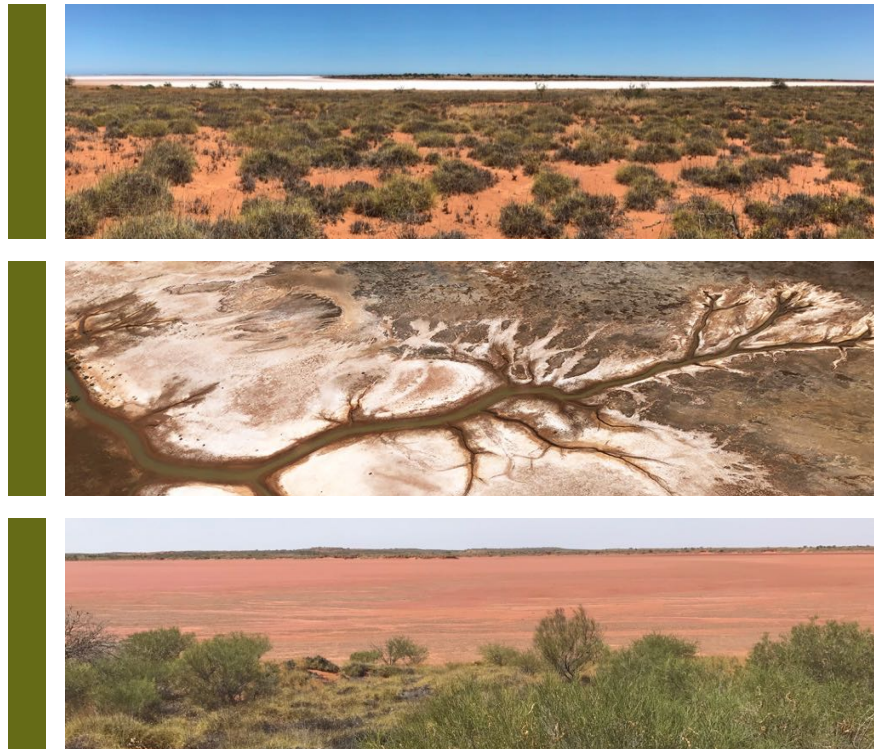




# Ashburton Salt Project Detailed Vegetation and Flora Survey



Prepared for K Plus S Australia

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**Biota**  
Environmental  
Sciences



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# 1.0 Executive Summary

K plus S Salt Australia Pty Ltd (K+S) are evaluating the possibility of developing a greenfield solar salt project (the proposed Ashburton Salt Project), located on the Western Australian coast approximately 40 km southwest of Onslow. This report documents the results of a two-phase detailed botanical survey completed in this study area by a team of Biota botanists.

In the first survey phase, a total of 56 floristic survey quadrats were established and assessed, along with six relevés (unbounded flora sampling sites). In addition, 15 contextual sites were established outside the study area. Targeted searches for flora of conservation significance and weeds were also completed. In the second survey phase, 51 quadrats were resampled along with 14 of the contextual sites. In addition, eight historical quadrats were assessed and targeted searches were undertaken. Further targeted flora searches were also undertaken subsequently.

A total of 18 vegetation types were identified for the study area in five broad landforms: coastal strand, saline mudflats and clay plains, creeklines and drainage areas, sand dunes (coastal and inland), and sand plains. Most of the vegetation was in Very Good to Excellent condition, however there were extensive populations of introduced grasses (*\*Cenchrus* spp.) in some places.

None of the vegetation types represented Threatened Ecological Communities or Priority Ecological Communities. The following units are considered to be of somewhat elevated conservation significance (these units are not particularly restricted or unusual, and would be of local rather than regional significance):

- C1 and C2 comprised vegetation with scattered trees to an open woodland of Coolibah (*Eucalyptus victrix*). Although C1 was degraded through grazing and weed invasion, and C2 sometimes had high levels of weeds, both represent potential Groundwater Dependent Vegetation.
- Three units (S1, S2 and S3) comprise samphire shrublands dominated by *Tecticornia* spp.; such vegetation is poorly represented in the conservation estate and is a high reservation priority for both the Cape Range and Roebourne subregions.

A total of 288 native vascular flora species from 126 genera and 45 families have been recorded from the study area based on all surveys to date.

Five Priority flora taxa were recorded from the study area, with all of the Priority 3 species previously recorded in the Onslow locality:

- Priority 1: *Minuria tridens* (the specimen was in poor condition and was therefore only tentatively identified as *M. tridens* by the WA Herbarium taxonomist, Mike Hislop);
- Priority 3: *Abutilon* sp. Pritzelianum (S. van Leeuwen 5095);
- Priority 3: *Eremophila forrestii* subsp. *viridis*;
- Priority 3: *Stackhousia clementii*; and
- Priority 3: *Triumfetta echinata*.

Given the lack of collecting in the locality, several other species were also identified as reasonable range extensions. Voucher specimens will be submitted to the WA Herbarium for these species, where suitable material is present.

A total of 15 introduced flora species (weeds) have been recorded from the study area: *\*Aerva javanica*, *\*Cenchrus ciliaris*, *\*Cenchrus setiger*, *\*Chenopodium murale*, *\*Flaveria trinervia*, *\*Malvastrum americanum*, *\*Melilotus indicus*, *\*Parkinsonia aculeata*, *\*Passiflora foetida* var. *hispida*, *\*Phoenix dactylifera*, *\*Prosopis pallida*, *\*Setaria verticillata*, *\*Sonchus oleraceus*, *\*Tamarix aphylla* and *\*Vachellia farnesiana*. Three of these species, *\*Parkinsonia aculeata*, *\*Prosopis pallida* and *\*Tamarix aphylla*, are declared pests under the WA Biosecurity and Agriculture Management Act 2007 and are also listed as Weeds of National Significance. In addition, *\*Aerva*

*javanica*, \**Cenchrus ciliaris* and \**Cenchrus setiger* are generally considered to be serious environmental weeds. One additional weed species, \**Momordica balsamina*, was recorded outside the study area during the current surveys.

## 2.0 Introduction

### 2.1 Project Background

K plus S Salt Australia Pty Ltd (K+S) are evaluating the possibility of developing a green field solar salt project (the proposed Ashburton Salt Project), located on the Western Australian coast approximately 40 km southwest of Onslow. A development envelope has been identified to include the solar salt evaporation and crystallisation ponds and associated infrastructure. This area, combined with an associated access road survey area, is hereafter referred to as the study area (Figure 2.1).

### 2.2 Scope and Objectives

Biota Environmental Sciences (Biota) was commissioned to conduct a two-phase Detailed flora and vegetation survey within the study area consistent with the requirements of EPA (2016a). This study is intended for use as a supporting document for the environmental impact assessment of the proposal, which has been referred under Section 38 of the *Environmental Protection Act 1986* (EP Act).

This report documents the methods, results and key findings of both the first phase 'dry season' and second 'wet season' vegetation and flora survey conducted in the Ashburton Salt study area, as well as a subsequent targeted flora search.

Note that the scope of Biota's vegetation and flora survey comprised only the terrestrial habitats in the study area. While this included sampling and mapping of samphire habitat, mangroves were assessed as part of a separate exercise by AECOM.

The specific objectives of the survey were as follows:

1. Undertake a desktop assessment, including database and literature searches, to consolidate all available existing data relevant to the study area.
2. Undertake a dry and wet season field survey to:
  - describe, photograph and map the dominant vegetation units of the terrestrial landscape;
  - assess vegetation condition;
  - identify any vegetation units of conservation significance;
  - compile a list of vascular flora species recorded in the study area;
  - record and photograph any flora of particular conservation significance, including Threatened and Priority species and any other species of interest; and
  - record any introduced flora species (weeds) occurring in the study area.
3. Complete a contextual clustering analysis using site data from both the study area and the surrounding locality to assist with identification of floristic communities present in the study area, including identification of any conservation significant communities;
4. Collate, present and discuss all data from both survey phases, with integration of any historical data as appropriate, with a particular focus on identification of any communities or species of particular conservation significance.

The approach and methodology for the survey were developed with consideration of the following:

- EPA "*Technical Guidance – Flora and Vegetation Surveys for Environmental Impact Assessment*" (EPA 2016a); and
- EPA "*Environmental Factor Guideline: Flora and Vegetation*" (EPA 2016b).

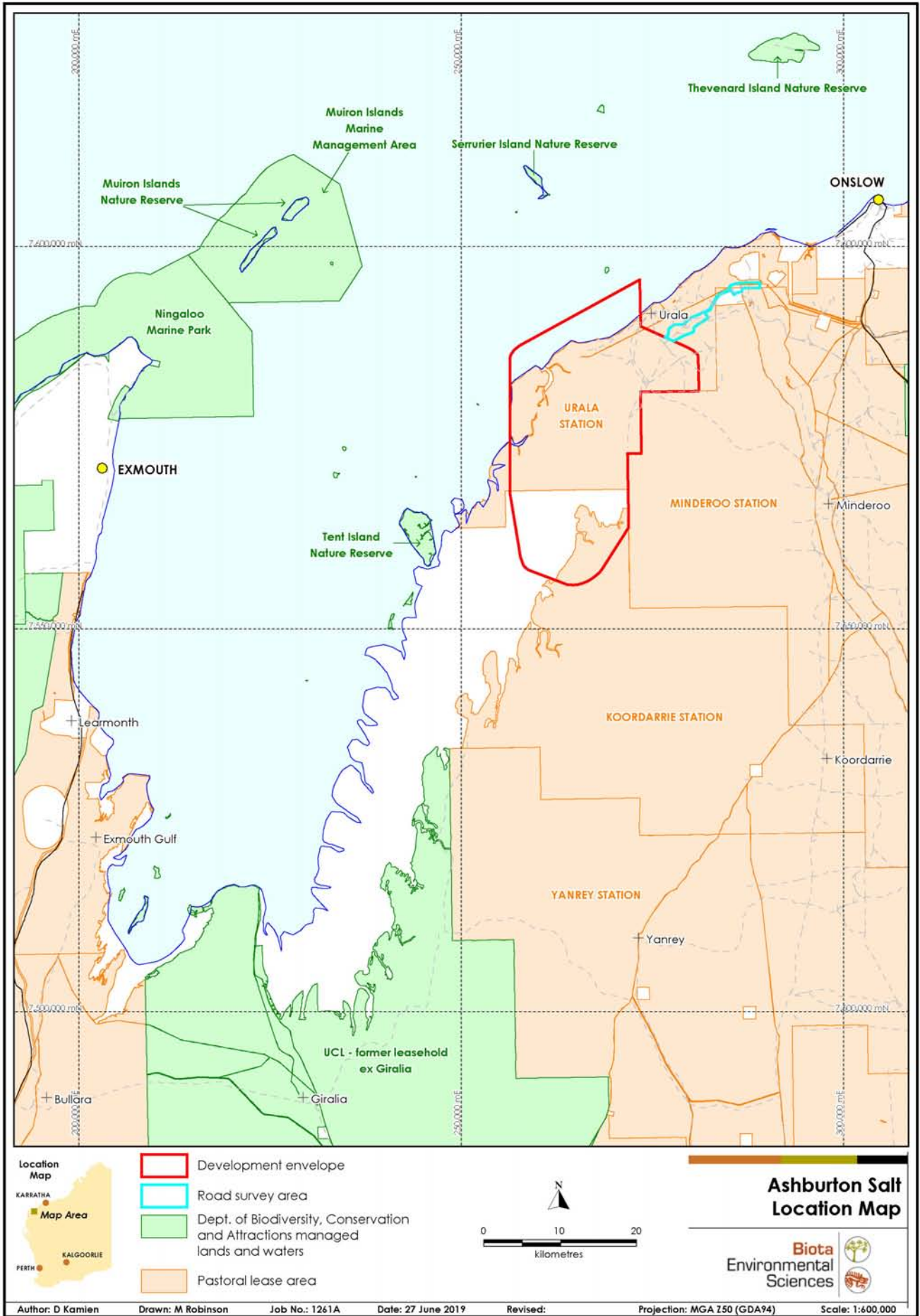


Figure 2.1: Location of the Ashburton Salt Project study area.

## 3.0 Methodology

### 3.1 Desktop Review

A desktop review was undertaken to identify features of conservation significance that had already been recorded within the study area or that were known from the broader locality. Further information regarding the framework for conservation significance ranking of communities and species in WA is presented in Appendix 1. The review considered regional information, previous biological surveys in the locality, and the results of various database searches, as discussed in the following sections.

#### 3.1.1 Database Searches

The following databases were searched to assist in the determination of botanical features of significance that may potentially be relevant to the study area:

1. NatureMap<sup>1</sup> was searched to identify flora species that had previously been recorded in the locality. This database is the most comprehensive source of information on the distribution of WA's flora, and comprises records from the WA Threatened and Priority Flora Database and the WA Herbarium Specimen Database (both maintained by the Department of Biodiversity, Conservation and Attractions (DBCA)).
2. A specific search of the DBCA's Threatened and Priority Flora Database was also commissioned to confirm the Threatened and Priority flora species known from the locality.
3. The DBCA's database of Threatened Ecological Communities (TECs), Priority Ecological Communities (PECs) and Environmentally Sensitive Areas (ESAs) was searched to identify significant communities known to occur in the locality.
4. The Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) Protected Matters Database was searched to identify conservation significant communities and flora species that may occur in the locality.

Searches 2 and 3 above were conducted using a buffer of 40 km around the study area boundary. Due to the large size of the study area, two separate searches were conducted for Searches 1 and 4 (NatureMap and the Protected Matters Database), using a buffer of 40 km around two points within the study area – 1) 114° 42' 39" E, 22° 00' 42" S; and 2) 114° 47' 59" E, 21° 52' 12" S. Results are provided in Appendix 2 for those searches that were conducted using publicly available tools (i.e. the NatureMap and EPBC Act searches).

In addition, outputs from Biota's internal database of conservation significant species and weeds from previous studies in the locality were reviewed.

#### 3.1.2 Literature Review

Published and unpublished reports relevant to the study area were reviewed. These included several regional-scale reports and datasets, including a summary of information for the biological subregion (Kendrick and Mau 2003), land systems mapping (van Vreeswyk et al. 2004) and vegetation description and mapping by Beard (1975a, 1975b).

Additionally, a number of botanical surveys previously undertaken in the locality were reviewed (see Figure 3.1 and Section 4.7).

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<sup>1</sup> <https://naturemap.dbca.wa.gov.au>

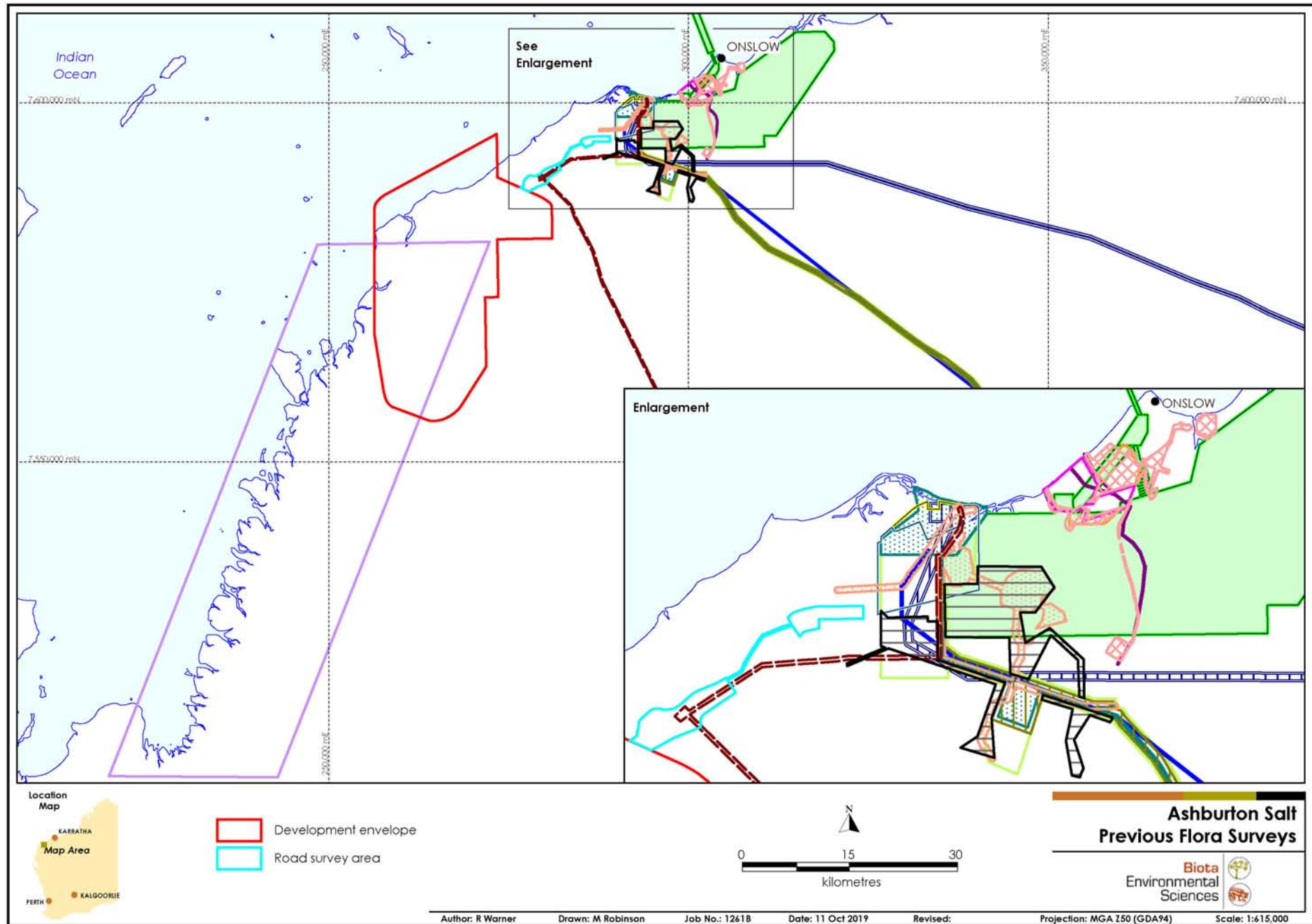


Figure 3.1: Key previous flora surveys that were reviewed for the current study (see legend overleaf).

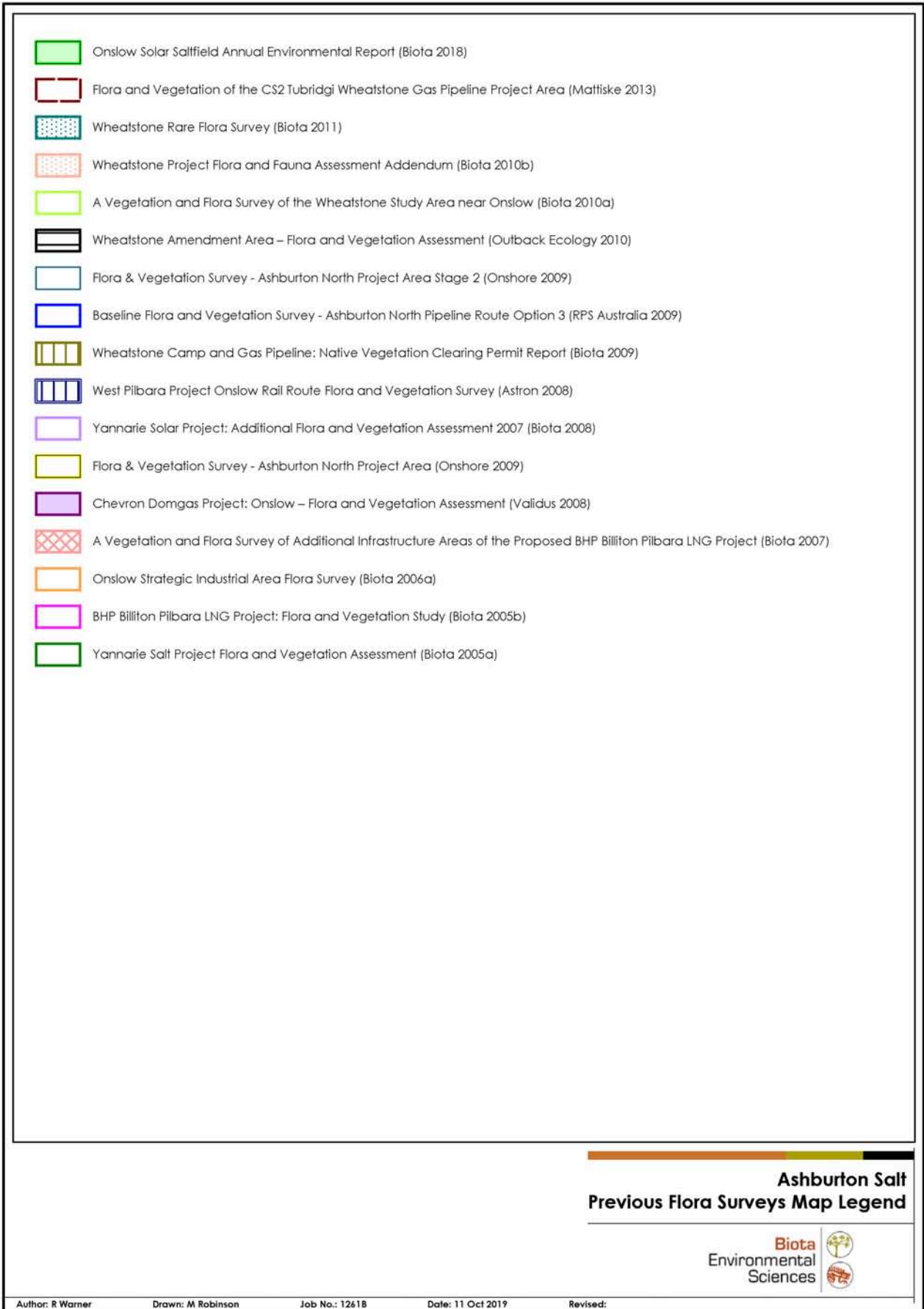


Figure 3.2: Legend for the map of key previous flora surveys that were reviewed for the current study.

### 3.1.3 Ranking of Conservation Significant Flora

The results from the literature review and database searches were used to compile a list of conservation significant flora species that had previously been recorded from the locality. The likelihood that each species would occur in the study area was then assessed using the rankings and criteria provided in Table 3.1. Through the remainder of this report, the term “close proximity” has been defined as being within 20 km of the study area, while the broader “locality” comprises the area up to 40 km from the study area.

**Table 3.1: Ranking system used to assign the likelihood that a species would occur in the study area.**

Rank	Criteria
Recorded	1. The species has been previously recorded in the study area.
Likely to occur	1. There are existing records of the species in close proximity to the study area (within 20 km); and <ul style="list-style-type: none"> <li>• the species is strongly linked to a specific habitat, which is present in the study area; or</li> <li>• the species has more general habitat preferences, and suitable habitat is present.</li> </ul>
May potentially occur	1. There are existing records of the species from the locality (within 40 km), however <ul style="list-style-type: none"> <li>• the species is strongly linked to a specific habitat, of which only a small amount is present in the study area; or</li> <li>• the species has more general habitat preferences, but only some suitable habitat is present.</li> </ul> 2. There is suitable habitat in the study area, but the species is recorded infrequently in the locality.
Unlikely to occur	1. The species is linked to a specific habitat, which is absent from the study area; or 2. Suitable habitat is present, however there are no existing records of the species from the locality despite reasonable previous search effort in suitable habitat; or 3. There is some suitable habitat in the study area, however the species is very infrequently recorded in the locality.
Would not occur	1. The species is strongly linked to a specific habitat, which is absent from the study area; and/or 2. The species' range is very restricted and would not include the study area.

Two rankings have been provided:

1. An initial assessment was made during the desktop review (see Appendix 3). This was based on consideration of the overall distribution of the species, the proximity of the study area to known populations, the reliability and age of any historical records, and, if the species was known to be linked to particular habitats, whether suitable habitat appeared to be present in the study area based on inspection of aerial photography and/or existing information.
2. The likelihood rankings were subsequently revised as necessary based on the findings of the field survey (see Appendix 3). Where the initial and final likelihood rankings were different, the reason was provided.

## 3.2 Field Survey

### 3.2.1 Survey Team

The Phase 1 field survey was conducted by a team of four Biota botanists over 10 days (October 31 to November 9, 2018). Excluding mobilisation and demobilisation time, a total of 36 person days were spent on the Phase 1 survey. Tasks completed during this phase included vegetation mapping, establishment of quadrats and relevés, and rare flora searches.

The Phase 2 field survey was conducted by a team of four Biota scientists (three botanists and one zoologist) over nine days (April 8 to April 16, 2019). Excluding mobilisation and demobilisation



time, a total of 32 person days were spent on the Phase 2 survey. This phase focused on resampling of quadrats and rare flora searches.

Following above-average rainfall in winter 2019, it was considered opportune to undertake some additional targeted searches for conservation significant flora and annual flora that may not have been present during the two earlier surveys. Two Biota botanists undertook these targeted searches over two days (August 26 and 27, 2019).

Details of the field team members and their roles in the current study are provided in Table 3.2.

**Table 3.2: Summary of personnel involved in the flora and vegetation surveys.**

Name	Position at Biota	Qualification	Years of Experience	Survey Role	Flora Licence No.
Michi Maier (Phase 1 only)	Director / Principal Botanist	BSc. Hons	27	Project Director Quadrat sampling Vegetation mapping Rare flora searches	SL012300
Rachel Warner	Principal Environmental Scientist / Botany Manager	BSc. Hons	12	Project Manager Quadrat sampling Rare flora searches	SL012302, FB2000036
Scott Werner	Senior Botanist	BSc. Hons	8	Quadrat sampling Rare flora searches	SL012304, FB2000038
Rebecca Mason	Botanist	BSc.	7	Quadrat sampling	SL012205, FB2000035
Jacinta King (Phase 2 only)	Zoologist	BSc. Hons	7	Quadrat sampling	NA
Pierre-Louis de Kock	Senior Botanist	BSc.	12	Rare flora searches	FB62000034

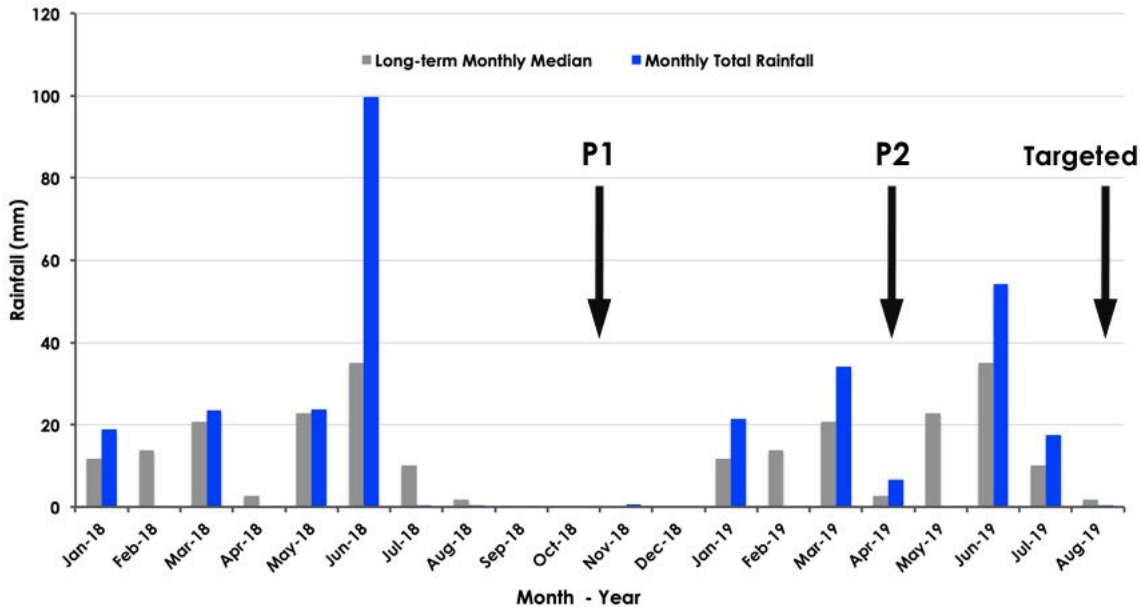
### 3.2.2 Survey Timing and Conditions

The weather conditions preceding a field survey can directly impact the number and type of flora species that are recorded from an area. Total monthly rainfall data were sourced from the Bureau of Meteorology (BoM) weather station at Onslow Airport WA (station number 5017). These data were then compared with the long-term (1940-2018) median data from the same station (see Figure 3.3).

The total rainfall received in the six months prior to the Phase 1 survey (May to October 2018) was 124.6 mm, which is almost twice the long-term median for this period (69.8 mm). Much of this fell in June (99.8 mm). The total rainfall received in the three months prior to this survey (August to October 2018) was negligible (0.6 mm), which is similar to the long-term median for this period (2.0 mm). Despite the high rainfall in June, low rainfall in the subsequent months led to a mostly typical dry season at the time of the survey, with unfavourable conditions for the collection of most annual and cryptic perennial flora species. However, several annual daisy species (family Asteraceae) were present, which is unusual for the dry season.

The total rainfall received in the six months prior to the Phase 2 survey was 56.2 mm, which is similar to the long-term median for this period (46.2 mm). Most of this rainfall fell in the three months prior to the survey, however conditions in the study area were considered sub-optimal for sampling. It is possible that less rainfall fell in the Ashburton Salt study area than at the Onslow Airport station, given the sporadic nature of rainfall in the locality.

The targeted searches in August 2019 followed a total of 72 mm of rainfall in June-July, which is approximately 60% higher than the median for this period. Conditions during this survey were relatively good, although still somewhat dry, which is a typical characteristic of the locality.



**Figure 3.3:** Total monthly rainfall from January 2018 to August 2019 compared to the long-term monthly median rainfall (Onslow Airport WA). Arrows indicate survey timing.

### 3.2.3 Floristic Data Collection: Assessment of Quadrats and Relevés

Indicative sampling locations were selected prior to the Phase 1 field survey. The study area boundaries were overlain on aerial imagery, and sampling sites were then selected based on the broad habitats and vegetation types apparent. Once in the field, the actual locations of the sampling sites were adjusted as necessary (e.g. to be placed in an area more representative of the broader vegetation unit). Locations of previously sampled sites situated in the study area (and the vegetation units they related to) were taken into consideration when selecting locations for new sampling sites.

Sampling sites were established as either:

1. **Quadrats:** bounded floristic sampling sites. The standard for the Carnarvon and Pilbara bioregions comprises a 30 m x 30 m and 50 m x 50 m square (or a modified shape with an equivalent area), respectively. The latter was considered more appropriate, with 50 m x 50 m quadrats established. Quadrats were measured using optical squares and measuring tapes, and permanently marked using steel fence droppers at each corner; or
2. **Relevés:** unbounded floristic sampling sites with a similar search area to a quadrat. All relevés were thoroughly surveyed for flora, but were not permanently marked. Relevés were used within a section of the study area that intersected the Australian Gas Infrastructure Group's (AGIG) Tubridgi gas storage facility, where the insertion of fence droppers was prohibited. Relevés were also used occasionally outside this area, to support the vegetation mapping.

During the 2018 Phase 1 field survey, a total of 56 quadrats were established and assessed in the study area, along with eight relevés. In addition, 15 contextual quadrats were established outside the study area and assessed.

During the 2019 field survey, 51 of the Phase 1 quadrats and 14 of the Phase 1 contextual quadrats were resampled. In addition, eight unmarked quadrats from a previous survey (STR01-STR08: Biota 2008) were resampled.

The following parameters were recorded for all quadrats and relevés sampled:

- locations using MGA coordinates (WGS84 datum, Zone 50K,  $\pm 5$  m) were recorded with a handheld Global Positioning System (GPS) unit; coordinates were recorded for all four corners of a quadrat, and at least the central point of a relevé;

- a digital photograph of each site (usually taken from the northwest corner of a quadrat or the central point of a relevé);
- habitat description;
- broad soil type;
- fire history (approximate time since last fire, where applicable);
- vegetation description based on the height and estimated percent foliar cover of dominant species (see Appendix 4);
- vegetation condition ranking according to the scale developed by Trudgen (1988), as presented in EPA (2016a) (see Appendix 4); and
- the estimated percent foliar cover of each flora species present within the quadrat, or in the vicinity of the relevé (within a ~30 m radius of the centre point).

Quadrats established within the study area during the current survey were assigned the prefix 'ASH' and relevés were assigned the prefix 'ASH-REL', followed by consecutive numbers. Contextual quadrats were assigned the prefix 'ASHC', followed by consecutive numbers. Locations of sampling sites are provided in Appendix 5 and described in overview in Section 4.7. Raw data from the current quadrats and relevés are summarised in Appendix 6.

### 3.2.4 Vegetation Description and Mapping

Vegetation maps were created and consolidated using Geographical Information System (GIS) software (QGIS and MapInfo Professional), and subsequently populated with point locations of sampling sites, mapping notes, conservation significant flora and weeds. All maps in this report were produced by Melissa Robinson (Senior GIS Cartographer, Biota) and Paul Sawers (GIS Manager, Biota), using MapInfo Professional.

Field vegetation descriptions were based on the height and estimated percent foliar cover of dominant species at the sub-association level (level VI as per the National Vegetation Information System; NVIS)<sup>2</sup> (see Appendix 4). The descriptions were collected during the quadrat and relevé sampling, and also through the recording of mapping notes (brief notes recorded during the foot traverses through the study area).

The vegetation descriptions were then compared and grouped by similarity; descriptions that were considered alike shared a suite of perennial species with a similar range of percent foliar cover values. These similar descriptions were then used to generate broader, representative vegetation units for the study area, defined at approximately the association level (Level V of the NVIS<sup>3</sup>). Although some of the vegetation units were initially defined in the field, the majority of the vegetation mapping was completed in the office following the fieldwork. Field data and aerial imagery were reviewed to determine boundaries of vegetation associations, which were then mapped to an appropriate scale.

Each vegetation unit mapped for this assessment was given two unique codes:

1. A detailed alphabetic code represented the dominant flora species from the tallest to lowest stratum. Species names were abbreviated to capital letter(s) for the genus, followed by lower case letter(s) for species, with multiple letters used where necessary (e.g. *Eucalyptus victrix* = Ev; *Triodia epactia* = Te).
2. To aid interpretation, each vegetation unit was also assigned a simple alphanumeric code as a unique precursor to the species-driven code. This was a short string comprising a character

<sup>2</sup> Level VI of the NVIS Information Hierarchy, or sub-association level, comprises the dominant growth form, height, cover and species (5 species) for all layers/sub-strata.  
<http://www.environment.gov.au/erin/nvis/publications/avam/section-2-1.html#hierarchy>

<sup>3</sup> Level V of the NVIS Information Hierarchy, or association level, comprises the dominant growth form, height, cover and species (3 species) for the three traditional strata. (i.e. upper, mid and ground).

representing the broad landform group (i.e. 'B' for beach strand, 'S' for saline flats, 'C' for creeks and drainage areas, 'P' for plains, and 'D' for dunes), followed by a number sequence.

The codes and a description of each vegetation unit are presented in Section 5.0.

Once the vegetation associations were defined, they were compared against the published descriptions of TECs and PECs to determine whether any of the vegetation associations in the study area corresponded to listed community types.

Similar to mapping of vegetation units, mapping of vegetation condition was completed in the office. Field data (site data, mapping notes, vegetation boundaries and locations of weeds) and aerial imagery were used to determine the boundaries of areas of differing condition, which were then mapped at an appropriate scale. Vegetation condition was ranked using the scale developed by Trudgen (1988) (see Appendix 4).

### 3.2.5 Searches for Conservation Significant Flora and Weeds

Targeted, non-systematic searches were conducted on foot in areas considered to be potential habitat for conservation significant flora (i.e. Threatened and Priority listed species). The routes of the foot traverses intersected all major vegetation/habitat units in the study area (see Appendix 5), and survey effort was increased in areas that were recognised as having a high potential to support conservation significant or restricted species (e.g. areas of skeletal sandstone, dunes, drainage lines, etc.) The distance between observers varied depending on the terrain.

Locations of species of conservation significance or unknown taxa were recorded using a handheld GPS unit (WGS84 datum). The number of individuals and extent of the population were also recorded for each location, along with the habitat and associated species.

Locations of introduced flora species (weeds) were also recorded during the foot traverses, along with an estimate of their population size. However, given the extensive and widespread populations of several weed species in the study area (in particular, *Cenchrus* spp. and *Vachellia farnesiana*), no attempt was made to record every location encountered; rather, indicative locations were recorded and general notes were made.

## 3.3 Specimen Identification, Nomenclature and Data Management

Common taxa that were well known to the survey botanists were confirmed in the field. A voucher specimen was collected if the taxon was either difficult to determine without closer examination, belonged to a recognised species complex, was poorly collected or otherwise unusual, or was in very good condition and considered useful to submit to the WA Herbarium. Each voucher specimen was assigned a unique internal code to facilitate tracking of data. Specimens were pressed in the field and then returned to Perth for further examination and confirmation.

Voucher specimens were identified by Biota botanists using flora keys, consulting appropriate publications and checking reference collections. The majority of these determinations were confirmed by Pierre-Louis de Kock (Senior Botanist/Specialist Taxonomist) and Michi Maier (Principal Botanist/Director), however the following specialists are gratefully acknowledged for their assistance:

- Malcolm Trudgen (an expert on flora of the Pilbara and Carnarvon bioregions) was consulted to provide advice and identify various unusual or difficult specimens, including confirmation of specimens of the Priority 3 *Abutilon* sp. Pritzelianum (S. van Leeuwen 5095).
- Mike Hislop (identification botanist at the WA Herbarium) identified specimens of the Priority 1 *Minuria tridens* and Priority 3 *Eremophila forrestii* subsp. *viridis*, as well as several specimens of other taxa (*Eragrostis falcata*, *Gnephosis brevifolia*, *Indigofera chamaeclada* subsp. *pubens*, *Melaleuca bracteata* (from outside the study area), *M. glomerata* and *Swainsona pterostylis*).

- Two specialist taxonomists at the WA Herbarium, Kelly Shepherd and Steve Dillon, were also consulted to provide advice on the *Tecticornia* specimens and a *Euphorbia* specimen, respectively.
- Frank Obbens (Bushtech Consultancy) determined a specimen of *Calandrinia polyandra*.

All data from the current survey were entered into an Access database structure held at Biota (the Site Species Database, developed by Ted Griffin at the request of Malcolm Trudgen of M.E. Trudgen and Associates).

A full flora species list is provided in Appendix 7. Nomenclature and conservation significance rankings used in this report are consistent with the current listing of flora recognised by the WA Herbarium on FloraBase<sup>4</sup> at the time of preparation of this report.

## 3.4 Analysis

### 3.4.1 Sampling Adequacy

Plots of species accumulation curves can be used to assess sampling adequacy. When a survey has sampled an adequate proportion of the floristic assemblage, the curve should plateau and approach asymptote. PRIMER v6 (Clarke and Gorley 2006) was used to calculate smoothed species accumulation curves based on 999 random permutations of the species data; only quadrat and relevé data were used (opportunistic records were excluded).

Species accumulation curves alone cannot be reliably used to extrapolate predicted species richness for future biological sampling. In order to estimate asymptotic richness (i.e. an extrapolation of species richness) for the incidence data (i.e. presence, rather than abundance data), the Chao 2 Mean and ICE Mean estimators were calculated using EstimateS (Colwell 2013).

### 3.4.2 Floristic Analysis

To assist with placing the vegetation types from the study area into a broader regional context, a hierarchical clustering analysis was conducted in PRIMER v6 (Clarke and Gorley 2006) to investigate the similarity of sampling sites based on their floristic composition. The floristic analysis for the current study utilised a single data set derived from sites sampled in the study area, together with sites completed for surveys up to 100 km southwest and 150 km northeast. Only thoroughly sampled quadrats and relevés were included in the data set; sites with incomplete data and recently burnt sites were excluded.

The data set incorporated the following 493 sites:

- 87 sites sampled in the study area and surrounds during the current surveys in 2018-2019;
- 50 sites from the Yannarie Solar Saltfield project (Biota 2005a), distributed from the southern boundary of the current study area up to 55 km southwest; data from eight additional sites in the southern section of the current study area were incorporated as "Phase 1" data for the relevant Biota sites listed above (STR01-STR08);
- 41 sites from Giralia Station (Biota unpubl. data), 55-100 km southwest of the southern end of the study area;
- 96 sites from Wheatstone (Biota 2010a), distributed over a range of 70 km extending from 9 km northeast of the eastern end of the access road survey area to 80 km east of the southern end of the study area;
- 11 sites from the Onslow Industrial Area (Biota 2006a), 13-17 km northeast of the eastern end of the access road survey area;
- 12 sites from the Onslow Salt study area (Biota unpubl. data), distributed between 15 – 25 km northeast of the eastern end of the access road survey area;

<sup>4</sup> <http://florabase.dpaw.wa.gov.au>

- 49 sites sampled for the Chevron Domgas Project (Validus 2008), distributed between 16 km northeast and 15 km southeast of the eastern end of the access road survey area;
- six sites from the Onslow Townsite Strategy (ENV 2011), distributed between 16 – 20 km northeast of the eastern end of the access road survey area;
- 42 sites from the BHP Billiton Pilbara LNG site at Onslow (Biota 2005b), distributed between 22 km northeast and 14 km southeast of the eastern end of the access road survey area;
- 57 sites from the Mesa A Northern Transport Corridor (Biota 2006b), 95-150 km east of the eastern end of the access road survey area;
- 30 sites from the Mesa A Southern Transport Corridor (Biota unpubl. data), 105-150 km east of the eastern end of the access road survey area; and
- 12 sites from the 2016 monitoring survey of the Mesa A Sand Sheet PEC (Biota 2016), distributed between 102 – 106 km east of the eastern end of the access road survey area.

For sites that had been sampled twice, data from the two phases were merged; where cover values differed between phases, the higher value was included.

A combined species list was generated from all sites in the data set, and reviewed for errors and inconsistencies. Old nomenclature was updated, and taxon names and records were then rationalised as follows:

- Parasitic mistletoes (*Amyema*, *Diplatia* and *Lysiana* species) were removed, along with records of fungi.
- Taxa that could potentially refer to more than one entity across different projects (e.g. "*Euphorbia* sp.") were removed.
- Where taxa were considered likely to refer to the same entity, or where identifications may vary between projects, these were merged (e.g. records of *Triodia* "*basedowii*" were treated as *Triodia glabra*). Where two or more such taxa were present within one site, the cover values were summed.
- Species that were present at only single sites were also removed to reduce 'noise' in the data set.
- Weeds were removed with the exception of *\*Cenchrus ciliaris*, *\*Prosopis pallida* and *\*Vachellia farnesiana*, which were dominant in the vegetation at some sites.

The final species list included 302 entities; taxa that were omitted or merged are listed in Table 1 in Appendix 11.

Two data sets were then prepared:

1. The first included all species (annual and perennial).
2. The second excluded annual and weakly perennial species, to mitigate the effect of sampling in poor seasonal conditions. This left only those perennial species that would be expected to be recorded at most times of year. In this data set, all weed species were also removed.

Two analyses were then run for each data set, using:

1. Percent cover data (square-root transformed); and
2. Presence-absence data.

Finally, separate analyses were run using only those sites sampled by the current surveys, to mitigate any effects of sampling in different seasons.

In each case, the Bray-Curtis measure of similarity was used to produce a similarity matrix and the group average method cluster analysis was used to determine floristic groups. Statistically different groups were identified through similarity profile analysis (SIMPROF). The similarity percentage test (SIMPER) was used to determine which species contributed most to the similarities between groups.

Results were investigated through outputs including dendrograms (tree diagrams) of site similarity, and Non-metric Multi-Dimensional Scaling plots (NMDS plots). Selected inputs and outputs from the analysis are provided in Appendix 11. Due to the size of the input data set and output dendrogram, these have not been provided in full in this report, however they have been included in the data supply for this project.

### 3.5 Limitations of the Study

The results of the field surveys provide a good representation of the flora and vegetation of the study area and its conservation values. However, there are limitations to this study that must be considered when reviewing and applying the results detailed in this report. As per the EPA's Technical Guidance for botanical surveys for EIA (EPA 2016a), potential constraints and consequent limitations of this assessment are summarised in Table 3.3.

**Table 3.3: Potential constraints and limitations of the field surveys.**

Potential Constraint	Statement of Limitations																																
1. Availability of contextual information at a regional and local scale	The area around Onslow has been surveyed extensively, and some studies have been completed in the broader locality. A large number of unpublished reports were considered as part of the desktop review. Publicly available databases of rare species and communities' information were also searched, as were private company databases. Whilst the current survey adds considerable new data specific to the study area, contextual information is not considered to be a particular limiting factor for this study.																																
2. Competency/ experience of the team carrying out the survey, including experience in the bioregion surveyed	The field personnel were suitably qualified to identify flora, with at least one botanist in each team of two having a minimum of 8 years experience in the Pilbara bioregion, and with a history of conducting regular flora surveys in the Onslow locality (see Section 3.2.1). Additional assistance was sought as required from specialist external taxonomists (see Section 3.3). There were therefore no limitations due to experience of personnel.																																
3. Proportion of flora recorded and/or collected, any identification issues	A total of 289 native vascular flora species from 126 genera and 45 families have been recorded from the study area based on all survey work to date, along with 15 weed species. Almost all of the flora specimens collected during the current field surveys (>92%) were of sufficient quality to be fully determined. Fungi and non-vascular flora (algae, mosses and liverworts) were not sampled, which is consistent with the current accepted level of effort for a survey of this type and scale.  The proportion of flora recorded was not considered to be a limitation.																																
4. Appropriate area fully surveyed (effort and extent)	A detailed survey as described by EPA (2016a) was considered appropriate to address the requirements for EIA of the study area. A total of 18 vegetation types were described and mapped. These were supported by sampling of 64 quadrats and eight relevés inside the study area, with 15 contextual quadrats sampled outside. Most of the vegetation types were sampled with at least the three sites recommended in EPA (2016a), with the exception of units that were extensively degraded or very small in size. The seven vegetation types that accounted for most of the study area were actually sampled in excess of EPA guidance (especially unit P1): <table border="1"> <thead> <tr> <th>Vegetation Type</th> <th>Area (ha)</th> <th>Proportion of Study Area</th> <th>No. of Quadrats</th> </tr> </thead> <tbody> <tr> <td>P1</td> <td>8,535.0</td> <td>38.4%</td> <td>24</td> </tr> <tr> <td>P2</td> <td>3,526.1</td> <td>15.8%</td> <td>3</td> </tr> <tr> <td>P4</td> <td>2,800.9</td> <td>12.6%</td> <td>9</td> </tr> <tr> <td>C3</td> <td>1,447.4</td> <td>6.5%</td> <td>4</td> </tr> <tr> <td>S3</td> <td>1,150.5</td> <td>5.2%</td> <td>7</td> </tr> <tr> <td>C2</td> <td>681.2</td> <td>3.1%</td> <td>3</td> </tr> <tr> <td>D1</td> <td>646.2</td> <td>2.9%</td> <td>3</td> </tr> </tbody> </table> The exception above, vegetation type P2, was not sampled in excess of guidance as it was largely degraded by erosion and weed invasion. Together, these 7 vegetation types represent 84% of the study area. Overall, by area, 93.5% of the vegetation types were sampled with at least 3 quadrats, with the remaining units being small in extent or degraded, as outlined above. The study area is therefore considered to have been appropriately sampled.	Vegetation Type	Area (ha)	Proportion of Study Area	No. of Quadrats	P1	8,535.0	38.4%	24	P2	3,526.1	15.8%	3	P4	2,800.9	12.6%	9	C3	1,447.4	6.5%	4	S3	1,150.5	5.2%	7	C2	681.2	3.1%	3	D1	646.2	2.9%	3
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D1	646.2	2.9%	3																														

Potential Constraint	Statement of Limitations
5. Access restrictions within the study area	<p>The northern section of the study area contained a reasonable network of established tracks, most of which were in good condition. Given the size of the study area, most survey sites were established relatively close to these tracks. A helicopter was available during the field surveys and enabled access to all other sections of the study area.</p> <p>Access to the study area was therefore not considered to be a limitation.</p>
6. Survey timing, rainfall, season of survey	<p>Both the Phase 1 and Phase 2 field surveys followed relatively poor rainfall. Although the Phase 2 survey was timed appropriately to follow the typical 'wet season', and rainfall received in 2019 was similar to the median, conditions were not favourable for recording annual and cryptic perennial species (see Section 3.2.2). The additional rare flora searches conducted in August 2019 were undertaken in optimal conditions.</p> <p>Although the lack of rainfall is a limitation to the recording of possible annual and cryptic perennial species, the current study is considered to provide an adequate representation of the flora values of the study area. It should also be noted that even if annual or cryptic perennial species were present but not recorded due to the lack of favourable conditions, it is unlikely that such species would be restricted to the study area, given that the habitat types present are widespread in the local area and present within the broader region.</p> <p>Given that the habitats present in the study area are not unique, and any possible annual and cryptic perennial species present but not recorded are unlikely to be restricted to the study area, the rainfall conditions preceding the surveys are not considered a limitation to the Environmental Impact Assessment.</p>
7. Disturbance that may have affected the results of survey such as fire, flood or clearing	<p>Small areas of clearing (including tracks, and gas / pastoral infrastructure) were present throughout the study area; these were not surveyed. Disturbance is not otherwise considered to be a limitation for the study.</p>



## 4.0 Desktop Assessment

### 4.1 IBRA Bioregion and Subregion

The Interim Biogeographic Regionalisation of Australia (IBRA7) recognises 89 bioregions for Australia (Department of the Environment and Energy 2019). The study area lies within the Cape Range subregion of the Carnarvon bioregion (CAR). It is also situated near the western boundary of the Roebourne subregion of the Pilbara bioregion (PIL).

The Cape Range subregion (CAR1) is 2,547,911 ha and is described as:

*“Cape Range and Giralia dunefields form the northern part of Carnarvon Basin. Rugged tertiary limestone ranges and extensive areas of red aeolian dunefield, Quaternary coastal beach dunes and mud flats. Acacia shrublands over Triodia on limestone (Acacia stuartii or A. bivenosa) and red dunefields, Triodia hummock grasslands with sparse Eucalyptus trees and shrubs on the Cape Range. Extensive hummock grasslands (Triodia) on the Cape Range and eastern dune-fields. Tidal mudflats of sheltered embayments of Exmouth Gulf support extensive mangroves. Beach dunes with Spinifex communities. An extensive mosaic of saline alluvial plains with samphire and saltbush low shrublands along the eastern hinterland of Exmouth Gulf. Islands of the Muiron, Barrow, Lowendal and Montebello groups are limestone-based. Climate is arid, semi-desert to sub-tropical climate, with variable summer and winter rainfall. Cyclonic activity can be significant, and cyclonic systems may affect the coast and hinterland annually” (Kendrick and Mau 2003).*

The Roebourne subregion (PIL4) is 2,008,983 ha and is described as:

*“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 spp. 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. Climate is arid (semi-desert) tropical with highly variable rainfall, falling mainly in summer. Cyclonic activity is significant, with several systems affecting the coast and hinterland annually” (Kendrick and Stanley 2003).*

### 4.2 Land Systems

Land systems mapping covering the study area has been prepared by Agriculture WA (Payne et al. 1987, 1988, van Vreeswyk et al. 2004). The study area intersects four land systems (Dune, Littoral, Onslow and Yankagee), as summarised in Table 4.1 and shown in Figure 4.1. All four land systems are widespread in the locality.

**Table 4.1: Land systems intersected by the study area.**  
(Data from Payne et al. 1987, 1988, van Vreeswyk et al. 2004).

Land System	Description	Total Area of Land System in the Cape Range and Roebourne Subregions (ha)	Area of Land System in the Study Area (ha)	Percentage of Total Land System that Occurs in the Study Area (%)
Dune (RGEDUN)	Dune fields supporting soft spinifex grasslands	43,986.6	4,003.7	9.1%
Littoral (RGELIT)	Bare coastal mudflats with mangroves on seaward fringes, samphire flats, sandy islands, coastal dunes and beaches	354,181.4	30,054.8	8.5%
Onslow (RGEONS)	Undulating sandplains, dunes and level clay plains supporting soft spinifex grasslands and minor tussock grasslands.	86,606.6	15,965.2	18.4%
Yankagee (RGEYAN)	Plains with dunes and numerous claypans, soft spinifex and snakewood shrublands; in the west of the area.	110,310.4	2,647.7	2.4%

### 4.3 Surface Geology and Soils

The study area encompasses eight geological units (see Figure 4.2 and Table 4.2), mapped at a scale of 1:100,000 by the Geological Survey of WA and collated in Geoscience Australia (2008). Qe is the dominant geological unit in the study area (Table 4.2).

**Table 4.2: Geological units occurring in the study area (Geoscience Australia 2008).**

Unit Code	Geological Description	Area
Czs	Sand or gravel plains; quartz sand sheets commonly with ferruginous pisoliths or pebbles, minor clay; local calcrete, laterite, silcrete, silt, clay, alluvium, colluvium, aeolian sand	5,077.3
Qa	Channel and flood plain alluvium; gravel, sand, silt, clay, locally calcreted	89.0
Qd	Dunes, sandplain with dunes and swales; may include numerous interdune claypans; residual and aeolian sand with minor silt and clay; aeolian red quartz sand, clay and silt, in places gypsiferous; yellow hummocky sand	6,504.0
Qdc	Beach sand, sand dunes, coastal dunes, beaches, and beach ridges; calcareous and siliceous, locally shelly and/or cemented (beach rock); locally reworked	7,315.7
Qe	Coastal silt and evaporite deposits; estuarine, lagoonal, and lacustrine deposits	24,883.7
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	6,727.0
Qt	Lacustrine or residual mud, clay, silt and sand, commonly gypsiferous and/or saline; playa, claypan, and swamp deposits; peat; peaty sand and clay; halitic and gypsiferous evaporites	2,005.2
water	water	7,616.3

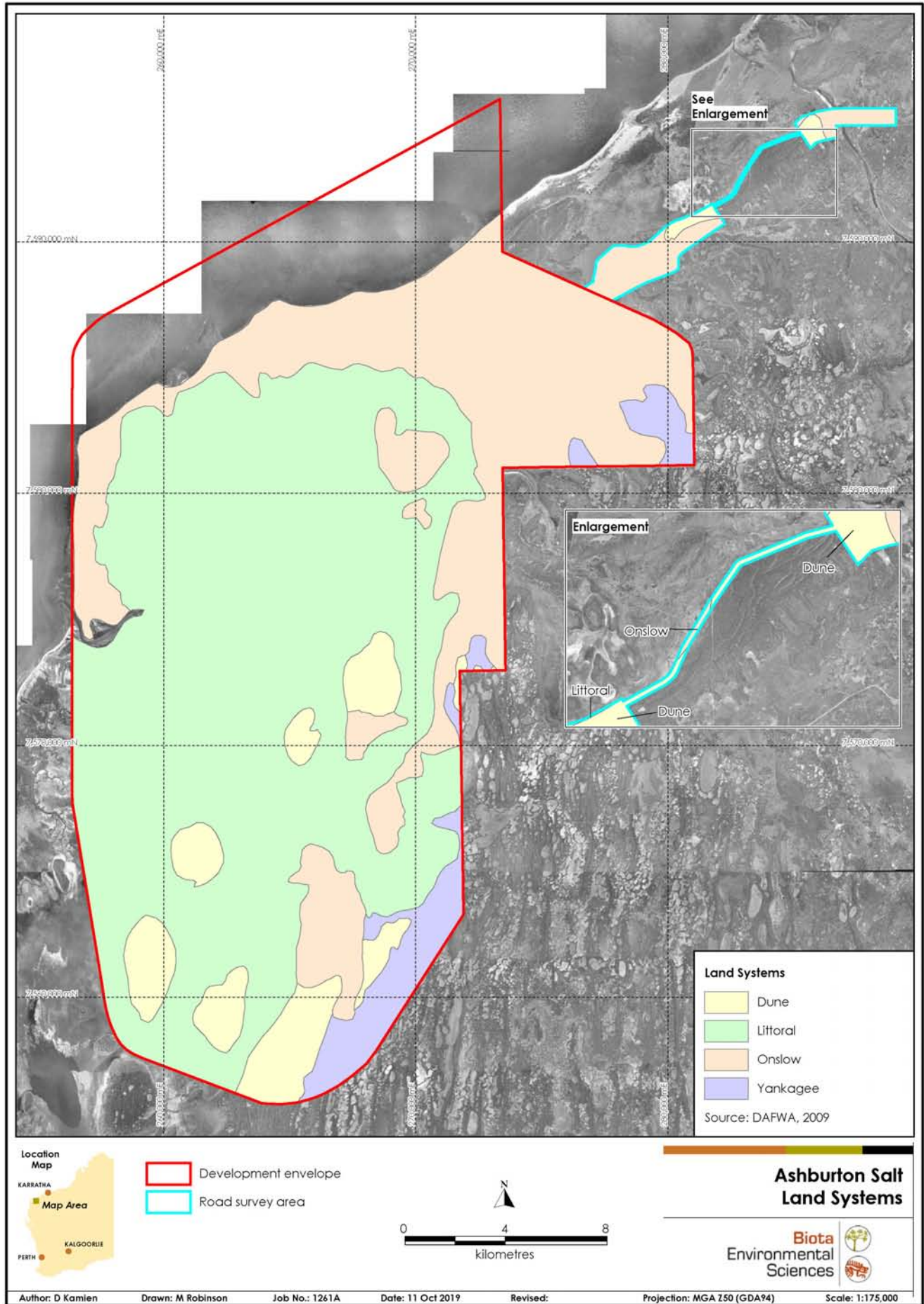


Figure 4.1: Land systems for the study area and locality.

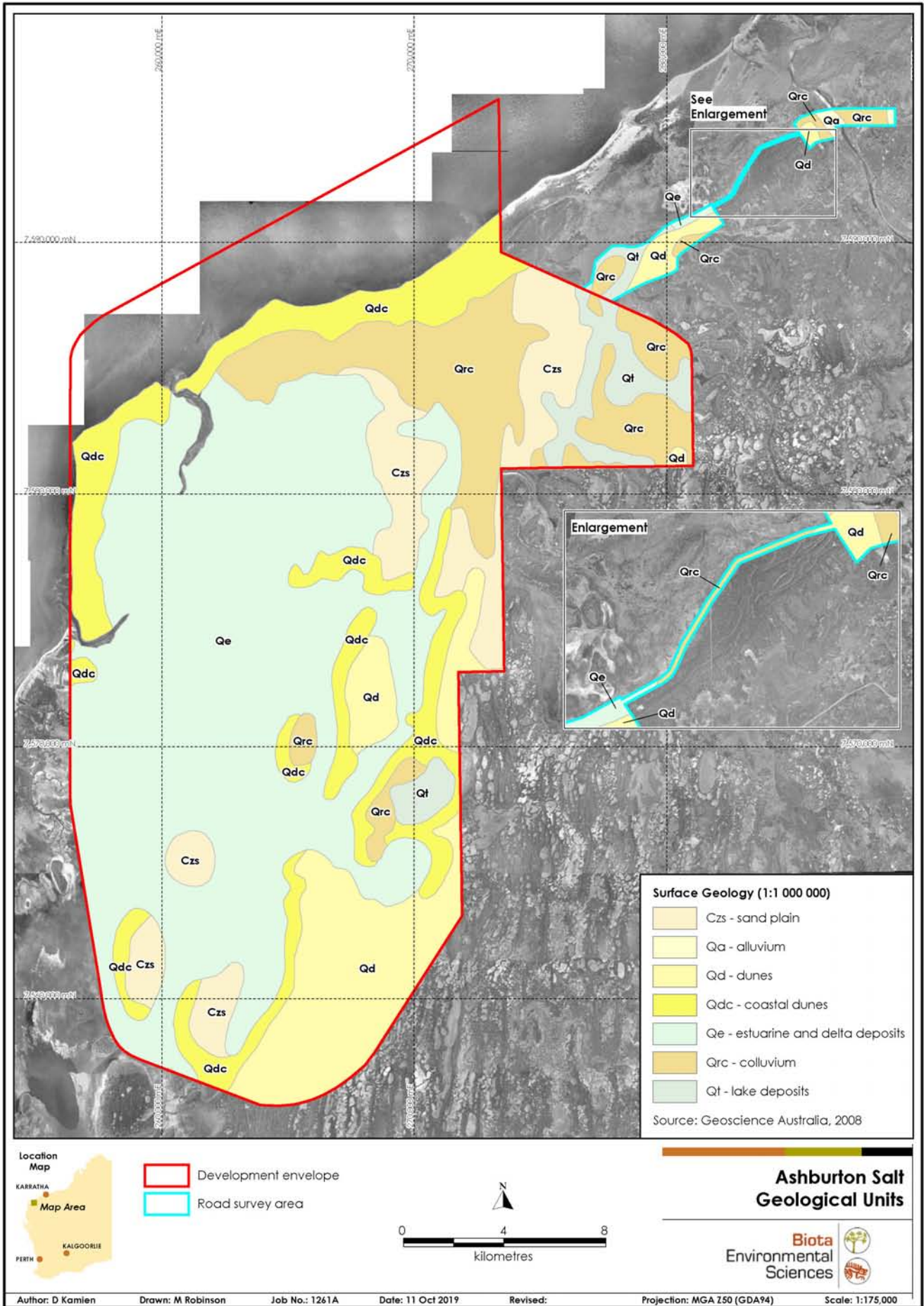


Figure 4.2: Geological units mapped for the study area (Geoscience Australia 2008).

Four soil units were also mapped at a scale of 1:2,000,000 for the study area by Agriculture Western Australia (1967) (see Table 4.3 and Figure 4.3). SV8 is the dominant soil unit.

**Table 4.3: Soil units occurring in the study area (Agriculture Western Australia 1967).**

Unit Code	Soil Description	Area (ha)
Jw1	Low-lying coastal plains with some sand dunes: chief soils are saline clays (Uf1.41) on the flat to very gently sloping plains. Associated are (Ug5) and (Uf) soils along the inland margin of the plains; areas of saline muds (Um1) on slopes and flats submerged at high tide; and very small areas of calcareous sands (Uc1.1) and/or siliceous sands (Uc1.2) on coastal dunes.	2,405.9
My57	Extensive plains with parallel sand dune formations: chief soils of the plains are neutral red earths (Gn2.12) but there are also areas of acid (Gn2.11) and alkaline (Gn2.13) red earths with some hard red soils (Dr2.33) towards margins and around drainage lines. Chief soils of the dunes are red sands (Uc1.23) and (Uc5.21).	2,682.8
Oc58	Broad alluvial plains with a few clay pans and red sand dunes; some areas of cracking clays along creek lines: chief soils are hard alkaline red soils (Dr2.33) and (Dr2.13). Associated are (Uf) soils in clay pans; red sands (Uc1.23) on dunes; and areas of cracking clays (Ug5.38) along creeks. This unit grades northwards into unit Oc72.	6,886.5
SV8	Salt flats, tidal swamps, and coastal dune sands: chief soils are saline loams (Um1.3) and (Um1.4) with shelly sands (Uc1.11, Uc1.13). Small areas of calcareous earths (Gc) and shallow loams (Um) are associated with marls.	41,333.0

## 4.4 Conservation Reserves in the Locality

The Class-A Tent Island Nature Reserve is the closest conservation reserve to the study area, situated 12 km to the southwest (see Figure 2.1 and Figure 4.4).

Six other reserves occur within 40 km of the study area – ex Giralia, ex Mt Minnie, Serrurier Island Nature Reserve (Class-A), Thevenard Island Nature Reserve (Class-A), Muiron Islands Marine Management Area and the World Heritage-listed Ningaloo Marine Park (Class-A) (Figure 2.1 and Figure 4.4).

## 4.5 Environmentally Sensitive Areas

ESAs are defined in the *Environmental Protection (Environmentally Sensitive Areas) Notice 2005* under section 51B of the *WA Environmental Protection Act 1986*. These include areas that are: World Heritage sites; included on the Register of the National Estate (RNE); defined wetlands; vegetation containing Threatened flora; TECs; and Bush Forever sites. The location of ESAs in the vicinity of the study area are shown on Figure 4.4.

Two RNE places are relevant to the study area:

- The “Coastal Margin Exmouth Gulf to Cape Preston” overlaps the western half of the main study area and the eastern end of the road access survey area.
- The “Old Onslow Townsite” boundary is 300 m north of the eastern end of the road access survey area at its closest point.

The study area is located within an ESA known as the Exmouth Gulf East wetland (WA007), which is listed in A Directory of Important Wetlands in Australia (see Figure 4.4). The Directory describes the significance of the wetland as “An outstanding example of tidal wetland systems of low coast of northwest Australia, with well-developed tidal creeks, extensive mangrove swamps and broad saline coastal flats.”

The only other ESA in the locality is the World Heritage listed Ningaloo Marine Park, which at its closest point is some 36 km to the west (not shown on Figure 4.4 due to distance from the study area).

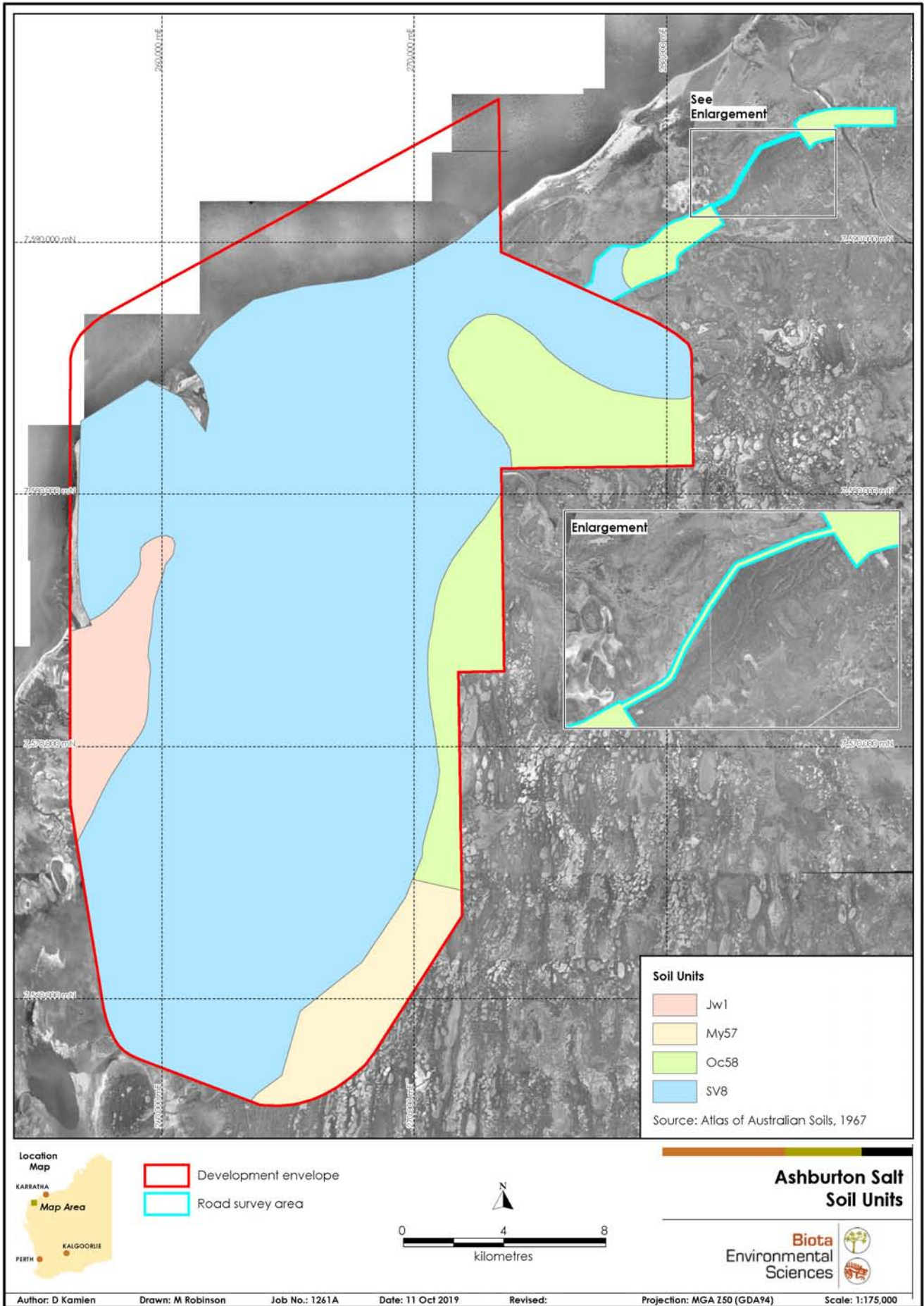


Figure 4.3: Soil units mapped for the study area (Agriculture Western Australia 1967).

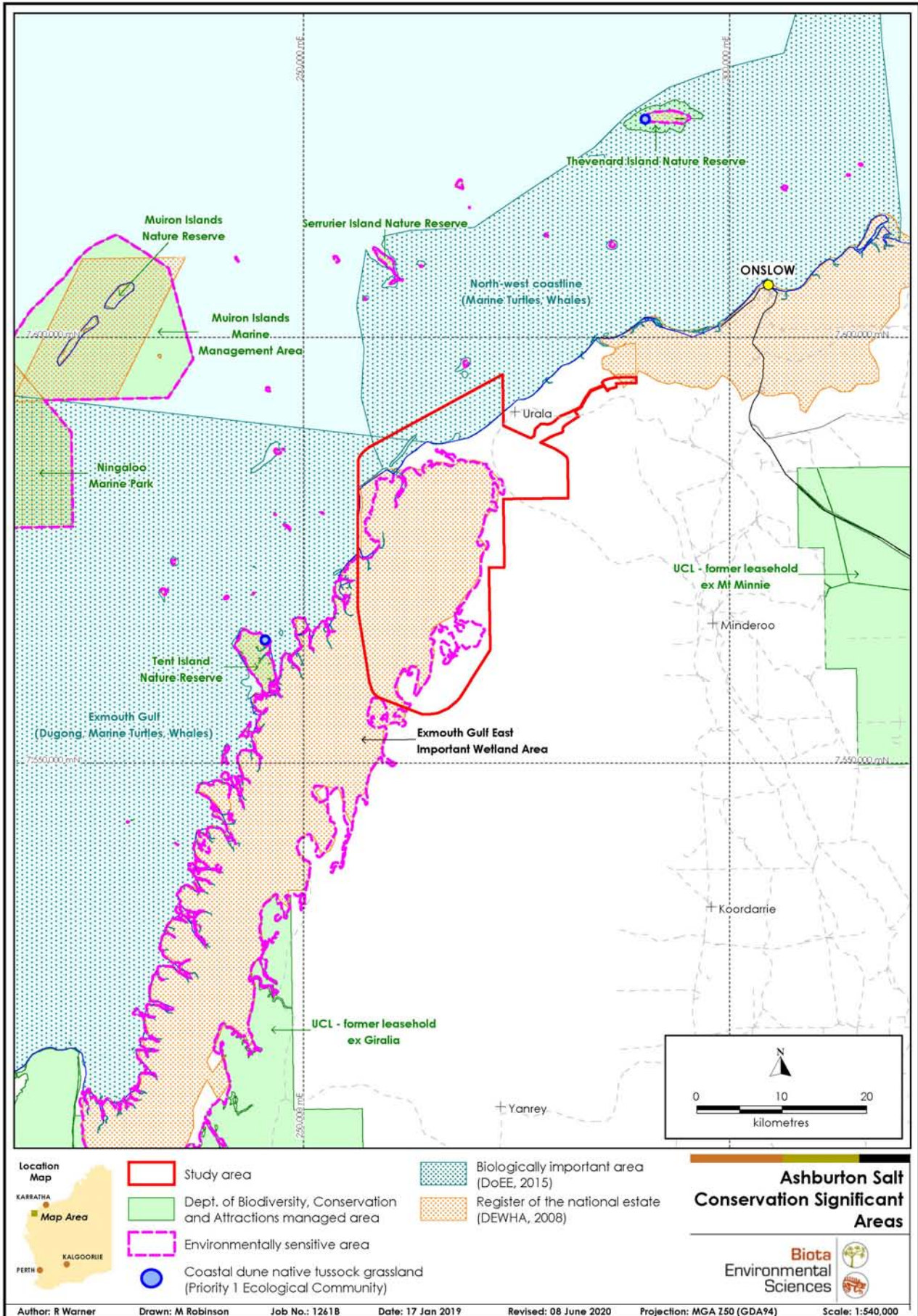


Figure 4.4: Locations of conservation reserves, ESAs and PECs within 40 km of the Ashburton Salt study area.

## 4.6 Beard's Regional Vegetation Mapping

Beard (1975a, 1975b) described and mapped the vegetation of the Pilbara and northern Carnarvon bioregion at a scale of 1:1,000,000. The study area intersects seven units mapped over the Cape Yannare Coastal Plain (CYCP) by Beard:

- CYCP 43: Low forest; mangroves (Kimberley) or thicket; mangroves (Pilbara).
- CYCP 117: Hummock grasslands, grass steppe; soft spinifex.
- CYCP 127: Bare areas; mud flats.
- CYCP 589: Mosaic: Short bunch grassland - savanna / grass plain (Pilbara) / Hummock grasslands, grass steppe; soft spinifex.
- CYCP 670: Hummock grasslands, shrub steppe; scattered shrubs over *Triodia basedowii*. (Note that *Triodia basedowii* is no longer considered to occur in this locality; this would now refer to *T. glabra*.)
- CYCP 676: Succulent steppe; samphire.
- CYCP 1271: Bare areas; claypans.

These vegetation units are widespread in the Cape Range subregion and with the exception of CYCP 117, have been subject to only minor clearing (see Table 4.4). However, given the broad scale of Beard's mapping, these units provide only limited information about the vegetation occurring in the study area (see Section 5.1 for a more detailed description of the vegetation).

**Table 4.4:** Beard's vegetation mapping units occurring in the study area and their pre-European and current extent in the Cape Range and Roebourne subregions combined.

Beards Vegetation Mapping Unit	Extent within Cape Range and Roebourne Subregions (ha)		Percent Remaining	Extent within the Study Area (ha) (% of Current Mapped Extent in the Cape Range and Roebourne Subregions)
	Pre-European	Current		
CYCP 43	45,943.8	42,619.2	92.8%	2,223.6 (5.3%)
CYCP 117	63,387.3	57,809.6	91.2%	2,959.2 (8.1%)
CYCP 127	278,166.4	258,814.89	93.0%	26,259.1 (9.4%)
CYCP 589	753,492.6	749,162.4	99.4%	9,048.4 (1.2%)
CYCP 670	147,810.2	147,793.6	>99.9%	6,764.3 (4.6%)
CYCP 676	39,573.3	38,769.7	98.0%	5,010.7 (12.8%)
CYCP 1271	18,353.6	18,353.6	100.0%	7,952.9 (13.2%)

## 4.7 Previous Botanical Surveys in the Study Area

The results of a selection of botanical surveys (i.e. major surveys completed within the locality surrounding the Ashburton Salt study area) were reviewed, with a focus on identifying records of TECs, PECs, and flora species of conservation significance known from the locality. The locations of these surveys are displayed in Figure 3.1. The findings from the most relevant surveys (those that were in close proximity and included similar habitats to those in the current study area) are summarised in Table 4.5.

For all of the surveys, it was recognised that these comprised "snap-shot" assessments of the flora at a particular time, and that further species would be recorded with additional survey work; the species lists should therefore be taken as indicative rather than exhaustive. Any other key limitations mentioned in the reports that are relevant to their current use are listed in Table 4.5.



**Table 4.5 A summary of the major vegetation and flora surveys completed in the vicinity of the study area.**

Project/Survey (Reference)	Survey Type: Date	Size of Area	No. of Native Taxa	Features of Conservation Significance / TECs and PECs / Threatened and Priority Species	Stated Limitations Relevant to the Current Use of this Survey
Onslow Solar Saltfield Annual Environmental Report (Biota 2018)	Annual Environmental Report: August 2018	23,626 ha	Not applicable	<ul style="list-style-type: none"> <li>• No TECs.</li> <li>• No PECs.</li> <li>• No Threatened flora.</li> <li>• One Priority 3 flora species: <i>Stackhousia clementii</i></li> </ul>	• None stated.
Flora and Vegetation of the CS2 Tubridgi Wheatstone Gas Pipeline Project Area (Mattiske 2013)	Flora and vegetation survey: April 2013	110 km linear corridor	<ul style="list-style-type: none"> <li>• 139 taxa</li> <li>• 80 genera</li> <li>• 28 families</li> </ul>	<ul style="list-style-type: none"> <li>• No TECs.</li> <li>• No PECs.</li> <li>• No Threatened flora.</li> <li>• One Priority 3 flora species: <i>Eremophila forrestii</i> subsp. <i>viridis</i>.</li> </ul>	• None stated.
Wheatstone Rare Flora Survey (Biota 2011)	Rare flora searches: March 2011	Greater Onslow locality.	Not applicable	<ul style="list-style-type: none"> <li>• No TECs.</li> <li>• No PECs.</li> <li>• No Threatened flora.</li> <li>• One Priority 1 flora species: <i>Abutilon</i> sp. Onslow (F. Smith s.n. 10/9/61).</li> <li>• Three Priority 3 flora species: <i>Eleocharis papillosa</i>, <i>Eremophila forrestii</i> subsp. <i>viridis</i>, <i>Triumfetta echinata</i>.</li> </ul>	• The timing of the survey was not suitable to collect flowering or fruiting material of the perennial target species.
A Vegetation and Flora Survey of the Wheatstone Study Area near Onslow (Biota 2010a)	Flora and vegetation survey: March & April 2009	9,794 ha	<ul style="list-style-type: none"> <li>• 418 taxa</li> <li>• 162 genera</li> <li>• 58 families</li> </ul>	<ul style="list-style-type: none"> <li>• No TECs.</li> <li>• No PECs.</li> <li>• Vegetation considered to be of high conservation significance: Inland linear sand dunes (units ID1, ID2), and Mangal vegetation (unit T2).</li> <li>• No Threatened flora.</li> <li>• One Priority 1 flora species: <i>Abutilon</i> sp. Onslow (F. Smith s.n. 10/9/61).</li> <li>• Four Priority 3 flora species: <i>Atriplex flabelliformis</i>, <i>Eleocharis papillosa</i>, <i>Eremophila forrestii</i> subsp. <i>viridis</i>, <i>Triumfetta echinata</i>.</li> </ul>	<ul style="list-style-type: none"> <li>• Although the timing of the 2009 surveys was appropriate to detect most annual flora species, groups such as the daisies (family Asteraceae), which germinate mainly after winter rainfall are under-represented on the vascular flora list.</li> <li>• The record of <i>Atriplex flabelliformis</i> was based on an unvouchered record from Astron (2008), and was considered questionable.</li> </ul>
Wheatstone Project Flora and Fauna Assessment Addendum (Biota 2010b)	Desktop assessment: May 2010	Five areas, totalling 2,772	<ul style="list-style-type: none"> <li>• 422 taxa</li> <li>• 161 genera</li> <li>• 58 families</li> </ul>	<ul style="list-style-type: none"> <li>• No TECs.</li> <li>• No PECs.</li> <li>• No Threatened flora.</li> <li>• Four Priority 3 flora species: <i>Atriplex flabelliformis</i>, <i>Eleocharis papillosa</i>, <i>Eremophila forrestii</i> subsp. <i>viridis</i>, <i>Triumfetta echinata</i>.</li> </ul>	• The record of <i>Atriplex flabelliformis</i> was based on an unvouchered record from Astron (2008), and was considered questionable.

