe humboldtiana</i>		
Habitat	grassland		
Disturbance	grazing – medium, livestock tracks, vehicle tracks, weed infestation,		
Vegetation condition	Very Good	Fire age	not evident
Total veg. cover (%)	60	Tree cover (%)	0
Shrub cover (%)	0	Grass cover (%)	60
Herb cover (%)	0		



Sample and effort summary				
Sample method	Visit	Sample date	Dimensions	Observer
Quadrat	1	18-Mar-2018	50 m x 50 m	Grant Wells

Species (14)	Status	Cover (%)	Height (m)
<i>Eragrostis xerophila</i>		60	0.25
* <i>Prosopis glandulosa</i> x <i>velutina</i>	Weed (WoNS)	1	1.5
<i>Triodia longiceps</i>		1	0.3
<i>Rhodanthe humboldtiana</i>		0.5	0.1
<i>Acacia synchronicia</i>		0.1	0.2
<i>Eriachne helmsii</i>		0.1	0.15
<i>Sclerolaena bicornis</i>		0	0.15
<i>Indigofera linifolia</i>		0	0.15
<i>Streptoglossa ?odora</i>		0	0.1
<i>Ptilotus gomphrenoides</i>		0	0.1
<i>Heliotropium inexplicitum</i>		0	0.1
<i>Angianthus acrohyalinus</i>		0	0.1
<i>Streptoglossa liatroides</i>		0	0.05
<i>Dactyloctenium radulans</i>		0	0.05

Site details			
Site	MSP221	Position (WGS84)	-21.23371, 115.947714
Slope	negligible	Topography	plain
Soil colour	red-orange,	Soil texture	clay loam,
Rock cover (%)	0	Rock type	ferrous – ironstone

Observation details - visit 1 (18 Mar 2018)			
Sample description	Tall open <i>Acacia bivenosa</i> , <i>A. xiphophylla</i> and <i>Prosopis glandulosa</i> x <i>velutinashrubland</i> over isolated low <i>Indigofera trita</i> , <i>Scaevola spinescens</i> and <i>Eremophila forrestii</i> subsp. <i>fo</i>		
Habitat	shrubland		
Disturbance	weed infestation,		
Vegetation condition	Very Good	Fire age	moderate (>5 years)
Total veg. cover (%)	90	Tree cover (%)	15
Shrub cover (%)	1	Grass cover (%)	90
Herb cover (%)	0		



Sample and effort summary				
Sample method	Visit	Sample date	Dimensions	Observer
Quadrat	1	18-Mar-2018	50 m x 50 m	Grant Wells

Species (19)	Status	Cover (%)	Height (m)
<i>Triodia longiceps</i>		80	0.6
<i>Acacia bivenosa</i>		13	2.2
<i>Triodia wiseana</i>		10	0.6
<i>Acacia xiphophylla</i>		2	2.5
* <i>Prosopis glandulosa</i> x <i>velutina</i>	Weed (WoNS)	1	1.3
<i>Eremophila forrestii</i> subsp. <i>forrestii</i>		1	0.6
<i>Scaevola spinescens</i>		1	0.5
<i>Indigofera trita</i>		1	0.5
<i>Solanum lasiophyllum</i>		0.5	0.4
* <i>Vachellia farnesiana</i>	Weed	0.1	1.5
<i>Senna</i>		0.1	0.6
<i>Eremophila forrestii</i> subsp. <i>forrestii</i>		0.1	0.6
<i>Hibiscus sturtii</i>		0.1	0.3
<i>Goodenia forrestii</i>		0.1	0.3
<i>Solanum cleistogamum</i>		0.1	0.3
<i>Cucumis variabilis</i>		0.1	0.3
<i>Rhynchosia minima</i>		0.1	0.2
<i>Sclerolaena costata</i>		0.1	0.1
<i>Bonamia pilbarensis</i>		0	0.05



Site details			
Site	MSP222Q1	Position (WGS84)	-21.298459, 115.793589
Slope	negligible	Topography	tidal creek
Soil colour	brown,	Soil texture	sandy clay, sandy loam,
Rock cover (%)	0	Rock type	alluvial

Observation details - visit 1 (20 Mar 2018)			
Sample description	Low <i>Surreya diandra</i> , <i>Tecticornia halocnemoides</i> subsp. <i>tenuis</i> and <i>Tecticornia indica</i> subsp. <i>leiostachya</i> shrubland.		
Habitat	shrubland		
Disturbance	none,		
Vegetation condition	Excellent	Fire age	not evident
Total veg. cover (%)	40	Tree cover (%)	0
Shrub cover (%)	40	Grass cover (%)	0
Herb cover (%)	0		



Sample and effort summary				
Sample method	Visit	Sample date	Dimensions	Observer
Transect-Quadrat	1	20-Mar-2018	3 m x 3 m	Alice Watt

Species (3)	Status	Cover (%)	Height (m)
<i>Tecticornia halocnemoides</i> subsp. <i>tenuis</i>		27	0.4
<i>Surreya diandra</i>		10	0.2
<i>Tecticornia indica</i> subsp. <i>leiostachya</i>		1	0.2

Site details			
Site	MSP222Q2	Position (WGS84)	-21.298375, 115.7933
Slope	negligible	Topography	tidal mudflat
Soil colour	brown,	Soil texture	sandy clay, sandy loam,
Rock cover (%)	0	Rock type	alluvial

Observation details - visit 1 (20 Mar 2018)			
Sample description	Low open <i>Tecticornia halocnemoides</i> subsp. <i>tenuis</i> and <i>T. indica</i> subsp. <i>leiostachya</i> chenopod shrubland.		
Habitat	shrubland		
Disturbance	none,		
Vegetation condition	Excellent	Fire age	not evident
Total veg. cover (%)	20	Tree cover (%)	0
Shrub cover (%)	20	Grass cover (%)	0
Herb cover (%)	0		



Sample and effort summary				
Sample method	Visit	Sample date	Dimensions	Observer
Transect-Quadrat	1	20-Mar-2018	3 m x 3 m	Alice Watt

Species (2)	Status	Cover (%)	Height (m)
<i>Tecticornia halocnemoides</i> subsp. <i>tenuis</i>		25	0.3
<i>Tecticornia indica</i> subsp. <i>leiostachya</i>		0.1	0.1

Site details			
Site	MSP222Q3	Position (WGS84)	-21.298324, 115.793112
Slope	negligible	Topography	tidal mudflat
Soil colour	brown,	Soil texture	sandy clay, sandy loam,
Rock cover (%)	0	Rock type	alluvial

Observation details - visit 1 (20 Mar 2018)			
Sample description	Low open <i>Tecticornia halocnemoides</i> subsp. <i>tenuis</i> , <i>Trianthema turgidifolia</i> and <i>Frankenia ambita</i> shrubland.		
Habitat	shrubland		
Disturbance	none,		
Vegetation condition	Excellent	Fire age	not evident
Total veg. cover (%)	15	Tree cover (%)	0
Shrub cover (%)	15	Grass cover (%)	0
Herb cover (%)	0		



Sample and effort summary				
Sample method	Visit	Sample date	Dimensions	Observer
Transect-Quadrat	1	20-Mar-2018	3 m x 3 m	Alice Watt

Species (3)	Status	Cover (%)	Height (m)
<i>Tecticornia halocnemoides</i> subsp. <i>tenuis</i>		12	0.3
<i>Trianthema turgidifolium</i>		2	0.2
<i>Frankenia ambita</i>		2	0.2

Site details			
Site	MSP222Q4	Position (WGS84)	-21.29817, 115.792778
Slope	negligible	Topography	sand dune
Soil colour	brown,	Soil texture	sandy clay,
Rock cover (%)	0	Rock type	alluvial

Observation details - visit 1 (20 Mar 2018)			
Sample description	Isolated low <i>Frankenia ambita</i> , <i>Neobassia astrocarpa</i> and <i>Tecticornia halocnemoides</i> subsp. <i>tenuis</i> shrubs over low <i>Triodia epactia</i> hummock grassland.		
Habitat	spinifex grassland		
Disturbance	none,		
Vegetation condition	Excellent	Fire age	not evident
Total veg. cover (%)	40	Tree cover (%)	0
Shrub cover (%)	5	Grass cover (%)	35
Herb cover (%)	0		



Sample and effort summary				
Sample method	Visit	Sample date	Dimensions	Observer
Transect-Quadrat	1	20-Mar-2018	3 m x 3 m	Alice Watt

Species (4)	Status	Cover (%)	Height (m)
<i>Triodia epactia</i>		35	0.5
<i>Tecticornia halocnemoides</i> subsp. <i>tenuis</i>		3	0.2
<i>Neobassia astrocarpa</i>		1	0.3
<i>Frankenia ambita</i>		1	0.2



Site details			
Site	MSP224	Position (WGS84)	-21.319796, 115.80624
Slope	negligible	Topography	creek
Soil colour	red-brown,	Soil texture	clay loam,
Rock cover (%)	0	Rock type	ferrous – ironstone;
Observation details - visit 2 (16 Aug 2018)			
Sample description	Low <i>Eucalyptus victrix</i> woodland over tall open <i>Acacia coriacea</i> subsp. <i>pendens</i> shrubland over low <i>Eragrostis brownii</i> , <i>Eulalia aurea</i> and <i>Triodia wiseana</i> grassland.		

Sample and effort summary				
Sample method	Visit	Sample date	Dimensions	Observer
Quadrat	2	16-Aug-2018	50 m x 50 m	Laurinda Timmins

Species (27)	Status	Cover (%)	Height (m)
<i>Hybanthus aurantiacus</i>			
<i>Acacia coriacea</i> subsp. <i>pendens</i>			
<i>Acacia synchronicia</i>			
<i>Acacia tetragonophylla</i>			
<i>Alternanthera nodiflora</i>			
<i>Centipeda minima</i> subsp. <i>macrocephala</i>			
<i>Commelina ensifolia</i>			
<i>Diplachne fusca</i> subsp. <i>fusca</i>			
<i>Eragrostis tenellula</i>			
<i>Eriachne benthamii</i>			
<i>Eucalyptus victrix</i>			
<i>Eulalia aurea</i>			
<i>Acacia bivenosa</i>			
<i>Goodenia nuda</i>	P4 (DBCA list)		
* <i>Prosopis glandulosa</i> x <i>velutina</i>	Weed (WoNS)		
<i>Maireana tomentosa</i> subsp. <i>tomentosa</i>			
<i>Marsilea hirsuta</i>			
<i>Pluchea rubelliflora</i>			
<i>Pterocaulon</i> ? <i>sphacelatum</i>			
<i>Ptilotus murrayi</i>			
<i>Sida</i> ? <i>arenicola</i>			
<i>Solanum cleistogamum</i>			
<i>Solanum lasiophyllum</i>			
<i>Trianthema turgidifolium</i>			
<i>Triodia wiseana</i>			
* <i>Cenchrus ciliaris</i>	Weed		
<i>Evolvulus alsinoides</i> var. <i>villosicalyx</i>			

Site details			
Site	MSP225	Position (WGS84)	-21.302819, 115.856384
Slope	negligible	Topography	plain
Soil colour	red-brown,	Soil texture	clay,
Rock cover (%)	0	Rock type	none
Observation details - visit 2 (16 Aug 2018)			
Sample description	Isolated mid <i>Acacia ampliceps</i> and <i>Prosopis glandulosa</i> x <i>velutina</i> shrubs over low <i>Trianthema turgidifloium</i> , <i>Frankenia ambita</i> and <i>Neobassia astrocarpa</i> shrubland over isolated low <i>Sporobolus</i>		

Sample and effort summary				
Sample method	Visit	Sample date	Dimensions	Observer
Quadrat	2	16-Aug-2018	50 m x 50 m	Laurinda Timmins

Species (11)	Status	Cover (%)	Height (m)
<i>*Prosopis glandulosa x velutina</i>	Weed (WoNS)		
<i>Triodia longiceps</i>			
<i>Trianthema turgidifolium</i>			
<i>Trianthema cusackianum</i>			
<i>Sporobolus virginicus</i>			
<i>Pluchea rubelliflora</i>			
<i>Neobassia astrocarpa</i>			
<i>Frankenia ambita</i>			
<i>Dissocarpus paradoxus</i>			
<i>Atriplex ?bunburyana</i>			
<i>Acacia ampliceps</i>			

Site details			
Site	MSP226	Position (WGS84)	-21.30326, 115.915629
Slope	negligible	Topography	creek
Soil colour	red-brown,	Soil texture	gravel / alluvial, clay loam, clay,
Rock cover (%)	0	Rock type	ferrous – ironstone;
Observation details - visit 2 (17 Aug 2018)			
Sample description	Tall open <i>Acacia citrinoviridis</i> , <i>A. coriacea</i> subsp. <i>pendens</i> and <i>Erythrina vespertilio</i> shrubland over sparse mid <i>Acacia xiphophylla</i> shrubland over low open * <i>Cenchrus ciliaris</i> ,		