Project/Survey (Reference)	Survey Type: Date	Size of Area	No. of Native Taxa	Features of Conservation Significance / TECs and PECs / Threatened and Priority Species	Stated Limitations Relevant to the Current Use of this Survey
Wheatstone Amendment Area – Flora and Vegetation Assessment (Outback Ecology 2010)	Flora and vegetation assessment: January 2010	3,423 ha	<ul style="list-style-type: none"> <li>• 96 taxa</li> <li>• 56 genera</li> <li>• 29 families</li> </ul>	<ul style="list-style-type: none"> <li>• No TECs.</li> <li>• No PECs.</li> <li>• No Threatened flora.</li> <li>• One Priority 3 flora species: <i>Eremophila forrestii</i> subsp. <i>viridis</i>.</li> </ul>	<ul style="list-style-type: none"> <li>• Poor rainfall prior to field survey.</li> </ul>
Flora & Vegetation Survey - Ashburton North Project Area Stage 2 (Onshore 2009)	Flora and vegetation survey: November 2008	2,200 ha	<ul style="list-style-type: none"> <li>• 196 taxa</li> <li>• 120 genera</li> <li>• 43 families</li> </ul>	<ul style="list-style-type: none"> <li>• No TECs.</li> <li>• No PECs.</li> <li>• Vegetation types of high conservation value: tidal flats and associated mangrove vegetation, linear dunes interspersed with claypans, and claypans and broader saline drainage areas.</li> <li>• No Threatened flora.</li> <li>• One Priority 3 flora species: <i>Triumfetta echinata</i>.</li> </ul>	<ul style="list-style-type: none"> <li>• None stated.</li> </ul>
Baseline Flora and Vegetation Survey - Ashburton North Pipeline Route Option 3 (RPS Australia 2009)	Flora and vegetation survey: November 2008	100 km linear corridor	<ul style="list-style-type: none"> <li>• 187 taxa</li> <li>• 96 genera</li> <li>• 37 families</li> </ul>	<ul style="list-style-type: none"> <li>• No TECs.</li> <li>• No PECs.</li> <li>• No Threatened flora.</li> <li>• One Priority 3 flora species: <i>Triumfetta echinata</i>.</li> </ul>	<ul style="list-style-type: none"> <li>• Poor rainfall prior to field survey</li> <li>• Limited access to some areas within the survey boundary.</li> </ul>
Wheatstone Camp and Gas Pipeline: Native Vegetation Clearing Permit Report (Biota 2009)	NVCP survey: April 2009	3,766 ha	<p>Camp NVCP:</p> <ul style="list-style-type: none"> <li>• 145 taxa</li> <li>• 88 genera</li> <li>• 31 families</li> </ul> <p>Pipeline NVCP:</p> <ul style="list-style-type: none"> <li>• 218 taxa</li> <li>• 109 genera</li> <li>• 43 families</li> </ul>	<ul style="list-style-type: none"> <li>• No TECs.</li> <li>• No PECs.</li> <li>• Vegetation considered to be of high conservation significance: Inland linear sand dunes (units ID1, ID2)</li> <li>• No Threatened flora.</li> <li>• One Priority 1 flora species: <i>Abutilon</i> sp. Onslow (F. Smith s.n. 10/9/61).</li> <li>• Three Priority 3 flora species: <i>Eleocharis papillosa</i>, <i>Eremophila forrestii</i> subsp. <i>viridis</i>, <i>Triumfetta echinata</i>.</li> </ul>	<ul style="list-style-type: none"> <li>• Although the timing of the 2009 surveys was appropriate to detect most annual flora species, groups which germinate mainly after winter rainfall (such as the daisies; family Asteraceae) are under-represented on the vascular flora list. In addition, the entire NVCP areas were not systematically searched for rare flora.</li> </ul>

Project/Survey (Reference)	Survey Type: Date	Size of Area	No. of Native Taxa	Features of Conservation Significance / TECs and PECs / Threatened and Priority Species	Stated Limitations Relevant to the Current Use of this Survey
West Pilbara Project Onslow Rail Route Flora and Vegetation Survey (Astron 2008)	Flora and vegetation survey: August & November 2008	150 km linear corridor	<ul style="list-style-type: none"> <li>• 450 taxa</li> <li>• 156 genera</li> <li>• 51 families</li> </ul>	<ul style="list-style-type: none"> <li>• No TECs.</li> <li>• No PECs.</li> <li>• No Threatened flora.</li> <li>• Two Priority 3 flora species: <i>Atriplex flabelliformis</i>, <i>Eremophila forrestii</i> subsp. <i>viridis</i>.</li> <li>• One Priority 4 flora species: <i>Goodenia nuda</i>.</li> </ul>	<ul style="list-style-type: none"> <li>• Access to Urala station was unable to be gained, therefore that portion of the study area remained unsurveyed.</li> <li>• A considerable portion of the survey area had been burnt which affected identification of species and resulted in altered dominance and species composition in quadrats sampled from those areas.</li> <li>• The fourth field trip was conducted late in the season when many species were desiccated/senesced and species richness is likely to have been reduced, with potentially some annual/ephemeral species being under-represented.</li> </ul>
Yannarie Solar Project: Additional Flora and Vegetation Assessment 2007 (Biota 2008)	Flora and vegetation survey; November 2007	19,500 ha	<ul style="list-style-type: none"> <li>• 97 taxa</li> <li>• 64 genera</li> <li>• 29 families</li> </ul>	<ul style="list-style-type: none"> <li>• No TECs.</li> <li>• No PECs.</li> <li>• Vegetation considered being regionally and locally significant: Coolibah woodlands on claypans, saline mudflats, succulent samphire steppe on the margins of inland saline flats and coastal islands, linear and parallel inland sand dunes.</li> <li>• No Threatened flora.</li> <li>• No Priority flora.</li> </ul>	<ul style="list-style-type: none"> <li>• All of the quadrat selection, sampling and vegetation assessment was completed via helicopter due to access constraints using four-wheel drive vehicles. As only a portion of the area of the project area could be systematically sampled, not all of the variation in the vegetation, nor all of the flora species, would have been identified.</li> <li>• The late October-early November fieldwork was completed at an inappropriate time for the detection of ephemeral flora species, due to the lack of rainfall in the locality in 2007.</li> </ul>
Flora & Vegetation Survey - Ashburton North Project Area (Onshore 2009)	Flora and vegetation survey: August 2008	405 ha	<ul style="list-style-type: none"> <li>• 183 taxa</li> <li>• 118 genera</li> <li>• 47 families</li> </ul>	<ul style="list-style-type: none"> <li>• No TECs.</li> <li>• No PECs.</li> <li>• Vegetation types of high conservation value: tidal flats and associated mangrove vegetation, linear dunes interspersed with claypans and broader saline drainage areas.</li> <li>• No Threatened flora.</li> <li>• Two Priority 1 flora species: <i>Abutilon</i> sp. Onslow (F. Smith s.n. 10/9/61), and <i>Helichrysum oligochaetum</i>.</li> <li>• One Priority 3 flora species: <i>Carpobrotus</i> sp. Thevenard Island (M. White 050).</li> </ul>	<ul style="list-style-type: none"> <li>• None stated.</li> </ul>

Project/Survey (Reference)	Survey Type: Date	Size of Area	No. of Native Taxa	Features of Conservation Significance / TECs and PECs / Threatened and Priority Species	Stated Limitations Relevant to the Current Use of this Survey
Chevron Domgas Project: Onslow – Flora and Vegetation Assessment (Validus 2008)	Flora and vegetation survey: March 2008.	190 ha	<ul style="list-style-type: none"> <li>• 95 taxa</li> <li>• 76 genera</li> <li>• 32 families</li> </ul>	<ul style="list-style-type: none"> <li>• No TECs.</li> <li>• No PECs.</li> <li>• Two reservation priority ecosystems: succulent steppe (samphire) and mudflats (bare areas).</li> <li>• No Threatened flora.</li> <li>• No Priority flora.</li> </ul>	<ul style="list-style-type: none"> <li>• None stated.</li> </ul>
A Vegetation and Flora Survey of Additional Infrastructure Areas of the Proposed BHP Billiton Pilbara LNG Project (Biota 2007)	Flora and vegetation survey: August 2006	1,305 ha	<ul style="list-style-type: none"> <li>• 242 taxa</li> <li>• 140 genera</li> <li>• 47 families</li> </ul>	<ul style="list-style-type: none"> <li>• No TECs.</li> <li>• No PECs.</li> <li>• Vegetation considered being regionally and locally significant: samphire shrublands of saline flats (units SF.1, SF.2, SF.3, and SF.4), and ephemeral bare claypans (unit BCp).</li> <li>• No Threatened flora.</li> <li>• No Priority flora.</li> </ul>	<ul style="list-style-type: none"> <li>• Some sections of the project area were not accessible by vehicle, and could only be reached on foot. An area south of a main tributary of Beadon Creek could not be accessed on foot or by vehicle, as there are no crossings of the creek in this area.</li> </ul>
Onslow Strategic Industrial Area Flora Survey (Biota 2006a)	Flora and vegetation survey: October 2005	~500 ha	<ul style="list-style-type: none"> <li>• 158 taxa</li> <li>• 95 genera</li> <li>• 41 families</li> </ul>	<ul style="list-style-type: none"> <li>• No TECs.</li> <li>• No PECs.</li> <li>• No Threatened flora.</li> <li>• No Priority flora.</li> </ul>	<ul style="list-style-type: none"> <li>• Some sections of the project area were not accessible by vehicle, and could only be reached on foot.</li> <li>• As only a portion of the project area could be systematically sampled, not all of the variation in the vegetation, nor all of the flora species, would have been identified.</li> </ul>
BHP Billiton Pilbara LNG Project: Flora and Vegetation Study (Biota 2005b)	Flora and vegetation survey: June 2005	490 ha	<ul style="list-style-type: none"> <li>• 158 taxa</li> <li>• 95 genera</li> <li>• 41 families</li> </ul>	<ul style="list-style-type: none"> <li>• No TECs.</li> <li>• No PECs.</li> <li>• No Threatened flora.</li> <li>• No Priority flora.</li> </ul>	<ul style="list-style-type: none"> <li>• Some sections of the project area were not accessible by vehicle, and could only be reached on foot.</li> <li>• As only a portion of the project area could be systematically sampled, not all of the variation in the vegetation, nor all of the flora species, would have been identified.</li> </ul>
Yannarie Salt Project Flora and Vegetation Assessment (Biota 2005a)	Flora and vegetation survey: August 2004	231,800 ha	<ul style="list-style-type: none"> <li>• 192 taxa</li> <li>• 100 genera</li> <li>• 41 families</li> </ul>	<ul style="list-style-type: none"> <li>• No TECs.</li> <li>• No PECs.</li> <li>• Vegetation considered being regionally and locally significant: Coolibah woodlands on claypans, saline mudflats, succulent samphire steppe on the margins of inland saline flats and coastal islands, linear and parallel inland sand dunes.</li> <li>• No Threatened flora.</li> <li>• No Priority flora.</li> </ul>	<ul style="list-style-type: none"> <li>• All of the quadrat selection, sampling and vegetation assessment was completed via helicopter due to access constraints using 4WD vehicles. As only a portion of the area of the project area could be systematically sampled, not all of the variation in the vegetation, nor all of the flora species, would have been identified.</li> </ul>

## 4.8 Communities of Conservation Significance from the Locality

### 4.8.1 TECs Known from the Locality

TECs are described by DBCA as biological assemblages occurring in a particular habitat, which are under threat of modification or destruction from various processes (as per DEC 2010; see Appendix 1). TECs are listed by the WA Minister for Environment and are significant at the State level, being protected as ESAs under the WA *Environmental Protection Act 1986*.

A total of 69 TECs are currently described for WA, including two in each of the Carnarvon and Pilbara bioregions (DBCA 2018):

- Camerons Cave Troglotic Community (Carnarvon Basin);
- Cape Range Remipede Community (Carnarvon Basin);
- Ethel Gorge aquifer stygobiont community (Pilbara); and
- *Themeda* grasslands on cracking clays (Hamersley Station, Pilbara).

The *Themeda* grasslands on cracking clays TEC is restricted to a specific habitat and landform that is not present in the locality of the Ashburton area. The remaining three TECs represent invertebrate communities and are not relevant to the current report.

### 4.8.2 PECs Known from the Locality

PECs are biological communities that are considered to be of significance, but do not meet the criteria for listing as a TEC. There are five categories of PECs, none of which are currently protected under legislation (see Appendix 1).

A total of 42 PECs are listed for the "Pilbara" (DBCA 2019a), which includes those in the Pilbara and Carnarvon bioregions. Two occurrences of one PEC were identified by a search of the DBCA database as occurring within 40 km of the study area. This PEC is described below:

- **Coastal dune native tussock grassland dominated by *Whiteochloa airoides* – Priority 3**

"Tussock grassland of *Whiteochloa airoides* occurs on the landward side of foredunes, hind dunes or remnant dunes with white or pinkish white medium sands with marine fragments. There may be occasional *Spinifex longifolius* tussock or *Triodia epactia* hummock grasses and scattered low shrubs of *Olearia* sp. Kennedy Range (G. Byrne 66), *Scaevola spinescens*, *S. cunninghamii*, *Trianthema turgidifolium* and *Corchorus* species (*C. walcottii*, *C. laniflorus*).

Occurs on Barrow Island, Tent Island and possibly some unaffected littoral areas in west Pilbara.

Threats: weed invasion (*\*Cenchrus ciliaris*, *\*Aerva javanica*), altered fire regimes, grazing, basic raw material extraction" (DBCA 2019a),

This PEC occurs in two small areas: 11 km southwest of the study area on Tent Island, and 37 km northeast of the study area on the western extent of Thevenard Island (Figure 4.4). This PEC has the potential to be present within the study area.

Two further PECs are present outside the 40 km buffer:

- "Peedamulla Marsh vegetation complex" (Priority 1), 53 km northeast of the study area; and
- "Tussock grasslands or grassy tall or low shrublands of the Yarcowie Land System" (Priority 1), 61 km southwest.

Both of these PECs are restricted in their distribution and would not occur within the study area.

## 4.9 Flora of Conservation Significance from the Locality

### 4.9.1 Threatened Flora

Threatened flora species are listed at the State level under the WA BC Act, and/or at the Federal level under the EPBC Act.

One Threatened flora species is currently listed for the Carnarvon bioregion under both the BC Act and EPBC Act:

- ***Eucalyptus beardiana*** occurs on red or yellow sand ridges. The nearest known populations are at the southernmost end of the Carnarvon bioregion, over 540 km south of the study area.

While there is suitable habitat for this species in the study area, the distance of the nearest populations suggest that this species would not occur in the study area.

Three Threatened flora species are currently listed for the Pilbara bioregion under the BC Act, some of which are also listed under the EPBC Act: *Aluta quadrata*, *Pityrodia* sp. Marble Bar (G. Woodman & D. Coultas GWDC Opp 4) and *Thryptomene wittweri*. *Aluta quadrata* is currently only listed as a Threatened species under the BC Act. *Pityrodia* sp. Marble Bar (G. Woodman & D. Coultas GWDC Opp 4) and *Thryptomene wittweri* are listed as Threatened species under both the BC Act and the EPBC Act.

- ***Aluta quadrata*** is a perennial shrub that is currently only known from south-facing slopes and gullies on a range of hills near Paraburdoo.
- ***Pityrodia* sp. Marble Bar (G. Woodman & D. Coultas GWDC Opp 4)** is a shrub growing to approximately 1.5 m tall, which is described as occurring on steep hill slopes with a granite, ironstone or sandstone substrate. This species occurs in the vicinity of Marble Bar, and the current collection locations occur over a range of less than 40 km east-west.
- ***Thryptomene wittweri*** (Mountain Thryptomene) is a spreading, perennial shrub occurring in skeletal stony soils on breakaways and in drainage channels, typically high in the landscape (elevations >1,000 m). Locations in the Pilbara are restricted to the vicinity of Mt Meharry.

Given the restricted ranges of the above Pilbara species, as well as the lack of suitable habitat in the study area, none of these would occur.

One species listed as Vulnerable under the EPBC Act has been recorded in the Onslow locality by Biota (2010a, 2011), however this species is not listed as Threatened under the BC Act:

- ***Eleocharis papillosa*** (Dwarf Desert Spike-rush) has been recorded from multiple locations in the wider Onslow locality. Two records from along the Onslow Road (Biota 2010a, 2011) were from samphire shrubland within tidally influenced creeks. The records from the Onslow locality represent a considerable extension of the range of this species in WA, with the nearest other records being approximately 430 km east-southeast in the Fortescue Marsh. There is considerable suitable habitat for this species in the locality (including in the study area), and it would be likely to occur more widely. Targeted surveys would need to be conducted at an appropriate time of year to detect this small sedge (i.e. soon after a summer wet season, with higher rainfall than experienced recently). Although this species is listed as Vulnerable at the Federal level, it is only listed as a Priority 3 species for WA.

Based on their distributions and habitat requirements, no Threatened species other than *Eleocharis papillosa* would be expected to occur within the study area.

### 4.9.2 Priority Flora

Based on the database searches and literature reviews conducted for this study, a total of 12 Priority flora taxa have apparently been recorded in the locality of the study area (within 40 km; see Table

4.6). Locations of these taxa are shown on the maps in Appendix 9, together with a table of the records.

**Table 4.6 Priority flora species identified through the desktop review as having been recorded previously in the locality of the study area.**

Status	Species
Priority 1	<i>Abutilon</i> sp. Onslow (F. Smith s.n. 10/9/61)
	<i>Abutilon</i> sp. Pritzelianum (S. van Leeuwen 5095)
	<i>Myriocephalus scalpellus</i>
Priority 3	<i>Atriplex flabelliformis</i>
	<i>Carpobrotus</i> sp. Thevenard Island (M. White 050)
	<i>Corchorus congener</i>
	<i>Eleocharis papillosa</i> †
	<i>Eremophila forrestii</i> subsp. <i>viridis</i>
	<i>Lepidium biplicatum</i>
	<i>Lygodium flexuosum</i>
	<i>Stackhousia clementii</i>
	<i>Triumfetta echinata</i>

† Listed as Threatened under the EPBC Act.

Based on the known distributions and habitat preferences of these species, compared with the habitats that appeared to be present in the study area, all except the following three species were identified as having the potential to occur in the area (see Appendix 3 for further discussion):

- *Myriocephalus scalpellus* was represented by a single unvouchered record from the Pilbara Biological Survey, however this record is thought to apply to a location near the Fortescue Marsh. This species was considered unlikely to occur in the area.
- *Atriplex flabelliformis* was represented only by a single unvouchered record from a historical survey (Astron 2008), and was considered unlikely to occur in the study area.
- *Lygodium flexuosum* is a Kimberley fern species, which appears to have been misapplied against a fauna record in the DBCA Fauna Survey Returns Database. This fern would not occur in the study area.

The nine other taxa listed in Table 4.6 were considered the key target taxa for this study's field surveys.

## 4.10 Introduced Flora Species from the Locality

A total of 22 introduced flora species have previously been recorded from the locality, as listed in Table 4.7. Two species that were previously considered to be introduced (*Cucumis melo* and *Portulaca oleracea*) have since been reclassified as likely native species (DBCA 2019b).

Weeds that pose a significant threat to biosecurity or agriculture in WA are classified as declared pests pursuant to the WA *Biosecurity and Agriculture Management Act 2007* (BAM Act). In addition, Weeds of National Significance (WoNS) have been identified by Australian governments based on their invasiveness, potential for spread and environmental, social and economic impacts (Thorp and Lynch 2000). In addition to being listed as WoNS, three of the species recorded from the locality are classified as declared pests under the BAM Act in the following categories:

- *\*Prosopis glandulosa* and *\*P. pallida* are both prohibited organisms listed under s12: control category 2 (C2 – Eradication). Plants in the C2 control category are “organisms which should be eradicated from part or all of Western Australia”.
- *\*Parkinsonia aculeata* is a declared pest listed under s22(2); control category 3 (C3 – Management). Plants in the C3 control category are “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”.

- *Tamarix aphylla* is a declared pest listed under s22(2), with no control category assigned.

Several other introduced flora listed in Table 4.7, while not listed as declared pests or WoNS, are highly invasive and are considered to be serious environmental weeds for the region.

Characteristics of species in each region of WA were assessed and categorised during the Pilbara Region Weed Species Prioritisation Process (Department of Parks and Wildlife 2014). With respect to those species found in the study area, the most important of these comprise *Aerva javanica*, *Cenchrus* species and *Passiflora foetida* var. *hispida*. *Cenchrus* species in particular have a "Very High" environmental weed risk assessment rating (see DAFWA 2019a), and *Cenchrus ciliaris* is one of the invasive species listed under the EPBC Act within the group of species comprising "other introduced plants that are considered by the States and Territories to pose a particularly significant threat to biodiversity". Although *Phoenix dactylifera* can be highly invasive in permanent wetlands, it would be unlikely to proliferate in the section of the study area in which it was recorded. The species *Cynodon dactylon*, *Malvastrum americanum*, *Setaria verticillata*, *Stylosanthes hamata* and *Vachellia farnesiana* were also listed as having High ecological impact (Department of Parks and Wildlife 2014), however these species are rarely seen as dense infestations except in areas of very high grazing pressure.

**Table 4.7: Introduced (weed) recorded previously in the locality of the study area.**

Species	Common Name
<i>Aerva javanica</i>	Kapok Bush
<i>Argemone ochroleuca</i> subsp. <i>ochroleuca</i>	Mexican poppy
<i>Bidens bipinnata</i>	Beggartick
<i>Cenchrus ciliaris</i>	Buffel Grass
<i>Cenchrus setiger</i>	Birdwood Grass
<i>Cynodon dactylon</i>	Couch
<i>Echinochloa colona</i>	Awnless Barnyard Grass
<i>Euphorbia hirta</i>	Asthma Plant
<i>Flaveria trinervia</i>	Speedy Weed
<i>Indigofera sessiliflora</i>	-
<i>Malvastrum americanum</i>	Spiked Malvastrum
<i>Parkinsonia aculeata</i>	Parkinsonia
<i>Passiflora foetida</i> var. <i>hispida</i>	Stinking Passion Flower
<i>Phoenix dactylifera</i>	Date Palm
<i>Prosopis glandulosa</i>	Honey Mesquite
<i>Prosopis pallida</i>	Mesquite, Algaroba
<i>Rumex vesicarius</i>	Ruby Dock
<i>Setaria verticillata</i>	Whorled Pigeon Grass
<i>Sonchus oleraceus</i>	Common Sowthistle
<i>Stylosanthes hamata</i>	Verano Stylo
<i>Tribulus terrestris</i>	Caltrop
<i>Vachellia farnesiana</i>	Mimosa Bush



## 5.0 Vegetation of the Study Area

### 5.1 Overview

Mangrove vegetation (mangal) occurs in the study area, but is addressed by the separate reporting by AECOM. The vegetation types in the remainder of the study area were associated with five broad landforms:

1. Coastal strand, essentially comprising the beachfront;
2. Saline plains;
3. Creeklines and drainage areas, including low-lying areas through clay loam plains;
4. Sand plains; and
5. Sand dunes, including both coastal dunes and longitudinal dunes of the mainland remnants (islands) and inland areas.

A total of 18 vegetation types have been described and mapped for the study area, along with areas of bare mudflat and claypan, dune blowouts (mainly along the coast, but occasionally inland, and cleared areas (see Table 5.1). Each vegetation unit is described in the following sections and mapped in Appendix 8. Representative photos of the mapping units are presented in Plate 5.1 to Plate 5.37.

**Table 5.1: Summary of mapping units from the study area.**

Unit Code	Description	Area within Study Area (ha)
<b>Vegetation of the Coastal Strand</b>		
B1	<i>Spinifex longifolius</i> very open hummock grassland	298.2
<b>Vegetation of Hypersaline Mudflats and Saline Plains</b>		
S1	<i>Tecticornia dolliformis</i> , ( <i>T. indica</i> , <i>T. halocnemoides</i> , <i>Frankenia ambita</i> ) low shrubland over <i>Sporobolus mitchellii</i> , <i>Eragrostis falcata</i> very open grassland	414.5
S2	<i>Tecticornia indica</i> , ( <i>T. auriculata</i> , <i>T. halocnemoides</i> ) low open shrubland over <i>Eragrostis falcata</i> scattered grasses	153.1
S3	<i>Tecticornia auriculata</i> , ( <i>T. indica</i> , <i>T. halocnemoides</i> ) low shrubland over <i>Eragrostis falcata</i> scattered grasses	1,150.5
S4	<i>Atriplex bunburyana</i> scattered low shrubs over <i>A. codonocarpa</i> , <i>Sclerolaena recurvicauspis</i> very open herbland with * <i>Cenchrus</i> spp. scattered tussock grasses to very open tussock grassland	342.8
S5	<i>Acacia xiphophylla</i> tall open scrub over <i>Atriplex bunburyana</i> scattered low shrubs over * <i>Cenchrus ciliaris</i> open tussock grassland	14.7
S4/S1	Mosaic of units S4 and S1	1,379.0
<b>Vegetation of Creeklines, Drainage Areas and Clay Plains</b>		
C1	<i>Eucalyptus victrix</i> low open woodland over * <i>Prosopis pallida</i> scattered tall shrubs over * <i>Cenchrus ciliaris</i> , (* <i>C. setiger</i> ) open tussock grassland	10.7
C2	<i>Eucalyptus victrix</i> low woodland to low open woodland over <i>Acacia synchronicia</i> , <i>A. tetragonophylla</i> scattered tall shrubs to tall open shrubland over <i>Eriachne benthamii/flaccida</i> , ( <i>Eulalia aurea</i> , <i>Sporobolus mitchellii</i> ) tussock grassland	681.2
C3	<i>Acacia tetragonophylla</i> , ( <i>A. synchronicia</i> ) tall shrubland over <i>Eriachne benthamii/flaccida</i> open to very open tussock grassland with <i>Triodia epactia</i> scattered hummock grasses to very open hummock grassland	1,447.4
C4	<i>Acacia synchronicia</i> , <i>A. tetragonophylla</i> scattered tall shrubs over <i>Eriachne benthamii/flaccida</i> , ( <i>Sporobolus mitchellii</i> ) closed tussock grassland	350.8

Unit Code	Description	Area within Study Area (ha)
<b>Vegetation of Sand Plains</b>		
P1	<i>Acacia tetragonophylla</i> , <i>A. synchronicia</i> , <i>A. sclerosperma</i> subsp. <i>sclerosperma</i> , ( <i>A. coriacea</i> subsp. <i>coriacea</i> ) scattered tall shrubs to tall open shrubland over <i>A. stellaticeps</i> scattered low shrubs to low shrubland over <i>Triodia epactia</i> hummock grassland with * <i>Cenchrus ciliaris</i> very open tussock grassland	8,535.0
P2	<i>Acacia synchronicia</i> , <i>A. tetragonophylla</i> scattered tall shrubs over <i>Triodia epactia</i> very open hummock grassland with * <i>Cenchrus ciliaris</i> very open tussock grassland to tussock grassland	3,526.1
P3	<i>Acacia synchronicia</i> , <i>A. tetragonophylla</i> scattered tall shrubs over <i>Triodia glabra</i> , ( <i>T. epactia</i> ) hummock grassland	622.1
P4	<i>Acacia tetragonophylla</i> , <i>A. sclerosperma</i> subsp. <i>sclerosperma</i> tall open shrubland over <i>Triodia glabra</i> , <i>T. epactia</i> , ( <i>T. avenoides</i> ) hummock grassland over * <i>Cenchrus</i> spp. very open tussock grassland	2,800.9
<b>Vegetation of Sand Dunes</b>		
D1	<i>Acacia coriacea</i> subsp. <i>coriacea</i> low open woodland over <i>Spinifex longifolius</i> very open to open tussock grassland with <i>Triodia epactia</i> scattered hummock grasses	646.2
D2	<i>Acacia coriacea</i> subsp. <i>coriacea</i> low open woodland over <i>Triodia epactia</i> open hummock grassland with * <i>Cenchrus ciliaris</i> very open tussock grassland	339.3
D3	<i>Grevillea stenobotrya</i> , <i>Hakea stenophylla</i> subsp. <i>stenophylla</i> , <i>Acacia coriacea</i> subsp. <i>coriacea</i> tall open shrubland over <i>A. stellaticeps</i> , <i>Scaevola sericophylla</i> , <i>Quoya loxocarpa</i> low open shrubland over <i>Triodia epactia</i> open hummock grassland with * <i>Cenchrus ciliaris</i> very open tussock grassland	563.6
D4	<i>Grevillea stenobotrya</i> , <i>Hakea stenophylla</i> subsp. <i>stenophylla</i> , ( <i>Acacia coriacea</i> subsp. <i>coriacea</i> ) tall open shrubland over <i>Acacia stellaticeps</i> open shrubland over <i>Scaevola sericophylla</i> low open shrubland over <i>Triodia avenoides</i> , ( <i>T. epactia</i> ) hummock grassland	354.8
<b>Other Mapping Units</b>		
X1	Bare hypersaline and intertidal mudflats/bare clay pans	422.6
X2	Bare dune blowouts/mobile dunes	105.9
X3	Cleared areas	14.4
Water	Water	422.6

## 5.2 Description of Vegetation Types

### 5.2.1 Vegetation of the Coastal Strand

<b>B1: SPI</b>	<b><i>Spinifex longifolius</i> very open hummock grassland.</b>
Distribution and habitat	This vegetation fringed the westernmost edge of the study area, occurring just above the beach strand.
Other associated species	<u>Shrubs:</u> <i>Ipomoea costata</i> , <i>Scaevola crassifolia</i> . <u>Grasses:</u> <i>Eriachne gardneri</i> . <u>Herbs:</u> <i>Ipomoea pes-caprae</i> subsp. <i>brasiliensis</i> , <i>Ptilotus villosiflorus</i> , <i>Salsola australis</i> .
Vegetation condition	Excellent.
Sampling sites	Inside study area: ASH47, ASH-REL08 (very narrow strip of vegetation; considered adequately sampled with two sites).
Notes	This vegetation was naturally species poor, reflecting the harsh environmental conditions, and all other species apart from <i>Spinifex longifolius</i> occurred only as scattered individuals.



Plate 5.1: Unit B1, showing *Spinifex longifolius* and *Ipomoea pes-caprae*.



Plate 5.2: Unit B1 (ASH-REL08, Phase 1).

## 5.2.2 Vegetation of Hypersaline Mudflats and Saline Plains

S1: TECd	<b><i>Tecticornia doliiformis</i>, (<i>T. indica</i>, <i>T. halocnemoides</i>, <i>Frankenia ambita</i>) low shrubland over <i>Sporobolus mitchellii</i>, <i>Eragrostis falcata</i> very open grassland.</b>
Distribution and habitat	This vegetation occurred on broad hypersaline mudflats through the study area, and ranged from areas dominated by the samphire ( <i>Tecticornia</i> ) species, to areas dominated by <i>Frankenia ambita</i> .
Other associated species	<u>Shrubs:</u> <i>Enchylaena tomentosa</i> var. <i>tomentosa</i> , <i>Lawrenzia viridigrisea</i> , <i>Muellerolimon salicorniaceum</i> , <i>Scaevola spinescens</i> , <i>Solanum lasiophyllum</i> . <u>Grasses:</u> * <i>Cenchrus ciliaris</i> (typically scattered only; occasionally to 3%), <i>Dactyloctenium radulans</i> . <u>Herbs:</u> <i>Angianthus milnei</i> , <i>Atriplex semilunaris</i> , <i>Marsilea hirsuta</i> , <i>Neobassia astrocarpa</i> , <i>Nicotiana rosulata</i> subsp. <i>rosulata</i> , <i>Rhodanthe stricta</i> , <i>Rhynchosia minima</i> , <i>Sclerolaena costata</i> , <i>Sida fibulifera</i> .
Vegetation condition	Very Good: scattered weeds (mainly * <i>Cenchrus ciliaris</i> ), some signs of grazing, occasional tracks and rubbish.
Sampling sites	Inside study area: ASH10, ASH53, ASH55. Outside study area: ASHC04.



Plate 5.3: Unit S1 (ASHC04, Phase 1).



Plate 5.4: Unit S1 (ASH55, Phase 2).

<b>S2: TECi</b>	<b><i>Tecticornia indica</i>, (<i>T. auriculata</i>, <i>T. halocnemoides</i>) low open shrubland over <i>Eragrostis falcata</i> scattered grasses.</b>
Distribution and habitat	This vegetation occurred on broad hypersaline mudflats through the study area.
Other associated species	<u>Shrubs</u> : <i>Frankenia ambita</i> , <i>Lawrenzia viridigrisea</i> , <u>Grasses</u> : * <i>Cenchrus</i> spp. (typically scattered only), <i>Dactyloctenium radulans</i> , <i>Eragrostis dielsii</i> , <i>E. pergracilis</i> , <i>Sporobolus virginicus</i> , <i>Triodia epactia</i> (providing low cover in places). <u>Sedges</u> : <i>Cyperus bulbosus</i> . <u>Herbs</u> : <i>Angianthus acrohyalinus</i> , <i>A. milnei</i> (sometimes dense), <i>Atriplex codonocarpa</i> , <i>A. semilunaris</i> , <i>Cullen cinereum</i> (occasionally dense), <i>Dysphania plantaginella</i> , <i>Lotus cruentus</i> , <i>Mimulus gracilis</i> , <i>Neobassia astrocarpa</i> , <i>Nicotiana</i> spp., <i>Salsola australis</i> , <i>Swainsona pterostylis</i> .
Vegetation condition	Very Good; scattered weeds, mainly * <i>Cenchrus ciliaris</i> and * <i>Sonchus oleraceus</i> ; signs of grazing.
Sampling sites	Inside study area: ASH21, ASH35.



Plate 5.5: Unit S2 (ASH21, Phase 1).



Plate 5.6: Unit S2 (ASH35, Phase 1).

<b>S3: TECa</b>	<b><i>Tecticornia auriculata</i>, (<i>T. indica</i>, <i>T. halocnemoides</i>) low shrubland over <i>Eragrostis falcata</i> scattered grasses.</b>
Distribution and habitat	This vegetation occurred on hypersaline mudflats through the study area.
Other associated species	<u>Shrubs</u> : <i>Lawrenzia viridigrisea</i> , <u>Grasses</u> : * <i>Cenchrus ciliaris</i> (typically scattered only), <i>Chloris pumilio</i> , <i>Dactyloctenium radulans</i> , <i>Eragrostis dielsii</i> , <i>Sporobolus mitchellii</i> , <i>S. virginicus</i> . <u>Sedges</u> : <i>Cyperus bulbosus</i> . <u>Herbs</u> : <i>Angianthus milnei</i> , <i>Atriplex codonocarpa</i> , <i>A. semilunaris</i> , <i>Cressa australis</i> , <i>Neobassia astrocarpa</i> , <i>Nicotiana rosulata</i> subsp. <i>rosulata</i> ,
Vegetation condition	Excellent to Very Good: scattered weeds (mainly * <i>Cenchrus ciliaris</i> ); some evidence of cattle (mainly scats and tracks).
Sampling sites	Inside study area: ASH09, ASH22, ASH40, ASH41, ASH54, ASH-REL05. Outside study area: ASHC08, ASHC11.



Plate 5.7: Unit S3 (ASH09, Phase 2).



Plate 5.8: Unit S3 (ASH54, Phase 2).

<b>S4: ATR spp SCL spp</b>	<b><i>Atriplex bunburyana</i> scattered low shrubs over <i>A. codonocarpa</i>, <i>Sclerolaena recurvicauspis</i> very open herbland with *<i>Cenchrus</i> spp. scattered tussock grasses to very open tussock grassland.</b>
Distribution and habitat	This vegetation occurred on 'scalded' areas within the broad sandy plains in the study area; based on the species present, these plains are likely to be somewhat saline.
Other associated species	<u>Shrubs</u> : <i>Tecticornia indica</i> (scattered only), <i>Frankenia ambita</i> . <u>Grasses</u> : <i>Eragrostis falcata</i> , <i>Eriachne benthamii</i> , <i>Sporobolus mitchellii</i> . <u>Sedges</u> : <i>Cyperus bulbosus</i> . <u>Herbs</u> : <i>Atriplex semilunaris</i> , <i>Calotis porphyroglossa</i> .
Vegetation condition	Very Good to Poor: * <i>Cenchrus ciliaris</i> typically present, sometimes forming a very open tussock grassland; areas often grazed.
Sampling sites	Inside study area: ASH33, ASH-REL07 (most areas in Good or Poor condition; not considered to warrant additional sites).



Plate 5.9: Unit S4 (ASH33, Phase 1).



Plate 5.10: Unit S4 (ASH-REL07, Phase 1).

<b>S5: AxATRbCEc</b>	<b><i>Acacia xiphophylla</i> tall open scrub over <i>Atriplex bunburyana</i> scattered low shrubs over *<i>Cenchrus ciliaris</i> open tussock grassland.</b>
Distribution and habitat	This vegetation occurred in a single stand on an area of sandy plain at the edge of an island in the southernmost end of the main study area. The proximity of saline substrate appeared to influence the species present, with a number of chenopod species recorded.
Other associated species	<u>Shrubs:</u> <i>Enchylaena tomentosa</i> var. <i>tomentosa</i> , <i>Lepidium platypetalum</i> , <i>Scaevola spinescens</i> , <i>Senna artemisioides</i> subsp. <i>oligophylla</i> (thinly sericeous form MET 15,035). <u>Grasses:</u> <i>Triodia epactia</i> (scattered only). <u>Herbs:</u> <i>Sclerolaena diacantha</i> .
Vegetation condition	Good: moderate cover of * <i>Cenchrus ciliaris</i> .
Sampling sites	Inside study area: ASH18 (no other stands of this vegetation in the study area; similar vegetation sampled at Giralia),



Plate 5.11: Unit S5 (ASH18, Phase 1).

### 5.2.3 Vegetation of Creeklines, Drainage Areas and Clay Plains

<b>C1: EvPpCEspp</b>	<b><i>Eucalyptus victrix</i> low open woodland over *<i>Prosopis pallida</i> scattered tall shrubs over *<i>Cenchrus ciliaris</i>, (*<i>C. setiger</i>) open tussock grassland.</b>
Distribution and habitat	This vegetation occurred only along the section of the Ashburton River intersected by the access corridor, approximately 6 km inland from the coast. Although this was the largest drainage channel in the study area, it was also the most degraded, being heavily grazed and with abundant weeds.
Other associated species	<u>Shrubs:</u> <i>Acacia coriacea</i> subsp. <i>coriacea</i> , <i>A. synchronicia</i> , <i>A. tetragonophylla</i> , <i>Rhagodia eremaea</i> , <i>Scaevola spinescens</i> . <u>Grasses:</u> <i>Chrysopogon fallax</i> , <i>Setaria dielsii</i> , <i>Sporobolus mitchellii</i> . <u>Herbs:</u> <i>Atriplex codonocarpa</i> , <i>A. semilunaris</i> , <i>Rhynchosia minima</i> , <i>Salsola australis</i> .
Vegetation condition	Poor: several weed species present, including significant weeds such as * <i>Prosopis</i> and * <i>Cenchrus</i> ; signs of cattle.
Sampling sites	Inside study area: ASH56 (vegetation type narrow and degraded; not considered to warrant additional sampling).



Plate 5.12: Unit C1 (ASH56, Phase 2).

<b>C2:</b> EvAsyAteERibERIfEUaSPOm	<b><i>Eucalyptus victrix</i> low woodland to low open woodland over <i>Acacia synchronicia</i>, <i>A. tetragonophylla</i> scattered tall shrubs to tall open shrubland over <i>Eriachne benthamii</i>, <i>E. flaccida</i>, (<i>Eulalia aurea</i>, <i>Sporobolus mitchellii</i>) tussock grassland.</b>
Distribution and habitat	This vegetation occurred in low-lying drainage areas in and near the access corridor. Specimens appearing to represent both <i>Eriachne benthamii</i> and <i>E. flaccida</i> were collected from the sites in this vegetation type.
Other associated species	<u>Shrubs:</u> <i>Acacia coriacea</i> subsp. <i>coriacea</i> , * <i>Prosopis pallida</i> (occasional only), <i>Stemodia</i> sp. Onslow (A.A. Mitchell 76/148), * <i>Vachellia farnesiana</i> (scattered). <u>Herbs:</u> <i>Bergia perennis</i> , <i>Calotis porphyroglossa</i> , <i>Marsilea hirsuta</i> , <i>Ptilotus exaltatus</i> .
Vegetation condition	Very Good to Poor: weeds were present at varying density, and typically included * <i>Cenchrus ciliaris</i> and often * <i>Vachellia farnesiana</i> and * <i>Prosopis pallida</i> ; there was evidence of cattle at most sites.
Sampling sites	Inside study area: ASH02, ASH30, ASH42, ASH-REL03, ASH-REL04.



Plate 5.13: Unit C2 (ASH02, Phase 2).



Plate 5.14: Unit C2 (ASH-REL04, Phase 1).

<b>C3:</b> <b>AteAsyERibTe</b>	<b><i>Acacia tetragonophylla</i>, (<i>A. synchronica</i>) tall shrubland over <i>Eriachne benthamii</i> open to very open tussock grassland with <i>Triodia epactia</i> scattered hummock grasses to very open hummock grassland.</b>
Distribution and habitat	This vegetation occurred through drainage areas in the northeastern and southern sections of the study area.
Other associated species	<u>Trees</u> : <i>Eucalyptus victrix</i> present in places, usually only as scattered trees. <u>Shrubs</u> : <i>Enchylaena tomentosa</i> var. <i>tomentosa</i> , <i>Rhagodia eremaea</i> , <i>Scaevola spinescens</i> , * <i>Vachellia farnesiana</i> (scattered only). <u>Grasses</u> : * <i>Cenchrus ciliaris</i> (typically absent or only scattered plants, occasionally to 4%), <i>Chrysopogon fallax</i> , <i>Eragrostis setifolia</i> , <i>Eulalia aurea</i> , <i>Sporobolus mitchellii</i> . <u>Herbs</u> : <i>Atriplex codonocarpa</i> , <i>Cullen cinereum</i> , <i>Marsilea hirsuta</i> , <i>Nicotiana occidentalis</i> , <i>Ptilotus polystachyus</i> , <i>Rhynchosia minima</i> .
Vegetation condition	Very Good: weeds often present, but usually only scattered (typically including * <i>Cenchrus ciliaris</i> ); cattle tracks and scats present at most sites.
Sampling sites	Inside study area: ASH03, ASH08, ASH16, ASH-REL01.



Plate 5.15: Unit C3 (ASH08, Phase 1).



Plate 5.16: Unit C3 (ASH16, Phase 1).

<b>C4:</b> <b>AsyAteERibERIFSPom</b>	<b><i>Acacia synchronica</i>, <i>A. tetragonophylla</i> scattered tall shrubs over <i>Eriachne benthamii</i>, <i>E. flaccida</i>, (<i>Sporobolus mitchellii</i>) closed tussock grassland.</b>
Distribution and habitat	This vegetation occurred through drainage areas in the northeastern section of the study area, and on areas of plain with a clayey substrated, including a few areas of true gilgai ('crabhole'). Very few shrubs were present, and the tussock grassland was the dominant stratum. Specimens appearing to represent both <i>Eriachne benthamii</i> and <i>E. flaccida</i> were collected from the sites in this vegetation type.
Other associated species	<u>Shrubs</u> : * <i>Prosopis pallida</i> , * <i>Vachellia farnesiana</i> (occasional only). <u>Grasses</u> : <i>Eulalia aurea</i> , <i>Panicum decompositum</i> . <u>Sedges</u> : <i>Cyperus iria</i> , <i>C. rigidellus</i> . <u>Herbs</u> : <i>Alternanthera nodiflora</i> , <i>Centipeda minima</i> subsp. <i>macrocephala</i> , <i>Cullen cinereum</i> , <i>Marsilea hirsuta</i> , <i>Sesbania cannabina</i> .
Vegetation condition	Very Good: signs of cattle at most sites; occasional weeds (mainly * <i>Vachellia farnesiana</i> ).
Sampling sites	Inside study area: ASH48. Outside study area: ASHC01, ASHC12.





Plate 5.17: Unit C4 (ASH48, Phase 2).



Plate 5.18: Unit C4 (ASHC01, Phase 2).

## 5.2.4 Vegetation of Sand Plains

P1: AteAsyAscAcAstTeCEc	<b><i>Acacia tetragonophylla</i>, <i>A. synchronica</i>, <i>A. sclerosperma</i> subsp. <i>sclerosperma</i>, (<i>A. coriacea</i> subsp. <i>coriacea</i>) scattered tall shrubs to tall open shrubland over <i>A. stellaticeps</i> scattered low shrubs to low shrubland over <i>Triodia epactia</i> hummock grassland with *<i>Cenchrus ciliaris</i> very open tussock grassland.</b>
Distribution and habitat	This vegetation was widespread on the gently undulating sandy plains throughout the study area, including the access corridor. It was present both on the mainland remnants (islands within the mudflats), as well as on the inland plains.
Other associated species	<u>Shrubs</u> : <i>Indigofera bovipерda</i> subsp. <i>bovipерda</i> , <i>Lepidium platypetalum</i> , <i>Rhagodia eremaea</i> , <i>Scaevola spinescens</i> , <i>Solanum cleistogamum</i> , <i>S. lasiophyllum</i> , * <i>Vachellia farnesiana</i> (scattered only). <u>Grasses</u> : <i>Chrysopogon fallax</i> , <i>Dactyloctenium radulans</i> , <i>Eulalia aurea</i> . <u>Herbs</u> : <i>Calandrinia polyandra</i> , <i>Cassytha capillaris</i> , <i>Goodenia microptera</i> , <i>Haloragis gossei</i> , <i>Nicotiana occidentalis</i> , <i>Ptilotus exaltatus</i> , <i>P. polystachyus</i> , <i>Rhynchosia minima</i> , <i>Roebuckiella cheilocarpa</i> var. <i>cheilocarpa</i> , <i>Trachymene pilbarensis</i> .
Vegetation condition	Very Good: scattered weeds (mainly * <i>Cenchrus ciliaris</i> ); cattle scats and tracks.
Sampling sites	Inside study area: ASH05, ASH06, ASH07, ASH11, ASH17, ASH19, ASH23, ASH24, ASH25, ASH29, ASH31, ASH36, ASH37, ASH38, ASH39, ASH43, ASH45, ASH51, ASH-REL02, STR06R. Outside study area: ASHC03, ASHC05, ASHC09, ASHC10, ASHC13.



Plate 5.19: Unit P1 (ASH07, Phase 1).



Plate 5.20: Unit P1 (ASH19, Phase 2).

<b>P2: AsyAteTeCEc</b>	<b><i>Acacia synchronica</i>, <i>A. tetragonophylla</i> scattered tall shrubs over <i>Triodia epactia</i> very open hummock grassland with *<i>Cenchrus ciliaris</i> very open tussock grassland to tussock grassland.</b>
Distribution and habitat	This vegetation occurred in broad areas through the northern central section of the main study area, often associated with areas that had been historically cleared or grazed, but also occurring along the edges of mainland remnants, as such habitats were prone to erosion and consequently weed invasion.
Other associated species	<u>Shrubs:</u> <i>Acacia coriacea</i> subsp. <i>coriacea</i> , <i>A. stellaticeps</i> , <i>Atriplex bunburyana</i> , <i>Scaevola spinescens</i> , <i>Senna artemisioides</i> subsp. <i>oligophylla</i> (thinly sericeous form MET 15,035), * <i>Vachellia farnesiana</i> (scattered only). <u>Grasses:</u> <i>Dactyloctenium radulans</i> , <i>Eragrostis xerophila</i> . <u>Herbs:</u> <i>Crotalaria medicaginea</i> var. <i>neglecta</i> , <i>Rhynchosia minima</i> , <i>Salsola australis</i> , <i>Swainsona pterostylis</i> .
Vegetation condition	Very Poor to Good: generally with a moderate to high cover of * <i>Cenchrus</i> grasses.
Sampling sites	Inside study area: ASH01, ASH26, ASH27.



Plate 5.21: Unit P2 (ASH01, Phase 2).



Plate 5.22: Unit P2 (ASH27, Phase 1).

<b>P3: AsyAteTgTe</b>	<b><i>Acacia synchronicia</i>, <i>A. tetragonophylla</i> scattered tall shrubs over <i>Triodia glabra</i>, (<i>T. epactia</i>) hummock grassland.</b>
Distribution and habitat	This vegetation occurred in the northern section of the main study area on elevated areas, which were dominated by <i>Triodia glabra</i> .
Other associated species	<u>Shrubs</u> : <i>Hibiscus sturtii</i> , <i>Indigofera boviperda</i> subsp. <i>boviperda</i> , <i>Solanum lasiophyllum</i> . <u>Grasses</u> : * <i>Cenchrus ciliaris</i> (typically only scattered). <u>Herbs</u> : <i>Haloragis gossei</i> , <i>Ptilotus exaltatus</i> , <i>P. polystachyus</i> .
Vegetation condition	Very Good: * <i>Cenchrus ciliaris</i> usually present, but only as scattered individuals; cattle scats and tracks at some sites but no obvious signs of grazing.
Sampling sites	Inside study area: ASH04, ASH50.



Plate 5.23: Unit P3 (ASH04, Phase 2).



Plate 5.24: Unit P3 (ASH50, Phase 2).

<b>P4: AteAscTgTeTavCEssp</b>	<b><i>Acacia tetragonophylla</i>, <i>A. sclerosperma</i> subsp. <i>sclerosperma</i> tall open shrubland over <i>Triodia glabra</i>, <i>T. epactia</i>, (<i>T. avenoides</i>) hummock grassland over *<i>Cenchrus</i> spp. very open tussock grassland.</b>
Distribution and habitat	This vegetation was widespread on sandy plains throughout the study area, including the access corridor. It tended to occur on slightly elevated areas, and included <i>Triodia glabra</i> as a dominant species, together with <i>T. epactia</i> ; patches of <i>T. avenoides</i> also occurred in places.
Other associated species	<u>Shrubs</u> : <i>Acacia coriacea</i> subsp. <i>coriacea</i> , <i>A. synchronicia</i> , <i>A. stellaticeps</i> (patchy; scattered shrubs to a low open shrubland), <i>Corchorus elachocarpus</i> , <i>Eremophila forrestii</i> subsp. <i>forrestii</i> , <i>E. forrestii</i> subsp. <i>viridis</i> , <i>Grevillea stenobotrya</i> , <i>Hakea stenophylla</i> subsp. <i>stenophylla</i> , <i>Hibiscus brachychlaenus</i> , <i>H. sturtii</i> , <i>Indigofera boviperda</i> subsp. <i>boviperda</i> , <i>Rhagodia eremaea</i> , <i>Scaevola sericophylla</i> , <i>S. spinescens</i> , <i>Senna artemisioides</i> subsp. <i>oligophylla</i> , <i>Senna glutinosa</i> subsp. <i>glutinosa</i> , <i>Solanum lasiophyllum</i> , <i>Streptoglossa decurrens</i> . <u>Grasses</u> : <i>Chrysopogon fallax</i> . <u>Herbs</u> : <i>Cassytha capillaris</i> , <i>C. racemosa</i> , <i>Pterocaulon sphacelatum</i> , <i>Ptilotus exaltatus</i> , <i>P. polystachyus</i> , <i>Rhodanthe psammophila</i> , <i>Trachymene pilbarensis</i> .
Vegetation condition	Usually Very Good, with only scattered * <i>Cenchrus ciliaris</i> and some signs of cattle; Good in areas with higher cover of * <i>Cenchrus</i> .
Sampling sites	Inside study area: ASH15, ASH34, ASH52, ASH-REL06, STR02R, STR03R, STR04R, STR05R, STR07R. Outside study area: ASHC14.



Plate 5.25: Unit P4 (ASH52, Phase 1).



Plate 5.26: Unit P4 (STR03R, Phase 2).

### 5.2.5 Vegetation of Sand Dunes

<b>D1: AcSPITe</b>	<b><i>Acacia coriacea</i> subsp. <i>coriacea</i> low open woodland over <i>Spinifex longifolius</i> very open to open tussock grassland with <i>Triodia epactia</i> scattered hummock grasses.</b>
Distribution and habitat	This vegetation occurred on primary dunes along the coast.
Other associated species	<u>Shrubs</u> : <i>Crotalaria cunninghamii</i> subsp. <i>sturtii</i> , <i>Solanum lasiophyllum</i> , <i>Tephrosia gardneri</i> , <i>Trichodesma zeylanicum</i> var. <i>grandiflorum</i> . <u>Grasses</u> : * <i>Cenchrus ciliaris</i> (scattered plants to a very open tussock grassland), <i>Eriachne aristidea</i> , <i>E. gardneri</i> . <u>Herbs</u> : <i>Cassytha capillaris</i> , <i>Corynotheca pungens</i> , <i>Euphorbia myrtoides</i> , <i>Salsola australis</i> , <i>Sida rohlenae</i> subsp. <i>rohlenae</i> , <i>Tribulus occidentalis</i> .
Vegetation condition	Very Good: scattered weeds (mainly * <i>Cenchrus ciliaris</i> ).
Sampling sites	Inside study area: ASH49. Outside study area: ASHC02, ASHC15.



Plate 5.27: Unit D1 (ASHC02, Phase 2).



Plate 5.28: Unit D1 (ASHC15, Phase 2).

<b>D2: AcTeCEc</b>	<b><i>Acacia coriacea</i> subsp. <i>coriacea</i> low open woodland over <i>Triodia epactia</i> open hummock grassland with *<i>Cenchrus ciliaris</i> very open tussock grassland.</b>
Distribution and habitat	This vegetation occurred on more consolidated coastal dunes behind the primary dunes.
Other associated species	<u>Shrubs:</u> <i>Adriana tomentosa</i> var. <i>tomentosa</i> , <i>Crotalaria cunninghamii</i> subsp. <i>sturtii</i> , <i>Indigofera bovipera</i> subsp. <i>bovipera</i> , <i>Rhagodia preissii</i> subsp. <i>obovata</i> , <i>Tephrosia gardneri</i> , <i>Trichodesma zeylanicum</i> var. <i>grandiflorum</i> . <u>Grasses:</u> <i>Eriachne gardneri</i> . <u>Herbs:</u> <i>Cassytha capillaris</i> , <i>Corynotheca pungens</i> , <i>Euphorbia myrtoides</i> , <i>Indigofera colutea</i> , <i>Rhynchosia minima</i> , <i>Salsola australis</i> , <i>Sida rohlenae</i> subsp. <i>rohlenae</i> , <i>Tribulus occidentalis</i> .
Vegetation condition	Very Good: scattered weeds (* <i>Cenchrus ciliaris</i> ), and signs of cattle (scats).
Sampling sites	Inside study area: ASH12. Outside study area: OS26, WH41.



Plate 5.29: Unit D2 (ASH12, Phase 2).

<b>D3: GsHsAcTeCEc</b>	<b><i>Grevillea stenobotrya</i>, <i>Hakea stenophylla</i> subsp. <i>stenophylla</i>, <i>Acacia coriacea</i> subsp. <i>coriacea</i> tall open shrubland over <i>A. stellaticeps</i>, <i>Scaevola sericophylla</i>, <i>Quoya loxocarpa</i> low open shrubland over <i>Triodia epactia</i> open hummock grassland with *<i>Cenchrus ciliaris</i> very open tussock grassland.</b>
Distribution and habitat	This vegetation occurred on the crests and swales of secondary longitudinal dunes and on intervening sandy plains, through the central section of the access corridor and the main study area.
Other associated species	<u>Shrubs:</u> <i>Acacia tetragonophylla</i> , <i>Bonamia erecta</i> , <i>Eremophila forrestii</i> subsp. <i>forrestii</i> , <i>Hibiscus brachychlaenus</i> , <i>Olearia</i> sp. Kennedy Range (G. Byrne 66), <i>Rhagodia eremaea</i> , <i>Scaevola spinescens</i> , <i>Solanum diversiflorum</i> , <i>S. lasiophyllum</i> , <i>Trichodesma zeylanicum</i> var. <i>grandiflorum</i> , <i>Verticordia forrestii</i> . <u>Grasses:</u> <i>Aristida holathera</i> var. <i>holathera</i> , <i>Eragrostis eriopoda</i> . <u>Herbs:</u> <i>Cassytha capillaris</i> , <i>Corynotheca pungens</i> , <i>Diplopeltis eriocarpa</i> , <i>Pterocaulon sphacelatum</i> , <i>Rhynchosia minima</i> , <i>Sida rohlenae</i> subsp. <i>rohlenae</i> .
Vegetation condition	Very Good: weeds present at low density (mainly * <i>Cenchrus ciliaris</i> ).
Sampling sites	Inside study area: ASH28, ASH32, STR01R, STR08R. Outside study area: ASHC06.



Plate 5.30: Unit D3 (ASH28, Phase 1).



Plate 5.31: Unit D3 (ASHC06, Phase 1).

<b>D4: GsHsAcAstTavTe</b>	<b><i>Grevillea stenobotrya</i>, <i>Hakea stenophylla</i> subsp. <i>stenophylla</i>, (<i>Acacia coriacea</i> subsp. <i>coriacea</i>) tall open shrubland over <i>Acacia stellaticeps</i> open shrubland over <i>Scaevola sericophylla</i> low open shrubland over <i>Triodia avenoides</i>, (<i>T. epactia</i>) hummock grassland.</b>
Distribution and habitat	This vegetation occurred on the crests and swales of inland longitudinal dunes and on intervening sandy plains along the eastern edge of the main study area.
Other associated species	<u>Shrubs:</u> <i>Acacia sclerosperma</i> subsp. <i>sclerosperma</i> , <i>Adriana tomentosa</i> var. <i>tomentosa</i> , <i>Alyogyne pinoniana</i> var. <i>pinoniana</i> , <i>Bonamia erecta</i> , <i>Crotalaria cunninghamii</i> subsp. <i>sturtii</i> , <i>Eremophila setacea</i> , <i>Grevillea eriostachya</i> , <i>Hibiscus brachychlaenus</i> , <i>Quoya loxocarpa</i> , <i>Q. paniculata</i> , <i>Scaevola spinescens</i> , <i>Solanum lasiophyllum</i> , <i>Tephrosia rosea</i> var. <i>clementii</i> , <i>Trichodesma zeylanicum</i> var. <i>grandiflorum</i> , <i>Verticordia forrestii</i> . <u>Grasses:</u> <i>Aristida holathera</i> var. <i>holathera</i> , * <i>Cenchrus ciliaris</i> (scattered grasses to very open tussock grassland). <u>Herbs:</u> <i>Cassytha capillaris</i> , <i>Corynotheca pungens</i> , <i>Euphorbia myrtoides</i> , <i>Ptilotus polystachyus</i> , <i>Rhodanthe psammophila</i> , <i>Roebuckiella cheilocarpa</i> var. <i>cheilocarpa</i> , <i>Salsola australis</i> , <i>Sida rohlenae</i> subsp. <i>rohlenae</i> .
Vegetation condition	Very Good: scattered weeds (mainly * <i>Cenchrus ciliaris</i> ); signs of cattle at some sites.
Sampling sites	Inside study area: ASH13, ASH14, ASH20, ASH44. Outside study area: ASHC07.



Plate 5.32: Unit D4 (ASH14, Phase 2).



Plate 5.33: Unit D4 (ASH20, Phase 1).

## 5.2.6 Other Mapping units

A large proportion (55%) of the study area was naturally devoid of perennial vegetation. Such habitats ranged from broad areas of intertidal and hypersaline mudflats, to large claypans supporting mainly annual herbs and grasses following the wet season, to small bare claypans within the plains vegetation, to dune blowouts and areas of water within the Ashburton River channel (Plate 5.34 to Plate 5.37). These areas were naturally bare, and were not ranked for condition.

A very small proportion (0.2%) of the study area had been cleared for tracks, pastoral infrastructure and development of the AGIG Tubridgi gas storage facility. These areas were ranked as Completely Degraded.



Plate 5.34: Bare mudflat with isolated islands.



Plate 5.35: Large claypan with scattered herbs (Phase 1).



Plate 5.36: Small dry bare claypan (Phase 1).



Plate 5.37: Inundated claypan (Phase 2).

## 5.3 Condition of the Vegetation Units

Vegetation condition assessments were based on the ranking scale developed by Trudgen (1988). The resulting condition of the vegetation in the study area is mapped in Appendix 10, with weed locations shown in overview. The rankings considered the degree of invasion by introduced flora (weeds), impact from humans, feral animal and livestock activities, and the structural integrity of the vegetation (see Appendix 4).

A large proportion (55%) of the study area was not assigned a condition ranking, as it comprised areas that were naturally devoid of vegetation. The vegetation of the majority of the remainder of the study area was ranked as being in Very Good condition (see Table 5.2). The sapphire vegetation was largely weed-free, with only very occasional *Sonchus oleraceus* and *Cenchrus* grasses. Vegetation on sand dunes and plains generally contained at least scattered *Cenchrus*

grasses, and sometimes dense patches or large infestations; condition was generally ranked as Very Good, with some areas ranked Good to Poor (e.g. within P2 and P4).

Vegetation along the Ashburton River (unit C1) and in the larger drainage areas supporting unit C2 was mostly in Poor condition, containing high numbers of weeds and being more heavily used by cattle.

A very small proportion (0.2%) of the study area had been cleared for tracks and for pastoral and gas storage infrastructure; these areas were scored as Completely Degraded.

**Table 5.2: Summary of condition categories assigned to vegetation in the study area.**

Condition Category	Area in Study Area (ha)	Proportion of Study Area (%)
Excellent	336.4	0.6%
Very Good	17,181.7	32.6%
Good/Very Good	869.1	1.6%
Good	1,585.7	3.0%
Poor	3,237.0	6.1%
Very Poor	421.0	0.8%
Completely Degraded	105.9	0.2%
N/A (naturally bare; e.g. mudflats and claypans)	29,022.7	55.0%

## 5.4 Results of the Floristic Analysis

The first analysis was completed to assist with determining the vegetation units and used only those sites from the current survey work (including the reference sites outside the study area). Both cover and presence-absence data were used, with the cover data yielding the most logical groupings. The dendrogram based on cover data and the NMDS plot are provided in Figures 1 and 2 in Appendix 11. Table 1 and Table 2 in Appendix 11 summarise the number of sites in each vegetation type in each floristic group based on cover and presence-absence data, respectively. Table 3 in Appendix 11 summarises the key species contributing the greatest amount to the similarity of sites in each floristic group based on cover.

There was relatively good congruence between a number of the vegetation types identified on the basis of structure and dominant species, and the floristic groups identified through the PRIMER analyses, while other vegetation types were less consistent in their floristic composition. Based on the analyses of sites from the current surveys, and using cover data (unless otherwise specified):

- Sites from the coastal strand (unit B1) occurred in a distinct floristic group ( $FG_i$ ), and sites on the near-coastal dunes (units D1 and D2) were similarly quite distinct ( $FG_j$  and  $FG_k$  respectively). This is as expected given the reduced set of species occurring in these habitats, all of which are either restricted to the coastal fringe or are most abundant on the narrow backing dunes.
- Sites from samphire vegetation on the saline flats (units S1, S2 and S3) occurred mainly in three floristic groups ( $FG_a$ ,  $FG_b$  and  $FG_c$ ), which only contained *Tecticornia*-dominated sites. All sites from unit S1 were in  $FG_c$ , distinct from all other sites, but the sites in the other samphire units were less clearly associated.  $FG_b$  only contained sites from unit S3, however sites from this unit also occurred in  $FG_a$ . One site from S2 also occurred in  $FG_a$  while the other (ASH35) grouped with the sites from the scald vegetation (S4) in  $FG_d$ , due to the shared presence of *Atriplex codonocarpa* and *Sclerolaena recurvicauspis*. Based on presence data, the samphire sites clustered entirely in three groups ( $FG_q$ ,  $FG_s$  and  $FG_t$ ). All sites from unit S1 were again in a single group ( $FG_t$ ), however this group also contained sites from S2 and S3, as well as ASH33 from S4. In addition, some sites from S2 and S3 occurred in  $FG_q$  and/or  $FG_s$ . The groupings were therefore slightly different depending on whether cover or presence were used.
- The single site in Snakewood vegetation (ASH18 in S5) clustered within  $FG_l$  with the single site on the floodbanks of the Ashburton River (ASH56 in C1). Although structurally distinct and occurring on very different landforms, these sites shared a moderate cover of *\*Cenchrus ciliaris*, and two



species that were not particularly common in the data set (*Enchylaena tomentosa* var. *tomentosa* and *Scaevola spinescens*); they also had no or negligible spinifex cover and lacked a number of common species that were present in many other sites. On the basis of the presence-absence data, these two sites were no longer clustered together; ASH18 grouped with two sites from the plains vegetation unit P1, while ASH56 grouped with sites from the drainage vegetation types C2 and C3. This would represent a more reasonable floristic association for these two sites.

- Sites in the other drainage vegetation units (C2, C3 and C4) were distributed across four floristic groups ( $FG_e$ ,  $FG_f$ ,  $FG_g$  and  $FG_h$ ), with only C4 occurring in a single group ( $FG_f$ ). Sites in these drainage vegetation units contained a similar mixture of dominant species, particularly *Eucalyptus victrix*, *Eriachne benthamii/flaccida* and *Sporobolus mitchellii*, but often different proportions of each species. On the basis of the presence-absence data, sites in C2, C3 and C4 still occurred over four floristic groups, however these groups generally contained different combinations of sites; only C4 continued to group separately, as the most cohesive grouping of sites.
- Sites from the plains vegetation units (P1 to P4) occurred mainly in four groups ( $FG_m$ ,  $FG_n$ ,  $FG_o$  and  $FG_q$ ). The sites in units P1 and P4 in particular were not consistent with regards to floristic composition. This is as expected given that these units shared a similar mixture of dominant species occurring in different proportions (particularly *Acacia tetragonophylla*, *A. stellaticeps*, *\*Cenchrus ciliaris* and *Triodia epactia*), which may not always be well captured by individual sampling sites.
- Sites from the inland sand dune vegetation units (D3 and D4) occurred mainly in a single group ( $FG_p$ ), clustering together due to species that are characteristic of dune habitats (e.g. *Scaevola sericophylla* and *Grevillea stenobotrya*). A few dune sites occurred in other groups ( $FG_r$  and  $FG_s$ ) due to the presence of *Triodia avenoides*; this species occurred sporadically through the landscape and was not considered to warrant being distinguished as a separate mapping unit.

## 5.5 Vegetation of Conservation Significance

### 5.5.1 Threatened and Priority Ecological Communities

None of the vegetation types identified for the study area represent TECs listed either under the Commonwealth EPBC Act or the WA *Environmental Protection Act 1986*, and no PECs were identified in the study area.

### 5.5.2 Other Vegetation Communities of Conservation Significance

The vegetation types currently considered to be of somewhat elevated significance are summarised in Table 5.3 and briefly described below. These units are not particularly restricted or unusual, and would be of local rather than regional significance.

**Table 5.3: Vegetation units of elevated conservation significance within the study area.**

Significance	Mapping Unit from the Current Study	Area (ha)
<b>Groundwater Dependent Vegetation</b>		
GDV	C1: <i>Eucalyptus victrix</i> low open woodland over <i>*Prosopis pallida</i> scattered tall shrubs over <i>*Cenchrus ciliaris</i> , ( <i>*C. setiger</i> ) open tussock grassland	10.7
	C2: <i>Eucalyptus victrix</i> low woodland to low open woodland over <i>Acacia synchronicia</i> , <i>A. tetragonophylla</i> scattered tall shrubs to tall open shrubland over <i>Eriachne benthamii/flaccida</i> , ( <i>Eulalia aurea</i> , <i>Sporobolus mitchellii</i> ) tussock grassland.	681.2
<b>Vegetation Communities of Local Significance (high reservation priority)</b>		
Sapphire shrublands	S1: <i>Tecticornia doliiformis</i> , ( <i>T. indica</i> , <i>T. halocnemoides</i> , <i>Frankenia ambita</i> ) low shrubland over <i>Sporobolus mitchellii</i> , <i>Eragrostis falcata</i> very open grassland	414.5
	S2: <i>Tecticornia indica</i> , ( <i>T. auriculata</i> , <i>T. halocnemoides</i> ) low open shrubland over <i>Eragrostis falcata</i> scattered grasses	153.1
	S3: <i>Tecticornia auriculata</i> , ( <i>T. indica</i> , <i>T. halocnemoides</i> ) low shrubland over <i>Eragrostis falcata</i> scattered grasses	1,150.5

The remaining vegetation types in the study area are considered to be of lower conservation significance, being representative of the vegetation occurring in similar habitats throughout the locality. Note that this is not meant to imply that the vegetation in the study area is of no conservation value, as all intact native vegetation is inherently valuable (DEWHA 2010).

## 6.0 Flora of the Study Area

### 6.1 Overview

A total of 288 native vascular flora species from 126 genera and 45 families have been recorded from the study area based on all surveys to date. This total excludes taxa that could not be fully determined but would represent named species already on the list (e.g. sterile specimens of *Nicotiana occidentalis*). Ten additional native taxa were recorded from the survey work completed outside the study area, however six of these were taxa that could only be determined to genus level due to the poor condition of the material; these were likely to represent named taxa on the species list.

The dominant native plant families and genera recorded from the study area are presented in Table 6.1. These families and genera are typically represented in species lists from this region.

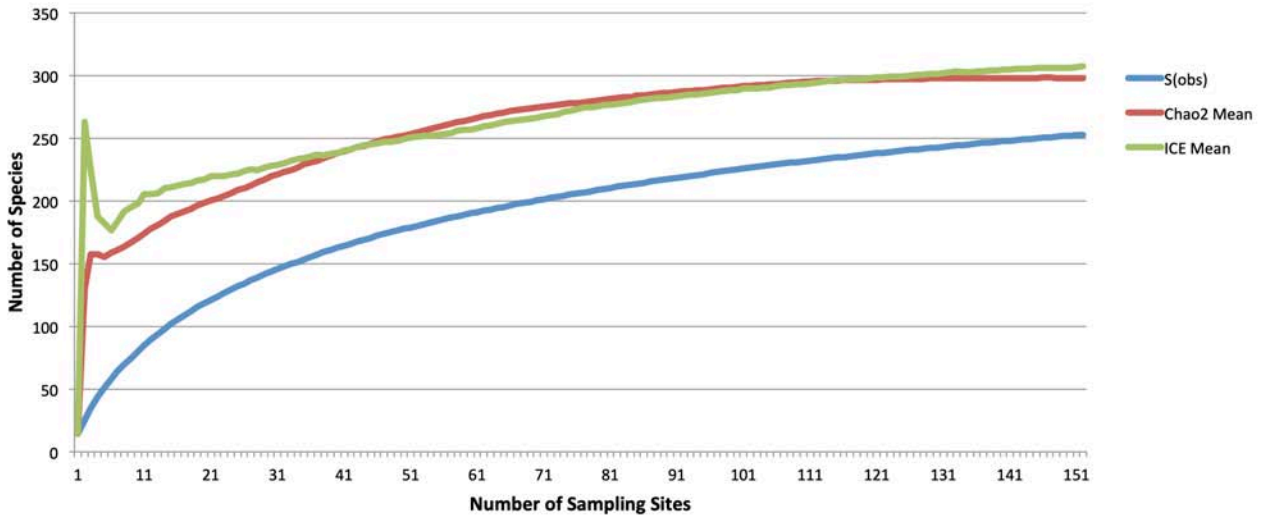
**Table 6.1 Dominant families and genera recorded from the study area.**

Family	No. of Native Species	Genus	No. of Native Species
Fabaceae	46	<i>Acacia</i>	15
Poaceae	43	<i>Ptilotus</i>	10
Chenopodiaceae	31	<i>Eragrostis</i>	8
Asteraceae	27	<i>Euphorbia</i>	8
Malvaceae	21	<i>Tecticornia</i>	8
Amaranthaceae	12	<i>Abutilon</i>	7
Goodeniaceae	11	<i>Eriachne</i>	7
Convolvulaceae	9	<i>Scaevola</i>	7
Euphorbiaceae	9	<i>Senna</i>	7

In addition to the above, 15 introduced flora species (weeds) from 14 genera and nine families have been recorded from the study area, and one additional weed was recorded during the current surveys in the locality (see Section 6.5)

### 6.2 Sampling Adequacy and Species Richness

The species accumulation curve generated from the quadrat and relevé survey data is approaching a plateau, indicating that the sampling of the study area was relatively thorough (Figure 6.1). However, the two estimates of species richness (ICE and Chao2) suggested that the actual number of species present in the sampled area was approximately 303, which would mean that 82-85% of the total flora (native and introduced species) were recorded during the site sampling for the current study (Table 6.2). These sorts of proportions are similar to those reported for other surveys of a similar nature (e.g. 83% (Ecoedge 2014); 84% (Ecologia 2016), 82-88% (Ecologia 2009b); 86-87% (Biota 2018); and 87% (Coffey 2015)). When the additional species that were recorded opportunistically are included, the species recorded in 2018-2019 represent 100% of the total species estimated to occur in the sampling area.



**Figure 6.1:** Species accumulation curve based on actual observations at the sampling sites (S(obs)), together with two estimates of species richness (ICE and Chao 2).

**Table 6.2:** Recorded species richness compared with predicted species richness using incidence-based estimators (without opportunistic records).

Parameter		Number of Species	Percent of Estimated Richness Recorded
Number of Species Recorded (from 2018-2019 quadrats and relevés only)		253	N/A
Estimated Number of Species	Chao 2 Mean	298	85%
	ICE Mean	307	82%

Species richness typically shows a positive relationship with various factors, including the size of the study area, the diversity of habitats present, and the amount of rainfall received by the locality. Coastal areas in the Carnarvon bioregion are not particularly species rich: coastal environments generally do not support a diverse array of species, and many habitats are harsh environments for plant growth (e.g. saline mudflats and mobile sand dunes).

It is difficult to compare the species richness of the current study area with other survey areas in the locality, as it contains such large areas of unvegetated mudflat. Using the area of vegetated habitat only, the total number of species recorded from the study area is in the order expected for a survey area of this site in this locality (see Figure 6.2). The particularly high number of species recorded from the Wheatstone survey area reflects a relatively more diverse array of landforms and geology types present in this area, as well as repeated sampling.

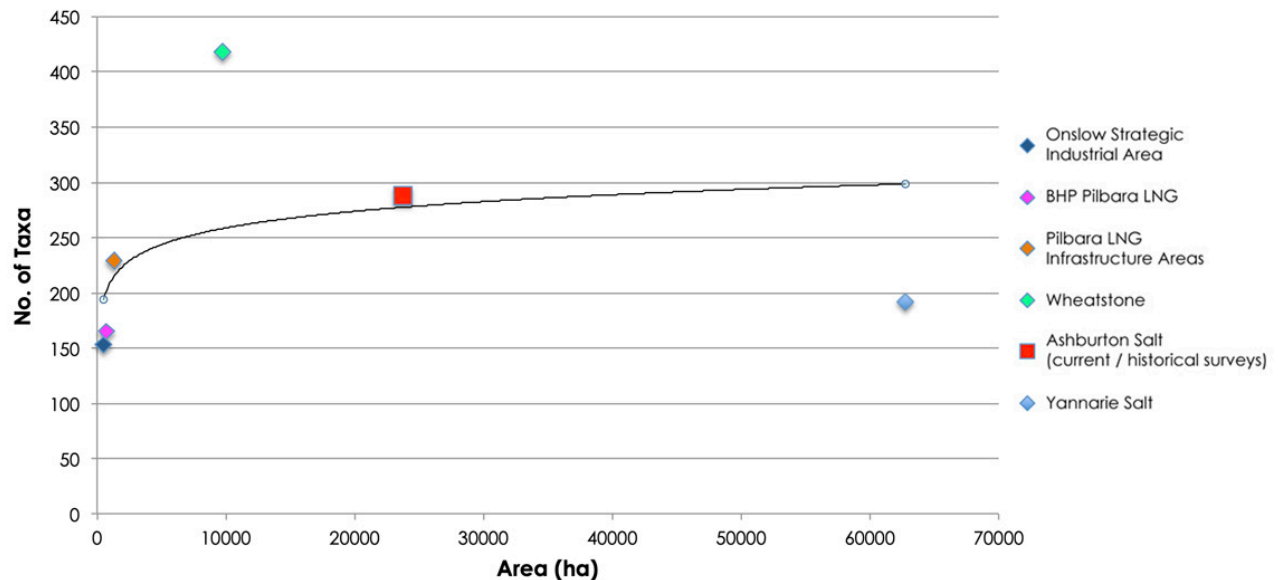


Figure 6.2: Species richness for the current study area, compared to other survey areas in the locality.

## 6.3 Undescribed or Unresolved Taxa from the Current Survey

With regards to the 304 species (native and introduced) recorded from this study, a total of 24 taxa (8%) could not be fully resolved (those assigned "sp."), or were only tentatively identified (those with "?"). This was mainly due to the poor conditions at the time of the surveys, which resulted in inadequate material for identification, but was also in some cases because the taxonomic framework was not sufficiently developed (e.g. *Tecticornia pterygosperma* subsp. aff. *denticulata*). Only one of these taxa is considered to be of note:

- ***Acacia ? ligulata* (possible hybrid)**

One wattle specimen collected during the targeted searches appeared unusual; the phyllodes superficially resembled *A. ligulata*, but were atypical in showing frequent anastomosing of the veins. The identity of this species could not be resolved on the basis of the material collected.



Plate 6.1: *Acacia ? ligulata*.

## 6.4 Flora of Conservation Significance

### 6.4.1 Threatened Flora

No species listed as Threatened flora under State legislation have been recorded in the study area to date, and none would be expected to occur (see Section 4.9.1 and Appendix 3).

However, one species listed as Threatened under Commonwealth legislation was recorded: *Minuria tridens* is listed as Vulnerable under the EPBC Act. This species is only listed as a Priority 1 species in WA (see discussion in Section 6.4.2). The specimen was in poor condition and therefore only tentatively identified as *M. tridens* by WA Herbarium Taxonomist Mike Hislop.

The small sedge *Eleocharis papillosa*, which is similarly a Threatened species under the EPBC Act but is only listed as a Priority 3 species in WA, was not recorded during the field surveys but would be likely to occur in the study area (see Section 6.4.2). This species would only be detected after high rainfall. In the event that it does occur in the study area, it would be highly unlikely to be restricted to the project area, given that its habitat (low-lying sandplain) is abundant locally and occurs elsewhere in the region.

## **6.4.2 Priority Flora**

A total of five Priority flora taxa were recorded from the study area during the current survey (see Appendix 9 for tabulated records, and locations shown on maps). These species are listed and briefly described in Table 6.4. All except *Minuria tridens* have been documented previously from the broader locality.

**Table 6.3 Summary of Priority flora taxa recorded from the study area.**

Taxon	Description	Total Counts and Distribution
<b>Priority 1</b>		
<i>Minuria tridens</i>	A perennial subshrub growing to 30 cm tall with pale blue flowers (Plate 6.2). Currently represented in WA by a single specimen from near Cue, approximately 720 km south-southeast of Onslow. All other records are more than 1700 km east of Onslow in the Northern Territory, where it occurs over a range of more than 300 km on "dolomite, limestone and calcrete impregnated sandstone hills, rises and ranges" (Nano et al. 2012). It seems questionable that the WA populations would represent the same entity present in the Northern Territory, however genetic analysis would be required to investigate this.	1 plant recorded in Phase 1 from an island surrounded by mudflat in the northern section of the study area. Mike Hislop from the WA Herbarium provided the following advice in relation to this specimen: "I recently inspected a flowering specimen from the same area and found no reason to doubt that it was <i>Minuria tridens</i> , notwithstanding the geographical disjunction from the nearest known population. While I am fairly confident that this material is of the same species, it is totally sterile and so there is a degree of uncertainty."
<b>Priority 3</b>		
<i>Abutilon</i> sp. Pritzelianum (S. van Leeuwen 5095)	A shrub growing to 1.5 m tall with yellow-orange flowers in August. This species occurs on sand plains with orange brown sandy loam substrate, and is distributed over a range of more than 700 km, extending from the southern Carnarvon bioregion through to Port Hedland in the Pilbara (DBCA 2019b).	29 individuals recorded from 12 locations in the study area. A further 137 individuals recorded from 13 locations outside the study area. Most records from near coastal dune vegetation, but records also from sand plains, including in the far south of the study area.
<i>Eremophila forrestii</i> subsp. <i>viridis</i>	A shrub growing to 1.5 m tall (Plate 6.3), with broad, deep green leaves that are covered in raised bumps and have a few branched hairs, and pale pink flowers from June to August (Brown and Buirchell 2011). Most records distributed over a range of 70 km in the area where the Carnarvon and Pilbara bioregions meet, with an outlying record over 1,000 km east on the Canning Stock Route.	935 individuals recorded from 54 locations in the study area. A further 13 individuals recorded from 2 locations outside the study area. Recorded from numerous locations on sand plains throughout the study area, including isolated islands surrounded by mudflat.
<i>Stackhousia clementii</i>	A dense, broom-like perennial shrub growing to 50 cm tall, with yellow tubular flowers (Plate 6.4), found on sandy plains and occasionally inundated areas (DBCA 2019b). This species has a broad distribution across the breadth of the arid zone of WA, with most records from the Carnarvon, Pilbara and Murchison bioregions, but some records also towards the Northern Territory border.	390 individuals recorded from 9 locations on an island surrounded by mudflat in the northern section of the study area, all concentrated on an area of limestone pavement ~100x300 m in size.
<i>Triumfetta echinata</i>	A low spreading shrub to 40 cm tall with grey leaves densely covered with stellate hairs, and fruit with long spines (Plate 6.5). Recorded from the area where the Carnarvon, Pilbara and Gascoyne bioregions meet, where it occurs on red sand dunes; distributed over a range of only 42 km between Onslow and Uaroo Station.	1 plant recorded during targeted searches in 2019 towards the eastern end of the road corridor, occurring on the side of a track near the crest of a sand dune.



Plate 6.2: *Minuria tridens* (image from Nano et al. 2012).



Plate 6.3: *Eremophila forrestii* subsp. *viridis*.



Plate 6.4: *Stackhousia clementii* – habitat and growth form.





Plate 6.5: *Triumfetta echinata*.

## 6.5 Introduced Flora

A total of 16 introduced flora taxa (weed species) were recorded during the current surveys, one of which was only recorded outside the study area (see Table 6.4). All records are shown on the vegetation condition mapping and tabulated in Appendix 10. Note that for the purpose of providing a total number of individuals, any record for which this information was not recorded was assigned a nominal value of “1”.

Additionally, it should be noted that no attempt was made to record every individual location for the species that were particularly widespread throughout the study area (e.g. *Cenchrus* spp., *Prosopis pallida* and *Vachellia farnesiana*). The records for these species are by no means comprehensive, but merely intended to represent the broad distribution of these species in the area. Although weeds were widespread as scattered individuals, dense introduced species were most commonly recorded from areas of pastoral activity such as cattle pens, infrastructure areas and open grazed plains, and also in the vicinity of the Ashburton River.

Three species recorded from the study area, *Parkinsonia aculeata* (Parkinsonia), *Prosopis pallida* (Mesquite) and *Tamarix aphylla* (Athele Pine) are declared plants under the WA BAM Act (see DAFWA 2019b) and are also listed as WoNS (Thorpe and Lynch 2000)<sup>5</sup>.

The then Department of Parks and Wildlife's (2013a) Weed Species Ranking, which was derived from the Department's Weed Prioritisation Process (WPP) (Department of Parks and Wildlife 2013b), took into account the potential distribution, current distribution, ecological impact, invasiveness and feasibility of control to derive a broad qualitative weed species ranking corresponding to specific management actions. The majority (10) of the species recorded from the study area have both a 'High' ranking for Ecological Impact and a 'Rapid' ranking for Invasiveness through this process: *Aerva javanica*, *Cenchrus ciliaris*, *Cenchrus setiger*, *Malvastrum americanum*, *Parkinsonia aculeata*, *Passiflora foetida* var. *hispida*, *Prosopis pallida*, *Setaria verticillata*, *Tamarix aphylla* and *Vachellia farnesiana*. *Aerva javanica*, *Cenchrus ciliaris*, *C. setiger*, *Parkinsonia aculeata* and *Prosopis pallida* in particular are all generally considered to be serious environmental weeds.

<sup>5</sup> For the current listing of Weeds of National Significance, go to <http://www.environment.gov.au/biodiversity/invasive/weeds/weeds/lists/wons.html>

**Table 6.4 Summary of introduced taxa recorded during the current surveys, including WPP rankings.**

Species	Description	WPP – Weed Species Ranking		Current Survey Total Counts and Distribution
		Ecological Impact	Invasiveness	
* <i>Aerva javanica</i> (Kapok Bush)	Erect perennial herb, often occurs on sandy soils. Originally introduced to assist with the revegetation of disturbed bushland; now widespread from Carnarvon to the Kimberley (Hussey et al. 2007).	H	R	Recorded from near-coastal areas at the northern end of the main study area (52 individuals from 4 locations), and along the access road through the western half of the road corridor (253 individuals from 10 locations).
* <i>Cenchrus ciliaris</i> (Buffel Grass)	Perennial tussock grass growing to 1 m tall and flowering for most of the year. Introduced by pastoralists as a fodder species and now widespread through WA. This species has demonstrated allelopathic capacities, whereby it releases chemicals that inhibit the growth of other plants (Cheam 1984a, 1984b, Hussain et al. 2010), and it competes aggressively and effectively with native flora species.	H	R	This species is widespread throughout the study area and in the broader locality, as shown by the 253 locations recorded inside and the additional 33 locations outside, representing well over 120,000 individuals. In most cases, Buffel Grass was present as only scattered individuals or in low numbers, however some dense infestations occurred in sandy habitats near the coast and in the central paddock. This species was largely absent from the mudflats and samphire vegetation.
* <i>Cenchrus setiger</i> (Birdwood Grass)	An erect grass forming tussocks to 80 cm tall, with a compact spike inflorescence (DBCA 2019b), which has more robust spikelets than * <i>C. ciliaris</i> (see Plate 6.11).	H	R	This species was much less common than * <i>C. ciliaris</i> , with over 12,800 individuals recorded from 28 locations inside and one location outside. This species was recorded mainly through the road corridor and in the northern section of the main study area.
* <i>Chenopodium murale</i> (Nettle-leaf Goosefoot)	An erect, much-branched annual herb growing to 1 m tall, with green flowers from April to December (DBCA 2019b).	L	U	3 individuals at a single location in the north of the main study area, growing underneath an old dead tree.
* <i>Flaveria trinervia</i> (Speedy Weed)	Annual daisy to 40 cm tall, with an inflorescence consisting of a large dense cluster of yellow flower heads. Widespread through the Pilbara and Kimberley in a variety of habitats, including drainages and disturbed areas (Hussey et al. 2007).	–	–	Scattered occurrences from the eastern end of the road corridor to the southwestern section of the main study area (total of 49 individuals from 6 locations).
* <i>Malvastrum americanum</i> (Spiked Malvastrum)	Erect, perennial herb or shrub to 1.3 m tall, with yellow or orange flowers from April to July (DBCA 2019b). A common introduced species associated with Mulga vegetation, hills, rockpiles, plains and drainage lines and floodplains. This species is widespread throughout the Kimberley, Pilbara, Gascoyne and Carnarvon bioregions.	H	R	Over 468 individuals recorded from 9 locations spread through the road corridor and northeastern section of the main study area, including 450 individuals on the verge of a track through a drainage area.
* <i>Melilotus indicus</i> (King Island Melilot)	An erect annual or short-lived perennial to 50 cm with small yellow flowers (Hussey et al. 2007).	–	–	5 individuals recorded from a single location in the north of the main study area.
* <i>Momordica balsamina</i> (Balsam Apple)	Trailing herbaceous creeper, recorded from scattered locations from the Kimberley to Perth (DBCA 2019b), usually on sandy soils in near-coastal areas.	H	U	Not recorded in the study area. Single individual recorded outside the study area from a near-coastal dune (ASHC15); present in both phases.