Sample and effort summary				
Sample method	Visit	Sample date	Dimensions	Observer
Quadrat	2	17-Aug-2018	50 m x 50 m	Laurinda Timmins

Species (46)	Status	Cover (%)	Height (m)
<i>Bonamia pilbarensis</i>			
<i>Abutilon lepidum</i>			
<i>Euphorbia biconvexa</i>			
<i>Eulalia aurea</i>			
<i>Erythrina vespertilio</i>			
<i>Eriachne helmsii</i>			
<i>Eremophila forrestii</i> subsp. <i>forrestii</i>			
<i>Ehretia saligna</i>			
<i>Dysphania rhadinostachya</i> subsp. <i>rhadinostachya</i>			
<i>Duperreya commixta</i>			
<i>Goodenia muelleriana</i>			
<i>Corymbia candida</i> subsp. <i>dipsodes</i>			
<i>Indigofera boviparda</i> subsp. <i>boviparda</i>			
<i>Bonamia erecta</i>			
<i>Alternanthera nana</i>			
<i>Acacia xiphophylla</i>			
<i>Acacia tumida</i> var. <i>pilbarensis</i>			
<i>Acacia tetragonophylla</i>			
<i>Acacia sclerosperma</i>			
<i>Acacia inaequilatera</i>			
<i>Acacia coriacea</i> subsp. <i>pendens</i>			
<i>Acacia citrinoviridis</i>			
<i>Cucumis melo</i>			
<i>Solanum diversiflorum</i>			
* <i>Cenchrus ciliaris</i>	Weed		
<i>Waltheria indica</i>			
<i>Triumfetta appendiculata</i>			
<i>Triodia epactia</i>			
<i>Trichodesma zeylanicum</i> var. <i>grandiflorum</i>			
<i>Synaptantha tillaeacea</i> var. <i>tillaeacea</i>			
<i>Striga squamigera</i>			
<i>Streptoglossa ?bubakii</i>			
<i>Sporobolus virginicus</i>			
<i>Gomphrena canescens</i>			
<i>Solanum horridum</i>			
* <i>Malvastrum americanum</i>	Weed		
<i>Sesbania cannabina</i>			
<i>Senna notabilis</i>			
<i>Senna glutinosa</i> subsp. <i>glutinosa</i>			

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*Scaevola spinescens*

*Rhynchosia minima*

*Pterocaulon sphacelatum*

*Phyllanthus maderaspatensis*

*Operculina aequisejala*

*Ipomoea muelleri*

*Solanum lasiophyllum*

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Site details			
Site	MSP228	Position (WGS84)	-21.214807, 115.936144
Slope	gentle	Topography	drainage line
Soil colour	red-brown,	Soil texture	gravel / alluvial, clay loam, clay,
Rock cover (%)	0	Rock type	quartz;
Observation details - visit 2 (18 Aug 2018)			
Sample description	Tall <i>Acacia sclerosperma</i> shrubland over mid open <i>Acacia bivenosa</i> , <i>A. ligulata</i> and <i>Senna glutinosa</i> subsp. <i>glutinosa</i> shrubland over low open * <i>Cenchrus ciliaris</i> , <i>Sporobolus virginicus</i> and		

Sample and effort summary				
Sample method	Visit	Sample date	Dimensions	Observer
Quadrat	2	18-Aug-2018	50 m x 50 m	Laurinda Timmins



Species (19)	Status	Cover (%)	Height (m)
<i>Sporobolus virginicus</i>			
<i>Acacia ligulata</i>			
<i>Acacia sclerosperma</i>			
<i>Capparis spinosa</i>			
<i>Frankenia ambita</i>			
<i>Myoporum montanum</i>			
<i>Ptilotus exaltatus</i>			
<i>Scaevola spinescens</i>			
<i>Acacia bivenosa</i>			
<i>Solanum lasiophyllum</i>			
* <i>Vachellia farnesiana</i>	Weed		
<i>Tecticornia halocnemoides</i> subsp. <i>tenuis</i>			
<i>Tecticornia indica</i> subsp. <i>leiostachya</i>			
<i>Tecticornia</i> sp. sterile 4			
<i>Tecticornia</i>			
<i>Triodia longiceps</i>			
* <i>Cenchrus ciliaris</i>	Weed		
* <i>Prosopis glandulosa</i> x <i>velutina</i>	Weed (WoNS)		
<i>Senna glutinosa</i> subsp. <i>glutinosa</i>			

Site details			
Site	MSP230	Position (WGS84)	-21.292601, 115.908046
Slope	negligible	Topography	drainage line
Soil colour	red-brown,	Soil texture	gravel / alluvial, sandy clay, loam, clay loam, clay,
Rock cover (%)	0	Rock type	ferrous – ironstone;
Observation details - visit 2 (18 Aug 2018)			
Sample description	Low open <i>Eucalyptus victrix</i> woodland over mid open <i>Acacia coriacea</i> subsp. <i>pendens</i> , <i>A bivenosa</i> and <i>Ehretia saligna</i> over sparse low <i>Triodia epactia</i> and * <i>Cenchrus ciliaris</i>		

Sample and effort summary				
Sample method	Visit	Sample date	Dimensions	Observer
Quadrat	2	18-Aug-2018	50 m x 50 m	Laurinda Timmins

Species (26)	Status	Cover (%)	Height (m)
<i>Indigofera trita</i>			
<i>Acacia ampliceps</i> x <i>bivenosa</i>			
<i>Acacia ampliceps</i>			
<i>Acacia bivenosa</i>			
<i>Acacia coriacea</i> subsp. <i>pendens</i>			
<i>Acacia inaequilatera</i>			
<i>Alternanthera nodiflora</i>			
<i>Centipeda minima</i> subsp. <i>macrocephala</i>			
<i>Ehretia saligna</i>			
<i>Eragrostis tenellula</i>			
<i>Eucalyptus victrix</i>			
<i>Abutilon</i>			
<i>Indigofera boviparda</i> subsp. <i>boviparda</i>			
* <i>Prosopis glandulosa</i> x <i>velutina</i>	Weed (WoNS)		
<i>Isotropis atropurpurea</i>			
<i>Phyllanthus maderaspatensis</i>			
<i>Pterocaulon sphacelatum</i>			
<i>Scaevola spinescens</i>			
<i>Senna notabilis</i>			
<i>Sesbania cannabina</i>			
<i>Solanum lasiophyllum</i>			
<i>Stemodia grossa</i>			
<i>Trichodesma zeylanicum</i> var. <i>grandiflorum</i>			
<i>Triodia epactia</i>			
* <i>Cenchrus ciliaris</i>	Weed		
<i>Hybanthus aurantiacus</i>			

Site details			
Site	MSP230a	Position (WGS84)	-21.294396, 115.908633
Slope	negligible	Topography	undulating plain
Soil colour	red-brown,	Soil texture	gravel / alluvial, sandy clay, clay loam, clay,
Rock cover (%)	0	Rock type	ferrous – ironstone;
Observation details - visit 2 (18 Aug 2018)			
Sample description	Mid shrubland of <i>Acacia bivenosa</i> over mid hummock grassland of <i>Triodia</i> sp		

Sample and effort summary				
Sample method	Visit	Sample date	Dimensions	Observer
Relevé	2	18-Aug-2018	unbounded	Laurinda Timmins

Species (2)	Status	Cover (%)	Height (m)
<i>Triodia longiceps</i>			
<i>Acacia bivenosa</i>			

Site details			
Site	MSP231	Position (WGS84)	-21.300042, 115.8476
Slope	negligible	Topography	plain
Soil colour	red-brown,	Soil texture	clay loam, clay,
Rock cover (%)	0	Rock type	none
Observation details - visit 2 (19 Aug 2018)			
Sample description	Low sparse <i>Trianthema turgidifolia</i> , <i>Tecticornia</i> sp. sterile 1 and and <i>Tecticornia indica</i> subsp. <i>leiostrachya</i> shrubland over low <i>Sporobolus virginicus</i> , * <i>Cenchrus ciliaris</i> and <i>Dactylo</i>		

Sample and effort summary				
Sample method	Visit	Sample date	Dimensions	Observer
Quadrat	2	19-Aug-2018	50 m x 50 m	Laurinda Timmins

Species (11)	Status	Cover (%)	Height (m)
<i>*Prosopis glandulosa x velutina</i>	Weed (WoNS)		
<i>*Cenchrus ciliaris</i>	Weed		
<i>Triodia longiceps</i>			
<i>Trianthema turgidifolium</i>			
<i>Trianthema cusackianum</i>			
<i>Tecticornia</i> sp. sterile 1			
<i>Tecticornia indica</i> subsp. <i>leiostachya</i>			
<i>Sporobolus virginicus</i>			
<i>Pluchea rubelliflora</i>			
<i>Neobassia astrocarpa</i>			
<i>Dactyloctenium radulans</i>			

Site details			
Site	MSP232	Position (WGS84)	-21.222039, 115.872355
Slope	negligible	Topography	tidal mudflat
Soil colour	brown,	Soil texture	clay,
Rock cover (%)	0	Rock type	none

Observation details - visit 1 (21 Aug 2018)			
Sample description	Low <i>Tecticornia auriculata</i> , <i>T. halocnemoides</i> subsp. <i>longispicata</i> and <i>T. sp.</i> chenopod shrubland.		
Habitat	chenopod shrubland		
Disturbance	none,		
Vegetation condition	Excellent	Fire age	not evident
Total veg. cover (%)	40	Tree cover (%)	0
Shrub cover (%)	40	Grass cover (%)	0
Herb cover (%)	0		



Sample and effort summary				
Sample method	Visit	Sample date	Dimensions	Observer
Quadrat	1	21-Aug-2018	50 m x 50 m	Grant Wells



Species (6)	Status	Cover (%)	Height (m)
<i>Tecticornia auriculata</i>		20	0.6
<i>Tecticornia</i>		10	0.25
<i>Tecticornia halocnemoides</i> subsp. <i>longispicata</i>		10	0.25
<i>Tecticornia</i>		1	0.4
<i>Muellerolimon salicorniaceum</i>		0.1	0.15
<i>Tecticornia indica</i> subsp. <i>leiostachya</i>			

Site details			
Site	MSP233	Position (WGS84)	-21.295897, 115.89651
Slope	negligible	Topography	plain
Soil colour	brown,	Soil texture	sandy clay,
Rock cover (%)	0	Rock type	granite rocks;

Observation details - visit 1 (21 Aug 2018)			
Sample description	Tall isolated <i>Vachellia farnesiana</i> and <i>Prosopis glandulosa</i> x <i>velutina</i> shrubs over mid <i>Triodia longiceps</i> hummock grassland over isolated clumps of low <i>Schenkia coementii</i> forbs.		
Habitat	spinifex grassland		
Disturbance	none,		
Vegetation condition	Very Good	Fire age	not evident
Total veg. cover (%)	60	Tree cover (%)	2
Shrub cover (%)	0	Grass cover (%)	60
Herb cover (%)	0		



Sample and effort summary				
Sample method	Visit	Sample date	Dimensions	Observer
Quadrat	1	21-Aug-2018	50 m x 50 m	Alice Watt

Species (6)	Status	Cover (%)	Height (m)
<i>Triodia longiceps</i>		50	1
<i>Eriachne ?helmsii</i>		10	0.3
* <i>Vachellia farnesiana</i>	Weed	1	2
* <i>Prosopis glandulosa x velutina</i>	Weed (WoNS)	1	1.8
<i>Eulalia aurea</i>		1	0.5
<i>Schenkia clementii</i>		0.1	0.05

Site details			
Site	MSP234	Position (WGS84)	-21.185946, 115.941446
Slope	gentle	Topography	plain
Soil colour	brown,	Soil texture	sandy clay,
Rock cover (%)	0	Rock type	none

Observation details - visit 1 (21 Aug 2018)			
Sample description	Tall open <i>Prosopis glandulosa</i> x <i>velutina</i> shrubland over mid <i>Triodia longiceps</i> grassland over low open * <i>Cenchrus ciliaris</i> grassland.		
Habitat	shrubland		
Disturbance	grazing – medium, livestock tracks, weed infestation,		
Vegetation condition	Good	Fire age	not evident
Total veg. cover (%)	60	Tree cover (%)	25
Shrub cover (%)	0	Grass cover (%)	55
Herb cover (%)	0		



Sample and effort summary				
Sample method	Visit	Sample date	Dimensions	Observer
Quadrat	1	21-Aug-2018	50 m x 50 m	Alice Watt