Species	Description	WPP – Weed Species Ranking		Current Survey Total Counts and Distribution
		Ecological Impact	Invasiveness	
* <i>Parkinsonia aculeata</i> (Parkinsonia)	A spiny shrub or tree, which grows to 8 m tall and has yellow flowers during March or from May to December. It occurs on Sandy or clayey soil, often along watercourses (DBCA 2019b).	H	R	Over 50 individuals recorded from 4 locations in the road corridor, all associated with the banks and adjacent floodplain of the Ashburton River.
* <i>Passiflora foetida</i> var. <i>hispida</i> (Stinking Passion Flower)	A woody climber growing to 9 m tall, with an unpleasant odour. It has cream-white-blue flowers from February to November (DBCA 2019b), followed by small orange fruit.	H	R	41 individuals recorded from 13 locations, concentrated in the vicinity of the Ashburton River in the road corridor, and in the northeastern section of the main study area.
* <i>Phoenix dactylifera</i> (Date Palm)	Palm growing to 8 m tall (DBCA 2019b), typically planted around historical settlements or at water pools and rivers (and from there establishing more widely).	H	R	One individual (with multiple stems) was recorded in the study area from sand plain towards the coast.
* <i>Prosopis pallida</i> (Mesquite)	A spiny tree or shrub growing to 10 m tall, with yellow flowers and glabrous seed pods (DBCA 2019b). Widespread in near-coastal areas from Geraldton to the Kimberley, with particularly severe infestations at Mardie Station, ~70 km northeast of Onslow.	H	R	Widespread through the locality: over 1,600 individuals were recorded from 143 locations inside the study area, with one additional individual recorded outside. Most records were from the northern half of the main study area and the road corridor, where it was most frequently recorded in the vicinity of the Ashburton River; however one record of 10 individuals from the far south of the main study area, indicating that this species potentially occurs throughout the area. Most records were of under 20 individuals, however some records of 100-200 plants from the northern section of the main study area.
* <i>Setaria verticillata</i> (Whorled Pigeon Grass)	A grass growing to 1 m tall, with a distinctive inflorescence bearing bristles with recurved spines (DBCA 2019b).	H	R	Over 46 individuals were recorded from 4 locations; two each in the northern and southern sections of the main study area.
* <i>Sonchus oleraceus</i> (Common Sowthistle)	Short-lived annual herb growing to 1.5 m tall (DBCA 2019b). This species is common and widespread in disturbed areas of WA from Wittenoom to the Nullarbor (Hussey et al. 2007).	L	R	Scattered in the northern half of the main study area (35 individuals recorded from 4 locations).
* <i>Tamarix aphylla</i> (Athele Tree)	A dense tree growing to 12 m tall, with white to pink flowers in February or May (DBCA 2019b). Widespread from Perth to the Kimberley, where it was often planted as a shade tree or to combat erosion.	H	R	Three individuals recorded from the northern section of the study area; one very large tree near the coast, and two smaller trees near Cades Bore.
* <i>Vachellia farnesiana</i> (Mimosa Bush)	A spreading, spinescent shrub or tree growing to 4 m tall, with dark grey bark, pinnate leaves and yellow flowers in winter (DBCA 2019b). Can be distinguished from * <i>Prosopis pallida</i> by the presence of white lenticels on the stems.	H	R	Widespread through the locality: over 870 individuals were recorded from 164 locations inside the study area, with two additional individuals recorded from a location outside. Most abundant through the road corridor and northern section of the main study area, with only occasional records from the southern section.

WPP = Weed Prioritisation Process (Department of Parks and Wildlife 2013b); only species with rankings in both categories are listed:

**Ecological Impact Ranking:** H = High, L = Low, U = Unknown. **Invasiveness Ranking:** M = Moderate, R = Rapid, U = Unknown.



Plate 6.6: Mesquite.



Plate 6.7: Date Palm.



Plate 6.8: Stinking Passion Flower.



Plate 6.9: Dense Buffel Grass at ASH26 (Phase 1).



Plate 6.10: Small patch of Buffel Grass in general plains vegetation.



Plate 6.11: Comparison of spikelets of *\*Cenchrus ciliaris* (left) and *\*C. setiger* (right).

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# Appendix 1

## Framework for Conservation Significance Ranking of Communities and Species in WA





## A. Definitions, Categories and Criteria for Threatened and Priority Ecological Communities (DEC 2010)

### 1. **General Definitions**

#### **Ecological Community**

A naturally occurring biological assemblage that occurs in a particular type of habitat.

Note: The scale at which biological communities are defined will often depend on the level of detail in the information source, therefore no particular scale is specified.

A **threatened ecological community** (TEC) is one which is found to fit into one of the following categories; "presumed totally destroyed", "critically endangered", "endangered" or "vulnerable".

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

An **assemblage** is a defined group of biological entities.

**Habitat** is defined as the areas in which an organism and/or assemblage of organisms lives. It includes the abiotic factors (e.g. substrate and topography), and the biotic factors.

**Occurrence:** a discrete example of an ecological community, separated from other examples of the same community by more than 20 metres of a different ecological community, an artificial surface or a totally destroyed community.

By ensuring that every discrete occurrence is recognised and recorded future changes in status can be readily monitored.

**Adequately Surveyed** is defined as follows:

"An ecological community that has been searched for thoroughly in most likely habitats, by relevant experts."

**Community structure** is defined as follows:

"The spatial organisation, construction and arrangement of the biological elements comprising a biological assemblage" (e.g. *Eucalyptus salmonophloia* woodland over scattered small shrubs over dense herbs; structure in a faunal assemblage could refer to trophic structure, e.g. dominance by feeders on detritus as distinct from feeders on live plants).

Definitions of **Modification** and **Destruction** of an ecological community:

**Modification:** "changes to some or all of ecological processes (including abiotic processes such as hydrology), species composition and community structure as a direct or indirect result of human activities. The level of damage involved could be ameliorated naturally or by human intervention."

**Destruction:** "modification such that reestablishment of ecological processes, species composition and community structure within the range of variability exhibited by the original community is unlikely within the foreseeable future even with positive human intervention."

**Note:** Modification and destruction are difficult concepts to quantify, and their application will be determined by scientific judgement. Examples of modification and total destruction are cited below:

Modification of ecological processes: The hydrology of Toolibin Lake has been altered by clearing of the catchment such that death of some of the original flora has occurred due to dependence on fresh water. The system may be bought back to a semblance of the original state by redirecting saline runoff and pumping waters of the rising underground watertable away to restore the hydrological balance. Total destruction of downstream lakes has occurred due to hydrology being altered to the point that few of the original flora or fauna species are able to tolerate the level of salinity and/or water logging.

Modification of structure: The understorey of a plant community may be altered by weed invasion due to nutrient enrichment by addition of fertiliser. Should the additional nutrients be removed from the system the balance may be restored, and the original plant species better able to compete. Total destruction may occur if additional nutrients continue to be added to the system causing the understorey to be completely replaced by weed species, and death of overstorey species due to inability to tolerate high nutrient levels.

Modification of species composition: Pollution may cause alteration of the invertebrate species present in a freshwater lake. Removal of pollutants may allow the return of the original inhabitant species. Addition of residual highly toxic substances may cause permanent changes to water quality, and total destruction of the community.

**Threatening processes** are defined as follows:

“Any process or activity that threatens to destroy or significantly modify the ecological community and/or affect the continuing evolutionary processes within any ecological community.”

Examples of some of the continuing threatening processes in Western Australia include: general pollution; competition, predation and change induced in ecological communities as a result of introduced animals; competition and displacement of native plants by introduced species; hydrological changes; inappropriate fire regimes; diseases resulting from introduced micro-organisms; direct human exploitation and disturbance of ecological communities.

**Restoration** is defined as returning an ecological community to its pre-disturbance or natural state in terms of abiotic conditions, community structure and species composition.

**Rehabilitation** is defined as the re-establishment of ecological attributes in a damaged ecological community although the community will remain modified.

## **2. Definitions and Criteria for Presumed Totally Destroyed, Critically Endangered, Endangered and Vulnerable Ecological Communities**

### **ECOLOGICAL COMMUNITIES**

#### **Presumed Totally Destroyed (PD)**

An ecological community that has been adequately searched for but for which no representative occurrences have been located. The community has been found to be totally destroyed or so extensively modified throughout its range that no occurrence of it is likely to recover its species composition and/or structure in the foreseeable future.

An ecological community will be listed as presumed totally destroyed if there are no recent records of the community being extant and either of the following applies (A or B):

- A) Records within the last 50 years have not been confirmed despite thorough searches of known or likely habitats or
- B) All occurrences recorded within the last 50 years have since been destroyed

#### **Critically Endangered (CR)**

An ecological community that has been adequately surveyed and found to have been subject to a major contraction in area and/or that was originally of limited distribution and is facing severe modification or destruction throughout its range in the immediate future, or is already severely degraded throughout its range but capable of being substantially restored or rehabilitated.

An ecological community will be listed as Critically Endangered when it has been adequately surveyed and is found to be facing an extremely high risk of total destruction in the immediate future. This will be determined on the basis of the best available information, by it meeting any one or more of the following criteria (A, B or C):

- A) The estimated geographic range, and/or total area occupied, and/or number of discrete occurrences since European settlement have been reduced by at least 90% and either or both of the following apply (i or ii):
  - i) geographic range, and/or total area occupied and/or number of discrete occurrences are continuing to decline such that total destruction of the community is imminent (within approximately 10 years);
  - ii) modification throughout its range is continuing such that in the immediate future (within approximately 10 years) the community is unlikely to be capable of being substantially rehabilitated.
- B) Current distribution is limited, and one or more of the following apply (i, ii or iii):
  - i) geographic range and/or number of discrete occurrences, and/or area occupied is highly restricted and the community is currently subject to known threatening processes which are likely to result in total destruction throughout its range in the immediate future (within approximately 10 years);
  - ii) there are very few occurrences, each of which is small and/or isolated and extremely vulnerable to known threatening processes;

- iii) there may be many occurrences but total area is very small and each occurrence is small and/or isolated and extremely vulnerable to known threatening processes.

C) The ecological community exists only as highly modified occurrences that may be capable of being rehabilitated if such work begins in the immediate future (within approximately 10 years).

### **Endangered (EN)**

An ecological community that has been adequately surveyed and found to have been subject to a major contraction in area and/or was originally of limited distribution and is in danger of significant modification throughout its range or severe modification or destruction over most of its range in the near future.

An ecological community will be listed as Endangered when it has been adequately surveyed and is not Critically Endangered but is facing a very high risk of total destruction in the near future. This will be determined on the basis of the best available information by it meeting any one or more of the following criteria (A, B, or C):

- A) The geographic range, and/or total area occupied, and/or number of discrete occurrences have been reduced by at least 70% since European settlement and either or both of the following apply (i or ii):
  - i) the estimated geographic range, and/or total area occupied and/or number of discrete occurrences are continuing to decline such that total destruction of the community is likely in the short term future (within approximately 20 years);
  - ii) modification throughout its range is continuing such that in the short term future (within approximately 20 years) the community is unlikely to be capable of being substantially restored or rehabilitated.
- B) Current distribution is limited, and one or more of the following apply (i, ii or iii):
  - i) geographic range and/or number of discrete occurrences, and/or area occupied is highly restricted and the community is currently subject to known threatening processes which are likely to result in total destruction throughout its range in the short term future (within approximately 20 years);
  - ii) there are few occurrences, each of which is small and/or isolated and all or most occurrences are very vulnerable to known threatening processes;
  - iii) there may be many occurrences but total area is small and all or most occurrences are small and/or isolated and very vulnerable to known threatening processes.
- C) The ecological community exists only as very modified occurrences that may be capable of being substantially restored or rehabilitated if such work begins in the short-term future (within approximately 20 years).

### **Vulnerable (VU)**

An ecological community that has been adequately surveyed and is found to be declining and/or has declined in distribution and/or condition and whose ultimate security has not yet been assured and/or a community that is still widespread but is believed likely to move into a category of higher threat in the near future if threatening processes continue or begin operating throughout its range.

An ecological community will be listed as Vulnerable when it has been adequately surveyed and is not Critically Endangered or Endangered but is facing a high risk of total destruction or significant modification in the medium to long-term future. This will be determined on the basis of the best available information by it meeting any one or more of the following criteria (A, B or C):

- A) The ecological community exists largely as modified occurrences that are likely to be capable of being substantially restored or rehabilitated.
- B) The ecological community may already be modified and would be vulnerable to threatening processes, is restricted in area and/or range and/or is only found at a few locations.
- C) The ecological community may be still widespread but is believed likely to move into a category of higher threat in the medium to long term future because of existing or impending threatening processes.

### 3. Definitions and Criteria for Priority Ecological Communities

#### **PRIORITY ECOLOGICAL COMMUNITY LIST**

Possible threatened ecological communities that do not meet survey criteria or that are not adequately defined are added to the Priority Ecological Community Lists under Priorities 1, 2 and 3. These three categories are ranked in order of priority for survey and/or definition of the community, and evaluation of conservation status, so that consideration can be given to their declaration as threatened ecological communities. Ecological Communities that are adequately known, and are rare but not threatened or meet criteria for Near Threatened, or that have been recently removed from the threatened list, are placed in Priority 4. These ecological communities require regular monitoring. Conservation Dependent ecological communities are placed in Priority 5.

#### **Priority One:** Poorly-known ecological communities

Ecological communities with apparently few, small occurrences, all or most not actively managed for conservation (e.g. within agricultural or pastoral lands, urban areas, active mineral leases) and for which current threats exist. Communities may be included if they are comparatively well-known from one or more localities but do not meet adequacy of survey requirements, and/or are not well defined, and appear to be under immediate threat from known threatening processes across their range.

#### **Priority Two:** Poorly-known ecological communities

Communities that are known from few small occurrences, all or most of which are actively managed for conservation (e.g. within national parks, conservation parks, nature reserves, State forest, unallocated Crown land, water reserves, etc.) and not under imminent threat of destruction or degradation. Communities may be included if they are comparatively well known from one or more localities but do not meet adequacy of survey requirements, and/or are not well defined, and appear to be under threat from known threatening processes.

#### **Priority Three:** Poorly known ecological communities

- (i) Communities that are known from several to many occurrences, a significant number or area of which are not under threat of habitat destruction or degradation or:
- (ii) communities known from a few widespread occurrences, which are either large or within significant remaining areas of habitat in which other occurrences may occur, much of it not under imminent threat, or;
- (iii) communities made up of large, and/or widespread occurrences, that may or not be represented in the reserve system, but are under threat of modification across much of their range from processes such as grazing by domestic and/or feral stock, and inappropriate fire regimes.

Communities may be included if they are comparatively well known from several localities but do not meet adequacy of survey requirements and/or are not well defined, and known threatening processes exist that could affect them.

**Priority Four:** Ecological communities that are adequately known, rare but not threatened or meet criteria for Near Threatened, or that have been recently removed from the threatened list. These communities require regular monitoring.

- (a) Rare. Ecological communities known from few occurrences that are considered to have been adequately surveyed, or for which sufficient knowledge is available, and that are considered not currently threatened or in need of special protection, but could be if present circumstances change. These communities are usually represented on conservation lands.
- (b) Near Threatened. Ecological communities that are considered to have been adequately surveyed and that do not qualify for Conservation Dependent, but that are close to qualifying for Vulnerable.
- (c) Ecological communities that have been removed from the list of threatened communities during the past five years.

#### **Priority Five:** Conservation Dependent ecological communities

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



## **B. Categories for Flora and Fauna Species**

### **1. Western Australian Biodiversity Conservation Act 2016, and Priority Species Classification**

In Western Australia, 'Threatened', 'Extinct' and 'Specially Protected' fauna and flora species are protected under the *Biodiversity Conservation Act 2016* (the BC Act), making it an offence to take or disturb these species without Ministerial approval. The definition of 'take' is broad, and includes killing, injuring, harvesting or capturing fauna, and gathering, cutting, destroying, harvesting or damaging flora.

Such species are classified within a framework of several categories.

Species of the highest conservation significance are designated as Threatened species and are protected under sections 19(1)(a), 19(1)(b) and 19(1)(c) of the BC Act. Species are listed within one of three categories:

- Critically endangered (CR), Endangered (EN), or Vulnerable (V), representing those species listed in Schedules 1 to 3 respectively of the *Wildlife Conservation (Specially Protected Fauna) Notice 2018* or the *Wildlife Conservation (Rare Flora) Notice 2018*.

Presumed extinct species are protected under sections 24 and 25 of the BC Act and are listed in one of two categories:

- Extinct (EX), representing those species listed in Schedule 4 of the *Wildlife Conservation (Specially Protected Fauna) Notice 2018* or the *Wildlife Conservation (Rare Flora) Notice 2018*; or
- Extinct in the wild (EW); there are currently no listed species under this category.

Specially protected species are protected under section 13(1) of the BC Act, and include species of special conservation interest, migratory species, cetaceans, species subject to international agreement, or species otherwise in need of special protection. Of these:

- Migratory species (MI) are those listed under schedule 5 of the *Wildlife Conservation (Specially Protected Fauna) Notice 2018*;
- Species of special conservation interest (conservation dependent fauna) (CD) are those listed under schedule 6 of the *Wildlife Conservation (Specially Protected Fauna) Notice 2018*; and
- Other specially protected fauna (OS) are those listed under schedule 7 of the *Wildlife Conservation (Specially Protected Fauna) Notice 2018*;

In addition to the species formally designated as protected under the BC Act, the WA Department of Biodiversity, Conservation and Attractions (DBCA) also maintains a list of 'Priority species'.

Species that appear to be rare or threatened, but for which there is insufficient information to properly evaluate their conservation significance, are assigned to one of three Priority categories (Priority 1 to Priority 3), while species that are adequately known but require regular monitoring are assigned to Priority 4.

Note that of the above classifications, only 'Threatened', 'Extinct' and 'Specially Protected' species have statutory standing. The Priority flora and fauna classifications are employed by the WA DBCA to manage and classify their database of species considered potentially rare or at risk, but these categories have no legislative status.

Further explanations of the categories is provided in more detail in the following pages.



# CONSERVATION CODES

## For Western Australian Flora and Fauna

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

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

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

### **T**     **Threatened species**

Listed by order of the Minister as Threatened in the category of critically endangered, endangered or vulnerable under section 19(1), or is a rediscovered species to be regarded as threatened species under section 26(2) of the *Biodiversity Conservation Act 2016* (BC Act).

**Threatened fauna** is that subset of 'Specially Protected Fauna' listed under schedules 1 to 3 of the *Wildlife Conservation (Specially Protected Fauna) Notice 2018* for Threatened Fauna.

**Threatened flora** is that subset of 'Rare Flora' listed under schedules 1 to 3 of the *Wildlife Conservation (Rare Flora) Notice 2018* for Threatened Flora.

The assessment of the conservation status of these species is based on their national extent and ranked according to their level of threat using IUCN Red List categories and criteria as detailed below.

### **CR**     **Critically endangered species**

Threatened species considered to be "*facing an extremely high risk of extinction in the wild in the immediate future, as determined in accordance with criteria set out in the ministerial guidelines*".

Listed as critically endangered under section 19(1)(a) of the BC Act in accordance with the criteria set out in section 20 and the ministerial guidelines. Published under schedule 1 of the *Wildlife Conservation (Specially Protected Fauna) Notice 2018* for critically endangered fauna or the *Wildlife Conservation (Rare Flora) Notice 2018* for critically endangered flora.

### **EN**     **Endangered species**

Threatened species considered to be "*facing a very high risk of extinction in the wild in the near future, as determined in accordance with criteria set out in the ministerial guidelines*".

Listed as endangered under section 19(1)(b) of the BC Act in accordance with the criteria set out in section 21 and the ministerial guidelines. Published under schedule 2 of the *Wildlife Conservation (Specially Protected Fauna) Notice 2018* for endangered fauna or the *Wildlife Conservation (Rare Flora) Notice 2018* for endangered flora.

### **VU**     **Vulnerable species**

Threatened species considered to be "*facing a high risk of extinction in the wild in the medium-term future, as determined in accordance with criteria set out in the ministerial guidelines*".

Listed as vulnerable under section 19(1)(c) of the BC Act in accordance with the criteria set out in section 22 and the ministerial guidelines. Published under schedule 3 of the *Wildlife Conservation (Specially Protected Fauna) Notice 2018* for vulnerable fauna or the *Wildlife Conservation (Rare Flora) Notice 2018* for vulnerable flora.

## **Extinct species**

Listed by order of the Minister as extinct under section 23(1) of the BC Act as extinct or extinct in the wild.

### **EX Extinct species**

Species where “*there is no reasonable doubt that the last member of the species has died*”, and listing is otherwise in accordance with the ministerial guidelines (section 24 of the BC Act).

Published as presumed extinct under schedule 4 of the *Wildlife Conservation (Specially Protected Fauna) Notice 2018* for extinct fauna or the *Wildlife Conservation (Rare Flora) Notice 2018* for extinct flora.

### **EW Extinct in the wild species**

Species that “*is known only to survive in cultivation, in captivity or as a naturalised population well outside its past range; and it has not been recorded in its known habitat or expected habitat, at appropriate seasons, anywhere in its past range, despite surveys over a time frame appropriate to its life cycle and form*”, and listing is otherwise in accordance with the ministerial guidelines (section 25 of the BC Act).

Currently there are no threatened fauna or threatened flora species listed as extinct in the wild. If listing of a species as extinct in the wild occurs, then a schedule will be added to the applicable notice.

## **Specially protected species**

Listed by order of the Minister as specially protected under section 13(1) of the BC Act. Meeting one or more of the following categories: species of special conservation interest; migratory species; cetaceans; species subject to international agreement; or species otherwise in need of special protection.

Species that are listed as threatened species (critically endangered, endangered or vulnerable) or extinct species under the BC Act cannot also be listed as Specially Protected species.

### **MI Migratory species**

Fauna that periodically or occasionally visit Australia or an external Territory or the exclusive economic zone; or the species is subject of an international agreement that relates to the protection of migratory species and that binds the Commonwealth; and listing is otherwise in accordance with the ministerial guidelines (section 15 of the BC Act).

Includes birds that are subject to an agreement between the government of Australia and the governments of Japan (JAMBA), China (CAMBA) and The Republic of Korea (ROKAMBA), and fauna subject to the *Convention on the Conservation of Migratory Species of Wild Animals* (Bonn Convention), an environmental treaty under the United Nations Environment Program. Migratory species listed under the BC Act are a subset of the migratory animals, that are known to visit Western Australia, protected under the international agreements or treaties, excluding species that are listed as Threatened species.

Published as migratory birds protected under an international agreement under schedule 5 of the *Wildlife Conservation (Specially Protected Fauna) Notice 2018*.

### **CD Species of special conservation interest (conservation dependent fauna)**

Fauna of special conservation need being species dependent on ongoing conservation intervention to prevent it becoming eligible for listing as threatened, and listing is otherwise in accordance with the ministerial guidelines (section 14 of the BC Act).

Published as conservation dependent fauna under schedule 6 of the *Wildlife Conservation (Specially Protected Fauna) Notice 2018*.

### **OS Other specially protected species**

Fauna otherwise in need of special protection to ensure their conservation, and listing is otherwise in accordance with the ministerial guidelines (section 18 of the BC Act).

Published as other specially protected fauna under schedule 7 of the *Wildlife Conservation (Specially Protected Fauna) Notice 2018*.

**P** **Priority species**

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

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

Assessment of Priority codes is based on the Western Australian distribution of the species, unless the distribution in WA is part of a contiguous population extending into adjacent States, as defined by the known spread of locations.

**1** **Priority 1: Poorly-known species**

Species that are known from one or a few locations (generally five or less) which are potentially at risk. All occurrences are either: very small; or on lands not managed for conservation, e.g. agricultural or pastoral lands, urban areas, road and rail reserves, gravel reserves and active mineral leases; or otherwise under threat of habitat destruction or degradation. Species may be included if they are comparatively well known from one or more locations but do not meet adequacy of survey requirements and appear to be under immediate threat from known threatening processes. Such species are in urgent need of further survey.

**2** **Priority 2: Poorly-known species**

Species that are known from one or a few locations (generally five or less), some of which are on lands managed primarily for nature conservation, e.g. national parks, conservation parks, nature reserves and other lands with secure tenure being managed for conservation. Species may be included if they are comparatively well known from one or more locations but do not meet adequacy of survey requirements and appear to be under threat from known threatening processes. Such species are in urgent need of further survey.

**3** **Priority 3: Poorly-known species**

Species that are known from several locations, and the species does not appear to be under imminent threat, or from few but widespread locations with either large population size or significant remaining areas of apparently suitable habitat, much of it not under imminent threat. Species may be included if they are comparatively well known from several locations but do not meet adequacy of survey requirements and known threatening processes exist that could affect them. Such species are in need of further survey.

**4** **Priority 4: Rare, Near Threatened and other species in need of monitoring**

(a) Rare. Species that are considered to have been adequately surveyed, or for which sufficient knowledge is available, and that are considered not currently threatened or in need of special protection but could be if present circumstances change. These species are usually represented on conservation lands.

(b) Near Threatened. Species that are considered to have been adequately surveyed and that are close to qualifying for vulnerable but are not listed as Conservation Dependent.

(c) Species that have been removed from the list of threatened species during the past five years for reasons other than taxonomy.

<sup>1</sup> The definition of flora includes algae, fungi and lichens

<sup>2</sup> Species includes all taxa (plural of taxon - a classificatory group of any taxonomic rank, e.g. a family, genus, species or any infraspecific category i.e. subspecies or variety, or a distinct population).

## 2. Commonwealth *Environment Protection and Biodiversity Conservation Act 1999*

Many of the species that are specially protected at State level are also listed as Threatened species at the Federal level, as one of the Matters of National Environmental Significance (MNES) identified under the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (the EPBC Act). These may be classified as 'critically endangered', 'endangered', 'vulnerable' or 'lower risk', consistent with IUCN categories:

1. **Critically Endangered (CR):** a taxon is Critically Endangered when it is facing an extremely high risk of extinction in the wild in the immediate future.
2. **Endangered (EN):** a taxon is Endangered when it is not Critically Endangered but is facing a very high risk of extinction in the wild in the near future.
3. **Vulnerable (VU):** a taxon is Vulnerable when it is not Critically Endangered or Endangered but is facing a high risk of extinction in the wild in the medium-term future.
4. **Lower Risk (LR):** a taxon is Lower Risk when it has been evaluated, does not satisfy the criteria for any of the categories Critically Endangered, Endangered or Vulnerable. Taxa included in the Lower Risk category can be separated into three subcategories:
  - **Conservation Dependent (CD).** Taxa which are the focus of a continuing taxon-specific or habitat-specific conservation program targeted towards the taxon in question, the cessation of which would result in the taxon qualifying for one of the threatened categories above within a period of five years.
  - **Near Threatened (NT).** Taxa which do not qualify for Conservation Dependent, but which are close to qualifying for Vulnerable.
  - **Least Concern (LC).** Taxa which do not qualify for Conservation Dependent or Near Threatened.

In addition, numerous Migratory species are listed as MNES under the EPBC Act (some of which are also listed as Threatened). Migratory species are those animals that migrate to Australia and its external territories, or pass through or over Australian waters during their annual migrations. The list of migratory species consists of those species listed under the following international conventions:

1. Convention on the Conservation of Migratory Species of Wild Animals (Bonn Convention);
2. China-Australia Migratory Bird Agreement (CAMBA);
3. Japan-Australia Migratory Bird Agreement (JAMBA); and,
4. Republic of Korea-Australia Migratory Bird Agreement (ROKAMBA).

Marine species are also protected under the EPBC Act, and are listed to ensure the long-term conservation of the species. Marine species include all Australian sea snakes, seals, crocodiles, dugongs, marine turtles, seahorses and seabirds that naturally occur in the Commonwealth marine area.

Under the terms of the EPBC Act, an action (e.g. a project or development) is required to be referred to the Australian Government Environment Minister for approval if it has, will have, or is likely to have, a significant impact on an MNES. The term 'action' includes projects and developments subsequent to commencement of the Act, however there are a number of exemptions (e.g. projects in Commonwealth areas). According to Department of the Environment (2013), a 'significant impact' is an impact which is important, notable, or of consequence, having regard to its context or intensity. Whether or not an action is likely to have a significant impact depends upon the sensitivity, value, and quality of the environment which is impacted, and upon the intensity, duration, magnitude and geographic extent of the impacts.

### References:

Department of the Environment (2013). Matters of National Environmental Significance - Significant Impact Guidelines 1.1 *Environment Protection and Biodiversity Conservation Act 1999*. Department of the Environment, Canberra, Australia.



## Appendix 2

### EPBC Act and NatureMap Search Results









# EPBC Act Protected Matters Report

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

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

Information is available about [Environment Assessments](#) and the EPBC Act including significance guidelines, forms and application process details.

Report created: 10/10/18 18:06:45

[Summary](#)

[Details](#)

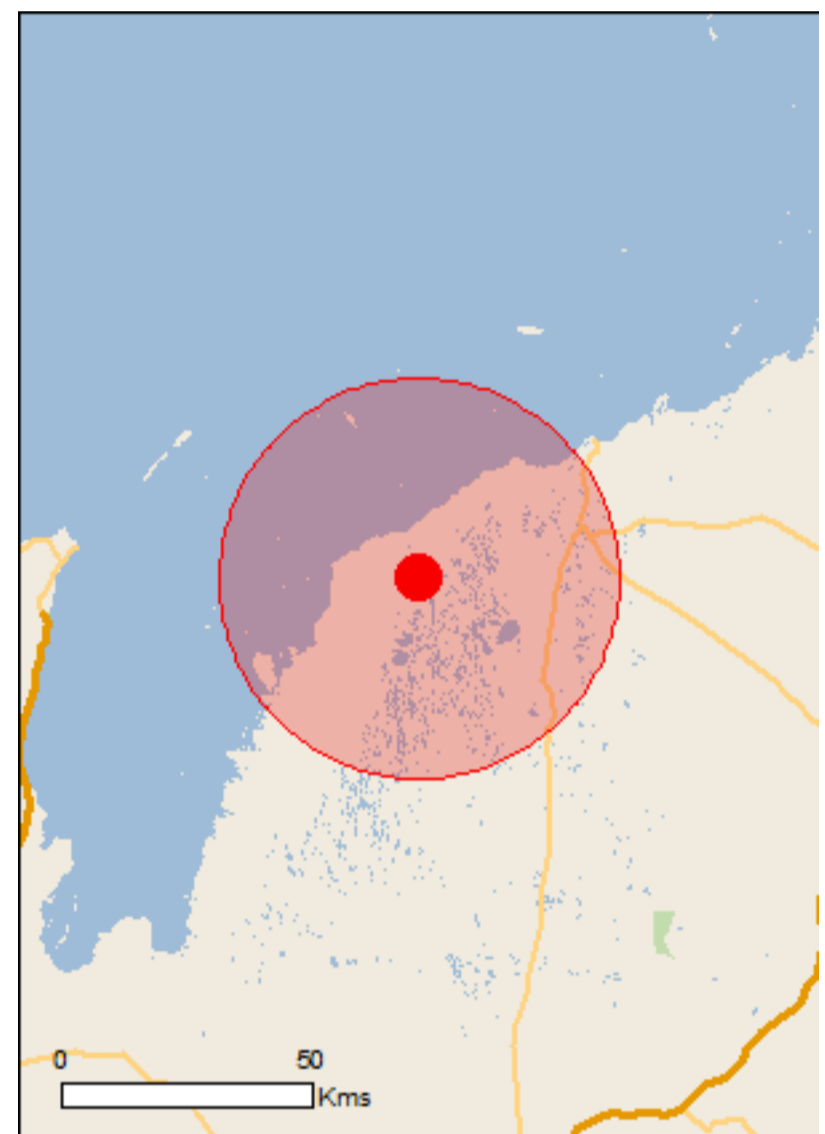
[Matters of NES](#)

[Other Matters Protected by the EPBC Act](#)

[Extra Information](#)

[Caveat](#)

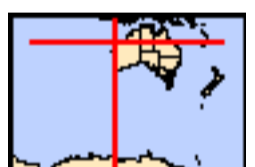
[Acknowledgements](#)



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

[Coordinates](#)

Buffer: 40.0Km



# Summary

## Matters of National Environmental Significance

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

<a href="#">World Heritage Properties:</a>	None
<a href="#">National Heritage Places:</a>	None
<a href="#">Wetlands of International Importance:</a>	None
<a href="#">Great Barrier Reef Marine Park:</a>	None
<a href="#">Commonwealth Marine Area:</a>	None
<a href="#">Listed Threatened Ecological Communities:</a>	None
<a href="#">Listed Threatened Species:</a>	25
<a href="#">Listed Migratory Species:</a>	44

## Other Matters Protected by the EPBC Act

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

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

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

<a href="#">Commonwealth Land:</a>	1
<a href="#">Commonwealth Heritage Places:</a>	None
<a href="#">Listed Marine Species:</a>	84
<a href="#">Whales and Other Cetaceans:</a>	13
<a href="#">Critical Habitats:</a>	None
<a href="#">Commonwealth Reserves Terrestrial:</a>	None
<a href="#">Australian Marine Parks:</a>	None

## Extra Information

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

<a href="#">State and Territory Reserves:</a>	10
<a href="#">Regional Forest Agreements:</a>	None
<a href="#">Invasive Species:</a>	12
<a href="#">Nationally Important Wetlands:</a>	1
<a href="#">Key Ecological Features (Marine)</a>	None

# Details

## Matters of National Environmental Significance

Listed Threatened Species		[ Resource Information ]
Name	Status	Type of Presence
<b>Birds</b>		
<a href="#">Calidris canutus</a> Red Knot, Knot [855]	Endangered	Species or species habitat may occur within area
<a href="#">Calidris ferruginea</a> Curlew Sandpiper [856]	Critically Endangered	Species or species habitat known to occur within area
<a href="#">Limosa lapponica baueri</a> Bar-tailed Godwit (baueri), Western Alaskan Bar-tailed Godwit [86380]	Vulnerable	Species or species habitat may occur within area
<a href="#">Limosa lapponica menzbieri</a> Northern Siberian Bar-tailed Godwit, Bar-tailed Godwit (menzbieri) [86432]	Critically Endangered	Species or species habitat may occur within area
<a href="#">Macronectes giganteus</a> Southern Giant-Petrel, Southern Giant Petrel [1060]	Endangered	Species or species habitat may occur within area
<a href="#">Numenius madagascariensis</a> Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat known to occur within area
<a href="#">Pezoporus occidentalis</a> Night Parrot [59350]	Endangered	Species or species habitat may occur within area
<a href="#">Sternula nereis nereis</a> Australian Fairy Tern [82950]	Vulnerable	Breeding known to occur within area
<a href="#">Thalassarche impavida</a> Campbell Albatross, Campbell Black-browed Albatross [64459]	Vulnerable	Species or species habitat may occur within area
<b>Mammals</b>		
<a href="#">Balaenoptera musculus</a> Blue Whale [36]	Endangered	Species or species habitat likely to occur within area
<a href="#">Dasyurus hallucatus</a> Northern Quoll, Digul [Gogo-Yimidir], Wijingadda [Dambimangari], Wiminji [Martu] [331]	Endangered	Species or species habitat known to occur within area
<a href="#">Eubalaena australis</a> Southern Right Whale [40]	Endangered	Species or species habitat may occur within area
<a href="#">Megaptera novaeangliae</a> Humpback Whale [38]	Vulnerable	Congregation or

Name	Status	Type of Presence
aggregation known to occur within area		
<b>Reptiles</b>		
<a href="#">Aipysurus apraefrontalis</a> Short-nosed Seasnake [1115]	Critically Endangered	Species or species habitat likely to occur within area
<a href="#">Caretta caretta</a> Loggerhead Turtle [1763]	Endangered	Foraging, feeding or related behaviour known to occur within area
<a href="#">Chelonia mydas</a> Green Turtle [1765]	Vulnerable	Breeding known to occur within area
<a href="#">Ctenotus angusticeps</a> Northwestern Coastal Ctenotus, Airlie Island Ctenotus [25937]	Vulnerable	Species or species habitat may occur within area
<a href="#">Dermochelys coriacea</a> Leatherback Turtle, Leathery Turtle, Luth [1768]	Endangered	Species or species habitat known to occur within area
<a href="#">Eretmochelys imbricata</a> Hawksbill Turtle [1766]	Vulnerable	Breeding known to occur within area
<a href="#">Natator depressus</a> Flatback Turtle [59257]	Vulnerable	Breeding known to occur within area
<b>Sharks</b>		
<a href="#">Carcharias taurus (west coast population)</a> Grey Nurse Shark (west coast population) [68752]	Vulnerable	Species or species habitat known to occur within area
<a href="#">Carcharodon carcharias</a> White Shark, Great White Shark [64470]	Vulnerable	Species or species habitat likely to occur within area
<a href="#">Pristis clavata</a> Dwarf Sawfish, Queensland Sawfish [68447]	Vulnerable	Species or species habitat known to occur within area
<a href="#">Pristis zijsron</a> Green Sawfish, Dindagubba, Narrowsnout Sawfish [68442]	Vulnerable	Species or species habitat known to occur within area
<a href="#">Rhincodon typus</a> Whale Shark [66680]	Vulnerable	Species or species habitat may occur within area

**Listed Migratory Species** [ [Resource Information](#) ]

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

Name	Threatened	Type of Presence
<b>Migratory Marine Birds</b>		
<a href="#">Anous stolidus</a> Common Noddy [825]		Species or species habitat may occur within area
<a href="#">Apus pacificus</a> Fork-tailed Swift [678]		Species or species habitat likely to occur within area
<a href="#">Ardenna pacifica</a> Wedge-tailed Shearwater [84292]		Breeding known to occur within area
<a href="#">Calonectris leucomelas</a> Streaked Shearwater [1077]		Species or species habitat likely to occur within area
<a href="#">Fregata ariel</a> Lesser Frigatebird, Least Frigatebird [1012]		Species or species habitat likely to occur

Name	Threatened	Type of Presence within area
<a href="#">Hydroprogne caspia</a> Caspian Tern [808]		Breeding known to occur within area
<a href="#">Macronectes giganteus</a> Southern Giant-Petrel, Southern Giant Petrel [1060]	Endangered	Species or species habitat may occur within area
<a href="#">Onychoprion anaethetus</a> Bridled Tern [82845]		Breeding known to occur within area
<a href="#">Thalassarche impavida</a> Campbell Albatross, Campbell Black-browed Albatross [64459]	Vulnerable	Species or species habitat may occur within area
<b>Migratory Marine Species</b>		
<a href="#">Anoxypristis cuspidata</a> Narrow Sawfish, Knifetooth Sawfish [68448]		Species or species habitat likely to occur within area
<a href="#">Balaena glacialis australis</a> Southern Right Whale [75529]	Endangered*	Species or species habitat may occur within area
<a href="#">Balaenoptera edeni</a> Bryde's Whale [35]		Species or species habitat may occur within area
<a href="#">Balaenoptera musculus</a> Blue Whale [36]	Endangered	Species or species habitat likely to occur within area
<a href="#">Carcharodon carcharias</a> White Shark, Great White Shark [64470]	Vulnerable	Species or species habitat likely to occur within area
<a href="#">Caretta caretta</a> Loggerhead Turtle [1763]	Endangered	Foraging, feeding or related behaviour known to occur within area
<a href="#">Chelonia mydas</a> Green Turtle [1765]	Vulnerable	Breeding known to occur within area
<a href="#">Dermochelys coriacea</a> Leatherback Turtle, Leathery Turtle, Luth [1768]	Endangered	Species or species habitat known to occur within area
<a href="#">Dugong dugon</a> Dugong [28]		Breeding known to occur within area
<a href="#">Eretmochelys imbricata</a> Hawksbill Turtle [1766]	Vulnerable	Breeding known to occur within area
<a href="#">Manta alfredi</a> Reef Manta Ray, Coastal Manta Ray, Inshore Manta Ray, Prince Alfred's Ray, Resident Manta Ray [84994]		Species or species habitat known to occur within area
<a href="#">Manta birostris</a> Giant Manta Ray, Chevron Manta Ray, Pacific Manta Ray, Pelagic Manta Ray, Oceanic Manta Ray [84995]		Species or species habitat known to occur within area
<a href="#">Megaptera novaeangliae</a> Humpback Whale [38]	Vulnerable	Congregation or aggregation known to occur within area
<a href="#">Natator depressus</a> Flatback Turtle [59257]	Vulnerable	Breeding known to occur within area
<a href="#">Orcinus orca</a> Killer Whale, Orca [46]		Species or species habitat may occur within area

Name	Threatened	Type of Presence
<a href="#">Pristis clavata</a> Dwarf Sawfish, Queensland Sawfish [68447]	Vulnerable	Species or species habitat known to occur within area
<a href="#">Pristis zijsron</a> Green Sawfish, Dindagubba, Narrowsnout Sawfish [68442]	Vulnerable	Species or species habitat known to occur within area
<a href="#">Rhincodon typus</a> Whale Shark [66680]	Vulnerable	Species or species habitat may occur within area
<a href="#">Sousa chinensis</a> Indo-Pacific Humpback Dolphin [50]		Species or species habitat likely to occur within area
<a href="#">Tursiops aduncus (Arafura/Timor Sea populations)</a> Spotted Bottlenose Dolphin (Arafura/Timor Sea populations) [78900]		Species or species habitat known to occur within area
<b>Migratory Terrestrial Species</b>		
<a href="#">Hirundo rustica</a> Barn Swallow [662]		Species or species habitat may occur within area
<a href="#">Motacilla cinerea</a> Grey Wagtail [642]		Species or species habitat may occur within area
<a href="#">Motacilla flava</a> Yellow Wagtail [644]		Species or species habitat may occur within area
<b>Migratory Wetlands Species</b>		
<a href="#">Actitis hypoleucos</a> Common Sandpiper [59309]		Species or species habitat known to occur within area
<a href="#">Calidris acuminata</a> Sharp-tailed Sandpiper [874]		Species or species habitat known to occur within area
<a href="#">Calidris canutus</a> Red Knot, Knot [855]	Endangered	Species or species habitat may occur within area
<a href="#">Calidris ferruginea</a> Curlew Sandpiper [856]	Critically Endangered	Species or species habitat known to occur within area
<a href="#">Calidris melanotos</a> Pectoral Sandpiper [858]		Species or species habitat likely to occur within area
<a href="#">Charadrius veredus</a> Oriental Plover, Oriental Dotterel [882]		Species or species habitat may occur within area
<a href="#">Glareola maldivarum</a> Oriental Pratincole [840]		Species or species habitat may occur within area
<a href="#">Limosa lapponica</a> Bar-tailed Godwit [844]		Species or species habitat known to occur within area
<a href="#">Numenius madagascariensis</a> Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat known to occur within area
<a href="#">Pandion haliaetus</a> Osprey [952]		Breeding known to occur within area

Name	Threatened	Type of Presence
<a href="#">Thalasseus bergii</a> Crested Tern [83000]		Breeding known to occur within area
<a href="#">Tringa nebularia</a> Common Greenshank, Greenshank [832]		Species or species habitat likely to occur within area

## Other Matters Protected by the EPBC Act

### Commonwealth Land [\[ Resource Information \]](#)

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

Name
Commonwealth Land -

### Listed Marine Species [\[ Resource Information \]](#)

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

Name	Threatened	Type of Presence
<b>Birds</b>		
<a href="#">Actitis hypoleucos</a> Common Sandpiper [59309]		Species or species habitat known to occur within area
<a href="#">Anous stolidus</a> Common Noddy [825]		Species or species habitat may occur within area
<a href="#">Apus pacificus</a> Fork-tailed Swift [678]		Species or species habitat likely to occur within area
<a href="#">Ardea alba</a> Great Egret, White Egret [59541]		Breeding known to occur within area
<a href="#">Ardea ibis</a> Cattle Egret [59542]		Species or species habitat may occur within area
<a href="#">Calidris acuminata</a> Sharp-tailed Sandpiper [874]		Species or species habitat known to occur within area
<a href="#">Calidris canutus</a> Red Knot, Knot [855]	Endangered	Species or species habitat may occur within area
<a href="#">Calidris ferruginea</a> Curlew Sandpiper [856]	Critically Endangered	Species or species habitat known to occur within area
<a href="#">Calidris melanotos</a> Pectoral Sandpiper [858]		Species or species habitat likely to occur within area

Name	Threatened	Type of Presence
<a href="#">Calonectris leucomelas</a> Streaked Shearwater [1077]		Species or species habitat likely to occur within area
<a href="#">Charadrius veredus</a> Oriental Plover, Oriental Dotterel [882]		Species or species habitat may occur within area
<a href="#">Chrysococcyx osculans</a> Black-eared Cuckoo [705]		Species or species habitat known to occur within area
<a href="#">Fregata ariel</a> Lesser Frigatebird, Least Frigatebird [1012]		Species or species habitat likely to occur within area
<a href="#">Glareola maldivarum</a> Oriental Pratincole [840]		Species or species habitat may occur within area
<a href="#">Haliaeetus leucogaster</a> White-bellied Sea-Eagle [943]		Species or species habitat known to occur within area
<a href="#">Hirundo rustica</a> Barn Swallow [662]		Species or species habitat may occur within area
<a href="#">Larus novaehollandiae</a> Silver Gull [810]		Breeding known to occur within area
<a href="#">Limosa lapponica</a> Bar-tailed Godwit [844]		Species or species habitat known to occur within area
<a href="#">Macronectes giganteus</a> Southern Giant-Petrel, Southern Giant Petrel [1060]	Endangered	Species or species habitat may occur within area
<a href="#">Merops ornatus</a> Rainbow Bee-eater [670]		Species or species habitat may occur within area
<a href="#">Motacilla cinerea</a> Grey Wagtail [642]		Species or species habitat may occur within area
<a href="#">Motacilla flava</a> Yellow Wagtail [644]		Species or species habitat may occur within area
<a href="#">Numenius madagascariensis</a> Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat known to occur within area
<a href="#">Pandion haliaetus</a> Osprey [952]		Breeding known to occur within area
<a href="#">Puffinus pacificus</a> Wedge-tailed Shearwater [1027]		Breeding known to occur within area
<a href="#">Sterna anaethetus</a> Bridled Tern [814]		Breeding known to occur within area
<a href="#">Sterna bengalensis</a> Lesser Crested Tern [815]		Breeding known to occur within area
<a href="#">Sterna bergii</a> Crested Tern [816]		Breeding known to occur within area
<a href="#">Sterna caspia</a> Caspian Tern [59467]		Breeding known to occur within area



Name	Threatened	Type of Presence
<a href="#">Sterna fuscata</a> Sooty Tern [794]		Breeding known to occur within area
<a href="#">Sterna nereis</a> Fairy Tern [796]		Breeding known to occur within area
<a href="#">Thalassarche impavida</a> Campbell Albatross, Campbell Black-browed Albatross [64459]	Vulnerable	Species or species habitat may occur within area
<a href="#">Tringa nebularia</a> Common Greenshank, Greenshank [832]		Species or species habitat likely to occur within area
<b>Fish</b>		
<a href="#">Acentronura larsonae</a> Helen's Pygmy Pipehorse [66186]		Species or species habitat may occur within area
<a href="#">Bulbonaricus brauni</a> Braun's Pughead Pipefish, Pug-headed Pipefish [66189]		Species or species habitat may occur within area
<a href="#">Campichthys tricarinatus</a> Three-keel Pipefish [66192]		Species or species habitat may occur within area
<a href="#">Choeroichthys brachysoma</a> Pacific Short-bodied Pipefish, Short-bodied Pipefish [66194]		Species or species habitat may occur within area
<a href="#">Choeroichthys latispinosus</a> Muiron Island Pipefish [66196]		Species or species habitat may occur within area
<a href="#">Choeroichthys suillus</a> Pig-snouted Pipefish [66198]		Species or species habitat may occur within area
<a href="#">Doryrhamphus dactyliophorus</a> Banded Pipefish, Ringed Pipefish [66210]		Species or species habitat may occur within area
<a href="#">Doryrhamphus janssi</a> Cleaner Pipefish, Janss' Pipefish [66212]		Species or species habitat may occur within area
<a href="#">Doryrhamphus multiannulatus</a> Many-banded Pipefish [66717]		Species or species habitat may occur within area
<a href="#">Doryrhamphus negrosensis</a> Flagtail Pipefish, Masthead Island Pipefish [66213]		Species or species habitat may occur within area
<a href="#">Festucalex scalaris</a> Ladder Pipefish [66216]		Species or species habitat may occur within area
<a href="#">Filicampus tigris</a> Tiger Pipefish [66217]		Species or species habitat may occur within area
<a href="#">Halicampus brocki</a> Brock's Pipefish [66219]		Species or species habitat may occur within area
<a href="#">Halicampus grayi</a> Mud Pipefish, Gray's Pipefish [66221]		Species or species habitat may occur within area
<a href="#">Halicampus nitidus</a> Glittering Pipefish [66224]		Species or species

Name	Threatened	Type of Presence
<a href="#">Halicampus spirostris</a> Spiny-snout Pipefish [66225]		habitat may occur within area  Species or species habitat may occur within area
<a href="#">Haliichthys taeniophorus</a> Ribbioned Pipehorse, Ribbioned Seadragon [66226]		Species or species habitat may occur within area
<a href="#">Hippichthys penicillus</a> Beady Pipefish, Steep-nosed Pipefish [66231]		Species or species habitat may occur within area
<a href="#">Hippocampus angustus</a> Western Spiny Seahorse, Narrow-bellied Seahorse [66234]		Species or species habitat may occur within area
<a href="#">Hippocampus histrix</a> Spiny Seahorse, Thorny Seahorse [66236]		Species or species habitat may occur within area
<a href="#">Hippocampus kuda</a> Spotted Seahorse, Yellow Seahorse [66237]		Species or species habitat may occur within area
<a href="#">Hippocampus planifrons</a> Flat-face Seahorse [66238]		Species or species habitat may occur within area
<a href="#">Hippocampus trimaculatus</a> Three-spot Seahorse, Low-crowned Seahorse, Flat-faced Seahorse [66720]		Species or species habitat may occur within area
<a href="#">Micrognathus micronotopterus</a> Tidepool Pipefish [66255]		Species or species habitat may occur within area
<a href="#">Phoxocampus belcheri</a> Black Rock Pipefish [66719]		Species or species habitat may occur within area
<a href="#">Solegnathus hardwickii</a> Pallid Pipehorse, Hardwick's Pipehorse [66272]		Species or species habitat may occur within area
<a href="#">Solegnathus lettiensis</a> Gunther's Pipehorse, Indonesian Pipefish [66273]		Species or species habitat may occur within area
<a href="#">Solenostomus cyanopterus</a> Robust Ghostpipefish, Blue-finned Ghost Pipefish, [66183]		Species or species habitat may occur within area
<a href="#">Syngnathoides biaculeatus</a> Double-end Pipehorse, Double-ended Pipehorse, Alligator Pipefish [66279]		Species or species habitat may occur within area
<a href="#">Trachyrhamphus bicoarctatus</a> Bentstick Pipefish, Bend Stick Pipefish, Short-tailed Pipefish [66280]		Species or species habitat may occur within area
<a href="#">Trachyrhamphus longirostris</a> Straightstick Pipefish, Long-nosed Pipefish, Straight Stick Pipefish [66281]		Species or species habitat may occur within area
<b>Mammals</b>		
<a href="#">Dugong dugon</a> Dugong [28]		Breeding known to occur within area
<b>Reptiles</b>		
<a href="#">Acalyptophis peronii</a> Horned Seasnake [1114]		Species or species

Name	Threatened	Type of Presence
<a href="#">Aipysurus apraefrontalis</a> Short-nosed Seasnake [1115]	Critically Endangered	habitat may occur within area Species or species habitat likely to occur within area
<a href="#">Aipysurus duboisii</a> Dubois' Seasnake [1116]		Species or species habitat may occur within area
<a href="#">Aipysurus eydouxii</a> Spine-tailed Seasnake [1117]		Species or species habitat may occur within area
<a href="#">Aipysurus laevis</a> Olive Seasnake [1120]		Species or species habitat may occur within area
<a href="#">Astrotia stokesii</a> Stokes' Seasnake [1122]		Species or species habitat may occur within area
<a href="#">Caretta caretta</a> Loggerhead Turtle [1763]	Endangered	Foraging, feeding or related behaviour known to occur within area
<a href="#">Chelonia mydas</a> Green Turtle [1765]	Vulnerable	Breeding known to occur within area
<a href="#">Dermochelys coriacea</a> Leatherback Turtle, Leathery Turtle, Luth [1768]	Endangered	Species or species habitat known to occur within area
<a href="#">Disteira kingii</a> Spectacled Seasnake [1123]		Species or species habitat may occur within area
<a href="#">Disteira major</a> Olive-headed Seasnake [1124]		Species or species habitat may occur within area
<a href="#">Emydocephalus annulatus</a> Turtle-headed Seasnake [1125]		Species or species habitat may occur within area
<a href="#">Ephalophis greyi</a> North-western Mangrove Seasnake [1127]		Species or species habitat may occur within area
<a href="#">Eretmochelys imbricata</a> Hawksbill Turtle [1766]	Vulnerable	Breeding known to occur within area
<a href="#">Hydrophis czeblukovi</a> Fine-spined Seasnake [59233]		Species or species habitat may occur within area
<a href="#">Hydrophis elegans</a> Elegant Seasnake [1104]		Species or species habitat may occur within area
<a href="#">Hydrophis ornatus</a> Spotted Seasnake, Ornate Reef Seasnake [1111]		Species or species habitat may occur within area
<a href="#">Natator depressus</a> Flatback Turtle [59257]	Vulnerable	Breeding known to occur within area
<a href="#">Pelamis platurus</a> Yellow-bellied Seasnake [1091]		Species or species habitat may occur within area

Name	Status	Type of Presence
<b>Mammals</b>		
<a href="#">Balaenoptera acutorostrata</a> Minke Whale [33]		Species or species habitat may occur within area
<a href="#">Balaenoptera edeni</a> Bryde's Whale [35]		Species or species habitat may occur within area
<a href="#">Balaenoptera musculus</a> Blue Whale [36]	Endangered	Species or species habitat likely to occur within area
<a href="#">Delphinus delphis</a> Common Dolphin, Short-beaked Common Dolphin [60]		Species or species habitat may occur within area
<a href="#">Eubalaena australis</a> Southern Right Whale [40]	Endangered	Species or species habitat may occur within area
<a href="#">Grampus griseus</a> Risso's Dolphin, Grampus [64]		Species or species habitat may occur within area
<a href="#">Megaptera novaeangliae</a> Humpback Whale [38]	Vulnerable	Congregation or aggregation known to occur within area
<a href="#">Orcinus orca</a> Killer Whale, Orca [46]		Species or species habitat may occur within area
<a href="#">Sousa chinensis</a> Indo-Pacific Humpback Dolphin [50]		Species or species habitat likely to occur within area
<a href="#">Stenella attenuata</a> Spotted Dolphin, Pantropical Spotted Dolphin [51]		Species or species habitat may occur within area
<a href="#">Tursiops aduncus</a> Indian Ocean Bottlenose Dolphin, Spotted Bottlenose Dolphin [68418]		Species or species habitat likely to occur within area
<a href="#">Tursiops aduncus (Arafura/Timor Sea populations)</a> Spotted Bottlenose Dolphin (Arafura/Timor Sea populations) [78900]		Species or species habitat known to occur within area
<a href="#">Tursiops truncatus s. str.</a> Bottlenose Dolphin [68417]		Species or species habitat may occur within area

## Extra Information

State and Territory Reserves	[ Resource Information ]
Name	State
Bessieres Island	WA
Burnside And Simpson Island	WA
Cane River (Mount Minnie and Nanutarra)	WA
Gnandaroo Island	WA
Locker Island	WA
Rocky Island	WA
Round Island	WA

Name	State
Serrurier Island	WA
Tent Island	WA
Unnamed WA44665	WA

## Invasive Species [\[ Resource Information \]](#)

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

Name	Status	Type of Presence
<b>Birds</b>		
Columba livia Rock Pigeon, Rock Dove, Domestic Pigeon [803]		Species or species habitat likely to occur within area
<b>Mammals</b>		
Canis lupus familiaris Domestic Dog [82654]		Species or species habitat likely to occur within area
Capra hircus Goat [2]		Species or species habitat likely to occur within area
Equus asinus Donkey, Ass [4]		Species or species habitat likely to occur within area
Felis catus Cat, House Cat, Domestic Cat [19]		Species or species habitat likely to occur within area
Mus musculus House Mouse [120]		Species or species habitat likely to occur within area
Oryctolagus cuniculus Rabbit, European Rabbit [128]		Species or species habitat likely to occur within area
Vulpes vulpes Red Fox, Fox [18]		Species or species habitat likely to occur within area
<b>Plants</b>		
Cenchrus ciliaris Buffel-grass, Black Buffel-grass [20213]		Species or species habitat likely to occur within area
Parkinsonia aculeata Parkinsonia, Jerusalem Thorn, Jelly Bean Tree, Horse Bean [12301]		Species or species habitat likely to occur within area
Prosopis spp. Mesquite, Algaroba [68407]		Species or species habitat likely to occur within area
<b>Reptiles</b>		
Ramphotyphlops braminus Flowerpot Blind Snake, Brahminy Blind Snake, Cacing Besi [1258]		Species or species habitat may occur within area

## Nationally Important Wetlands [\[ Resource Information \]](#)

Name	State
<a href="#">Exmouth Gulf East</a>	WA

# Caveat

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

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

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

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

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

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

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

- migratory and
- marine

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

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

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

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

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

# Coordinates

-21.87 114.79972

# Acknowledgements

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

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

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

Please feel free to provide feedback via the [Contact Us](#) page.



# EPBC Act Protected Matters Report

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

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

Information is available about [Environment Assessments](#) and the EPBC Act including significance guidelines, forms and application process details.

Report created: 10/10/18 18:06:15

[Summary](#)

[Details](#)

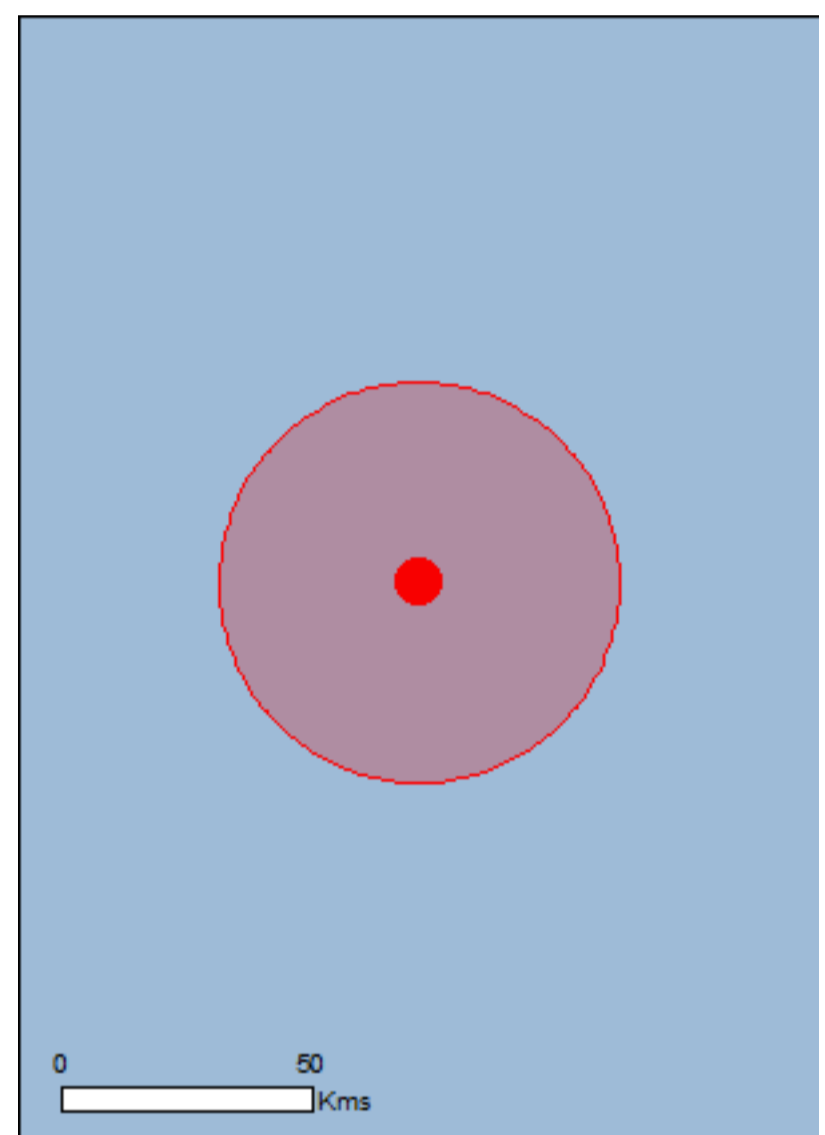
[Matters of NES](#)

[Other Matters Protected by the EPBC Act](#)

[Extra Information](#)

[Caveat](#)

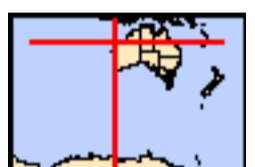
[Acknowledgements](#)



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

[Coordinates](#)

Buffer: 40.0Km





# Summary

## Matters of National Environmental Significance

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

<a href="#">World Heritage Properties:</a>	None
<a href="#">National Heritage Places:</a>	None
<a href="#">Wetlands of International Importance:</a>	None
<a href="#">Great Barrier Reef Marine Park:</a>	None
<a href="#">Commonwealth Marine Area:</a>	None
<a href="#">Listed Threatened Ecological Communities:</a>	None
<a href="#">Listed Threatened Species:</a>	24
<a href="#">Listed Migratory Species:</a>	41

## Other Matters Protected by the EPBC Act

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

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

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

<a href="#">Commonwealth Land:</a>	None
<a href="#">Commonwealth Heritage Places:</a>	None
<a href="#">Listed Marine Species:</a>	77
<a href="#">Whales and Other Cetaceans:</a>	13
<a href="#">Critical Habitats:</a>	None
<a href="#">Commonwealth Reserves Terrestrial:</a>	None
<a href="#">Australian Marine Parks:</a>	None

## Extra Information

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

<a href="#">State and Territory Reserves:</a>	8
<a href="#">Regional Forest Agreements:</a>	None
<a href="#">Invasive Species:</a>	13
<a href="#">Nationally Important Wetlands:</a>	1
<a href="#">Key Ecological Features (Marine)</a>	None

# Details

## Matters of National Environmental Significance

Listed Threatened Species		[ Resource Information ]
Name	Status	Type of Presence
<b>Birds</b>		
<a href="#">Calidris canutus</a> Red Knot, Knot [855]	Endangered	Species or species habitat may occur within area
<a href="#">Calidris ferruginea</a> Curlew Sandpiper [856]	Critically Endangered	Species or species habitat likely to occur within area
<a href="#">Limosa lapponica baueri</a> Bar-tailed Godwit (baueri), Western Alaskan Bar-tailed Godwit [86380]	Vulnerable	Species or species habitat may occur within area
<a href="#">Limosa lapponica menzbieri</a> Northern Siberian Bar-tailed Godwit, Bar-tailed Godwit (menzbieri) [86432]	Critically Endangered	Species or species habitat may occur within area
<a href="#">Macronectes giganteus</a> Southern Giant-Petrel, Southern Giant Petrel [1060]	Endangered	Species or species habitat may occur within area
<a href="#">Numenius madagascariensis</a> Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat known to occur within area
<a href="#">Pezoporus occidentalis</a> Night Parrot [59350]	Endangered	Species or species habitat may occur within area
<a href="#">Sternula nereis nereis</a> Australian Fairy Tern [82950]	Vulnerable	Breeding likely to occur within area
<a href="#">Thalassarche impavida</a> Campbell Albatross, Campbell Black-browed Albatross [64459]	Vulnerable	Species or species habitat may occur within area
<b>Mammals</b>		
<a href="#">Balaenoptera musculus</a> Blue Whale [36]	Endangered	Species or species habitat likely to occur within area
<a href="#">Dasyurus hallucatus</a> Northern Quoll, Digul [Gogo-Yimidir], Wijingadda [Dambimangari], Wiminji [Martu] [331]	Endangered	Species or species habitat known to occur within area
<a href="#">Eubalaena australis</a> Southern Right Whale [40]	Endangered	Species or species habitat may occur within area
<a href="#">Megaptera novaeangliae</a> Humpback Whale [38]	Vulnerable	Congregation or

Name	Status	Type of Presence
<b>Reptiles</b>		
<a href="#">Aipysurus apraefrontalis</a> Short-nosed Seasnake [1115]	Critically Endangered	aggregation known to occur within area Species or species habitat known to occur within area
<a href="#">Caretta caretta</a> Loggerhead Turtle [1763]	Endangered	Foraging, feeding or related behaviour known to occur within area
<a href="#">Chelonia mydas</a> Green Turtle [1765]	Vulnerable	Breeding known to occur within area
<a href="#">Dermochelys coriacea</a> Leatherback Turtle, Leathery Turtle, Luth [1768]	Endangered	Foraging, feeding or related behaviour known to occur within area
<a href="#">Eretmochelys imbricata</a> Hawksbill Turtle [1766]	Vulnerable	Breeding known to occur within area
<a href="#">Natator depressus</a> Flatback Turtle [59257]	Vulnerable	Breeding known to occur within area
<b>Sharks</b>		
<a href="#">Carcharias taurus (west coast population)</a> Grey Nurse Shark (west coast population) [68752]	Vulnerable	Species or species habitat known to occur within area
<a href="#">Carcharodon carcharias</a> White Shark, Great White Shark [64470]	Vulnerable	Species or species habitat likely to occur within area
<a href="#">Pristis clavata</a> Dwarf Sawfish, Queensland Sawfish [68447]	Vulnerable	Species or species habitat known to occur within area
<a href="#">Pristis zijsron</a> Green Sawfish, Dindagubba, Narrowsnout Sawfish [68442]	Vulnerable	Species or species habitat known to occur within area
<a href="#">Rhincodon typus</a> Whale Shark [66680]	Vulnerable	Species or species habitat may occur within area
<b>Listed Migratory Species</b>		<b>[ Resource Information ]</b>
* Species is listed under a different scientific name on the EPBC Act - Threatened Species list.		
Name	Threatened	Type of Presence
<b>Migratory Marine Birds</b>		
<a href="#">Anous stolidus</a> Common Noddy [825]		Species or species habitat may occur within area
<a href="#">Apus pacificus</a> Fork-tailed Swift [678]		Species or species habitat likely to occur within area
<a href="#">Ardenna pacifica</a> Wedge-tailed Shearwater [84292]		Breeding known to occur within area
<a href="#">Calonectris leucomelas</a> Streaked Shearwater [1077]		Species or species habitat likely to occur within area
<a href="#">Fregata ariel</a> Lesser Frigatebird, Least Frigatebird [1012]		Species or species habitat likely to occur within area
<a href="#">Macronectes giganteus</a> Southern Giant-Petrel, Southern Giant Petrel [1060]	Endangered	Species or species habitat may occur within

Name	Threatened	Type of Presence area
<a href="#">Thalassarche impavida</a> Campbell Albatross, Campbell Black-browed Albatross [64459]	Vulnerable	Species or species habitat may occur within area
<b>Migratory Marine Species</b>		
<a href="#">Anoxypristis cuspidata</a> Narrow Sawfish, Knifetooth Sawfish [68448]		Species or species habitat likely to occur within area
<a href="#">Balaena glacialis australis</a> Southern Right Whale [75529]	Endangered*	Species or species habitat may occur within area
<a href="#">Balaenoptera edeni</a> Bryde's Whale [35]		Species or species habitat may occur within area
<a href="#">Balaenoptera musculus</a> Blue Whale [36]	Endangered	Species or species habitat likely to occur within area
<a href="#">Carcharodon carcharias</a> White Shark, Great White Shark [64470]	Vulnerable	Species or species habitat likely to occur within area
<a href="#">Caretta caretta</a> Loggerhead Turtle [1763]	Endangered	Foraging, feeding or related behaviour known to occur within area
<a href="#">Chelonia mydas</a> Green Turtle [1765]	Vulnerable	Breeding known to occur within area
<a href="#">Dermochelys coriacea</a> Leatherback Turtle, Leathery Turtle, Luth [1768]	Endangered	Foraging, feeding or related behaviour known to occur within area
<a href="#">Dugong dugon</a> Dugong [28]		Breeding known to occur within area
<a href="#">Eretmochelys imbricata</a> Hawksbill Turtle [1766]	Vulnerable	Breeding known to occur within area
<a href="#">Manta alfredi</a> Reef Manta Ray, Coastal Manta Ray, Inshore Manta Ray, Prince Alfred's Ray, Resident Manta Ray [84994]		Species or species habitat known to occur within area
<a href="#">Manta birostris</a> Giant Manta Ray, Chevron Manta Ray, Pacific Manta Ray, Pelagic Manta Ray, Oceanic Manta Ray [84995]		Species or species habitat known to occur within area
<a href="#">Megaptera novaeangliae</a> Humpback Whale [38]	Vulnerable	Congregation or aggregation known to occur within area
<a href="#">Natator depressus</a> Flatback Turtle [59257]	Vulnerable	Breeding known to occur within area
<a href="#">Orcinus orca</a> Killer Whale, Orca [46]		Species or species habitat may occur within area
<a href="#">Pristis clavata</a> Dwarf Sawfish, Queensland Sawfish [68447]	Vulnerable	Species or species habitat known to occur within area
<a href="#">Pristis zijsron</a> Green Sawfish, Dindagubba, Narrowsnout Sawfish [68442]	Vulnerable	Species or species habitat known to occur within area
<a href="#">Rhincodon typus</a> Whale Shark [66680]	Vulnerable	Species or species habitat may occur within

Name	Threatened	Type of Presence area
<a href="#">Sousa chinensis</a> Indo-Pacific Humpback Dolphin [50]		Species or species habitat likely to occur within area
<a href="#">Tursiops aduncus (Arafura/Timor Sea populations)</a> Spotted Bottlenose Dolphin (Arafura/Timor Sea populations) [78900]		Species or species habitat known to occur within area
<b>Migratory Terrestrial Species</b>		
<a href="#">Hirundo rustica</a> Barn Swallow [662]		Species or species habitat may occur within area
<a href="#">Motacilla cinerea</a> Grey Wagtail [642]		Species or species habitat may occur within area
<a href="#">Motacilla flava</a> Yellow Wagtail [644]		Species or species habitat may occur within area
<b>Migratory Wetlands Species</b>		
<a href="#">Actitis hypoleucos</a> Common Sandpiper [59309]		Species or species habitat known to occur within area
<a href="#">Calidris acuminata</a> Sharp-tailed Sandpiper [874]		Species or species habitat known to occur within area
<a href="#">Calidris canutus</a> Red Knot, Knot [855]	Endangered	Species or species habitat may occur within area
<a href="#">Calidris ferruginea</a> Curlew Sandpiper [856]	Critically Endangered	Species or species habitat likely to occur within area
<a href="#">Calidris melanotos</a> Pectoral Sandpiper [858]		Species or species habitat likely to occur within area
<a href="#">Charadrius veredus</a> Oriental Plover, Oriental Dotterel [882]		Species or species habitat may occur within area
<a href="#">Glareola maldivarum</a> Oriental Pratincole [840]		Species or species habitat may occur within area
<a href="#">Limosa lapponica</a> Bar-tailed Godwit [844]		Species or species habitat known to occur within area
<a href="#">Numenius madagascariensis</a> Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat known to occur within area
<a href="#">Pandion haliaetus</a> Osprey [952]		Breeding known to occur within area
<a href="#">Tringa nebularia</a> Common Greenshank, Greenshank [832]		Species or species habitat likely to occur within area

## Other Matters Protected by the EPBC Act

### Listed Marine Species [ [Resource Information](#) ]

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

Name	Threatened	Type of Presence
<b>Birds</b>		
<a href="#">Actitis hypoleucos</a>		
Common Sandpiper [59309]		Species or species habitat known to occur within area
<a href="#">Anous stolidus</a>		
Common Noddy [825]		Species or species habitat may occur within area
<a href="#">Apus pacificus</a>		
Fork-tailed Swift [678]		Species or species habitat likely to occur within area
<a href="#">Ardea alba</a>		
Great Egret, White Egret [59541]		Breeding known to occur within area
<a href="#">Ardea ibis</a>		
Cattle Egret [59542]		Species or species habitat may occur within area
<a href="#">Calidris acuminata</a>		
Sharp-tailed Sandpiper [874]		Species or species habitat known to occur within area
<a href="#">Calidris canutus</a>		
Red Knot, Knot [855]	Endangered	Species or species habitat may occur within area
<a href="#">Calidris ferruginea</a>		
Curlew Sandpiper [856]	Critically Endangered	Species or species habitat likely to occur within area
<a href="#">Calidris melanotos</a>		
Pectoral Sandpiper [858]		Species or species habitat likely to occur within area
<a href="#">Calonectris leucomelas</a>		
Streaked Shearwater [1077]		Species or species habitat likely to occur within area
<a href="#">Charadrius veredus</a>		
Oriental Plover, Oriental Dotterel [882]		Species or species habitat may occur within area
<a href="#">Chrysococcyx osculans</a>		
Black-eared Cuckoo [705]		Species or species habitat likely to occur within area
<a href="#">Fregata ariel</a>		
Lesser Frigatebird, Least Frigatebird [1012]		Species or species habitat likely to occur within area
<a href="#">Glareola maldivarum</a>		
Oriental Pratincole [840]		Species or species habitat may occur within area
<a href="#">Haliaeetus leucogaster</a>		
White-bellied Sea-Eagle [943]		Species or species habitat known to occur within area
<a href="#">Hirundo rustica</a>		
Barn Swallow [662]		Species or species habitat may occur within area

Name	Threatened	Type of Presence
<a href="#">Limosa lapponica</a> Bar-tailed Godwit [844]		Species or species habitat known to occur within area
<a href="#">Macronectes giganteus</a> Southern Giant-Petrel, Southern Giant Petrel [1060]	Endangered	Species or species habitat may occur within area
<a href="#">Merops ornatus</a> Rainbow Bee-eater [670]		Species or species habitat may occur within area
<a href="#">Motacilla cinerea</a> Grey Wagtail [642]		Species or species habitat may occur within area
<a href="#">Motacilla flava</a> Yellow Wagtail [644]		Species or species habitat may occur within area
<a href="#">Numenius madagascariensis</a> Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat known to occur within area
<a href="#">Pandion haliaetus</a> Osprey [952]		Breeding known to occur within area
<a href="#">Puffinus pacificus</a> Wedge-tailed Shearwater [1027]		Breeding known to occur within area
<a href="#">Sterna bengalensis</a> Lesser Crested Tern [815]		Breeding known to occur within area
<a href="#">Thalassarche impavida</a> Campbell Albatross, Campbell Black-browed Albatross [64459]	Vulnerable	Species or species habitat may occur within area
<a href="#">Tringa nebularia</a> Common Greenshank, Greenshank [832]		Species or species habitat likely to occur within area
<b>Fish</b>		
<a href="#">Acentronura larsonae</a> Helen's Pygmy Pipehorse [66186]		Species or species habitat may occur within area
<a href="#">Bulbonaricus brauni</a> Braun's Pughead Pipefish, Pug-headed Pipefish [66189]		Species or species habitat may occur within area
<a href="#">Campichthys tricarinatus</a> Three-keel Pipefish [66192]		Species or species habitat may occur within area
<a href="#">Choeroichthys brachysoma</a> Pacific Short-bodied Pipefish, Short-bodied Pipefish [66194]		Species or species habitat may occur within area
<a href="#">Choeroichthys latispinosus</a> Muiron Island Pipefish [66196]		Species or species habitat may occur within area
<a href="#">Choeroichthys suillus</a> Pig-snouted Pipefish [66198]		Species or species habitat may occur within area
<a href="#">Doryrhamphus dactyliophorus</a> Banded Pipefish, Ringed Pipefish [66210]		Species or species habitat may occur within area
<a href="#">Doryrhamphus janssi</a> Cleaner Pipefish, Janss' Pipefish [66212]		Species or species habitat may occur within

Name	Threatened	Type of Presence area
<a href="#">Doryramphus multiannulatus</a> Many-banded Pipefish [66717]		Species or species habitat may occur within area
<a href="#">Doryramphus negrosensis</a> Flagtail Pipefish, Masthead Island Pipefish [66213]		Species or species habitat may occur within area
<a href="#">Festucalex scalaris</a> Ladder Pipefish [66216]		Species or species habitat may occur within area
<a href="#">Filicampus tigris</a> Tiger Pipefish [66217]		Species or species habitat may occur within area
<a href="#">Halicampus brocki</a> Brock's Pipefish [66219]		Species or species habitat may occur within area
<a href="#">Halicampus grayi</a> Mud Pipefish, Gray's Pipefish [66221]		Species or species habitat may occur within area
<a href="#">Halicampus nitidus</a> Glittering Pipefish [66224]		Species or species habitat may occur within area
<a href="#">Halicampus spinirostris</a> Spiny-snout Pipefish [66225]		Species or species habitat may occur within area
<a href="#">Haliichthys taeniophorus</a> Ribboned Pipehorse, Ribboned Seadragon [66226]		Species or species habitat may occur within area
<a href="#">Hippichthys penicillus</a> Beady Pipefish, Steep-nosed Pipefish [66231]		Species or species habitat may occur within area
<a href="#">Hippocampus angustus</a> Western Spiny Seahorse, Narrow-bellied Seahorse [66234]		Species or species habitat may occur within area
<a href="#">Hippocampus histrix</a> Spiny Seahorse, Thorny Seahorse [66236]		Species or species habitat may occur within area
<a href="#">Hippocampus kuda</a> Spotted Seahorse, Yellow Seahorse [66237]		Species or species habitat may occur within area
<a href="#">Hippocampus planifrons</a> Flat-face Seahorse [66238]		Species or species habitat may occur within area
<a href="#">Hippocampus trimaculatus</a> Three-spot Seahorse, Low-crowned Seahorse, Flat-faced Seahorse [66720]		Species or species habitat may occur within area
<a href="#">Micrognathus micronotopterus</a> Tidepool Pipefish [66255]		Species or species habitat may occur within area
<a href="#">Phoxocampus belcheri</a> Black Rock Pipefish [66719]		Species or species habitat may occur within area
<a href="#">Solegnathus hardwickii</a> Pallid Pipehorse, Hardwick's Pipehorse [66272]		Species or species habitat may occur within area



Name	Threatened	Type of Presence
<a href="#">Solegnathus lettiensis</a> Gunther's Pipehorse, Indonesian Pipefish [66273]		Species or species habitat may occur within area
<a href="#">Solenostomus cyanopterus</a> Robust Ghostpipefish, Blue-finned Ghost Pipefish, [66183]		Species or species habitat may occur within area
<a href="#">Syngnathoides biaculeatus</a> Double-end Pipehorse, Double-ended Pipehorse, Alligator Pipefish [66279]		Species or species habitat may occur within area
<a href="#">Trachyrhamphus bicoarctatus</a> Bentstick Pipefish, Bend Stick Pipefish, Short-tailed Pipefish [66280]		Species or species habitat may occur within area
<a href="#">Trachyrhamphus longirostris</a> Straightstick Pipefish, Long-nosed Pipefish, Straight Stick Pipefish [66281]		Species or species habitat may occur within area
<b>Mammals</b>		
<a href="#">Dugong dugon</a> Dugong [28]		Breeding known to occur within area
<b>Reptiles</b>		
<a href="#">Acalyptophis peronii</a> Horned Seasnake [1114]		Species or species habitat may occur within area
<a href="#">Aipysurus apraefrontalis</a> Short-nosed Seasnake [1115]	Critically Endangered	Species or species habitat known to occur within area
<a href="#">Aipysurus duboisii</a> Dubois' Seasnake [1116]		Species or species habitat may occur within area
<a href="#">Aipysurus eydouxii</a> Spine-tailed Seasnake [1117]		Species or species habitat may occur within area
<a href="#">Aipysurus laevis</a> Olive Seasnake [1120]		Species or species habitat may occur within area
<a href="#">Astrotia stokesii</a> Stokes' Seasnake [1122]		Species or species habitat may occur within area
<a href="#">Caretta caretta</a> Loggerhead Turtle [1763]	Endangered	Foraging, feeding or related behaviour known to occur within area
<a href="#">Chelonia mydas</a> Green Turtle [1765]	Vulnerable	Breeding known to occur within area
<a href="#">Dermochelys coriacea</a> Leatherback Turtle, Leathery Turtle, Luth [1768]	Endangered	Foraging, feeding or related behaviour known to occur within area
<a href="#">Disteira kingii</a> Spectacled Seasnake [1123]		Species or species habitat may occur within area
<a href="#">Disteira major</a> Olive-headed Seasnake [1124]		Species or species habitat may occur within area
<a href="#">Emydocephalus annulatus</a> Turtle-headed Seasnake [1125]		Species or species habitat may occur within area

Name	Threatened	Type of Presence
<a href="#">Ephalophis greyi</a> North-western Mangrove Seasnake [1127]		Species or species habitat may occur within area
<a href="#">Eretmochelys imbricata</a> Hawksbill Turtle [1766]	Vulnerable	Breeding known to occur within area
<a href="#">Hydrophis elegans</a> Elegant Seasnake [1104]		Species or species habitat may occur within area
<a href="#">Hydrophis ornatus</a> Spotted Seasnake, Ornate Reef Seasnake [1111]		Species or species habitat may occur within area
<a href="#">Natator depressus</a> Flatback Turtle [59257]	Vulnerable	Breeding known to occur within area
<a href="#">Pelamis platurus</a> Yellow-bellied Seasnake [1091]		Species or species habitat may occur within area

## Whales and other Cetaceans

[ [Resource Information](#) ]

Name	Status	Type of Presence
<b>Mammals</b>		
<a href="#">Balaenoptera acutorostrata</a> Minke Whale [33]		Species or species habitat may occur within area
<a href="#">Balaenoptera edeni</a> Bryde's Whale [35]		Species or species habitat may occur within area
<a href="#">Balaenoptera musculus</a> Blue Whale [36]	Endangered	Species or species habitat likely to occur within area
<a href="#">Delphinus delphis</a> Common Dolphin, Short-beaked Common Dolphin [60]		Species or species habitat may occur within area
<a href="#">Eubalaena australis</a> Southern Right Whale [40]	Endangered	Species or species habitat may occur within area
<a href="#">Grampus griseus</a> Risso's Dolphin, Grampus [64]		Species or species habitat may occur within area
<a href="#">Megaptera novaeangliae</a> Humpback Whale [38]	Vulnerable	Congregation or aggregation known to occur within area
<a href="#">Orcinus orca</a> Killer Whale, Orca [46]		Species or species habitat may occur within area
<a href="#">Sousa chinensis</a> Indo-Pacific Humpback Dolphin [50]		Species or species habitat likely to occur within area
<a href="#">Stenella attenuata</a> Spotted Dolphin, Pantropical Spotted Dolphin [51]		Species or species habitat may occur within area
<a href="#">Tursiops aduncus</a> Indian Ocean Bottlenose Dolphin, Spotted Bottlenose Dolphin [68418]		Species or species habitat likely to occur within area
<a href="#">Tursiops aduncus (Arafura/Timor Sea populations)</a> Spotted Bottlenose Dolphin (Arafura/Timor Sea populations) [78900]		Species or species habitat known to occur

Name	Status	Type of Presence within area
<a href="#">Tursiops truncatus s. str.</a> Bottlenose Dolphin [68417]		Species or species habitat may occur within area

## Extra Information

State and Territory Reserves	[ Resource Information ]
Name	State
Burnside And Simpson Island	WA
Giralia	WA
Gnandaroo Island	WA
Locker Island	WA
Rocky Island	WA
Tent Island	WA
Victor Island	WA
Y Island	WA

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

Name	Status	Type of Presence
<b>Birds</b>		
Columba livia Rock Pigeon, Rock Dove, Domestic Pigeon [803]		Species or species habitat likely to occur within area
<b>Mammals</b>		
Canis lupus familiaris Domestic Dog [82654]		Species or species habitat likely to occur within area
Capra hircus Goat [2]		Species or species habitat likely to occur within area
Equus asinus Donkey, Ass [4]		Species or species habitat likely to occur within area
Equus caballus Horse [5]		Species or species habitat likely to occur within area
Felis catus Cat, House Cat, Domestic Cat [19]		Species or species habitat likely to occur within area
Mus musculus House Mouse [120]		Species or species habitat likely to occur within area
Oryctolagus cuniculus Rabbit, European Rabbit [128]		Species or species

Name	Status	Type of Presence
Vulpes vulpes Red Fox, Fox [18]		habitat likely to occur within area  Species or species habitat likely to occur within area

### Plants

Cenchrus ciliaris Buffel-grass, Black Buffel-grass [20213]		Species or species habitat likely to occur within area
Parkinsonia aculeata Parkinsonia, Jerusalem Thorn, Jelly Bean Tree, Horse Bean [12301]		Species or species habitat likely to occur within area
Prosopis spp. Mesquite, Algaroba [68407]		Species or species habitat likely to occur within area

### Reptiles

Ramphotyphlops braminus Flowerpot Blind Snake, Brahminy Blind Snake, Cacing Besi [1258]		Species or species habitat may occur within area
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### Nationally Important Wetlands [ Resource Information ]

Name	State
<a href="#">Exmouth Gulf East</a>	WA

# Caveat

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

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

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

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

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

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

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

- migratory and
- marine

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

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

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

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

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

# Coordinates

-22.01167 114.71083

# Acknowledgements

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

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

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

Please feel free to provide feedback via the [Contact Us](#) page.