Species (3)	Status	Cover (%)	Height (m)
<i>Triodia longiceps</i>		45	0.7
* <i>Prosopis glandulosa x velutina</i>	Weed (WoNS)	25	2
* <i>Cenchrus ciliaris</i>	Weed	10	0.1

Site details			
Site	MSP235	Position (WGS84)	-21.156009, 115.919955
Slope	gentle	Topography	sand dune
Soil colour	red-brown	Soil texture	sandy loam,
Rock cover (%)	0	Rock type	none

Observation details - visit 1 (21 Aug 2018)			
Sample description	Isolated mid Prosopis sp. shrubs over Triodia epactia and Cenchrus ciliaris grassland.		
Habitat	spinifex grassland		
Disturbance	weed infestation,		
Vegetation condition	Good	Fire age	not evident
Total veg. cover (%)		Tree cover (%)	
Shrub cover (%)		Grass cover (%)	
Herb cover (%)			

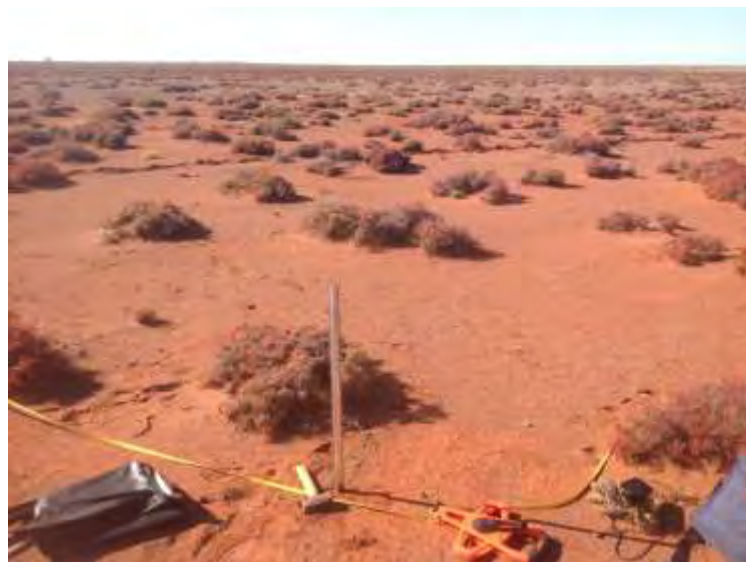


Sample and effort summary				
Sample method	Visit	Sample date	Dimensions	Observer
Relevé	1	21-Aug-2018	unbounded	Grant Wells



Site details			
Site	MSP236	Position (WGS84)	-21.299173, 115.804367
Slope	gentle	Topography	sandy rise
Soil colour	red-orange,	Soil texture	sandy clay, clay loam,
Rock cover (%)	0	Rock type	none

Observation details - visit 1 (22 Aug 2018)			
Sample description	Low open <i>Tecticornia auriculata</i> , <i>T. halocnemoides</i> subsp. <i>tenuis</i> and <i>T. sp.</i> affinity to <i>T. halocnemoides</i> large ovate seed aggregate shrubland over isolated clumps of low <i>Eragrostis falcata</i> gr		
Habitat	chenopod shrubland		
Disturbance	livestock tracks,		
Vegetation condition	Excellent	Fire age	not evident
Total veg. cover (%)	25	Tree cover (%)	0
Shrub cover (%)	25	Grass cover (%)	0
Herb cover (%)	0		



Sample and effort summary				
Sample method	Visit	Sample date	Dimensions	Observer
Quadrat	1	22-Aug-2018	50 m x 50 m	Grant Wells



Species (9)	Status	Cover (%)	Height (m)
<i>Tecticornia</i>		10	0.3
<i>Tecticornia halocnemoides</i> subsp. <i>tenuis</i>		10	0.3
<i>Tecticornia auriculata</i>		5	0.3
<i>Eragrostis falcata</i>		0.5	0.4
<i>Trianthema turgidifolium</i>		0.5	0.2
<i>Frankenia ?ambita</i>		0.5	0.2
<i>Gomphrena canescens</i>		0.1	0.2
<i>Sclerolaena costata</i>		0.1	0.1
<i>Trianthema cusackianum</i>		0.1	0.02

Site details			
Site	MSP237	Position (WGS84)	-21.07824, 115.93062
Slope	gentle	Topography	sand dune
Soil colour	brown,	Soil texture	sand,
Rock cover (%)	0	Rock type	none

Observation details - visit 1 (23 Aug 2018)			
Sample description	Isolated mid <i>Adriana tomentosa</i> var. <i>tomentosa</i> , <i>Trichodesma zeylanicum</i> var. <i>zeylanicum</i> and <i>Rhagodia preissii</i> subsp. <i>obovata</i> shrubs over isolated low * <i>Aerva javanica</i> , <i>Chorchorus walcott</i>		
Habitat	grassland		
Disturbance	litter, weed infestation,		
Vegetation condition	Very Good	Fire age	not evident
Total veg. cover (%)	75	Tree cover (%)	0
Shrub cover (%)	2	Grass cover (%)	75
Herb cover (%)	1		



Sample and effort summary				
Sample method	Visit	Sample date	Dimensions	Observer
Quadrat	1	23-Aug-2018	50 m x 50 m	Grant Wells

Species (20)	Status	Cover (%)	Height (m)
<i>Triodia epactia</i>		45	0.6
<i>Whiteochloa airoides</i>		30	0.7
<i>Adriana tomentosa</i> var. <i>tomentosa</i>		1	1.5
* <i>Aerva javanica</i>	Weed	1	0.6
<i>Rhynchosia minima</i>		0.5	0.5
<i>Euphorbia coghlanii</i>		0.5	0.4
<i>Euphorbia drummondii</i>		0.5	0.2
<i>Trichodesma zeylanicum</i> var. <i>zeylanicum</i>		0.1	1.2
<i>Rhagodia preissii</i> subsp. <i>obovata</i>		0.1	1.2
<i>Cassytha capillaris</i>		0.1	0.5
<i>Pterocaulon sphacelatum</i>		0.1	0.4
<i>Corchorus walcottii</i>		0.1	0.4
* <i>Cenchrus ciliaris</i>	Weed	0.1	0.3
<i>Nicotiana occidentalis</i> subsp. <i>occidentalis</i>		0.1	0.25
<i>Cleome viscosa</i>		0.1	0.2
<i>Euphorbia tannensis</i> subsp. <i>eremophila</i>		0.1	0.15
<i>Swainsona kingii</i>		0.1	0.1
<i>Indigofera linifolia</i>		0.1	0.1
<i>Ptilotus villosiflorus</i>		0.1	0.08
<i>Dysphania plantaginella</i>		0.1	0.06

Site details			
Site	MSP238	Position (WGS84)	-21.077843, 115.931262
Slope	moderate	Topography	sand dune
Soil colour	brown, whitish,	Soil texture	sand,
Rock cover (%)	0	Rock type	none

Observation details - visit 1 (23 Aug 2018)			
Sample description	Isolated low <i>Aerva javanica</i> , <i>Atriplex bunburyana</i> and <i>Rhagodia preissii</i> subsp. <i>obovata</i> shrubs over tall <i>Spinifex longifolius</i> grassland over low <i>Triodia epactia</i> , <i>Cenchrus ciliaris</i> and		
Habitat	shrubland		
Disturbance	litter, weed infestation,		
Vegetation condition	Very Good	Fire age	not evident
Total veg. cover (%)	55	Tree cover (%)	0
Shrub cover (%)	40	Grass cover (%)	30
Herb cover (%)	1		



Sample and effort summary				
Sample method	Visit	Sample date	Dimensions	Observer
Quadrat	1	23-Aug-2018	unbounded	Grant Wells

Species (14)	Status	Cover (%)	Height (m)
<i>Spinifex longifolius</i>		40	1.2
<i>Triodia epactia</i>		20	0.4
* <i>Cenchrus ciliaris</i>	Weed	10	0.3
<i>Whiteochloa airoides</i>		1	0.5
<i>Euphorbia coghlanii</i>		0.5	0.4
<i>Euphorbia drummondii</i>		0.5	0.2
<i>Rhagodia preissii</i> subsp. <i>obovata</i>		0.1	0.8
* <i>Aerva javanica</i>	Weed	0.1	0.5
<i>Rhynchosia minima</i>		0.1	0.5
<i>Ipomoea</i>		0.1	0.4
<i>Threlkeldia diffusa</i>		0.1	0.3
<i>Atriplex bunburyana</i>		0.1	0.25
<i>Salsola australis</i>		0.1	0.1
<i>Euphorbia australis</i>		0.1	0.03

Site details			
Site	MSP45	Position (WGS84)	-21.123926, 115.924847
Slope		Topography	sandy rise
Soil colour		Soil texture	
Rock cover (%)		Rock type	

Observation details - visit 1 (21 Aug 2018)			
Sample description	Sparse low <i>Tecticornia auriculata</i> ., <i>Trianthema turgidifolia</i> and <i>Lawrenca sp.</i> shrubland over isolated low <i>Triodia epactia</i> and <i>Aristida contorta</i> grasses		
Habitat	chenopod shrubland		
Disturbance	none,		
Vegetation condition	Excellent	Fire age	not evident
Total veg. cover (%)		Tree cover (%)	
Shrub cover (%)		Grass cover (%)	
Herb cover (%)			

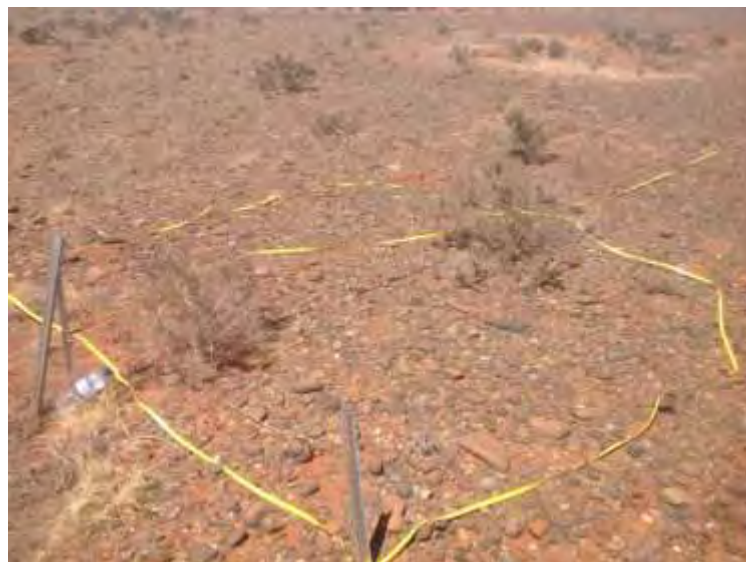


Sample and effort summary				
Sample method	Visit	Sample date	Dimensions	Observer
Relevé	1	21-Aug-2018	unbounded	Grant Wells

Species (1)	Status	Cover (%)	Height (m)
<i>Tecticornia auriculata</i>			

Site details			
Site	MSP60AQ1	Position (WGS84)	-21.14239, 115.92481
Slope	negligible	Topography	sandy rise
Soil colour	brown,	Soil texture	sandy clay, sandy loam,
Rock cover (%)	0	Rock type	alluvial

Observation details - visit 1 (20 Mar 2018)			
Sample description	Low <i>Tecticornia auriculata</i> open chenopod shrubland over isolated low <i>Triodia longiceps</i> grasses.		
Habitat	shrubland		
Disturbance	none,		
Vegetation condition	Excellent	Fire age	not evident
Total veg. cover (%)	20	Tree cover (%)	0
Shrub cover (%)	19	Grass cover (%)	1
Herb cover (%)	0		



Sample and effort summary				
Sample method	Visit	Sample date	Dimensions	Observer
Transect-Quadrat	1	20-Mar-2018	3 m x 3 m	Grant Wells



Species (2)	Status	Cover (%)	Height (m)
<i>Tecticornia auriculata</i>		19	0.4
<i>Triodia longiceps</i>		1	0.15

Site details			
Site	MSP60AQ2	Position (WGS84)	-21.142638, 115.924269
Slope	negligible	Topography	sandy rise
Soil colour	brown,	Soil texture	sandy clay, sandy loam,
Rock cover (%)	0	Rock type	alluvial

Observation details - visit 1 (20 Mar 2018)			
Sample description	Low open <i>Tecticornia indica</i> subsp. <i>biden</i> s and <i>Tecticornia indica</i> subsp. <i>leiostachya</i> chenopod shrubland over isolated low <i>Eragrostis falcata</i> grasses.		
Habitat	shrubland		
Disturbance	none,		
Vegetation condition	Excellent	Fire age	not evident
Total veg. cover (%)	15	Tree cover (%)	0
Shrub cover (%)	13	Grass cover (%)	2
Herb cover (%)	0		



Sample and effort summary				
Sample method	Visit	Sample date	Dimensions	Observer
Transect-Quadrat	1	20-Mar-2018	3 m x 3 m	Grant Wells

Species (3)	Status	Cover (%)	Height (m)
<i>Tecticornia indica</i> subsp. <i>bidens</i>		13	0.4
<i>Eragrostis falcata</i>		2	0.1
<i>Tecticornia indica</i> subsp. <i>leiostachya</i>		0.1	0.15

Site details			
Site	MSP60AQ3	Position (WGS84)	-21.14287, 115.924246
Slope	negligible	Topography	sandy rise
Soil colour	brown,	Soil texture	sandy clay, sandy loam,
Rock cover (%)	0	Rock type	alluvial

Observation details - visit 1 (20 Mar 2018)			
Sample description	Low open <i>Tecticornia indica</i> subsp. <i>leiostachya</i> chenopod shrubland over isolated low <i>Triodia longiceps</i> and <i>Eragrostis falcata</i> grasses.		
Habitat	shrubland		
Disturbance	none,		
Vegetation condition	Excellent	Fire age	not evident
Total veg. cover (%)	20	Tree cover (%)	0
Shrub cover (%)	15	Grass cover (%)	5
Herb cover (%)	0		



Sample and effort summary				
Sample method	Visit	Sample date	Dimensions	Observer
Transect-Quadrat	1	20-Mar-2018	3 m x 3 m	Grant Wells

Species (3)	Status	Cover (%)	Height (m)
<i>Tecticornia indica</i> subsp. <i>leiostachya</i>		15	0.4
<i>Triodia longiceps</i>		5	0.4
<i>Eragrostis falcata</i>		0.5	0.1

Site details			
Site	MSP67	Position (WGS84)	-21.16885, 115.912076
Slope	gentle	Topography	sand dune
Soil colour	red-orange,	Soil texture	sandy loam,
Rock cover (%)	0	Rock type	none

Observation details - visit 1 (21 Aug 2018)			
Sample description	Isolated low <i>Tecticornia indica</i> and <i>Trianthema turgidifolia</i> shrubs over low <i>Triodia epactia</i> hummock grassland.		
Habitat	spinifex grassland		
Disturbance	none		
Vegetation condition	Excellent	Fire age	not recorded
Total veg. cover (%)		Tree cover (%)	
Shrub cover (%)		Grass cover (%)	
Herb cover (%)			



Sample and effort summary				
Sample method	Visit	Sample date	Dimensions	Observer
Relevé	1	21-Aug-2018	unbounded	Grant Wells

Species (1)	Status	Cover (%)	Height (m)
<i>Tecticornia indica</i> subsp. <i>leiostachya</i>			

Site details			
Site	MSP86	Position (WGS84)	-21.263538, 115.84325
Slope	negligible	Topography	tidal mudflat
Soil colour	brown,	Soil texture	clay loam,
Rock cover (%)	0	Rock type	none

Observation details - visit 1 (19 Mar 2018)			
Sample description	Low sparse <i>Tecticornia halocnemoides</i> subsp. <i>longispicata</i> , <i>T. pterygosperma</i> subsp. <i>denticulata</i> and <i>T. indica</i> subsp. <i>leiostachya</i> chenopod shrubland.		
Habitat	chenopod shrubland		
Disturbance	none,		
Vegetation condition	Excellent	Fire age	not evident
Total veg. cover (%)	6	Tree cover (%)	0
Shrub cover (%)	6	Grass cover (%)	0
Herb cover (%)	0		



Sample and effort summary				
Sample method	Visit	Sample date	Dimensions	Observer
Quadrat	1	19-Mar-2018	50 m x 50 m	Grant Wells



Species (3)	Status	Cover (%)	Height (m)
<i>Tecticornia halocnemoides</i> subsp. <i>longispicata</i>		5	0.2
<i>Tecticornia pterygosperma</i> subsp. <i>denticulata</i>		1	0.1
<i>Tecticornia indica</i> subsp. <i>leiostachya</i>		0.1	0.15

Site details			
Site	MSPAR01	Position (WGS84)	-21.16318, 115.971425
Slope	gentle	Topography	undulating plain
Soil colour	red-orange	Soil texture	clay loam
Rock cover (%)	0	Rock type	ferrous - ironstone

Observation details - visit 1 (19 Mar 2018)			
Sample description	Tall open <i>Grevillea pyramidalis</i> , <i>Hakea lorea</i> and <i>Prosopis glandulosa</i> x <i>velutina</i> shrubland over isolated mid <i>Acacia inaequilatera</i> and <i>Senna glutinosa</i> subsp. <i>glutinosa</i> shrubs over		
Habitat	shrubland		
Disturbance	livestock tracks, weed infestation,		
Vegetation condition	Very Good	Fire age	not evident
Total veg. cover (%)	85	Tree cover (%)	10
Shrub cover (%)	5	Grass cover (%)	80
Herb cover (%)	0		



Sample and effort summary				
Sample method	Visit	Sample date	Dimensions	Observer
Quadrat	1	19-Mar-2018	50 m x 50 m	Grant Wells

Species (20)	Status	Cover (%)	Height (m)
<i>Triodia epactia</i>		80	0.4
* <i>Prosopis glandulosa</i> x <i>velutina</i>	Weed (WoNS)	14	2.5
<i>Grevillea pyramidalis</i>		5	3.5
<i>Hakea lorea</i> subsp. <i>lorea</i>		1	2.6
<i>Acacia inaequilatera</i>		1	1.2
* <i>Cenchrus ciliaris</i>	Weed	1	0.3
<i>Ptilotus helipteroides</i>		1	0.1
<i>Euphorbia tannensis</i> subsp. <i>eremophila</i>		0.5	0.05
<i>Bonamia pilbarensis</i>		0.5	0.05
<i>Solanum lasiophyllum</i>		0.2	0.5
* <i>Vachellia farnesiana</i>	Weed	0.1	1.6
<i>Acacia coriacea</i>		0.1	1.5
<i>Senna glutinosa</i> subsp. <i>glutinosa</i>		0.1	1.4
<i>Trichodesma zeylanicum</i> var. <i>grandiflorum</i>		0.1	1.2
<i>Cucumis variabilis</i>		0.1	0.5
<i>Acacia bivenosa</i>		0.1	0.4
<i>Euphorbia boophthona</i>		0.1	0.4
<i>Indigofera trita</i>		0.1	0.4
<i>Triumfetta clementii</i>		0.1	0.2
<i>Sclerolaena costata</i>		0.1	0.15

Site details			
Site	MSPAR02	Position (WGS84)	-21.165022, 115.990125
Slope	negligible	Topography	plain
Soil colour	red-brown,	Soil texture	clay loam,
Rock cover (%)	0	Rock type	none

Observation details - visit 1 (19 Mar 2018)			
Sample description	Low open <i>Eucalyptus victrix</i> woodland over tall open <i>Acacia synchronicia</i> and <i>Prosopis glandulosa</i> x <i>velutina</i> shrubland over low closed <i>Eragrostis xerophila</i> and * <i>Cenchrus ciliaris</i> tussock grass		
Habitat	open woodland		
Disturbance	grazing – low, historic clearing, livestock tracks, weed infestation,		
Vegetation condition	Poor	Fire age	not evident
Total veg. cover (%)	85	Tree cover (%)	30
Shrub cover (%)	2	Grass cover (%)	80
Herb cover (%)	0		



Sample and effort summary				
Sample method	Visit	Sample date	Dimensions	Observer
Quadrat	1	19-Mar-2018	50 m x 50 m	Grant Wells

Species (5)	Status	Cover (%)	Height (m)
<i>Eragrostis xerophila</i>		60	0.35
* <i>Cenchrus ciliaris</i>	Weed	20	0.4
* <i>Prosopis glandulosa</i> x <i>velutina</i>	Weed (WoNS)	10	2
<i>Eucalyptus victrix</i>		8	8
<i>Acacia synchronicia</i>		2	4

Site details			
Site	MSPAR03	Position (WGS84)	-21.174371, 116.005114
Slope	gentle	Topography	undulating plain
Soil colour	red-brown,	Soil texture	clay loam,
Rock cover (%)	0	Rock type	alluvial

Observation details - visit 1 (20 Mar 2018)			
Sample description	Tall open <i>Prosopis glandulosa x velutina</i> and <i>Acacia xiphophylla</i> shrubland over isolated mid <i>Acacia glaucocaesia</i> shrubs over isolated low <i>Eragrostis xerophila</i> , * <i>Cenchrus ciliaris</i> and		
Habitat	shrubland		
Disturbance	grazing – medium, livestock tracks, vehicle tracks, weed infestation,		
Vegetation condition	Degraded	Fire age	not evident
Total veg. cover (%)	25	Tree cover (%)	20
Shrub cover (%)	5	Grass cover (%)	2
Herb cover (%)	0		



Sample and effort summary				
Sample method	Visit	Sample date	Dimensions	Observer
Quadrat	1	20-Mar-2018	50 m x 50 m	Grant Wells

Species (20)	Status	Cover (%)	Height (m)
<i>*Prosopis glandulosa x velutina</i>	Weed (WoNS)	25	4
<i>Eragrostis xerophila</i>		2	0.1
<i>Acacia xiphophylla</i>		1	2.2
<i>Acacia glaucocaesia</i>	P3 (DBCA list)	1	1.8
<i>Acacia pyrifolia</i> var. <i>pyrifolia</i>		1	0.5
<i>Triodia epactia</i>		1	0.4
<i>*Cenchrus ciliaris</i>	Weed	1	0.25
<i>Sclerolaena costata</i>		1	0.1
<i>Aristida contorta</i>		1	0.05
<i>Scaevola spinescens</i>		0.1	0.4
<i>Hakea lorea</i> subsp. <i>lorea</i>		0.1	0.3
<i>Myoporum montanum</i>		0.1	0.2
<i>abutilon fraseri</i>		0.1	0.15
<i>Senna artemisioides</i> subsp. <i>oligophylla</i>		0.1	0.15
<i>Senna notabilis</i>		0.1	0.15
<i>Ptilotus helipteroides</i>		0.1	0.1
<i>Ptilotus aervoides</i>		0.1	0.03
<i>Dactyloctenium radulans</i>		0.1	0.02
<i>Polymeria ambigua</i>		0.1	0.02
<i>Solanum lasiophyllum</i>			

Site details			
Site	MSPAR04	Position (WGS84)	-21.227094, 116.056743
Slope	negligible	Topography	plain
Soil colour	red-brown,	Soil texture	clay loam,
Rock cover (%)	0	Rock type	ferrous – ironstone

Observation details - visit 1 (20 Mar 2018)			
Sample description	Low closed <i>Eragrostis xerophila</i> , * <i>Cenchrus ciliaris</i> and <i>Enneapogon caerulescens</i> grassland over isolated low <i>Corchorus tridens</i> , <i>Rhynchosia minima</i> and <i>Euphorbia drummondii</i> forbs.		
Habitat	grassland		
Disturbance	grazing – high, livestock tracks, weed infestation,		
Vegetation condition	Good	Fire age	not evident
Total veg. cover (%)	85	Tree cover (%)	0
Shrub cover (%)	0	Grass cover (%)	85
Herb cover (%)	0		



Sample and effort summary				
Sample method	Visit	Sample date	Dimensions	Observer
Quadrat	1	20-Mar-2018	50 m x 50 m	Grant Wells



Species (15)	Status	Cover (%)	Height (m)
<i>Eragrostis xerophila</i>		80	0.3
* <i>Cenchrus ciliaris</i>	Weed	5	0.2
<i>Eriachne helmsii</i>		1	0.15
<i>Enneapogon caeruleus</i>		1	0.05
<i>Corchorus tridens</i>		1	0.05
<i>Sida sp. Excedentifolia</i> (J.L. Egan 1925)		0.1	0.2
<i>Rhynchosia minima</i>		0.1	0.2
<i>Euphorbia tannensis</i> subsp. <i>eremophila</i>		0.1	0.15
<i>Dichanthium sericeum</i> subsp. <i>humilius</i>		0.1	0.15
<i>Maireana tomentosa</i> subsp. <i>tomentosa</i>		0.1	0.1
<i>Haloragis gossei</i>		0.1	0.1
<i>Sida</i>		0.1	0.08
* <i>Cenchrus setiger</i>	Weed	0.1	0.05
<i>Sporobolus virginicus</i>		0.1	0.05
<i>Euphorbia drummondii</i>		0.1	0.01

Site details			
Site	MSPAR05	Position (WGS84)	-21.252919, 116.079994
Slope	gentle	Topography	undulating plain
Soil colour	red-brown,	Soil texture	clay loam,
Rock cover (%)	0	Rock type	ferrous – ironstone