# NatureMap Species Report

Created By Guest user on 09/10/2018

**Kingdom** Plantae  
**Current Names Only** Yes  
**Core Datasets Only** Yes  
**Method** 'By Circle'  
**Centre** 114° 47' 59" E, 21° 52' 12" S  
**Buffer** 40km  
**Group By** Family

Family	Species	Records
Acanthaceae	2	8
Aizoaceae	7	10
Amaranthaceae	17	92
Anadyomenaceae	1	1
Apocynaceae	2	9
Araliaceae	1	7
Areaceae	1	1
Asparagaceae	3	6
Asteraceae	38	185
Bonnemaisoniaceae	1	4
Boraginaceae	5	32
Brassicaceae	4	5
Campanulaceae	1	1
Capparaceae	1	3
Caryophyllaceae	1	1
Caulerpaceae	4	6
Celastraceae	1	1
Chenopodiaceae	28	267
Cleomaceae	1	13
Codiaceae	1	1
Convolvulaceae	12	36
Cymodoceaceae	4	9
Cyperaceae	9	39
Dasyaceae	1	1
Dichotomosiphonaceae	1	1
Elatinaceae	4	8
Euphorbiaceae	13	103
Fabaceae	52	309
Frankeniaceae	2	10
Galaxauraceae	1	1
Gentianaceae	2	2
Geraniaceae	2	4
Goodeniaceae	10	82
Gyrostemonaceae	2	3
Halimedeaceae	3	8
Haloragaceae	2	5
Hemerocallidaceae	3	25
Hydrocharitaceae	1	1
Isoetaceae	1	1
Juncaginaceae	1	2
Lamiaceae	3	11
Lauraceae	3	13
Loranthaceae	1	1
Lygodiaceae	1	1
Lythraceae	1	1
Malvaceae	20	54
Marsileaceae	2	2
Molluginaceae	1	1
Montiaceae	2	3
Myrtaceae	3	5
Nyctaginaceae	5	65
Ophioglossaceae	2	2
Orobanchaceae	2	2
Phrymaceae	2	5
Phyllanthaceae	4	6
Plantaginaceae	1	12
Plumbaginaceae	2	5
Poaceae	59	407
Polygalaceae	2	2
Portulacaceae	4	20
Primulaceae	3	3
Proteaceae	5	15
Rhizophoraceae	1	1
Rhizophyllidaceae	1	1
Rhodomelaceae	2	2
Ricciaceae	1	1
Rubiaceae	1	2
Santalaceae	2	8
Sapindaceae	2	2
Scrophulariaceae	5	11
Siphonocladaceae	1	1
Solanaceae	5	23
Surianaceae	1	4
Thymelaeaceae	1	1
Udoteaceae	3	10

Zygophyllaceae	3	50
<b>TOTAL</b>	<b>403</b>	<b>2056</b>



Name ID	Species Name	Naturalised	Conservation Code	Endemic To Query Area
<b>Acanthaceae</b>				
1.	6828 <i>Avicennia marina</i> (White Mangrove)			
2.	12088 <i>Rostellularia adscendens</i> var. <i>clementii</i>			
<b>Aizoaceae</b>				
3.	<i>Carpobrotus</i> sp. subsp. <i>Thevenard Island</i> (M. White 050)			
4.	2798 <i>Carpobrotus virescens</i> (Coastal Pigface, Kolboko, Bain)			
5.	2818 <i>Sesuvium portulacastrum</i>			
6.	44305 <i>Trianthena pilosum</i>			
7.	44362 <i>Trianthena triquetrum</i>			
8.	44360 <i>Trianthena turgidifolium</i>			
9.	29095 <i>Zaleya galericulata</i> subsp. <i>galericulata</i>			
<b>Amaranthaceae</b>				
10.	2646 <i>Aerva javanica</i> (Kapok Bush)	Y		
11.	2652 <i>Alternanthera nodiflora</i> (Common Joyweed)			
12.	2657 <i>Amaranthus clementii</i>			
13.	2666 <i>Amaranthus mitchellii</i> (Boggabri Weed)			
14.	20018 <i>Amaranthus undulatus</i>			
15.	11131 <i>Gomphrena sordida</i>			
16.	2695 <i>Ptilotus arthrolasius</i>			
17.	2708 <i>Ptilotus chamaecladus</i>			
18.	2717 <i>Ptilotus divaricatus</i> (Climbing Mulla Mulla)			
19.	2728 <i>Ptilotus gomphrenoides</i>			
20.	2738 <i>Ptilotus latifolius</i> (Tangled Mulla Mulla)			
21.	2741 <i>Ptilotus macrocephalus</i> (Featherheads)			
22.	2745 <i>Ptilotus murrayi</i>			
23.	2746 <i>Ptilotus nobilis</i> (Tall Mulla Mulla)			
24.	2751 <i>Ptilotus polystachyus</i> (Prince of Wales Feather)			
25.	2766 <i>Ptilotus villosiflorus</i>			
26.	43203 <i>Surreya diandra</i>			
<b>Anadyomenaceae</b>				
27.	35872 <i>Anadyomene plicata</i>			
<b>Apocynaceae</b>				
28.	6584 <i>Cynanchum floribundum</i> (Dumara Bush, Tjipa)			
29.	48280 <i>Cynanchum viminalis</i> subsp. <i>australe</i>			
<b>Araliaceae</b>				
30.	19053 <i>Trachymene pilbarensis</i>			
<b>Arecaceae</b>				
31.	1042 <i>Phoenix dactylifera</i> (Date Palm)	Y		
<b>Asparagaceae</b>				
32.	1208 <i>Acanthocarpus preissii</i>			
33.	1211 <i>Acanthocarpus verticillatus</i>			
34.	46756 <i>Thysanotus exfimbriatus</i>			
<b>Asteraceae</b>				
35.	7817 <i>Actinobole uliginosum</i> (Flannel Cudweed)			
36.	7822 <i>Angianthus acrohyalinus</i> (Hook-leaf Angianthus)			
37.	7827 <i>Angianthus cunninghamii</i> (Coast Angianthus)			
38.	7832 <i>Angianthus milnei</i> (Cone-spike Angianthus)			
39.	7866 <i>Blumea tenella</i>			
40.	7906 <i>Calotis plumulifera</i>			
41.	7919 <i>Centipeda minima</i> (Spreading Sneezewood, Kanjirralaa, Inteng-inteng, Karengkal, Kata-palkalpa, Munyu-parnti-parnti)			
42.	19762 <i>Centipeda minima</i> subsp. <i>macrocephala</i>			
43.	7946 <i>Cotula cotuloides</i> (Smooth Cotula)			
44.	7958 <i>Decazesia hecatoccephala</i>			
45.	35558 <i>Flaveria trinervia</i> (Speedy Weed)	Y		
46.	7989 <i>Gnephosis brevifolia</i> (Short-leaved Gnephosis)			
47.	<i>Launaea sarmentosa</i>			
48.	8098 <i>Launaea sarmentosa</i>			
49.	17925 <i>Myriocephalus oldfieldii</i>			
50.	8121 <i>Myriocephalus rudallii</i>			
51.	19420 <i>Myriocephalus scalpellus</i>		P1	
52.	<i>Olearia Kennedy Range</i> (G. Byrne 66)			
53.	8127 <i>Olearia axillaris</i> (Coastal Daisybush)			

Name ID	Species Name	Naturalised	Conservation Code	<sup>1</sup> Endemic To Query Area
54.	42024 <i>Olearia</i> sp. Kennedy Range (G. Byrne 66)			
55.	8167 <i>Pluchea dentex</i>			
56.	17817 <i>Pluchea dunlopii</i>			
57.	17816 <i>Pluchea ferdinandi-muelleri</i>			
58.	43944 <i>Pluchea longiseta</i>			
59.	8168 <i>Pluchea rubelliflora</i>			
60.	8189 <i>Pseudognaphalium luteoalbum</i> (Jersey Cudweed)			
61.	8192 <i>Pterocaulon sphacelatum</i> (Apple Bush, Fruit Salad Plant)			
62.	8193 <i>Pterocaulon sphaeranthoides</i>			
63.	13246 <i>Rhodanthe humboldtiana</i>			
64.	13297 <i>Rhodanthe psammophila</i>			
65.	13254 <i>Rhodanthe stricta</i>			
66.	13299 <i>Rhodanthe tietkensis</i>			
67.	45154 <i>Roebuckiella cheilocarpa</i> var. <i>cheilocarpa</i>			
68.	20161 <i>Senecio pinnatifolius</i>			
69.	25883 <i>Senecio pinnatifolius</i> var. <i>pinnatifolius</i>			
70.	8237 <i>Streptoglossa decurrens</i>			
71.	8238 <i>Streptoglossa liatroides</i>			
72.	8240 <i>Streptoglossa odora</i>			
<b>Bonnemaisoniaceae</b>				
73.	26486 <i>Asparagopsis taxiformis</i>			
<b>Boraginaceae</b>				
74.	17299 <i>Heliotropium ammophilum</i>			
75.	6705 <i>Heliotropium crispatum</i>			
76.	6708 <i>Heliotropium diversifolium</i>			
77.	17309 <i>Heliotropium pachyphyllum</i>			
78.	6727 <i>Trichodesma zeylanicum</i> (Camel Bush, Kumbalin)			
<b>Brassicaceae</b>				
79.	3020 <i>Lepidium biplicatum</i>		P3	
80.	3035 <i>Lepidium pedicellosum</i>			
81.	3038 <i>Lepidium pholidogynum</i>			
82.	3039 <i>Lepidium platypetalum</i> (Slender Peppergrass)			
<b>Campanulaceae</b>				
83.	7393 <i>Wahlenbergia tumidifruca</i>			
<b>Capparaceae</b>				
84.	2981 <i>Capparis spinosa</i>			
<b>Caryophyllaceae</b>				
85.	12075 <i>Polycarpha corymbosa</i> var. <i>corymbosa</i>			
<b>Caulerpaceae</b>				
86.	26554 <i>Caulerpa brachypus</i>			
87.	44547 <i>Caulerpa lamourouxii</i>			
88.	26568 <i>Caulerpa lentillifera</i>			
89.	26577 <i>Caulerpa sertularioides</i>			
<b>Celastraceae</b>				
90.	4729 <i>Stackhousia clementii</i>		P3	
<b>Chenopodiaceae</b>				
91.	2451 <i>Atriplex bunburyana</i> (Silver Saltbush)			
92.	2463 <i>Atriplex isatidea</i> (Coast Saltbush)			
93.	2476 <i>Atriplex semilunaris</i> (Annual Saltbush)			
94.	2502 <i>Dysphania kalpari</i> (Rat's Tail, Kalpari)			
95.	33596 <i>Dysphania melanocarpa</i> forma <i>leucocarpa</i>			
96.	2504 <i>Dysphania plantaginella</i>			
97.	2505 <i>Dysphania platycarpa</i>			
98.	2511 <i>Enchylaena tomentosa</i> (Barrier Saltbush)			
99.	2547 <i>Maireana lanosa</i> (Woolly Bluebush)			
100.	2573 <i>Neobassia astrocarpa</i>			
101.	2582 <i>Rhagodia eremaea</i> (Thorny Saltbush)			
102.	2583 <i>Rhagodia latifolia</i>			
103.	2584 <i>Rhagodia preissii</i>			
104.	11240 <i>Rhagodia preissii</i> subsp. <i>obovata</i>			
105.	30434 <i>Salsola australis</i>			
106.	2604 <i>Sclerolaena costata</i>			
107.	2633 <i>Sclerolaena uniflora</i> (Two-spined Saltbush)			
108.	31616 <i>Tecticornia auriculata</i>			
109.	46513 <i>Tecticornia doliiformis</i>			
110.	33236 <i>Tecticornia halocnemoides</i> (Shrubby Samphire)			

Name ID	Species Name	Naturalised	Conservation Code	<sup>1</sup> Endemic To Query Area
111.	33238 <i>Tecticornia halocnemoides</i> subsp. <i>tenuis</i>			
112.	33317 <i>Tecticornia indica</i>			
113.	33319 <i>Tecticornia indica</i> subsp. <i>bidens</i>			
114.	33318 <i>Tecticornia indica</i> subsp. <i>leiostachya</i> (Samphire)			
115.	33296 <i>Tecticornia pergranulata</i>			
116.	33297 <i>Tecticornia pergranulata</i> subsp. <i>pergranulata</i> (Blackseed Samphire)			
117.	33220 <i>Tecticornia pterygosperma</i> subsp. <i>denticulata</i>			
118.	2644 <i>Threlkeldia diffusa</i> (Coast Bonefruit)			
<b>Cleomaceae</b>				
119.	2988 <i>Cleome viscosa</i> (Tickweed, Tjinduwadhu)			
<b>Codiaceae</b>				
120.	35857 <i>Codium dwarkense</i>			
<b>Convolvulaceae</b>				
121.	11167 <i>Bonamia erecta</i>			
122.	19565 <i>Cressa australis</i>			
123.	6662 <i>Cuscuta australis</i> (Australian Dodder)			
124.	13733 <i>Cuscuta victoriana</i>			
125.	11416 <i>Evolvulus alsinoides</i> var. <i>decumbens</i>			
126.	11200 <i>Evolvulus alsinoides</i> var. <i>villosicalyx</i>			
127.	6631 <i>Ipomoea lonchophylla</i> (Cowvine)			
128.	6633 <i>Ipomoea muelleri</i> (Poison Morning Glory, Yumbu)			
129.	6635 <i>Ipomoea pes-caprae</i>			
130.	11312 <i>Ipomoea pes-caprae</i> subsp. <i>brasiliensis</i>			
131.	6637 <i>Ipomoea polymorpha</i>			
132.	6651 <i>Operculina aequisejala</i>			
<b>Cymodoceaceae</b>				
133.	126 <i>Amphibolis antarctica</i> (Sea Nymph)			
134.	128 <i>Cymodocea angustata</i>			
135.	13730 <i>Cymodocea rotundata</i>			
136.	129 <i>Cymodocea serrulata</i>			
<b>Cyperaceae</b>				
137.	750 <i>Bulbostylis barbata</i>			
138.	777 <i>Cyperus bulbosus</i> (Bush Onion, Tjanmata)			
139.	798 <i>Cyperus iria</i>			
140.	808 <i>Cyperus pygmaeus</i>			
141.	809 <i>Cyperus rigidellus</i>			
142.	814 <i>Cyperus squarrosus</i>			
143.	31017 <i>Eleocharis papillosa</i>		P3	
144.	48355 <i>Schoenoplectiella dissachantha</i>			
145.	16257 <i>Schoenoplectus subulatus</i>			
<b>Dasyaceae</b>				
146.	26740 <i>Dasya frutescens</i>			
<b>Dichotomosiphonaceae</b>				
147.	26498 <i>Avrainvillea obscura</i>			
<b>Elatinaceae</b>				
148.	5183 <i>Bergia ammannioides</i>			
149.	5185 <i>Bergia perennis</i>			
150.	11726 <i>Bergia perennis</i> subsp. <i>exigua</i>			
151.	5186 <i>Bergia trimera</i>			
<b>Euphorbiaceae</b>				
152.	4583 <i>Adriana tomentosa</i>			
153.	17422 <i>Adriana tomentosa</i> var. <i>tomentosa</i>			
154.	4617 <i>Euphorbia australis</i> (Namana)			
155.	35307 <i>Euphorbia australis</i> var. <i>australis</i>			
156.	35303 <i>Euphorbia australis</i> var. <i>subtomentosa</i>			
157.	4620 <i>Euphorbia boophthona</i> (Gascoyne Spurge)			
158.	4623 <i>Euphorbia coghlanii</i> (Namana)			
159.	4626 <i>Euphorbia drummondii</i> (Caustic Weed, Piwi)			
160.	4635 <i>Euphorbia myrtoides</i>			
161.	4644 <i>Euphorbia sharkoensis</i>			
162.	4647 <i>Euphorbia tannensis</i>			
163.	12097 <i>Euphorbia tannensis</i> subsp. <i>eremophila</i> (Desert Spurge)			
164.	42879 <i>Euphorbia trigonosperma</i>			
<b>Fabaceae</b>				
165.	3241 <i>Acacia bivenosa</i>			

Name ID	Species Name	Naturalised	Conservation Code	<sup>1</sup> Endemic To Query Area
166.	3260 <i>Acacia citrinoviridis</i>			
167.	3270 <i>Acacia coriacea</i> (Wirewood)			
168.	13500 <i>Acacia coriacea</i> subsp. <i>coriacea</i>			
169.	14088 <i>Acacia cyperophylla</i> var. <i>cyperophylla</i>			
170.	3419 <i>Acacia ligulata</i> (Umbrella Bush, Watarka)			
171.	3471 <i>Acacia orthocarpa</i> (Needleleaf Wattle)			
172.	3476 <i>Acacia pachycarpa</i>			
173.	3534 <i>Acacia sclerosperma</i> (Limestone Wattle)			
174.	13078 <i>Acacia sclerosperma</i> subsp. <i>sclerosperma</i>			
175.	29135 <i>Acacia sericophylla</i>			
176.	19456 <i>Acacia stellaticeps</i>			
177.	13070 <i>Acacia synchronicia</i>			
178.	3577 <i>Acacia tetragonophylla</i> (Kurara, Wakalpuka)			
179.	3579 <i>Acacia trachycarpa</i> (Minni Ritchi, Balgali)			
180.	20319 <i>Acacia tumida</i> var. <i>pilbarensis</i>			
181.	3603 <i>Acacia wiseana</i>			
182.	3680 <i>Aeschynomene indica</i> (Budda Pea)			
183.	3749 <i>Canavalia rosea</i> (Wild Jack Bean)			
184.	3774 <i>Crotalaria cunninghamii</i> (Green Birdflower, Bilbun)			
185.	20175 <i>Crotalaria cunninghamii</i> subsp. <i>sturtii</i>			
186.	20179 <i>Crotalaria medicaginea</i> var. <i>neglecta</i>			
187.	17117 <i>Cullen cinereum</i>			
188.	17436 <i>Cullen graveolens</i>			
189.	17116 <i>Cullen martinii</i>			
190.	3853 <i>Desmodium filiforme</i>			
191.	3971 <i>Indigofera bovipерda</i>			
192.	17113 <i>Indigofera bovipерda</i> subsp. <i>bovipерda</i>			
193.	3973 <i>Indigofera colutea</i> (Sticky Indigo)			
194.	3974 <i>Indigofera georgei</i> (Bovine Indigo)			
195.	3980 <i>Indigofera linifolia</i>			
196.	3981 <i>Indigofera linnaei</i> (Birdsville Indigo)			
197.	3982 <i>Indigofera monophylla</i>			
198.	4061 <i>Lotus cruentus</i> (Redflower Lotus)			
199.	3614 <i>Neptunia dimorphantha</i> (Sensitive Plant)			
200.	3673 <i>Parkinsonia aculeata</i> (Parkinsonia)	Y		
201.	3674 <i>Petalostylis cassioides</i>			
202.	3620 <i>Prosopis pallida</i> (Mesquite, Algaroba)	Y		
203.	4191 <i>Rhynchosia minima</i> (Rhynchosia)			
204.	18346 <i>Senna glutinosa</i>			
205.	12309 <i>Senna glutinosa</i> subsp. <i>pruinosa</i>			
206.	4198 <i>Sesbania formosa</i> (White Dragon Tree)			
207.	4231 <i>Swainsona kingii</i>			
208.	4242 <i>Swainsona pterostylis</i>			
209.	13587 <i>Swainsona tanamiensis</i>			
210.	<i>Tephrosia</i> Carnarvon (J.H. Ross 2681)			Y
211.	15947 <i>Tephrosia</i> sp. B Kimberley Flora (C.A. Gardner 7300)			
212.	41815 <i>Tephrosia</i> sp. Carnarvon (J.H. Ross 2681)			
213.	39422 <i>Tephrosia</i> sp. Onslow (K.R. Newbey 10571)			
214.	30716 <i>Vachellia farnesiana</i> (Mimosa Bush)	Y		
215.	31391 <i>Vigna</i> sp. Hamersley Clay (A.A. Mitchell PRP 113)			
216.	4326 <i>Zornia albiflora</i>			
<b>Frankeniaceae</b>				
217.	5188 <i>Frankenia ambita</i>			
218.	5209 <i>Frankenia pauciflora</i> (Seaheath)			
<b>Galaxauraceae</b>				
219.	26835 <i>Galaxaura rugosa</i>			
<b>Gentianaceae</b>				
220.	41660 <i>Schenkia australis</i>			
221.	41646 <i>Schenkia clementii</i>			
<b>Geraniaceae</b>				
222.	4334 <i>Erodium crinitum</i> (Corkscrew)			
223.	4335 <i>Erodium cygnorum</i> (Blue Heronsbill)			
<b>Goodeniaceae</b>				
224.	7501 <i>Goodenia corynocarpa</i>			
225.	7509 <i>Goodenia forrestii</i>			
226.	7521 <i>Goodenia lamprosperma</i>			
227.	7526 <i>Goodenia microptera</i>			
228.	12571 <i>Goodenia pascua</i>			

Name ID	Species Name	Naturalised	Conservation Code	<sup>1</sup> Endemic To Query Area
229.	7606 <i>Scaevola crassifolia</i> (Thick-leaved Fan-flower)			
230.	7608 <i>Scaevola cunninghamii</i>			
231.	12584 <i>Scaevola pulchella</i>			
232.	7643 <i>Scaevola sericophylla</i>			
233.	7644 <i>Scaevola spinescens</i> (Currant Bush, Maroon)			
<b>Gyrostemonaceae</b>				
234.	2778 <i>Codonocarpus cotinifolius</i> (Native Poplar, Kundurangu)			
235.	2784 <i>Gyrostemon ramulosus</i> (Corkybark)			
<b>Halimedaaceae</b>				
236.	26891 <i>Halimeda cylindracea</i>			
237.	26892 <i>Halimeda discoidea</i>			
238.	26894 <i>Halimeda macroloba</i>			
<b>Haloragaceae</b>				
239.	6174 <i>Haloragis gossei</i>			
240.	23464 <i>Haloragis gossei</i> var. <i>inflata</i>			
<b>Hemerocallidaceae</b>				
241.	1284 <i>Corynotheca flexuosissima</i>			
242.	1285 <i>Corynotheca micrantha</i> (Sand Lily)			
243.	1286 <i>Corynotheca pungens</i>			
<b>Hydrocharitaceae</b>				
244.	165 <i>Halophila spinulosa</i>			
<b>Isoetaceae</b>				
245.	15 <i>Isoetes tripus</i>			
<b>Juncaginaceae</b>				
246.	145 <i>Triglochin hexagona</i> (Six-point Arrowgrass)			
<b>Lamiaceae</b>				
247.	13689 <i>Clerodendrum tomentosum</i> var. <i>lanceolatum</i>			
248.	41063 <i>Quoya loxocarpa</i>			
249.	41061 <i>Quoya paniculata</i>			
<b>Lauraceae</b>				
250.	2948 <i>Cassytha aurea</i>			
251.	12073 <i>Cassytha aurea</i> var. <i>aurea</i>			
252.	2949 <i>Cassytha capillaris</i>			
<b>Loranthaceae</b>				
253.	11874 <i>Amyema sanguinea</i> var. <i>sanguinea</i>			
<b>Lygodiaceae</b>				
254.	19 <i>Lygodium flexuosum</i>		P3	
<b>Lythraceae</b>				
255.	5278 <i>Ammannia multiflora</i>			
<b>Malvaceae</b>				
256.	4895 <i>Abutilon lepidum</i>			
257.	4899 <i>Abutilon malvifolium</i> (Bastard Marshmallow)			
258.	<i>Abutilon</i> sp.			
259.	42920 <i>Abutilon</i> sp. <i>Dioicum</i> (A.A. Mitchell PRP 1618)			
260.	14110 <i>Abutilon</i> sp. <i>Onslow</i> (F. Smith s.n. 10/9/61)		P1	
261.	4907 <i>Alyogyne pinoniana</i> (Sand Hibiscus)			
262.	18411 <i>Corchorus congener</i>		P3	
263.	4864 <i>Corchorus sidoides</i> (Flannel Weed)			
264.	18414 <i>Corchorus sidoides</i> subsp. <i>vermicularis</i>			
265.	4910 <i>Gossypium australe</i> (Native Cotton)			
266.	4922 <i>Hibiscus brachychlaenus</i>			
267.	4923 <i>Hibiscus brachysiphonius</i>			
268.	4960 <i>Lawrenzia viridigrisea</i>			
269.	4962 <i>Malvastrum americanum</i> (Spiked Malvastrum)	Y		
270.	5051 <i>Melhanina oblongifolia</i>			
271.	31758 <i>Sida arsinata</i>			
272.	4977 <i>Sida fibulifera</i> (Silver Sida)			
273.	4988 <i>Sida rohlenae</i>			
274.	18149 <i>Sida rohlenae</i> subsp. <i>rohlenae</i>			
275.	17524 <i>Triumfetta echinata</i>		P3	
<b>Marsileaceae</b>				
276.	75 <i>Marsilea exarata</i>			
277.	<i>Marsilea</i> sp.			

Name ID	Species Name	Naturalised	Conservation Code	<sup>1</sup> Endemic To Query Area
<b>Molluginaceae</b>				
278.	2835 <i>Glinus lotoides</i> (Hairy Carpet Weed)			
<b>Montiaceae</b>				
279.	2860 <i>Calandrinia polyandra</i> (Parakeelya)			
280.	2864 <i>Calandrinia ptychosperma</i>			
<b>Myrtaceae</b>				
281.	35343 <i>Eucalyptus camaldulensis</i> subsp. <i>refulgens</i>			
282.	14548 <i>Eucalyptus victrix</i>			
283.	6081 <i>Verticordia forrestii</i> (Forrest's Featherflower)			
<b>Nyctaginaceae</b>				
284.	2769 <i>Boerhavia burbridgeana</i>			
285.	2770 <i>Boerhavia coccinea</i> (Tar Vine, Wituka)			
286.	2772 <i>Boerhavia gardneri</i>			
287.	2775 <i>Boerhavia schomburgkiana</i>			
288.	2776 <i>Commicarpus australis</i> (Perennial Tar Vine)			
<b>Ophioglossaceae</b>				
289.	17 <i>Ophioglossum lusitanicum</i> (Adders Tongue)			
290.	18 <i>Ophioglossum polyphyllum</i>			
<b>Orobanchaceae</b>				
291.	7103 <i>Striga curviflora</i>			
292.	12492 <i>Striga squamigera</i>			
<b>Phrymaceae</b>				
293.	7082 <i>Mimulus gracilis</i>			
294.	18463 <i>Peplidium</i> sp. <i>C Evol. Fl. Fauna Arid Aust. (N.T. Burbidge &amp; A. Kanis 8158)</i>			
<b>Phyllanthaceae</b>				
295.	<i>Breynia desorii</i>			
296.	17626 <i>Phyllanthus erwinii</i>			
297.	4680 <i>Phyllanthus maderaspatensis</i>			
298.	48206 <i>Synostemon rhytidospermus</i>			
<b>Plantaginaceae</b>				
299.	17295 <i>Stemodia</i> sp. <i>Onslow (A.A. Mitchell 76/148)</i>			
<b>Plumbaginaceae</b>				
300.	6486 <i>Aegialitis annulata</i> (Club Mangrove)			
301.	6490 <i>Muellerolimon salicorniaceum</i>			
<b>Poaceae</b>				
302.	207 <i>Aristida contorta</i> (Bunched Kerosene Grass)			
303.	12063 <i>Aristida holathera</i> var. <i>holathera</i>			
304.	215 <i>Aristida latifolia</i> (Feathertop Wiregrass)			
305.	227 <i>Astrebala elymoides</i> (Weeping Mitchell Grass)			
306.	258 <i>Cenchrus ciliaris</i> (Buffel Grass)	Y		
307.	269 <i>Chloris pectinata</i> (Comb Chloris)			
308.	270 <i>Chloris pumilio</i>			
309.	273 <i>Chrysopogon fallax</i> (Golden Beard Grass)			
310.	279 <i>Cymbopogon ambiguus</i> (Scentgrass)			
311.	290 <i>Dactyloctenium radulans</i> (Button Grass)			
312.	13741 <i>Dichanthium sericeum</i> subsp. <i>humilius</i>			
313.	48378 <i>Diplachne fusca</i> subsp. <i>fusca</i>			
314.	357 <i>Enneapogon caeruleus</i> (Limestone Grass)			
315.	369 <i>Eragrostis australasica</i> (Canegrass)			
316.	370 <i>Eragrostis barrelleri</i>	Y		
317.	375 <i>Eragrostis cumingii</i> (Cuming's Love Grass)			
318.	378 <i>Eragrostis dielsii</i> (Mallee Lovegrass)			
319.	379 <i>Eragrostis elongata</i> (Clustered Lovegrass)			
320.	380 <i>Eragrostis eriopoda</i> (Woollybutt Grass, Wangurnu)			
321.	381 <i>Eragrostis falcata</i> (Sickle Lovegrass)			
322.	388 <i>Eragrostis leptocarpa</i> (Drooping Lovegrass)			
323.	389 <i>Eragrostis minor</i> (Smaller Stinkgrass)	Y		
324.	392 <i>Eragrostis pergracilis</i>			
325.	393 <i>Eragrostis setifolia</i> (Neverfail Grass)			
326.	398 <i>Eragrostis tenellula</i> (Delicate Lovegrass)			
327.	399 <i>Eragrostis xerophila</i> (Knotty-butt Neverfail)			
328.	400 <i>Eriachne aristidea</i>			
329.	403 <i>Eriachne benthamii</i> (Swamp Wanderrrie)			
330.	409 <i>Eriachne gardneri</i>			
331.	411 <i>Eriachne helmsii</i> (Buck Wanderrrie Grass)			

Name ID	Species Name	Naturalised	Conservation Code	<sup>1</sup> Endemic To Query Area
332.	414 <i>Eriachne obtusa</i> (Northern Wandrarrie Grass)			
333.	426 <i>Eriochloa pseudoacrotricha</i> (Perennial Cupgrass)			
334.	11011 <i>Eulalia aurea</i>			
335.	458 <i>Iseilema dolichotrichum</i>			
336.	464 <i>Iseilema membranaceum</i> (Small Flinders Grass)			
337.	465 <i>Iseilema vaginiflorum</i> (Red Flinders Grass)			
338.	503 <i>Panicum decompositum</i> (Native Millet, Kaltu-kaltu)			
339.	505 <i>Panicum laevinode</i>			
340.	513 <i>Paractaenum novae-hollandiae</i> (Reflexed Panic Grass)			
341.	11232 <i>Paractaenum novae-hollandiae</i> subsp. <i>novae-hollandiae</i>			
342.	606 <i>Setaria dielsii</i> (Diels' Pigeon Grass)			
343.	613 <i>Setaria verticillata</i> (Whorled Pigeon Grass)	Y		
344.	619 <i>Sorghum plumosum</i> (Plume Canegrass)			
345.	625 <i>Spinifex longifolius</i> (Beach Spinifex)			
346.	633 <i>Sporobolus mitchellii</i> (Ratstail Couch)			
347.	<i>Sporobolus</i> sp.			
348.	635 <i>Sporobolus virginicus</i> (Marine Couch)			
349.	678 <i>Tragus australianus</i> (Small Burrgrass)			
350.	13131 <i>Triodia epactia</i>			
351.	696 <i>Triodia pungens</i> (Soft Spinifex)			
352.	17873 <i>Triodia schinzii</i>			
353.	704 <i>Triodia wiseana</i> (Limestone Spinifex)			
354.	706 <i>Triraphis mollis</i> (Needle Grass)			
355.	11321 <i>Urochloa holosericea</i> subsp. <i>velutina</i>			
356.	29269 <i>Urochloa occidentalis</i> var. <i>occidentalis</i>			
357.	717 <i>Urochloa piligera</i>			
358.	725 <i>Whiteochloa airoides</i>			
359.	728 <i>Whiteochloa cymbiformis</i>			
360.	11894 <i>Yakirra australiensis</i> var. <i>australiensis</i>			
<b>Polygalaceae</b>				
361.	41365 <i>Polygala glaucifolia</i>			
362.	4572 <i>Polygala isingii</i>			
<b>Portulacaceae</b>				
363.	2878 <i>Portulaca conspicua</i>			
364.	2882 <i>Portulaca intraterranea</i>			
365.	2884 <i>Portulaca oleracea</i> (Purslane, Wakati)			
366.	2886 <i>Portulaca pilosa</i> (Djanggara)	Y		
<b>Primulaceae</b>				
367.	6478 <i>Aegiceras corniculatum</i> (River Mangrove)			
368.	6484 <i>Samolus repens</i> (Creeping Brookweed)			
369.	14027 <i>Samolus</i> sp. <i>Millstream</i> (M.I.H. Brooker 2076)			
<b>Proteaceae</b>				
370.	2001 <i>Grevillea eriostachya</i> (Flame Grevillea, Kaliny-kalinypa)			
371.	2079 <i>Grevillea pyramidalis</i> (Caustic Bush, Tjungu)			
372.	2096 <i>Grevillea stenobotrya</i>			
373.	2177 <i>Hakea lorea</i> (Witinti)			
374.	16897 <i>Hakea stenophylla</i> subsp. <i>stenophylla</i>			
<b>Rhizophoraceae</b>				
375.	39680 <i>Ceriops australis</i>			
<b>Rhizophyllidaceae</b>				
376.	27186 <i>Portieria hornemannii</i>			
<b>Rhodomelaceae</b>				
377.	26762 <i>Dictyomenia sonderi</i>			
378.	46834 <i>Osmundaria melvillii</i>			
<b>Ricciaceae</b>				
379.	<i>Riccia</i> sp.			
<b>Rubiaceae</b>				
380.	13339 <i>Synaptantha tillaeacea</i> var. <i>tillaeacea</i>			
<b>Santalaceae</b>				
381.	10765 <i>Exocarpos sparteus</i> (Broom Ballart, Djuk)			
382.	2357 <i>Santalum lanceolatum</i> (Northern Sandalwood, Yarnguli)			
<b>Sapindaceae</b>				
383.	4739 <i>Alectryon oleifolius</i>			
384.	4745 <i>Diplopeltis eriocarpa</i> (Hairy Pepperflower)			

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<b>Scrophulariaceae</b>				
385.	7189 <i>Eremophila clarkei</i> (Turpentine Bush)			
386.	17177 <i>Eremophila forrestii</i> subsp. <i>viridis</i>		P3	
387.	17175 <i>Eremophila glabra</i> subsp. <i>albicans</i>			
388.	14193 <i>Eremophila glabra</i> subsp. <i>carcosa</i>			
389.	17158 <i>Myoporum montanum</i> (Native Myrtle)			
<b>Siphonocladaceae</b>				
390.	26507 <i>Boergesenia forbesii</i>			
<b>Solanaceae</b>				
391.	6976 <i>Nicotiana occidentalis</i> (Native Tobacco)			
392.	11856 <i>Nicotiana occidentalis</i> subsp. <i>occidentalis</i>			
393.	11734 <i>Nicotiana rosulata</i> subsp. <i>rosulata</i>			
394.	7002 <i>Solanum diversiflorum</i>			
395.	7018 <i>Solanum lasiophyllum</i> (Flannel Bush, Mindjulu)			
<b>Surianaceae</b>				
396.	3182 <i>Stylobasium spathulatum</i> (Pebble Bush)			
<b>Thymelaeaceae</b>				
397.	5230 <i>Pimelea ammocharis</i>			
<b>Udoteaceae</b>				
398.	27121 <i>Penicillus nodulosus</i>			
399.	27348 <i>Udotea argentea</i>			
400.	27349 <i>Udotea flabellum</i>			
<b>Zygophyllaceae</b>				
401.	4375 <i>Tribulus cistoides</i>			
402.	4380 <i>Tribulus occidentalis</i> (Perennial Caltrop)			
403.	4386 <i>Zygophyllum aurantiacum</i> (Shrubby Twinleaf)			

**Conservation Codes**

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

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



# NatureMap Species Report

Created By Guest user on 09/10/2018

**Kingdom** Plantae  
**Current Names Only** Yes  
**Core Datasets Only** Yes  
**Method** 'By Circle'  
**Centre** 114° 42' 39" E, 22° 00' 42" S  
**Buffer** 40km  
**Group By** Family

Family	Species	Records
Acanthaceae	2	8
Aizoaceae	5	5
Amaranthaceae	10	26
Apocynaceae	1	8
Araliaceae	1	2
Asparagaceae	4	11
Asteraceae	31	104
Bonnemaisoniaceae	1	4
Boraginaceae	4	24
Brassicaceae	4	5
Campanulaceae	1	1
Capparaceae	1	1
Caulerpaceae	4	4
Chenopodiaceae	29	145
Cleomaceae	1	5
Convolvulaceae	7	15
Cymodoceaceae	5	15
Cyperaceae	5	7
Dasyaceae	1	1
Dichotomosiphonaceae	1	1
Elatinaceae	1	1
Euphorbiaceae	11	68
Fabaceae	42	176
Frankeniaceae	2	13
Funariaceae	1	1
Gentianaceae	2	2
Geraniaceae	2	4
Goodeniaceae	5	51
Gyrostemonaceae	2	2
Halimedeaceae	2	3
Haloragaceae	1	2
Hemerocallidaceae	1	10
Hydrocharitaceae	1	1
Isoetaceae	3	3
Juncaginaceae	1	1
Lamiaceae	2	5
Lauraceae	3	13
Liagoraceae	2	2
Loranthaceae	1	1
Lygodiaceae	1	1
Malvaceae	13	34
Montiaceae	2	2
Myrtaceae	2	2
Nyctaginaceae	4	19
Ophioglossaceae	2	2
Orobanchaceae	2	2
Phrymaceae	1	1
Phyllanthaceae	2	2
Plantaginaceae	1	3
Plumbaginaceae	2	7
Poaceae	49	272
Portulacaceae	4	6
Primulaceae	2	2
Proteaceae	1	1
Rhizophoraceae	1	1
Rhodomelaceae	1	1
Ricciaceae	2	2
Santalaceae	2	6
Sapindaceae	2	4
Scrophulariaceae	2	6
Solanaceae	5	23
Surianaceae	1	2
Udoteaceae	3	7
Zygophyllaceae	4	21
<b>TOTAL</b>	<b>314</b>	<b>1180</b>

Name ID Species Name

Naturalised

Conservation Code

<sup>1</sup>Endemic To Query Area

Name ID	Species Name	Naturalised	Conservation Code	<sup>1</sup> Endemic To Query Area
<b>Acanthaceae</b>				
1.	6828 <i>Avicennia marina</i> (White Mangrove)			
2.	12088 <i>Rostellularia adscendens</i> var. <i>clementii</i>			
<b>Aizoaceae</b>				
3.	<i>Carpobrotus</i> sp. subsp. <i>Thevenard Island</i> (M. White 050)			
4.	2818 <i>Sesuvium portulacastrum</i>			
5.	44305 <i>Trianthema pilosum</i>			
6.	44362 <i>Trianthema triquetrum</i>			
7.	29095 <i>Zaleya galericulata</i> subsp. <i>galericulata</i>			
<b>Amaranthaceae</b>				
8.	2646 <i>Aerva javanica</i> (Kapok Bush)	Y		
9.	20018 <i>Amaranthus undulatus</i>			
10.	2708 <i>Ptilotus chamaecladus</i>			
11.	2727 <i>Ptilotus gaudichaudii</i>			
12.	2728 <i>Ptilotus gomphrenoides</i>			
13.	2741 <i>Ptilotus macrocephalus</i> (Featherheads)			
14.	2746 <i>Ptilotus nobilis</i> (Tall Mulla Mulla)			
15.	34701 <i>Ptilotus polakii</i> subsp. <i>juxtus</i>			
16.	2766 <i>Ptilotus villosiflorus</i>			
17.	43203 <i>Surreya diandra</i>			
<b>Apocynaceae</b>				
18.	6584 <i>Cynanchum floribundum</i> (Dumara Bush, Tjipa)			
<b>Araliaceae</b>				
19.	19053 <i>Trachymene pilbarensis</i>			
<b>Asparagaceae</b>				
20.	1208 <i>Acanthocarpus preissii</i>			
21.	1211 <i>Acanthocarpus verticillatus</i>			
22.	1312 <i>Sowerbaea laxiflora</i> (Purple Tassels)			
23.	46756 <i>Thysanotus exfimbriatus</i>			
<b>Asteraceae</b>				
24.	7817 <i>Actinobole uliginosum</i> (Flannel Cudweed)			
25.	7822 <i>Angianthus acrohyalinus</i> (Hook-leaf Angianthus)			
26.	7827 <i>Angianthus cunninghamii</i> (Coast Angianthus)			
27.	7832 <i>Angianthus milnei</i> (Cone-spike Angianthus)			
28.	7866 <i>Blumea tenella</i>			
29.	7906 <i>Calotis plumulifera</i>			
30.	19762 <i>Centipeda minima</i> subsp. <i>macrocephala</i>			
31.	7946 <i>Cotula cotuloides</i> (Smooth Cotula)			
32.	7958 <i>Decazesia hecatocephala</i>			
33.	35558 <i>Flaveria trinervia</i> (Speedy Weed)	Y		
34.	7989 <i>Gnephosis brevifolia</i> (Short-leaved Gnephosis)			
35.	<i>Launaea sarmentosa</i>			
36.	17925 <i>Myriocephalus oldfieldii</i>			
37.	8121 <i>Myriocephalus rudallii</i>			
38.	19420 <i>Myriocephalus scalpellus</i>		P1	
39.	<i>Olearia Kennedy Range</i> (G. Byrne 66)			
40.	42024 <i>Olearia</i> sp. <i>Kennedy Range</i> (G. Byrne 66)			
41.	8167 <i>Pluchea dentex</i>			
42.	17817 <i>Pluchea dunlopii</i>			
43.	17816 <i>Pluchea ferdinandi-muelleri</i>			
44.	43944 <i>Pluchea longiseta</i>			
45.	8168 <i>Pluchea rubelliflora</i>			
46.	8189 <i>Pseudognaphalium luteoalbum</i> (Jersey Cudweed)			
47.	8192 <i>Pterocaulon sphacelatum</i> (Apple Bush, Fruit Salad Plant)			
48.	8193 <i>Pterocaulon sphaeranthoides</i>			
49.	13297 <i>Rhodanthe psammophila</i>			
50.	13299 <i>Rhodanthe tietkensis</i>			
51.	45154 <i>Roebuckiella cheilocarpa</i> var. <i>cheilocarpa</i>			
52.	20161 <i>Senecio pinnatifolius</i>			
53.	8235 <i>Streptoglossa bubakii</i>			
54.	8238 <i>Streptoglossa liatroides</i>			
<b>Bonnemaisoniaceae</b>				
55.	26486 <i>Asparagopsis taxiformis</i>			
<b>Boraginaceae</b>				
56.	17299 <i>Heliotropium ammophilum</i>			
57.	6705 <i>Heliotropium crispatum</i>			

Name ID	Species Name	Naturalised	Conservation Code	<sup>1</sup> Endemic To Query Area
58.	6727 <i>Trichodesma zeylanicum</i> (Camel Bush, Kumbalin)			
59.	13559 <i>Trichodesma zeylanicum</i> var. <i>grandiflorum</i>			
<b>Brassicaceae</b>				
60.	3020 <i>Lepidium biplicatum</i>		P3	
61.	3035 <i>Lepidium pedicellosum</i>			
62.	3038 <i>Lepidium pholidogynum</i>			
63.	3039 <i>Lepidium platypetalum</i> (Slender Peppergrass)			
<b>Campanulaceae</b>				
64.	7393 <i>Wahlenbergia tumidifruca</i>			
<b>Capparaceae</b>				
65.	2981 <i>Capparis spinosa</i>			
<b>Caulerpaceae</b>				
66.	26554 <i>Caulerpa brachypus</i>			
67.	26556 <i>Caulerpa cactoides</i>			
68.	44547 <i>Caulerpa lamourouxii</i>			
69.	26568 <i>Caulerpa lentillifera</i>			
<b>Chenopodiaceae</b>				
70.	2451 <i>Atriplex bunburyana</i> (Silver Saltbush)			
71.	2463 <i>Atriplex isatidea</i> (Coast Saltbush)			
72.	2470 <i>Atriplex paludosa</i> (Marsh Saltbush)			
73.	2476 <i>Atriplex semilunaris</i> (Annual Saltbush)			
74.	2502 <i>Dysphania kalpari</i> (Rat's Tail, Kalpari)			
75.	33596 <i>Dysphania melanocarpa</i> forma <i>leucocarpa</i>			
76.	2504 <i>Dysphania plantaginella</i>			
77.	2505 <i>Dysphania platycarpa</i>			
78.	2511 <i>Enchylaena tomentosa</i> (Barrier Saltbush)			
79.	12064 <i>Enchylaena tomentosa</i> var. <i>tomentosa</i> (Barrier Saltbush)			
80.	2573 <i>Neobassia astrocarpa</i>			
81.	2582 <i>Rhagodia eremaea</i> (Thorny Saltbush)			
82.	2583 <i>Rhagodia latifolia</i>			
83.	2584 <i>Rhagodia preissii</i>			
84.	11240 <i>Rhagodia preissii</i> subsp. <i>obovata</i>			
85.	30434 <i>Salsola australis</i>			
86.	2604 <i>Sclerolaena costata</i>			
87.	2633 <i>Sclerolaena uniflora</i> (Two-spined Saltbush)			
88.	2638 <i>Suaeda arbusculoides</i>			
89.	31616 <i>Tecticornia auriculata</i>			
90.	46513 <i>Tecticornia doliiformis</i>			
91.	33236 <i>Tecticornia halocnemoides</i> (Shrubby Samphire)			
92.	33238 <i>Tecticornia halocnemoides</i> subsp. <i>tenuis</i>			
93.	33317 <i>Tecticornia indica</i>			
94.	33319 <i>Tecticornia indica</i> subsp. <i>bidens</i>			
95.	33318 <i>Tecticornia indica</i> subsp. <i>leiostachya</i> (Samphire)			
96.	33296 <i>Tecticornia pergranulata</i>			
97.	33297 <i>Tecticornia pergranulata</i> subsp. <i>pergranulata</i> (Blackseed Samphire)			
98.	2644 <i>Threlkeldia diffusa</i> (Coast Bonefruit)			
<b>Cleomaceae</b>				
99.	2988 <i>Cleome viscosa</i> (Tickweed, Tjinduwadhu)			
<b>Convolvulaceae</b>				
100.	19565 <i>Cressa australis</i>			
101.	6662 <i>Cuscuta australis</i> (Australian Dodder)			
102.	11416 <i>Evolvulus alsinoides</i> var. <i>decumbens</i>			
103.	6631 <i>Ipomoea lonchophylla</i> (Cowvine)			
104.	6633 <i>Ipomoea muelleri</i> (Poison Morning Glory, Yumbu)			
105.	6635 <i>Ipomoea pes-caprae</i>			
106.	6651 <i>Operculina aequisepala</i>			
<b>Cymodoceaceae</b>				
107.	126 <i>Amphibolis antarctica</i> (Sea Nymph)			
108.	128 <i>Cymodocea angustata</i>			
109.	13730 <i>Cymodocea rotundata</i>			
110.	129 <i>Cymodocea serrulata</i>			
111.	131 <i>Halodule uninervis</i>			
<b>Cyperaceae</b>				
112.	750 <i>Bulbostylis barbata</i>			
113.	777 <i>Cyperus bulbosus</i> (Bush Onion, Tjanmata)			
114.	809 <i>Cyperus rigidellus</i>			

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115.	814 <i>Cyperus squarrosus</i>			
116.	16257 <i>Schoenoplectus subulatus</i>			
<b>Dasyaceae</b>				
117.	26732 <i>Dasya baldockii</i>			
<b>Dichotomosiphonaceae</b>				
118.	26498 <i>Avrainvillea obscura</i>			
<b>Elatinaceae</b>				
119.	11726 <i>Bergia perennis</i> subsp. <i>exigua</i>			
<b>Euphorbiaceae</b>				
120.	4583 <i>Adriana tomentosa</i>			
121.	17422 <i>Adriana tomentosa</i> var. <i>tomentosa</i>			
122.	35307 <i>Euphorbia australis</i> var. <i>australis</i>			
123.	35303 <i>Euphorbia australis</i> var. <i>subtomentosa</i>			
124.	4620 <i>Euphorbia boophthona</i> (Gascoyne Spurge)			
125.	4623 <i>Euphorbia coghlanii</i> (Namana)			
126.	4626 <i>Euphorbia drummondii</i> (Caustic Weed, Piwi)			
127.	4635 <i>Euphorbia myrtoides</i>			
128.	4647 <i>Euphorbia tannensis</i>			
129.	12097 <i>Euphorbia tannensis</i> subsp. <i>eremophila</i> (Desert Spurge)			
130.	42879 <i>Euphorbia trigonosperma</i>			
<b>Fabaceae</b>				
131.	3241 <i>Acacia bivenosa</i>			
132.	3260 <i>Acacia citrinoviridis</i>			
133.	3270 <i>Acacia coriacea</i> (Wirewood)			
134.	13500 <i>Acacia coriacea</i> subsp. <i>coriacea</i>			
135.	14088 <i>Acacia cyperophylla</i> var. <i>cyperophylla</i>			
136.	3356 <i>Acacia gregorii</i> (Gregory's Wattle)			
137.	3419 <i>Acacia ligulata</i> (Umbrella Bush, Watarka)			
138.	3452 <i>Acacia murrayana</i> (Sandplain Wattle)			
139.	3471 <i>Acacia orthocarpa</i> (Needleleaf Wattle)			
140.	3476 <i>Acacia pachycarpa</i>			
141.	3525 <i>Acacia rostellifera</i> (Summer-scented Wattle)			
142.	3534 <i>Acacia sclerosperma</i> (Limestone Wattle)			
143.	13078 <i>Acacia sclerosperma</i> subsp. <i>sclerosperma</i>			
144.	29135 <i>Acacia sericophylla</i>			
145.	13070 <i>Acacia synchronicia</i>			
146.	3577 <i>Acacia tetragonophylla</i> (Kurara, Wakalpuka)			
147.	20319 <i>Acacia tumida</i> var. <i>pilbarensis</i>			
148.	3749 <i>Canavalia rosea</i> (Wild Jack Bean)			
149.	3774 <i>Crotalaria cunninghamii</i> (Green Birdflower, Bilbun)			
150.	17117 <i>Cullen cinereum</i>			
151.	17116 <i>Cullen martinii</i>			
152.	3853 <i>Desmodium filiforme</i>			
153.	3971 <i>Indigofera bovipерda</i>			
154.	17113 <i>Indigofera bovipерda</i> subsp. <i>bovipерda</i>			
155.	3973 <i>Indigofera colutea</i> (Sticky Indigo)			
156.	3980 <i>Indigofera linifolia</i>			
157.	3981 <i>Indigofera linnaei</i> (Birdsville Indigo)			
158.	4061 <i>Lotus cruentus</i> (Redflower Lotus)			
159.	3614 <i>Neptunia dimorphantha</i> (Sensitive Plant)			
160.	3673 <i>Parkinsonia aculeata</i> (Parkinsonia)	Y		
161.	3620 <i>Prosopis pallida</i> (Mesquite, Algaroba)	Y		
162.	4191 <i>Rhynchosia minima</i> (Rhynchosia)			
163.	12280 <i>Senna artemisioides</i> subsp. <i>oligophylla</i>			
164.	18346 <i>Senna glutinosa</i>			
165.	12305 <i>Senna glutinosa</i> subsp. <i>chatelainiana</i>			
166.	12309 <i>Senna glutinosa</i> subsp. <i>pruinosa</i>			
167.	4198 <i>Sesbania formosa</i> (White Dragon Tree)			
168.	4242 <i>Swainsona pterostylis</i>			
169.	13587 <i>Swainsona tanamiensis</i>			
170.	<i>Tephrosia Carnarvon</i> (J.H. Ross 2681)			Y
171.	41815 <i>Tephrosia</i> sp. <i>Carnarvon</i> (J.H. Ross 2681)			
172.	30716 <i>Vachellia farnesiana</i> (Mimosa Bush)	Y		
<b>Frankeniaceae</b>				
173.	5188 <i>Frankenia ambita</i>			
174.	5209 <i>Frankenia pauciflora</i> (Seaheath)			

Name ID	Species Name	Naturalised	Conservation Code	<sup>1</sup> Endemic To Query Area
<b>Funariaceae</b>				
175.	32472 <i>Goniomitrium acuminatum subsp. enerve</i>			
<b>Gentianaceae</b>				
176.	41660 <i>Schenkia australis</i>			
177.	41646 <i>Schenkia clementii</i>			
<b>Geraniaceae</b>				
178.	4334 <i>Erodium crinitum (Corkscrew)</i>			
179.	4335 <i>Erodium cygnorum (Blue Heronsbill)</i>			
<b>Goodeniaceae</b>				
180.	7521 <i>Goodenia lamprosperma</i>			
181.	7606 <i>Scaevola crassifolia (Thick-leaved Fan-flower)</i>			
182.	7608 <i>Scaevola cunninghamii</i>			
183.	7643 <i>Scaevola sericophylla</i>			
184.	7644 <i>Scaevola spinescens (Currant Bush, Maroon)</i>			
<b>Gyrostemonaceae</b>				
185.	2778 <i>Codonocarpus cotinifolius (Native Poplar, Kundurangu)</i>			
186.	2784 <i>Gyrostemon ramulosus (Corkybark)</i>			
<b>Halimedaceae</b>				
187.	26892 <i>Halimeda discoidea</i>			
188.	26894 <i>Halimeda macroloba</i>			
<b>Haloragaceae</b>				
189.	6174 <i>Haloragis gossei</i>			
<b>Hemerocallidaceae</b>				
190.	1286 <i>Corynotheca pungens</i>			
<b>Hydrocharitaceae</b>				
191.	165 <i>Halophila spinulosa</i>			
<b>Isoetaceae</b>				
192.	13 <i>Isoetes mongerensis</i>			
193.	14 <i>Isoetes muelleri</i>			
194.	15 <i>Isoetes tripus</i>			
<b>Juncaginaceae</b>				
195.	145 <i>Triglochin hexagona (Six-point Arrowgrass)</i>			
<b>Lamiaceae</b>				
196.	13689 <i>Clerodendrum tomentosum var. lanceolatum</i>			
197.	41063 <i>Quoya loxocarpa</i>			
<b>Lauraceae</b>				
198.	2948 <i>Cassytha aurea</i>			
199.	12073 <i>Cassytha aurea var. aurea</i>			
200.	2957 <i>Cassytha racemosa (Dodder Laurel)</i>			
<b>Liagoraceae</b>				
201.	26836 <i>Ganonema borowitzkae</i>			
202.	27021 <i>Liagora ceranoides</i>			
<b>Loranthaceae</b>				
203.	11874 <i>Amyema sanguinea var. sanguinea</i>			
<b>Lygodiaceae</b>				
204.	19 <i>Lygodium flexuosum</i>		P3	
<b>Malvaceae</b>				
205.	4895 <i>Abutilon lepidum</i>			
206.	4899 <i>Abutilon malvifolium (Bastard Marshmallow)</i>			
207.	4907 <i>Alyogyne pinoniana (Sand Hibiscus)</i>			
208.	<i>Corchorus Scholl</i>			
209.	18411 <i>Corchorus congener</i>		P3	
210.	4857 <i>Corchorus elachocarpus</i>			
211.	4864 <i>Corchorus sidoides (Flannel Weed)</i>			
212.	4910 <i>Gossypium australe (Native Cotton)</i>			
213.	4960 <i>Lawrencia viridigrisea</i>			
214.	4962 <i>Malvastrum americanum (Spiked Malvastrum)</i>	Y		
215.	4977 <i>Sida fibulifera (Silver Sida)</i>			
216.	4988 <i>Sida rohlenae</i>			
217.	18149 <i>Sida rohlenae subsp. rohlenae</i>			
<b>Montiaceae</b>				
218.	2860 <i>Calandrinia polyandra (Parakeelya)</i>			

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219.	2864 <i>Calandrinia ptychosperma</i>			
<b>Myrtaceae</b>				
220.	35343 <i>Eucalyptus camaldulensis</i> subsp. <i>refulgens</i>			
221.	5887 <i>Melaleuca cardiophylla</i> (Tangling Melaleuca)			
<b>Nyctaginaceae</b>				
222.	2769 <i>Boerhavia burbridgeana</i>			
223.	2770 <i>Boerhavia coccinea</i> (Tar Vine, Wituka)			
224.	2775 <i>Boerhavia schomburgkiana</i>			
225.	2776 <i>Commicarpus australis</i> (Perennial Tar Vine)			
<b>Ophioglossaceae</b>				
226.	17 <i>Ophioglossum lusitanicum</i> (Adders Tongue)			
227.	18 <i>Ophioglossum polyphyllum</i>			
<b>Orobanchaceae</b>				
228.	7103 <i>Striga curviflora</i>			
229.	12492 <i>Striga squamigera</i>			
<b>Phrymaceae</b>				
230.	7082 <i>Mimulus gracilis</i>			
<b>Phyllanthaceae</b>				
231.	<i>Breynia desorii</i>			
232.	4680 <i>Phyllanthus maderaspatensis</i>			
<b>Plantaginaceae</b>				
233.	17295 <i>Stemodia</i> sp. Onslow (A.A. Mitchell 76/148)			
<b>Plumbaginaceae</b>				
234.	6486 <i>Aegialitis annulata</i> (Club Mangrove)			
235.	6490 <i>Muellerolimon salicorniaceum</i>			
<b>Poaceae</b>				
236.	207 <i>Aristida contorta</i> (Bunched Kerosene Grass)			
237.	12063 <i>Aristida holathera</i> var. <i>holathera</i>			
238.	215 <i>Aristida latifolia</i> (Feathertop Wiregrass)			
239.	227 <i>Astrebula elymoides</i> (Weeping Mitchell Grass)			
240.	240 <i>Bothriochloa ewartiana</i> (Desert Bluegrass)			
241.	258 <i>Cenchrus ciliaris</i> (Buffel Grass)	Y		
242.	269 <i>Chloris pectinata</i> (Comb Chloris)			
243.	270 <i>Chloris pumilio</i>			
244.	273 <i>Chrysopogon fallax</i> (Golden Beard Grass)			
245.	279 <i>Cymbopogon ambiguus</i> (Scentgrass)			
246.	290 <i>Dactyloctenium radulans</i> (Button Grass)			
247.	13741 <i>Dichanthium sericeum</i> subsp. <i>humilius</i>			
248.	357 <i>Enneapogon caeruleus</i> (Limestone Grass)			
249.	375 <i>Eragrostis cumingii</i> (Cuming's Love Grass)			
250.	378 <i>Eragrostis dielsii</i> (Mallee Lovegrass)			
251.	380 <i>Eragrostis eriopoda</i> (Woollybutt Grass, Wangurnu)			
252.	381 <i>Eragrostis falcata</i> (Sickle Lovegrass)			
253.	388 <i>Eragrostis leptocarpa</i> (Drooping Lovegrass)			
254.	389 <i>Eragrostis minor</i> (Smaller Stinkgrass)	Y		
255.	393 <i>Eragrostis setifolia</i> (Neverfail Grass)			
256.	398 <i>Eragrostis tenellula</i> (Delicate Lovegrass)			
257.	399 <i>Eragrostis xerophila</i> (Knotty-butt Neverfail)			
258.	400 <i>Eriachne aristidea</i>			
259.	403 <i>Eriachne benthamii</i> (Swamp Wanderrrie)			
260.	409 <i>Eriachne gardneri</i>			
261.	411 <i>Eriachne helmsii</i> (Buck Wanderrrie Grass)			
262.	414 <i>Eriachne obtusa</i> (Northern Wanderrrie Grass)			
263.	11011 <i>Eulalia aurea</i>			
264.	458 <i>Iseilema dolichotrichum</i>			
265.	464 <i>Iseilema membranaceum</i> (Small Flinders Grass)			
266.	465 <i>Iseilema vaginiflorum</i> (Red Flinders Grass)			
267.	503 <i>Panicum decompositum</i> (Native Millet, Kaltu-kaltu)			
268.	505 <i>Panicum laevinode</i>			
269.	513 <i>Paractaenum novae-hollandiae</i> (Reflexed Panic Grass)			
270.	11232 <i>Paractaenum novae-hollandiae</i> subsp. <i>novae-hollandiae</i>			
271.	606 <i>Setaria dielsii</i> (Diels' Pigeon Grass)			
272.	619 <i>Sorghum plumosum</i> (Plume Canegrass)			
273.	625 <i>Spinifex longifolius</i> (Beach Spinifex)			
274.	633 <i>Sporobolus mitchellii</i> (Ratstail Couch)			
275.	635 <i>Sporobolus virginicus</i> (Marine Couch)			

Name ID	Species Name	Naturalised	Conservation Code	<sup>1</sup> Endemic To Query Area
276.	678 <i>Tragus australianus</i> (Small Burrgrass)			
277.	13131 <i>Triodia epactia</i>			
278.	696 <i>Triodia pungens</i> (Soft Spinifex)			
279.	17873 <i>Triodia schinzii</i>			
280.	706 <i>Triraphis mollis</i> (Needle Grass)			
281.	29269 <i>Urochloa occidentalis</i> var. <i>occidentalis</i>			
282.	717 <i>Urochloa piligera</i>			
283.	725 <i>Whiteochloa airoides</i>			
284.	728 <i>Whiteochloa cymbiformis</i>			
<b>Portulacaceae</b>				
285.	2878 <i>Portulaca conspicua</i>			
286.	2882 <i>Portulaca intraterranea</i>			
287.	2884 <i>Portulaca oleracea</i> (Purslane, Wakati)			
288.	2886 <i>Portulaca pilosa</i> (Djanggara)	Y		
<b>Primulaceae</b>				
289.	6478 <i>Aegiceras corniculatum</i> (River Mangrove)			
290.	6484 <i>Samolus repens</i> (Creeping Brookweed)			
<b>Proteaceae</b>				
291.	<i>Hakea stenophylla</i> subsp. <i>Stenophylla</i>			Y
<b>Rhizophoraceae</b>				
292.	39680 <i>Ceriops australis</i>			
<b>Rhodomelaceae</b>				
293.	27336 <i>Tolypiocladia glomerulata</i>			
<b>Ricciaceae</b>				
294.	<i>Riccia limbata</i>			
295.	<i>Riccia</i> sp.			
<b>Santalaceae</b>				
296.	10765 <i>Exocarpos sparteus</i> (Broom Ballart, Djuk)			
297.	2357 <i>Santalum lanceolatum</i> (Northern Sandalwood, Yarnguli)			
<b>Sapindaceae</b>				
298.	4739 <i>Alectryon oleifolius</i>			
299.	4745 <i>Diplopeltis eriocarpa</i> (Hairy Pepperflower)			
<b>Scrophulariaceae</b>				
300.	14193 <i>Eremophila glabra</i> subsp. <i>carnea</i>			
301.	17158 <i>Myoporum montanum</i> (Native Myrtle)			
<b>Solanaceae</b>				
302.	6976 <i>Nicotiana occidentalis</i> (Native Tobacco)			
303.	11856 <i>Nicotiana occidentalis</i> subsp. <i>occidentalis</i>			
304.	6998 <i>Solanum cleistogamum</i>			
305.	7002 <i>Solanum diversiflorum</i>			
306.	7018 <i>Solanum lasiophyllum</i> (Flannel Bush, Mindjulu)			
<b>Surianaceae</b>				
307.	3182 <i>Stylobasium spathulatum</i> (Pebble Bush)			
<b>Udoteaceae</b>				
308.	27121 <i>Penicillus nodulosus</i>			
309.	27348 <i>Udotea argentea</i>			
310.	27349 <i>Udotea flabellum</i>			
<b>Zygophyllaceae</b>				
311.	4375 <i>Tribulus cistoides</i>			
312.	4378 <i>Tribulus hystrix</i>			
313.	4380 <i>Tribulus occidentalis</i> (Perennial Caltrop)			
314.	4386 <i>Zygophyllum aurantiacum</i> (Shrubby Twinleaf)			

**Conservation Codes**

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

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





## Appendix 3

Flora of Conservation  
Significance Known from the  
Locality and their Likelihood of  
Occurrence in the Study Area





Taxon	Habit	Habitat	Database Searches			Previous Surveys					Likelihood of Occurrence Within the Study Area	
			TPFL	WA Herbarium	NatureMap	Onslow Salt (Biota 2018)	Wheatstone (Mattiske 2013)	Wheatstone (Biota 2011)	Wheatstone (Biota 2010a)	Wheatstone (Outback Ecology 2010)	Initial Ranking Based on Desktop Review	Final Ranking Including Results of 2018/2019 Field Surveys
<b>Priority 1</b>												
<i>Abutilon</i> sp. Pritzelianum (S. van Leeuwen 5095)	Shrub to 2 m tall, with yellow flowers.	Sand plains.		✓							Likely to occur: extensive suitable habitat in the study area and the closest record is 20 km east.	Recorded: a total of 29 individuals recorded from 12 locations in the study area, and a further 137 individuals recorded from 13 locations outside the study area.
<i>Abutilon</i> sp. Onslow (F. Smith s.n. 10/9/61)	Prostrate to semi-prostrate shrub.	Sand plains.		✓	✓			✓	✓		May potentially occur: suitable habitat in the study area and has been recorded from multiple surveys in the locality; closest record is 24 km southeast of the study area.	May potentially occur: not recorded in 2018/2019 but may not have been identifiable during the surveys, if present.
<i>Minuria tridens</i>	Herb with simple hairs on stems and three-toothed leaf apices.	Single record from WA is from a roadside; populations in Northern Territory are from rocky habitats.									NA – not identified as a prospective species: known from a single location in WA approximately 700 km southeast of the study area.	Recorded: 1 individual collected during the Phase 1 survey. Note that this material was in poor condition (sterile), however Mike Hislop (WA Herbarium) was reasonably confident of the determination. Given the disparate habitats between the WA populations and the Northern Territory populations, which are >1,800 km southeast, it is questionable whether the taxa are the same.
<i>Myriocephalus scalpellus</i>	Semi-erect herb to 8 cm tall.	On clay in depressions and floodplains.			✓						Unlikely to occur; extensive suitable habitat in the study area, however the NatureMap search returned a single unvouchered record from a claypan in the search area; this was apparently from the Pilbara Biological Survey, however the two records from that survey were both reported as being from Coondiner Pool in the Fortescue Marsh; the NatureMap record therefore appears to be in error.	Unlikely to occur.
<b>Priority 3</b>												
<i>Atriplex flabelliformis</i>	Monoecious, erect, rounded perennial herb to 35 cm.	Clay loam on saline flats and marshes.							✓		Unlikely to occur: suitable habitat in the study area, however there are no vouchered records from the locality; the record in Biota (2010a) was based on an unvouchered record reported in Astron (2008); the nearest confirmed record is in the Fortescue Marsh.	Unlikely to occur.
<i>Carpobrotus</i> sp. Thevenard Island (M. White 050)	Prostrate, succulent perennial herb to 20 cm.	Coarse white sand, dunes and disturbed areas.	✓	✓	✓						May potentially occur: some suitable habitat in the study area, however all records from the locality are from offshore; the nearest record is 31 km north on Thevenard Island.	Unlikely to occur; not recorded during the field survey.
<i>Corchorus congener</i>	Spreading shrub to 60 cm.	On sand and red sandy loam with limestone, on sand dunes and plains.		✓	✓						Likely to occur: suitable habitat in the study area and several records from Tent Island, 12 km west.	May potentially occur: not recorded in 2018/2019 but may not have been identifiable during the survey, if present.
<i>Eleocharis papillosa</i>	Annual sedge to 10 cm tall.	Red clay over granite, open clay flats and claypans.		✓	✓			✓	✓		Likely to occur: closest record is 2.1 km northeast of the study area and has been recorded from multiple surveys within the locality.	Likely to occur: not recorded in 2018/2019 but may not have been identifiable during these surveys, if present. Surveys would need to be optimally timed after rainfall to record this species.
<i>Eremophila forrestii</i> subsp. <i>viridis</i>	Much branched shrub to 2 m tall.	Skeletal soils to heavy clays.		✓	✓		✓	✓	✓	✓	Likely to occur: closest record is 11.3 km northeast of the study area and this species has been recorded from multiple surveys within the locality.	Recorded: a total of 935 individuals recorded from 54 locations in the study area, with additional records outside.
<i>Lepidium biplicatum</i>	Erect shrub.	Coastal areas.		✓	✓						May potentially occur: suitable habitat in the study area and the nearest record is 16 km to the southeast, however the species is recorded infrequently in the locality.	May potentially occur: not recorded in 2018/2019 but may not have been identifiable during the survey, if present.

Taxon	Habit	Habitat	Database Searches			Previous Surveys					Likelihood of Occurrence Within the Study Area	
			TPFL	WA Herbarium	NatureMap	Onslow Salt (Biota 2018)	Wheatstone (Mattiske 2013)	Wheatstone (Biota 2011)	Wheatstone (Biota 2010a)	Wheatstone (Outback Ecology 2010)	Initial Ranking Based on Desktop Review	Final Ranking Including Results of 2018/2019 Field Surveys
<i>Lygodium flexuosum</i>	Fern.	Sand, damp shaded sites (e.g. gorges).			✓						Would not occur: no suitable habitat, and no confirmed records outside the Kimberley; apparent record on NatureMap from the Pilbara is noted as being a "shark" from the Fauna Survey Returns Database, and therefore appears erroneous.	Would not occur.
<i>Stackhousia clementii</i>	Broom-like perennial herb to 45 cm tall.	Skeletal soils, sandstone hills.		✓	✓	✓					Likely to occur: closest record is 18.5 km northeast of the study area and species has been recorded from multiple surveys in the locality.	Recorded: 390 individuals recorded from 9 locations during the current surveys, all from a single island.
<i>Triumfetta echinata</i>	Prostrate perennial shrub.	Red sandy soils, sand dunes.	✓	✓	✓			✓	✓		Likely to occur: closest record is 14.6 km east of the study area and species has been recorded from multiple surveys within the locality.	Recorded: 1 plant recorded during the targeted searches in 2019; likely to occur at other locations on sand dunes in the study area.

# Appendix 4

## Vegetation Structural Classification and Condition Scale





Vegetation structural classes based on modifications of the vegetation classification system of Specht (1970) by Muir (1977) and Aplin (1979).

Stratum	Canopy Cover (%)				
	70-100%	30-70%	10-30%	2-10%	<2%
Trees over 30 m	Tall closed forest	Tall open forest	Tall woodland	Tall open woodland	Scattered tall trees
Trees 10-30 m	Closed forest	Open forest	Woodland	Open woodland	Scattered trees
Trees under 10 m	Low closed forest	Low open forest	Low woodland	Low open woodland	Scattered low trees
Shrubs over 2 m	Tall closed scrub	Tall open scrub	Tall shrubland	Tall open shrubland	Scattered tall shrubs
Shrubs 1-2 m	Closed heath	Open heath	Shrubland	Open shrubland	Scattered shrubs
Shrubs under 1 m	Low closed heath	Low open heath	Low shrubland	Low open shrubland	Scattered low shrubs
Hummock grasses	Closed hummock grassland	Hummock grassland	Open hummock grassland	Very open hummock grassland	Scattered hummock grasses
Grasses, Sedges, Herbs	Closed tussock grassland / bunch grassland / sedgeland / herbland	Tussock grassland / bunch grassland / sedgeland / herbland	Open tussock grassland / bunch grassland / sedgeland / herbland	Very open tussock grassland / bunch grassland / sedgeland / herbland	Scattered tussock grasses / bunch grasses / sedges / herbs

Vegetation condition scale taken from EPA (2016a), based on scales developed by Keighery (1994) and Trudgen (1988).

<b>Vegetation Condition</b>	<b>South West and Interzone Botanical Provinces</b>	<b>Eremaean and Northern Botanical Provinces</b>
<b>Pristine</b>	Pristine or nearly so, no obvious signs of disturbance or damage caused by human activities since European settlement.	
<b>Excellent</b>	Vegetation structure intact, disturbance affecting individual species and weeds are non-aggressive species. Damage to trees caused by fire, the presence of non-aggressive weeds and occasional vehicle tracks.	Pristine or nearly so, no obvious signs of damage caused by human activities since European settlement.
<b>Very Good</b>	Vegetation structure altered, obvious signs of disturbance. Disturbance to vegetation structure caused by repeated fires, the presence of some more aggressive weeds, dieback, logging and grazing.	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.
<b>Good</b>	Vegetation structure significantly altered by very obvious signs of multiple disturbances. Retains basic vegetation structure or ability to regenerate it. Disturbance to vegetation structure caused by very frequent fires, the presence of very aggressive weeds, partial clearing, dieback and grazing.	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.
<b>Poor</b>		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.
<b>Degraded</b>	Basic vegetation structure severely impacted by disturbance. Scope for regeneration but not to a state approaching good condition without intensive management. Disturbance to vegetation structure caused by very frequent fires, the presence of very aggressive weeds at high density, partial clearing, dieback and grazing.	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.
<b>Completely Degraded</b>	The structure of the vegetation is no longer intact and the area is completely or almost completely without native species. These areas are often described as 'parkland cleared' with the flora comprising weed or crop species with isolated native trees and shrubs.	Areas that are completely or almost completely without native species in the structure of their vegetation; i.e. areas that are cleared or 'parkland cleared' with their flora comprising weed or crop species with isolated native trees or shrubs.