Observation details - visit 1 (20 Mar 2018)			
Sample description	Mid open <i>Acacia bivenosa</i> , <i>A. ancistrocarpa</i> and <i>A. atkinsiana</i> shrubland over isolated low <i>A. pyrifolia</i> var. <i>pyrifolia</i> , <i>A. inaequilatera</i> and <i>Maireana georgei</i> shrubs over low closed <i>Trio</i>		
Habitat	shrubland		
Disturbance	none,		
Vegetation condition	Excellent	Fire age	not evident
Total veg. cover (%)	85	Tree cover (%)	1
Shrub cover (%)	20	Grass cover (%)	80
Herb cover (%)	0		



Sample and effort summary				
Sample method	Visit	Sample date	Dimensions	Observer
Quadrat	1	20-Mar-2018	50 m x 50 m	Grant Wells

Species (19)	Status	Cover (%)	Height (m)
<i>Triodia wiseana</i>		80	0.45
<i>Acacia bivenosa</i>		10	2
<i>Acacia atkinsiana</i>		5	1.8
<i>Acacia ancistrocarpa</i>		2	1.5
<i>Acacia synchronicia</i>		1	1.2
<i>Maireana georgei</i>		1	1
<i>Corymbia hamersleyana</i>		0.1	2.5
<i>Acacia trachycarpa</i>		0.1	1.8
<i>Amyema preissii</i>		0.1	1.5
<i>Senna glutinosa</i> subsp. <i>glutinosa</i>		0.1	1.3
<i>Acacia inaequilatera</i>		0.1	0.8
<i>Senna glutinosa</i> subsp. <i>glutinosa</i>		0.1	0.8
<i>Hakea lorea</i> subsp. <i>lorea</i>		0.1	0.5
<i>Ptilotus exaltatus</i>		0.1	0.5
<i>Heliotropium ovalifolium</i>		0.1	0.4
<i>Acacia pyrifolia</i> var. <i>pyrifolia</i>		0.1	0.4
<i>Euphorbia boophthona</i>		0.1	0.4
<i>Abutilon</i> sp. <i>Pilbara</i> (W.R. Barker 2025)		0.1	0.15
<i>Tephrosia clementii</i>		0.1	0.15

Site details			
Site	MSPAR06	Position (WGS84)	-21.268029, 116.090082
Slope	negligible	Topography	plain
Soil colour	red-brown,	Soil texture	clay loam,
Rock cover (%)	0	Rock type	ferrous – ironstone

Observation details - visit 1 (20 Mar 2018)			
Sample description	Isolated clumps of mid <i>Acacia xiphophylla</i> and <i>A. inaequilatera</i> shrubs over low <i>Eragrostis xerophila</i> , * <i>Cenchrus ciliaris</i> and <i>Triodia epactia</i> grassland over sparse low <i>Corchorus tridens</i> , <i>Ipomoea</i>		
Habitat	grassland		
Disturbance	firebreak, grazing – high, livestock tracks, vehicle tracks, weed infestation,		
Vegetation condition	Good	Fire age	not evident
Total veg. cover (%)	60	Tree cover (%)	0
Shrub cover (%)	0	Grass cover (%)	55
Herb cover (%)	7		



Sample and effort summary				
Sample method	Visit	Sample date	Dimensions	Observer
Quadrat	1	20-Mar-2018	50 m x 50 m	Grant Wells

Species (45)	Status	Cover (%)	Height (m)
<i>Eragrostis xerophila</i>		58	0.3
<i>Corchorus tridens</i>		4	0.08
<i>Ipomoea muelleri</i>		3	0.05
* <i>Cenchrus ciliaris</i>	Weed	2	0.25
<i>Eriachne helmsii</i>		1	0.2
<i>Sida fibulifera</i>		1	0.1
<i>Enneapogon caerulescens</i>		0.5	0.1
<i>Dactyloctenium radulans</i>		0.5	0.05
<i>Acacia synchronicia</i>		0.1	1.8
<i>Euphorbia tannensis</i> subsp. <i>eremophila</i>		0.1	1.5
<i>Acacia inaequilatera</i>		0.1	1.4
<i>Acacia xiphophylla</i>		0.1	1.2
<i>Triodia epactia</i>		0.1	0.45
<i>Solanum phlomoides</i>		0.1	0.4
<i>Trichodesma zeylanicum</i> var. <i>grandiflorum</i>		0.1	0.4
<i>Acacia bivenosa</i>		0.1	0.4
<i>Stemodia kingii</i>		0.1	0.3
<i>Senna notabilis</i>		0.1	0.2
<i>Abutilon malvifolium</i>		0.1	0.2
* <i>Vachellia farnesiana</i>	Weed	0.1	0.2
<i>Gomphrena kanisii</i>		0.1	0.2
<i>Rhynchosia minima</i>		0.1	0.2
<i>Sclerolaena bicornis</i>		0.1	0.2
<i>Alysicarpus muelleri</i>		0.1	0.2
<i>Solanum lasiophyllum</i>		0.1	0.2
<i>Sclerolaena costata</i>		0.1	0.2
<i>Cleome viscosa</i>		0.1	0.15
<i>Ptilotus gomphrenoides</i>		0.1	0.15
<i>Indigofera linifolia</i>		0.1	0.15
<i>Phyllanthus maderaspatensis</i>		0.1	0.15
<i>Sporobolus australasicus</i>		0.1	0.15
<i>Senna artemisioides</i> subsp. <i>oligophylla</i>		0.1	0.15
* <i>Malvastrum americanum</i>	Weed	0.1	0.1
<i>Eragrostis tenellula</i>		0.1	0.1
<i>Trianthema turgidifolium</i>		0.1	0.1
<i>Crotalaria medicaginea</i> var. <i>neglecta</i>		0.1	0.1
<i>Ipomoea pes-caprae</i> subsp. <i>brasiliensis</i>		0.1	0.1
<i>Boerhavia burbridgeana</i>		0.1	0.1
<i>Ptilotus axillaris</i>		0.1	0.07

<i>Streptoglossa ?odora</i>	0.1	0.05
<i>Ptilotus exaltatus</i>	0.1	0.05
<i>Ptilotus carinatus</i>	0.1	0.05
<i>Euphorbia drummondii</i>	0.1	0.01
<i>Boerhavia paludosa</i>	0.1	
<i>Gomphrena canescens</i>		

**Appendix 3 Flora species records from desktop review**

Family (66)	Species (414)	EPBC (1)	DBCA (43)
Acanthaceae (1)	<i>Avicennia marina</i>		
Aizoaceae (6)	<i>Carpobrotus</i> sp. Thevenard Island (M. White 050)		P3
	<i>Sesuvium portulacastrum</i>		
	<i>Trianthema</i> sp. Python Pool (G.R. Guerin & M.E. Trudgen GG 1023)		P2
	<i>Trianthema triquetrum</i>		
	<i>Trianthema turgidifolium</i>		
	<i>Zaleya galericulata</i> subsp. <i>galericulata</i>		
Amaranthaceae (25)	<i>Achyranthes aspera</i>		
	* <i>Aerva javanica</i>		
	<i>Alternanthera denticulata</i>		
	<i>Amaranthus cuspidifolius</i>		
	<i>Amaranthus induratus</i>		
	<i>Amaranthus mitchellii</i>		
	<i>Amaranthus undulatus</i>		
	* <i>Amaranthus viridis</i>		
	<i>Gomphrena affinis</i>		
	<i>Gomphrena affinis</i> subsp. <i>pilbarensis</i>		
	<i>Gomphrena cunninghamii</i>		
	<i>Gomphrena pusilla</i>		P2
	<i>Ptilotus aevroides</i>		
	<i>Ptilotus auriculifolius</i>		
	<i>Ptilotus clementii</i>		
	<i>Ptilotus divaricatus</i>		
	<i>Ptilotus drummondii</i>		
	<i>Ptilotus gomphrenoides</i>		
	<i>Ptilotus helipteroides</i>		
	<i>Ptilotus latifolius</i>		
	<i>Ptilotus macrocephalus</i>		
	<i>Ptilotus murrayi</i>		
	<i>Ptilotus obovatus</i>		
	<i>Ptilotus villosiflorus</i>		
	<i>Surreya diandra</i>		
Amaryllidaceae (1)	<i>Crinum flaccidum</i>		P2
Apocynaceae (3)	<i>Cynanchum floribundum</i>		
	<i>Cynanchum viminale</i> subsp. <i>australe</i>		
	<i>Gymnanthera cunninghamii</i>		P3
Araliaceae (1)	<i>Trachymene oleracea</i> subsp. <i>oleracea</i>		
Arecaceae (1)	* <i>Washingtonia filifera</i>		
Asphodelaceae (1)	* <i>Asphodelus fistulosus</i>		
Asteraceae (26)	* <i>Arctotheca calendula</i>		
	<i>Angianthus acrohyalinus</i>		
	<i>Angianthus cunninghamii</i>		
	<i>Angianthus milnei</i>		
	<i>Blumea tenella</i>		
	<i>Calotis multicaulis</i>		

Family (66)	Species (414)	EPBC (1)	DBCA (43)
	<i>Calotis plumulifera</i>		
	* <i>Conyza bonariensis</i>		
	* <i>Flaveria trinervia</i>		
	<i>Gnephosis arachnoidea</i>		
	<i>Helichrysum oligochaetum</i>		P1
	<i>Launaea sarmentosa</i>		
	<i>Myriocephalus nudus</i>		P1
	<i>Pentalepis trichodesmoides</i> subsp. <i>trichodesmoides</i>		
	<i>Pluchea dunlopil</i>		
	<i>Pterocaulon sphacelatum</i>		
	<i>Pterocaulon sphaeranthoides</i>		
	<i>Rhodanthe ascendens</i>		P1
	<i>Rhodanthe floribunda</i>		
	<i>Rhodanthe frenchii</i>		P2
	* <i>Sonchus oleraceus</i>		
	<i>Streptoglossa adscendens</i>		
	<i>Streptoglossa bubakii</i>		
	<i>Streptoglossa decurrens</i>		
	<i>Streptoglossa liatroides</i>		
	<i>Streptoglossa odora</i>		
Boraginaceae (9)	<i>Ehretia saligna</i>		
	<i>Heliotropium cunninghamii</i>		
	<i>Heliotropium curassavicum</i>		
	<i>Heliotropium heteranthum</i>		
	<i>Heliotropium ovalifolium</i>		
	<i>Heliotropium pachyphyllum</i>		
	<i>Heliotropium tenuifolium</i>		
	<i>Trichodesma zeylanicum</i>		
	<i>Trichodesma zeylanicum</i> var. <i>zeylanicum</i>		
Brassicaceae 2)	<i>Lepidium pedicellosum</i>		
	<i>Lepidium platypetalum</i>		
Capparaceae (3)	<i>Capparis spinosa</i>		
Capparaceae	<i>Capparis spinosa</i> subsp. <i>nummularia</i>		
Capparaceae	<i>Capparis umbonata</i>		
Caryophyllaceae (3)	<i>Polycarpaea holtzei</i>		
	<i>Polycarpaea longiflora</i>		
	* <i>Polycarpon tetraphyllum</i>		
Casuarinaceae (1)	* <i>Casuarina equisetifolia</i>		
Celastraceae (2)	<i>Stackhousia clementii</i>		P3
	<i>Stackhousia umbellata</i>		P3
Chenopodiaceae (26)	<i>Atriplex bunburyana</i>		
	<i>Atriplex flabelliformis</i>		P3
	<i>Atriplex isatidea</i>		
	<i>Atriplex semilunaris</i>		
	<i>Dysphania rhadinostachya</i> subsp. <i>rhadinostachya</i>		
	<i>Enchylaena tomentosa</i>		
	<i>Enchylaena tomentosa</i> var. <i>tomentosa</i>		