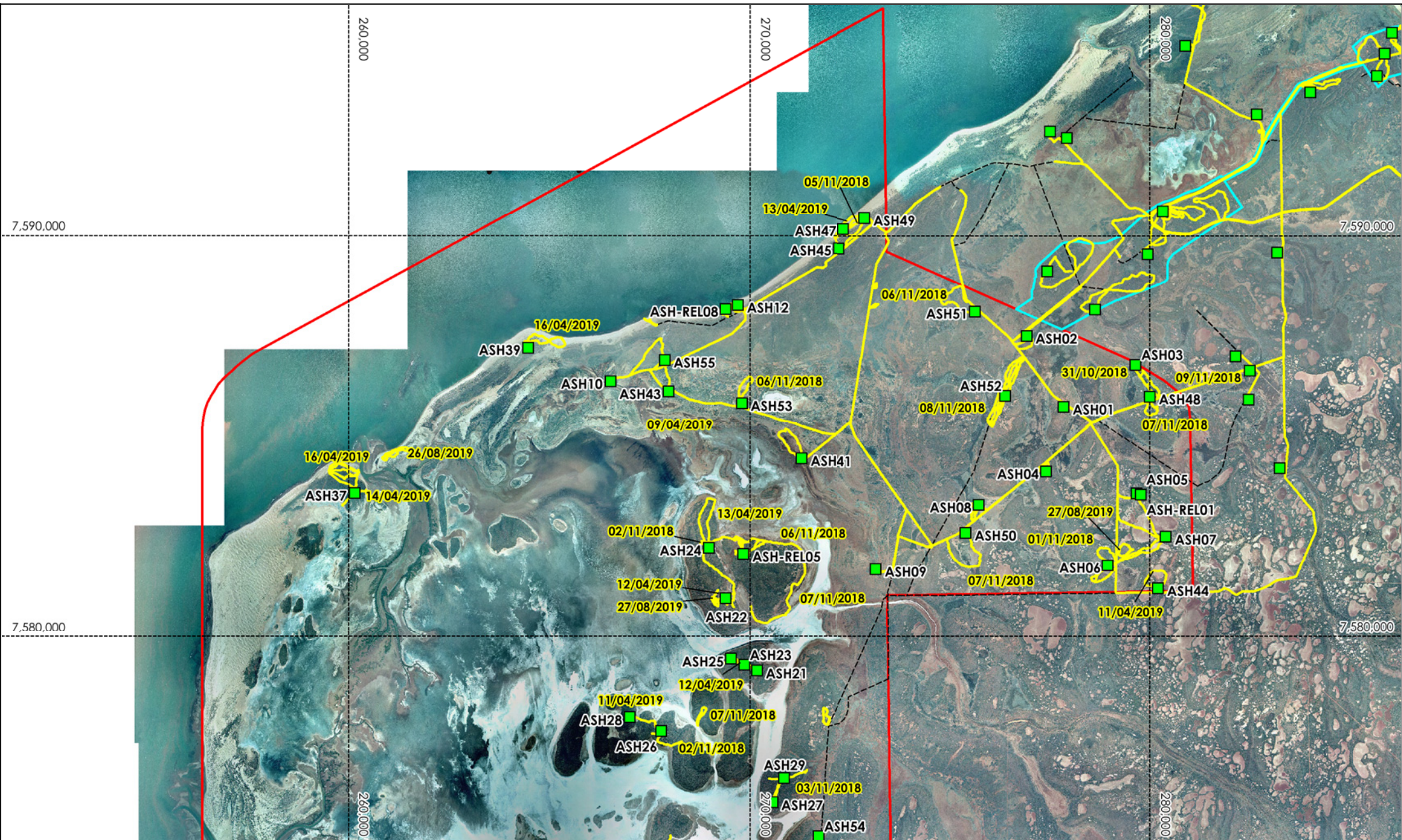


## Appendix 5

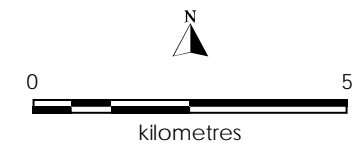
### Survey Effort: Location of Sampling Sites and Foot Traverses





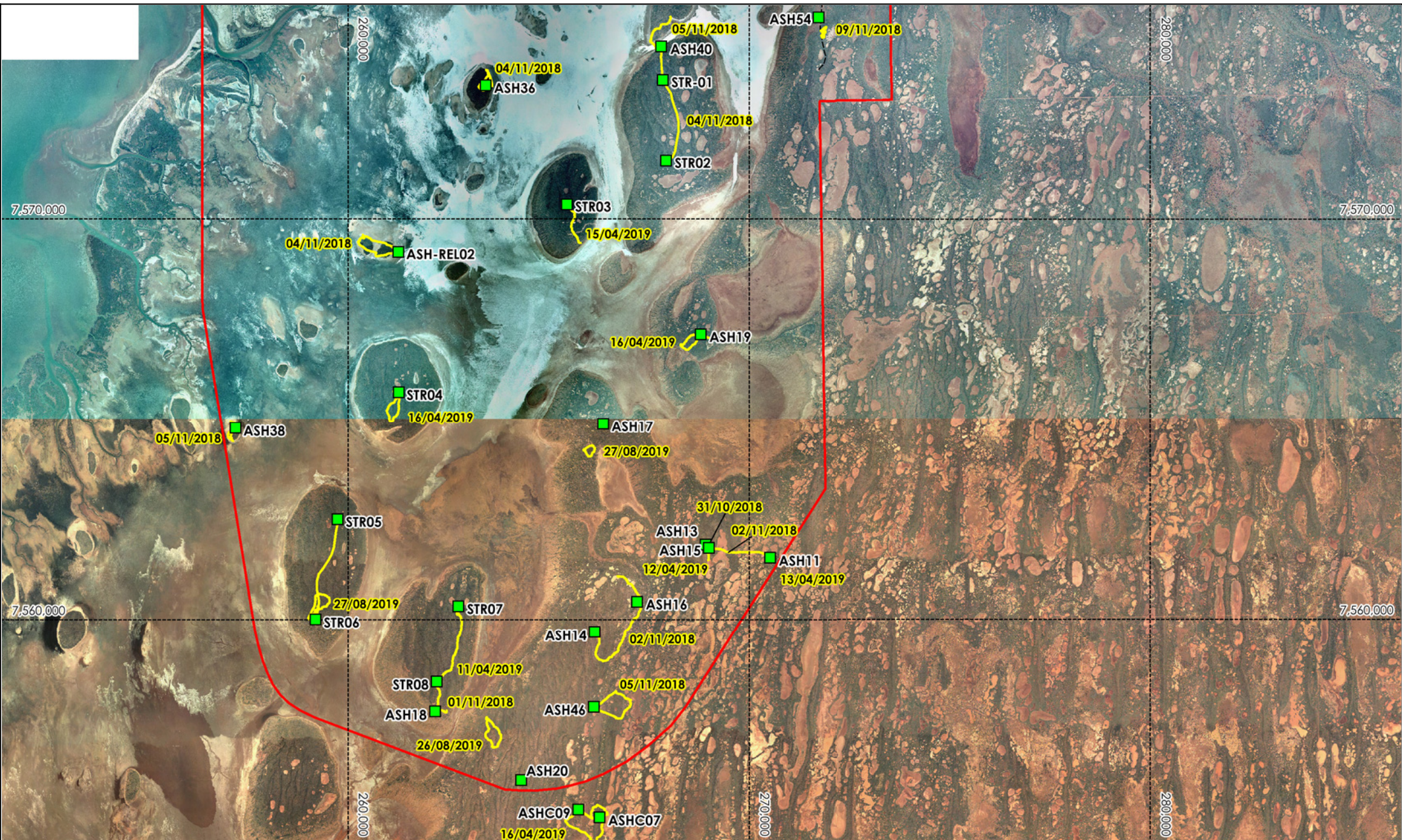


- Development envelope
- Road survey area
- Access
- GPS tracklog
- Flora site location

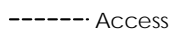


## Ashburton Salt Flora Survey Effort Map 2



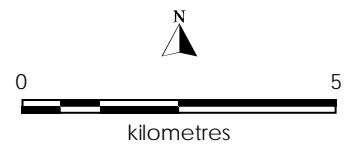


 Development envelope

 Access

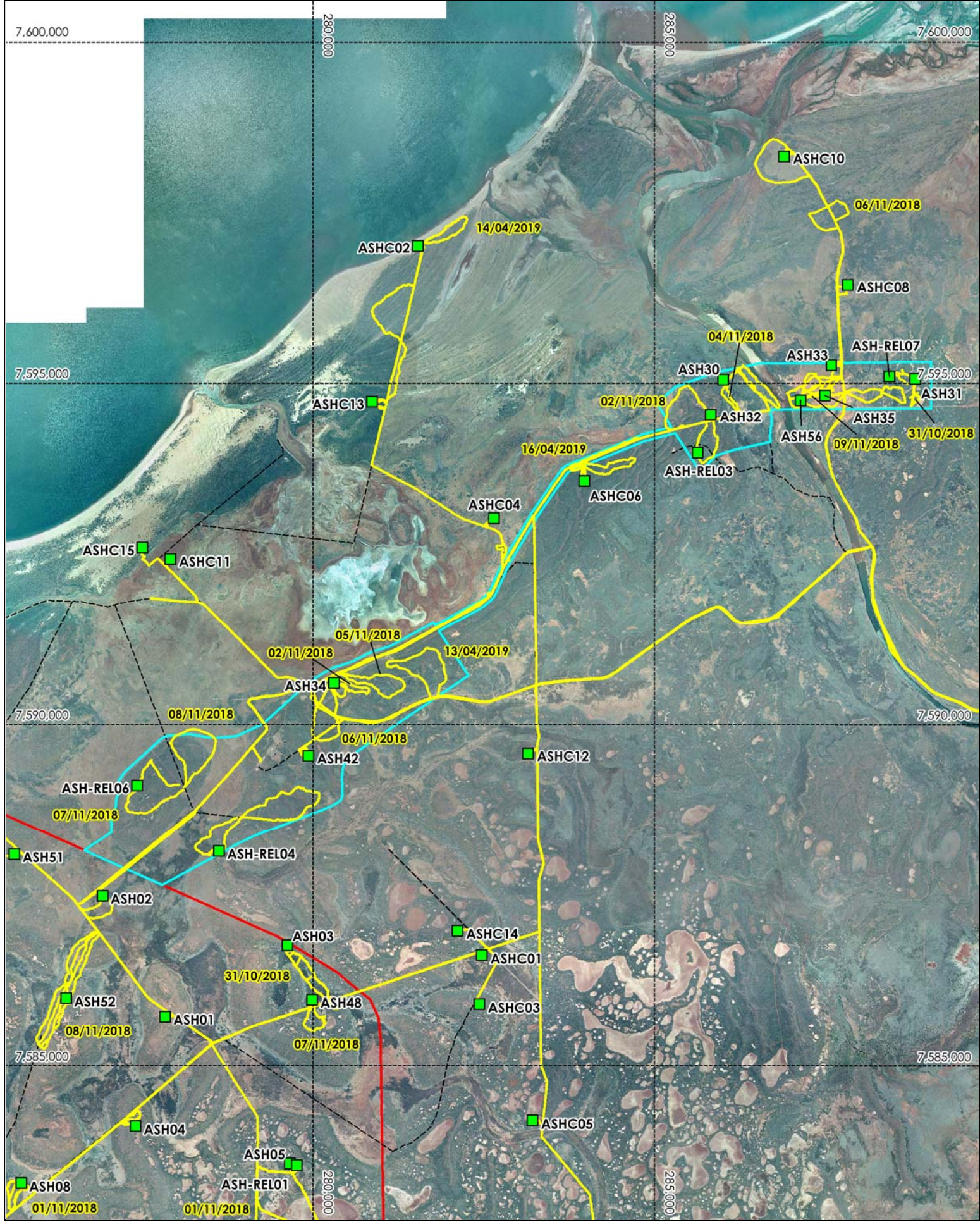
 GPS tracklog

 Flora site location

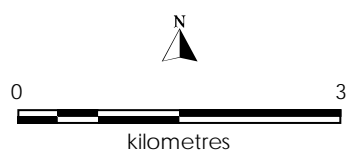


## Ashburton Salt Flora Survey Effort Map 3





- Development envelope
- Road survey area
- Access
- GPS tracklog
- Flora site location



## Ashburton Salt Flora Survey Effort Map 1





## Appendix 6

Summarised Raw Data from  
Quadrats and Relevés  
Sampled in 2018 and 2019







**Ashburton Salt Flora**      **Site**    ASH01  
**Described by**    P1: MM/RM    P2: SWJK      **Date**    P1: 31-Oct-18    P2: 08-Apr-19    **Type**    Quadrat 50 x 50 m  
**MGA Zone**        50    277834 **mE**      7585760 **mN**    114.850763 **°E**    -21.818002 **°S**  
**Habitat**            Dune: broad low dune within an undulating sandy plain.  
**Soil**                 Yellowish red sandy loam.  
**Rock Type**        Nil.  
**Vegetation**        P1: *Acacia tetragonophylla* scattered shrubs over \**Cenchrus ciliaris* tussock grassland over *Triodia glabra*, *T. epactia* scattered hummock grasses.  
P2: *Acacia tetragonophylla* scattered shrubs over \**Cenchrus ciliaris* tussock grassland with *Triodia glabra* scattered hummock grasses.  
**Veg Condition**    P1: Very Poor: high cover of \**Cenchrus ciliaris*; cattle scats and tracks present.  
P2: Very Poor: high cover of \**Cenchrus ciliaris*.  
**Fire Age**            P1 & P2: No sign of recent fire.  
**Notes**                P1: More cover of *Triodia* spp. to the south.  
P2: Dead *Vachellia farnesiana* present (120 cm).

Phase 1: Species	Cover (%)	Height (cm)	Specimen	Notes	Phase 2: Species	Cover (%)	Height (cm)
<i>Acacia synchronicia</i>	0.1	110	ASH01-02,3		<i>Acacia synchronicia</i>	0.1	70
<i>Acacia tetragonophylla</i>	0.1	90			<i>Acacia tetragonophylla</i>	0.1	150
<i>Cenchrus ciliaris</i>	45	40			<i>Cenchrus ciliaris</i>	40	20
<i>Crotalaria medicaginea</i> var. <i>neglecta</i>	0.1	10					
<i>Eragrostis xerophila</i>	0.1	30	ASH01-01		<i>Eragrostis xerophila</i>	0.1	15
<i>Indigofera chamaeclada</i> subsp. <i>pubens</i>	0.1	30	ASH01-05	M. Hislop det.	<i>Indigofera chamaeclada</i> subsp. <i>pubens</i>	0.1	15
<i>Ptilotus polystachyus</i>	0.1	15	ASH01-06b				
<i>Roebuckiella cheilocarpa</i> var. <i>cheilocarpa</i>	0.1	8	ASH01-08				
<i>Salsola australis</i>	0.1	15					
<i>Solanum lasiophyllum</i>	0.1	15					
<i>Swainsona pterostylis</i>	0.1	10	ASH01-07				
<i>Triodia epactia</i>	0.5	50	ASH01-06a		<i>Triodia epactia</i>	0.1	50
<i>Triodia glabra</i>	1	40	ASH01-04		<i>Triodia glabra</i>	2	40
<i>Vachellia farnesiana</i>	0.1	120		N=1.			



**Phase 1**



**Phase 2**

**Ashburton Salt Flora**      **Site**      ASH02

**Described by**      P1: RWSW      P2: RWRM      **Date**      P1: 31-Oct-18      P2: 09-Apr-19      **Type**      Quadrat 50 x 50 m

**MGA Zone**      50      276895 **mE**      7587517 **mN**      114.841922 **°E**      -21.802020 **°S**

**Habitat**      Drainage flat; within broad flat coastal plain.

**Soil**      Red (2.5 YR 4/6) silty clay; dry, with cracking surface.

**Rock Type**      Nil.

**Vegetation**      P1: *Eucalyptus victrix* low woodland over *Acacia synchronicia*, (*A. tetragonophylla*) tall open shrubland over *Eriachne flaccida* open tussock grassland.  
P2: *Eucalyptus victrix* low woodland over *Acacia synchronicia*, (*A. tetragonophylla*) open shrubland over *Eriachne flaccida* very open tussock grassland.

**Veg Condition**      P1: Very Good: occasional *Prosopis pallida* and *Vachellia farnesiana* present; cattle scats (not many).  
P2: Very Good: 1 x *Vachellia* present and a few cattle scats.

**Fire Age**      P1 & P2: No sign of recent fire.

**Notes**      P2: Dead *Prosopis* to 2m.

Phase 2: Species	Cover (%)	Height (cm)	Specimen	Notes	Phase 2: Species	Cover (%)	Height (cm)	Notes
					<i>Acacia coriacea</i> subsp. <i>coriacea</i>	0.1	70	
<i>Acacia synchronicia</i>	5	350			<i>Acacia synchronicia</i>	4	190	
<i>Acacia tetragonophylla</i>	2	200			<i>Acacia tetragonophylla</i>	2	160	
<i>Bergia perennis</i> subsp. <i>exigua</i>	0.1	2	ASH02-03		<i>Bergia perennis</i> subsp. <i>exigua</i>	0.1	2	
<i>Calotis porphyroglossa</i>	0.1	10	ASH02-02					
<i>Eriachne flaccida</i>	20	40	ASH02-06		<i>Eriachne flaccida</i>	5	40	
<i>Eucalyptus victrix</i>	20	600			<i>Eucalyptus victrix</i>	16	600	
<i>Eulalia aurea</i>	0.1	45		Mostly sterile; dead.				
<i>Gnephosis arachnoidea</i>	0.1	10	ASH02-05					
					<i>Marsilea hirsuta</i>	0.1	10	
<i>Myriocephalus oldfieldii</i>	0.1	10	ASH02-04					
<i>Prosopis pallida</i>	0.1	190		N=1.				
<i>Sporobolus mitchellii</i>	0.1	15	ASH02-01		<i>Sporobolus mitchellii</i>	0.1	20	
<i>Stemodia</i> sp. Onslow (A.A. Mitchell 76/148)	0.1	10			<i>Stemodia</i> sp. Onslow (A.A. Mitchell 76/148)	0.1	10	
<i>Vachellia farnesiana</i>	0.1	60		N=1.	<i>Vachellia farnesiana</i>	0.1	160	N=1.



**Phase 1**



**Phase 2**

**Ashburton Salt Flora Phase 1**      **Site**    ASH03  
**Described by**    MM/RM      **Date**    31-Oct-18      **Type**    Quadrat 25 x 100 m  
**MGA Zone**        50    279648 **mE**    7586804 **mN**    114.868442 °E    -21.808803 °S  
**Habitat**            Drainage line; situated between *Triodia epactia* plain and *Eriachne benthamii* plain.  
**Soil**                 Yellowish red sandy loam.  
**Rock Type**         Nil.  
**Vegetation**        *Eucalyptus victrix* low open woodland over *Acacia tetragonophylla*, (\**Vachellia farnesiana*) tall open shrubland over *Eriachne benthamii*, *Sporobolus mitchellii*, (*Eulalia aurea*, *Chrysopogon fallax*) very open tussock grassland over *Triodia epactia* scattered hummock grasses.  
**Veg Condition**    Very Good: weeds present; cattle tracks and scats.  
**Fire Age**            No sign of recent fire.

Phase 1: Species	Cover (%)	Height (cm)	Specimen	Notes
<i>Acacia synchronicia</i>	0.1	90	ASH01-2,3=	
<i>Acacia tetragonophylla</i>	5	250		
<i>Atriplex codonocarpa</i>	0.1	20		
<i>Atriplex semilunaris</i>	0.1	20	ASH-MB11=	
<i>Cenchrus ciliaris</i>	0.1	30		N=100.
<i>Chloris pumilio</i>	0.1	5	ASH-MB10=	
<i>Chrysopogon fallax</i>	0.5	60		
<i>Enchylaena tomentosa</i> var. <i>tomentosa</i>	0.1	30		
<i>Eriachne benthamii</i>	1	30	ASH03-01	
<i>Eucalyptus victrix</i>	5	400		
<i>Eulalia aurea</i>	0.5	40		
<i>Goodenia forrestii</i>	0.1	20		
<i>Marsilea hirsuta</i>	0.1	5	ASH03-04	
<i>Nicotiana occidentalis</i>	0.1	10	ASH03-03	Inadequate material for determination to subsp.
<i>Ptilotus exaltatus</i>	0.1	30		
<i>Ptilotus polystachyus</i>	0.1	30		
<i>Rhagodia eremaea</i>	0.1	50		
<i>Salsola australis</i>	0.1	20		
<i>Scaevola spinescens</i>	0.1	30		
<i>Setaria verticillata</i>	0.1	30	ASH03-02	N=5.
<i>Sporobolus mitchellii</i>	1	15	ASH-MB06=	
<i>Stemodia</i> sp. Onslow (A.A. Mitchell 76/148)	0.1	30		
<i>Triodia epactia</i>	0.5	20		
<i>Vachellia farnesiana</i>	0.5	210		N=5.



**Phase 1**

**Ashburton Salt Flora**      **Site**      ASH04

**Described by**      P1: RWSW      P2: SWJK      **Date**      P1: 31-Oct-18      P2: 08-Apr-19      **Type**      Quadrat 50 x 50 m

**MGA Zone**      50      277396 **mE**      7584158 **mN**      114.846311 °E      -21.832410 °S

**Habitat**      Plain; gently undulating coastal plain.

**Soil**      Reddish brown (2.5 YR 4/4) loamy sand.

**Rock Type**      Nil.

**Vegetation**      P1: *Acacia synchronicia*, *A. tetragonophylla* scattered tall shrubs over *Triodia glabra* hummock grassland over \**Cenchrus ciliaris* scattered tussock grasses.  
P2: *Acacia tetragonophylla* scattered shrubs over *Acacia synchronicia* scattered low shrubs over *Triodia glabra* hummock grassland over \**Cenchrus ciliaris* scattered tussock grasses.

**Veg Condition**      P1 & P2: Very Good: scattered \**Cenchrus ciliaris*.

**Fire Age**      P1 & P2: No sign of recent fire.

**Notes**      P2: More germinating \**Cenchrus ciliaris* than Phase 1.

Phase 1: Species	Cover (%)	Height (cm)	Specimen	Notes	Phase 2: Species	Cover (%)	Height (cm)
<i>Acacia synchronicia</i>	0.5	220			<i>Acacia synchronicia</i>	0.5	80
<i>Acacia tetragonophylla</i>	0.5	210			<i>Acacia tetragonophylla</i>	0.5	175
<i>Cenchrus ciliaris</i>	0.5	30			<i>Cenchrus ciliaris</i>	0.5	10
<i>Dactyloctenium radulans</i>	0.1	2					
<i>Decazesia hecatocephala</i>	0.1	5	ASH04-01				
<i>Hibiscus sturtii</i> var. <i>platyklamys</i>	0.1	25	ASH04-03		<i>Hibiscus sturtii</i> var. <i>platyklamys</i>	0.1	70
<i>Ptilotus polystachyus</i>	0.1	30					
<i>Schizachyrium fragile</i>	0.1	5		Large range extension.			
<i>Solanum lasiophyllum</i>	0.1	25			<i>Solanum lasiophyllum</i>	0.1	25
<i>Triodia epactia</i>	0.1	35			<i>Triodia epactia</i>	0.1	40
<i>Triodia glabra</i>	40	35	ASH04-02		<i>Triodia glabra</i>	40	40



**Phase 1**



**Phase 2**



**Ashburton Salt Flora Phase 1**      **Site**    ASH05  
**Described by**    MM/RM      **Date**    01-Nov-18      **Type**    Quadrat 50 x 50 m  
**MGA Zone**        50      279672 **mE**      7583611 **mN**      114.868247 °E    -21.837634 °S  
**Habitat**            Plain; low-lying sandy plain with numerous scalded, gravelly areas with little vegetation.  
**Soil**                 Yellowish red sandy loam.  
**Rock Type**        Mixed; very few smooth stones.  
**Vegetation**        *Acacia tetragonophylla*, (\**Vachellia farnesiana*) tall open shrubland over *Triodia epactia* hummock grassland.  
**Veg Condition**    Very Good: \**Vachellia farnesiana* present, with occasional \**Cenchrus*.  
**Fire Age**            No sign of recent fire.

Phase 1: Species	Cover (%)	Height (cm)	Specimen	Notes
<i>Acacia sclerosperma</i> subsp. <i>sclerosperma</i>	0.1	170		
<i>Acacia synchronicia</i>	0.1	60		
<i>Acacia synchronicia</i>	0.1	160	ASH01-03=	
<i>Acacia tetragonophylla</i>	8	280		
<i>Aristida latifolia</i>	0.1	60	REL01-06=	
<i>Bulbostylis barbata</i>	0.1	5		
<i>Calandrinia ptychosperma</i>	0.1	5	ASH05-02	
<i>Calotis porphyroglossa</i>	0.1	15	ASH-MB02=	
<i>Cenchrus ciliaris</i>	0.1	30		N=100.
<i>Chloris pectinata</i>	0.1	10	REL01-02=	
<i>Chloris pumilio</i>	0.1	5	ASH-MB10=	
<i>Chrysopogon fallax</i>	0.1	60		
<i>Cullen cinereum</i>	0.1	10		
<i>Cullen pogonocarpum</i>	0.1	15		
<i>Dichanthium sericeum</i> subsp. <i>humilius</i>	0.1	15		
<i>Dysphania rhadinostachya</i> subsp. <i>rhadinostachya</i>	0.1	5	REL01-07=	
<i>Enchylaena tomentosa</i> var. <i>tomentosa</i>	0.1	40		
<i>Eragrostis falcata</i>	0.1	30	ASH05-05	
<i>Eragrostis xerophila</i>	0.1	30		
<i>Eremophila longifolia</i>	0.1	150		
<i>Eriachne benthamii</i>	0.1	30		
<i>Eulalia aurea</i>	0.1	15		
<i>Haloragis gossei</i> x <i>trigonocarpa</i>	0.1	5	ASH05-01	
<i>Iseilema membranaceum</i>	0.1	10	REL01-03=	
<i>Lotus cruentus</i>	0.1	10	ASH-MB08=	
<i>Maireana georgei</i>	0.1	40	REL01-04=	
<i>Nicotiana occidentalis</i>	0.1	20	REL01-08=	Inadequate material for determination to subsp.
<i>Ptilotus exaltatus</i>	0.1	30		

Phase 1: Species	Cover (%)	Height (cm)	Specimen	Notes
<i>Ptilotus polystachyus</i>	0.1	40		
<i>Rhagodia eremaea</i>	0.1	80		
<i>Rhynchosia minima</i>	0.1	10		
<i>Scaevola spinescens</i>	0.1	80		
<i>Sida fibulifera</i>	0.1	30	ASH05-03	sens. lat.
<i>Sporobolus mitchellii</i>	0.1	20	ASH-MB06=	
<i>Streptoglossa bubakii</i>	0.1	10	ASH05-04	
<i>Trachymene pilbarensis</i>	0.1	15		
<i>Triodia epactia</i>	40	30		
<i>Vachellia farnesiana</i>	0.5	350		N=20; dead adults.



Phase 1

**Ashburton Salt Flora**      **Site**      ASH06

**Described by**      P1: RWSW      P2: RWRM      **Date**      P1: 01-Nov-18      P2: 11-Apr-19      **Type**      Quadrat 50 x 50 m

**MGA Zone**      50      278917 **mE**      7581802 **mN**      114.860702 °E      -21.853872 °S

**Habitat**      Plain; gently undulating plain.

**Soil**      Reddish brown (2.5 YR 4/4) loamy sand.

**Rock Type**      Nil.

**Vegetation**      P1: *Acacia synchronicia*, *A. tetragonophylla* scattered tall shrubs over *A. sclerosperma* subsp. *sclerosperma* scattered shrubs over *Triodia epactia* open hummock grassland.  
P2: *Acacia tetragonophylla*, *A. synchronicia* tall open shrubland over *Acacia sclerosperma* subsp. *sclerosperma* scattered shrubs over *Triodia epactia* open hummock grassland over *Chrysopogon fallax* scattered tussock grasses.

**Veg Condition**      P1: Very Good: presence of *\*Cenchrus ciliaris*, *\*Prosopis pallida* in low densities; cattle scats.  
P2: Very Good: occasional weeds and cattle.

**Fire Age**      P1 & P2: No sign of recent fire.

Phase 1: Species	Cover (%)	Height (cm)	Specimen	Notes	Phase 2: Species	Cover (%)	Height (cm)	Specimen	Notes
<i>Acacia sclerosperma</i> subsp. <i>sclerosperma</i>	1	180	ASH06-02		<i>Acacia sclerosperma</i> subsp. <i>sclerosperma</i>	1	120		
<i>Acacia stellaticeps</i>	0.1	100			<i>Acacia stellaticeps</i>	0.1	110		
<i>Acacia synchronicia</i>	1	350			<i>Acacia synchronicia</i>	2	300		
<i>Acacia tetragonophylla</i>	0.5	170			<i>Acacia tetragonophylla</i>	2	350		
<i>Atriplex semilunaris</i>	0.1	25	ASH06-01						
<i>Bulbostylis barbata</i>	0.1	5			<i>Bulbostylis barbata</i>	0.1	5		
<i>Cenchrus ciliaris</i>	0.5	50		N=20.	<i>Cenchrus ciliaris</i>	0.1	35		
<i>Chrysopogon fallax</i>	0.1	60	ASH06-03B		<i>Chrysopogon fallax</i>	0.5	60		
<i>Eulalia aurea</i>	0.1	65			<i>Eulalia aurea</i>	0.1	50		
<i>Gnephosis arachnoidea</i>	0.1	10	ASH02-05=						
<i>Goodenia forrestii</i>	0.1	20							
					<i>Indigofera boviparda</i> subsp. <i>boviparda</i>	0.1	25		
<i>Iseilema dolichotrichum</i>	0.1	5	ASH06-04						
<i>Maireana georgei</i>	0.1	40	RW02=		<i>Maireana georgei</i>	0.1	20	ASH06R-02	
<i>Prosopis pallida</i>	0.1	150		N=3.	<i>Prosopis pallida</i>	0.1	130		N=11.
					<i>Ptilotus exaltatus</i>	0.1	4		
<i>Ptilotus polystachyus</i>	0.1	25							
					<i>Rhagodia eremaea</i>	0.1	60	ASH06R-01	
					<i>Rhynchosia minima</i>	0.1	40		
<i>Salsola australis</i>	0.1	20			<i>Salsola australis</i>	0.1	15		
					<i>Scaevola spinescens</i>	0.1	50		
<i>Solanum lasiophyllum</i>	0.1	40			<i>Solanum lasiophyllum</i>	0.1	60		

Phase 1: Species	Cover (%)	Height (cm)	Specimen	Notes	Phase 2: Species	Cover (%)	Height (cm)	Specimen	Notes
<i>Stemodia</i> sp. Onslow (A.A. Mitchell 76/148)	0.1	60			<i>Stemodia</i> sp. Onslow (A.A. Mitchell 76/148)	0.1	10		
<i>Triodia epactia</i>	28	30	ASH06-03B		<i>Triodia epactia</i>	28	30		
<i>Triodia glabra</i>	0.1	25			<i>Triodia glabra</i>	0.1	30	ASH06R-03	
					<i>Vachellia farnesiana</i>	0.1	160		N=1



Phase 1



Phase 2

**Ashburton Salt Flora**      **Site**    ASH07  
**Described by**    P1: MM/RM    P2: RWRM      **Date**    P1: 01-Nov-18    P2: 11-Apr-19      **Type**    Quadrat 50 x 50 m  
**MGA Zone**        50      280348 **mE**      7582515 **mN**      114.874637 **°E**    -21.847614 **°S**  
**Habitat**            Plain; undulating sandy plain surrounded by dunes.  
**Soil**                 Yellowish red sandy loam.  
**Rock Type**        Mixed; smooth pebbles 1-25% cover.  
**Vegetation**        P1: *Acacia tetragonophylla* tall open shrubland over *A. sclerosperma* subsp. *sclerosperma* scattered shrubs over *Triodia epactia* hummock grassland over \**Cenchrus ciliaris* scattered tussock grasses.  
                           P2: *Acacia tetragonophylla* tall open shrubland over *Triodia epactia* hummock grassland.  
**Veg Condition**    P1: Very Good: scattered weeds; cattle scats and tracks.  
                           P2: Very Good: occasional \**Cenchrus ciliaris*.  
**Fire Age**            P1 & P2: No sign of recent fire.

Phase 1: Species	Cover (%)	Height (cm)	Specimen	Notes	Phase 2: Species	Cover (%)	Height (cm)	Specimen
<i>Acacia sclerosperma</i> subsp. <i>sclerosperma</i>	1	170			<i>Acacia sclerosperma</i> subsp. <i>sclerosperma</i>	1	200	
<i>Acacia synchronicia</i>	0.1	170	ASH01-03=		<i>Acacia synchronicia</i>	0.1	280	
<i>Acacia tetragonophylla</i>	2	280			<i>Acacia tetragonophylla</i>	5	350	
<i>Bulbostylis barbata</i>	0.1	5						
<i>Calandrinia ptychosperma</i>	0.1	5	ASH05-02=					
<i>Calotis porphyroglossa</i>	0.1	10						
<i>Cenchrus ciliaris</i>	1	30		N=200.	<i>Cenchrus ciliaris</i>	0.1	25	
<i>Chrysopogon fallax</i>	0.1	70			<i>Chrysopogon fallax</i>	0.1	60	
<i>Cyperus squarrosus</i>	0.1	5	ASH07-02					
<i>Dactyloctenium radulans</i>	0.1	5						
<i>Dysphania rhadinostachya</i> subsp. <i>rhadinostachya</i>	0.1	10	REL01-07=					
<i>Eragrostis cumingii</i>	0.1	10						
<i>Eragrostis dielsii</i>	0.1	5						
<i>Eriachne obtusa</i>	0.1	30	ASH07-08					
<i>Eulalia aurea</i>	0.1	60			<i>Eulalia aurea</i>	0.1	35	
<i>Gnephosis brevifolia</i>	0.1	5	ASH07-04	M. Hislop det.				
<i>Goodenia forrestii</i>	0.1	30						
<i>Haloragis gossei</i> x <i>trigonocarpa</i>	0.1	15	ASH05-01=					
<i>Lobelia heterophylla</i> subsp. <i>pilbarensis</i>	0.1	30	ASH07-07	Need better material to confidently ID to subsp.				

Phase 1: Species	Cover (%)	Height (cm)	Specimen	Notes	Phase 2: Species	Cover (%)	Height (cm)	Specimen
<i>Pluchea rubelliflora</i>	0.1	10	ASH07-03					
<i>Ptilotus polystachyus</i>	0.1	15	ASH07-05					
					<i>Ptilotus</i> sp.	0.1	5	ASH07-02
<i>Solanum lasiophyllum</i>	0.1	45			<i>Solanum lasiophyllum</i>	0.1	40	
<i>Streptoglossa macrocephala</i>	0.1	30	ASH07-06		<i>Streptoglossa decurrens</i>	0.1	20	ASH07-01
<i>Synaptantha tillaeacea</i> var. <i>tillaeacea</i>	0.1	5						
<i>Trachymene pilbarensis</i>	0.1	15						
<i>Triodia epactia</i>	55	30			<i>Triodia epactia</i>	35	40	
<i>Wahlenbergia</i> sp.	0.1	15	ASH07-01	Inadequate material.				



Phase 1



Phase 2

**Ashburton Salt Flora**      **Site**    ASH08  
**Described by**    P1: RWSW      P2: RWRM      **Date**    P1: 01-Nov-18    P2: 08-Apr-19      **Type**    Quadrat 50 x 50 m  
**MGA Zone**        50    275730 **mE**      7583327 **mN**    114.830088 °E    -21.839701 °S  
**Habitat**            Drainage flat; within a broader area of undulating plain.  
**Soil**                 Reddish brown (2.5YR 4/4) sandy clay; hard surface.  
**Rock Type**        Nil.  
**Vegetation**        P1 & P2: *Eucalyptus victrix* low woodland over *Acacia tetragonophylla*, *A. synchronicia* scattered shrubs.  
**Veg Condition**    P1: Very Good: three weed species present at low density.  
                           P2: Very Good: Weeds and cattle.  
**Fire Age**            P1 & P2: No sign of recent fire.  
**Notes**                P1: Tussock grasses (*Eriachne* and *Sporobolus*) would form a dominant stratum when live.

Phase 1: Species	Cover (%)	Height (cm)	Specimen	Notes	Phase 2: Species	Cover (%)	Height (cm)	Notes
<i>Acacia coriacea</i> subsp. <i>coriacea</i>	0.1	210			<i>Acacia coriacea</i> subsp. <i>coriacea</i>	0.1	210	
<i>Acacia synchronicia</i>	0.5	130			<i>Acacia synchronicia</i>	0.5	130	
<i>Acacia tetragonophylla</i>	1	160			<i>Acacia tetragonophylla</i>	1	130	
<i>Cenchrus ciliaris</i>	0.1	20		N=20 (estimated not counted)				
					<i>Enchylaena tomentosa</i> var. <i>tomentosa</i>	0.1	20	
<i>Eriachne benthamii</i>	0.1	30	ASH08-03		<i>Eriachne benthamii</i>	0.1	35	
<i>Eucalyptus victrix</i>	28	700			<i>Eucalyptus victrix</i>	28	700	
					<i>Ipomoea muelleri</i>	0.1	2	
<i>Prosopis pallida</i>	0.1	160		N=1.	<i>Prosopis pallida</i>	0.1	190	N=1
<i>Ptilotus polystachyus</i>	0.1	10						
					<i>Rhagodia eremaea</i>	0.1	50	
<i>Salsola australis</i>	0.1	10						
<i>Senna artemisioides</i> subsp. <i>oligophylla</i> (thinly sericeous form MET 15,035)	0.1	50	ASH08-01		<i>Senna artemisioides</i> subsp. <i>oligophylla</i> (thinly sericeous form MET 15,035)	0.1	50	
<i>Sporobolus mitchellii</i>	0.1	15	ASH08-02					
<i>Stemodia</i> sp. Onslow (A.A. Mitchell 76/148)	0.1	10						
<i>Triodia epactia</i>	0.1	20			<i>Triodia epactia</i>	0.1	10	
<i>Vachellia farnesiana</i>	0.1	120		N=1.	<i>Vachellia farnesiana</i>	0.1	100	N=3



**Phase 1**



**Phase 2**



**Ashburton Salt Flora**      **Site**    ASH09  
**Described by**    P1: MM/RM    P2: SWJK      **Date**    P1: 01-Nov-18    P2: 10-Apr-19      **Type**    Quadrat 50 x 50 m  
**MGA Zone**        50    273132 **mE**      7581694 **mN**    114.804740 **°E**    -21.854111 **°S**  
**Habitat**            Clay plain; low-lying saline clay plain.  
**Soil**                 Yellowish red light clay.  
**Rock Type**        Nil.  
**Vegetation**        P1: *Tecticornia auriculata*, *T. indica* subsp. *bidens*, (*T. halocnemoides* subsp. *tenuis*) low shrubland over \**Cenchrus ciliaris* scattered tussock grasses.  
P2: *Tecticornia auriculata*, *T. indica* subsp. *bidens*, (*T. halocnemoides* subsp. *tenuis*) low shrubland.  
**Veg Condition**    P1: Very Good: scattered weeds; cattle scats and tracks.  
P2: Very Good: occasional \**Cenchrus ciliaris*.  
**Fire Age**            P1 & P2: No sign of recent fire.  
**Notes**                P1: Worse (i.e. 'Good') condition around edges of this vegetation type; more \**Cenchrus ciliaris*.

Phase 1: Species	Cover (%)	Height (cm)	Specimen	Notes	Phase 2: Species	Cover (%)	Height (cm)
<i>Abutilon malvifolium</i>	0.1	15	ASH09-10				
<i>Acacia synchronicia</i>	0.1	20					
<i>Angianthus milnei</i>	0.1	5	ASH09-05				
<i>Atriplex codonocarpa</i>	0.1	20			<i>Atriplex codonocarpa</i>	0.1	10
<i>Atriplex semilunaris</i>	0.1	15					
<i>Cenchrus ciliaris</i>	0.5	10		N=1000; juveniles.	<i>Cenchrus ciliaris</i>	0.1	10
<i>Chloris pectinata</i>	0.1	5	REL01-02=				
<i>Chloris pumilio</i>	0.1	5	ASH-MB10=				
<i>Convolvulus clementii</i>	0.1	20					
<i>Cullen cinereum</i>	0.1	15					
<i>Dactyloctenium radulans</i>	0.1	5					
<i>Dichanthium sericeum</i> subsp. <i>humilius</i>	0.1	15					
<i>Eragrostis dielsii</i>	0.1	5	ASH09-12	sens. lat.	<i>Eragrostis dielsii</i>	0.1	10
<i>Erodium</i> sp.	0.1	15	ASH09-11	Probably <i>E. cygnorum</i> ; inadequate material for further determination.			
<i>Frankenia ambita</i>	0.1	25	ASH09-14				
<i>Iseilema vaginiflorum</i>	0.1	5	ASH09-07				
<i>Lotus cruentus</i>	0.1	10	ASH-MB08=				
<i>Neobassia astrocarpa</i>	0.1	10			<i>Neobassia astrocarpa</i>	0.1	20
<i>Nicotiana occidentalis</i>	0.1	20	ASH09-04	Inadequate material for determination to subsp.			
<i>Nicotiana rosulata</i> subsp. <i>rosulata</i>	0.1	20	ASH09-03				

Phase 1: Species	Cover (%)	Height (cm)	Specimen	Notes	Phase 2: Species	Cover (%)	Height (cm)
<i>Ptilotus xerophilus</i>	0.1	20	ASH09-15				
<i>Rhagodia eremaea</i>	0.1	40			<i>Rhagodia eremaea</i>	0.1	45
<i>Rhodanthe humboldtiana</i>	0.1	15	ASH09-09				
<i>Sonchus oleraceus</i>	0.1	20	ASH09-06	N=25.			
<i>Sporobolus mitchellii</i>	0.1	10	ASH09-13				
<i>Tecticornia auriculata</i>	12	70	ASH09-01		<i>Tecticornia auriculata</i>	12	70
<i>Tecticornia halocnemoides</i> subsp. <i>tenuis</i>	1	20	ASH09-08		<i>Tecticornia halocnemoides</i> subsp. <i>tenuis</i>	1	20
<i>Tecticornia indica</i> subsp. <i>bidens</i>	12	40	ASH09-02		<i>Tecticornia indica</i> subsp. <i>bidens</i>	12	40



Phase 1



Phase 2

**Ashburton Salt Flora**     **Site**     ASH10

**Described by**     P1: RWSW     P2: RWRM     **Date**     P1: 01-Nov-18     P2: 09-Apr-19     **Type**     Quadrat 50 x 50 m

**MGA Zone**     50     266510 **mE**     7586394 **mN**     114.741367 °E     -21.810816 °S

**Habitat**     Plain; low-lying samphire flat within a broader undulating plain.

**Soil**     Yellowish red (5YR 4/6) loamy clay.

**Rock Type**     Nil.

**Vegetation**     P1: *Tecticornia doliiformis*, (*T. indica* subsp. *bidens*, *Frankenia ambita*) low shrubland over *Eragrostis falcata* scattered tussock grasses.  
P2: *Tecticornia doliiformis*, (*T. indica* subsp. *bidens*) low shrubland.

**Veg Condition**     P1: Very Good: small number of \**Cenchrus* plants; cattle scats; some metal wire etc.  
P2: Very Good: signs of cattle.

**Fire Age**     P1 & P2: No sign of recent fire.

Phase 1: Species	Cover (%)	Height (cm)	Specimen	Notes	Phase 2: Species	Cover (%)	Height (cm)	Specimen
<i>Angianthus milnei</i>	0.1	5	ASH10-02					
<i>Atriplex semilunaris</i>	0.1	25						
<i>Cenchrus ciliaris</i>	0.1	5		N=20 (estimated not counted)				
<i>Dactyloctenium radulans</i>	0.1	1						
<i>Enchylaena tomentosa</i> var. <i>tomentosa</i>	0.1	40						
<i>Eragrostis falcata</i>	1	20	ASH10-06		<i>Eragrostis falcata</i>	0.1	15	
<i>Frankenia ambita</i>	2	25	ASH10-05		<i>Frankenia ambita</i>	0.1	25	
<i>Muellerolimon salicorniaceum</i>	0.1	35	ASH10-01		<i>Muellerolimon salicorniaceum</i>	0.1	25	
<i>Neobassia astrocarpa</i>	0.1	25			<i>Neobassia astrocarpa</i>	0.1	20	
<i>Nicotiana rosulata</i> subsp. <i>rosulata</i>	0.1	10	ASH10-03					
					<i>Rhynchosia minima</i>	0.1	2	
<i>Samolus</i> sp. Shark Bay (M.E. Trudgen 7410)	0.1	40	ASH10-10		<i>Samolus</i> sp. Shark Bay (M.E. Trudgen 7410)	0.1	40	
					<i>Scaevola spinescens</i>	0.1	25	
<i>Sporobolus mitchellii</i>	0.1	15	ASH10-07		<i>Sporobolus mitchellii</i>	0.1	20	
<i>Surreya diandra</i>	0.1	25	ASH10-04		<i>Surreya diandra</i>	0.1	30	
<i>Tecticornia doliiformis</i>	26	30	ASH10-08	K. Shepherd det.	<i>Tecticornia doliiformis</i>	26	35	ASH10R-01
<i>Tecticornia halocnemoides</i> subsp. <i>tenuis</i>	0.1	25	ASH10-11		<i>Tecticornia halocnemoides</i> subsp. <i>tenuis</i>	0.1	25	
<i>Tecticornia indica</i> subsp. <i>bidens</i>	2	30	ASH10-09		<i>Tecticornia indica</i> subsp. <i>bidens</i>	2	40	



**Phase 1**



**Phase 2**

**Ashburton Salt Flora**      **Site**      ASH11

**Described by**      P1: MM/RM      P2: SWJK      **Date**      P1: 02-Nov-18      P2: 12-Apr-19      **Type**      Quadrat 50 x 50 m

**MGA Zone**      50      270520 **mE**      7561579 **mN**      114.776658 **°E**      -22.035366 **°S**

**Habitat**      Plain; broad undulating plain.

**Soil**      Yellowish red sandy loam.

**Rock Type**      Nil.

**Vegetation**      P1: *Acacia tetragonophylla*, *A. synchronicia* open shrubland over *Indigofera bovipерda* subsp. *bovipерda* scattered low shrubs over *Triodia epactia* hummock grassland.  
P2: *Acacia synchronicia* scattered shrubs over *Acacia tetragonophylla*, *Indigofera bovipерda* subsp. *bovipерda* low open shrubland over *Triodia epactia* hummock grassland.

**Veg Condition**      P1 & P2: Very Good: scattered \**Cenchrus ciliaris*.

**Fire Age**      P1 & P2: No sign of recent fire.

Phase 1: Species	Cover (%)	Height (cm)	Specimen	Notes	Phase 2: Species	Cover (%)	Height (cm)
<i>Acacia sclerosperma</i> subsp. <i>sclerosperma</i>	0.1	150			<i>Acacia sclerosperma</i> subsp. <i>sclerosperma</i>	0.1	140
<i>Acacia stellaticeps</i>	0.1	90			<i>Acacia stellaticeps</i>	0.1	110
<i>Acacia synchronicia</i>	1	140	ASH11-03		<i>Acacia synchronicia</i>	1	150
<i>Acacia tetragonophylla</i>	1.5	170			<i>Acacia tetragonophylla</i>	2	70
<i>Bulbostylis barbata</i>	0.1	5					
<i>Calandrinia polyandra</i>	0.1	15	ASH11-02				
<i>Cenchrus ciliaris</i>	0.1	50		N=63.	<i>Cenchrus ciliaris</i>	0.1	45
<i>Decazesia hecatocephala</i>	0.1	5	ASH13-01=				
<i>Eulalia aurea</i>	0.1	80			<i>Eulalia aurea</i>	0.1	50
<i>Haloragis gossei</i>	0.1	10					
<i>Indigofera bovipерda</i> subsp. <i>bovipерda</i>	0.25	30			<i>Indigofera bovipерda</i> subsp. <i>bovipерda</i>	0.5	15
<i>Scaevola spinescens</i> (broad form)	0.25	90			<i>Scaevola spinescens</i> (broad form)	0.1	30
<i>Swainsona pterostylis</i>	0.1	20	ASH11-04				
<i>Tephrosia</i> sp. B Kimberley Flora (C.A. Gardner 7300)	0.1	60	ASH11-05				
<i>Trachymene pilbarensis</i>	0.1	30					
<i>Triodia epactia</i>	68	35	ASH11-01		<i>Triodia epactia</i>	55	50



**Phase 1**



**Phase 2**

**Ashburton Salt Flora**      **Site**      ASH12

**Described by**      P1: RWSW      P2: SWJK      **Date**      P1: 01-Nov-18      P2: 12-Apr-19      **Type**      Quadrat 25 x 100 m

**MGA Zone**      50      269748 **mE**      7588314 **mN**      114.772940 **°E**      -21.793908 **°S**

**Habitat**      Dune crest and slopes; medium dune.

**Soil**      Dark reddish brown (5YR 34) sand.

**Rock Type**      Nil.

**Vegetation**      P1: *Acacia coriacea* subsp. *coriacea* tall open shrubland over *Tephrosia gardneri* scattered shrubs over *Indigofera bovipерda* subsp. *bovipерda* low open shrubland over *Triodia epactia* open hummock grassland and *Corynotheca pungens* open herbland.  
P2: *Acacia coriacea* subsp. *coriacea* open shrubland over *Corynotheca pungens*, *Indigofera bovipерda* subsp. *bovipерda*, (*Tephrosia gardneri*) low shrubland over *Triodia epactia* open hummock grassland over \**Cenchrus ciliaris* scattered tussock grasses.

**Veg Condition**      P1: Very Good: occasional weeds (\**Cenchrus ciliaris*); cattle scats.  
P2: Very Good: occasional \**Cenchrus ciliaris*.

**Fire Age**      P1 & P2: No sign of recent fire.

Phase 1: Species	Cover (%)	Height (cm)	Specimen	Notes	Phase 2: Species	Cover (%)	Height (cm)	Specimen	Notes
<i>Acacia coriacea</i> subsp. <i>coriacea</i>	4	400			<i>Acacia coriacea</i> subsp. <i>coriacea</i>	4	160		
<i>Cassytha capillaris</i>	0.1	25			<i>Cassytha capillaris</i>	0.1	30		
<i>Cenchrus ciliaris</i>	0.1	30		N=20 (estimated not counted)	<i>Cenchrus ciliaris</i>	0.5	40		
<i>Corynotheca pungens</i>	8	80			<i>Corynotheca pungens</i>	7	40		
<i>Eriachne gardneri</i>	0.1	45	ASH12-04		<i>Eriachne gardneri</i>	0.1	25		
					<i>Euphorbia myrtoides</i>	0.1	10	ASH12-01	
<i>Euphorbia trigonosperma</i>	0.1	25	ASH12-01						
					<i>Euphorbia</i> sp.	0.1	15		Sterile.
<i>Indigofera bovipерda</i> subsp. <i>bovipерda</i>	5	30	ASH12-02		<i>Indigofera bovipерda</i> subsp. <i>bovipерda</i>	5	20		
<i>Ptilotus exaltatus</i>	0.1	1			<i>Ptilotus exaltatus</i>	0.1	5		
<i>Ptilotus villosiflorus</i>	0.1	25	ASH12-07						
<i>Rhynchosia minima</i>	0.1	25			<i>Rhynchosia minima</i>	0.1	10		
<i>Salsola australis</i>	0.1	40			<i>Salsola australis</i>	0.1	40		
<i>Sida rohlenae</i> subsp. <i>rohlenae</i>	0.1	35	ASH12-06						
<i>Spinifex longifolius</i>	0.1	60			<i>Spinifex longifolius</i>	0.1	80		
<i>Tephrosia gardneri</i>	2	120	ASH12-03		<i>Tephrosia gardneri</i>	0.5	80		
<i>Triodia epactia</i>	17	30			<i>Triodia epactia</i>	15	40		
<i>Whiteochloa airoides</i>	0.1	60	ASH12-05		<i>Whiteochloa airoides</i>	0.1	50		



**Phase 1**



**Phase 2**



**Ashburton Salt Flora**      **Site**    ASH13

**Described by**    P1: MM/RM    P2: RWRM      **Date**    P1: 02-Nov-18    P2: 12-Apr-19      **Type**    Quadrat 50 x 50 m

**MGA Zone**        50    268897 **mE**      7561909 **mN**    114.760989 °E    -22.032173 °S

**Habitat**            Dune; low sandy dune running north-south.

**Soil**                 Red sandy loam.

**Rock Type**        Nil.

**Vegetation**        P1: *Acacia coriacea* subsp. *coriacea*, *Grevillea stenobotrya* scattered tall shrubs over *A. stellaticeps* scattered shrubs over *Scaevola sericophylla* low open shrubland over *Triodia epactia*, *T. avenoides* hummock grassland with *Corynotheca pungens* scattered herbs.  
P2: *Acacia coriacea* subsp. *coriacea*, *Grevillea stenobotrya* scattered tall shrubs over *Acacia stellaticeps* scattered shrubs over *Scaevola sericophylla* low open shrubland over *Triodia avenoides*, *T. epactia* hummock grassland.

**Veg Condition**    P1: Very Good: scattered weeds.  
P2: Very Good: scattered \**Cenchrus ciliaris*.

**Fire Age**            P1 & P2: No sign of recent fire.

**Notes**                P1: Very difficult to distinguish spinifex species, as most hummocks are not flowering; cover split equally.

Phase 1: Species	Cover (%)	Height (cm)	Specimen	Notes	Phase 2: Species	Cover (%)	Height (cm)	Specimen	Notes
<i>Acacia coriacea</i> subsp. <i>coriacea</i>	0.5	230			<i>Acacia coriacea</i> subsp. <i>coriacea</i>	0.5	260		
<i>Acacia stellaticeps</i>	0.5	160			<i>Acacia stellaticeps</i>	0.5	150		
<i>Bonamia erecta</i>	0.1	30			<i>Bonamia erecta</i>	0.1	20		
<i>Bulbostylis barbata</i>	0.1	5							
<i>Calandrinia polyandra</i>	0.1	15	ASH13-03	F. Obbens det.					
<i>Cenchrus ciliaris</i>	0.1	30		N=35.	<i>Cenchrus ciliaris</i>	0.1	30		
<i>Corynotheca pungens</i>	0.5	50	ASH13-07		<i>Corynotheca pungens</i>	0.1	40		
<i>Crotalaria cunninghamii</i> subsp. <i>sturtii</i>	0.1	30			<i>Crotalaria cunninghamii</i> subsp. <i>sturtii</i>	0.1	5		
<i>Decazesia hecatocephala</i>	0.1	5	ASH13-01						
<i>Euphorbia myrtoides</i>	0.1	10	ASH13-10		<i>Euphorbia myrtoides</i>	0.1	35	ASH13R-02, 03	sens lat.
<i>Grevillea stenobotrya</i>	0.5	280	ASH13-05		<i>Grevillea stenobotrya</i>	0.5	220		
<i>Heliotropium crispatum</i>	0.1	15	ASH13-12						

Phase 1: Species	Cover (%)	Height (cm)	Specimen	Notes	Phase 2: Species	Cover (%)	Height (cm)	Specimen	Notes
<i>Lobelia heterophylla</i> subsp. <i>pilbarensis</i>	0.1	20	ASH-MB21=	Need better material to confidently ID to subsp.					
<i>Nicotiana occidentalis</i>	0.1	25	ASH13-08	Inadequate material for determination to subsp.					
<i>Podolepis aristata</i> subsp. <i>auriculata</i>	0.1	25	ASH13-14						
<i>Ptilotus polystachyus</i>	0.1	30							
<i>Quoya loxocarpa</i>	0.1	80	ASH13-11		<i>Quoya loxocarpa</i>	0.1	120		
<i>Quoya paniculata</i>	0.1	140	ASH13-06		<i>Quoya paniculata</i>	0.1	120		
<i>Rhodanthe psammophila</i>	0.1	20	ASH13-04						
<i>Roebuckiella cheilocarpa</i> var. <i>cheilocarpa</i>	0.1	10	ASH13-02						
<i>Scaevola sericophylla</i>	2.5	90	ASH-MB19=		<i>Scaevola sericophylla</i>	2	60		
<i>Sida rohlenae</i> subsp. <i>rohlenae</i>	0.1	20			<i>Sida rohlenae</i> subsp. <i>rohlenae</i>	0.1	30		
<i>Solanum lasiophyllum</i>	0.1	60			<i>Solanum lasiophyllum</i>	0.1	30		
<i>Tribulus occidentalis</i>	0.1	15	ASH13-09						
<i>Trichodesma zeylanicum</i> var. <i>grandiflorum</i>	0.1	10							
<i>Triodia avenoides</i>	30	30			<i>Triodia avenoides</i>	30	40	ASH13R-01	
<i>Triodia epactia</i>	30	30			<i>Triodia epactia</i>	30	40		



**Phase 1**



**Phase 2**

**Ashburton Salt Flora**      **Site**      ASH14  
**Described by**      P1: RWSW      P2: SWJK      **Date**      P1: 02-Nov-18      P2: 15-Apr-19      **Type**      Quadrat 35 x 70 m  
**MGA Zone**      50      266114 **mE**      7559719 **mN**      114.733727 °E      -22.051572 °S  
**Habitat**      Low dune; crest and slopes of dune, within a broad system of inland low dunes/swales.  
**Soil**      Dark reddish brown (2.5YR 2.5/4) sand.  
**Rock Type**      Nil.  
**Vegetation**      P1: *Corymbia zygophylla* scattered low trees over *Grevillea stenobotrya* tall shrubland over *Acacia stellaticeps* open shrubland over *Triodia avenoides* very open hummock grassland and \**Cenchrus ciliaris* very open tussock grassland.  
P2: *Corymbia zygophylla* scattered low trees over *Grevillea stenobotrya* open shrubland over *Scaevola sericophylla*, *Acacia stellaticeps* scattered low shrubs over *Triodia avenoides* open hummock grassland over \**Cenchrus ciliaris* scattered tussock grasses.  
**Veg Condition**      P1: Very Good to Good: some \**Cenchrus ciliaris*.  
P2: Very Good: scattered \**Cenchrus ciliaris*.  
**Fire Age**      P1 & P2: No sign of recent fire.

Phase 1: Species	Cover (%)	Height (cm)	Specimen	Phase 2: Species	Cover (%)	Height (cm)	Specimen	Notes
				<i>Acacia sclerosperma</i> subsp. <i>sclerosperma</i>	0.1	170		
<i>Acacia sericophylla</i>	0.1	300	ASH14-05A					
<i>Acacia stellaticeps</i>	2	120		<i>Acacia stellaticeps</i>	1	25		
<i>Alyogyne pinoniana</i> var. <i>pinoniana</i>	0.1	70	ASH14-03	<i>Alyogyne pinoniana</i> var. <i>pinoniana</i>	0.1	120		
<i>Bonamia erecta</i>	0.1	25		<i>Bonamia erecta</i>	0.1	20		
<i>Cenchrus ciliaris</i>	3	40		<i>Cenchrus ciliaris</i>	1	35		
<i>Corymbia zygophylla</i>	1	300	ASH14-07	<i>Corymbia zygophylla</i>	0.5	200		
<i>Enchylaena tomentosa</i> var. <i>tomentosa</i>	0.1	45		<i>Enchylaena tomentosa</i> var. <i>tomentosa</i>	0.1	40		
				<i>Eremophila forrestii</i> subsp. <i>viridis</i>	0.1	40	ASH14-01	N=4
<i>Eremophila setacea</i>	0.1	130	ASH14-02					
				<i>Grevillea eriostachya</i>	0.1	120		
<i>Grevillea stenobotrya</i>	12	300	ASH14-05B	<i>Grevillea stenobotrya</i>	8	150		
<i>Hibiscus brachychlaenus</i>	0.1	50	ASH14-01	<i>Hibiscus brachychlaenus</i>	0.1	40		
<i>Polycarpaea corymbosa</i> var. <i>corymbosa</i>	0.1	20						
<i>Ptilotus latifolius</i>	0.1	35	ASH14-04					
<i>Quoya loxocarpa</i>	0.1	45	ASH14-08	<i>Quoya loxocarpa</i>	0.1	60		
<i>Salsola australis</i>	0.1	15		<i>Salsola australis</i>	0.1	50		
<i>Scaevola sericophylla</i>	0.1	50		<i>Scaevola sericophylla</i>	0.5	60		
<i>Solanum lasiophyllum</i>	0.1	20		<i>Solanum lasiophyllum</i>	0.1	30		
				<i>Tephrosia</i> sp.	0.1	5		Inadequate material.

Phase 1: Species	Cover (%)	Height (cm)	Specimen	Phase 2: Species	Cover (%)	Height (cm)	Specimen	Notes
<i>Triodia avenoides</i>	7	60	ASH14-06	<i>Triodia avenoides</i>	14	60		



Phase 1



Phase 2

**Ashburton Salt Flora**      **Site**    ASH15

**Described by**    P1: MM/RM    P2: RWRM      **Date**    P1: 02-Nov-18    P2: 12-Apr-19      **Type**    Quadrat 50 x 50 m

**MGA Zone**        50    268988 **mE**      7561833 **mN**    114.761859 **°E**    -22.032871 **°S**

**Habitat**            Swale; broad swale between low dunes.

**Soil**                 Yellowish red sandy loam.

**Rock Type**        Nil.

**Vegetation**        P1: *Acacia stellaticeps*, (*Eremophila forrestii* subsp. *viridis*) low open shrubland over *Triodia glabra*, (*T. epactia*, *T. avenoides*) hummock grassland.  
P2: *Acacia stellaticeps*, (*Eremophila forrestii* subsp. *viridis*, *Grevillea stenobotrya*) shrubland over *Triodia glabra*, (*T. epactia*) hummock grassland.

**Veg Condition**    P1: Very Good: occasional weeds.  
P2: Very Good: occasional \**Cenchrus ciliaris*.

**Fire Age**            P1 & P2: No sign of recent fire.

Phase 1: Species	Cover (%)	Height (cm)	Specimen	Notes	Phase 2: Species	Cover (%)	Height (cm)
<i>Acacia sclerosperma</i> subsp. <i>sclerosperma</i>	0.1	280					
<i>Acacia stellaticeps</i>	11	90			<i>Acacia stellaticeps</i>	12	110
<i>Bonamia erecta</i>	0.1	20			<i>Bonamia erecta</i>	0.1	5
<i>Calandrinia polyandra</i>	0.1	15	ASH13-03=				
<i>Cenchrus ciliaris</i>	0.1	30		N=20.	<i>Cenchrus ciliaris</i>	0.1	30
<i>Decazesia hecatocephala</i>	0.1	5	ASH13-01=				
<i>Eremophila forrestii</i> subsp. <i>viridis</i>	0.5	90	ASH-MB18=	N=10.	<i>Eremophila forrestii</i> subsp. <i>viridis</i>	1	120
<i>Euphorbia boophthona</i>	0.1	30					
<i>Grevillea stenobotrya</i>	0.1	150	ASH15-01		<i>Grevillea stenobotrya</i>	0.25	190
<i>Hakea stenophylla</i> subsp. <i>stenophylla</i>	0.1	80	ASH15-04		<i>Hakea stenophylla</i> subsp. <i>stenophylla</i>	0.1	190
<i>Haloragis gossei</i>	0.1	10					
<i>Heliotropium crispatum</i>	0.1	10	ASH13-12=				
<i>Hibiscus sturtii</i> var. <i>platyklamys</i>	0.1	30	ASH15-03				
<i>Indigofera bovipерda</i> subsp. <i>bovipерda</i>	0.1	15			<i>Indigofera bovipерda</i> subsp. <i>bovipерda</i>	0.1	10
<i>Podolepis aristata</i> subsp. <i>auriculata</i>	0.1	25	ASH13-14=				
<i>Ptilotus polystachyus</i>	0.1	20					
<i>Quoya paniculata</i>	0.1	40	ASH-MB20=		<i>Quoya paniculata</i>	0.1	50
					<i>Rhagodia eremaea</i>	0.1	110
<i>Scaevola spinescens</i> (broad form)	0.1	70			<i>Scaevola spinescens</i> (broad form)	0.1	60
<i>Senna artemisioides</i> subsp. <i>oligophylla</i>	0.1	90	ASH15-02		<i>Senna artemisioides</i> subsp. <i>oligophylla</i>	0.1	70
<i>Solanum lasiophyllum</i>	0.1	40			<i>Solanum lasiophyllum</i>	0.1	90
<i>Trachymene pilbarensis</i>	0.1	20					
<i>Triodia avenoides</i>	1	30					

Phase 1: Species	Cover (%)	Height (cm)	Specimen	Notes	Phase 2: Species	Cover (%)	Height (cm)
<i>Triodia epactia</i>	1	30			<i>Triodia epactia</i>	5	35
<i>Triodia glabra</i>	48	30			<i>Triodia glabra</i>	45	30



Phase 1



Phase 2

**Ashburton Salt Flora**      **Site**    ASH16  
**Described by**    P1: RWSW    P2: SWJK      **Date**    P1: 02-Nov-18    P2: 15-Apr-19    **Type**    Quadrat 50 x 50 m  
**MGA Zone**        50    267177 **mE**      7560473 **mN**    114.744129 °E    -22.044908 °S  
**Habitat**            Plain; old drainage feature adjacent to quadrat.  
**Soil**                 Red (2.5YR 4/6) clay loam.  
**Rock Type**        Nil.  
**Vegetation**        P1: *Acacia tetragonophylla*, (*A. synchronicia*) tall shrubland over *\*Cenchrus ciliaris*, (*Eriachne benthamii*, *Eulalia aurea*, *Sporobolus mitchellii*) very open tussock grassland with *Triodia epactia* scattered hummock grasses.  
P2: *Acacia tetragonophylla*, (*Acacia synchronicia*) tall open shrubland over *Triodia epactia* very open hummock grassland over *Eriachne benthamii*, *\*Cenchrus ciliaris*, *Eulalia aurea* very open tussock grassland.  
**Veg Condition**    P1: Very Good to Good: 4% cover of *\*Cenchrus ciliaris*, *\*Setaria verticillata* also present.  
P2: Very Good: 2% cover of *\*Cenchrus ciliaris*; cattle tracks and scats present.  
**Fire Age**            P1 & P2: No sign of recent fire.  
**Notes**                P2: Majority of *Acacia tetragonophylla* dead (stratum change since P1).

Phase 1: Species	Cover (%)	Height (cm)	Specimen	Notes	Phase 2: Species	Cover (%)	Height (cm)	Specimen
<i>Acacia synchronicia</i>	0.5	220			<i>Acacia synchronicia</i>	1	200	
<i>Acacia tetragonophylla</i>	25	320			<i>Acacia tetragonophylla</i>	5	250	
<i>Atriplex codonocarpa</i>	0.1	25			<i>Atriplex codonocarpa</i>	0.1	30	
<i>Cenchrus ciliaris</i>	4	35			<i>Cenchrus ciliaris</i>	2	20	
<i>Enchylaena tomentosa</i> var. <i>tomentosa</i>	0.1	40			<i>Enchylaena tomentosa</i> var. <i>tomentosa</i>	0.1	80	
<i>Eragrostis setifolia</i>	0.1	20	ASH16-02					
<i>Eriachne benthamii</i>	1	70	ASH16-03		<i>Eriachne benthamii</i>	4	40	
<i>Eulalia aurea</i>	1	70			<i>Eulalia aurea</i>	1	60	
<i>Rhagodia eremaea</i>	0.1	110			<i>Rhagodia eremaea</i>	0.1	160	
<i>Scaevola spinescens</i>	0.1	110			<i>Scaevola spinescens</i>	0.1	70	
					<i>Senna artemisioides</i> subsp. <i>oligophylla</i> (thinly sericeous form MET 15,035)	0.1	35	ASH16-01
<i>Setaria verticillata</i>	0.1	15		N=1.				
<i>Sporobolus mitchellii</i>	1	30	ASH16-01		<i>Sporobolus mitchellii</i>	0.1	30	
<i>Triodia epactia</i>	1	35			<i>Triodia epactia</i>	4	60	





**Phase 1**



**Phase 2**

**Ashburton Salt Flora**      **Site**    ASH17  
**Described by**    P1: MM/RM    P2: SWJK      **Date**    P1: 02-Nov-18    P2: 11-Apr-19    **Type**    Quadrat 50 x 50 m  
**MGA Zone**        50    266354 **mE**      7564923 **mN**    114.736798 **°E**    -22.004626 **°S**  
**Habitat**            Undulating plain; broad undulating sandy plain.  
**Soil**                 Yellowish red sandy loam.  
**Rock Type**        Nil.  
**Vegetation**       P1 & P2: *Triodia epactia* hummock grassland over \**Cenchrus ciliaris* scattered tussock grasses.  
**Veg Condition**    P1: Very Good: scattered weeds.  
                           P2: Very Good: scattered \**Cenchrus ciliaris*.  
**Fire Age**            P1 & P2: No sign of recent fire.

Phase 1: Species	Cover (%)	Height (cm)	Specimen	Notes	Phase 2: Species	Cover (%)	Height (cm)
<i>Atriplex bunburyana</i>	0.1	30	ASH-MB14=		<i>Atriplex bunburyana</i>	0.1	40
<i>Atriplex semilunaris</i>	0.1	20			<i>Atriplex semilunaris</i>	0.1	60
<i>Cenchrus ciliaris</i>	1.5	30	N=500.		<i>Cenchrus ciliaris</i>	1	30
<i>Chrysopogon fallax</i>	0.1	40			<i>Chrysopogon fallax</i>	0.1	80
<i>Dactyloctenium radulans</i>	0.1	5					
<i>Heliotropium crispatum</i>	0.1	20	ASH13-12=				
<i>Rhodanthe stricta</i>	0.1	25	ASH13-04=				
<i>Roebuckiella cheilocarpa</i> var. <i>cheilocarpa</i>	0.1	20	ASH13-02=				
<i>Sclerolaena diacantha</i>	0.1	15	ASH17-01	sens. lat.			
<i>Trachymene pilbarensis</i>	0.1	20					
<i>Triodia epactia</i>	60	30			<i>Triodia epactia</i>	60	40



**Phase 1**



**Phase 2**

**Ashburton Salt Flora**      **Site**    ASH18  
**Described by**    P1: RWSW      P2: RWRM      **Date**    P1: 02-Nov-18    P2: 10-Apr-19    **Type**    Quadrat 50 x 50 m  
**MGA Zone**        50    262140 **mE**      7557738 **mN**    114.694954 °E    -22.068918 °S  
**Habitat**            Undulating plain; edge of island with linear dunes.  
**Soil**                 Reddish brown (2.5YR 4/4) sandy clay loam.  
**Rock Type**        Nil.  
**Vegetation**        P1 & P2: Acacia xiphophylla tall open scrub over Atriplex bunburyana scattered low shrubs over \*Cenchrus ciliaris open tussock grassland.  
**Veg Condition**    P1: Good to Poor: 17% cover of \*Cenchrus grasses.  
                           P2: Good: 12% cover of \*Cenchrus ciliaris.  
**Fire Age**            P1 & P2: No sign of recent fire.

Phase 1: Species	Cover (%)	Height (cm)	Specimen	Phase 2: Species	Cover (%)	Height (cm)	Specimen	Notes
<i>Acacia xiphophylla</i>	45	350		<i>Acacia xiphophylla</i>	45	350		
<i>Angianthus milnei</i>	0.1	15	ASH18-03	<i>Angianthus milnei</i>	0.1	5		
<i>Atriplex bunburyana</i>	1	60	ASH18-02	<i>Atriplex bunburyana</i>	1	50		
				<i>Bonamia erecta</i>	0.1	25		
<i>Cenchrus ciliaris</i>	17	50		<i>Cenchrus ciliaris</i>	12	70		
<i>Enchylaena tomentosa</i> var. <i>tomentosa</i>	0.1	65		<i>Enchylaena tomentosa</i> var. <i>tomentosa</i>	0.1	50		
<i>Lepidium platypetalum</i>	0.1	50	ASH18-01	<i>Lepidium platypetalum</i>	0.1	40		
<i>Scaevola spinescens</i>	0.1	40		<i>Scaevola spinescens</i>	0.1	60	ASH18R-02	
				<i>Sclerolaena diacantha</i>	0.1	10	ASH18R-01	sens lat.
<i>Senna artemisioides</i> subsp. <i>oligophylla</i> (thinly sericeous form MET 15,035)	0.1	110	ASH18-04	<i>Senna artemisioides</i> subsp. <i>oligophylla</i> (thinly sericeous form MET 15,035)	0.1	90		
<i>Triodia epactia</i>	0.1	30		<i>Triodia epactia</i>	0.1	35		



**Phase 1**



**Phase 2**

**Ashburton Salt Flora Phase 1**      **Site**    ASH19

**Described by**    P1: MM/RM    P2: RM    **Date**    P1: 02-Nov-18    P2: 16-Apr-19    **Type**    Quadrat 50 x 50 m

**MGA Zone**        50    268774 **mE**        7567153 **mN**        114.760542 **°E**    -21.984816 **°S**

**Habitat**            Plain; broad undulating sandy plain

**Soil**                 Yellowish red sandy loam.

**Rock Type**        Nil.

**Vegetation**        P1: *Acacia tetragonophylla*, *A. xiphophylla*, (*A. sclerosperma* subsp. *sclerosperma*, *A. synchronicia*) tall open shrubland over *Triodia epactia* hummock grassland over \**Cenchrus ciliaris* very open tussock grassland.  
 P2: *Acacia tetragonophylla*, *A. xiphophylla*, *A. sclerosperma* subsp. *sclerosperma*, *A. synchronicia* tall open shrubland over *Triodia epactia* hummock grassland over \**Cenchrus ciliaris* very open tussock grassland.

**Veg Condition**    P1 & P2: Very Good: some weeds.

**Fire Age**            P1 & P2: No sign of recent fire.

Phase 1: Species	Cover (%)	Height (cm)	Specimen	Notes	Phase 1: Species	Cover (%)	Height (cm)	Notes
<i>Acacia coriacea</i> subsp. <i>coriacea</i>	0.1	180			<i>Acacia coriacea</i> subsp. <i>coriacea</i>	0.1	200	
<i>Acacia sclerosperma</i> subsp. <i>sclerosperma</i>	0.5	210			<i>Acacia sclerosperma</i> subsp. <i>sclerosperma</i>	1	210	
<i>Acacia synchronicia</i>	0.5	220			<i>Acacia synchronicia</i>	0.5	220	
<i>Acacia tetragonophylla</i>	2	250			<i>Acacia tetragonophylla</i>	2	250	
<i>Acacia xiphophylla</i>	1	300			<i>Acacia xiphophylla</i>	1	300	
<i>Cassyltha capillaris</i>	0.1	30			<i>Cassyltha capillaris</i>	0.1	30	
<i>Cenchrus ciliaris</i>	2.5	30		N=500.	<i>Cenchrus ciliaris</i>	2.5	30	
<i>Dysphania rhadinostachya</i>	0.1	5						
<i>Enchylaena tomentosa</i> var. <i>tomentosa</i>	0.1	30			<i>Enchylaena tomentosa</i> var. <i>tomentosa</i>	0.1	50	
<i>Eragrostis dielsii</i>	0.1	5			<i>Eragrostis dielsii</i>	0.1	7	
<i>Erodium</i> sp.	0.1	10	ASH09-11=	Probably <i>E. cygnorum</i> ; inadequate material for further determination.				
<i>Goodenia tenuiloba</i>	0.1	20	ASH19-03					
<i>Haloragis gossei</i>	0.1	10						
<i>Heliotropium crispatum</i>	0.1	5	ASH13-12=					
<i>Nicotiana occidentalis</i>	0.1	20	ASH19-01	Inadequate material for determination to subsp.				
<i>Ptilotus exaltatus</i>	0.1	30						
<i>Ptilotus polystachyus</i>	0.1	20						
<i>Rhagodia eremaea</i>	0.1	250			<i>Rhagodia eremaea</i>	0.1	250	
<i>Rhodanthe stricta</i>	0.1	20	ASH13-04=					

Phase 1: Species	Cover (%)	Height (cm)	Specimen	Notes	Phase 1: Species	Cover (%)	Height (cm)	Notes
<i>Roebuckiella cheilocarpa</i> var. <i>cheilocarpa</i>	0.1	15	ASH13-02=					
<i>Scaevola spinescens</i>	0.1	60			<i>Scaevola spinescens</i>	0.1	60	
<i>Scaevola spinescens</i> (broad form)	0.1	60			<i>Scaevola spinescens</i> (broad form)	0.1	90	
<i>Sclerolaena diacantha</i>	0.1	15	ASH19-02	Sens. lat.	<i>Sclerolaena diacantha</i>	0.1	15	
<i>Solanum lasiophyllum</i>	0.1	60			<i>Solanum lasiophyllum</i>	0.1	90	
<i>Trachymene pilbarensis</i>	0.1	30						
<i>Triodia epactia</i>	45	30			<i>Triodia epactia</i>	45	30	
<i>Vachellia farnesiana</i>	0.1	150		N=1.	<i>Vachellia farnesiana</i>	0.1	50	N=1



Phase 1



Phase 2

**Ashburton Salt Flora Phase 1**      **Site**    ASH20

**Described by**    RWSW    **Date**    02-Nov-18      **Type**    Quadrat 50 x 50 m

**MGA Zone**        50      264286 **mE**      7556027 **mN**      114.715489 °E    -22.084655 °S

**Habitat**            Dune swale; linear dune system.

**Soil**                 Dark reddish brown (2.5YR 3/4) loamy sand.

**Rock Type**        Nil.

**Vegetation**        *Hakea stenophylla* subsp. *stenophylla*, *Acacia sclerosperma* subsp. *sclerosperma* open shrubland over *Triodia avenoides* hummock grassland.

**Veg Condition**    Very Good: occasional \**Cenchrus ciliaris*.

**Fire Age**            No sign of recent fire.

Phase 1: Species	Cover (%)	Height (cm)	Specimen	Notes
<i>Acacia sclerosperma</i> subsp. <i>sclerosperma</i>	1	180		
<i>Alyogyne pinoniana</i> var. <i>pinoniana</i>	0.1	30	ASH14-03=	
<i>Cenchrus ciliaris</i>	0.1	35		N=20 (estimated not counted)
<i>Grevillea eriostachya</i>	0.1	130	ASH20-02	
<i>Hakea stenophylla</i> subsp. <i>stenophylla</i>	2	180	ASH20-01	
<i>Scaevola sericophylla</i>	0.1	40		
<i>Scaevola spinescens</i> (broad form)	0.1	100		
<i>Triodia avenoides</i>	40	50		
<i>Triodia glabra</i>	0.1	50		



**Phase 1**

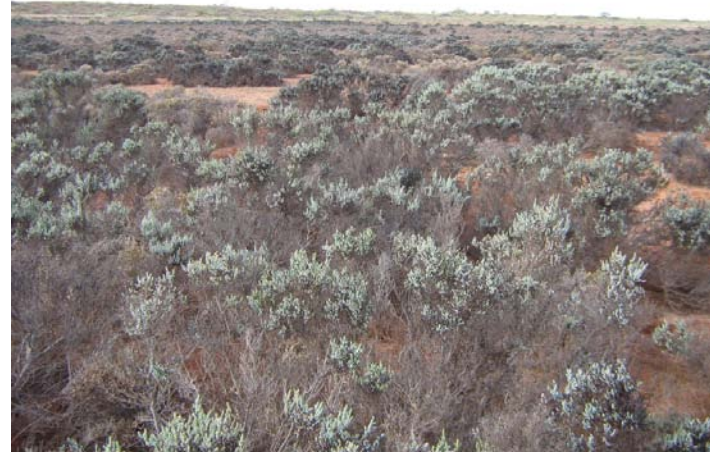


**Ashburton Salt Flora**      **Site**    ASH21  
**Described by**    P1: MM/RM    P2: RWRM      **Date**    P1: 03-Nov-18    P2: 12-Apr-19      **Type**    Quadrat 50 x 50 m  
**MGA Zone**        50    270175 **mE**      7579181 **mN**    114.775792 °**E**    -21.876415 °**S**  
**Habitat**            Clay pan; low lying saline clay plain/clay pan between elevated plain to the west and low dune to the east.  
**Soil**                 Yellowish red sandy clay.  
**Rock Type**        Nil.  
**Vegetation**        P1: *Tecticornia indica* subsp. *leiostachya*, *T. auriculata* low open heath.  
                           P2: *Tecticornia auriculata*, *T. indica* subsp. *leiostachya*, (*T. indica* subsp. *bidens*) low open heath.  
**Veg Condition**    P1: Very Good: occasional \**Sonchus oleraceus*.  
                           P2: Excellent.  
**Fire Age**            P1 & P2: No sign of recent fire.

Phase 1: Species	Cover (%)	Height (cm)	Specimen	Notes	Phase 2: Species	Cover (%)	Height (cm)
<i>Angianthus acrohyalinus</i>	0.1	20	ASH21-09				
<i>Cullen cinereum</i>	0.1	20					
<i>Dysphania plantaginella</i>	0.1	5	ASH21-04				
<i>Eragrostis falcata</i>	0.1	5	ASH21-02		<i>Eragrostis falcata</i>	0.1	15
<i>Lawrenzia densiflora</i>	0.1	5	ASH21-05				
<i>Nicotiana rosulata</i> subsp. <i>rosulata</i>	0.1	20	ASH21-03				
<i>Rhodanthe stricta</i>	0.1	25	ASH21-06				
<i>Salsola australis</i>	0.1	20					
<i>Sonchus oleraceus</i>	0.1	25	ASH09-06=	N=5.			
<i>Swainsona pterostylis</i>	0.1	15	REL01-01=				
<i>Tecticornia auriculata</i>	25	50	ASH21-08		<i>Tecticornia auriculata</i>	30	50
<i>Tecticornia indica</i> subsp. <i>bidens</i>	0.1	30	ASH21-07		<i>Tecticornia indica</i> subsp. <i>bidens</i>	5	30
<i>Tecticornia indica</i> subsp. <i>leiostachya</i>	35	30	ASH21-01		<i>Tecticornia indica</i> subsp. <i>leiostachya</i>	25	30



**Phase 1**



**Phase 2**

**Ashburton Salt Flora**      **Site**      ASH22

**Described by**      P1: RWSW      P2: RWRM      **Date**      P1: 03-Nov-18      P2: 12-Apr-19      **Type**      Quadrat 50 x 50 m

**MGA Zone**      50      269380 **mE**      7580974 **mN**      114.768354 **°E**      -21.860124 **°S**

**Habitat**      Plain; saline plain adjacent to low hill within broad coastal island.

**Soil**      1: Dark reddish brown (2.5YR 3/4) loamy clay sand; 2: Dark reddish brown (2.5YR 3/4) sandy clay.

**Rock Type**      Nil.

**Vegetation**      P1 & P2: *Tecticornia auriculata* low shrubland.

**Veg Condition**      P1 & P2: Very Good: occasional \**Cenchrus ciliaris*.

**Fire Age**      P1 & P2: Very long unburnt.

**Notes**      P1: Few seedlings present.

Phase 1: Species	Cover (%)	Height (cm)	Specimen	Notes	Phase 2: Species	Cover (%)	Height (cm)
<i>Angianthus milnei</i>	0.1	10	ASH22-02				
<i>Cenchrus ciliaris</i>	0.1	20		N=20 (estimated not counted)	<i>Cenchrus ciliaris</i>	0.1	15
<i>Eragrostis falcata</i>	0.1	30	ASH22-04		<i>Eragrostis falcata</i>	0.1	30
<i>Lawrenzia viridigrisea</i>	0.1	25	ASH22-03		<i>Lawrenzia viridigrisea</i>	0.1	35
					<i>Neobassia astrocarpa</i>	0.1	25
<i>Tecticornia auriculata</i>	22	90	ASH22-01		<i>Tecticornia auriculata</i>	20	90
<i>Tecticornia halocnemoides</i> subsp. <i>tenuis</i>	0.1	20	ASH22-05				



Phase 1



Phase 2

**Ashburton Salt Flora**      **Site**    ASH23

**Described by**    P1: MM/RM    P2: RWRM      **Date**    P1: 03-Nov-18    P2: 12-Apr-19      **Type**    Quadrat 50 x 50 m

**MGA Zone**        50    269851 **mE**        7579311 **mN**        114.772676 **°E**    -21.875199 **°S**

**Habitat**            Dune; broad and low dune, to plain.

**Soil**                 Yellowish red sandy loam.

**Rock Type**        Nil.

**Vegetation**        P1: *Acacia tetragonophylla* scattered shrubs over *Scaevola cunninghamii*, (*A. stellaticeps*) low open shrubland over *Triodia epactia* open hummock grassland.  
P2: *Acacia tetragonophylla* scattered shrubs over *Scaevola cunninghamii*, *Acacia stellaticeps* low open shrubland over *Triodia epactia* open hummock grassland.

**Veg Condition**    P1: Very Good: scattered weeds.

**Fire Age**            P1 & P2: No sign of recent fire.

**Notes**                P1: Not a soft sand dune; has a hard surface with little loose sand; possibly cryptogam crust.

Phase 1: Species	Cover (%)	Height (cm)	Specimen	Notes	Phase 2: Species	Cover (%)	Height (cm)	Specimen	Notes
<i>Acacia coriacea</i> subsp. <i>coriacea</i>	0.1	70			<i>Acacia coriacea</i> subsp. <i>coriacea</i>	0.1	40		
<i>Acacia sclerosperma</i> subsp. <i>sclerosperma</i>	0.1	80			<i>Acacia sclerosperma</i> subsp. <i>sclerosperma</i>	0.1	80		
<i>Acacia stellaticeps</i>	0.5	50			<i>Acacia stellaticeps</i>	0.5	60		
<i>Acacia tetragonophylla</i>	0.25	165			<i>Acacia tetragonophylla</i>	0.25	150		
<i>Cenchrus ciliaris</i>	0.1	30		N=100.	<i>Cenchrus ciliaris</i>	0.1	30		
<i>Eragrostis eriopoda</i>	0.1	30	ASH23-03		<i>Eragrostis eriopoda</i>	0.1	30		
<i>Eriachne obtusa</i>	0.1	30			<i>Eriachne obtusa</i>	0.1	30		
<i>Eulalia aurea</i>	0.1	70							
					<i>Euphorbia tannensis</i> subsp. <i>eremophila</i>	0.1	10	ASH23R-02	
<i>Euphorbia</i> sp. ( <i>boophthona/tannensis</i> )	0.1	5		Inadequate material.					
<i>Goodenia microptera</i>	0.1	15	ASH23-04						
<i>Haloragis gossei</i> var. <i>gossei</i>	0.1	20	ASH23-01B						
<i>Haloragis gossei</i> var. <i>inflata</i>	0.1	10	ASH23-01A						
					<i>Melhania oblongifolia</i>	0.1	35	ASH23R-03	
<i>Nicotiana occidentalis</i>	0.1	10	ASH23-05	Inadequate material for determination to subsp.					
<i>Polygala glaucifolia</i>	0.1	5	ASH23-06						
<i>Ptilotus polystachyus</i>	0.1	40							

Phase 1: Species	Cover (%)	Height (cm)	Specimen	Notes	Phase 2: Species	Cover (%)	Height (cm)	Specimen	Notes
<i>Rhagodia eremaea</i>	0.1	60			<i>Rhagodia eremaea</i>	0.1	110		
<i>Scaevola cunninghamii</i>	2	30	ASH23-02		<i>Scaevola cunninghamii</i>	3	40		
					<i>Scaevola spinescens</i>	0.1	70		
<i>Scaevola spinescens</i> (broad form)	0.1	45							
<i>Senna artemisioides</i> subsp. <i>oligophylla</i> (thinly sericeous form MET 15,035)	0.1	40	ASH23-07		<i>Senna artemisioides</i> subsp. <i>oligophylla</i> (thinly sericeous form MET 15,035)	0.1	30		
<i>Solanum lasiophyllum</i>	0.1	30			<i>Solanum lasiophyllum</i>	0.1	50		
<i>Tribulus occidentalis</i>	0.1	10	ASH13-09=						
					<i>Tribulus</i> sp.	0.1	10	ASH23R-01	Inadequate material.
<i>Triodia epactia</i>	25	30			<i>Triodia epactia</i>	25	30		



Phase 1



Phase 2

**Ashburton Salt Flora**      **Site**      ASH24

**Described by**      P1: RWSW      P2: RMJK      **Date**      P1: 03-Nov-18      P2: 11-Apr-19      **Type**      Quadrat 50 x 50 m

**MGA Zone**      50      268955 **mE**      7582234 **mN**      114.764421 **°E**      -21.848693 **°S**

**Habitat**      Plain; quadrat located on a coastal island between a low hill and samphire flat.

**Soil**      Yellowish red sandy loam.

**Rock Type**      Nil.

**Vegetation**      P1 & P2: *Acacia tetragonophylla*, *A. synchronicia* scattered tall shrubs over *A. sclerosperma* subsp. *sclerosperma* open shrubland over *Scaevola spinescens* (broad form) scattered low shrubs over *Triodia epactia* open hummock grassland.