Family (66)	Species (414)	EPBC (1)	DBCA (43)
	<i>Maireana tomentosa</i>		
	<i>Maireana tomentosa</i> subsp. <i>tomentosa</i>		
	<i>Neobassia astrocarpa</i>		
	<i>Rhagodia eremaea</i>		
	<i>Rhagodia latifolia</i>		
	<i>Rhagodia preissii</i>		
	<i>Rhagodia preissii</i> subsp. <i>obovata</i>		
	<i>Salsola australis</i>		
	<i>Sclerolaena diacantha</i>		
	<i>Sclerolaena glabra</i>		
	<i>Tecticornia auriculata</i>		
	<i>Tecticornia globulifera</i>		P1
	<i>Tecticornia halocnemoides</i>		
	<i>Tecticornia halocnemoides</i> subsp. <i>longispicata</i>		
	<i>Tecticornia halocnemoides</i> subsp. <i>tenuis</i>		
	<i>Tecticornia indica</i> subsp. <i>bidens</i>		
	<i>Tecticornia medusa</i>		P3
	<i>Tecticornia</i> sp. Christmas Creek (K.A. Shepherd & T. Colmer et al. KS 1063)		P1
	<i>Threlkeldia diffusa</i>		
Cleomaceae (1)	<i>Cleome viscosa</i>		
Combretaceae (2)	<i>Terminalia circumalata</i>		
	<i>Terminalia supranitifolia</i>		P3
Convolvulaceae (13)	<i>Bonamia brevifolia</i>		P1
	<i>Bonamia erecta</i>		
	<i>Cuscuta australis</i>		
	<i>Cuscuta victoriana</i>		
	<i>Evolvulus alsinoides</i> var. <i>villosicalyx</i>		
	* <i>Ipomoea cairica</i>		
	<i>Ipomoea coptica</i>		
	<i>Ipomoea muelleri</i>		
	<i>Ipomoea pes-caprae</i>		
	<i>Ipomoea pes-caprae</i> subsp. <i>brasiliensis</i>		
	<i>Operculina aequisejala</i>		
	<i>Polymeria ambigua</i>		
	<i>Polymeria calycina</i>		
Cucurbitaceae (6)	* <i>Citrullus colocynthis</i>		
	* <i>Citrullus lanatus</i>		
	<i>Cucumis melo</i>		
	<i>Cucumis</i> sp. Barrow Island (D.W. Goodall 1264)		P2
	<i>Cucumis variabilis</i>		
	<i>Trichosanthes cucumerina</i>		
Cyperaceae (13)	<i>Cyperus bulbosus</i>		
	<i>Cyperus difformis</i>		
	<i>Cyperus iria</i>		
	<i>Cyperus pulchellus</i>		
	<i>Cyperus squarrosus</i>		

Family (66)	Species (414)	EPBC (1)	DBCA (43)
	<i>Cyperus vaginatus</i>		
	<i>Eleocharis atropurpurea</i>		
	<i>Eleocharis papillosa</i>	VU	P3
	<i>Fimbristylis dichotoma</i>		
	<i>Fimbristylis simulans</i>		
	<i>Isolepis marginata</i>		
	<i>Schoenoplectus laevis</i>		
	<i>Schoenoplectus subulatus</i>		
Euphorbiaceae (13)	<i>Adriana tomentosa</i> var. <i>tomentosa</i>		
	<i>Euphorbia australis</i>		
	<i>Euphorbia biconvexa</i>		
	<i>Euphorbia careyi</i>		
	<i>Euphorbia coghlanii</i>		
	<i>Euphorbia drummondii</i>		
	<i>Euphorbia myrtoides</i>		
	<i>Euphorbia sharkoensis</i>		
	<i>Euphorbia tannensis</i>		
	<i>Euphorbia tannensis</i> subsp. <i>eremophila</i>		
	<i>Euphorbia trigonosperma</i>		
	<i>Euphorbia vaccaria</i> var. <i>vaccaria</i>		
	<i>Adriana tomentosa</i>		
Fabaceae (78)	<i>Acacia ampliceps</i>		
	<i>Acacia ancistrocarpa</i>		
	<i>Acacia aneura</i>		
	<i>Acacia aptaneura</i>		
	<i>Acacia atkinsiana</i>		
	<i>Acacia bivenosa</i>		
	<i>Acacia citrinoviridis</i>		
	<i>Acacia coriacea</i>		
	<i>Acacia coriacea</i> subsp. <i>coriacea</i>		
	<i>Acacia glaucocaesia</i>		
	<i>Acacia ligulata</i>		
	<i>Acacia monticola</i>		
	<i>Acacia pyrifolia</i> var. <i>morrisonii</i>		
	<i>Acacia pyrifolia</i> var. <i>pyrifolia</i>		
	<i>Acacia sclerosperma</i>		
	<i>Acacia sclerosperma</i> subsp. <i>sclerosperma</i>		
	<i>Acacia startii</i>		P3
	<i>Acacia synchronica</i>		
	<i>Acacia tenuissima</i>		
	<i>Acacia trachycarpa</i>		
	<i>Acacia trachycarpa</i> x <i>tumida</i> var. <i>pilbarensis</i>		
	<i>Acacia wanyu</i>		
	<i>Acacia xiphophylla</i>		
	<i>Alysicarpus muelleri</i>		
	<i>Cajanus cinereus</i>		
	<i>Cajanus pubescens</i>		

Family (66)	Species (414)	EPBC (1)	DBCA (43)
	<i>Canavalia rosea</i>		
	<i>Crotalaria cunninghamii</i>		
	<i>Crotalaria medicaginea</i>		
	<i>Cullen lachnostachys</i>		
	<i>Cullen pogonocarpum</i>		
	<i>Erythrina vespertilio</i>		
	<i>Gastrolobium polystachyum</i>		
	<i>Indigofera bovipерda</i>		
	<i>Indigofera bovipерda</i> subsp. <i>bovipерda</i>		
	<i>Indigofera colutea</i>		
	<i>Indigofera linifolia</i>		
	<i>Indigofera linnaei</i>		
	<i>Indigofera monophylla</i>		
	<i>Indigofera</i> sp. Bungaroo Creek (S. van Leeuwen 4301)		P3
	<i>Indigofera trita</i>		
	<i>Isotropis atropurpurea</i>		
	<i>Lotus cruentus</i>		
	<i>Neptunia dimorphantha</i>		
	* <i>Parkinsonia aculeata</i> (WoNS)		
	* <i>Prosopis glandulosa</i> x <i>velutina</i> (WoNS)		
	* <i>Prosopis pallida</i> (WoNS)		
	* <i>Prosopis</i> ssp.		
	<i>Rhynchosia bungarensis</i>		P4
	<i>Rhynchosia minima</i>		
	<i>Senna artemisioides</i> subsp. <i>oligophylla</i>		
	<i>Senna glutinosa</i> subsp. <i>glutinosa</i>		
	<i>Senna glutinosa</i> subsp. <i>pruinosa</i>		
	<i>Senna glutinosa</i> subsp. x <i>luerssenii</i>		
	<i>Senna notabilis</i>		
	* <i>Senna occidentalis</i>		
	* <i>Stylosanthes hamata</i>		
	<i>Swainsona formosa</i>		
	<i>Swainsona kingii</i>		
	<i>Swainsona leana</i>		
	<i>Swainsona pterostylis</i>		
	<i>Swainsona thompsoniana</i>		P3
	* <i>Tamarindus indica</i>		
	<i>Tephrosia clementii</i>		
	<i>Tephrosia rosea</i> var. Fortescue creeks (M.I.H. Brooker 2186)		
	<i>Tephrosia rosea</i> var. Port Hedland (A.S. George 1114)		P1
	<i>Tephrosia</i> sp. B Kimberley Flora (C.A. Gardner 7300)		
	<i>Tephrosia</i> sp. Kennedy Range (J.S. Beard 4392)		P1
	<i>Tephrosia</i> sp. NW Eremaean (S. van Leeuwen et al. PBS 0356)		
	<i>Tephrosia supina</i>		
	<i>Tephrosia uniovulata</i>		
	<i>Vigna</i> sp. Hamersley Clay (A.A. Mitchell PRP 113)		
Frankeniaceae (1)	<i>Frankenia ambita</i>		

Family (66)	Species (414)	EPBC (1)	DBCA (43)
Galaxauraceae (1)	<i>Galaxaura rugosa</i>		
Gentianaceae (2)	* <i>Centaurium erythraea</i>		
	<i>Schenkia clementii</i>		
Goodeniaceae (13)	<i>Goodenia forrestii</i>		
	<i>Goodenia lamprosperma</i>		
	<i>Goodenia microptera</i>		
	<i>Goodenia muelleriana</i>		
	<i>Goodenia nuda</i>		P4
	<i>Goodenia pallida</i>		P1
	<i>Goodenia pascua</i>		
	<i>Goodenia</i> sp. East Pilbara (A.A. Mitchell PRP 727)		P3
	<i>Goodenia stobbsiana</i>		
	<i>Lechenaultia subcymosa</i>		
	<i>Scaevola crassifolia</i>		
	<i>Scaevola cunninghamii</i>		
	<i>Scaevola spinescens</i>		
Gyrostemonaceae (1)	<i>Codonocarpus cotinifolius</i>		
Halimedaceae (1)	<i>Halimeda discoidea</i>		
Hydrocharitaceae (1)	<i>Halophila spinulosa</i>		
Lamiaceae (2)	<i>Basilicum polystachyon</i>		
	<i>Clerodendrum floribundum</i> var. <i>floribundum</i>		
Lauraceae (3)	<i>Cassytha aurea</i>		
	<i>Cassytha capillaris</i>		
	<i>Cassytha filiformis</i>		
Loranthaceae (2)	<i>Lysiana casuarinae</i>		
	<i>Lysiana subfalcata</i>		
Lythraceae (2)	<i>Rotala diandra</i>		
	<i>Rotala mexicana</i>		
Malvaceae (30)	<i>Abutilon fraseri</i>		
	<i>Abutilon lepidum</i>		
	<i>Abutilon macrum</i>		
	<i>Abutilon</i> sp. Dioicum (A.A. Mitchell PRP 1618)		
	<i>Abutilon</i> sp. Onslow (F. Smith s.n. 10/9/61)		P1
	<i>Abutilon</i> sp. Quobba (H. Demar 3858)		P2
	<i>Brachychiton acuminatus</i>		
	<i>Corchorus congener</i>		P3
	<i>Corchorus parviflorus</i>		
	<i>Corchorus trilocularis</i>		
	<i>Corchorus walcottii</i>		
	<i>Gossypium australe</i>		
	<i>Gossypium robinsonii</i>		
	<i>Hibiscus brachysiphonius</i>		
	<i>Hibiscus leptocladus</i>		
	<i>Hibiscus sturtii</i> var. <i>grandiflorus</i>		
	* <i>Malvastrum americanum</i>		
	<i>Melhania oblongifolia</i>		
	* <i>Melochia pyramidata</i>		

Family (66)	Species (414)	EPBC (1)	DBCA (43)
	<i>Seringia nephrosperma</i>		
	<i>Sida arsinata</i>		
	<i>Sida clementii</i>		
	<i>Sida fibulifera</i>		
	<i>Sida rohlenae</i> subsp. <i>rohlenae</i>		
	<i>Sida</i> sp. Supplejack Station (T.S. Henshall 2345)		
	<i>Sida</i> sp. verrucose glands (F.H. Mollemans 2423)		
	<i>Triumfetta appendiculata</i>		
	<i>Triumfetta clementii</i>		
	<i>Triumfetta echinata</i>		P3
	<i>Waltheria indica</i>		
Meliaceae (1)	<i>Owenia acidula</i>		P3
Molluginaceae (1)	<i>Trigastrotheca molluginea</i>		
Myrtaceae (7)	<i>Corymbia candida</i>		
	<i>Corymbia candida</i> subsp. <i>candida</i>		
	<i>Corymbia candida</i> subsp. <i>dipsodes</i>		
	<i>Corymbia hamersleyana</i>		
	<i>Eucalyptus camaldulensis</i> subsp. <i>obtusata</i>		
	<i>Melaleuca bracteata</i>		
	<i>Melaleuca linophylla</i>		
Nyctaginaceae (6)	<i>Boerhavia burbridgeana</i>		
	<i>Boerhavia coccinea</i>		
	<i>Boerhavia gardneri</i>		
	<i>Boerhavia repleta</i>		
	<i>Boerhavia schomburgkiana</i>		
	<i>Commicarpus australis</i>		
Oleaceae (1)	<i>Jasminum didymum</i> subsp. <i>lineare</i>		
Orobanchaceae (1)	<i>Striga curviflora</i>		
Oxalidaceae (1)	* <i>Oxalis corniculata</i>		
Papaveraceae (1)	* <i>Papaver somniferum</i>		
Passifloraceae (2)	* <i>Passiflora foetida</i>		
	* <i>Passiflora foetida</i> var. <i>hispida</i>		
Phrymaceae (1)	<i>Uvedalia linearis</i>		
Phyllanthaceae (1)	<i>Phyllanthus maderaspatensis</i>		
Plantaginaceae (1)	<i>Stemodia kingii</i>		
Plumbaginaceae (1)	<i>Muellerolimon salicorniaceum</i>		
Poaceae (54)	<i>Aristida contorta</i>		
	<i>Aristida latifolia</i>		
	<i>Astrebla pectinata</i>		
	<i>Bothriochloa decipiens</i> var. <i>cloncurrans</i>		P1
	<i>Bothriochloa ewartiana</i>		
	* <i>Cenchrus ciliaris</i>		
	* <i>Cenchrus echinatus</i>		
	* <i>Cenchrus setaceus</i>		
	* <i>Cenchrus setiger</i>		
	* <i>Chloris virgata</i>		
	<i>Cymbopogon ambiguus</i>		