**Veg Condition**      P1 & P2: Very Good; scattered \**Cenchrus ciliaris*.

**Fire Age**      P1 & P2: No sign of recent fire.

**Notes**      P1: NE corner not pegged.

Species	Cover (%)	Height (cm)	Specimen	Notes	Species	Cover (%)	Height (cm)
<i>Acacia coriacea</i> subsp. <i>coriacea</i>	0.1	150			<i>Acacia coriacea</i> subsp. <i>coriacea</i>	0.1	140
<i>Acacia sclerosperma</i> subsp. <i>sclerosperma</i>	6	120			<i>Acacia sclerosperma</i> subsp. <i>sclerosperma</i>	4	130
<i>Acacia stellaticeps</i>	0.1	60			<i>Acacia stellaticeps</i>	0.1	30
<i>Acacia synchronicia</i>	0.5	320			<i>Acacia synchronicia</i>	0.5	320
<i>Acacia tetragonophylla</i>	1	250			<i>Acacia tetragonophylla</i>	1	250
<i>Cassytha capillaris</i>	0.1	35			<i>Cassytha capillaris</i>	0.1	30
<i>Cenchrus ciliaris</i>	0.1	30		N=20 (estimated not counted)	<i>Cenchrus ciliaris</i>	0.1	30
<i>Chrysopogon fallax</i>	0.1	120			<i>Chrysopogon fallax</i>	0.1	50
<i>Eragrostis eriopoda</i>	0.1	15	ASH24-01		<i>Eragrostis eriopoda</i>	0.1	30
<i>Eriachne helmsii</i>	0.1	35	ASH24-02				
<i>Eulalia aurea</i>	0.1	45			<i>Eulalia aurea</i>	0.1	30
<i>Goodenia microptera</i>	0.1	30					
<i>Hibiscus sturtii</i> var. <i>platyklamys</i>	0.1	15	ASH24-04		<i>Hibiscus sturtii</i> var. <i>platyklamys</i>	0.1	20
					<i>Indigofera bovipерda</i> subsp. <i>bovipерda</i>	0.1	30
<i>Lepidium platypetalum</i>	0.1	50	ASH24-05		<i>Lepidium platypetalum</i>	0.1	40
<i>Scaevola spinescens</i> (broad form)	1	60			<i>Scaevola spinescens</i> (broad form)	0.5	70
<i>Sida fibulifera</i>	0.1	15	ASH24-03	sens. lat.	<i>Sida fibulifera</i>	0.1	15
<i>Solanum lasiophyllum</i>	0.1	35			<i>Solanum lasiophyllum</i>	0.1	60
<i>Triodia epactia</i>	22	25			<i>Triodia epactia</i>	25	30



**Phase 1**



**Phase 2**

**Ashburton Salt Flora**      **Site**    ASH25  
**Described by**    P1: MM/RM    P2: RWRM      **Date**    P1: 03-Nov-18    P2: 12-Apr-19      **Type**    Quadrat 50 x 50 m  
**MGA Zone**        50    269528 **mE**      7579473 **mN**    114.769575 °**E**    -21.873694 °**S**  
**Habitat**            Plain; undulating plain (very low dune to undulating plain) on an island.  
**Soil**                 Yellowish red sandy loam.  
**Rock Type**        Nil.  
**Vegetation**        P1: *Acacia synchronicia* scattered tall shrubs over *A. coriacea* subsp. *coriacea*, (*A. tetragonophylla*) scattered shrubs over *Triodia epactia* hummock grassland with \**Cenchrus ciliaris* very open tussock grassland.  
P2: *Acacia synchronicia* scattered tall shrubs over *A. coriacea* subsp. *coriacea*, *A. tetragonophylla* scattered shrubs over *Triodia epactia* open hummock grassland over \**Cenchrus ciliaris* very open tussock grassland  
**Veg Condition**    P1: Very Good: 3% cover of \**Cenchrus ciliaris*.  
P2: Very Good to Good: 5% cover of \**Cenchrus ciliaris*.  
**Fire Age** P1 & P2: No sign of recent fire.

Phase 1: Species	Cover (%)	Height (cm)	Specimen	Notes	Phase 2: Species	Cover (%)	Height (cm)	Specimen	Notes
<i>Acacia coriacea</i> subsp. <i>coriacea</i>	1	170			<i>Acacia coriacea</i> subsp. <i>coriacea</i>	1	170		
<i>Acacia sclerosperma</i> subsp. <i>sclerosperma</i>	0.1	160			<i>Acacia sclerosperma</i> subsp. <i>sclerosperma</i>	0.1	170		
<i>Acacia synchronicia</i>	1.5	280			<i>Acacia synchronicia</i>	1.5	280		
<i>Acacia tetragonophylla</i>	0.25	170			<i>Acacia tetragonophylla</i>	0.25	170		
<i>Angianthus acrohyalinus</i>	0.1	15	ASH21-09=						
<i>Atriplex bunburyana</i>	0.1	60	ASH-MB14=		<i>Atriplex bunburyana</i>	0.1	80		
<i>Cenchrus ciliaris</i>	3	30		N=1500.	<i>Cenchrus ciliaris</i>	5	30		
<i>Eragrostis xerophila</i>	0.1	30	ASH25-03		<i>Eragrostis xerophila</i>	0.1	30	ASH25R-01	
<i>Erodium</i> sp.	0.1	10	ASH09-11=	Probably <i>E. cygnorum</i> ; inadequate material for further determination.					
					<i>Euphorbia</i> sp.	0.1	20	ASH25R-03	Inadequate material.
					<i>Indigofera boviparda</i> subsp. <i>boviparda</i>	0.1	45		Mostly dead.
<i>Lepidium platypetalum</i>	0.1	70	ASH25-01		<i>Lepidium platypetalum</i>	0.1	80		
<i>Rhagodia eremaea</i>	0.1	70			<i>Rhagodia eremaea</i>	0.1	70		
<i>Rhynchosia minima</i>	0.1	10							
<i>Scaevola spinescens</i>	0.1	50							



Phase 1: Species	Cover (%)	Height (cm)	Specimen	Notes	Phase 2: Species	Cover (%)	Height (cm)	Specimen	Notes
<i>Sclerolaena diacantha</i>	0.1	20			<i>Sclerolaena diacantha</i>	0.1	30	ASH25R-02	
<i>Senna artemisioides</i> subsp. <i>oligophylla</i> (thinly sericeous form MET 15,035)	0.1	60	ASH25-02		<i>Senna artemisioides</i> subsp. <i>oligophylla</i> (thinly sericeous form MET 15,035)	0.1	70		
<i>Swainsona pterostylis</i>	0.1	20	REL01-01=						
<i>Triodia epactia</i>	45	30			<i>Triodia epactia</i>	28	30		



Phase 1



Phase 2

**Ashburton Salt Flora**      **Site**      ASH26

**Described by**      P1: RWSW      P2: RWRM      **Date**      P1: 03-Nov-18      P2: 11-Apr-19      **Type**      Quadrat 50 x 50 m

**MGA Zone**      50      267796 **mE**      7577680 **mN**      114.752570 **°E**      -21.889653 **°S**

**Habitat**      Dune; low undulating dune on an island.

**Soil**      Reddish brown (2.5YR 4/4) loamy sand.

**Rock Type**      Nil.

**Vegetation**      P1: *Acacia tetragonophylla* scattered tall shrubs over *A. stellaticeps* scattered shrubs over \**Cenchrus ciliaris* tussock grassland and *Triodia epactia* very open hummock grassland.  
P2: *Acacia stellaticeps*, *A. tetragonophylla* open shrubland over *Triodia epactia* very open hummock grassland over \**Cenchrus ciliaris* tussock grassland.

**Veg Condition**      P1: Very Poor: high cover of \**Cenchrus ciliaris*.  
P2: Poor: high cover of \**Cenchrus ciliaris*.

**Fire Age**      P1 & P2: No sign of recent fire.

Phase 1: Species	Cover (%)	Height (cm)	Specimen	Phase 2: Species	Cover (%)	Height (cm)
<i>Acacia coriacea</i> subsp. <i>coriacea</i>	0.1	70		<i>Acacia coriacea</i> subsp. <i>coriacea</i>	0.1	70
<i>Acacia sclerosperma</i> subsp. <i>sclerosperma</i>	0.1	60		<i>Acacia sclerosperma</i> subsp. <i>sclerosperma</i>	0.1	110
<i>Acacia stellaticeps</i>	0.5	150		<i>Acacia stellaticeps</i>	4	110
<i>Acacia synchronicia</i>	0.1	250		<i>Acacia synchronicia</i>	0.1	210
<i>Acacia tetragonophylla</i>	0.5	210		<i>Acacia tetragonophylla</i>	2	150
				<i>Atriplex bunburyana</i>	0.1	60
<i>Cenchrus ciliaris</i>	45	40		<i>Cenchrus ciliaris</i>	40	40
<i>Cullen martinii</i>	0.1	20	RW08=			
<i>Rhagodia eremaea</i>	0.1	120	ASH26-01	<i>Rhagodia eremaea</i>	0.1	130
<i>Rhynchosia minima</i>	0.1	2		<i>Rhynchosia minima</i>	0.1	3
				<i>Scaevola spinescens</i>	0.1	60
<i>Scaevola spinescens</i> (broad form)	0.1	40				
				<i>Senna artemisioides</i> subsp. <i>oligophylla</i>	0.1	60
<i>Senna artemisioides</i> subsp. <i>oligophylla</i> (thinly sericeous form MET 15,035)	0.1	90	ASH26-02			
<i>Triodia epactia</i>	7	40		<i>Triodia epactia</i>	5	60



**Phase 1 (NW corner)**



**Phase 1 (more representative)**

**(NB. Phase 2 photo not taken)**

**Ashburton Salt Flora**      **Site**    ASH27  
**Described by**    P1: MM/RM    P2: SWJK      **Date**    P1: 03-Nov-18    P2: 11-Apr-19      **Type**    Quadrat 50 x 50 m  
**MGA Zone**        50    270564 **mE**      7575906 **mN**    114.779097 °E    -21.906032 °S  
**Habitat**            Plain; broad undulating plain on western edge of an island.  
**Soil**                 Yellowish red sandy loam.  
**Rock Type**        Nil.  
**Vegetation**        P1 & P2: *Acacia synchronicia* scattered tall shrubs over *Triodia epactia* very open hummock grassland over \**Cenchrus ciliaris* very open tussock grassland.  
**Veg Condition**    P1: Very Good to Good: 5% cover of \**Cenchrus ciliaris*.  
                               P2: Good: 3% cover of \**Cenchrus ciliaris*; cattle scats also present.  
**Fire Age**            P1 & P2: No sign of recent fire.

Phase 1: Species	Cover (%)	Height (cm)	Specimen	Notes	Phase 2: Species	Cover (%)	Height (cm)
<i>Acacia synchronicia</i>	0.1	210			<i>Acacia synchronicia</i>	1	220
<i>Angianthus acrohyalinus</i>	0.1	10	ASH21-09=				
<i>Cenchrus ciliaris</i>	5	30		N=1000.	<i>Cenchrus ciliaris</i>	5	20
<i>Dactyloctenium radulans</i>	0.1	5					
<i>Eragrostis xerophila</i>	0.1	30					
<i>Erodium</i> sp.	0.1	5	ASH09-11=	Probably <i>E. cygnorum</i> ; inadequate material for further determination.			
<i>Triodia epactia</i>	4	30			<i>Triodia epactia</i>	3	60



Phase 1



Phase 2

**Ashburton Salt Flora**      **Site**    ASH28  
**Described by**    P1: RWSW      P2: BMRW      **Date**    P1: 03-Nov-18    P2: 11-Apr-19    **Type**    Quadrat 25 x 100 m  
**MGA Zone**        50      267009 **mE**      7578042 **mN**      114.745008 °E    -21.886281 °S  
**Habitat**            Dune; low dune.  
**Soil**                 Red (2.5YR 4/6) loamy sand.  
**Rock Type**        Nil.  
**Vegetation**        P1: *Hakea stenophylla* subsp. *stenophylla* tall open shrubland over *Quoya loxocarpa* open shrubland over *Triodia epactia* hummock grassland over \**Cenchrus ciliaris* scattered tussock grasses over *Corynotheca pungens* scattered herbs.  
P2: *Hakea stenophylla* subsp. *stenophylla* tall open shrubland over *Quoya loxocarpa*, (*Scaevola sericophylla*) scattered shrubs over *Triodia epactia* open hummock grassland over \**Cenchrus ciliaris* scattered tussock grasses.  
**Veg Condition**    P1 & P2: Very Good: scattered \**Cenchrus ciliaris*.  
**Fire Age**            P1 & P2: No sign of recent fire.

Phase 1: Species	Cover (%)	Height (cm)	Specimen	Notes	Phase 2: Species	Cover (%)	Height (cm)	Specimen
<i>Acacia coriacea</i> subsp. <i>coriacea</i>	0.1	140			<i>Acacia coriacea</i> subsp. <i>coriacea</i>	0.1	150	
<i>Angianthus acrohyalinus</i>	0.1	10	ASH28-04					
<i>Cassytha capillaris</i>	0.1	30						
<i>Cenchrus ciliaris</i>	1.5	30			<i>Cenchrus ciliaris</i>	1	35	
<i>Corynotheca pungens</i>	1	110			<i>Corynotheca pungens</i>	0.1	40	
<i>Crotalaria cunninghamii</i> subsp. <i>sturtii</i>	0.1	30			<i>Crotalaria cunninghamii</i> subsp. <i>sturtii</i>	0.1	20	
					<i>Enchylaena tomentosa</i> var. <i>tomentosa</i>	0.1	110	
<i>Eragrostis eriopoda</i>	0.1	30	ASH28-01, 09		<i>Eragrostis eriopoda</i>	0.1	25	
					<i>Euphorbia tannensis</i> subsp. <i>eremophila</i>	0.1	20	ASH28-01
<i>Euphorbia</i> sp. ( <i>boophthona/tannensis</i> )	0.1	25	ASH28-07	Inadequate material.				
<i>Hakea stenophylla</i> subsp. <i>stenophylla</i>	2	210	ASH28-10		<i>Hakea stenophylla</i> subsp. <i>stenophylla</i>	5	160	
<i>Lepidium platypetalum</i>	0.1	60	ASH28-06		<i>Lepidium platypetalum</i>	0.1	50	
<i>Olearia</i> sp. Kennedy Range (G. Byrne 66)	0.1	90	ASH28-12		<i>Olearia</i> sp. Kennedy Range (G. Byrne 66)	0.1	90	
<i>Pterocaulon sphacelatum</i>	0.1	15	ASH28-08		<i>Pterocaulon sphaeranthoides</i>	0.1	4	
<i>Quoya loxocarpa</i>	2	100	ASH28-11		<i>Quoya loxocarpa</i>	1	60	

Phase 1: Species	Cover (%)	Height (cm)	Specimen	Notes	Phase 2: Species	Cover (%)	Height (cm)	Specimen
					<i>Rhagodia eremaea</i>	0.1	35	
<i>Rhynchosia minima</i>	0.1	2			<i>Rhynchosia minima</i>	0.1	2	
<i>Scaevola sericophylla</i>	0.1	70			<i>Scaevola sericophylla</i>	0.5	70	
<i>Scaevola spinescens</i> (broad form)	0.1	90						
<i>Senna glutinosa</i> subsp. <i>x luerssenii</i>	0.1	160	ASH28-05		<i>Senna glutinosa</i> subsp. <i>x luerssenii</i>	0.1	160	
					<i>Sida rohlenae</i> subsp. <i>rohlenae</i>	0.1	40	
<i>Solanum lasiophyllum</i>	0.1	30			<i>Solanum lasiophyllum</i>	0.1	35	
<i>Streptoglossa bubakii</i>	0.1	10	ASH28-03					
<i>Trichodesma zeylanicum</i> var. <i>grandiflorum</i>	0.1	25			<i>Trichodesma zeylanicum</i> var. <i>grandiflorum</i>	0.1	35	
<i>Triodia epactia</i>	35	40			<i>Triodia epactia</i>	28	45	
<i>Yakirra australiensis</i> var. <i>australiensis</i>	0.1	5	ASH28-02					



Phase 1



Phase 2

**Ashburton Salt Flora**      **Site**    ASH29  
**Described by**    P1: MM/RM    P2: SWJK      **Date**    P1: 03-Nov-18    P2: 11-Apr-19    **Type**    Quadrat 40 x 62.5 m  
**MGA Zone**        50      270853 **mE**      7576512 **mN**      114.781977 °E    -21.900599 °S  
**Habitat**            Dune; low sand dune N-S.  
**Soil**                 Yellowish red sandy loam.  
**Rock Type**        Nil.  
**Vegetation**        P1: *Acacia coriacea* subsp. *coriacea*, *A. tetragonophylla*, *A. sclerosperma* subsp. *sclerosperma* scattered shrubs over *A. stellaticeps*, (*Scaevola spinescens* (broad form)) low shrubland over *Triodia epactia* open hummock grassland.  
P2: *Acacia tetragonophylla*, *A. sclerosperma* subsp. *sclerosperma* open shrubland over *Acacia stellaticeps*, (*Scaevola spinescens*, *Lepidium platypetalum*, *Stylobasium spathulatum*, *Solanum lasiophyllum*) low open shrubland over *Triodia epactia* open hummock grassland.  
**Veg Condition**    P1: Very Good: scattered weeds.  
P2: Very Good: scattered \**Cenchrus ciliaris*.  
**Fire Age**            P1 & P2: No sign of recent fire.  
**Notes**                P1: Dune has cryptogam crust rather than soft sand.

Phase 1: Species	Cover (%)	Height (cm)	Specimen	Notes	Phase 2: Species	Cover (%)	Height (cm)	Specimen
<i>Acacia coriacea</i> subsp. <i>coriacea</i>	0.25	170			<i>Acacia coriacea</i> subsp. <i>coriacea</i>	0.1	150	
<i>Acacia sclerosperma</i> subsp. <i>sclerosperma</i>	0.25	110			<i>Acacia sclerosperma</i> subsp. <i>sclerosperma</i>	0.5	110	
<i>Acacia stellaticeps</i>	12	90			<i>Acacia stellaticeps</i>	3	99	
<i>Acacia tetragonophylla</i>	0.25	120			<i>Acacia tetragonophylla</i>	0.5	105	
<i>Cassutha capillaris</i>	0.1	30		Sterile.	<i>Cassutha capillaris</i>	0.1	20	
<i>Cenchrus ciliaris</i>	0.1	30		N=100.	<i>Cenchrus ciliaris</i>	0.1	25	
<i>Euphorbia tannensis</i> subsp. <i>eremophila</i>	0.1	15						
<i>Goodenia microptera</i>	0.1	25						
<i>Haloragis gossei</i>	0.1	20						
<i>Heliotropium crispatum</i>	0.1	10	ASH13-12=					
					<i>Lepidium platypetalum</i>	0.5	40	
<i>Nicotiana occidentalis</i>	0.1	20	ASH09-04=	Inadequate material for determination to subsp.				
					<i>Pterocaulon sphacelatum</i>	0.1	15	
<i>Ptilotus polystachyus</i>	0.1	40						
<i>Rhodanthe stricta</i>	0.1	25	ASH13-04=					
					<i>Scaevola cunninghamii</i>	0.1	25	ASH38-01=
<i>Scaevola pulchella</i>	0.1	40	ASH29-01					

Phase 1: Species	Cover (%)	Height (cm)	Specimen	Notes	Phase 2: Species	Cover (%)	Height (cm)	Specimen
<i>Scaevola spinescens</i> (broad form)	3	45			<i>Scaevola spinescens</i> (broad form)	1	50	
<i>Senna artemisioides</i> subsp. <i>oligophylla</i> (thinly sericeous form MET 15,035)	0.1	40	ASH29-02		<i>Senna artemisioides</i> subsp. <i>oligophylla</i> (thinly sericeous form MET 15,035)	0.1	40	
<i>Solanum diversiflorum</i>	0.1	10						
<i>Solanum lasiophyllum</i>	0.1	30			<i>Solanum lasiophyllum</i>	0.5	40	
<i>Stylobasium spathulatum</i>	0.1	140			<i>Stylobasium spathulatum</i>	0.5	100	
<i>Trachymene pilbarensis</i>	0.1	30						
<i>Triodia epactia</i>	25	30			<i>Triodia epactia</i>	15	25	



Phase 1



Phase 2



**Ashburton Salt Flora**      **Site**      ASH30  
**Described by**      P1: RWSW      P2: SWJK      **Date**      P1: 04-Nov-18      P2: 16-Apr-19      **Type**      Quadrat 50 x 50 m  
**MGA Zone**      50      285983 **mE**      7595075 **mN**      114.930764 **°E**      -21.734905 **°S**  
**Habitat**      Floodplain; adjacent to the Ashburton River.  
**Soil**      Dark reddish brown (2.5YR 3/4) sandy clay loam.  
**Rock Type**      Nil.  
**Vegetation**      P1: *Eucalyptus victrix* low open woodland over *\*Parkinsonia aculeata*, (*Acacia synchronicia*) tall open shrubland over *\*Vachellia farnesiana* scattered shrubs over *Eriachne flaccida*, *Eulalia aurea* open tussock grassland.  
P2: *Eucalyptus victrix* low open woodland over *\*Parkinsonia aculeata*, (*Acacia synchronicia*) tall open shrubland over *\*Vachellia farnesiana* open shrubland over *Eriachne flaccida*, *Eulalia aurea*, (*Sporobolus mitchellii*, *\*Cenchrus ciliaris*) tussock grassland.  
**Veg Condition**      P1: Good: several weed species, including 3% cover of Mesquite.  
P2: Good to Poor: several weed species, including 6% cover of Mesquite.  
**Fire Age**      P1 & P2: No sign of recent fire.  
**Notes**      P1: Grass stratum in very good condition despite weedy overstorey.

Phase 1: Species	Cover (%)	Height (cm)	Specimen	Notes	Phase 2: Species	Cover (%)	Height (cm)	Specimen	Notes
<i>Acacia coriacea</i> subsp. <i>coriacea</i>	0.1	210			<i>Acacia coriacea</i> subsp. <i>coriacea</i>	0.1	300		
<i>Acacia synchronicia</i>	1	280			<i>Acacia synchronicia</i>	0.5	180		
<i>Acacia tetragonophylla</i>	0.1	160			<i>Acacia tetragonophylla</i>	0.1	160		
<i>Calotis porphyroglossa</i>	0.1	15	ASH30-03		<i>Calotis porphyroglossa</i>	0.1	15		
					<i>Cenchrus ciliaris</i>	0.5	40		
<i>Cullen leucanthum</i>	0.1	50	ASH30-05	sens. lat.					
					<i>Dactyloctenium radulans</i>	0.1	10		
<i>Eriachne flaccida</i>	14	40	ASH30-08		<i>Eriachne flaccida</i>	20	35		
<i>Eucalyptus victrix</i>	2	700			<i>Eucalyptus victrix</i>	2	200		
<i>Eulalia aurea</i>	14	80			<i>Eulalia aurea</i>	14	60		
					<i>Euphorbia tannensis</i> subsp. <i>eremophila</i>	0.1	40	ASH30-02	
<i>Euphorbia</i> sp. ( <i>boophthona/tannensis</i> )	0.1	25	ASH30-01	Inadequate material.					
					<i>Ipomoea coptica</i>	0.1	20	ASH30-01	
<i>Ipomoea muelleri</i>	0.1	25	ASH30-09		<i>Ipomoea muelleri</i>	0.1	10		
					<i>Maireana</i> sp.	0.1	5		
<i>Malvastrum americanum</i>	0.1	20		N=1	<i>Malvastrum americanum</i>	0.1	10		

Phase 1: Species	Cover (%)	Height (cm)	Specimen	Notes	Phase 2: Species	Cover (%)	Height (cm)	Specimen	Notes
<i>Parkinsonia aculeata</i>	3	400			<i>Parkinsonia aculeata</i>	6	400		N=17
<i>Passiflora foetida</i> var. <i>hispida</i>	0.1	120	ASH30-10	N=1.	<i>Passiflora foetida</i> var. <i>hispida</i>	0.1	300		N=7
<i>Prosopis pallida</i>	0.1	600		N=1.	<i>Prosopis pallida</i>	0.1	200		N=1
<i>Pterocaulon sphacelatum</i>	0.1	40	ASH30-02		<i>Pterocaulon sphacelatum</i>	0.1	40		
					<i>Ptilotus exaltatus</i>	0.1	5		
<i>Rhagodia eremaea</i>	0.1	80	ASH30-07		<i>Rhagodia eremaea</i>	0.1	170		
<i>Rhynchosia minima</i>	0.1	10			<i>Rhynchosia minima</i>	0.1	5		
<i>Scaevola spinescens</i>	0.1	40			<i>Scaevola spinescens</i>	0.1	40		
<i>Setaria dielsii</i>	0.1	15	ASH30-06						
<i>Sida fibulifera</i>	0.1	15	ASH30-04	sens. lat.	<i>Sida fibulifera</i>	0.1	10		
<i>Sporobolus mitchellii</i>	0.5	15	ASH16-01=		<i>Sporobolus mitchellii</i>	2	15		
<i>Stemodia</i> sp. Onslow (A.A. Mitchell 76/148)	0.1	60			<i>Stemodia</i> sp. Onslow (A.A. Mitchell 76/148)	0.1	50		
<i>Trichodesma zeylanicum</i> var. <i>grandiflorum</i>	0.1	30							
<i>Vachellia farnesiana</i>	1.5	180			<i>Vachellia farnesiana</i>	2	150		N=20



**Phase 1**



**Phase 2**

**Ashburton Salt Flora Phase 1**      **Site**    ASH31  
**Described by**    MM/RM      **Date**    04-Nov-18      **Type**    Quadrat 50 x 50 m  
**MGA Zone**        50    288802 **mE**    7595096 **mN**    114.958009 °E    -21.735054 °S  
**Habitat**            Plain; undulating plain surrounded by low hills/dunes.  
**Soil**                 Yellowish red sandy loam.  
**Rock Type**         Nil.  
**Vegetation**        *Acacia tetragonophylla* scattered shrubs over *Triodia epactia* closed hummock grassland.  
**Veg Condition**    Very Good: scattered weeds.  
**Fire Age**            No sign of recent fire.

Phase 1: Species	Cover (%)	Height (cm)	Specimen	Notes
<i>Abutilon lepidum</i>	0.1	5	ASH31-03	
<i>Acacia tetragonophylla</i>	0.5	180		
<i>Angianthus acrohyalinus</i>	0.1	15	ASH21-09=	
<i>Atriplex semilunaris</i>	0.1	30		
<i>Calandrinia polyandra</i>	0.1	20	ASH13-03=	
<i>Cenchrus ciliaris</i>	0.1	30		N=100.
<i>Chrysopogon fallax</i>	0.1	70		
<i>Dactyloctenium radulans</i>	0.1	5		
<i>Eragrostis cumingii</i>	0.1	5	ASH31-01	
<i>Eulalia aurea</i>	0.1	60		
<i>Gnephosis arachnoidea</i>	0.1	15	RELO2-02=	
<i>Lepidium platypetalum</i>	0.1	50	ASH25-01=	
<i>Lobelia heterophylla</i> subsp. <i>pilbarensis</i>	0.1	30	ASH-MB21=	Need better material to confidently ID to subsp.
<i>Nicotiana occidentalis</i>	0.1	15	ASH09-04=	Inadequate material for determination to subsp.
<i>Ptilotus polystachyus</i>	0.1	30		
<i>Rhagodia eremaea</i>	0.1	165		
<i>Rhynchosia minima</i>	0.1	10		
<i>Roebuckiella cheilocarpa</i> var. <i>cheilocarpa</i>	0.1	20	ASH13-02=	
<i>Sclerolaena recurvicauspis</i>	0.1	15	RELO2-01=	
<i>Stenopetalum</i> sp.	0.1	25	ASH-MB25=	Inadequate material for determination.
<i>Trachymene pilbarensis</i>	0.1	20		
<i>Triodia epactia</i>	80	40		
<i>Wahlenbergia</i> sp.	0.1	20	ASH31-02	Inadequate material for determination.



**Phase 1**

**Ashburton Salt Flora**      **Site**      ASH32

**Described by**      P1: RWSW      P2: SWJK      **Date**      P1: 04-Nov-18      P2: 16-Apr-19      **Type**      Quadrat 50 x 50 m

**MGA Zone**      50      285795 **mE**      7594553 **mN**      114.928879 °E      -21.739596 °S

**Habitat**      Dune; medium.

**Soil**      Dark reddish brown (2.5YR 3/4) sand.

**Rock Type**      Nil.

**Vegetation**      P1: *Acacia coriacea* subsp. *coriacea*, *Grevillea stenobotrya* tall open shrubland over *A. stellaticeps* shrubland over *Triodia epactia* open hummock grassland over \**Cenchrus ciliaris* scattered tussock grasses.  
P2: *Grevillea stenobotrya* tall open shrubland over *Acacia stellaticeps* (*A. coriacea* subsp. *coriacea*, *Stylobasium spathulatum*, *Olearia* sp. Kennedy Range (G. Byrne 66)) shrubland over *Triodia epactia* open hummock grassland over \**Cenchrus ciliaris* very open tussock grassland.

**Veg Condition**      P1: Very Good: low density of \**Cenchrus ciliaris*.  
P2: Very Good to Good: 7% cover of \**Cenchrus ciliaris*.

**Fire Age**      P1: No sign of recent fire.  
P2: Very long unburnt.

**Notes**      P1: Fauna pit trap line within quadrat.

Phase 1: Species	Cover (%)	Height (cm)	Specimen	Notes	Phase 2: Species	Cover (%)	Height (cm)	Notes
<i>Abutilon</i> sp. Pritzelianum (S. van Leeuwen 5095)	0.1	130	ASH32-02	N=1	<i>Abutilon</i> sp. Pritzelianum (S. van Leeuwen 5095)	0.1	25	N=7
<i>Acacia coriacea</i> subsp. <i>coriacea</i>	3	550			<i>Acacia coriacea</i> subsp. <i>coriacea</i>	2	80	
<i>Acacia stellaticeps</i>	11	130			<i>Acacia stellaticeps</i>	11	110	
<i>Acacia tetragonophylla</i>	0.1	150			<i>Acacia tetragonophylla</i>	0.1	130	
<i>Bonamia erecta</i>	0.1	40			<i>Bonamia erecta</i>	0.1	30	
<i>Cassytha capillaris</i>	0.1	40	ASH32-08		<i>Cassytha capillaris</i>	0.1	20	
<i>Cenchrus ciliaris</i>	1	35			<i>Cenchrus ciliaris</i>	7	30	
<i>Crotalaria cunninghamii</i> subsp. <i>sturtii</i>	0.1	15			<i>Crotalaria cunninghamii</i> subsp. <i>sturtii</i>	0.1	35	
<i>Cullen leucanthum</i>	0.1	20	ASH30-05=	sens. lat.	<i>Cullen leucanthum</i>	0.1	5	
<i>Eragrostis eriopoda</i>	0.1	35	ASH32-05					
<i>Grevillea stenobotrya</i>	2	300	ASH32-07		<i>Grevillea stenobotrya</i>	2	210	
<i>Hakea chordophylla</i>	0.1	140			<i>Hakea chordophylla</i>	0.1	140	
<i>Maireana</i> ? <i>lobiflora</i>	0.1	35	ASH32-09					
<i>Olearia</i> sp. Kennedy Range (G. Byrne 66)	0.1	120	ASH32-01		<i>Olearia</i> sp. Kennedy Range (G. Byrne 66)	0.5	70	
<i>Quoya loxocarpa</i>	0.1	20	ASH32-03		<i>Quoya loxocarpa</i>	0.1	20	
<i>Rhynchosia minima</i>	0.1	20			<i>Rhynchosia minima</i>	0.1	10	
<i>Scaevola sericophylla</i>	0.1	30			<i>Scaevola sericophylla</i>	0.1	60	
<i>Solanum diversiflorum</i>	0.1	30						
<i>Solanum lasiophyllum</i>	0.1	40			<i>Solanum lasiophyllum</i>	0.1	80	

Phase 1: Species	Cover (%)	Height (cm)	Specimen	Notes	Phase 2: Species	Cover (%)	Height (cm)	Notes
<i>Stylobasium spathulatum</i>	0.5	195	ASH32-06	Atypical.	<i>Stylobasium spathulatum</i>	0.5	170	
<i>Triodia epactia</i>	25	40			<i>Triodia epactia</i>	25	60	
<i>Verticordia forrestii</i>	0.1	45	ASH32-04		<i>Verticordia forrestii</i>	0.1	60	



Phase 1



Phase 2

**Ashburton Salt Flora**      **Site**    ASH33

**Described by**    P1: MM/RM    P2: JKRM      **Date**    P1: 04-Nov-18    P2: 13-Apr-19      **Type**    Quadrat 50 x 50 m

**MGA Zone**        50    287589 **mE**      7595307 **mN**    114.946314 **°E**    -21.733004 **°S**

**Habitat**            Plain; 'scalded' clay plain (saline).

**Soil**                 Yellowish red sandy loam to sandy clay loam.

**Rock Type**        Nil.

**Vegetation**        P1: *Atriplex bunburyana*, *Tecticornia indica* subsp. *leiostachya* low open shrubland over *Atriplex codonocarpa*, (*Sclerolaena recurvicauspis*) very open herbland over \**Cenchrus ciliaris*, \**C. setiger* very open tussock grassland.  
P2: *Tecticornia indica* subsp. *leiostachya*, *Atriplex bunburyana* low open shrubland over \**Cenchrus ciliaris*, (*Sporobolus mitchellii*, \**C. setiger*) very open tussock grassland with *Atriplex codonocarpa* scattered herbs.

**Veg Condition**    P1: Good: scattered weeds; cattle grazing and scats.  
P2: Good: \**Cenchrus* spp. present.

**Fire Age**            P1 & P2: No sign of recent fire.

**Notes**                P1: This scalded habitat appears to be a natural progression, as the general *Triodia* hummock grassland plains erode down towards the base substrate, at which point they will become bare claypans; the vegetation would appear to be in "Poor" condition, given its sparseness, but given that this seems a natural process it has been assigned a ranking of "Good".

Phase 1: Species	Cover (%)	Height (cm)	Specimen	Notes	Phase 2: Species	Cover (%)	Height (cm)	Specimen
<i>Atriplex bunburyana</i>	1.5	50			<i>Atriplex bunburyana</i>	1	30	
<i>Atriplex codonocarpa</i>	3	20			<i>Atriplex codonocarpa</i>	0.5	20	
<i>Atriplex semilunaris</i>	0.1	30	ASH33-06					
<i>Calotis porphyroglossa</i>	0.1	15	ASH-MB02=					
<i>Cenchrus ciliaris</i>	1.5	30		N=500.	<i>Cenchrus ciliaris</i>	4	30	
<i>Cenchrus setiger</i>	1.5	40		N=500.	<i>Cenchrus setiger</i>	1	25	
<i>Chloris pumilio</i>	0.1	5	ASH-MB10=					
<i>Cyperus bulbosus</i>	0.1	20	ASH33-04		<i>Cyperus bulbosus</i>	0.1	15	
<i>Dactyloctenium radulans</i>	0.1	5			<i>Dactyloctenium radulans</i>	0.1	5	
<i>Eragrostis falcata</i>	0.1	25			<i>Eragrostis falcata</i>	0.1	20	
<i>Eriachne benthamii</i>	0.1	30			<i>Eriachne benthamii</i>	0.1	30	
<i>Frankenia ambita</i>	0.1	25	ASH09-14=		<i>Frankenia ambita</i>	0.1	10	
<i>Lepidium phlebopetalum</i>	0.1	10	ASH33-01					
<i>Ptilotus exaltatus</i>	0.1	20						
<i>Rhynchosia minima</i>	0.1	5						
<i>Salsola australis</i>	0.1	30						
<i>Scaevola spinescens</i>	0.1	50			<i>Scaevola spinescens</i>	0.1	50	
<i>Sclerolaena diacantha</i>	0.1	20	ASH33-03	sens. lat.	<i>Sclerolaena diacantha</i>	0.1	25	
<i>Sclerolaena recurvicauspis</i>	1	25	RELO2-01=		<i>Sclerolaena recurvicauspis</i>	0.1	25	
<i>Sporobolus mitchellii</i>	0.1	20	ASH-MB06=		<i>Sporobolus mitchellii</i>	2	20	
<i>Streptoglossa liatroides</i>	0.1	15	ASH33-05		<i>Streptoglossa liatroides</i>	0.1	20	



Phase 1: Species	Cover (%)	Height (cm)	Specimen	Notes	Phase 2: Species	Cover (%)	Height (cm)	Specimen
<i>Tecticornia indica</i> subsp. <i>leiostrachya</i>	1	50	ASH33-02		<i>Tecticornia indica</i> subsp. <i>leiostrachya</i>	1	45	ASH33-01



Phase 1



Phase 2

**Ashburton Salt Flora**      **Site**      ASH34

**Described by**      P1: RWSW      P2: RWRM      **Date**      P1: 04-Nov-18      P2: 10-Apr-19      **Type**      Quadrat 50 x 50 m

**MGA Zone**      50      280302 **mE**      7590646 **mN**      114.875277 °E      -21.774197 °S

**Habitat**      Swale; elevated between two low dunes.

**Soil**      Dark reddish brown (2.5YR 3/4) sandy clay loam (more loam).

**Rock Type**      Nil.

**Vegetation**      P1: *Hakea lorea* subsp. *lorea*, *Acacia synchronicia* scattered tall shrubs over *A. sclerosperma* subsp. *sclerosperma*, *A. tetragonophylla* open shrubland over *Triodia epactia*, *T. avenoides* open hummock grassland.  
P2: *Acacia sclerosperma* subsp. *sclerosperma*, *A. tetragonophylla*, (*Hakea lorea* subsp. *lorea*) open shrubland over *Triodia epactia*, *T. avenoides* open hummock grassland.

**Veg Condition**      P1 & P2: Very Good: scattered \**Cenchrus ciliaris*.

**Fire Age**      P1 & P2: No sign of recent fire.

**Notes**      P1: Hard to tell cover of distinct *Triodia* spp., as most are sterile; overall cover has been divided roughly equally.

Phase 1: Species	Cover (%)	Height (cm)	Specimen	Notes	Phase 2: Species	Cover (%)	Height (cm)	Specimen	Notes
					<i>Acacia coriacea</i> subsp. <i>coriacea</i>	0.1	130		
<i>Acacia sclerosperma</i> subsp. <i>sclerosperma</i>	4	170			<i>Acacia sclerosperma</i> subsp. <i>sclerosperma</i>	4	170		
<i>Acacia stellaticeps</i>	0.1	70			<i>Acacia stellaticeps</i>	0.1	50		
<i>Acacia synchronicia</i>	0.5	210			<i>Acacia synchronicia</i>	0.1	220		
<i>Acacia tetragonophylla</i>	2	130			<i>Acacia tetragonophylla</i>	2	160		
<i>Acacia trachycarpa</i>	0.1	210	ASH34-07		<i>Acacia trachycarpa</i>	0.1	220		
<i>Cenchrus ciliaris</i>	0.1	20		N=100 (estimated not counted)	<i>Cenchrus ciliaris</i>	0.5	30		
<i>Chrysopogon fallax</i>	0.1	45			<i>Chrysopogon fallax</i>	0.1	60		
<i>Eragrostis xerophila</i>	0.1	35	ASH34-05						
<i>Eremophila forrestii</i> subsp. <i>viridis</i>	0.1	100	ASH34-06	N=3.	<i>Eremophila forrestii</i> subsp. <i>viridis</i>	0.1	100		N=3
					<i>Eriachne helmsii</i>	0.1	30	ASH34-03	
					<i>Euphorbia boophthona</i>	0.1	40	ASH34-04	
<i>Euphorbia</i> sp. ( <i>boophthona/tannensis</i> )	0.1	30	ASH34-09	Inadequate material.					
					<i>Goodenia forrestii</i>	0.1	30		
<i>Goodenia microptera</i>	0.1	30							
<i>Hakea lorea</i> subsp. <i>lorea</i>	1	210			<i>Hakea lorea</i> subsp. <i>lorea</i>	1	150	ASH34-01	
					<i>Hibiscus sturtii</i> var. aff. <i>grandiflorus</i>	0.1	20	ASH34-02	
<i>Hibiscus sturtii</i> var. <i>platyklamys</i>	0.1	30	ASH34-08						
<i>Olearia</i> sp. Kennedy Range (G. Byrne 66)	0.1	130	ASH34-03		<i>Olearia</i> sp. Kennedy Range (G. Byrne 66)	0.1	125		

Phase 1: Species	Cover (%)	Height (cm)	Specimen	Notes	Phase 2: Species	Cover (%)	Height (cm)	Specimen	Notes
<i>Paraneurachne muelleri</i>	0.1	25							
<i>Rhagodia eremaea</i>	0.1	50	ASH34-10		<i>Rhagodia eremaea</i>	0.1	60		
<i>Scaevola pulchella</i>	0.1	25	ASH34-04		<i>Scaevola pulchella</i>	0.1	30		
<i>Senna artemisioides</i> subsp. <i>oligophylla</i>	0.1	100	ASH34-01		<i>Senna artemisioides</i> subsp. <i>oligophylla</i>	0.1	70		
<i>Sida fibulifera</i>	0.1	20	ASH34-02	sens. lat.	<i>Sida fibulifera</i>	0.1	15		
<i>Solanum lasiophyllum</i>	0.1	25			<i>Solanum lasiophyllum</i>	0.1	15		
<i>Triodia avenoides</i>	11	25			<i>Triodia avenoides</i>	10	30		
<i>Triodia epactia</i>	11	30			<i>Triodia epactia</i>	18	30		



Phase 1



Phase 2

**Ashburton Salt Flora**      **Site**    ASH35  
**Described by**    P1: MM/RM    P2: RMJK      **Date**    P1: 04-Nov-18    P2: 13-Apr-19      **Type**    Quadrat 50 x 50 m  
**MGA Zone**        50    287500 **mE**      7594869 **mN**    114.945397 °E    -21.736948 °S  
**Habitat**            Clay plain; saline, with small sandy islands.  
**Soil**                 Yellowish red sandy loam.  
**Rock Type**        Nil.  
**Vegetation**       P1 & P2: *Tecticornia indica* subsp. *leiostachya* low open shrubland.  
**Veg Condition**    P1: Very Good: scattered weeds and evidence of cattle.  
                           P2: Very Good: occasional \**Cenchrus ciliaris*.  
**Fire Age**            P1 & P2: No sign of recent fire.

Phase 1: Species	Cover (%)	Height (cm)	Specimen	Notes	Phase 2: Species	Cover (%)	Height (cm)	Specimen
<i>Angianthus acrohyalinus</i>	0.1	15	ASH21-09=					
<i>Atriplex codonocarpa</i>	0.1	5			<i>Atriplex codonocarpa</i>	0.1	20	
<i>Atriplex semilunaris</i>	0.1	10			<i>Atriplex semilunaris</i>	0.1	30	
<i>Cenchrus ciliaris</i>	0.1	10		N=200.	<i>Cenchrus ciliaris</i>	0.1	5	
<i>Dactyloctenium radulans</i>	0.1	5						
<i>Eragrostis falcata</i>	0.1	20						
<i>Frankenia ambita</i>	0.1	10	ASH09-14=		<i>Frankenia ambita</i>	0.1	20	
<i>Haloragis gossei</i>	0.1	20						
<i>Lepidium phlebopetalum</i>	0.1	5	ASH33-01=					
<i>Neobassia astrocarpa</i>	0.1	15	ASH35-02		<i>Neobassia astrocarpa</i>	0.1	20	
<i>Salsola australis</i>	0.1	15						
<i>Sclerolaena recurvicauspis</i>	0.1	20	REL02-01=		<i>Sclerolaena recurvicauspis</i>	0.1	20	ASH35-02
<i>Swainsona pterostylis</i>	0.1	10	REL01-01=					
<i>Tecticornia indica</i> subsp. <i>leiostachya</i>	5	25	ASH35-01		<i>Tecticornia indica</i> subsp. <i>leiostachya</i>	8	30	ASH35-01



**Phase 1**



**Phase 2**

**Ashburton Salt Flora Phase 1**      **Site**    ASH36

**Described by**    RWSW    **Date**    05-Nov-18      **Type**    Quadrat 50 x 50 m

**MGA Zone**        50      263401    **mE**        7573367    **mN**        114.709435 °E    -21.928002 °S

**Habitat**            Plain; on a small coastal island adjacent to a low dune.

**Soil**                 Reddish brown (2.5YR 4/4) clay loam.

**Rock Type**        Nil.

**Vegetation**        *Acacia sclerosperma* subsp. *sclerosperma*, (*A. synchronica*, *A. tetragonophylla*) open shrubland over *A. coriacea* subsp. *coriacea* scattered low shrubs over *Triodia epactia* hummock grassland.

**Veg Condition**    Very Good: low cover of \**Cenchrus ciliaris*.

**Fire Age**            No sign of recent fire.

Phase 1: Species	Cover (%)	Height (cm)	Specimen	Notes
<i>Acacia coriacea</i> subsp. <i>coriacea</i>	0.5	80		
<i>Acacia sclerosperma</i> subsp. <i>sclerosperma</i>	2	130		
<i>Acacia synchronica</i>	0.5	130		
<i>Acacia tetragonophylla</i>	0.5	170		
<i>Cassutha capillaris</i>	0.1	30		
<i>Cenchrus ciliaris</i>	0.1	20		N=20 (estimated not counted)
<i>Eriachne helmsii</i>	0.1	35	ASH36-01	
<i>Gnephosis arachnoidea</i>	0.1	10	ASH02-05=	
<i>Rhagodia eremaea</i>	0.1	70	ASH36-02	
<i>Scaevola cunninghamii</i>	0.1	30	ASH36-03	
<i>Scaevola spinescens</i> (broad form)	1	50		
<i>Solanum lasiophyllum</i>	0.1	30		
<i>Triodia epactia</i>	45	40		



**Phase 1**

**Ashburton Salt Flora**      **Site**    ASH37  
**Described by**    P1: MM/RM    P2: BDMJK      **Date**    P1: 04-Nov-18    P2: 14-Apr-19      **Type**    Quadrat 50 x 50 m  
**MGA Zone**        50    260132 **mE**        7583591 **mN**    114.679301 **°E**    -21.835264 **°S**  
**Habitat**            Plain; broad coastal plain.  
**Soil**                 Light reddish brown sandy loam.  
**Rock Type**        Nil.  
**Vegetation**        P1: *Indigofera bovipерda* subsp. *bovipерda*, *Quoya loxocarpa* scattered low shrubs over *Triodia epactia* closed hummock grassland over \**Cenchrus ciliaris* very open tussock grassland.  
P2: *Indigofera bovipерda* subsp. *bovipерda* scattered low shrubs over *Triodia epactia* hummock grassland over \**Cenchrus ciliaris* very open tussock grassland.  
**Veg Condition**    P1: Very Good: scattered weeds.  
P2: Very Good: scattered \**Cenchrus ciliaris*.  
**Fire Age**            P1: No sign of recent fire.  
P2: Very long unburnt.

Phase 1: Species	Cover (%)	Height (cm)	Specimen	Notes	Phase 2: Species	Cover (%)	Height (cm)	Specimen	Notes
<i>Cenchrus ciliaris</i>	3	30		N=1000.	<i>Cenchrus ciliaris</i>	2	25		
<i>Crotalaria cunninghamii</i> subsp. <i>sturtii</i>	0.1	90			<i>Crotalaria cunninghamii</i> subsp. <i>sturtii</i>	0.1	100		
<i>Dysphania plantaginella</i>	0.1	5	ASH37-01						
<i>Eragrostis eriopoda</i>	0.1	30			<i>Eragrostis eriopoda</i>	0.1	35		
<i>Euphorbia australis</i> var. <i>hispidula</i>	0.1	5	ASH37-05						
					<i>Euphorbia</i> ? <i>biconvexa</i>	0.1	15	ASH37-04	Poor material.
<i>Euphorbia tannensis</i> subsp. <i>eremophila</i>	0.1	30			<i>Euphorbia tannensis</i> subsp. <i>eremophila</i>	0.1	20	ASH37-03	
<i>Euphorbia trigonosperma</i>	0.1	25	ASH37-06		<i>Euphorbia trigonosperma</i>	0.1	20		
<i>Indigofera bovipерda</i> subsp. <i>bovipерda</i>	0.5	60			<i>Indigofera bovipерda</i> subsp. <i>bovipерda</i>	1	60	ASH37-01	
<i>Indigofera colutea</i>	0.1	5							
<i>Nicotiana occidentalis</i>	0.1	30	ASH37-02	Inadequate material for determination to subsp.	<i>Nicotiana occidentalis</i>	0.1	40		
<i>Pterocaulon sphacelatum</i>	0.1	50	ASH37-04		<i>Pterocaulon sphacelatum</i>	0.1	40		
<i>Pterocaulon sphaeranthoides</i>	0.1	40			<i>Pterocaulon sphaeranthoides</i>	0.1	40		
<i>Quoya loxocarpa</i>	0.25	70	ASH13-11=		<i>Quoya loxocarpa</i>	0.1	70		



Phase 1: Species	Cover (%)	Height (cm)	Specimen	Notes	Phase 2: Species	Cover (%)	Height (cm)	Specimen	Notes
<i>Rhynchosia minima</i>	0.1	30			<i>Rhynchosia minima</i>	0.1	30		
<i>Scaevola cunninghamii</i>	0.1	50	ASH37-07						
<i>Sida rohlenae</i> subsp. <i>rohlenae</i>	0.1	30			<i>Sida rohlenae</i> subsp. <i>rohlenae</i>	0.1	40		
<i>Solanum cleistogamum</i>	0.1	30	ASH37-03		<i>Solanum cleistogamum</i>	0.1	20		
<i>Solanum lasiophyllum</i>	0.1	50			<i>Solanum lasiophyllum</i>	0.1	70		
<i>Triodia epactia</i>	75	60			<i>Triodia epactia</i>	65	50		
<i>Whiteochloa airoides</i>	0.1	60	ASH37-08		<i>Whiteochloa airoides</i>	0.1	70		



Phase 1



Phase 2

**Ashburton Salt Flora**      **Site**    ASH38  
**Described by**    P1: RWSW      P2: SWJK      **Date**    P1: 05-Nov-18    P2: 11-Apr-19    **Type**    Quadrat 50 x 50 m  
**MGA Zone**        50    257154 **mE**      7564786 **mN**    114.647719 °E    -22.004609 °S  
**Habitat**            Plain; gently undulating plain on a coastal island (inland).  
**Soil**                 Reddish brown (2.5YR 4/4) loamy sand.  
**Rock Type**        Nil.  
**Vegetation**        P1: *Acacia stellaticeps*, (*A. tetragonophylla*, *A. coriacea* subsp. *coriacea*, *A. synchronicia*) open shrubland over *Triodia epactia* hummock grassland.  
P2: *Acacia tetragonophylla*, *A. coriacea* subsp. *coriacea* open shrubland over *Acacia stellaticeps* low open shrubland over *Triodia epactia* hummock grassland.  
**Veg Condition**    P1: Very Good: very occasional \**Cenchrus ciliaris*.  
P2: Excellent.  
**Fire Age**            P1 & P2: No sign of recent fire.  
**Notes**                P2: No \**Cenchrus* found.

Phase 1: Species	Cover (%)	Height (cm)	Specimen	Notes	Phase 2: Species	Cover (%)	Height (cm)	Specimen
<i>Acacia coriacea</i> subsp. <i>coriacea</i>	1	150			<i>Acacia coriacea</i> subsp. <i>coriacea</i>	1	120	
<i>Acacia stellaticeps</i>	3	120			<i>Acacia stellaticeps</i>	2	80	
<i>Acacia synchronicia</i>	0.5	130			<i>Acacia synchronicia</i>	0.1	170	
<i>Acacia tetragonophylla</i>	1	160			<i>Acacia tetragonophylla</i>	1	160	
<i>Cassyltha capillaris</i>	0.1	90			<i>Cassyltha capillaris</i>	0.1	40	
<i>Cenchrus ciliaris</i>	0.1	15		N=20 (estimated not counted)				
<i>Goodenia microptera</i>	0.1	25						
<i>Lepidium platypetalum</i>	0.1	50			<i>Lepidium platypetalum</i>	0.1	80	
<i>Nicotiana occidentalis</i>	0.1	35	RW35=	Inadequate material for determination to subsp.				
<i>Pterocaulon sphaeranthoides</i>	0.1	3			<i>Pterocaulon sphaeranthoides</i>	0.1	10	
<i>Ptilotus polystachyus</i>	0.1	25						
<i>Rhagodia eremaea</i>	0.1	110	ASH36-02=		<i>Rhagodia eremaea</i>	0.1	70	
<i>Salsola australis</i>	0.1	20						
					<i>Scaevola cunninghamii</i>	0.1	60	ASH38-01
<i>Scaevola spinescens</i>	0.1	60			<i>Scaevola spinescens</i>	0.1	60	
<i>Scaevola spinescens</i> (broad form)	0.1	35						
<i>Solanum cleistogamum</i>	0.1	35			<i>Solanum cleistogamum</i>	0.1	40	
<i>Solanum lasiophyllum</i>	0.1	30			<i>Solanum lasiophyllum</i>	0.1	40	
<i>Triodia epactia</i>	50	45			<i>Triodia epactia</i>	50	60	



**Phase 1**



**Phase 2**

**Ashburton Salt Flora**      **Site**    ASH39  
**Described by**    P1: MM/RM    P2: JKRM      **Date**    P1: 04-Nov-18    P2: 14-Apr-19    **Type**    Quadrat 50 x 50 m  
**MGA Zone**        50    264495 **mE**      7587243 **mN**    114.722009 °E    -21.802884 °S  
**Habitat**            Dune; slopes and crest of secondary sand dunes.  
**Soil**                 Reddish brown sand.  
**Rock Type**        Nil.  
**Vegetation**        P1: *Acacia coriacea* subsp. *coriacea* tall open shrubland over *A. stellaticeps* low open shrubland over *Corynotheca pungens* very open herbland over *Triodia epactia* hummock grassland over \**Cenchrus ciliaris* scattered tussock grasses.  
P2: *Acacia coriacea* subsp. *coriacea* tall open shrubland over *A. stellaticeps* low open shrubland over *Triodia epactia* hummock grassland over \**Cenchrus ciliaris* very open tussock grassland over *Corynotheca pungens* very open herbland.  
**Veg Condition**    P1: Very Good: scattered weeds.  
P2: Very Good: 3% cover of \**Cenchrus ciliaris*.  
**Fire Age**            P1 & P2: No sign of recent fire.

Phase 1: Species	Cover (%)	Height (cm)	Specimen	Notes	Phase 2: Species	Cover (%)	Height (cm)
<i>Acacia coriacea</i> subsp. <i>coriacea</i>	3	250			<i>Acacia coriacea</i> subsp. <i>coriacea</i>	3	250
<i>Acacia stellaticeps</i>	3	90			<i>Acacia stellaticeps</i>	3	120
<i>Calandrinia polyandra</i>	0.1	20	ASH11-02=				
<i>Cassutha capillaris</i>	0.1	50			<i>Cassutha capillaris</i>	0.1	30
<i>Cenchrus ciliaris</i>	0.5	30		N=1000.	<i>Cenchrus ciliaris</i>	3	30
<i>Corynotheca pungens</i>	5	60	ASH39-01		<i>Corynotheca pungens</i>	3	90
<i>Nicotiana occidentalis</i>	0.1	20	ASH09-04=	Inadequate material for determination to subsp.			
<i>Olearia</i> sp. Kennedy Range (G. Byrne 66)	0.1	110	ASH39-03		<i>Olearia</i> sp. Kennedy Range (G. Byrne 66)	0.1	100
<i>Ptilotus polystachyus</i>	0.1	30					
<i>Rhagodia eremaea</i>	0.1	140			<i>Rhagodia eremaea</i>	0.1	60
<i>Rhagodia preissii</i> subsp. <i>obovata</i>	0.1	60	ASH39-02		<i>Rhagodia preissii</i> subsp. <i>obovata</i>	0.1	60
<i>Solanum lasiophyllum</i>	0.1	25			<i>Solanum lasiophyllum</i>	0.1	60
<i>Triodia epactia</i>	55	50			<i>Triodia epactia</i>	55	50
<i>Whiteochloa airoides</i>	0.1	50	ASH37-08=		<i>Whiteochloa airoides</i>	0.1	70



**Phase 1**



**Phase 2**

**Ashburton Salt Flora**      **Site**      ASH40  
**Described by**      P1: RWSW      P2: SWJK      **Date**      P1: 05-Nov-18      P2: 09-Apr-19      **Type**      Quadrat 10 x 250 m  
**MGA Zone**      50      267699 **mE**      7574232 **mN**      114.751143 **°E**      -21.920767 **°S**  
**Habitat**      Saline flat; at the edge of a small inland island.  
**Soil**      Reddish brown (2.5YR 4/4) clayey sand (high salt content).  
**Rock Type**      Nil.  
**Vegetation**      P1: *Tecticornia auriculata*, (*T. pterygosperma* subsp. aff. *denticulata*, *Surreya diandra*) low shrubland.  
                          P2: *Tecticornia auriculata*, (*T. pterygosperma*, *Surreya diandra*) low shrubland.  
**Veg Condition**      P1 & P2: Very Good: scattered \**Cenchrus ciliaris*.  
**Fire Age**      P1 & P2: No sign of recent fire.

Phase 1: Species	Cover (%)	Height (cm)	Specimen	Notes	Phase 2: Species	Cover (%)	Height (cm)	Specimen
<i>Atriplex semilunaris</i>	0.1	5			<i>Atriplex semilunaris</i>	0.1	5	
<i>Cenchrus ciliaris</i>	0.1	25		N=20 (estimated not counted)	<i>Cenchrus ciliaris</i>	0.1	25	
<i>Cressa australis</i>	0.1	10	ASH40-01		<i>Cressa australis</i>	0.1	20	ASH40-02
<i>Eragrostis falcata</i>	0.1	30	ASH40-03		<i>Eragrostis falcata</i>	0.1	20	
<i>Frankenia ambita</i>	0.1	20	ASH40-04		<i>Frankenia ambita</i>	0.1	50	
<i>Muellerolimon salicorniaceum</i>	0.1	30	ASH40-05					
					<i>Neobassia astrocarpa</i>	0.1	20	ASH40-01
<i>Sporobolus virginicus</i>	0.1	25	ASH40-02					
<i>Surreya diandra</i>	2	30	ASH40-06		<i>Surreya diandra</i>	1.5	20	
<i>Tecticornia auriculata</i>	26	120	ASH40-07		<i>Tecticornia auriculata</i>	26	120	
<i>Tecticornia halocnemoides</i> subsp. <i>tenuis</i>	0.1	25	ASH40-09		<i>Tecticornia halocnemoides</i> subsp. <i>tenuis</i>	0.1	25	
<i>Tecticornia pterygosperma</i> subsp. aff. <i>denticulata</i>	2	50	ASH40-08	K. Shepherd det.	<i>Tecticornia pterygosperma</i> subsp. aff. <i>denticulata</i>	2	50	
<i>Tecticornia</i> sp.	0.1	60	ASH40-10	Inadequate material.				



**Phase 1**

**(NB. Phase 2 photo not taken.)**

**Ashburton Salt Flora**      **Site**    ASH41  
**Described by**    P1: MM/RM    P2: BMRW      **Date**    P1: 05-Nov-18    P2: 09-Apr-19      **Type**    Quadrat 50 x 50 m  
**MGA Zone**        50    271307 **mE**        7584471 **mN**        114.787477 °E    -21.828805 °S  
**Habitat**            Clay plain; saline clay plain.  
**Soil**                 Yellowish red light clay.  
**Rock Type**         Nil.  
**Vegetation**        P1: *Tecticornia auriculata* low shrubland.  
                           P2: *Tecticornia auriculata* shrubland.  
**Veg Condition**    P1: Very Good: cattle evidence (scats and tracks); no weeds.  
                           P2: Excellent. Old cattle scats present, but no evidence of current activity.  
**Fire Age**            P1 & P2: No sign of recent fire.

Phase 1: Species	Cover (%)	Height (cm)	Specimen	Notes	Phase 2: Species	Cover (%)	Height (cm)	Specimen
<i>Angianthus acrohyalinus</i>	0.1	20	ASH21-09=					
<i>Atriplex bunburyana</i>	0.1	25						
<i>Dysphania plantaginella</i>	0.1	10	ASH37-01=					
<i>Eragrostis falcata</i>	0.1	15						
<i>Lawrencia densiflora</i>	0.1	15	ASH41-05		<i>Lawrencia densiflora</i>	0.1	20	ASH41-01
<i>Neobassia astrocarpa</i>	0.1	20	ASH35-02=					
<i>Nicotiana rosulata</i> subsp. <i>rosulata</i>	0.1	15	ASH41-02					
<i>Tecticornia auriculata</i>	20	90	ASH41-01		<i>Tecticornia auriculata</i>	20	110	
<i>Tecticornia</i> sp.	0.1	25	ASH41-03	Inadequate material.				





**Phase 1**



**Phase 2**

**Ashburton Salt Flora**      **Site**      ASH42

**Described by**      P1: RWSW      P2: RWRM      **Date**      P1: 05-Nov-18      P2: 10-Apr-19      **Type**      Quadrat 50 x 50 m

**MGA Zone**      50      279932 **mE**      7589582 **mN**      114.871558 **°E**      -21.783758 **°S**

**Habitat**      Plain; adjacent to drainage; low dune adjacent to the east, otherwise broad coastal plain.

**Soil**      Dark reddish brown (2.5YR 3/4) loamy sand.

**Rock Type**      Nil.

**Vegetation**      P1: *Eucalyptus victrix* low open forest over *Acacia tetragonophylla*, (*A. coriacea* subsp. *coriacea*) tall open shrubland over *Triodia epactia* very open hummock grassland over *Eriachne flaccida*, (*Eulalia aurea*, *Sporobolus mitchellii*, *\*Cenchrus ciliaris*) very open tussock grassland.  
P2: *Eucalyptus victrix* low open forest over *Acacia tetragonophylla*, *A. coriacea* subsp. *coriacea* tall open shrubland over *Triodia epactia* open hummock grassland over *Eriachne flaccida*, *Sporobolus mitchellii*, *\*Cenchrus ciliaris* scattered tussock grasses.

**Veg Condition**      P1: Very Good: scattered *\*Cenchrus ciliaris*; cattle scats present.  
P2: Very Good: scattered weeds; cattle scats and tracks.

**Fire Age**      P1 & P2: No sign of recent fire.

Phase 1: Species	Cover (%)	Height (cm)	Specimen	Notes	Phase 2: Species	Cover (%)	Height (cm)	Specimen	Notes
					<i>Abutilon otocarpum</i>	0.1	5		
<i>Abutilon oxycarpum</i> subsp. Prostrate (A.A. Mitchell PRP 1266)	0.1	5	ASH42-02	Range extension.					
<i>Acacia coriacea</i> subsp. <i>coriacea</i>	1	320			<i>Acacia coriacea</i> subsp. <i>coriacea</i>	1	280		
<i>Acacia sclerosperma</i> subsp. <i>sclerosperma</i>	0.1	120			<i>Acacia sclerosperma</i> subsp. <i>sclerosperma</i>	0.1	150		
<i>Acacia synchronicia</i>	0.1	50			<i>Acacia synchronicia</i>	0.1	90		
<i>Acacia tetragonophylla</i>	2	320			<i>Acacia tetragonophylla</i>	3	250		
<i>Cenchrus ciliaris</i>	0.5	40			<i>Cenchrus ciliaris</i>	0.25	30		
<i>Chrysopogon fallax</i>	0.1	90			<i>Chrysopogon fallax</i>	0.1	40		
					<i>Cyperus bulbosus</i>	0.1	10		
<i>Enchylaena tomentosa</i> var. <i>tomentosa</i>	0.1	35			<i>Enchylaena tomentosa</i> var. <i>tomentosa</i>	0.1	60		
<i>Eragrostis falcata</i>	0.1	35	ASH42-01						
<i>Eriachne flaccida</i>	3	35	ASH42-04		<i>Eriachne flaccida</i>	0.25	30		
<i>Eucalyptus victrix</i>	43	650			<i>Eucalyptus victrix</i>	35	650		
<i>Eulalia aurea</i>	0.5	50							
					<i>Marsilea hirsuta</i>	0.1	5		
					<i>Ptilotus exaltatus</i>	0.1	5		
					<i>Rhagodia eremaea</i>	0.1	20	ASH42-01	
<i>Salsola australis</i>	0.1	10							
<i>Scaevola spinescens</i>	0.1	45			<i>Scaevola spinescens</i>	0.1	70		

Phase 1: Species	Cover (%)	Height (cm)	Specimen	Notes	Phase 2: Species	Cover (%)	Height (cm)	Specimen	Notes
<i>Setaria dielsii</i>	0.1	30							
					<i>Solanum cleistogamum</i>	0.1	20		
<i>Solanum horridum</i>	0.1	10							
<i>Solanum lasiophyllum</i>	0.1	20			<i>Solanum lasiophyllum</i>	0.1	25		
<i>Sporobolus mitchellii</i>	0.5	25	ASH42-03		<i>Sporobolus mitchellii</i>	0.25	20		
<i>Triodia epactia</i>	7	35			<i>Triodia epactia</i>	11	30		
<i>Vachellia farnesiana</i>	0.1	150		N=1.	<i>Vachellia farnesiana</i>	0.1	50		N=1.



Phase 1



Phase 2

**Ashburton Salt Flora**      **Site**      ASH43

**Described by**      P1: MM/RM      **Date**      P1: 05-Nov-18      **Type**      Quadrat 50 x 50 m

**MGA Zone**      50      267979 **mE**      7586150 **mN**      114.755535 °E      -21.813212 °S

**Habitat**      Plain; undulating plain with scattered termite mounds.

**Soil**      Reddish yellow sandy loam - sandy clay loam.

**Rock Type**      Nil.

**Vegetation**      P1 & P2: *Acacia tetragonophylla* scattered shrubs over *Triodia epactia* hummock grassland over \**Cenchrus ciliaris* open tussock grassland.

**Veg Condition**      P1: Good: 11% cover of \**Cenchrus ciliaris*; cattle scats.  
P2: Good: 13% cover of \**Cenchrus ciliaris*; a few cattle scats present.

**Fire Age**      P1 & P2: No sign of recent fire.

Phase 1: Species	Cover (%)	Height (cm)	Specimen	Notes	Phase 2: Species	Cover (%)	Height (cm)	Specimen
<i>Acacia coriacea</i> subsp. <i>coriacea</i>	0.1	70			<i>Acacia coriacea</i> subsp. <i>coriacea</i>	0.1	110	
<i>Acacia synchronicia</i>	0.1	170			<i>Acacia synchronicia</i>	0.1	190	
<i>Acacia tetragonophylla</i>	1	160			<i>Acacia tetragonophylla</i>	1	180	
<i>Angianthus milnei</i>	0.1	20	ASH09-05=					
<i>Atriplex bunburyana</i>	0.1	30						
					<i>Atriplex semilunaris</i>	0.1	20	ASH43-02
<i>Cenchrus ciliaris</i>	11	30		N=1000+.	<i>Cenchrus ciliaris</i>	13	35	
<i>Enchylaena tomentosa</i> var. <i>tomentosa</i>	0.1	40			<i>Enchylaena tomentosa</i> var. <i>tomentosa</i>	0.1	35	
<i>Eragrostis xerophila</i>	0.1	30			<i>Eragrostis xerophila</i>	0.1	25	
					<i>Indigofera trita</i> subsp. <i>trita</i>	0.1	20	ASH43-01
<i>Rhagodia eremaea</i>	0.1	70			<i>Rhagodia eremaea</i>	0.1	110	
					<i>Rhynchosia minima</i>	0.1	10	
<i>Scaevola spinescens</i>	0.1	70			<i>Scaevola spinescens</i>	0.1	50	
<i>Sclerolaena costata</i>	0.1	25	ASH43-01		<i>Sclerolaena costata</i>	0.1	20	
					<i>Solanum lasiophyllum</i>	0.1	40	
<i>Triodia epactia</i>	55	30			<i>Triodia epactia</i>	55	40	



**Phase 1**



**Phase 2**

**Ashburton Salt Flora**      **Site**      ASH44  
**Described by**      P1: RWSW      P2: BMRW      **Date**      P1: 05-Nov-18      P2: 11-Apr-19      **Type**      Quadrat 50 x 50 m  
**MGA Zone**      50      280161 **mE**      7581212 **mN**      114.872655 °E      -21.859354 °S  
**Habitat**      Dune; very undulating with distinct peaks/valleys.  
**Soil**      Dusky red (10R 3/4) sand.  
**Rock Type**      Nil.  
**Vegetation**      P1: *Grevillea stenobotrya* scattered tall shrubs over *Acacia stellaticeps*, (*A. coriacea* subsp. *coriacea*, *Verticordia forrestii*, *Quoya loxocarpa*, *Scaevola sericophylla*) open shrubland over *Triodia avenoides* very open hummock grassland over \**Cenchrus ciliaris* scattered tussock grasses.  
P2: *Grevillea stenobotrya* scattered tall shrubs over *Acacia stellaticeps*, (*A. coriacea* subsp. *coriacea*) open shrubland over *Scaevola sericophylla*, *Verticordia forrestii* low open shrubland over *Triodia avenoides* very open hummock grassland.  
**Veg Condition**      P1: Very Good: scattered weeds.  
P2: Very Good: scattered \**Cenchrus ciliaris*; signs of cattle.  
**Fire Age**      P1: Very long unburnt.  
P2: No sign of recent fire.

Phase 1: Species	Cover (%)	Height (cm)	Specimen	Phase 2: Species	Cover (%)	Height (cm)	Specimen
<i>Acacia coriacea</i> subsp. <i>coriacea</i>	1	140		<i>Acacia coriacea</i> subsp. <i>coriacea</i>	1	120	
<i>Acacia stellaticeps</i>	4	140		<i>Acacia stellaticeps</i>	5	160	
				<i>Adriana tomentosa</i> var. <i>tomentosa</i>	0.1	30	ASH44-01
				<i>Alyogyne pinoniana</i> var. <i>pinoniana</i>	0.1	20	
<i>Aristida holathera</i> var. <i>holathera</i>	0.1	35	ASH44-06	<i>Aristida holathera</i> var. <i>holathera</i>	0.1	30	
<i>Bonamia erecta</i>	0.1	30		<i>Bonamia erecta</i>	0.1	25	
				<i>Cassytha capillaris</i>	0.1	30	
<i>Cenchrus ciliaris</i>	1	40		<i>Cenchrus ciliaris</i>	0.1	35	
<i>Corynotheca pungens</i>	0.1	35		<i>Corynotheca pungens</i>	0.1	35	
<i>Crotalaria cunninghamii</i> subsp. <i>sturtii</i>	0.1	25		<i>Crotalaria cunninghamii</i> subsp. <i>sturtii</i>	0.1	25	
<i>Cullen martinii</i>	0.1	90	ASH44-04				
<i>Eremophila setacea</i>	0.1	130	ASH44-02	<i>Eremophila setacea</i>	0.1	120	
<i>Eriachne aristidea</i>	0.1	25		<i>Eriachne aristidea</i>	0.1	25	
<i>Grevillea stenobotrya</i>	1	320	ASH44-03	<i>Grevillea stenobotrya</i>	1	360	
<i>Ptilotus polystachyus</i>	0.1	120					
<i>Quoya loxocarpa</i>	1	45	ASH28-11=	<i>Quoya loxocarpa</i>	0.1	50	
<i>Rhagodia eremaea</i>	0.1	120	ASH44-01	<i>Rhagodia eremaea</i>	0.1	130	
<i>Scaevola sericophylla</i>	1	110		<i>Scaevola sericophylla</i>	1	70	
<i>Senna notabilis</i>	0.1	20					
<i>Sida rohlenae</i> subsp. <i>rohlenae</i>	0.1	45	ASH44-05				
<i>Solanum lasiophyllum</i>	0.1	30		<i>Solanum lasiophyllum</i>	0.1	30	
				<i>Tephrosia rosea</i> var. <i>clementii</i>	0.1	35	ASH44-02
<i>Triodia avenoides</i>	8	60		<i>Triodia avenoides</i>	9	80	ASH44-03

Phase 1: Species	Cover (%)	Height (cm)	Specimen	Phase 2: Species	Cover (%)	Height (cm)	Specimen
<i>Triodia epactia</i>	0.1	45					
<i>Verticordia forrestii</i>	1	130	ASH44-07	<i>Verticordia forrestii</i>	1	50	



Phase 1



Phase 2

**Ashburton Salt Flora**      **Site**    ASH45  
**Described by**    P1: MM/RM    P2: BMRW      **Date**    P1: 05-Nov-18    P2: 09-Apr-19      **Type**    Quadrat 50 x 50 m  
**MGA Zone**        50    272200 **mE**      7589705 **mN**    114.796835 **°E**    -21.781667 **°S**  
**Habitat**            Dune swale; undulating sandy plain between near-coastal dunes.  
**Soil**                 Reddish brown sand.  
**Rock Type**        Nil.  
**Vegetation**        P1 & P2: *Acacia coriacea* subsp. *coriacea* tall open shrubland over *A. stellaticeps* scattered low shrubs over *Triodia epactia* hummock grassland over  
\**Cenchrus ciliaris* very open tussock grassland.  
**Veg Condition**    P1: Very Good to Good: some weeds; cattle scats present.  
P2: Very Good: scattered weeds; cattle present.  
**Fire Age**            P1 & P2: No sign of recent fire.

Species	Cover (%)	Height (cm)	Specimen	Notes	Species	Cover (%)	Height (cm)	Specimen	Notes
<i>Acacia coriacea</i> subsp. <i>coriacea</i>	4	350			<i>Acacia coriacea</i> subsp. <i>coriacea</i>	4	400		
<i>Acacia sclerosperma</i> subsp. <i>sclerosperma</i>	0.1	110			<i>Acacia sclerosperma</i> subsp. <i>sclerosperma</i>	0.1	130		
<i>Acacia stellaticeps</i>	1	90			<i>Acacia stellaticeps</i>	1	60		
<i>Cenchrus ciliaris</i>	5	30		N=2000.	<i>Cenchrus ciliaris</i>	3	35		N=2,000.
<i>Corynotheca pungens</i>	0.1	40	ASH13-07=						
<i>Dysphania plantaginella</i>	0.1	5	ASH37-01=						
<i>Euphorbia tannensis</i> subsp. <i>eremophila</i>	0.1	50			<i>Euphorbia tannensis</i> subsp. <i>eremophila</i>	0.1	35		
<i>Indigofera bovipерda</i> subsp. <i>bovipерda</i>	0.1	30			<i>Indigofera bovipерda</i> subsp. <i>bovipерda</i>	0.1	35		
<i>Nicotiana occidentalis</i>	0.1	15	ASH09-04=	Inadequate material for determination to subsp.					
<i>Ptilotus polystachyus</i>	0.1	30							
					<i>Rhynchosia minima</i>	0.1	2		
<i>Solanum lasiophyllum</i>	0.1	60			<i>Solanum lasiophyllum</i>	0.1	50	ASH45-01	
<i>Thysanotus exfimbriatus</i>	0.1	30	ASH45-01						
<i>Triodia epactia</i>	50	30			<i>Triodia epactia</i>	55	60		
<i>Whiteochloa airoides</i>	0.1	70	ASH37-08=		<i>Whiteochloa airoides</i>	0.1	50		





**Phase 1**



**Phase 2**

**Ashburton Salt Flora**      **Site**      ASH46  
**Described by**      P1: RWSW      P2: SWJK      **Date**      P1: 06-Nov-18      P2: 15-Apr-19      **Type**      Quadrat 50 x 50 m  
**MGA Zone**      50      266116 **mE**      7557861 **mN**      114.733479 °E      -22.068346 °S  
**Habitat**      Plain; undulating, immediately adjacent to low dune.  
**Soil**      Dark reddish brown (2.5YR 3/4) loamy sand.  
**Rock Type**      Nil.  
**Vegetation**      P1: *Hakea stenophylla* subsp. *stenophylla*, *Acacia sclerosperma* subsp. *sclerosperma* tall shrubland over *A. stellaticeps* open shrubland over *Triodia epactia*, (*T. glabra*) very open hummock grassland over \**Cenchrus ciliaris* very open tussock grassland.  
P2: *Hakea stenophylla* subsp. *stenophylla*, *Acacia sclerosperma* subsp. *sclerosperma* open shrubland over *A. stellaticeps* scattered low shrubs over *Triodia epactia*, (*T. glabra*) very open hummock grassland over \**Cenchrus ciliaris* scattered tussock grasses.  
**Veg Condition**      P1: Very Good: cattle scats; scattered \**Cenchrus ciliaris*.  
P2: Very Good: scattered \**Cenchrus ciliaris*; cattle scats and tracks present.  
**Fire Age**      P1 & P2: No sign of recent fire.  
**Notes**      P1: Fire in surroundings and adjacent dunes.

Phase 1: Species	Cover (%)	Height (cm)	Specimen	Notes	Phase 2: Species	Cover (%)	Height (cm)	Specimen	Notes
<i>Acacia sclerosperma</i> subsp. <i>sclerosperma</i>	6	220			<i>Acacia sclerosperma</i> subsp. <i>sclerosperma</i>	3	170		
<i>Acacia stellaticeps</i>	2	130			<i>Acacia stellaticeps</i>	1	60		
<i>Alyogyne pinoniana</i> var. <i>pinoniana</i>	0.1	160	ASH46-05		<i>Alyogyne pinoniana</i> var. <i>pinoniana</i>	0.1	140		
<i>Cenchrus ciliaris</i>	2	45			<i>Cenchrus ciliaris</i>	1	30		
<i>Diplopeltis eriocarpa</i>	0.1	25	ASH46-07						
					<i>Enchylaena tomentosa</i> var. <i>tomentosa</i>	0.1	30	ASH46-01	
<i>Eragrostis eriopoda</i>	0.1	35	ASH46-02		<i>Eragrostis eriopoda</i>	0.1	30		
					<i>Euphorbia boophthona</i>	0.1	10		Sterile.
<i>Goodenia microptera</i>	0.1	25	ASH46-01						
<i>Hakea stenophylla</i> subsp. <i>stenophylla</i>	6	310	ASH46-06		<i>Hakea stenophylla</i> subsp. <i>stenophylla</i>	5	150		
					<i>Hibiscus sturtii</i> var. ?	0.1	30		
<i>Indigofera chamaeclada</i> subsp. <i>pubens</i>	0.1	20	ASH46-03	M. Hislop det.					
<i>Ptilotus exaltatus</i>	0.1	3							
<i>Rhagodia eremaea</i>	0.1	100	ASH46-04		<i>Rhagodia eremaea</i>	0.1	65		
<i>Salsola australis</i>	0.1	15							
<i>Scaevola spinescens</i> (broad form)	0.1	60			<i>Scaevola spinescens</i> (broad form)	0.1	70		
<i>Solanum lasiophyllum</i>	0.1	25			<i>Solanum lasiophyllum</i>	0.1	50		

Phase 1: Species	Cover (%)	Height (cm)	Specimen	Notes	Phase 2: Species	Cover (%)	Height (cm)	Specimen	Notes
<i>Triodia epactia</i>	6	40			<i>Triodia epactia</i>	7	60		
<i>Triodia glabra</i>	2	40			<i>Triodia glabra</i>	2	50		



Phase 1



Phase 2

**Ashburton Salt Flora**      **Site**    ASH47

**Described by**    P1: MM/RM    P2: SWJK      **Date**    P1: 05-Nov-18    P2: 12-Apr-19    **Type**    Quadrat 50 x 50 m

**MGA Zone**        50    272357 **mE**      7590215 **mN**    114.798423 °E    -21.777083 °S

**Habitat**            Dune and swale; coastal dunes and swales (strand).

**Soil**                 Pink sand.

**Rock Type**        Nil.

**Vegetation**        P1 & P2: *Spinifex longifolius* very open hummock grassland.

**Veg Condition**    P1 & P2: Excellent.

**Fire Age**            P1: Very long unburnt.  
P2: No sign of recent fire.

Phase 1: Species	Cover (%)	Height (cm)	Specimen	Phase 2: Species	Cover (%)	Height (cm)
<i>Eriachne gardneri</i>	0.1	20	REL04-02=	<i>Eriachne gardneri</i>	0.1	10
<i>Ipomoea costata</i>	0.1	30		<i>Ipomoea costata</i>	0.1	20
<i>Ptilotus villosiflorus</i>	0.1	10	REL04-01=			
<i>Salsola australis</i>	0.1	5				
<i>Spinifex longifolius</i>	5	30		<i>Spinifex longifolius</i>	4	60



Phase 1



Phase 2

**Ashburton Salt Flora**      **Site**    ASH48  
**Described by**    P1: MM/RM    P2: BMRW      **Date**    P1: 07-Nov-18    P2: 08-Apr-19      **Type**    Quadrat 50 x 50 m  
**MGA Zone**        50    279955 **mE**        7585982 **mN**    114.871300 **°E**    -21.816263 **°S**  
**Habitat**            Clay plain; broad clay plain.  
**Soil**                 Yellowish red medium clay.  
**Rock Type**        Nil.  
**Vegetation**        P1 & P2: *Eriachne benthamii*, (*Sporobolus mitchellii*) tussock grassland.  
**Veg Condition**    P1: Very Good: 1 x \**Prosopis pallida*; cattle scats and tracks.  
                           P2: Very Good: cattle tracks, scats and grazing present; 1 x \**Prosopis pallida*.  
**Fire Age**            P1 & P2: No sign of recent fire.