Family (66)	Species (414)	EPBC (1)	DBCA (43)
	<i>Cymbopogon obtectus</i>		
	* <i>Cynodon dactylon</i>		
	<i>Dactyloctenium radulans</i>		
	<i>Elytrophorus spicatus</i>		
	<i>Enneapogon caerulescens</i>		
	<i>Enneapogon polyphyllus</i>		
	<i>Eragrostis eriopoda</i>		
	* <i>Eragrostis minor</i>		
	<i>Eragrostis setifolia</i>		
	<i>Eragrostis surreyana</i>		P3
	<i>Eragrostis tenellula</i>		
	<i>Eragrostis xerophila</i>		
	<i>Eriachne benthamii</i>		
	<i>Eriachne flaccida</i>		
	<i>Eriachne pulchella</i> subsp. <i>dominii</i>		
	<i>Eriachne pulchella</i> subsp. <i>pulchella</i>		
	<i>Eulalia aurea</i>		
	<i>Iseilema vaginiflorum</i>		
	<i>Panicum laevinode</i>		
	<i>Paspalidium constrictum</i>		
	<i>Paspalidium tabulatum</i>		
	<i>Perotis rara</i>		
	<i>Phragmites karka</i>		
	<i>Setaria dielsii</i>		
	<i>Setaria surgens</i>		
	* <i>Setaria verticillata</i>		
	<i>Sorghum plumosum</i>		
	<i>Sorghum timorense</i>		
	<i>Spinifex longifolius</i>		
	<i>Sporobolus australasicus</i>		
	<i>Sporobolus virginicus</i>		
	<i>Themeda avenacea</i>		
	<i>Tragus australianus</i>		
	<i>Triodia epactia</i>		
	<i>Triodia pungens</i>		
	<i>Triodia</i> sp. Robe River (M.E. Trudgen et al. MET 12367)		P3
	<i>Triodia wiseana</i>		
	<i>Triraphis mollis</i>		
	<i>Whiteochloa airoides</i>		
	<i>Whiteochloa cymbiformis</i>		
	<i>Xerochloa laniflora</i>		
Polygalaceae (1)	<i>Polygala isingii</i>		
Polygonaceae (1)	<i>Rumex crystallinus</i>		P2
Portulacaceae (5)	<i>Calandrinia Ptychosperma</i>		
	<i>Portulaca conspicua</i>		
	<i>Portulaca intraterranea</i>		
	<i>Portulaca oleracea</i>		

Family (66)	Species (414)	EPBC (1)	DBCA (43)
	<i>*Portulaca pilosa</i>		
Proteaceae (3)	<i>Grevillea berryana</i>		
	<i>Grevillea wickhamii</i> subsp. <i>hispidula</i>		
	<i>Hakea lorea</i> subsp. <i>lorea</i>		
Restionaceae (1)	<i>Lepidobolus quadratus</i>		P3
Rhizophoraceae (2)	<i>Bruguiera exaristata</i>		
	<i>Rhizophora stylosa</i>		
Rhodomelaceae (1)	<i>Digenea simplex</i>		
Rubiaceae (2)	<i>Synaptantha tillaeacea</i>		
	<i>Synaptantha tillaeacea</i> var. <i>tillaeacea</i>		
Santalaceae (2)	<i>Santalum acuminatum</i>		
	<i>Santalum lanceolatum</i>		
Sapindaceae (2)	<i>Alectryon oleifolius</i>		
	<i>Diplopeltis stuartii</i> var. <i>stuartii</i>		
Scrophulariaceae (4)	<i>Eremophila forrestii</i> subsp. <i>forrestii</i>		
	<i>Eremophila forrestii</i> subsp. <i>viridis</i>		P3
	<i>Eremophila longifolia</i>		
	<i>Myoporum montanum</i>		
Solanaceae (13)	<i>*Datura leichhardtii</i> subsp. <i>leichhardtii</i>		
	<i>Nicotiana benthamiana</i>		
	<i>Nicotiana occidentalis</i>		
	<i>Nicotiana occidentalis</i> subsp. <i>obliqua</i>		
	<i>Nicotiana occidentalis</i> subsp. <i>occidentalis</i>		
	<i>Solanum albostellatum</i>		P3
	<i>Solanum cataphractum</i>		P3
	<i>Solanum cleistogamum</i>		
	<i>Solanum diversiflorum</i>		
	<i>Solanum gabrielae</i>		
	<i>Solanum horridum</i>		
	<i>Solanum lasiophyllum</i>		
	<i>*Solanum nigrum</i>		
Stylidiaceae (1)	<i>Stylidium weeliwolli</i>		P2
Tamaricaceae (1)	<i>*Tamarix aphylla</i> (WoNS)		
Udoteaceae (1)	<i>Udotea argentea</i>		
Violaceae (1)	<i>Hybanthus aurantiacus</i>		
Zygophyllaceae (6)	<i>Tribulus cistoides</i>		
	<i>Tribulus hirsutus</i>		
	<i>Tribulus occidentalis</i>		
	<i>Tribulus platypterus</i>		
	<i>Tribulus suberosus</i>		
	<i>*Tribulus terrestris</i>		

**Appendix 4 Flora species inventory**

Family	Species	Status
Acanthaceae	<i>Avicennia marina</i>	
Aizoaceae	<i>Trianthema cusackianum</i>	
Aizoaceae	<i>Trianthema triquetrum</i>	
Aizoaceae	<i>Trianthema turgidifolium</i>	
Amaranthaceae	* <i>Aerva javanica</i>	Weed
Amaranthaceae	<i>Alternanthera nana</i>	
Amaranthaceae	<i>Alternanthera nodiflora</i>	
Amaranthaceae	<i>Amaranthus clementii</i>	
Amaranthaceae	<i>Gomphrena ?canescens</i>	
Amaranthaceae	<i>Gomphrena canescens</i>	
Amaranthaceae	<i>Gomphrena cunninghamii</i>	
Amaranthaceae	<i>Gomphrena kanisii</i>	
Amaranthaceae	<i>Ptilotus aevroides</i>	
Amaranthaceae	<i>Ptilotus axillaris</i>	
Amaranthaceae	<i>Ptilotus carinatus</i>	
Amaranthaceae	<i>Ptilotus divaricatus</i>	
Amaranthaceae	<i>Ptilotus exaltatus</i>	
Amaranthaceae	<i>Ptilotus gomphrenoides</i>	
Amaranthaceae	<i>Ptilotus helipteroides</i>	
Amaranthaceae	<i>Ptilotus murrayi</i>	
Amaranthaceae	<i>Ptilotus obovatus</i>	
Amaranthaceae	<i>Ptilotus villosiflorus</i>	
Amaranthaceae	<i>Surreya diandra</i>	
Apocynaceae	<i>Carissa lanceolata</i>	
Arecaceae	* <i>Phoenix dactylifera</i>	Weed
Asteraceae	<i>Angianthus acrohyalinus</i>	
Asteraceae	<i>Centipeda minima</i> subsp. <i>macrocephala</i>	
Asteraceae	<i>Minuria tridens</i>	(VU EPBC Act; P1 DBCA list)
Asteraceae	<i>Pluchea rubelliflora</i>	
Asteraceae	<i>Pterocaulon ?sphacelatum</i>	
Asteraceae	<i>Pterocaulon sphacelatum</i>	
Asteraceae	<i>Rhodanthe humboldtiana</i>	
Asteraceae	<i>Streptoglossa ?adscendens</i>	
Asteraceae	<i>Streptoglossa ?bubakii</i>	
Asteraceae	<i>Streptoglossa ?odora</i>	
Asteraceae	<i>Streptoglossa adscendens</i>	
Asteraceae	<i>Streptoglossa bubakii</i>	
Asteraceae	<i>Streptoglossa liatroides</i>	
Asteraceae	<i>Streptoglossa odora</i>	
Boraginaceae	<i>Ehretia saligna</i>	
Boraginaceae	<i>Heliotropium chrysocarpum</i>	
Boraginaceae	<i>Heliotropium cunninghamii</i>	
Boraginaceae	<i>Heliotropium inexplicitum</i>	
Boraginaceae	<i>Heliotropium ovalifolium</i>	
Boraginaceae	<i>Trichodesma zeylanicum</i>	



Boraginaceae	<i>Trichodesma zeylanicum</i> var. <i>grandiflorum</i>	
Boraginaceae	<i>Trichodesma zeylanicum</i> var. <i>zeylanicum</i>	
Capparaceae	<i>Capparis lasiantha</i>	
Capparaceae	<i>Capparis spinosa</i>	
Chenopodiaceae	<i>Atriplex</i> ? <i>bunburyana</i>	
Chenopodiaceae	<i>Atriplex</i> ? <i>codonocarpa</i>	
Chenopodiaceae	<i>Atriplex bunburyana</i>	
Chenopodiaceae	<i>Atriplex codonocarpa</i>	
Chenopodiaceae	<i>Atriplex vesicaria</i>	
Chenopodiaceae	<i>Dissocarpus paradoxus</i>	
Chenopodiaceae	<i>Dysphania kalpari</i>	
Chenopodiaceae	<i>Dysphania plantaginella</i>	
Chenopodiaceae	<i>Dysphania rhadinostachya</i> subsp. <i>rhadinostachya</i>	
Chenopodiaceae	<i>Enchylaena tomentosa</i>	
Chenopodiaceae	<i>Maireana georgei</i>	
Chenopodiaceae	<i>Maireana planifolia</i>	
Chenopodiaceae	<i>Maireana tomentosa</i>	
Chenopodiaceae	<i>Maireana tomentosa</i> subsp. <i>tomentosa</i>	
Chenopodiaceae	<i>Neobassia astrocarpa</i>	
Chenopodiaceae	<i>Rhagodia eremaea</i>	
Chenopodiaceae	<i>Rhagodia preissii</i> subsp. <i>obovata</i>	
Chenopodiaceae	<i>Salsola australis</i>	
Chenopodiaceae	<i>Sclerolaena bicornis</i>	
Chenopodiaceae	<i>Sclerolaena costata</i>	
Chenopodiaceae	<i>Sclerolaena densiflora</i>	
Chenopodiaceae	<i>Sclerolaena diacantha</i>	
Chenopodiaceae	<i>Sclerolaena uniflora</i>	
Chenopodiaceae	<i>Suaeda arbusculoides</i>	
Chenopodiaceae	<i>Tecticornia auriculata</i>	
Chenopodiaceae	<i>Tecticornia halocnemoides</i> 'ovate seed aggregate'	
Chenopodiaceae	<i>Tecticornia halocnemoides</i> subsp. <i>longispicata</i>	
Chenopodiaceae	<i>Tecticornia halocnemoides</i> subsp. <i>tenuis</i>	
Chenopodiaceae	<i>Tecticornia indica</i> subsp. <i>bidens</i>	
Chenopodiaceae	<i>Tecticornia indica</i> subsp. <i>leiostachya</i>	
Chenopodiaceae	<i>Tecticornia pterygosperma</i> subsp. <i>denticulata</i>	
Chenopodiaceae	<i>Tecticornia</i> sp. (sterile 2)	
Chenopodiaceae	<i>Tecticornia</i> sp. affinity to <i>T. halocnemoides</i> large ovate seed aggregate	
Chenopodiaceae	<i>Tecticornia</i> sp. In early flower	
Chenopodiaceae	<i>Tecticornia</i> sp. sterile 1	
Chenopodiaceae	<i>Tecticornia</i> sp. sterile 4	
Chenopodiaceae	<i>Tecticornia</i> sp. sterile 6	
Chenopodiaceae	<i>Threlkeldia diffusa</i>	
Cleomaceae	<i>Cleome viscosa</i>	
Commelinaceae	<i>Commelina ensifolia</i>	
Convolvulaceae	<i>Bonamia erecta</i>	
Convolvulaceae	<i>Bonamia media</i>	