Phase 1: Species	Cover (%)	Height (cm)	Specimen	Notes	Phase 2: Species	Cover (%)	Height (cm)	Notes
<i>Acacia synchronicia</i>	0.1	35			<i>Acacia synchronicia</i>	0.1	40	
<i>Acacia tetragonophylla</i>	0.1	25						
<i>Atriplex semilunaris</i>	0.1	30						
<i>Calotis porphyroglossa</i>	0.1	10	ASH48-02					
<i>Cyperus iria</i>	0.1	5	ASHC01-05=					
<i>Dactyloctenium radulans</i>	0.1	10						
<i>Eriachne benthamii</i>	65	50			<i>Eriachne benthamii</i>	60	45	
<i>Lotus cruentus</i>	0.1	10	ASH48-01					
<i>Marsilea hirsuta</i>	0.1	5						
<i>Myriocephalus oldfieldii</i>	0.1	10	ASHC01-02=					
<i>Prosopis pallida</i>	0.1	90		N=1.	<i>Prosopis pallida</i>	0.1	110	N=1.
<i>Ptilotus polystachyus</i>	0.1	20						
<i>Ptilotus xerophilus</i>	0.1	40						
<i>Rhodanthe stricta</i>	0.1	15	ASH55-05=					
<i>Solanum cleistogamum</i>	0.1	5						
<i>Sporobolus mitchellii</i>	4	30	ASH-MB06=		<i>Sporobolus mitchellii</i>	1	25	



**Phase 1**



**Phase 2**

**Ashburton Salt Flora**      **Site**      ASH49

**Described by**      P1: MM/RM      P2: SWJK      **Date**      P1: 05-Nov-18      P2: 12-Apr-19      **Type**      Quadrat 50 x 50 m

**MGA Zone**      50      272875 **mE**      7590481 **mN**      114.803466 **°E**      -21.774749 **°S**

**Habitat**      Dune; small-medium primary dune.

**Soil**      Pink sand.

**Rock Type**      Nil.

**Vegetation**      P1: *Acacia coriacea* subsp. *coriacea* tall open shrubland over *Tephrosia gardneri* scattered low shrubs over *Spinifex longifolius*, (*Triodia epactia*) very open hummock grassland over \**Cenchrus ciliaris* scattered tussock grasses.  
P2: *Acacia coriacea* subsp. *coriacea* open shrubland over *Tephrosia gardneri* scattered low shrubs over *Spinifex longifolius*, (*Triodia epactia*) open hummock grassland.

**Veg Condition**      P1 & P2: Very Good: scattered \**Cenchrus ciliaris*.

**Fire Age**      P1 & P2: No sign of recent fire.

Phase 1: Species	Cover (%)	Height (cm)	Specimen	Notes	Phase 2: Species	Cover (%)	Height (cm)
<i>Acacia coriacea</i> subsp. <i>coriacea</i>	3	300			<i>Acacia coriacea</i> subsp. <i>coriacea</i>	6	140
<i>Cassutha aurea</i> var. <i>aurea</i>	0.1	50	ASH49-02		<i>Cassutha aurea</i> var. <i>aurea</i>	0.1	20
<i>Cenchrus ciliaris</i>	0.1	30		N=50.	<i>Cenchrus ciliaris</i>	0.1	30
<i>Eriachne gardneri</i>	0.1	40	REL04-02=		<i>Eriachne gardneri</i>	0.1	30
<i>Euphorbia australis</i> var. <i>hispidula</i>	0.1	20	ASH49-03		<i>Euphorbia australis</i> var. <i>hispidula</i>	0.1	10
<i>Euphorbia myrtoides</i>	0.1	15	ASH49-01		<i>Euphorbia myrtoides</i>	0.1	10
<i>Ptilotus polystachyus</i>	0.1	25					
<i>Salsola australis</i>	0.1	40			<i>Salsola australis</i>	0.5	30
<i>Sida rohlenae</i> subsp. <i>rohlenae</i>	0.1	60			<i>Sida rohlenae</i> subsp. <i>rohlenae</i>	0.1	60
<i>Spinifex longifolius</i>	9	30			<i>Spinifex longifolius</i>	14	75
<i>Tephrosia gardneri</i>	0.5	50	ASH-MB32=		<i>Tephrosia gardneri</i>	0.5	40
<i>Triodia epactia</i>	0.5	30			<i>Triodia epactia</i>	1	60



**Phase 1**



**Phase 2**



**Ashburton Salt Flora**      **Site**    ASH50

**Described by**    P1: MM/RM    P2: BMRW      **Date**    P1: 07-Nov-18    P2: 08-Apr-19      **Type**    Quadrat 50 x 50 m

**MGA Zone**        50    275364 **mE**      7582598 **mN**    114.826450 **°E**    -21.846236 **°S**

**Habitat**            Plain; undulating plain (higher point of undulating plain with hard surface crust).

**Soil**                 Yellowish red sandy loam.

**Rock Type**        Nil.

**Vegetation**        P1: *Acacia tetragonophylla*, *A. synchronica* scattered tall shrubs over *Triodia glabra*, (*T. epactia*) hummock grassland over \**Cenchrus ciliaris* very open tussock grassland.  
P2: *Acacia tetragonophylla*, *A. synchronica* scattered tall shrubs over *Triodia glabra*, (*T. epactia*) hummock grassland over \**Cenchrus ciliaris* scattered tussock grasses.

**Veg Condition**    P1: Very Good: cattle scats and tracks; some weeds.  
P2: Very Good: scattered weeds; cattle scats and tracks.

**Fire Age**            P1: No sign of recent fire.

Phase 1: Species	Cover (%)	Height (cm)	Specimen	Notes	Phase 2: Species	Cover (%)	Height (cm)
<i>Acacia synchronica</i>	0.25	230			<i>Acacia synchronica</i>	0.25	220
<i>Acacia tetragonophylla</i>	0.25	220			<i>Acacia tetragonophylla</i>	0.25	200
<i>Cenchrus ciliaris</i>	4	40		N=200.	<i>Cenchrus ciliaris</i>	1	35
<i>Chrysopogon fallax</i>	0.1	60			<i>Chrysopogon fallax</i>	0.1	60
<i>Eragrostis xerophila</i>	0.1	30	ASH50-01		<i>Eragrostis xerophila</i>	0.1	35
<i>Eulalia aurea</i>	0.1	50			<i>Eulalia aurea</i>	0.1	60
<i>Goodenia microptera</i>	0.1	10	ASH50-03				
<i>Haloragis gossei</i>	0.1	10					
<i>Indigofera bovipерda</i> subsp. <i>bovipерda</i>	0.1	20					
<i>Iseilema dolichotrichum</i>	0.1	10	ASHC03-01=				
<i>Ptilotus exaltatus</i>	0.1	40			<i>Ptilotus exaltatus</i>	0.1	2
<i>Ptilotus polystachyus</i>	0.1	10	ASH50-02				
<i>Rhodanthe floribunda</i>	0.1	10					
<i>Rhynchosia minima</i>	0.1	5					
<i>Salsola australis</i>	0.1	20			<i>Salsola australis</i>	0.1	5
<i>Sclerolaena costata</i>	0.1	15	ASH55-04=				
<i>Triodia epactia</i>	1	30			<i>Triodia epactia</i>	1	25
<i>Triodia glabra</i>	40	30			<i>Triodia glabra</i>	40	30
<i>Vachellia farnesiana</i>	0.1	120		N=1.	<i>Vachellia farnesiana</i>	0.1	120



**Phase 1**



**Phase 2**

**Ashburton Salt Flora**      **Site**    ASH51  
**Described by**    P1: MM/RM    P2: SWJK      **Date**    P1: 06-Nov-18    P2: 10-Apr-19    **Type**    Quadrat 50 x 50 m  
**MGA Zone**        50    275635 **mE**      7588138 **mN**    114.829825 °E    -21.796254 °S  
**Habitat**            Plain; undulating plain with termite mounds.  
**Soil**                 Yellowish red sandy loam.  
**Rock Type**        Nil.  
**Vegetation**        P1: *Acacia tetragonophylla*, (*A. coriacea* subsp. *coriacea*) tall open shrubland over *Triodia epactia*, (*T. glabra*) hummock grassland over \**Cenchrus ciliaris* very open tussock grassland.  
P2: *Acacia tetragonophylla*, (*A. coriacea* subsp. *coriacea*) tall open shrubland over *Triodia epactia*, (*T. glabra*) hummock grassland over \**Cenchrus ciliaris* scattered tussock grasses.  
**Veg Condition**    P1: Very Good: some weeds; cattle scats and tracks.  
P2: Very Good: scattered weeds; cattle tracks present.  
**Fire Age**            P1: No sign of recent fire.  
P2: Very long unburnt.

Phase 1: Species	Cover (%)	Height (cm)	Specimen	Notes	Phase 2: Species	Cover (%)	Height (cm)	Notes
<i>Acacia coriacea</i> subsp. <i>coriacea</i>	0.5	240			<i>Acacia coriacea</i> subsp. <i>coriacea</i>	0.5	200	
<i>Acacia stellaticeps</i>	0.1	90			<i>Acacia stellaticeps</i>	0.1	50	
<i>Acacia synchronicia</i>	0.1	250			<i>Acacia synchronicia</i>	0.1	65	
<i>Acacia tetragonophylla</i>	4	250			<i>Acacia tetragonophylla</i>	5	260	
<i>Calandrinia polyandra</i>	0.1	25	ASH11-02=					
<i>Calotis porphyroglossa</i>	0.1	20	ASH51-02					
<i>Cassutha capillaris</i>	0.1	30			<i>Cassutha capillaris</i>	0.1	10	
<i>Cenchrus ciliaris</i>	3	30		N=1000.	<i>Cenchrus ciliaris</i>	1	40	
<i>Chrysopogon fallax</i>	0.1	70			<i>Chrysopogon fallax</i>	0.1	100	
<i>Eulalia aurea</i>	0.1	40						
<i>Indigofera bovipерda</i> subsp. <i>bovipерda</i>	0.1	25			<i>Indigofera bovipерda</i> subsp. <i>bovipерda</i>	0.1	100	
<i>Ptilotus exaltatus</i>	0.1	40						
<i>Ptilotus polystachyus</i>	0.1	40						
<i>Rhagodia eremaea</i>	0.1	70			<i>Rhagodia eremaea</i>	0.1	80	
					<i>Rhynchosia minima</i>	0.1	5	
<i>Roebuckiella cheilocarpa</i> var. <i>cheilocarpa</i>	0.1	20	ASH13-02=					
<i>Scaevola spinescens</i>	0.1	40						
<i>Solanum cleistogamum</i>	0.1	40			<i>Solanum cleistogamum</i>	0.1	60	
<i>Solanum lasiophyllum</i>	0.1	30			<i>Solanum lasiophyllum</i>	0.1	15	
<i>Streptoglossa macrocephala</i>	0.1	40	ASH51-01	Involucres are on the small side.	<i>Streptoglossa macrocephala</i>	0.1	25	

Phase 1: Species	Cover (%)	Height (cm)	Specimen	Notes	Phase 2: Species	Cover (%)	Height (cm)	Notes
<i>Trachymene pilbarensis</i>	0.1	20						
<i>Triodia epactia</i>	55	30			<i>Triodia epactia</i>	60	40	
<i>Triodia glabra</i>	1.5	25			<i>Triodia glabra</i>	3	30	
<i>Vachellia farnesiana</i>	0.1	120		N=1.	<i>Vachellia farnesiana</i>	0.1	140	N=1



Phase 1



Phase 2

**Ashburton Salt Flora**      **Site**    ASH52  
**Described by**    P1: MM/RM    P2: SWJK      **Date**    P1: 08-Nov-18    P2: 10-Apr-19      **Type**    Quadrat 50 x 50 m  
**MGA Zone**        50    276390 **mE**      7586031 **mN**    114.836838 **°E**    -21.815372 **°S**  
**Habitat**            Plain; high point within broad undulating plain.  
**Soil**                 Yellowish red sandy loam.  
**Rock Type**        Nil.  
**Vegetation**        P1: *Acacia tetragonophylla*, (*A. synchronicia*) tall open shrubland over *A. sclerosperma* subsp. *sclerosperma* scattered shrubs over *Triodia glabra*, (*T. epactia*) open hummock grassland over \**Cenchrus ciliaris* very open tussock grassland.  
P2: *Acacia tetragonophylla* tall open shrubland over *A. sclerosperma* subsp. *sclerosperma* scattered shrubs over *Triodia glabra*, (*T. epactia*) open hummock grassland over \**Cenchrus ciliaris*, (\**C. setiger*) very open tussock grassland.  
**Veg Condition**    P1: Good: some weeds.  
P2: Good: \**Cenchrus* spp.; grazing and cattle scats present.  
**Fire Age**            P1 & P2: No sign of recent fire.

Phase 1: Species	Cover (%)	Height (cm)	Specimen	Notes	Phase 2: Species	Cover (%)	Height (cm)	Notes
<i>Acacia coriacea</i> subsp. <i>coriacea</i>	0.1	160			<i>Acacia coriacea</i> subsp. <i>coriacea</i>	0.1	140	
<i>Acacia sclerosperma</i> subsp. <i>sclerosperma</i>	0.5	110			<i>Acacia sclerosperma</i> subsp. <i>sclerosperma</i>	0.5	170	
<i>Acacia synchronicia</i>	0.5	280			<i>Acacia synchronicia</i>	0.1	300	
<i>Acacia tetragonophylla</i>	6	270			<i>Acacia tetragonophylla</i>	5	260	
<i>Cassytha capillaris</i>	0.1	20			<i>Cassytha capillaris</i>	0.1	20	
<i>Cenchrus ciliaris</i>	5	30		N=2000.	<i>Cenchrus ciliaris</i>	5	20	
<i>Cenchrus setiger</i>	0.1	30		N=1.	<i>Cenchrus setiger</i>	0.5	20	
<i>Dysphania rhadinostachya</i>	0.1	15						
<i>Eragrostis eriopoda</i>	0.1	30			<i>Eragrostis eriopoda</i>	0.1	30	
<i>Eremophila forrestii</i> subsp. <i>viridis</i>	0.1	60	ASH-MB42=	N=16.	<i>Eremophila forrestii</i> subsp. <i>viridis</i>	0.5	60	N=14
<i>Eremophila longifolia</i>	0.1	30						
<i>Goodenia forrestii</i>	0.1	30						
<i>Goodenia microptera</i>	0.1	30						
<i>Pterocaulon sphacelatum</i>	0.1	50			<i>Pterocaulon sphacelatum</i>	0.1	40	
<i>Rhagodia eremaea</i>	0.1	110						
<i>Solanum lasiophyllum</i>	0.1	30			<i>Solanum lasiophyllum</i>	0.1	10	
<i>Triodia epactia</i>	5	30			<i>Triodia epactia</i>	8	45	
<i>Triodia glabra</i>	20	30			<i>Triodia glabra</i>	12	40	



**Phase 1**



**Phase 2**

**Ashburton Salt Flora**      **Site**    ASH53

**Described by**    P1: MM/RM    P2: BMRW      **Date**    P1: 06-Nov-18    P2: 09-Apr-19      **Type**    Quadrat 50 x 50 m

**MGA Zone**        50    269805 **mE**      7585857 **mN**    114.773148 **°E**    -21.816097 **°S**

**Habitat**            Clay pan; clay pan with sandy islands of *Triodia epactia*.

**Soil**                 Light reddish brown sandy clay loam islands/light clay pan.

**Rock Type**        Nil.

**Vegetation**        P1: *Acacia tetragonophylla* scattered tall shrubs over *Frankenia ambita*, (*Neobassia astrocarpa*) low open shrubland over *Triodia epactia* scattered hummock grasses over \**Cenchrus ciliaris* very open tussock grassland.  
P2: *Acacia tetragonophylla* scattered shrubs over *Frankenia ambita* low open shrubland over *Triodia epactia* scattered hummock grasses over \**Cenchrus ciliaris* very open tussock grassland.

**Veg Condition**    P1: Very Good: some weeds; cattle scats and tracks.  
P2: Very Good: scattered \**Cenchrus ciliaris*; signs of cattle.

**Fire Age**            P1 & P2: No sign of recent fire.

Phase 1: Species	Cover (%)	Height (cm)	Specimen	Notes	Phase 2: Species	Cover (%)	Height (cm)	Specimen	Notes
<i>Acacia synchronicia</i>	0.1	160			<i>Acacia synchronicia</i>	0.1	200		
<i>Acacia tetragonophylla</i>	1	210			<i>Acacia tetragonophylla</i>	1	160		Mostly dead.
<i>Angianthus milnei</i>	0.1	10	ASH09-05=						
<i>Atriplex bunburyana</i>	0.1	60			<i>Atriplex bunburyana</i>	0.1	20		
<i>Atriplex codonocarpa</i>	0.1	30			<i>Atriplex codonocarpa</i>	0.1	15		
<i>Atriplex semilunaris</i>	0.1	10							
<i>Cenchrus ciliaris</i>	3	30		N=2000.	<i>Cenchrus ciliaris</i>	2	40		
<i>Chloris pectinata</i>	0.1	5							
<i>Chloris pumilio</i>	0.1	5	ASH-MB10=						
<i>Dactyloctenium radulans</i>	0.1	5							
<i>Enchylaena tomentosa</i> var. <i>tomentosa</i>	0.1	30			<i>Enchylaena tomentosa</i> var. <i>tomentosa</i>	0.1	70		
<i>Eragrostis falcata</i>	0.1	30			<i>Eragrostis falcata</i>	0.1	25	ASH53-03	
<i>Frankenia ambita</i>	3	15	ASH09-14=		<i>Frankenia ambita</i>	3	25		
<i>Lawrencia viridigrisea</i>	0.1	40			<i>Lawrencia viridigrisea</i>	0.1	25	ASH53-04	
<i>Neobassia astrocarpa</i>	0.25	10	ASH53-05		<i>Neobassia astrocarpa</i>	0.1	25		
<i>Ptilotus polystachyus</i>	0.1	30							
					<i>Rhagodia eremaea</i>	0.1	90		
<i>Rhodanthe stricta</i>	0.1	15	ASH55-05=						
<i>Salsola australis</i>	0.1	10							
<i>Scaevola spinescens</i>	0.1	70			<i>Scaevola spinescens</i>	0.1	40		
					<i>Sclerolaena costata</i>	0.1	20	ASH53-01	
<i>Sclerolaena diacantha</i>	0.1	25	ASH33-03=	sens. lat.					

Phase 1: Species	Cover (%)	Height (cm)	Specimen	Notes	Phase 2: Species	Cover (%)	Height (cm)	Specimen	Notes
<i>Sida fibulifera</i>	0.1	15	ASH53-02	sens. lat.	<i>Sida fibulifera</i>	0.1	15		
					<i>Solanum lasiophyllum</i>	0.1	25		
<i>Sporobolus mitchellii</i>	0.1	20	ASH-MB06=						
<i>Tecticornia halocnemoides</i> subsp. <i>tenuis</i>	0.1	50	ASH53-03	K. Shepherd det.	<i>Tecticornia halocnemoides</i> subsp. <i>tenuis</i>	0.1	35		
<i>Tecticornia indica</i> subsp. ? <i>leiostachya</i>	0.1	50	ASH53-04	Inadequate material for confident determination.	<i>Tecticornia indica</i> subsp. <i>leiostachya</i>	0.1	60		
					<i>Trianthema triquetrum</i>	0.1	1	ASH53-02	
<i>Triodia epactia</i>	1.5	30			<i>Triodia epactia</i>	1	35		



Phase 1



Phase 2



**Ashburton Salt Flora**      **Site**    ASH54  
**Described by**    P1: MM/RM    P2: SWJK      **Date**    P1: 09-Nov-18    P2: 10-Apr-19      **Type**    Quadrat 50 x 50 m  
**MGA Zone**        50    271707 **mE**      7575060 **mN**    114.790036 **°E**    -21.913818 **°S**  
**Habitat**            Clay pan; low lying saline clay pan.  
**Soil**                 Yellowish red light clay.  
**Rock Type**        Nil.  
**Vegetation**        P1: *Tecticornia auriculata* low open shrubland over *Eragrostis dielsii* very open bunch grassland.  
                           P2: *Tecticornia auriculata* low open shrubland over *Eragrostis dielsii* scattered tussock grasses.  
**Veg Condition**    P1 & P2: Excellent.  
**Fire Age**            P1 & P2: No sign of recent fire.  
**Notes**                P2: Dead *Cressa* present.

Phase 1: Species	Cover (%)	Height (cm)	Specimen	Notes	Phase 2: Species	Cover (%)	Height (cm)	Notes
<i>Angianthus milnei</i>	0.1	15	ASH09-05=					
<i>Atriplex codonocarpa</i>	0.1	10						
<i>Calotis porphyroglossa</i>	0.1	10						
<i>Chloris pumilio</i>	0.1	5	ASH-MB10=					
<i>Cressa australis</i>	0.1	10	ASH-MB62=		<i>Cressa australis</i>	0.1	10	Dead.
<i>Cullen cinereum</i>	0.1	25						
<i>Cyperus bulbosus</i>	0.1	10	ASH54-04					
<i>Dysphania plantaginella</i>	0.1	15	ASH37-01=					
<i>Eragrostis dielsii</i>	3	5	ASH54-02	sens. lat.	<i>Eragrostis dielsii</i>	1	5	
<i>Nicotiana rosulata</i> subsp. <i>rosulata</i>	0.1	25	ASH21-03=					
<i>Swainsona pterostylis</i>	0.1	10	REL01-01=					
<i>Tecticornia auriculata</i>	7	80	ASH54-01	K. Shepherd det.	<i>Tecticornia auriculata</i>	9	80	
<i>Tecticornia indica</i> subsp. <i>bidens</i>	0.1	30	ASH54-03		<i>Tecticornia indica</i> subsp. <i>bidens</i>	0.5	30	



**Phase 1**



**Phase 2**

**Ashburton Salt Flora**      **Site**    ASH55  
**Described by**    P1: MM/RM    P2: BMRW      **Date**    P1: 06-Nov-18    P2: 09-Apr-19      **Type**    Quadrat 50 x 50 m  
**MGA Zone**        50    267859 **mE**      7586910 **mN**    114.754482 °E    -21.806335 °S  
**Habitat**            Clay pan; broad saline clay plain/pan.  
**Soil**                 Yellowish red light clay.  
**Rock Type**        Nil.  
**Vegetation**        P1: *Tecticornia doliiformis*, (*Frankenia ambita*, *Muellerolimon salicorniaceum*) low shrubland over *Eragrostis falcata*, *Sporobolus mitchellii* scattered tussock grasses.  
                           P2: *Tecticornia doliiformis* (*Frankenia ambita*) low shrubland.  
**Veg Condition**    P1: Very Good: scattered weeds; cattle scats and tracks.  
                           P2: Very Good: cattle scats present; scattered \**Cenchrus ciliaris*.  
**Fire Age**            P1 & P2: No sign of recent fire.

Phase 1: Species	Cover (%)	Height (cm)	Specimen	Notes	Phase 2: Species	Cover (%)	Height (cm)	Notes
<i>Angianthus milnei</i>	0.1	20	ASH09-05=					
<i>Cenchrus ciliaris</i>	0.1	20		N=500.	<i>Cenchrus ciliaris</i>	0.1	15	
<i>Cullen cinereum</i>	0.1	6						
<i>Cyperus bulbosus</i>	0.1	10	ASH33-04=		<i>Cyperus bulbosus</i>	0.1	10	
<i>Dactyloctenium radulans</i>	0.1	5						
<i>Eragrostis falcata</i>	1	20			<i>Eragrostis falcata</i>	0.1	40	
<i>Frankenia ambita</i>	1	20	ASH09-14=		<i>Frankenia ambita</i>	1	35	
<i>Lawrenca viridigrisea</i>	0.1	40			<i>Lawrenca viridigrisea</i>	0.1	25	
					<i>Marsilea hirsuta</i>	0.1	10	
<i>Muellerolimon salicorniaceum</i>	0.5	30			<i>Muellerolimon salicorniaceum</i>	0.1	35	
					<i>Neobassia astrocarpa</i>	0.1	15	
<i>Nicotiana rosulata</i> subsp. <i>rosulata</i>	0.1	5	ASH55-03					
<i>Prosopis pallida</i>	0.1	60		N=3.				
<i>Rhodanthe stricta</i>	0.1	15	ASH55-05					
<i>Rhynchosia minima</i>	0.1	10						
<i>Scaevola spinescens</i>	0.1	40			<i>Scaevola spinescens</i>	0.1	40	
<i>Sclerolaena costata</i>	0.1	15	ASH55-04					
					<i>Sida fibulifera</i>	0.1	20	
<i>Solanum lasiophyllum</i>	0.1	10						
<i>Sporobolus mitchellii</i>	0.5	20	ASH-MB06=		<i>Sporobolus mitchellii</i>	0.1	30	
<i>Swainsona kingii</i>	0.1	5	ASH55-01					
<i>Tecticornia doliiformis</i>	28	40	ASH55-02		<i>Tecticornia doliiformis</i>	28	40	

Phase 1: Species	Cover (%)	Height (cm)	Specimen	Notes	Phase 2: Species	Cover (%)	Height (cm)	Notes
					<i>Vigna</i> sp.	0.1	5	Inadequate material; seedling.



Phase 1



Phase 2

**Ashburton Salt Flora**      **Site**    ASH56  
**Described by**    P1: RWSW      P2: RMJK      **Date**    P1: 09-Nov-18    P2: 13-Apr-19    **Type**    Quadrat 50 x 50 m  
**MGA Zone**        50    287150 **mE**      7594793 **mN**    114.942005 **°E**    -21.737592 **°S**  
**Habitat**            Floodplain.  
**Soil**                 2.5 YR 4/3 clay loam.  
**Vegetation**        P1: *Eucalyptus victrix* low open woodland over \**Prosopis pallida* scattered tall shrubs over \**Cenchrus ciliaris* (\**C. setiger*) open tussock grassland.  
P2: *Eucalyptus victrix* low open woodland over \**Prosopis pallida* tall open shrubland over \**Cenchrus ciliaris* (*C. setiger*) open tussock grassland.  
**Veg Condition**    P1: Poor: weeds and cattle.  
P2: Poor: weeds, including a high cover of \**Cenchrus ciliaris* and 3% \**Prosopis*; signs of cattle.  
**Fire Age**            P1 & P2: No sign of recent fire.

Phase 1: Species	Cover (%)	Height (cm)	Phase 2: Species	Cover (%)	Height (cm)	Specimen
<i>Acacia coriacea</i> subsp. <i>coriacea</i>	0.1	50				
<i>Acacia synchronicia</i>	0.1	140	<i>Acacia synchronicia</i>	0.1	50	
<i>Acacia tetragonophylla</i>	0.1	200	<i>Acacia tetragonophylla</i>	0.1	210	
			<i>Atriplex codonocarpa</i>	0.1	15	
<i>Atriplex semilunaris</i>	0.5	25	<i>Atriplex semilunaris</i>	0.1	25	
			<i>Boerhavia burbidgeana</i>	0.1	15	ASH56-02, 05
<i>Cenchrus ciliaris</i>	18	90	<i>Cenchrus ciliaris</i>	25	45	
<i>Cenchrus setiger</i>	5	90	<i>Cenchrus setiger</i>	2	30	
			<i>Chrysopogon fallax</i>	0.1	60	
			<i>Cucumis variabilis</i>	0.1	5	ASH56-04
			<i>Cyperus bulbosus</i>	0.1	10	ASH56-06
<i>Enchylaena tomentosa</i> var. <i>tomentosa</i>	0.1	110	<i>Enchylaena tomentosa</i> var. <i>tomentosa</i>	0.1	60	
<i>Eucalyptus victrix</i>	7	700	<i>Eucalyptus victrix</i>	4	700	
<i>Gnephosis arachnoidea</i>	0.1	10				
			<i>Portulaca oleracea/intraterranea</i>	0.1	10	ASH56-01
<i>Prosopis pallida</i>	1	350	<i>Prosopis pallida</i>	3	350	
			<i>Rhagodia eremaea</i>	0.1	50	
			<i>Rhynchosia minima</i>	0.1	5	
<i>Salsola australis</i>	0.1	15				
<i>Scaevola spinescens</i>	0.1	110	<i>Scaevola spinescens</i>	0.1	110	
			<i>Senna artemisioides</i> subsp. <i>oligophylla</i> (thinly sericeous form MET 15,035)	0.1	20	ASH56-03
<i>Senna glutinosa</i> subsp. <i>glutinosa</i>	0.1	130				
<i>Setaria dielsii</i>	0.1	30				
<i>Sporobolus mitchellii</i>	0.1	35	<i>Sporobolus mitchellii</i>	0.1	20	ASH56-07



**Phase 1**



**Phase 2**

**Ashburton Salt Flora**      **Site**    ASHC01  
**Described by**    P1: MM/RM    P2: SWJK      **Date**    P1: 07-Nov-18    P2: 08-Apr-19      **Type**    Quadrat 50 x 50 m  
**MGA Zone**        50    282482 **mE**        7586661 **mN**    114.895823 **°E**    -21.810446 **°S**  
**Habitat**            Clay plain.  
**Soil**                Yellowish red medium clay; deep cracks in clay.  
**Rock Type**        Nil.  
**Vegetation**        P1: *Eriachne benthamii*, (*Sporobolus mitchellii*) tussock grassland over *Marsilea hirsuta* scattered herbs.  
                           P2: *Eriachne benthamii*, (*Sporobolus mitchellii*) tussock grassland.  
**Veg Condition**    P1 & P2: Very Good: cattle scats.  
**Fire Age**            P1 & P2: No sign of recent fire.

Phase 1: Species	Cover (%)	Height (cm)	Specimen	Phase 2: Species	Cover (%)	Height (cm)	Specimen	Notes
<i>Bergia perennis</i> subsp. <i>exigua</i>	0.1	5	ASHC01-03	<i>Bergia perennis</i> subsp. <i>exigua</i>	0.1	3		
<i>Cyperus iria</i>	0.1	5	ASHC01-05					
<i>Eriachne benthamii</i>	60	50		<i>Eriachne benthamii</i>	50	35		
<i>Goodenia lamprosperma</i>	0.1	30	ASHC01-04					
<i>Marsilea hirsuta</i>	0.5	5		<i>Marsilea hirsuta</i>	0.1	5		
<i>Myriocephalus oldfieldii</i>	0.1	5	ASHC01-02	<i>Myriocephalus oldfieldii</i>	0.1	3		
<i>Sporobolus mitchellii</i>	5	30	ASH-MB06=	<i>Sporobolus mitchellii</i>	4	30		
				<i>Swainsona</i> sp.	0.1	5	ASHC01-01	Inadequate material; seedling



**Phase 1**



**Phase 2**



**Ashburton Salt Flora**      **Site**    ASHC02  
**Described by**    P1: RWSW      P2: RMJK      **Date**    P1: 06-Nov-18    P2: 14-Apr-19    **Type**    Quadrat 35 x 70 m  
**MGA Zone**        50      281499 **mE**      7597022 **mN**    114.887689 °E    -21.716779 °S  
**Habitat**            Dune; primary dune adjacent to beach.  
**Soil**                 Dark reddish brown (5YR 3/3) sand.  
**Rock Type**        Nil.  
**Vegetation**        P1: *Acacia coriacea* subsp. *coriacea* tall open shrubland over *Spinifex longifolius*, (*Triodia epactia*) very open hummock grassland over *Cenchrus ciliaris* scattered tussock grasses.  
                           P2: *Acacia coriacea* subsp. *coriacea* tall open shrubland over *Spinifex longifolius*, (*Triodia epactia*) very open hummock grassland.  
**Veg Condition**    P1: Very Good: scattered weeds.  
                           P2: Very Good: scattered *Cenchrus ciliaris*.  
**Fire Age**            P1 & P2: No sign of recent fire.

Phase 1: Species	Cover (%)	Height (cm)	Specimen	Notes	Phase 2: Species	Cover (%)	Height (cm)	Specimen	Notes
<i>Abutilon</i> sp. Pritzelianum (S. van Leeuwen 5095)	0.1	110	ASHC02-03	N=2 (estimated not recorded).	<i>Abutilon</i> sp. Pritzelianum (S. van Leeuwen 5095)	0.1	160		N=10
<i>Acacia coriacea</i> subsp. <i>coriacea</i>	9.5	300			<i>Acacia coriacea</i> subsp. <i>coriacea</i>	9	300		
<i>Acacia stellaticeps</i>	0.1	65			<i>Acacia stellaticeps</i>	0.1	100		
					<i>Cassutha capillaris</i>	5	30	ASHC02-02	
<i>Cenchrus ciliaris</i>	1.5	30			<i>Cenchrus ciliaris</i>	0.1	40		
<i>Corynotheca pungens</i>	0.1	35			<i>Corynotheca pungens</i>	0.1	30		
<i>Crotalaria cunninghamii</i> subsp. <i>sturtii</i>	0.1	30			<i>Crotalaria cunninghamii</i> subsp. <i>sturtii</i>	0.1	90		
<i>Enchylaena tomentosa</i> var. <i>tomentosa</i>	0.1	100			<i>Enchylaena tomentosa</i> var. <i>tomentosa</i>	0.1	120		
<i>Eriachne gardneri</i>	0.1	35	ASHC02-04						
<i>Indigofera chamaeclada</i> subsp. <i>pubens</i>	0.1	30	ASHC02-05	M. Hislop det.	<i>Indigofera chamaeclada</i> subsp. <i>pubens</i>	0.1	70	ASHC02-04	
<i>Quoya loxocarpa</i>	0.1	60	ASHC02-02		<i>Quoya loxocarpa</i>	0.1	60		
<i>Rhagodia eremaea</i>	0.1	120			<i>Rhagodia eremaea</i>	0.1	70		
					<i>Rhynchosia minima</i>	0.1	30		
<i>Salsola australis</i>	0.1	25			<i>Salsola australis</i>	0.1	50		
<i>Sida rohlenae</i> subsp. <i>rohlenae</i>	0.1	110	ASHC02-06						

Phase 1: Species	Cover (%)	Height (cm)	Specimen	Notes	Phase 2: Species	Cover (%)	Height (cm)	Specimen	Notes
<i>Spinifex longifolius</i>	3	90			<i>Spinifex longifolius</i>	8	60		
<i>Tephrosia gardneri</i>	0.1	35			<i>Tephrosia gardneri</i>	0.1	40		
<i>Threlkeldia diffusa</i>	0.1	120	ASHC02-10		<i>Threlkeldia diffusa</i>	0.1	120		
					<i>Tribulus occidentalis</i>	0.1	10	ASHC02-03	
<i>Tribulus</i> sp.	0.1	10	ASHC02-07	Sterile; inadequate material.					
<i>Trichodesma zeylanicum</i> var. <i>grandiflorum</i>	0.1	30			<i>Trichodesma zeylanicum</i> var. <i>grandiflorum</i>	0.1	70		
<i>Triodia epactia</i>	1	40			<i>Triodia epactia</i>	1	50		



Phase 1



Phase 2

**Ashburton Salt Flora**      **Site**    ASHC03

**Described by**    P1: MM/RM    P2: SWJK      **Date**    P1: 07-Nov-18    P2: 09-Apr-19      **Type**    Quadrat 50 x 50 m

**MGA Zone**        50    282431 **mE**        7585938 **mN**    114.895235 °E    -21.816967 °S

**Habitat**            Plain; broad undulating plain.

**Soil**                 Yellowish red sandy loam.

**Rock Type**        Nil.

**Vegetation**        P1: *Acacia tetragonophylla*, *A. synchronica* scattered shrubs over *Triodia epactia* hummock grassland over \**Cenchrus ciliaris* scattered tussock grasses.  
P2: *Acacia synchronica* scattered tall shrubs over *A. tetragonophylla* scattered shrubs over *Triodia epactia* hummock grassland over \**Cenchrus ciliaris* scattered tussock grasses.

**Veg Condition**    P1: Very Good: scattered weeds; cattle scats and tracks.  
P2: Very Good: scattered \**Cenchrus ciliaris*.

**Fire Age**            P1 & P2: No sign of recent fire.

Phase 1: Species	Cover (%)	Height (cm)	Specimen	Notes	Phase 2: Species	Cover (%)	Height (cm)
<i>Acacia synchronica</i>	0.25	160			<i>Acacia synchronica</i>	1	200
<i>Acacia tetragonophylla</i>	0.25	150			<i>Acacia tetragonophylla</i>	0.5	60
<i>Cenchrus ciliaris</i>	0.5	10		N=200.	<i>Cenchrus ciliaris</i>	1	4
<i>Chrysopogon fallax</i>	0.1	60			<i>Chrysopogon fallax</i>	0.1	80
<i>Cullen pogonocarpum</i>	0.1	10					
<i>Eragrostis xerophila</i>	0.1	30					
<i>Erodium</i> sp.	0.1	10	ASH09-11=	Probably <i>E. cygnorum</i> ; inadequate material for further determination.			
<i>Eulalia aurea</i>	0.1	60					
<i>Indigofera colutea</i>	0.1	5			<i>Indigofera colutea</i>	0.1	1
<i>Iseilema dolichotrichum</i>	0.1	7	ASHC03-01				
<i>Nicotiana occidentalis</i>	0.1	10	ASH09-04=	Inadequate material for determination to subsp.			
<i>Ptilotus polystachyus</i>	0.1	15	ASH50-02=				
<i>Ptilotus polystachyus</i>	0.1	20					
<i>Rhynchosia minima</i>	0.1	3			<i>Rhynchosia minima</i>	0.1	5
<i>Roebuckiella cheilocarpa</i> var. <i>cheilocarpa</i>	0.1	10	ASH13-02=				
<i>Trachymene pilbarensis</i>	0.1	15					
<i>Triodia epactia</i>	40	30			<i>Triodia epactia</i>	45	40



**Phase 1**



**Phase 2**

**Ashburton Salt Flora**      **Site**    ASHC04  
**Described by**    P1: RWSW      P2: JKRM      **Date**    P1: 06-Nov-18    P2: 13-Apr-19    **Type**    Quadrat 50 x 50 m  
**MGA Zone**        50      282640 **mE**      7593060 **mN**      114.898193 **°E**    -21.752691 **°S**  
**Habitat**            Plain; samphire flat bounded by broad plain and medium dunes to the east and west.  
**Soil**                 Reddish brown (2.5YR 4/3) clay loam.  
**Rock Type**        Nil.  
**Vegetation**        P1 & P2: *Tecticornia doliiformis*, (*Frankenia ambita*) low shrubland over *Sporobolus mitchellii*, *Eragrostis falcata* very open tussock grassland.  
**Veg Condition**    P1: Very Good: cattle scats; scattered \**Cenchrus ciliaris*.  
                           P2: Very Good: scattered \**Cenchrus ciliaris*; cattle scats and tracks.  
**Fire Age**            P1 & P2: No sign of recent fire.  
**Notes**                P1: Old drilling tracks adjacent.

Phase 1: Species	Cover (%)	Height (cm)	Specimen	Notes	Phase 2: Species	Cover (%)	Height (cm)	Specimen
<i>Atriplex semilunaris</i>	0.1	15			<i>Atriplex semilunaris</i>	0.1	15	ASHC04-04
<i>Cenchrus ciliaris</i>	0.1	10		N=20 (estimated not counted)	<i>Cenchrus ciliaris</i>	0.1	20	
<i>Cressa australis</i>	0.1	10	ASHC04-02		<i>Cressa australis</i>	0.1	5	ASHC04-02
					<i>Cullen sp.</i>	0.1	5	ASHC04-01
<i>Eragrostis falcata</i>	2	25	ASHC04-01		<i>Eragrostis falcata</i>	2	25	
<i>Frankenia ambita</i>	6	35	ASHC04-03		<i>Frankenia ambita</i>	5	40	
<i>Marsilea hirsuta</i>	0.1	10						
<i>Sporobolus mitchellii</i>	2	15	ASH42-03=		<i>Sporobolus mitchellii</i>	3	25	
<i>Tecticornia doliiformis</i>	15	50	ASHC04-04		<i>Tecticornia doliiformis</i>	20	50	
					<i>Tecticornia halocnemoides</i> subsp. <i>tenuis</i>	0.1	30	ASHC04-03



**Phase 1**



**Phase 2**

**Ashburton Salt Flora Phase 1**      **Site**    ASHC05  
**Described by**    MM/RM      **Date**    07-Nov-18      **Type**    Quadrat 25 x 100 m  
**MGA Zone**        50      283169 **mE**      7584200 **mN**      114.902142 °E    -21.832750 °S  
**Habitat**            Dune; small to medium sand dune bordering a saline clay plain to the north.  
**Soil**                 Yellowish red sand.  
**Rock Type**         Nil.  
**Vegetation**        *Grevillea stenobotrya* scattered shrubs over *Acacia stellaticeps* low open shrubland over *Triodia epactia* hummock grassland over \**Cenchrus ciliaris* scattered tussock grasses.  
**Veg Condition**    Very Good: scattered weeds.  
**Fire Age**            No sign of recent fire.

Phase 1: Species	Cover (%)	Height (cm)	Specimen	Notes
<i>Acacia coriacea</i> subsp. <i>coriacea</i>	0.1	110		
<i>Acacia stellaticeps</i>	5	90		
<i>Bonamia erecta</i>	0.1	30		
<i>Calandrinia polyandra</i>	0.1	10	ASH11-02=	
<i>Cenchrus ciliaris</i>	0.5	30		N=1000.
<i>Crotalaria cunninghamii</i> subsp. <i>sturtii</i>	0.1	20		
<i>Dysphania rhadinostachya</i>	0.1	5		
<i>Grevillea stenobotrya</i>	0.5	170	ASHC05-01	
<i>Hibiscus brachychlaenus</i>	0.1	70	ASH-MB60=	
<i>Lobelia heterophylla</i> subsp. <i>pilbarensis</i>	0.1	30	ASH-MB21=	Need better material to confidently ID to subsp.
<i>Ptilotus polystachyus</i>	1	30		
<i>Rhodanthe stricta</i>	0.1	25		
<i>Solanum lasiophyllum</i>	0.1	60		
<i>Tephrosia gardneri</i>	0.1	25	ASH-MB32=	
<i>Triodia avenoides</i>	0.1	50		
<i>Triodia epactia</i>	60	30		



**Phase 1**



**Ashburton Salt Flora**      **Site**      ASHC06

**Described by**      P1: RWSW      P2: BDMJK      **Date**      P1: 06-Nov-18      P2: 15-Apr-19      **Type**      Quadrat 25 x 100 m

**MGA Zone**      50      283996 **mE**      7593619 **mN**      114.911372 **°E**      -21.747810 **°S**

**Habitat**      Dune; series of low dunes; adjacent to plains to the northwest and the Ashburton river to the southeast.

**Soil**      Dark reddish brown (2.5YR 3/4) sand.

**Rock Type**      Nil.

**Vegetation**      P1: *Grevillea stenobotrya*, (*Acacia coriacea* subsp. *coriacea*) tall open shrubland over *Scaevola sericophylla* low open shrubland over *Triodia epactia* open hummock grassland.

P2: *Grevillea stenobotrya* open shrubland over *Scaevola sericophylla* low open shrubland over *Triodia epactia* open hummock grassland over

\**Cenchrus ciliaris* very open tussock grassland.

**Veg Condition**      P1 & P2: Very Good: scattered \**Cenchrus ciliaris*.

**Fire Age**      P1 & P2: No sign of recent fire.

Phase 1: Species	Cover (%)	Height (cm)	Specimen	Notes	Phase 2: Species	Cover (%)	Height (cm)	Specimen	Notes
<i>Acacia coriacea</i> subsp. <i>coriacea</i>	0.5	210			<i>Acacia coriacea</i> subsp. <i>coriacea</i>	0.1	180		
<i>Acacia sericophylla</i>	0.5	120	ASHC06-03						
					<i>Acacia tetragonophylla</i>	0.1	100		
<i>Bonamia erecta</i>	0.1	30			<i>Bonamia erecta</i>	0.1	35		
					<i>Cassutha capillaris</i>	0.1	25		
<i>Cenchrus ciliaris</i>	0.1	45		N=20 (estimated not counted)	<i>Cenchrus ciliaris</i>	2	40		
<i>Crotalaria cunninghamii</i> subsp. <i>sturtii</i>	0.1	10			<i>Crotalaria cunninghamii</i> subsp. <i>sturtii</i>	0.1	50		
<i>Diplopeltis eriocarpa</i>	0.1	25	ASH46-07=		<i>Diplopeltis eriocarpa</i>	0.1	15	ASHC06-01	
<i>Eragrostis eriopoda</i>	0.1	40			<i>Eragrostis eriopoda</i>	0.1	30		
<i>Gossypium australe</i>	0.1	20			<i>Gossypium australe</i>	0.1	60		
<i>Grevillea stenobotrya</i>	2	220	ASHC06-02		<i>Grevillea stenobotrya</i>	5	200		
<i>Hibiscus brachychlaenus</i>	0.1	110	ASHC06-01		<i>Hibiscus brachychlaenus</i>	0.1	140		
					<i>Ipomoea</i> sp.	0.1	5	ASHC06-03	Inadequate material.
					<i>Maireana</i> ? <i>lobiflora</i>	0.1	15	ASHC06-02	Poor material.
<i>Quoya loxocarpa</i>	0.1	90			<i>Quoya loxocarpa</i>	0.1	60		
					<i>Rhagodia eremaea</i>	0.1	120		

Phase 1: Species	Cover (%)	Height (cm)	Specimen	Notes	Phase 2: Species	Cover (%)	Height (cm)	Specimen	Notes
<i>Scaevola sericophylla</i>	3	45			<i>Scaevola sericophylla</i>	4	70		
<i>Solanum lasiophyllum</i>	0.1	40			<i>Solanum lasiophyllum</i>	0.1	70		
<i>Trichodesma zeylanicum</i> var. <i>grandiflorum</i>	0.1	20			<i>Trichodesma zeylanicum</i> var. <i>grandiflorum</i>	0.1	10		
<i>Triodia epactia</i>	22	35			<i>Triodia epactia</i>	20	60		



Phase 1



Phase 2

**Ashburton Salt Flora**      **Site**      ASHC07

**Described by**      P1: MM/RM      P2: RM      **Date**      P1: 08-Nov-18      P2: 15-Apr-19      **Type**      Quadrat 50 x 50 m

**MGA Zone**      50      266241 **mE**      7555103 **mN**      114.734293 **°E**      -22.093260 **°S**

**Habitat**      Dune; sand dune north-south with clay pan either side.

**Soil**      Red sand.

**Rock Type**      Nil.

**Vegetation**      P1: *Acacia sclerosperma* subsp. *sclerosperma* scattered tall shrubs over *Grevillea stenobotrya* scattered shrubs over *Scaevola sericophylla*, (*Quoya loxocarpa*) low open shrubland over *Triodia epactia* very open hummock grassland over \**Cenchrus ciliaris* scattered tussock grasses.  
P2: *Acacia sclerosperma* subsp. *sclerosperma* scattered tall shrubs over *Grevillea stenobotrya* scattered shrubs over *Scaevola sericophylla*, (*Quoya loxocarpa*) low open shrubland over *Triodia epactia* very open hummock grassland over \**Cenchrus ciliaris* scattered tussock grasses.

**Veg Condition**      P1: Very Good: scattered weeds; cattle scats and tracks.

P2: Very Good: scattered \**Cenchrus ciliaris*.

**Fire Age**      P1 & P2: No sign of recent fire.

Phase 1: Species	Cover (%)	Height (cm)	Specimen	Notes	Phase 2: Species	Cover (%)	Height (cm)	Notes
<i>Acacia sclerosperma</i> subsp. <i>sclerosperma</i>	0.25	230			<i>Acacia sclerosperma</i> subsp. <i>sclerosperma</i>	0.25	240	
<i>Bulbostylis barbata</i>	0.1	5						
<i>Calandrinia polyandra</i>	0.1	20	ASH11-02=					
<i>Cenchrus ciliaris</i>	1	30		N=1000.	<i>Cenchrus ciliaris</i>	1.5	60	
<i>Corchorus elachocarpus</i>	0.1	30	ASHC07-01		<i>Corchorus elachocarpus</i>	0.1	40	
<i>Corynotheca pungens</i>	0.1	60	ASH13-07=		<i>Corynotheca pungens</i>	0.1	30	Mostly dead.
<i>Eremophila setacea</i>	0.1	80	ASHC07-05		<i>Eremophila setacea</i>	0.1	70	
<i>Euphorbia myrtoides</i>	0.1	25	ASHC07-06					
<i>Evolvulus alsinoides</i> var. <i>villosicalyx</i>	0.1	20						
<i>Grevillea stenobotrya</i>	0.25	150	ASHC05-01=		<i>Grevillea stenobotrya</i>	0.25	150	
<i>Hakea stenophylla</i> subsp. <i>stenophylla</i>	0.1	60	ASHC07-03		<i>Hakea stenophylla</i> subsp. <i>stenophylla</i>	0.1	80	
<i>Haloragis gossei</i>	0.1	15						
<i>Hibiscus brachychlaenus</i>	0.1	180	ASH-MB60=		<i>Hibiscus brachychlaenus</i>	0.1	180	
<i>Lobelia heterophylla</i> subsp. <i>pilbarensis</i>	0.1	30	ASH-MB21=	Need better material to confidently ID to subsp.				
<i>Myriocephalus oldfieldii</i>	0.1	10	ASHC01-02=					
<i>Ptilotus polystachyus</i>	0.1	40						
<i>Quoya loxocarpa</i>	0.25	40	ASH13-11=		<i>Quoya loxocarpa</i>	0.25	80	
<i>Quoya paniculata</i>	0.1	35	ASHC07-02		<i>Quoya paniculata</i>	0.1	40	

Phase 1: Species	Cover (%)	Height (cm)	Specimen	Notes	Phase 2: Species	Cover (%)	Height (cm)	Notes
<i>Roebuckiella cheilocarpa</i> var. <i>cheilocarpa</i>	0.1	20	ASH13-02=					
<i>Scaevola sericophylla</i>	4	70	ASHC07-04		<i>Scaevola sericophylla</i>	4	80	
<i>Scaevola spinescens</i>	0.1	30			<i>Scaevola spinescens</i>	0.1	50	
<i>Scaevola spinescens</i> (broad form)	0.1	60			<i>Scaevola spinescens</i> (broad form)	0.1	70	
<i>Sida rohlenae</i> subsp. <i>rohlenae</i>	0.1	60			<i>Sida rohlenae</i> subsp. <i>rohlenae</i>	0.1	60	
<i>Solanum lasiophyllum</i>	0.1	30			<i>Solanum lasiophyllum</i>	0.1	30	
<i>Tephrosia gardneri</i>	0.1	35	ASH-MB32=		<i>Tephrosia gardneri</i>	0.1	30	
<i>Trianthema pilosum</i>	0.1	3						
<i>Triodia epactia</i>	7	30			<i>Triodia epactia</i>	8	30	



Phase 1



Phase 2

**Ashburton Salt Flora**      **Site**    ASHC08  
**Described by**    P1: RWSW      P2: RW    **Date**    P1: 07-Nov-18    P2: 13-Apr-19    **Type**    Quadrat 50 x 50 m  
**MGA Zone**        50    287821 **mE**      7596468 **mN**      114.948704 **°E**    -21.722549 **°S**  
**Habitat**            Plain; broad coastal plain.  
**Soil**                 Dark reddish brown (2.5YR 3/4) heavy clay.  
**Rock Type**        Nil.  
**Vegetation**        P1: *Tecticornia auriculata*, *T. indica* subsp. *leiostachya*, (*T. indica* subsp. *bidens*) low shrubland over *Eriachne flaccida* scattered tussock grasses.  
P2: *Tecticornia auriculata*, *T. indica* subsp. *leiostachya*, (*T. indica* subsp. *bidens*) low shrubland over *Eriachne flaccida*, *Sporobolus mitchellii*, *Eragrostis falcata* scattered tussock grasses over *Cyperus bulbosus* scattered sedges.  
**Veg Condition**    P1: Very Good: cattle scats and tracks; 1 x \**Cenchrus ciliaris*.  
P2: Very Good: signs of cattle.  
**Fire Age**            P1 & P2:: No sign of recent fire.

Phase 1: Species	Cover (%)	Height (cm)	Specimen	Notes	Phase 2: Species	Cover (%)	Height (cm)	Specimen	Notes
<i>Acacia synchronicia</i>	0.1	40							
<i>Angianthus milnei</i>	0.1	5							
<i>Atriplex codonocarpa</i>	0.1	20			<i>Atriplex codonocarpa</i>	0.1	20		
<i>Cenchrus ciliaris</i>	0.1	10		N=1.					
<i>Chloris pumilio</i>	0.1	5	ASHC08-04						
<i>Cressa australis</i>	0.1	10	ASH40-01=						
					<i>Cullen</i> sp.	0.1	5	ASHC08R-03	Inadequate material.
					<i>Cyperus bulbosus</i>	0.5	3	ASHC08R-07	
<i>Dactyloctenium radulans</i>	0.1	2							
					<i>Eragrostis falcata</i>	0.25	20	ASHC08R-04	
<i>Eragrostis pergracilis</i>	0.1	30							
<i>Eriachne flaccida</i>	1	25	ASHC08-01		<i>Eriachne flaccida</i>	1	35	ASHC08R-02	
					<i>Marsilea hirsuta</i>	0.1	10	ASHC08R-06	
					<i>Neobassia astrocarpa</i>	0.1	15		
					<i>Scaevola spinescens</i>	0.1	40		
<i>Sclerolaena bicornis</i> var. <i>bicornis</i>	0.1	25	ASHC08-08		<i>Sclerolaena bicornis</i> var. <i>bicornis</i>	0.1	25		
<i>Sclerolaena recurvicauspis</i>	0.1	25	ASHC08-03						
<i>Sporobolus virginicus</i>	0.1	15	ASH40-02=		<i>Sesbania cannabina</i>	0.1	5	ASHC08R-10	
					<i>Sporobolus mitchellii</i>	0.5	25	ASHC08R-05	
<i>Streptoglossa</i> sp.	0.1	5	ASHC08-02	Inadequate material for determination.	<i>Streptoglossa</i> sp.	0.1	2	ASHC08R-08	Inadequate material.
<i>Tecticornia auriculata</i>	7	110	ASHC08-05		<i>Tecticornia auriculata</i>	7	80		

Phase 1: Species	Cover (%)	Height (cm)	Specimen	Notes	Phase 2: Species	Cover (%)	Height (cm)	Specimen	Notes
					<i>Tecticornia halocnemoides</i> subsp. <i>tenuis</i>	0.1	30	ASHC08R-09	
<i>Tecticornia indica</i> subsp. <i>bidens</i>	2	50	ASHC08-06		<i>Tecticornia indica</i> subsp. <i>bidens</i>	2	40		
<i>Tecticornia indica</i> subsp. <i>leiostachya</i>	7	80	ASHC08-07		<i>Tecticornia indica</i> subsp. <i>leiostachya</i>	7	50		
					<i>Trianthema triquetrum</i>	0.1	2	ASHC08R-01	



Phase 1



Phase 2

**Ashburton Salt Flora**      **Site**    ASHC09

**Described by**    P1: MM/RM    P2: RM    **Date**    P1: 08-Nov-18    P2: 15-Apr-19    **Type**    Quadrat 50 x 50 m

**MGA Zone**        50    265711 **mE**        7555292 **mN**        114.729186 °E    -22.091482 °S

**Habitat**            Plain; undulating plain with scattered *Eucalyptus victrix* in surrounds.

**Soil**                 Yellowish red sandy loam - sand.

**Rock Type**        Nil.

**Vegetation**        P1: *Acacia tetragonophylla*, *A. synchronicia*, *A. sclerosperma* subsp. *sclerosperma* scattered shrubs over *Triodia epactia* hummock grassland over  
\**Cenchrus ciliaris* scattered tussock grasses.

P2: *Acacia sclerosperma* subsp. *sclerosperma*, *A. synchronicia*, *A. tetragonophylla* scattered shrubs over *Triodia epactia* hummock grassland over  
\**Cenchrus ciliaris* scattered tussock grasses.

**Veg Condition**    P1: Very Good: scattered weeds.

P2: Very Good: scattered \**Cenchrus ciliaris*.

**Fire Age**            P1: No sign of recent fire.

Phase 1: Species	Cover (%)	Height (cm)	Specimen	Notes	Phase 2: Species	Cover (%)	Height (cm)	Notes
<i>Acacia sclerosperma</i> subsp. <i>sclerosperma</i>	0.25	150			<i>Acacia sclerosperma</i> subsp. <i>sclerosperma</i>	0.25	160	
<i>Acacia synchronicia</i>	0.25	120			<i>Acacia synchronicia</i>	0.25	150	
<i>Acacia tetragonophylla</i>	0.25	140			<i>Acacia tetragonophylla</i>	0.25	150	
<i>Bulbostylis barbata</i>	0.1	3						
<i>Calandrinia polyandra</i>	0.1	20	ASH11-02=					
<i>Cenchrus ciliaris</i>	1	30		N=1000.	<i>Cenchrus ciliaris</i>	1	30	
<i>Dactyloctenium radulans</i>	0.1	5						
<i>Dysphania rhadinostachya</i>	0.1	20						
					<i>Enchylaena tomentosa</i> var. <i>tomentosa</i>	0.1	90	
<i>Eragrostis dielsii</i>	0.1	2	ASHC09-01	sens. lat.				
<i>Ptilotus polystachyus</i>	0.1	30						
<i>Roebuckiella cheilocarpa</i> var. <i>cheilocarpa</i>	0.1	25	ASH13-02=					
<i>Salsola australis</i>	0.1	20						
<i>Sclerolaena costata</i>	0.1	20			<i>Sclerolaena costata</i>	0.1	20	Mostly dead.
<i>Senna artemisioides</i> subsp. <i>oligophylla</i> (thinly sericeous form MET 15,035)	0.1	70	ASH29-02=		<i>Senna artemisioides</i> subsp. <i>oligophylla</i> (thinly sericeous form MET 15,035)	0.1	80	
<i>Swainsona kingii</i>	0.1	5	ASHC09-02					
<i>Swainsona pterostylis</i>	0.1	20	REL01-01=					
<i>Trachymene pilbarensis</i>	0.1	20						
<i>Triodia epactia</i>	55	60			<i>Triodia epactia</i>	50	60	



**Phase 1**



**Phase 2**



**Ashburton Salt Flora**      **Site**    ASHC10  
**Described by**    P1: RWSW      P2: BDMJK      **Date**    P1: 07-Nov-18    P2: 13-Apr-19      **Type**    Quadrat 50 x 50 m  
**MGA Zone**        50      286906 **mE**      7598372 **mN**      114.940108 **°E**    -21.705248 **°S**  
**Habitat**            Plain; broad coastal plain.  
**Soil**                 Dark reddish brown (2.5YR 3/3) loamy sand.  
**Rock Type**        Nil.  
**Vegetation**        P1: *Acacia stellaticeps* open shrubland over *Triodia epactia* hummock grassland over \**Cenchrus ciliaris* very open tussock grassland.  
P2: *Acacia stellaticeps* open shrubland over *Triodia epactia* hummock grassland over \**Cenchrus ciliaris* scattered tussock grasses.  
**Veg Condition**    P1: Very Good to Good: some \**Cenchrus ciliaris*.  
P2: Very Good: scattered weeds  
**Fire Age**            P1 & P2: No sign of recent fire.  
**Notes**                P1: \**Prosopis pallida* scattered in area.

Phase 1: Species	Cover (%)	Height (cm)	Specimen	Notes	Phase 2: Species	Cover (%)	Height (cm)	Specimen	Notes
<i>Acacia coriacea</i> subsp. <i>coriacea</i>	0.1	150			<i>Acacia coriacea</i> subsp. <i>coriacea</i>	0.1	150		
<i>Acacia stellaticeps</i>	4	150			<i>Acacia stellaticeps</i>	3	110		
<i>Cassutha capillaris</i>	0.1	40			<i>Cassutha capillaris</i>	0.1	30		
<i>Cenchrus ciliaris</i>	3	45			<i>Cenchrus ciliaris</i>	1	30		
<i>Myoporum montanum</i>	0.1	60	ASHC10-02		<i>Myoporum montanum</i>	0.1	60		
					<i>Pterocaulon sphacelatum</i>	0.1	25	ASHC10-01	
<i>Rhynchosia minima</i>	0.1	40			<i>Rhynchosia minima</i>	0.1	30		
<i>Samolus</i> sp. Shark Bay (M.E. Trudgen 7410)	0.1	40	ASHC10-01		<i>Samolus</i> sp. Shark Bay (M.E. Trudgen 7410)	0.1	45		
					<i>Scaevola</i> sp.	0.1	45		
					<i>Solanum cleistogamum</i>	0.1	50	ASHC10-02	
					<i>Solanum lasiophyllum</i>	0.1	60		
<i>Stemodia</i> sp. Onslow (A.A. Mitchell 76/148)	0.1	45			<i>Stemodia</i> sp. Onslow (A.A. Mitchell 76/148)	0.1	45		
<i>Triodia epactia</i>	60	80			<i>Triodia epactia</i>	65	40		
<i>Vachellia farnesiana</i>	0.1	120		N=2.	<i>Vachellia farnesiana</i>	0.1	120		N=2



**Phase 1**



**Phase 2**

**Ashburton Salt Flora**      **Site**    ASHC11  
**Described by**    P1: RWSW      P2: SWJK **Date**    P1: 07-Nov-18    P2: 10-Apr-19      **Type**    Quadrat 50 x 50 m  
**MGA Zone**        50    277902 **mE**      7592462 **mN**      114.852322 **°E**    -21.757502 **°S**  
**Habitat**            Plain; coastal plain adjacent to dunes lining the coast.  
**Soil**                 Reddish brown (2.5YR 4/4) patches of heavy clay - cracking, with loamy clay dominant.  
**Rock Type**        Nil.  
**Vegetation**        P1 & P2: *Tecticornia auriculata* low shrubland.  
**Veg Condition**    P1: Excellent; a few cattle scats.  
                               P2: Excellent.  
**Fire Age**            P1 & P2: No sign of recent fire.  
**Notes**                P2: *Atriplex* not present this year.

Phase 1: Species	Cover (%)	Height (cm)	Specimen	Notes	Phase 2: Species	Cover (%)	Height (cm)	Notes
<i>Atriplex semilunaris</i>	0.1	5		Only 1 alive; sterile.				
					<i>Cyperus</i> sp.	0.1	5	Juvenile.
<i>Tecticornia auriculata</i>	12	90	ASHC11-01		<i>Tecticornia auriculata</i>	15	70	



Phase 1



Phase 2

**Ashburton Salt Flora**      **Site**    ASHC12

**Described by**    P1: RWSW      P2: SWJK      **Date**    P1: 07-Nov-18    P2: 10-Apr-19    **Type**    Quadrat 50 x 50 m

**MGA Zone**      50      283126 **mE**      7589605 **mN**      114.902437 **°E**    -21.783945 **°S**

**Habitat**          Plain.

**Soil**                Dark reddish brown (2.5YR 3/3) heavy clay.

**Rock Type**      Nil.

**Vegetation**      P1: *Eriachne flaccida*, *Sporobolus mitchellii* tussock grassland.  
P2: *Eriachne flaccida*, (*Sporobolus mitchellii*) open tussock grassland.

**Veg Condition**    P1: Excellent: some cattle scats and tracks, but no sign of grazing; no weeds.  
P2: Very Good: cattle scats, tracks and grazing.

**Fire Age**         P1 & P2: No sign of recent fire.

Phase 1: Species	Cover (%)	Height (cm)	Specimen	Phase 2: Species	Cover (%)	Height (cm)
<i>Alternanthera nodiflora</i>	0.1	5	ASHC12-01			
<i>Eriachne flaccida</i>	24	45	ASHC08-01=	<i>Eriachne flaccida</i>	26	45
<i>Marsilea hirsuta</i>	0.1	15				
<i>Panicum decompositum</i>	0.1	30				
<i>Sporobolus mitchellii</i>	20	35		<i>Sporobolus mitchellii</i>	1	10



Phase 1



Phase 2

**Ashburton Salt Flora**      **Site**      ASHC13  
**Described by**      P1: RWSW      P2: BDMJK      **Date**      P1: 08-Nov-18      P2: 14-Apr-19      **Type**      Quadrat 50 x 50 m  
**MGA Zone**      50      280854 **mE**      7594770 **mN**      114.881159 °E      -21.737032 °S  
**Habitat**      Plain; undulating plain adjacent to primary dunes.  
**Soil**      Dark reddish brown (5YR 3/3) loamy sand with shell fragments.  
**Rock Type**      Nil.  
**Vegetation**      P1: *Acacia stellaticeps* shrubland over *Triodia epactia* open hummock grassland over *Whiteochloa airoides* scattered tussock grasses.  
                                  P2: *Acacia stellaticeps* shrubland over *Triodia epactia* hummock grassland over \**Cenchrus ciliaris* very open tussock grassland.  
**Veg Condition**      P1: Very Good: cattle scats and scattered \**Cenchrus ciliaris*.  
                                  P2: Very Good: scattered \**Cenchrus ciliaris*.  
**Fire Age**      P1 & P2: Very long unburnt.

Phase 1: Species	Cover (%)	Height (cm)	Specimen	Notes	Phase 2: Species	Cover (%)	Height (cm)
<i>Acacia coriacea</i> subsp. <i>coriacea</i>	0.1	130			<i>Acacia coriacea</i> subsp. <i>coriacea</i>	0.1	150
<i>Acacia stellaticeps</i>	27	110			<i>Acacia stellaticeps</i>	15	120
<i>Adriana tomentosa</i> var. <i>tomentosa</i>	0.1	160	ASHC13-03		<i>Adriana tomentosa</i> var. <i>tomentosa</i>	0.1	110
<i>Cassutha capillaris</i>	0.1	35			<i>Cassutha capillaris</i>	0.1	20
<i>Cenchrus ciliaris</i>	0.1	40		N=20 (estimated not counted)	<i>Cenchrus ciliaris</i>	2	20
<i>Corynotheca pungens</i>	0.1	35			<i>Corynotheca pungens</i>	0.1	50
<i>Eragrostis eriopoda</i>	0.1	25			<i>Eragrostis eriopoda</i>	0.1	25
<i>Indigofera bovipерda</i> subsp. <i>bovipерda</i>	0.1	30	ASHC13-01		<i>Indigofera bovipерda</i> subsp. <i>bovipерda</i>	0.1	25
<i>Olearia</i> sp. Kennedy Range (G. Byrne 66)	0.1	120	ASHC13-02		<i>Olearia</i> sp. Kennedy Range (G. Byrne 66)	0.1	60
<i>Pterocaulon sphacelatum</i>	0.1	15					
<i>Rhynchosia minima</i>	0.1	40					
<i>Salsola australis</i>	0.1	15					
<i>Scaevola sericophylla</i>	0.1	115			<i>Scaevola sericophylla</i>	0.1	100
<i>Solanum lasiophyllum</i>	0.1	25			<i>Solanum lasiophyllum</i>	0.1	50
<i>Triodia epactia</i>	20	90			<i>Triodia epactia</i>	45	60
<i>Whiteochloa airoides</i>	1	70	ASHC13-04		<i>Whiteochloa airoides</i>	0.1	60



**Phase 1**



**Phase 2**

**Ashburton Salt Flora**      **Site**      ASHC14  
**Described by**      P1: RWSW      P2: SWJK      **Date**      P1: 07-Nov-18      P2: 09-Apr-19      **Type**      Quadrat 50 x 50 m  
**MGA Zone**      50      282105 **mE**      7587015 **mN**      114.892225 °E      -21.807203 °S  
**Habitat**      Plain; broad undulating plain.  
**Soil**      Dark reddish brown (2.5YR 3/3) loamy sand.  
**Rock Type**      Nil.  
**Vegetation**      P1: *Acacia tetragonophylla* scattered tall shrubs over *A. stellaticeps* open shrubland over *Triodia epactia*, (*T. glabra*) open hummock grassland over \**Cenchrus ciliaris* scattered tussock grasses.  
P2: *Acacia stellaticeps*, (*A. tetragonophylla*) open shrubland over *Eremophila forrestii* subsp. *viridis* low open shrubland over *Triodia epactia* open hummock grassland over \**Cenchrus ciliaris* very open tussock grassland.  
**Veg Condition**      P1: Very Good: scattered weeds.  
P2: Good: some \**Cenchrus ciliaris*; cattle scats and grazing.  
**Fire Age**      P1 & P2: No sign of recent fire.

Phase 1: Species	Cover (%)	Height (cm)	Specimen	Notes	Phase 2: Species	Cover (%)	Height (cm)	Notes
<i>Acacia stellaticeps</i>	3	120			<i>Acacia stellaticeps</i>	7	100	
<i>Acacia tetragonophylla</i>	1	400			<i>Acacia tetragonophylla</i>	1	250	
<i>Cenchrus ciliaris</i>	1	45			<i>Cenchrus ciliaris</i>	8	20	
<i>Eragrostis eriopoda</i>	0.1	25						
<i>Eremophila forrestii</i> subsp. <i>viridis</i>	0.1	110	ASHC14-04	N=5; M. Hislop det.	<i>Eremophila forrestii</i> subsp. <i>viridis</i>	2	75	N=11
					<i>Gossypium australe</i>	0.1	50	
<i>Indigofera bovipерda</i> subsp. <i>bovipерda</i>	0.1	30	ASHC14-02		<i>Indigofera bovipерda</i> subsp. <i>bovipерda</i>	0.1	25	
					<i>Ptilotus</i> sp.	0.1	1	Juvenile
<i>Quoya paniculata</i>	0.1	50	ASHC14-03					
					<i>Rhagodia eremaea</i>	0.1	100	
<i>Senna artemisioides</i> subsp. <i>oligophylla</i>	0.1	110	ASHC14-01		<i>Senna artemisioides</i> subsp. <i>oligophylla</i>	0.1	90	
<i>Solanum lasiophyllum</i>	0.1	30			<i>Solanum lasiophyllum</i>	0.1	25	
<i>Triodia epactia</i>	18	50			<i>Triodia epactia</i>	15	40	
<i>Triodia glabra</i>	2	35						



**Phase 1**



**Phase 2**



**Ashburton Salt Flora**      **Site**    ASHC15  
**Described by**    P1: RWSW      P2: SWJK      **Date**    P1: 09-Nov-18    P2: 10-Apr-19    **Type**    Quadrat 50 x 50 m  
**MGA Zone**        50    277478 **mE**      7592622 **mN**    114.848246 **°E**    -21.756004 **°S**  
**Habitat**            Dune, undulating second series.  
**Soil**                 5YR 3/4, sand.  
**Vegetation**        P1: *Acacia coriacea* subsp. *coriacea* tall open shrubland over *Spinifex longifolius*, (*Triodia epactia*) very open hummock grassland over *\*Cenchrus ciliaris* very open tussock grassland.  
P2: *Acacia coriacea* subsp. *coriacea* low open woodland over *Spinifex longifolius*, (*Triodia epactia*) open hummock grassland over *\*Cenchrus ciliaris* very open tussock grassland.  
**Veg Condition**    P1: Very Good to Good: 5% cover of *\*Cenchrus ciliaris*.  
P2: Very Good: 2% cover of *\*Cenchrus ciliaris*.  
**Fire Age**            P1 & P2: No sign of recent fire.

Phase 1: Species	Cover (%)	Height (cm)	Specimen	Notes	Phase 2: Species	Cover (%)	Height (cm)
<i>Acacia coriacea</i> subsp. <i>coriacea</i>	8	300			<i>Acacia coriacea</i> subsp. <i>coriacea</i>	8	180
<i>Cassutha capillaris</i>	0.1	10	ASHC11-01		<i>Cassutha capillaris</i>	0.1	20
<i>Cenchrus ciliaris</i>	3	45			<i>Cenchrus ciliaris</i>	2	40
<i>Corynotheca pungens</i>	0.1	35					
<i>Eriachne aristidea</i>	0.1	25			<i>Eriachne aristidea</i>	0.1	25
<i>Indigofera colutea</i>	0.1	25	ASHC11-04		<i>Indigofera colutea</i>	0.1	25
<i>Momordica balsamina</i>	0.1	40	ASHC11-03	N=1	<i>Momordica balsamina</i>	0.1	80
<i>Salsola australis</i>	0.1	30			<i>Salsola australis</i>	1	40
<i>Sida rohlenae</i> subsp. <i>rohlenae</i>	0.5	60	ASHC11-05		<i>Sida rohlenae</i> subsp. <i>rohlenae</i>	0.5	80
					<i>Solanum cleistogamum</i>	0.1	20
<i>Solanum lasiophyllum</i>	0.1	60			<i>Solanum lasiophyllum</i>	0.1	80
<i>Spinifex longifolius</i>	7	130			<i>Spinifex longifolius</i>	8	100
<i>Tribulus occidentalis</i>	0.1	10	ASHC11-02		<i>Tribulus occidentalis</i>	0.1	15
<i>Triodia epactia</i>	1	40			<i>Triodia epactia</i>	2	40



**Phase 1**



**Phase 2**

**Ashburton Salt Flora Phase 1**      **Site**    ASH-REL01  
**Described by**    MM/RM      **Date**    01-Nov-18      **Type**    Relevé 30 x 80 m  
**MGA Zone**      50    279769 **mE**      7583570 **mN**      114.869179 °E    -21.838016 °S  
**Habitat**            Plain; lowest lying section of a broad plain between low dunes.  
**Soil**                 Yellowish red light clay.  
**Rock Type**        Mixed rounded riverstone; pebble 1-25%.  
**Vegetation**        *Acacia tetragonophylla* tall shrubland over *Eriachne benthamii* open tussock grassland.  
**Veg Condition**    Very Good: some weeds.  
**Fire Age**            No sign of recent fire.

Phase 1: Species	Cover (%)	Height (cm)	Specimen	Notes
<i>Acacia coriacea</i> subsp. <i>coriacea</i>	0.1	90		
<i>Acacia synchronica</i>	0.1	180	ASH01-03=	
<i>Acacia tetragonophylla</i>	11	280		
<i>Aristida latifolia</i>	0.1	60	REL01-06	
<i>Calotis hispidula</i>	0.1	10		Range extension.
<i>Calotis porphyroglossa</i>	0.1	10	ASH-MB02=	
<i>Cenchrus ciliaris</i>	0.1	10		N=1.
<i>Chloris pectinata</i>	0.1	5	REL01-02	
<i>Cullen cinereum</i>	0.1	10		
<i>Dactyloctenium radulans</i>	0.1	5		
<i>Dichanthium sericeum</i> subsp. <i>humilius</i>	0.1	15		
<i>Dysphania rhadinostachya</i> subsp. <i>rhadinostachya</i>	0.1	10	REL01-07	
<i>Enchylaena tomentosa</i> var. <i>tomentosa</i>	0.1	40		
<i>Eragrostis setifolia</i>	0.1	50	REL01-10	
<i>Eragrostis xerophila</i>	0.1	30		
<i>Eriachne benthamii</i>	25	40		
<i>Erodium</i> sp.	0.1	10	ASH09-11=	Probably <i>E. cygnorum</i> ; inadequate material for further determination.
<i>Eulalia aurea</i>	0.1	60		
<i>Iseilema membranaceum</i>	0.1	3	REL01-03	
<i>Lotus cruentus</i>	0.1	10	ASH-MB08=	
<i>Maireana georgei</i>	0.1	30	REL01-04	Range extension.
<i>Nicotiana occidentalis</i>	0.1	20	REL01-08	Inadequate material for determination to subsp.
<i>Ptilotus polystachyus</i>	0.1	20	ASH01-06=	
<i>Rhynchosia minima</i>	0.1	5		
<i>Scaevola spinescens</i>	0.1	60		
<i>Sporobolus mitchellii</i>	0.1	15	ASH-MB06=	
<i>Streptoglossa bubakii</i>	0.1	10	REL01-05	

Phase 1: Species	Cover (%)	Height (cm)	Specimen	Notes
<i>Swainsona pterostylis</i>	0.1	10	RELO1-01	
<i>Triodia epactia</i>	0.1	20		
<i>Urochloa occidentalis</i> var. <i>occidentalis</i>	0.1	10	RELO1-09	
<i>Vachellia farnesiana</i>	0.1			N=2; dead.



Phase 1

**Ashburton Salt Flora Phase 1**      **Site**    ASH-REL02

**Described by**    RW      **Date**    05-Nov-18      **Type**    Relevé 50 x 50 m

**MGA Zone**        50      261246 **mE**      7569178 **mN**      114.687973 °E    -21.965525 °S

**Habitat**            Undulating plain within a coastal island.

**Rock Type**        Nil.

**Vegetation**        *Acacia stellaticeps*, (*A. synchronica*) open shrubland over *A. coriacea* subsp. *coriacea* scattered low shrubs over *Triodia epactia* hummock grassland.

**Veg Condition**    Very Good, scattered \**Cenchrus ciliaris*.

**Fire Age**            No sign of recent fire.

Phase 1: Species	Cover (%)	Height (cm)
<i>Acacia coriacea</i> subsp. <i>coriacea</i>	0.5	60
<i>Acacia stellaticeps</i>	2	110
<i>Acacia synchronica</i>	0.5	160
<i>Cenchrus ciliaris</i>	0.1	35
<i>Goodenia microptera</i>	0.1	25
<i>Scaevola spinescens</i> (broad form)	0.1	25
<i>Solanum lasiophyllum</i>	0.1	25
<i>Triodia epactia</i>	42	45



**Phase 1**

**Ashburton Salt Flora Phase 1**      **Site**    ASH-RELO3

**Described by**    SW      **Date**    04-Nov-18      **Type**    Relevé 50 x 50 m

**MGA Zone**      50      285644 **mE**      7593985 **mN**      114.927347 °E    -21.744706 °S

**Habitat**            Floodplain; between red sand dunes.

**Soil**                Clay-loam.

**Rock Type**        Nil.

**Vegetation**        *Eucalyptus victrix* low open woodland over \**Vachellia farnesiana* scattered shrubs over *Eriachne benthamii*, (*Eulalia aurea*, *Sporobolus mitchellii*) tussock grassland.

**Veg Condition**    Very Good: cattle scats throughout site; no \**Cenchrus ciliaris*, but scattered \**Vachellia*

**Fire Age**            No sign of recent fire.

Phase 1: Species	Cover (%)	Height (cm)	Notes
<i>Acacia coriacea</i> subsp. <i>coriacea</i>	0.1	140	
<i>Acacia synchronicia</i>	0.1	130	
<i>Acacia tetragonophylla</i>	0.1	180	
<i>Chrysopogon fallax</i>	0.1	80	
<i>Eriachne benthamii</i>	55	50	
<i>Eucalyptus victrix</i>	8	800	
<i>Eulalia aurea</i>	4	60	
<i>Marsilea hirsuta</i>	0.1	10	
<i>Ptilotus exaltatus</i>	0.1	10	
<i>Sporobolus mitchellii</i>	2	30	
<i>Vachellia farnesiana</i>	0.5	130	N=15.

**Ashburton Salt Flora Phase 1**      **Site**    ASH-REL04  
**Described by**    RW      **Date**    08-Nov-18      **Type**    Relevé 50 x 50 m  
**MGA Zone**        50      278625 **mE**      7588151 **mN**      114.858732 °E    -21.796514 °S  
**Habitat**            Drainage area within broad plain.  
**Soil**                 Heavy clay to loamy clay.  
**Rock Type**        Nil.  
**Vegetation**        *Eucalyptus victrix* low woodland over *Eriachne benthamii*, (*Sporobolus mitchellii*) tussock grassland.  
**Veg Condition**    Very Good, some weeds (low density).  
**Fire Age**            No sign of recent fire.

Phase 1: Species	Cover (%)	Height (cm)	Specimen	Notes
<i>Acacia coriacea</i> subsp. <i>coriacea</i>	0.1	210		
<i>Acacia synchronicia</i>	0.1	350		
<i>Acacia tetragonophylla</i>	0.1	350		
<i>Bergia perennis</i> subsp. <i>exigua</i>	0.1	1	REL14-01	
<i>Eriachne benthamii</i>	40	40		
<i>Eucalyptus victrix</i>	28	1000		
<i>Marsilea hirsuta</i>	0.1	20		
<i>Sporobolus mitchellii</i>	10	35		
<i>Vachellia farnesiana</i>	0.1	50		N=1



**Phase 1**

**Ashburton Salt Flora Phase 1**      **Site**    ASH-REL05

**Described by**    RW      **Date**    07-Nov-18      **Type**    Relevé 50 x 50 m

**MGA Zone**      50      269848 **mE**      7582064 **mN**      114.773033 **°E**    -21.850345 **°S**

**Habitat**            Saline flat; between two arms of a coastal island.

**Soil**                Loamy clay sand.

**Rock Type**        Nil.

**Vegetation**        *Tecticornia auriculata*, (*T. indica* subsp. *bidens*, *T. halocnemoides* subsp. *tenuis*) low shrubland.

**Veg Condition**    Very Good: scattered \**Cenchrus ciliaris*.

**Fire Age**            No sign of recent fire.

Phase 1: Species	Cover (%)	Height (cm)	Specimen	Notes
<i>Angianthus acrohyalinus</i>	0.1	15	REL20-06	
<i>Cenchrus ciliaris</i>	0.1	10		N=20 (estimated not counted)
<i>Lawrencia viridigrisea</i>	0.1	25		
<i>Neobassia astrocarpa</i>	0.1	2		
<i>Tecticornia auriculata</i>	20	60	REL20-03,4	
<i>Tecticornia halocnemoides</i> subsp. <i>tenuis</i>	1	35	REL05-05	K. Shepherd det.
<i>Tecticornia indica</i> subsp. <i>bidens</i>	4	35	REL20-01	



**Phase 1**



**Ashburton Salt Flora Phase 1**      **Site**    ASH-REL06

**Described by**    RW      **Date**    08-Nov-18      **Type**    Relevé 50 m x 50 m

**MGA Zone**        50      277428 **mE**      7589114 **mN**      114.847290 °E    -21.787669 °S

**Habitat**            Plain; gently undulating coastal plain.

**Soil**                 Loamy sand.

**Vegetation**        *Acacia sclerosperma* subsp. *sclerosperma*, (*A. tetragonophylla*, *A. synchronicia*) open shrubland over *Triodia avenoides*, (*T. glabra*) open hummock grassland.

**Veg Condition**    Very Good: signs of cattle; scattered weeds.

**Fire Age**            No sign of recent fire.

Phase 1: Species	Cover (%)	Height (cm)	Specimen	Notes
<i>Acacia coriacea</i> subsp. <i>coriacea</i>	0.1	130		
<i>Acacia sclerosperma</i> subsp. <i>sclerosperma</i>	3	170		
<i>Acacia synchronicia</i>	1	160		
<i>Acacia tetragonophylla</i>	2	160		
<i>Acacia trachycarpa</i>	0.1	280	REL12-01	
<i>Cenchrus ciliaris</i>	0.1	40		N=20 (estimated not counted)
<i>Chrysopogon fallax</i>	0.1	70		
<i>Eulalia aurea</i>	0.1	35		
<i>Rhagodia eremaea</i>	0.1	110	REL12-02	
<i>Solanum lasiophyllum</i>	0.1	25		
<i>Triodia avenoides</i>	25	35		
<i>Triodia glabra</i>	4	25		
<i>Vachellia farnesiana</i>	0.1	120		N=1.