Convolvulaceae	<i>Bonamia pilbarensis</i>	
Convolvulaceae	<i>Duperreya commixta</i>	
Convolvulaceae	<i>Evolvulus alsinoides</i> var. <i>villosicalyx</i>	
Convolvulaceae	<i>Ipomoea coptica</i>	
Convolvulaceae	<i>Ipomoea muelleri</i>	
Convolvulaceae	<i>Ipomoea pes-caprae</i> subsp. <i>brasiliensis</i>	
Convolvulaceae	<i>Ipomoea</i> sp.	
Convolvulaceae	<i>Operculina aequisejala</i>	
Convolvulaceae	<i>Polymeria ambigua</i>	
Cucurbitaceae	<i>Cucumis melo</i>	
Cucurbitaceae	<i>Cucumis variabilis</i>	
Cucurbitaceae	<i>Cyperus rigidellus</i>	
Cyperaceae	<i>Cyperus vaginatus</i>	
Cyperaceae	<i>Schoenoplectus subulatus</i>	
Euphorbiaceae	<i>Adriana tomentosa</i> var. <i>tomentosa</i>	
Euphorbiaceae	<i>Euphorbia australis</i>	
Euphorbiaceae	<i>Euphorbia biconvexa</i>	
Euphorbiaceae	<i>Euphorbia boophthona</i>	
Euphorbiaceae	<i>Euphorbia coghlanii</i>	
Euphorbiaceae	<i>Euphorbia drummondii</i>	
Euphorbiaceae	<i>Euphorbia myrtoides</i>	
Euphorbiaceae	<i>Euphorbia tannensis</i> subsp. <i>eremophila</i>	
Fabaceae	* <i>Prosopis glandulosa</i> x <i>velutina</i>	Weed (WoNS)
Fabaceae	* <i>Prosopis pallida</i>	Weed (WoNS)
Fabaceae	* <i>Vachellia farnesiana</i>	Weed
Fabaceae	<i>Acacia ampliceps</i>	
Fabaceae	<i>Acacia ampliceps</i> x <i>bivenosa</i>	
Fabaceae	<i>Acacia ancistrocarpa</i>	
Fabaceae	<i>Acacia atkinsiana</i>	
Fabaceae	<i>Acacia bivenosa</i>	
Fabaceae	<i>Acacia citrinoviridis</i>	
Fabaceae	<i>Acacia coriacea</i>	
Fabaceae	<i>Acacia coriacea</i> subsp. ? <i>coriacea</i>	
Fabaceae	<i>Acacia coriacea</i> subsp. ? <i>pendens</i>	
Fabaceae	<i>Acacia coriacea</i> subsp. <i>coriacea</i>	
Fabaceae	<i>Acacia coriacea</i> subsp. <i>pendens</i>	
Fabaceae	<i>Acacia glaucocaesia</i>	
Fabaceae	<i>Acacia inaequilatera</i>	
Fabaceae	<i>Acacia ligulata</i>	
Fabaceae	<i>Acacia pyrifolia</i> ?var. <i>pyrifolia</i>	
Fabaceae	<i>Acacia pyrifolia</i> var. <i>pyrifolia</i>	
Fabaceae	<i>Acacia sclerosperma</i>	
Fabaceae	<i>Acacia sclerosperma</i> subsp. <i>sclerosperma</i>	
Fabaceae	<i>Acacia sericophylla</i>	
Fabaceae	<i>Acacia stellaticeps</i>	
Fabaceae	<i>Acacia synchronicia</i>	
Fabaceae	<i>Acacia tetragonophylla</i>	

Fabaceae	<i>Acacia trachycarpa</i>	
Fabaceae	<i>Acacia tumida</i> var. <i>pilbarensis</i>	
Fabaceae	<i>Acacia xiphophylla</i>	
Fabaceae	<i>Alysicarpus muelleri</i>	
Fabaceae	<i>Crotalaria medicaginea</i> var. <i>neglecta</i>	
Fabaceae	<i>Dichrostachys spicata</i>	
Fabaceae	<i>Erythrina vespertilio</i>	
Fabaceae	<i>Indigofera bovipерda</i> subsp. <i>bovipерda</i>	
Fabaceae	<i>Indigofera colutea</i>	
Fabaceae	<i>Indigofera linifolia</i>	
Fabaceae	<i>Indigofera monophylla</i>	
Fabaceae	<i>Indigofera trita</i>	
Fabaceae	<i>Isotropis atropurpurea</i>	
Fabaceae	<i>Lotus australis</i>	
Fabaceae	<i>Neptunia dimorphantha</i>	
Fabaceae	<i>Petalostylis labicheoides</i>	
Fabaceae	<i>Rhynchosia minima</i>	
Fabaceae	<i>Senna artemisioides</i> subsp. <i>oligophylla</i>	
Fabaceae	<i>Senna ferraria</i>	
Fabaceae	<i>Senna glutinosa</i> subsp. ? <i>glutinosa</i>	
Fabaceae	<i>Senna glutinosa</i> subsp. ? <i>x lueissenii</i>	
Fabaceae	<i>Senna glutinosa</i> subsp. <i>glutinosa</i>	
Fabaceae	<i>Senna glutinosa</i> subsp. <i>pruinosa</i>	
Fabaceae	<i>Senna notabilis</i>	
Fabaceae	<i>Sesbania cannabina</i>	
Fabaceae	<i>Sesbania formosa</i>	
Fabaceae	<i>Swainsona kingii</i>	
Fabaceae	<i>Swainsona pterostylis</i>	
Fabaceae	<i>Swainsona</i> sp.	
Fabaceae	<i>Tephrosia clementii</i>	
Fabaceae	<i>Tephrosia supina</i>	
Frankeniaceae	<i>Frankenia</i> ? <i>ambita</i>	
Frankeniaceae	<i>Frankenia</i> ? <i>pauciflora</i>	
Frankeniaceae	<i>Frankenia ambita</i>	
Gentianaceae	<i>Schenkia clementii</i>	
Goodeniaceae	<i>Goodenia</i> ? <i>armitiana</i>	
Goodeniaceae	<i>Goodenia forrestii</i>	
Goodeniaceae	<i>Goodenia muelleriana</i>	
Goodeniaceae	<i>Goodenia nuda</i>	P4 (DBCA list)
Goodeniaceae	<i>Goodenia prostrata</i>	
Goodeniaceae	<i>Scaevola acacioides</i>	
Goodeniaceae	<i>Scaevola cunninghamii</i>	
Goodeniaceae	<i>Scaevola spinescens</i>	
Haloragaceae	<i>Haloragis gossei</i>	
Lamiaceae	<i>Clerodendrum floribundum</i> var. <i>floribundum</i>	
Lauraceae	<i>Cassytha aurea</i> var. <i>aurea</i>	
Lauraceae	<i>Cassytha capillaris</i>	

Loranthaceae	<i>Amyema preissii</i>	
Malvaceae	* <i>Malvastrum americanum</i>	Weed
Malvaceae	<i>Abutilon cryptopetalum</i>	
Malvaceae	<i>Abutilon ?fraseri</i>	
Malvaceae	<i>Abutilon lepidum</i>	
Malvaceae	<i>Abutilon malvifolium</i>	
Malvaceae	<i>Abutilon</i> sp.	
Malvaceae	<i>Abutilon</i> sp. Pilbara (W.R. Barker 2025)	
Malvaceae	<i>Corchorus laniflorus</i>	
Malvaceae	<i>Corchorus lasiocarpus</i>	
Malvaceae	<i>Corchorus tridens</i>	
Malvaceae	<i>Corchorus walcottii</i>	
Malvaceae	<i>Hibiscus coatesii</i>	
Malvaceae	<i>Hibiscus sturtii</i>	
Malvaceae	<i>Lawrenca viridigrisea</i>	
Malvaceae	<i>Melhania oblongifolia</i>	
Malvaceae	<i>Sida ?arenicola</i>	
Malvaceae	<i>Sida ?sp.</i> Pilbara	
Malvaceae	<i>Sida fibulifera</i>	
Malvaceae	<i>Sida</i> sp. Excedentifolia (J.L. Egan 1925)	
Malvaceae	<i>Sida</i> sp. Pindan (B.G. Thomson 3398)	
Malvaceae	<i>Triumfetta appendiculata</i>	
Malvaceae	<i>Triumfetta clementii</i>	
Malvaceae	<i>Waltheria indica</i>	
Marsileaceae	<i>Marsilea hirsuta</i>	
Myrtaceae	<i>Corymbia candida</i>	
Myrtaceae	<i>Corymbia candida</i> subsp. <i>dipsodes</i>	
Myrtaceae	<i>Corymbia hamersleyana</i>	
Myrtaceae	<i>Eucalyptus</i> sp.	
Myrtaceae	<i>Eucalyptus victrix</i>	
Myrtaceae	<i>Melaleuca argentea</i>	
Myrtaceae	<i>Melaleuca globulifera</i>	
Myrtaceae	<i>Melaleuca glomerata</i>	
Myrtaceae	<i>Melaleuca lasiandra</i>	
Nyctaginaceae	<i>Boerhavia burbridgeana</i>	
Nyctaginaceae	<i>Boerhavia paludosa</i>	
Orobanchaceae	<i>Striga curviflora</i>	
Orobanchaceae	<i>Striga squamigera</i>	
Phyllanthaceae	<i>Phyllanthus maderaspatensis</i>	
Plantaginaceae	<i>Stemodia grossa</i>	
Plantaginaceae	<i>Stemodia kingii</i>	
Plumbaginaceae	<i>Muellerolimon salicorniaceum</i>	
Poaceae	* <i>Cenchrus ciliaris</i>	Weed
Poaceae	* <i>Cenchrus setiger</i>	Weed
Poaceae	<i>Aristida ?holathera</i>	
Poaceae	<i>Aristida contorta</i>	
Poaceae	<i>Chrysopogon fallax</i>	

Poaceae	<i>Cynodon convergens</i>	
Poaceae	<i>Dactyloctenium radulans</i>	
Poaceae	<i>Dichanthium sericeum</i> subsp. <i>humilius</i>	
Poaceae	<i>Diplachne fusca</i> subsp. <i>fusca</i>	
Poaceae	<i>Enneapogon caeruleus</i>	
Poaceae	<i>Eragrostis eriopoda</i>	
Poaceae	<i>Eragrostis falcata</i>	
Poaceae	<i>Eragrostis leptocarpa</i>	
Poaceae	<i>Eragrostis setifolia</i>	
Poaceae	<i>Eragrostis</i> sp.	
Poaceae	<i>Eragrostis tenellula</i>	
Poaceae	<i>Eragrostis xerophila</i>	
Poaceae	<i>Eriachne ?helmsii</i>	
Poaceae	<i>Eriachne benthamii</i>	
Poaceae	<i>Eriachne helmsii</i>	
Poaceae	<i>Eriachne mucronata</i>	
Poaceae	<i>Eulalia aurea</i>	
Poaceae	<i>Spinifex longifolius</i>	
Poaceae	<i>Sporobolus actinocladus</i>	
Poaceae	<i>Sporobolus australasicus</i>	
Poaceae	<i>Sporobolus mitchellii</i>	
Poaceae	<i>Sporobolus virginicus</i>	
Poaceae	<i>Tragus australianus</i>	
Poaceae	<i>Triodia angusta</i>	
Poaceae	<i>Triodia epactia</i>	
Poaceae	<i>Triodia longiceps</i>	
Poaceae	<i>Triodia wiseana</i>	
Poaceae	<i>Whiteochloa ?airoides</i>	
Poaceae	<i>Whiteochloa airoides</i>	
Poaceae	<i>Xerochloa laniflora</i>	
Polygalaceae	<i>Polygala glaucifolia</i>	
Portulacaceae	<i>Portulaca oleracea</i>	
Proteaceae	<i>Grevillea pyramidalis</i>	
Proteaceae	<i>Grevillea wickhamii</i>	
Proteaceae	<i>Hakea chordophylla</i>	
Proteaceae	<i>Hakea lorea</i> subsp. <i>lorea</i>	
Rhizophoraceae	<i>Rhizophora stylosa</i>	
Rubiaceae	<i>Synaptantha tillaeacea</i> var. <i>tillaeacea</i>	
Sapindaceae	<i>Alectryon oleifolius</i> subsp. <i>oleifolius</i>	
Sapindaceae	<i>Diplopeltis eriocarpa</i>	
Scrophulariaceae	<i>Eremophila forrestii</i> subsp. <i>forrestii</i>	
Scrophulariaceae	<i>Eremophila longifolia</i>	
Scrophulariaceae	<i>Myoporum montanum</i>	
Solanaceae	<i>Nicotiana occidentalis</i> subsp. <i>occidentalis</i>	
Solanaceae	<i>Solanum ?horridum</i>	
Solanaceae	<i>Solanum cleistogamum</i>	
Solanaceae	<i>Solanum diversiflorum</i>	

Solanaceae	<i>Solanum horridum</i>	
Solanaceae	<i>Solanum lasiophyllum</i>	
Solanaceae	<i>Solanum phlomoides</i>	
Surianaceae	<i>Stylobasium spathulatum</i>	
Typhaceae	<i>Typha domingensis</i>	
Violaceae	<i>Hybanthus aurantiacus</i>	
Zygophyllaceae	<i>Tribulus hirsutus</i>	