**Phase 1**

**Ashburton Salt Flora Phase 1**      **Site**    ASH-RELO7  
**Described by**    MM/RM      **Date**    04-Nov-18      **Type**    Relevé  
**MGA Zone**        50      288456 **mE**      7595106 **mN**      114.954666 °E    -21.734922 °S  
**Habitat**            Broad low plain.  
**Soil**                 Yellowish brown clay loam.  
**Rock Type**        Nil.  
**Vegetation**        *Sclerolaena recurvicauspis*, *Atriplex codonocarpa* very open herbland over mixed scattered tussock grasses.  
**Veg Condition**    Good: no weeds present, but 'scalded' habitat.  
**Fire Age**            No sign of recent fire.

Phase 1: Species	Cover (%)	Height (cm)	Specimen
<i>Atriplex bunburyana</i>	0.1	60	
<i>Atriplex codonocarpa</i>	3	25	
<i>Calotis porphyroglossa</i>	0.1	5	RELO2-03
<i>Eragrostis falcata</i>	0.1	30	
<i>Eragrostis xerophila</i>	0.1	30	
<i>Eriachne benthamii</i>	0.1	30	
<i>Frankenia ambita</i>	0.1	15	
<i>Gnephosis arachnoidea</i>	0.1	25	RELO2-02
<i>Sclerolaena recurvicauspis</i>	4	20	RELO2-01



**Phase 1**

**Ashburton Salt Flora Phase 1**      **Site**    ASH-REL08  
**Described by**    MM/RM      **Date**    05-Nov-18      **Type**    Relevé  
**MGA Zone**      50    269408 **mE**    7588170 **mN**    114.769633 °E    -21.795163 °S  
**Habitat**            Coastal strand/beach.  
**Soil**                Yellowish brown sand.  
**Vegetation**      *Spinifex longifolius* very open hummock grassland.  
**Veg Condition**    Excellent.  
**Fire Age**            No sign of recent fire.

Phase 1: Species	Cover (%)	Height (cm)	Specimen
<i>Eriachne gardneri</i>	0.1	30	REL04-02
<i>Ipomoea pes-caprae</i> subsp. <i>brasiliensis</i>	0.1	20	
<i>Ptilotus villosiflorus</i>	0.1	15	REL04-01
<i>Salsola australis</i>	0.1	40	
<i>Scaevola crassifolia</i>	0.1	40	REL04-03
<i>Spinifex longifolius</i>	3	60	



Phase 1

**Ashburton Salt Flora Phase 2**      **Site**      STR01R

**Described by**      SWJK      **Date**      09-Apr-19      **Type**      Quadrat      50 x 50 m

**MGA Zone**      50      267840 **mE**      7573465 **mN**      114.752398 **°E**      -21.927710 **°S**

**Habitat**      Low dune, upper mid and lower slopes.

**Soil**      Red-brown fine-grained aeolian sand

**Vegetation**      *Acacia tetragonophylla* scattered tall shrubs over *Hakea stenophylla* subsp. *stenophylla*, (*Acacia stellaticeps*, *Corymbia zygophylla*, *Acacia coriacea* subsp. *coriacea*) shrubland over *Triodia epactia* hummock grassland over \**Cenchrus ciliaris* scattered tussock grasses.

**Veg Condition**      Very Good: scattered \**Cenchrus ciliaris*.

**Fire Age**      Very long unburnt.

**Notes**      Dead *Ptilotus exaltatus* and *Trichodesma zeylanicum* present.

Phase 2: Species	Cover (%)	Height (cm)	Specimen
<i>Acacia bivenosa</i>	1	45	
<i>Acacia coriacea</i> subsp. <i>coriacea</i>	1	170	
<i>Acacia stellaticeps</i>	3	100	
<i>Acacia tetragonophylla</i>	0.5	250	
<i>Bonamia erecta</i>	0.1	20	
<i>Cenchrus ciliaris</i>	1	30	
<i>Corymbia zygophylla</i>	2	150	
<i>Enchylaena tomentosa</i> var. <i>tomentosa</i>	0.1	30	STR01-01
<i>Eremophila setacea</i>	0.1	60	
<i>Grevillea stenobotrya</i>	0.5	190	
<i>Hakea stenophylla</i> subsp. <i>stenophylla</i>	9	100	
<i>Indigofera boviparda</i> subsp. <i>boviparda</i>	0.1	25	STR01-02
<i>Rhagodia eremaea</i>	0.1	40	
<i>Scaevola sericophylla</i>	0.5	40	
<i>Scaevola spinescens</i>	0.1	50	
<i>Senna glutinosa</i> subsp. <i>glutinosa</i>	0.1	200	
<i>Solanum lasiophyllum</i>	0.1	40	
<i>Triodia epactia</i>	65	60	



**Phase 2**

**Ashburton Salt Flora Phase 2**      **Site**      STR02R

**Described by**      SWJK      **Date**      09-Apr-19      **Type**      Quadrat      50 x 50 m

**MGA Zone**      50      267919 **mE**      7571458 **mN**      114.752878 °E      -21.945839 °S

**Habitat**      Broad dune swale surrounded by low dune rises.

**Soil**      Red-brown fine aeolian sand

**Vegetation**      *Hakea stenophylla* subsp. *stenophylla*, (*Acacia tetragonophylla*) shrubland over *A. stellaticeps*, *Eremophila forrestii* subsp. *viridis* low open shrubland over *Triodia glabra*, (*T. epactia*) hummock grassland.

**Veg Condition**      Very Good: scattered \**Cenchrus ciliaris*.

**Fire Age**      No sign of recent fire.

Phase 2: Species	Cover (%)	Height (cm)	Specimen	Notes
<i>Acacia stellaticeps</i>	3	50		
<i>Acacia tetragonophylla</i>	1	160		
<i>Cenchrus ciliaris</i>	0.1	30		
<i>Eremophila forrestii</i> subsp. <i>viridis</i>	1	60	STR02-01	N=10
<i>Grevillea stenobotrya</i>	0.1	200	STR02-02	
<i>Hakea stenophylla</i> subsp. <i>stenophylla</i>	12	100		
<i>Indigofera bovipерda</i> subsp. <i>bovipерda</i>	0.1	25	=STR01	
<i>Rhagodia eremaea</i>	0.1	100		
<i>Scaevola sericophylla</i>	0.1	30		
<i>Scaevola spinescens</i>	0.1	50		
<i>Scaevola spinescens</i> (broad form)	0.1	0		
<i>Senna artemisioides</i> subsp. <i>oligophylla</i> (thinly sericeous form MET 15,035)	0.1	60		
<i>Solanum lasiophyllum</i>	0.1	30		
<i>Triodia epactia</i>	15	40		
<i>Triodia glabra</i>	30	25	STR02-03	



**Phase 2**



**Ashburton Salt Flora Phase 2**      **Site**      STR03R

**Described by**      BMRW      **Date**      15-Apr-19      **Type**      Quadrat      50 x 50 m

**MGA Zone**      50      265447 **mE**      7570368 **mN**      114.728801 °E      -21.955350 °S

**Habitat**      Broad dune swale between two low, parallel secondary dunes.

**Soil**      Red-orange clay loam, with a cracking crust

**Vegetation**      *Acacia tetragonophylla* scattered tall shrubs over *Acacia sclerosperma* subsp. *sclerosperma* scattered shrubs over *Triodia epactia*, (*T. glabra*) open hummock grassland.

**Veg Condition**      Good: 12% cover of \**Cenchrus ciliaris* and signs of cattle.

**Fire Age**      No sign of recent fire.

Phase 2: Species	Cover (%)	Height (cm)	Specimen	Notes
<i>Abutilon</i> sp.	0.1	5	STR03-02	Inadequate material.
<i>Acacia sclerosperma</i> subsp. <i>sclerosperma</i>	0.5	160		
<i>Acacia synchronicia</i>	0.1	170		
<i>Acacia tetragonophylla</i>	1	220		
<i>Cenchrus ciliaris</i>	12	40		
<i>Ptilotus exaltatus</i>	0.1	15		
<i>Scaevola spinescens</i>	0.1	70		
<i>Solanum lasiophyllum</i>	0.1	35		
<i>Triodia epactia</i>	18	50		
<i>Triodia glabra</i>	8	30	STR03-01	



**Phase 2**

**Ashburton Salt Flora Phase 2**      **Site**      STR04R

**Described by**      RM      **Date**      16-Apr-19      **Type**      Quadrat      50 x 50 m

**MGA Zone**      50      261259 **mE**      7565672 **mN**      114.687586 °E      -21.997176 °S

**Habitat**      Lower slope and base of swale area near a low secondary dune.

**Soil**      Red fine-grained aeolian sand

**Vegetation**      *Acacia tetragonophylla* scattered tall shrubs over *Grevillea stenobotrya*, *A. stellaticeps*, *A. coriacea* subsp. *coriacea* scattered shrubs over *Scaevola spinescens* scattered low shrubs over *Triodia epactia*, *T. avenoides*, (*T. glabra*) hummock grassland over \**Cenchrus ciliaris* very open tussock grassland.

**Veg Condition**      Very Good to Good: 5% cover of \**Cenchrus ciliaris*.

**Fire Age**      No sign of recent fire.

Phase 2: Species	Cover (%)	Height (cm)	Specimen	Notes
<i>Acacia coriacea</i> subsp. <i>coriacea</i>	0.25	170		
<i>Acacia stellaticeps</i>	0.5	120		
<i>Acacia synchronicia</i>	0.1	70		
<i>Acacia tetragonophylla</i>	1	250		
<i>Bonamia erecta</i>	0.1	30		
<i>Cassyltha capillaris</i>	0.1	30		
<i>Cassyltha racemosa</i>	0.1	30		
<i>Cenchrus ciliaris</i>	5	40		
<i>Eremophila forrestii</i> subsp. <i>viridis</i>	0.1	70	STR04-02, 04	N=4
<i>Eriachne helmsii</i>	0.1	40	STR04-01	
<i>Grevillea stenobotrya</i>	0.5	160		
<i>Hakea stenophylla</i> subsp. <i>stenophylla</i>	0.1	150		
<i>Hibiscus brachychlaenus</i>	0.1	70		
<i>Indigofera boviparda</i> subsp. <i>boviparda</i>	0.1	30		
<i>Rhagodia eremaea</i>	0.1	70		
<i>Scaevola sericophylla</i>	0.1	90		
<i>Scaevola spinescens</i>	0.5	90		
<i>Senna glutinosa</i> subsp. <i>glutinosa</i>	0.1	120		
<i>Solanum lasiophyllum</i>	0.1	65		
<i>Triodia avenoides</i>	1.5	40	STR04-03	
<i>Triodia epactia</i>	1.5	60		
<i>Triodia glabra</i>	5	30		



**Phase 2**

**Ashburton Salt Flora Phase 2**      **Site**      STR05R

**Described by**      SWJK      **Date**      11-Apr-19      **Type**      Quadrat      50 x 50 m

**MGA Zone**      50      259730 **mE**      7562502 **mN**      114.672318 °E      -22.025582 °S

**Habitat**      Mid to lower slope of a low secondary dune.

**Soil**      Red-brown fine aeolian sand

**Vegetation**      *Acacia tetragonophylla* scattered tall shrubs over *Eremophila forrestii* subsp. *forrestii*, *Grevillea eriostachya*, *Senna artemisioides* subsp. *oligophylla* (thinly sericeous form MET 15,035) scattered low shrubs over *Triodia glabra*, (*T. epactia*) hummock grassland.

**Veg Condition**      Very Good: scattered \**Cenchrus ciliaris*.

**Fire Age**      Very long unburnt.

Phase 2: Species	Cover (%)	Height (cm)	Specimen
<i>Acacia sclerosperma</i> subsp. <i>sclerosperma</i>	0.1	110	STR05-01
<i>Acacia synchronicia</i>	0.1	90	
<i>Acacia tetragonophylla</i>	0.5	200	
<i>Cassya capillaris</i>	0.1	35	
<i>Cenchrus ciliaris</i>	0.5	15	
<i>Dichanthium sericeum</i> subsp. <i>humilius</i>	0.1	20	
<i>Eremophila forrestii</i> subsp. <i>forrestii</i>	0.5	40	
<i>Eremophila setacea</i>	0.1	90	
<i>Grevillea eriostachya</i>	0.5	90	
<i>Hakea stenophylla</i> subsp. <i>stenophylla</i>	0.1	100	
<i>Senna artemisioides</i> subsp. <i>oligophylla</i> (thinly sericeous form MET 15,035)	0.5	50	STR05-02
<i>Solanum lasiophyllum</i>	0.1	30	
<i>Triodia epactia</i>	15	40	
<i>Triodia glabra</i>	30	40	



**Phase 2**

**Ashburton Salt Flora Phase 2**      **Site**    STR06R  
**Described by**    SWJK    **Date**    11-Apr-19      **Type**    Quadrat      50 x 50 m  
**MGA Zone**      50      259183 **mE**      7560002 **mN**      114.666652 °E    -22.048074 °S  
**Habitat**          Lower slope and base of two dunes bordering western and southern boundary of quadrat.  
**Soil**                Red-brown clay loam  
**Vegetation**      *Triodia epactia* hummock grassland over \**Cenchrus ciliaris* very open tussock grassland.  
**Veg Condition**    Good: 9% cover of \**Cenchrus ciliaris*.  
**Fire Age**          No sign of recent fire.

Phase 2: Species	Cover (%)	Height (cm)
<i>Acacia synchronica</i>	0.1	13
<i>Atriplex semilunaris</i>	0.1	10
<i>Cassyltha capillaris</i>	0.1	10
<i>Cenchrus ciliaris</i>	9	30
<i>Lawrenzia viridigrisea</i>	0.1	10
<i>Lepidium biplicatum</i>	0.1	50
<i>Neobassia astrocarpa</i>	0.1	40
<i>Scaevola spinescens</i>	0.1	40
<i>Triodia epactia</i>	55	50



**Phase 2**

**Ashburton Salt Flora Phase 2**      **Site**      STR07R

**Described by**      BMRW      **Date**      10-Apr-19      **Type**      Quadrat      50 x 50 m

**MGA Zone**      50      262746 **mE**      7560331 **mN**      114.701202 °E      -22.045593 °S

**Habitat**      Low swale between longitudinal dunes.

**Soil**      Red-brown fine clay loam

**Vegetation**      *Acacia tetragonophylla*, *A. synchronicia* open shrubland over *Triodia epactia* open hummock grassland over \**Cenchrus ciliaris* very open tussock grassland.

**Veg Condition**      Very Good to Good: 4% cover of \**Cenchrus ciliaris*.

**Fire Age**      No sign of recent fire.

Phase 2: Species	Cover (%)	Height (cm)	Specimen	Notes
<i>Acacia coriacea</i> subsp. <i>coriacea</i>	0.1	130		
<i>Acacia synchronicia</i>	1	160		
<i>Acacia tetragonophylla</i>	1	140		
<i>Atriplex bunburyana</i>	0.1	70	STR07-01	
<i>Cenchrus ciliaris</i>	4	25		
<i>Chrysopogon fallax</i>	0.1	45		
<i>Eragrostis xerophila</i>	0.1	25		
<i>Eremophila forrestii</i> subsp. <i>viridis</i>	0.1	40		N=1
<i>Euphorbia</i> sp.	0.1	15	STR07-02	Inadequate material.
<i>Ptilotus exaltatus</i>	0.1	10		
<i>Rhagodia eremaea</i>	0.1	120		
<i>Scaevola spinescens</i>	0.1	35		
<i>Trachymene pilbarensis</i>	0.1	1		
<i>Triodia epactia</i>	17	80		
<i>Triodia glabra</i>	0.1	35		



**Phase 2**



**Ashburton Salt Flora Phase 2**      **Site**      STR08R

**Described by**      RWRM      **Date**      10-Apr-19      **Type**      Quadrat      50 x 50 m

**MGA Zone**      50      262202      **mE**      7558453      **mN**      114.695659 °E      -22.062472 °S

**Habitat**      Crest of a low secondary dune.

**Soil**      Red-brown fine clay loam

**Vegetation**      *Grevillea stenobotrya* scattered tall shrubs over *Acacia stellaticeps* scattered shrubs over *Triodia epactia* open hummock grassland over \**Cenchrus ciliaris* very open tussock grassland.

**Veg Condition**      Good: 8% cover of \**Cenchrus ciliaris*.

**Fire Age**      Very long unburnt.

**Notes**      *Eremophila forrestii* subsp. *viridis* nearby.

Phase 2: Species	Cover (%)	Height (cm)	Notes
<i>Acacia coriacea</i> subsp. <i>coriacea</i>	0.1	45	
<i>Acacia stellaticeps</i>	0.5	140	
<i>Bonamia erecta</i>	0.1	20	
<i>Cenchrus ciliaris</i>	8	50	
<i>Corynotheca pungens</i>	0.1	90	
<i>Eremophila setacea</i>	0.1	160	Mostly dead.
<i>Grevillea stenobotrya</i>	0.5	290	
<i>Hakea stenophylla</i> subsp. <i>stenophylla</i>	0.1	90	
<i>Senna glutinosa</i> subsp. <i>glutinosa</i>	0.1	0	
<i>Solanum lasiophyllum</i>	0.1	45	
<i>Triodia epactia</i>	15	70	



**Phase 2**

## Appendix 7

Lists of Vascular Flora Species  
Recorded from the Study Area  
Based on all Sampling to Date





Family	Species	Status	Inside Study Area				Outside Study Area		
			Detailed Survey		Targeted Searches	Historical Sampling†	Detailed Survey		Targeted Searches
			Phase 1	Phase 2			Phase 1	Phase 2	
Aizoaceae	<i>Trianthema pilosum</i>		✓				✓		
Aizoaceae	<i>Trianthema triquetrum</i>			✓				✓	
Aizoaceae	<i>Trianthema turgidifolium</i>		✓						
Amaranthaceae	* <i>Aerva javanica</i>	Weed: serious environmental weed	✓						
Amaranthaceae	<i>Alternanthera nodiflora</i>		✓				✓		
Amaranthaceae	<i>Ptilotus astrolasius</i>					✓			
Amaranthaceae	<i>Ptilotus axillaris</i>				✓	✓			
Amaranthaceae	<i>Ptilotus exaltatus</i>		✓	✓		✓			
Amaranthaceae	<i>Ptilotus latifolius</i>		✓						
Amaranthaceae	<i>Ptilotus murrayi</i>		✓						
Amaranthaceae	<i>Ptilotus polystachyus</i>		✓		✓	✓	✓		
Amaranthaceae	<i>Ptilotus rotundifolius</i>		✓						
Amaranthaceae	<i>Ptilotus villosiflorus</i>		✓						
Amaranthaceae	<i>Ptilotus xerophilus</i>		✓						
Amaranthaceae	<i>Ptilotus</i> sp. (inadequate material)			✓				✓	
Amaranthaceae	<i>Surreya diandra</i>		✓	✓					
Apocynaceae	<i>Cynanchum viminale</i> subsp. <i>australe</i>			✓					
Araliaceae	<i>Trachymene pilbarensis</i>		✓	✓		✓	✓		
Arecaceae	* <i>Phoenix dactylifera</i>	Weed	✓						
Asparagaceae	<i>Thysanotus exfimbriatus</i>		✓						
Asteraceae	<i>Angianthus acrohyalinus</i>		✓						
Asteraceae	<i>Angianthus milnei</i>		✓	✓			✓		
Asteraceae	<i>Calotis hispidula</i>		✓						
Asteraceae	<i>Calotis porphyroglossa</i>		✓	✓					
Asteraceae	<i>Decazesia hecatocephala</i>		✓						
Asteraceae	* <i>Flaveria trinervia</i>	Weed	✓						
Asteraceae	<i>Gnephosis arachnoidea</i>		✓						
Asteraceae	<i>Gnephosis brevifolia</i>		✓						
Asteraceae	<i>Minuria integerrima</i>		✓	✓					
Asteraceae	<i>Minuria tridens</i>	Priority 1	✓						
Asteraceae	<i>Myriocephalus oldfieldii</i>		✓				✓	✓	

Family	Species	Status	Inside Study Area				Outside Study Area		
			Detailed Survey		Targeted Searches	Historical Sampling†	Detailed Survey		Targeted Searches
			Phase 1	Phase 2			Phase 1	Phase 2	
Asteraceae	<i>Olearia</i> sp. Kennedy Range (G. Byrne 66)		✓	✓	✓		✓	✓	
Asteraceae	<i>Pluchea longiseta</i>		✓						
Asteraceae	<i>Pluchea rubelliflora</i>		✓			✓			
Asteraceae	<i>Podolepis aristata</i> subsp. <i>auriculata</i>		✓						
Asteraceae	<i>Pterocaulon sphacelatum</i>		✓	✓		✓	✓		
Asteraceae	<i>Pterocaulon sphaeranthoides</i>		✓	✓					
Asteraceae	<i>Pterocaulon</i> sp. (inadequate material)					✓			
Asteraceae	<i>Rhodanthe floribunda</i>		✓						
Asteraceae	<i>Rhodanthe humboldtiana</i>		✓						
Asteraceae	<i>Rhodanthe psammophila</i>		✓		✓	✓			
Asteraceae	<i>Rhodanthe stricta</i>		✓				✓		
Asteraceae	<i>Roebuckiella cheilocarpa</i> var. <i>cheilocarpa</i>		✓			✓	✓		
Asteraceae	* <i>Sonchus oleraceus</i>	Weed	✓						
Asteraceae	<i>Streptoglossa bubakii</i>		✓			✓			
Asteraceae	<i>Streptoglossa decurrens</i>			✓		✓			
Asteraceae	<i>Streptoglossa</i> ? <i>decurrens</i>					✓			
Asteraceae	<i>Streptoglossa liatroides</i>		✓	✓					
Asteraceae	<i>Streptoglossa macrocephala</i>		✓	✓					
Asteraceae	<i>Streptoglossa</i> sp. (inadequate material)						✓	✓	
Boraginaceae	<i>Heliotropium crispatum</i>		✓			✓			
Boraginaceae	<i>Heliotropium curassavicum</i>		✓						
Boraginaceae	<i>Heliotropium pachyphyllum</i>			✓					
Boraginaceae	<i>Trichodesma zeylanicum</i> var. <i>grandiflorum</i>		✓	✓		✓	✓	✓	
Brassicaceae	<i>Lepidium oxytrichum</i>		✓						
Brassicaceae	<i>Lepidium phlebopetalum</i>		✓						
Brassicaceae	<i>Lepidium platypetalum</i>		✓	✓	✓				
Brassicaceae	<i>Stenopetalum</i> sp. (inadequate material)		✓						
Campanulaceae	<i>Lobelia heterophylla</i> subsp. <i>pilbarensis</i>		✓		✓		✓		

Family	Species	Status	Inside Study Area				Outside Study Area		
			Detailed Survey		Targeted Searches	Historical Sampling†	Detailed Survey		Targeted Searches
			Phase 1	Phase 2			Phase 1	Phase 2	
Campanulaceae	<i>Wahlenbergia</i> sp. (inadequate material)		✓						
Caryophyllaceae	<i>Polycarpaea corymbosa</i> var. <i>corymbosa</i>		✓						
Caryophyllaceae	<i>Polycarpaea holtzei</i>		✓						
Celastraceae	<i>Stackhousia clementii</i>	Priority 3	✓						
Chenopodiaceae	<i>Atriplex bunburyana</i>		✓	✓		✓			
Chenopodiaceae	<i>Atriplex codonocarpa</i>		✓	✓			✓	✓	
Chenopodiaceae	<i>Atriplex semilunaris</i>		✓	✓		✓	✓		
Chenopodiaceae	* <i>Chenopodium murale</i>	Weed	✓						
Chenopodiaceae	<i>Dysphania kalpari</i>		✓						
Chenopodiaceae	<i>Dysphania melanocarpa</i> forma <i>leucocarpa</i>				✓				
Chenopodiaceae	<i>Dysphania plantaginella</i>		✓		✓				
Chenopodiaceae	<i>Dysphania rhadinostachya</i> (sterile; subsp. not determined)		✓				✓		
Chenopodiaceae	<i>Dysphania rhadinostachya</i> subsp. <i>rhadinostachya</i>		✓						
Chenopodiaceae	<i>Enchylaena tomentosa</i> var. <i>tomentosa</i>		✓	✓		✓	✓	✓	
Chenopodiaceae	<i>Maireana georgei</i>		✓	✓					
Chenopodiaceae	<i>Maireana</i> ? <i>lobiflora</i> (poor material)		✓	✓				✓	
Chenopodiaceae	<i>Maireana tomentosa</i> subsp. <i>tomentosa</i>		✓			✓			
Chenopodiaceae	<i>Maireana</i> sp. (inadequate material)			✓					
Chenopodiaceae	<i>Neobassia astrocarpa</i>		✓	✓		✓		✓	
Chenopodiaceae	<i>Rhagodia eremaea</i>		✓	✓		✓	✓		
Chenopodiaceae	<i>Rhagodia preissii</i> subsp. <i>obovata</i>		✓	✓					
Chenopodiaceae	<i>Rhagodia preissii</i> subsp. <i>preissii</i>			✓					
Chenopodiaceae	<i>Salsola australis</i>		✓	✓			✓	✓	
Chenopodiaceae	<i>Sclerolaena bicornis</i> var. <i>bicornis</i>		✓				✓	✓	
Chenopodiaceae	<i>Sclerolaena costata</i>		✓	✓			✓	✓	
Chenopodiaceae	<i>Sclerolaena diacantha</i>		✓	✓		✓			
Chenopodiaceae	<i>Sclerolaena recurvicauspis</i>		✓	✓			✓		

Family	Species	Status	Inside Study Area				Outside Study Area		
			Detailed Survey		Targeted Searches	Historical Sampling†	Detailed Survey		Targeted Searches
			Phase 1	Phase 2			Phase 1	Phase 2	
Chenopodiaceae	<i>Sclerolaena uniflora</i>						✓		
Chenopodiaceae	<i>Tecticornia auriculata</i>		✓	✓				✓	✓
Chenopodiaceae	<i>Tecticornia doliiformis</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>leiostrachya</i>		✓	✓				✓	✓
Chenopodiaceae	<i>Tecticornia indica</i> subsp. ? <i>leiostrachya</i>		✓						
Chenopodiaceae	<i>Tecticornia pterygosperma</i> subsp. aff. <i>denticulata</i>		✓	✓					
Chenopodiaceae	<i>Tecticornia</i> sp. (inadequate material)		✓						
Chenopodiaceae	<i>Threlkeldia diffusa</i>							✓	✓
Convolvulaceae	<i>Bonamia erecta</i>		✓	✓			✓	✓	
Convolvulaceae	<i>Convolvulus clementii</i>		✓						
Convolvulaceae	<i>Cressa australis</i>		✓	✓				✓	✓
Convolvulaceae	<i>Evolvulus alsinoides</i> var. <i>villosicalyx</i>		✓				✓		
Convolvulaceae	<i>Ipomoea coptica</i>			✓					
Convolvulaceae	<i>Ipomoea costata</i>		✓	✓					
Convolvulaceae	<i>Ipomoea muelleri</i>		✓	✓					
Convolvulaceae	<i>Ipomoea pes-caprae</i> subsp. <i>brasiliensis</i>		✓						
Convolvulaceae	<i>Ipomoea</i> sp. (inadequate material)								✓
Convolvulaceae	<i>Polymeria ambigua</i>		✓						
Cucurbitaceae	<i>Cucumis variabilis</i>		✓	✓					
Cucurbitaceae	* <i>Momordica balsamina</i>	Weed						✓	✓
Cyperaceae	<i>Bulbostylis barbata</i>		✓	✓				✓	
Cyperaceae	<i>Cyperus bulbosus</i>		✓	✓					✓
Cyperaceae	<i>Cyperus iria</i>		✓					✓	
Cyperaceae	<i>Cyperus squarrosus</i>		✓						
Cyperaceae	<i>Cyperus</i> sp. (inadequate material)								✓
Elatinaceae	<i>Bergia perennis</i> subsp. <i>exigua</i>		✓	✓				✓	✓
Euphorbiaceae	<i>Adriana tomentosa</i> var. <i>tomentosa</i>		✓	✓				✓	✓
Euphorbiaceae	<i>Euphorbia australis</i> var. <i>hispidula</i>		✓	✓	✓				



Family	Species	Status	Inside Study Area				Outside Study Area		
			Detailed Survey		Targeted Searches	Historical Sampling†	Detailed Survey		Targeted Searches
			Phase 1	Phase 2			Phase 1	Phase 2	
Euphorbiaceae	<i>Euphorbia</i> ? <i>biconvexa</i>			✓					
Euphorbiaceae	<i>Euphorbia boophthona</i>		✓	✓					
Euphorbiaceae	<i>Euphorbia myrtiloides</i>		✓	✓			✓		
Euphorbiaceae	<i>Euphorbia sharkoensis</i>		✓						
Euphorbiaceae	<i>Euphorbia tannensis</i> subsp. <i>eremophila</i>		✓	✓					
Euphorbiaceae	<i>Euphorbia trigonosperma</i>		✓	✓					
Euphorbiaceae	<i>Euphorbia</i> sp. ( <i>boophthona/tannensis</i> ; poor material)		✓						
Euphorbiaceae	<i>Euphorbia</i> sp. (inadequate material)			✓					
Fabaceae	<i>Acacia bivenosa</i>		✓	✓					
Fabaceae	<i>Acacia colei</i> var. <i>colei</i>		✓						
Fabaceae	<i>Acacia coriacea</i> subsp. <i>coriacea</i>		✓	✓		✓	✓	✓	
Fabaceae	<i>Acacia gregorii</i>		✓						
Fabaceae	<i>Acacia ligulata</i>		✓						
Fabaceae	<i>Acacia</i> ? <i>ligulata</i> (possible hybrid; reticulate venation)				✓				
Fabaceae	<i>Acacia pyrifolia</i> var. <i>pyrifolia</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 xiphophylla</i>		✓	✓		✓			
Fabaceae	<i>Acacia</i> sp. (inadequate material)		✓						
Fabaceae	<i>Crotalaria cunninghamii</i> subsp. <i>sturtii</i>		✓	✓		✓	✓	✓	
Fabaceae	<i>Crotalaria medicaginea</i> var. <i>neglecta</i>		✓		✓				
Fabaceae	<i>Cullen cinereum</i>		✓						
Fabaceae	<i>Cullen lachnostachys</i>						✓		
Fabaceae	<i>Cullen leucanthum</i>		✓	✓					
Fabaceae	<i>Cullen martinii</i>		✓						
Fabaceae	<i>Cullen pogonocarpum</i>		✓				✓		

Family	Species	Status	Inside Study Area				Outside Study Area		
			Detailed Survey		Targeted Searches	Historical Sampling†	Detailed Survey		Targeted Searches
			Phase 1	Phase 2			Phase 1	Phase 2	
Fabaceae	<i>Cullen</i> sp. (inadequate material)							✓	
Fabaceae	<i>Indigofera bovipерda</i> subsp. <i>bovipерda</i>		✓	✓		✓	✓	✓	
Fabaceae	<i>Indigofera chamaeclada</i> subsp. <i>pubens</i>		✓	✓			✓	✓	
Fabaceae	<i>Indigofera colutea</i>		✓		✓		✓	✓	
Fabaceae	<i>Indigofera trita</i> subsp. <i>trita</i>			✓					
Fabaceae	<i>Lotus australis</i>		✓						
Fabaceae	<i>Lotus cruentus</i>		✓						
Fabaceae	* <i>Melilotus indicus</i>	Weed	✓						
Fabaceae	<i>Neptunia dimorphantha</i>							✓	
Fabaceae	* <i>Parkinsonia aculeata</i>	Weed: declared pest (prohibited organism), WoNS	✓	✓					
Fabaceae	<i>Petalostylis cassioides</i>		✓		✓				
Fabaceae	<i>Petalostylis labicheoides</i>		✓						
Fabaceae	* <i>Prosopis pallida</i>	Weed: declared pest, WoNS	✓	✓			✓		
Fabaceae	<i>Rhynchosia minima</i>		✓	✓			✓	✓	
Fabaceae	<i>Senna artemisioides</i> subsp. <i>oligophylla</i>		✓	✓			✓	✓	
Fabaceae	<i>Senna artemisioides</i> subsp. <i>oligophylla</i> (thinly sericeous form MET 1,035)		✓	✓		✓	✓	✓	
Fabaceae	<i>Senna glutinosa</i> subsp. <i>chatelainiana</i> x		✓						
Fabaceae	<i>Senna glutinosa</i> subsp. <i>glutinosa</i>		✓	✓		✓			
Fabaceae	<i>Senna glutinosa</i> subsp. <i>pruinosa</i>		✓						
Fabaceae	<i>Senna glutinosa</i> subsp. x <i>luerssenii</i>		✓	✓					
Fabaceae	<i>Senna notabilis</i>		✓						
Fabaceae	<i>Sesbania cannabina</i>		✓					✓	
Fabaceae	<i>Swainsona kingii</i>		✓				✓		
Fabaceae	<i>Swainsona pterostylis</i>		✓	✓			✓		
Fabaceae	<i>Swainsona</i> sp. (inadequate material)							✓	
Fabaceae	<i>Tephrosia gardneri</i>		✓	✓			✓	✓	
Fabaceae	<i>Tephrosia rosea</i> var. <i>clementii</i>		✓	✓	✓				
Fabaceae	<i>Tephrosia supina</i>		✓						

Family	Species	Status	Inside Study Area				Outside Study Area		
			Detailed Survey		Targeted Searches	Historical Sampling†	Detailed Survey		Targeted Searches
			Phase 1	Phase 2			Phase 1	Phase 2	
Fabaceae	<i>Tephrosia</i> sp. B Kimberley Flora (C.A. Gardner 7300)		✓						
Fabaceae	<i>Tephrosia</i> sp. (inadequate material)			✓					
Fabaceae	* <i>Vachellia farnesiana</i>	Weed	✓	✓			✓	✓	
Fabaceae	<i>Vigna</i> sp. (inadequate material)			✓					
Frankeniaceae	<i>Frankenia ambita</i>		✓	✓			✓	✓	
Gentianaceae	<i>Schenkia australis</i>		✓						
Geraniaceae	<i>Erodium cygnorum</i>					✓			
Geraniaceae	<i>Erodium</i> sp. (inadequate material, but likely <i>E. cygnorum</i> )		✓				✓		
Goodeniaceae	<i>Goodenia forrestii</i>		✓	✓					
Goodeniaceae	<i>Goodenia lamprosperma</i>			✓			✓		
Goodeniaceae	<i>Goodenia microptera</i>		✓						
Goodeniaceae	<i>Goodenia tenuiloba</i>		✓						
Goodeniaceae	<i>Scaevola crassifolia</i>		✓	✓					
Goodeniaceae	<i>Scaevola cunninghamii</i>		✓	✓					
Goodeniaceae	<i>Scaevola pulchella</i>		✓	✓					
Goodeniaceae	<i>Scaevola sericophylla</i>		✓	✓		✓	✓	✓	
Goodeniaceae	<i>Scaevola spinescens</i>		✓	✓		✓	✓	✓	
Goodeniaceae	<i>Scaevola spinescens</i> (broad form)		✓	✓		✓	✓	✓	
Goodeniaceae	<i>Scaevola spinescens</i> (narrow form)		✓						
Goodeniaceae	<i>Scaevola</i> sp. (inadequate material)							✓	
Gyrostemonaceae	<i>Gyrostemon ramulosus</i>					✓			
Haloragaceae	<i>Haloragis gossei</i> var. <i>gossei</i>		✓		✓				
Haloragaceae	<i>Haloragis gossei</i> var. <i>inflata</i>		✓		✓				
Haloragaceae	<i>Haloragis gossei</i> (sterile; var. not determined)		✓				✓		
Haloragaceae	<i>Haloragis gossei</i> x <i>trigonocarpa</i>		✓						
Haloragaceae	<i>Haloragis maierae</i>		✓						
Hemerocallidaceae	<i>Corynotheca pungens</i>		✓	✓		✓	✓	✓	
Lamiaceae	<i>Quoya loxocarpa</i>		✓	✓		✓	✓	✓	
Lamiaceae	<i>Quoya paniculata</i>		✓	✓			✓	✓	
Lauraceae	<i>Cassytha aurea</i> var. <i>aurea</i>		✓	✓					

Family	Species	Status	Inside Study Area				Outside Study Area		
			Detailed Survey		Targeted Searches	Historical Sampling†	Detailed Survey		Targeted Searches
			Phase 1	Phase 2			Phase 1	Phase 2	
Lauraceae	<i>Cassythia capillaris</i>		✓	✓			✓	✓	
Lauraceae	<i>Cassythia racemosa</i>			✓		✓			
Malvaceae	<i>Abutilon lepidum</i>		✓		✓	✓			
Malvaceae	<i>Abutilon malvifolium</i>		✓						
Malvaceae	<i>Abutilon otocarpum</i>		✓	✓					
Malvaceae	<i>Abutilon oxycarpum</i> subsp. Prostrate (A.A. Mitchell PRP 1266)		✓						
Malvaceae	<i>Abutilon</i> sp. Dioicum (A.A. Mitchell PRP 1618)					✓			
Malvaceae	<i>Abutilon</i> sp. Pritzelianum (S. van Leeuwen 5095)	Priority 3	✓	✓	✓		✓	✓	✓
Malvaceae	<i>Abutilon</i> sp. (inadequate material)			✓					
Malvaceae	<i>Alyogyne pinoniana</i> var. <i>pinoniana</i>		✓	✓					
Malvaceae	<i>Corchorus elachocarpus</i>				✓	✓	✓	✓	
Malvaceae	<i>Gossypium australe</i>		✓				✓	✓	
Malvaceae	<i>Hannafordia quadrivalvis</i> subsp. <i>recurva</i>		✓						
Malvaceae	<i>Hibiscus brachychlaenus</i>		✓	✓	✓	✓	✓	✓	
Malvaceae	<i>Hibiscus sturtii</i> var. aff. <i>grandiflorus</i>			✓					
Malvaceae	<i>Hibiscus sturtii</i> var. <i>platyklamys</i>		✓	✓					
Malvaceae	<i>Hibiscus sturtii</i> var. ?			✓		✓			
Malvaceae	<i>Lawrenzia densiflora</i>		✓	✓					
Malvaceae	<i>Lawrenzia viridigrisea</i>		✓	✓		✓			
Malvaceae	* <i>Malvastrum americanum</i>	Weed	✓	✓					
Malvaceae	<i>Melhanianthus oblongifolia</i>			✓					
Malvaceae	<i>Sida fibulifera</i>		✓	✓	✓	✓			
Malvaceae	<i>Sida rohlenae</i> subsp. <i>rohlenae</i>		✓	✓		✓	✓	✓	
Malvaceae	<i>Triumfetta echinata</i>	Priority 3			✓				
Marsileaceae	<i>Marsilea hirsuta</i>		✓	✓			✓	✓	
Molluginaceae	<i>Glinus lotoides</i>		✓						
Myrtaceae	<i>Corymbia zygophylla</i>		✓	✓		✓			
Myrtaceae	<i>Eucalyptus victrix</i>		✓	✓					
Myrtaceae	<i>Melaleuca bracteata</i>						✓		
Myrtaceae	<i>Melaleuca glomerata</i>		✓						

Family	Species	Status	Inside Study Area				Outside Study Area		
			Detailed Survey		Targeted Searches	Historical Sampling†	Detailed Survey		Targeted Searches
			Phase 1	Phase 2			Phase 1	Phase 2	
Myrtaceae	<i>Verticordia forrestii</i>		✓	✓					
Nyctaginaceae	<i>Boerhavia burbridgeana</i>			✓					
Passifloraceae	* <i>Passiflora foetida</i> var. <i>hispida</i>	Weed: serious environmental weed	✓	✓					
Plantaginaceae	<i>Stemodia</i> sp. Onslow (A.A. Mitchell 1/148)		✓	✓			✓	✓	
Plumbaginaceae	<i>Muellerolimon salicorniaceum</i>		✓	✓					
Poaceae	<i>Aristida holathera</i> var. <i>holathera</i>		✓	✓		✓			
Poaceae	<i>Aristida latifolia</i>		✓						
Poaceae	* <i>Cenchrus ciliaris</i>	Weed: serious environmental weed	✓	✓		✓	✓	✓	
Poaceae	* <i>Cenchrus setiger</i>	Weed: serious environmental weed	✓	✓			✓		
Poaceae	<i>Chloris pectinata</i>		✓						
Poaceae	<i>Chloris pumilio</i>		✓				✓		
Poaceae	<i>Chrysopogon fallax</i>		✓	✓		✓	✓	✓	
Poaceae	<i>Dactyloctenium radulans</i>		✓	✓			✓		
Poaceae	<i>Dichanthium sericeum</i> subsp. <i>humilius</i>		✓	✓					
Poaceae	<i>Enneapogon polyphyllus</i>		✓						
Poaceae	<i>Eragrostis australasica</i>		✓						
Poaceae	<i>Eragrostis cumingii</i>		✓						
Poaceae	<i>Eragrostis dielsii</i>		✓	✓			✓		
Poaceae	<i>Eragrostis eriopoda</i>		✓	✓			✓	✓	
Poaceae	<i>Eragrostis falcata</i>		✓	✓			✓	✓	
Poaceae	<i>Eragrostis pergracilis</i>		✓				✓		
Poaceae	<i>Eragrostis setifolia</i>		✓						
Poaceae	<i>Eragrostis xerophila</i>		✓	✓		✓	✓		
Poaceae	<i>Eriachne aristidea</i>		✓	✓			✓	✓	
Poaceae	<i>Eriachne benthamii</i>		✓	✓			✓	✓	
Poaceae	<i>Eriachne flaccida</i>		✓	✓			✓	✓	
Poaceae	<i>Eriachne gardneri</i>		✓	✓			✓		
Poaceae	<i>Eriachne helmsii</i>		✓	✓					
Poaceae	<i>Eriachne mucronata</i>		✓						
Poaceae	<i>Eriachne obtusa</i>		✓	✓					

Family	Species	Status	Inside Study Area				Outside Study Area		
			Detailed Survey		Targeted Searches	Historical Sampling†	Detailed Survey		Targeted Searches
			Phase 1	Phase 2			Phase 1	Phase 2	
Poaceae	<i>Eulalia aurea</i>		✓	✓	✓		✓		
Poaceae	<i>Iseilema dolichotrichum</i>		✓				✓		
Poaceae	<i>Iseilema membranaceum</i>		✓						
Poaceae	<i>Iseilema vaginiflorum</i>		✓						
Poaceae	<i>Panicum decompositum</i>		✓			✓	✓		
Poaceae	<i>Panicum laevinode</i>		✓						
Poaceae	<i>Paraneurachne muelleri</i>		✓		✓				
Poaceae	<i>Schizachyrium fragile</i>		✓						
Poaceae	<i>Setaria dielsii</i>		✓						
Poaceae	* <i>Setaria verticillata</i>	Weed	✓						
Poaceae	<i>Sorghum plumosum</i> var. <i>plumosum</i>				✓				
Poaceae	<i>Spinifex longifolius</i>		✓	✓			✓	✓	
Poaceae	<i>Sporobolus mitchellii</i>		✓	✓			✓	✓	
Poaceae	<i>Sporobolus virginicus</i>		✓			✓	✓		
Poaceae	<i>Triodia avenoides</i>		✓	✓		✓	✓		
Poaceae	<i>Triodia epactia</i>		✓	✓		✓	✓	✓	
Poaceae	<i>Triodia glabra</i>		✓	✓		✓	✓		
Poaceae	<i>Urochloa holosericea</i> subsp. <i>velutina</i>				✓				
Poaceae	<i>Urochloa occidentalis</i> var. <i>occidentalis</i>		✓						
Poaceae	<i>Whiteochloa airoides</i>		✓	✓			✓	✓	
Poaceae	<i>Yakirra australiensis</i> var. <i>australiensis</i>		✓						
Polygalaceae	<i>Polygala glaucifolia</i>		✓						
Portulacaceae	<i>Calandrinia polyandra</i>		✓				✓		
Portulacaceae	<i>Calandrinia ptychosperma</i>		✓						
Portulacaceae	<i>Portulaca oleracea</i> /intraterranea			✓					
Primulaceae	<i>Samolus</i> sp. Shark Bay (M.E. Trudgen 7410)		✓	✓			✓	✓	
Proteaceae	<i>Grevillea eriostachya</i>		✓	✓		✓			
Proteaceae	<i>Grevillea stenobotrya</i>		✓	✓		✓	✓	✓	
Proteaceae	<i>Hakea chordophylla</i>		✓	✓					
Proteaceae	<i>Hakea lorea</i> subsp. <i>lorea</i>		✓	✓					
Proteaceae	<i>Hakea stenophylla</i> subsp. <i>stenophylla</i>		✓	✓		✓	✓	✓	

Family	Species	Status	Inside Study Area				Outside Study Area		
			Detailed Survey		Targeted Searches	Historical Sampling†	Detailed Survey		Targeted Searches
			Phase 1	Phase 2			Phase 1	Phase 2	
Pteridaceae	<i>Cheilanthes austrotenuifolia</i>			✓					
Rubiaceae	<i>Synaptantha tillaeacea</i> var. <i>tillaeacea</i>		✓						
Sapindaceae	<i>Diplopeltis eriocarpa</i>		✓				✓	✓	
Scrophulariaceae	<i>Eremophila forrestii</i>								
Scrophulariaceae	<i>Eremophila forrestii</i> subsp. <i>forrestii</i>			✓					
Scrophulariaceae	<i>Eremophila forrestii</i> subsp. <i>viridis</i>	Priority 3	✓	✓	✓		✓	✓	
Scrophulariaceae	<i>Eremophila longifolia</i>		✓						
Scrophulariaceae	<i>Eremophila setacea</i>		✓	✓	✓		✓	✓	
Scrophulariaceae	<i>Myoporum montanum</i>		✓				✓	✓	
Solanaceae	<i>Nicotiana occidentalis</i> subsp. <i>obliqua</i>				✓				
Solanaceae	<i>Nicotiana occidentalis</i> subsp. <i>occidentalis</i>				✓		✓		
Solanaceae	<i>Nicotiana occidentalis</i> (sterile; subsp. not determined)		✓	✓			✓		
Solanaceae	<i>Nicotiana rosulata</i> subsp. <i>rosulata</i>		✓						
Solanaceae	<i>Nicotiana</i> sp. (inadequate material)						✓		
Solanaceae	<i>Solanum cleistogamum</i>		✓	✓	✓		✓	✓	
Solanaceae	<i>Solanum diversiflorum</i>		✓				✓		
Solanaceae	<i>Solanum horridum</i>		✓						
Solanaceae	<i>Solanum lasiophyllum</i>		✓	✓			✓	✓	
Surianaceae	<i>Stylobasium spathulatum</i>		✓	✓	✓				
Tamaricaceae	* <i>Tamarix aphylla</i>	Weed: declared pest, WoNS	✓						
Zygophyllaceae	<i>Tribulus occidentalis</i>		✓				✓	✓	
Zygophyllaceae	<i>Tribulus</i> sp. (inadequate material)			✓			✓		

† Records from quadrats sampled by Biota (2005a).



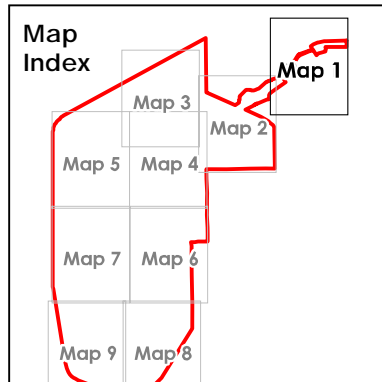
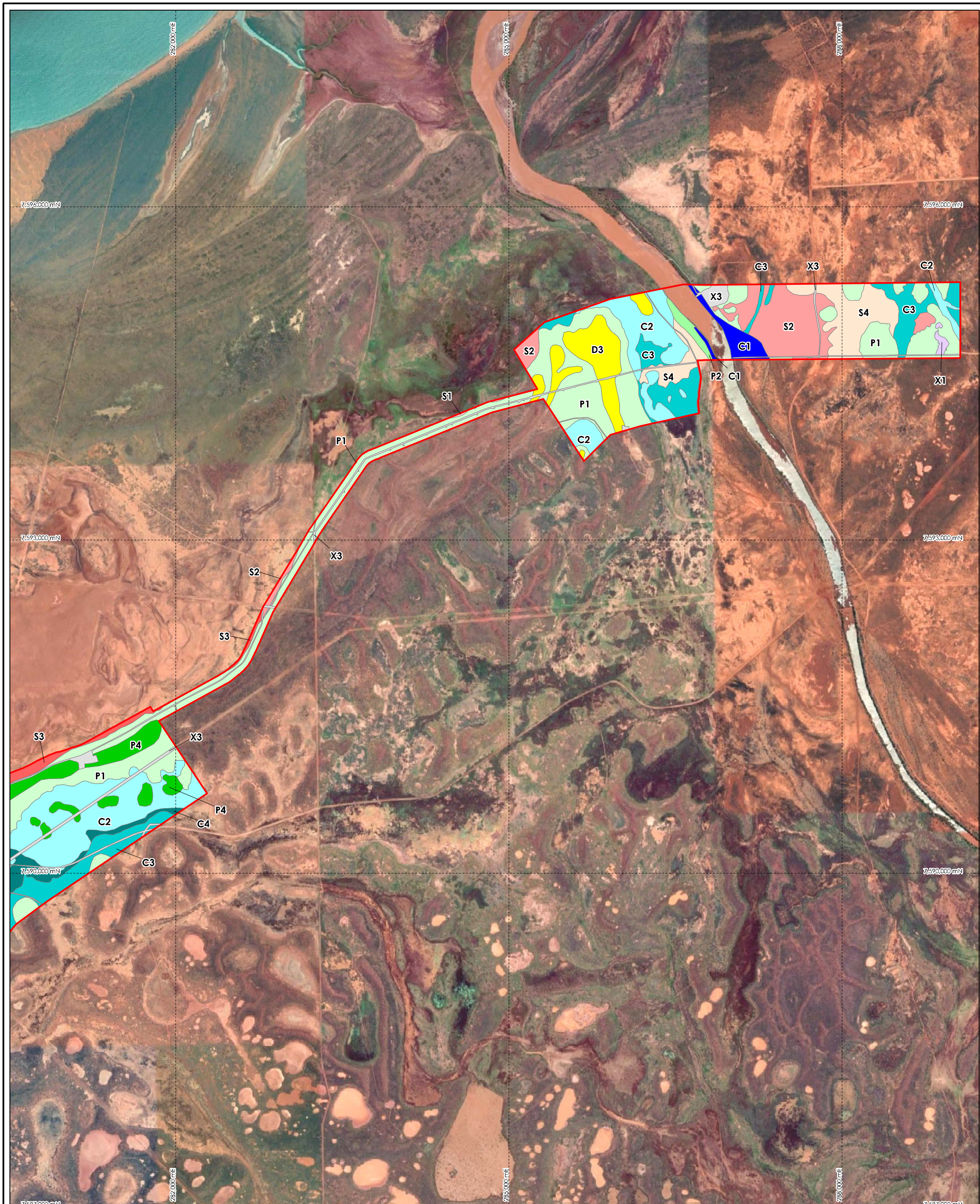


## Appendix 8

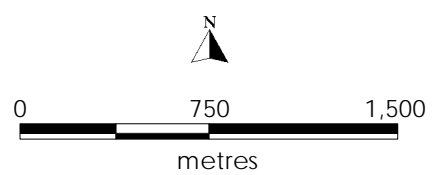
# Mapping of Vegetation Types in the Study Area







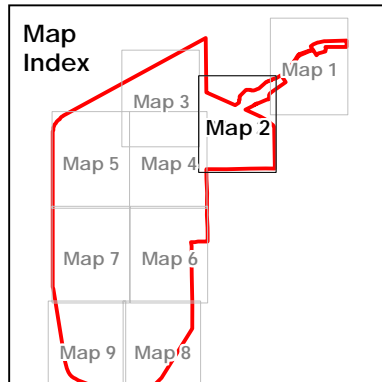
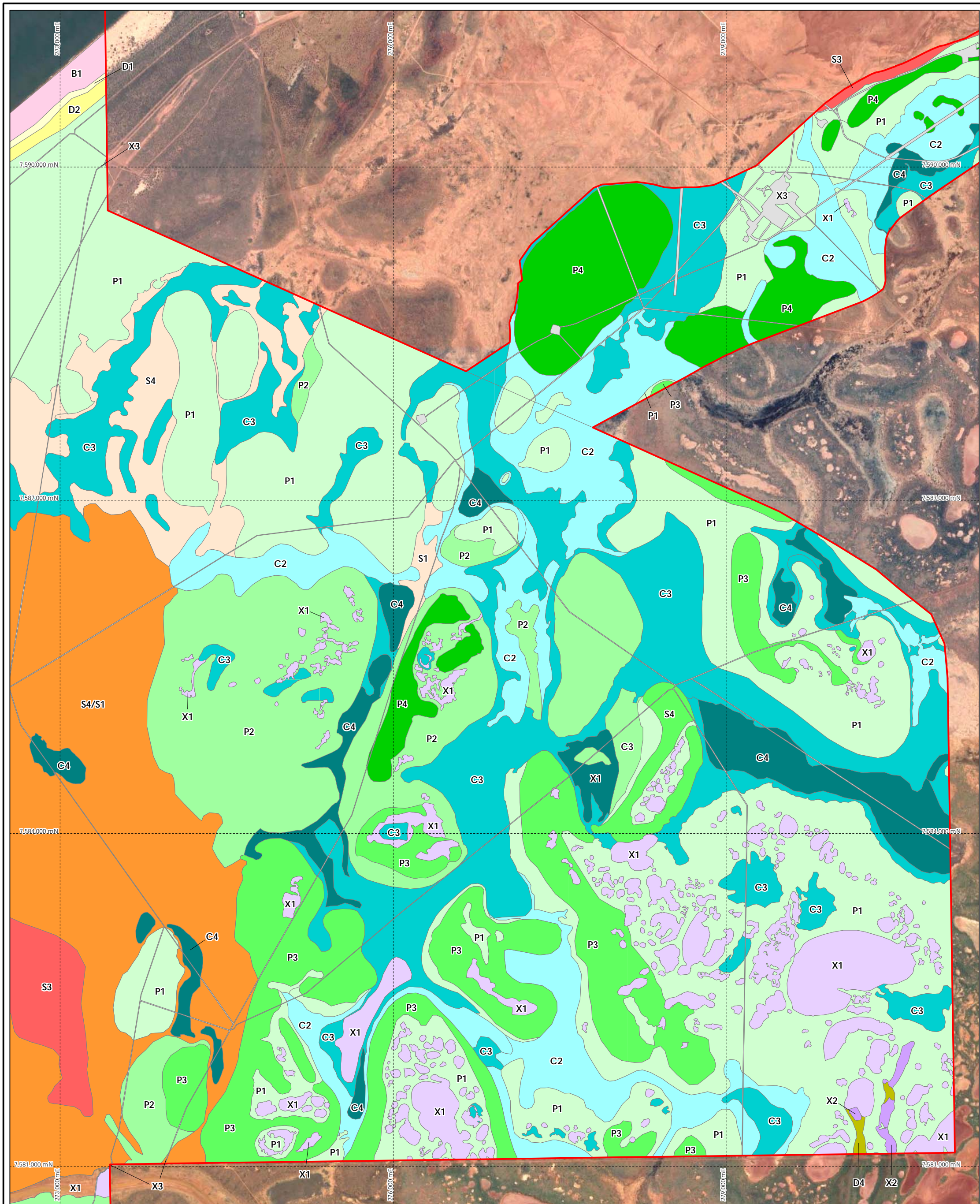
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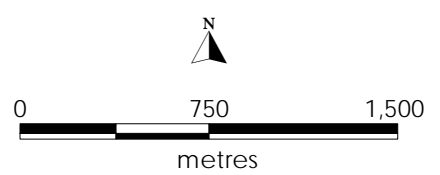
Aerial photography:  
Google Satellite, April 2020

# Ashburton Salt Vegetation Map 1





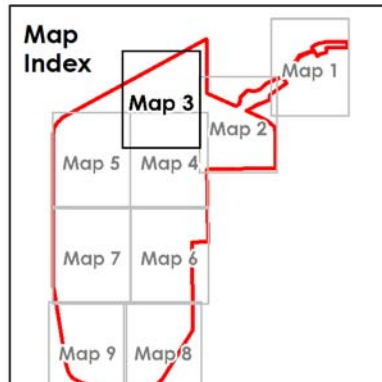
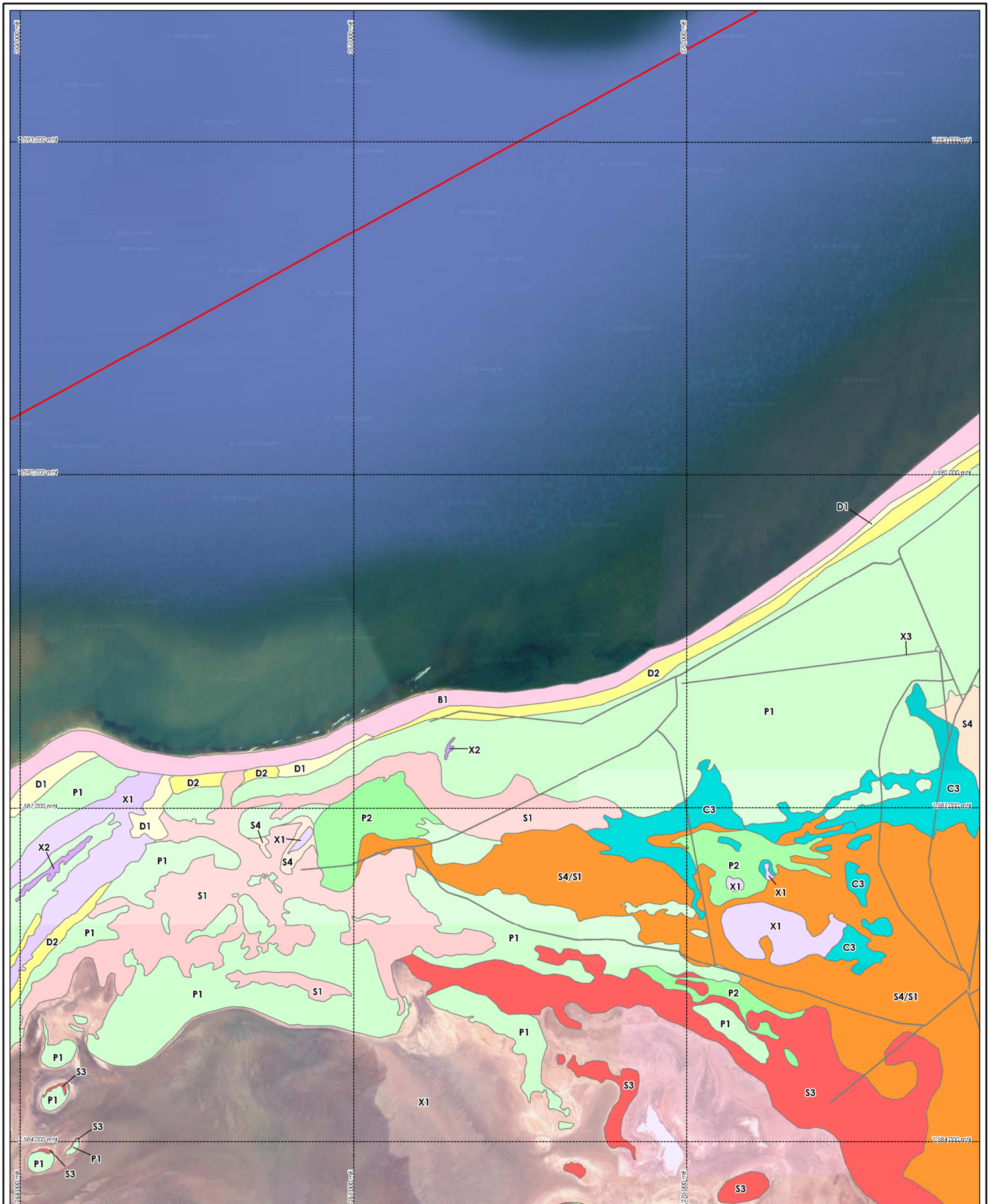
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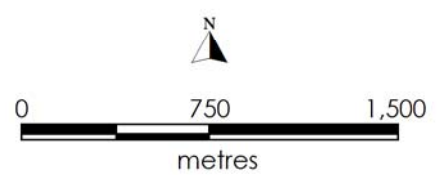
Aerial photography:  
Google Satellite, April 2020

## Ashburton Salt Vegetation Map 2





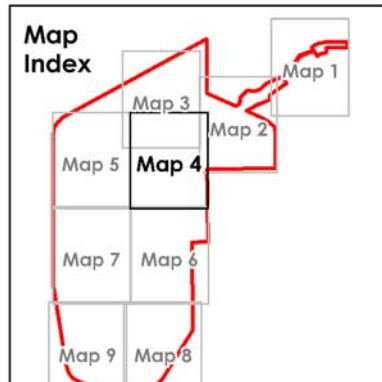
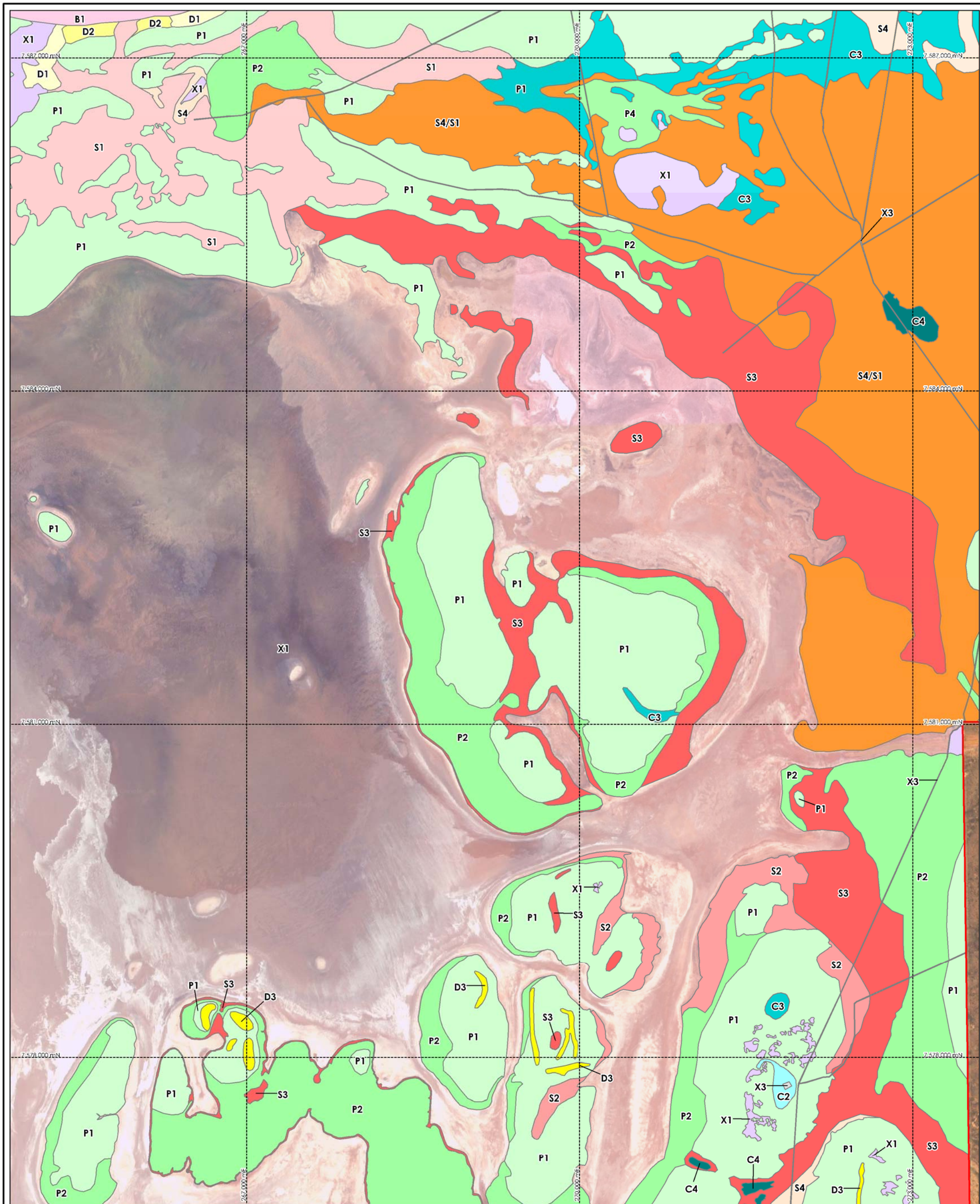
 Development envelope



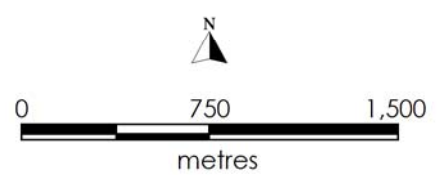
Aerial photography:  
Google Satellite, April 2020

# Ashburton Salt Vegetation Map 3





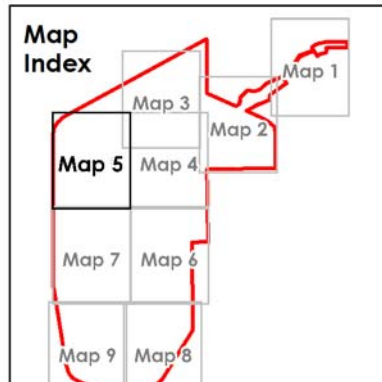
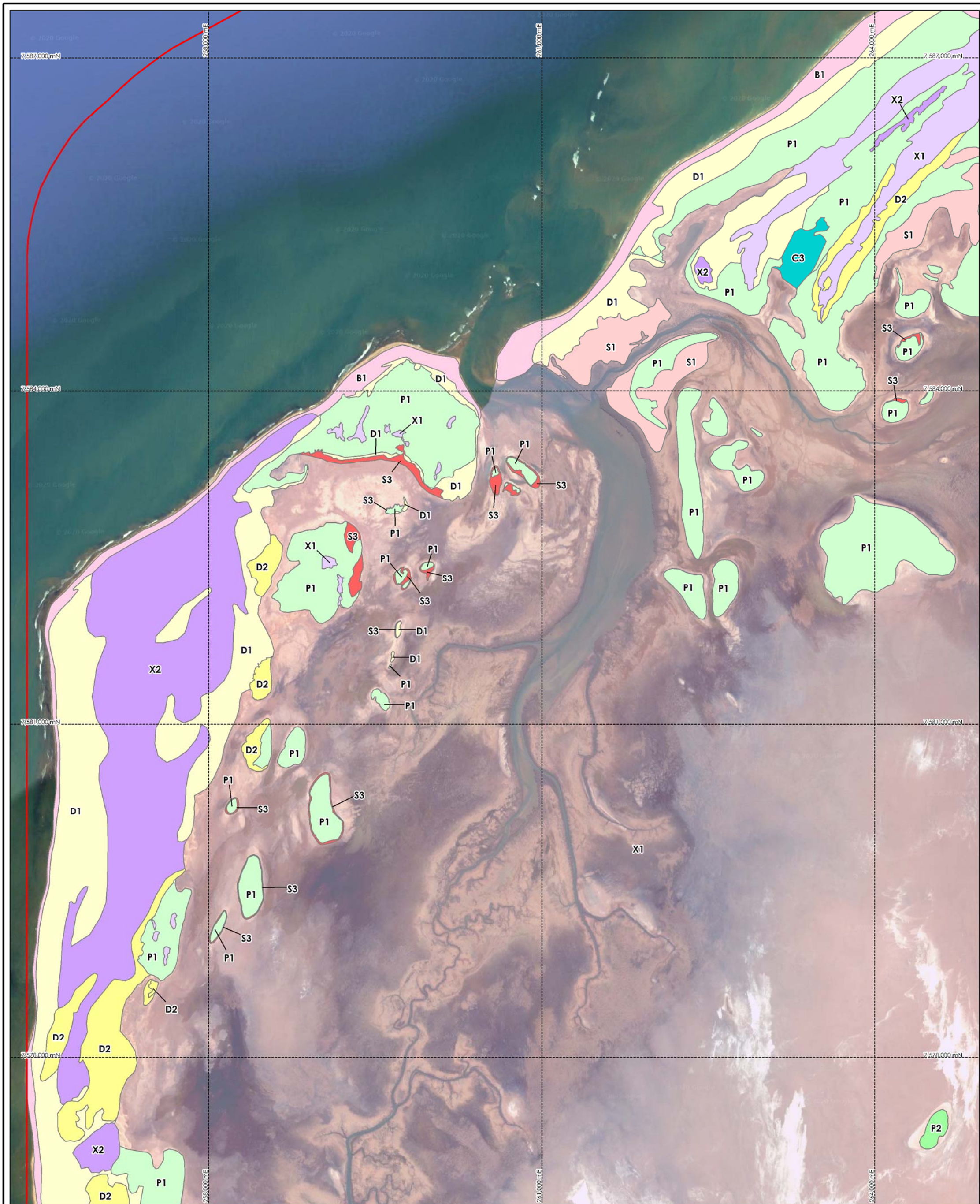
Development envelope



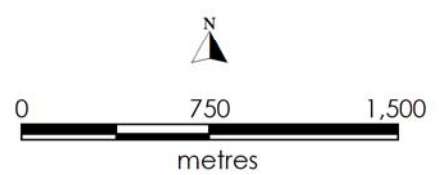
Aerial photography:  
Google Satellite, April 2020

## Ashburton Salt Vegetation Map 4





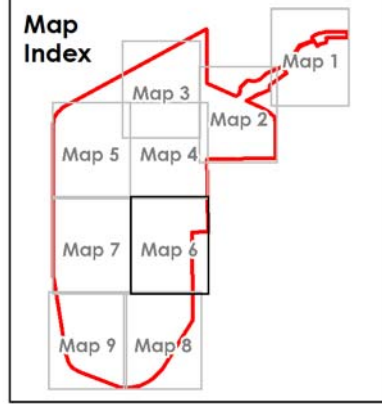
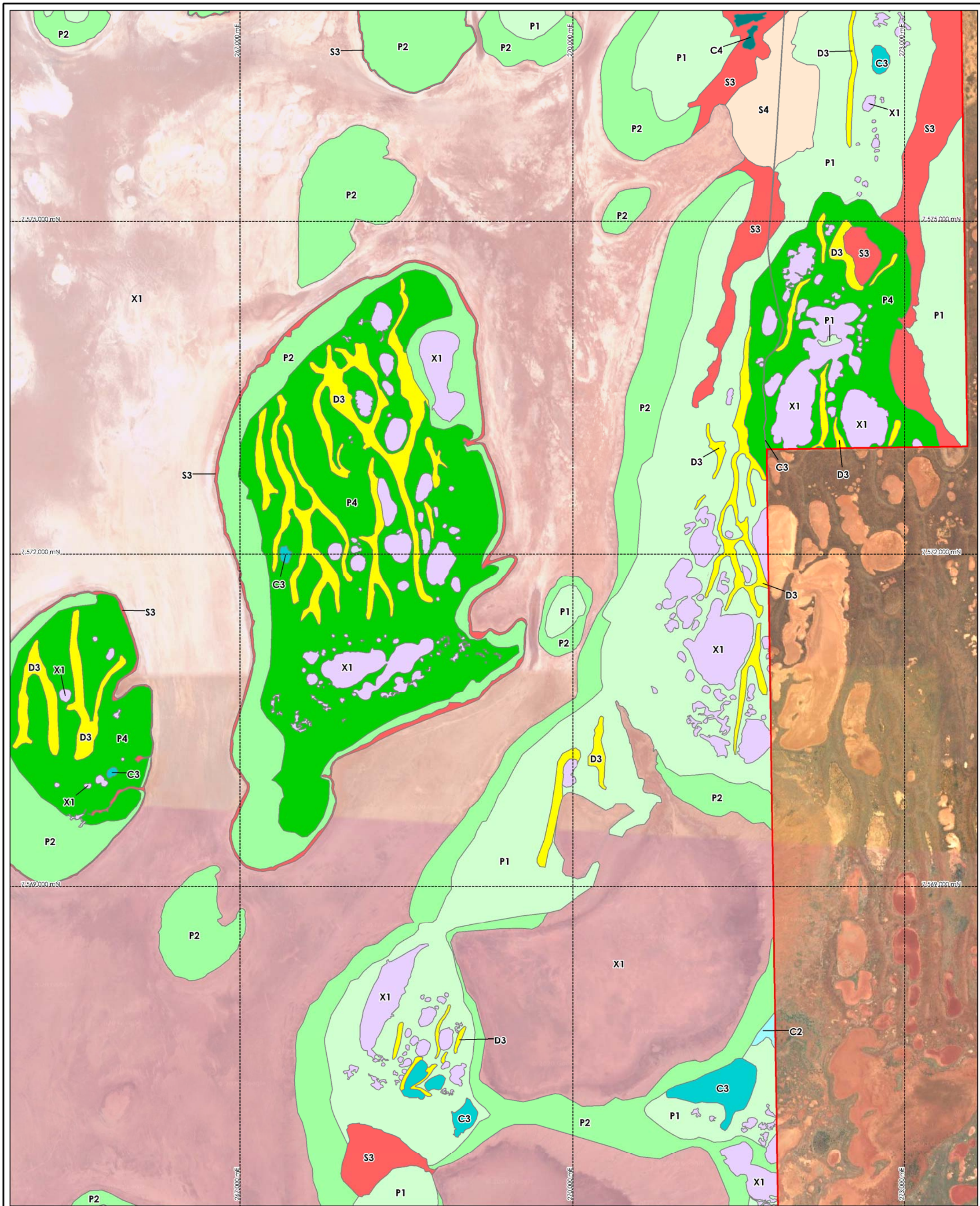
Development envelope



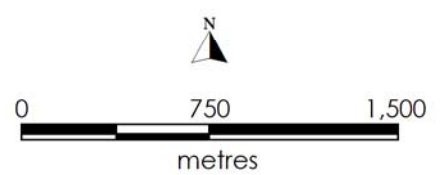
Aerial photography: Google Satellite, April 2020

# Ashburton Salt Vegetation Map 5





Development envelope

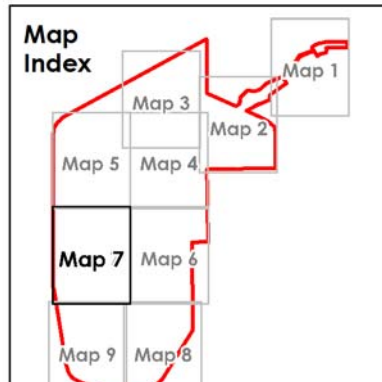
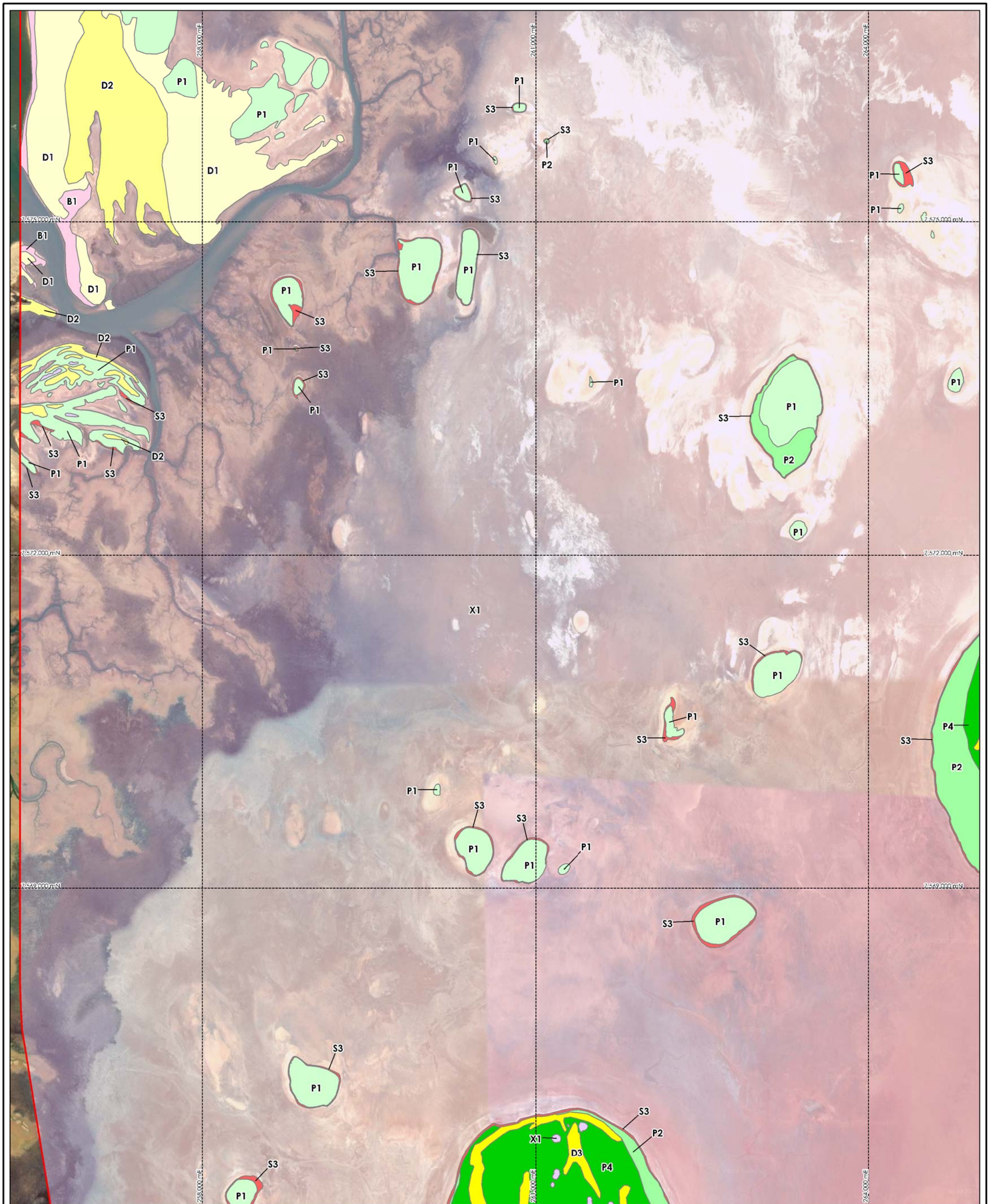


Aerial photography: Google Satellite, April 2020

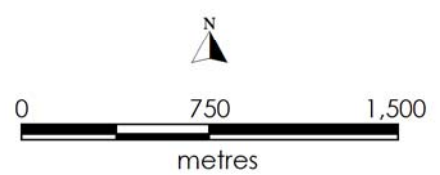
## Ashburton Salt Vegetation Map 6







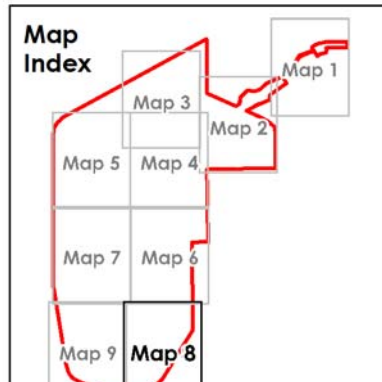
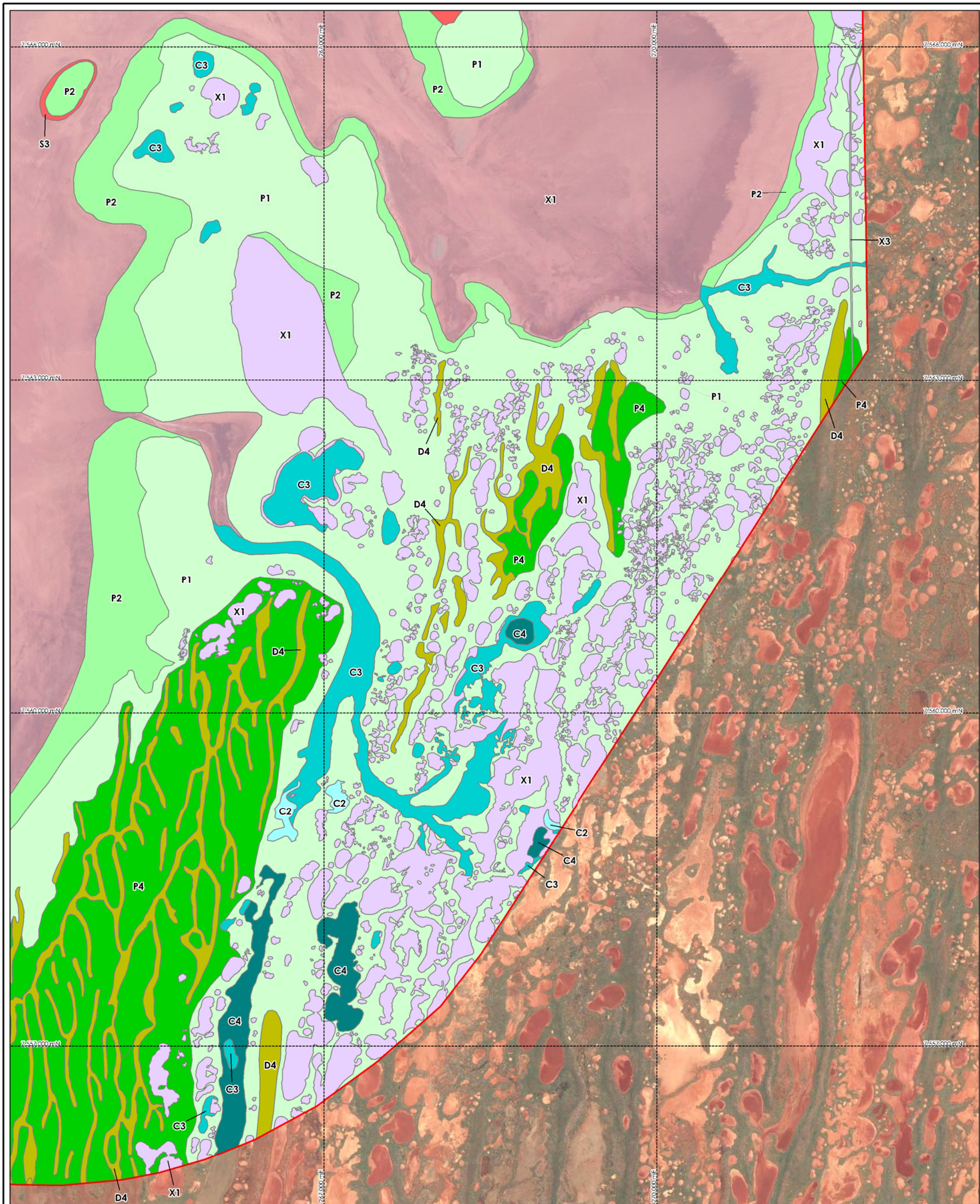
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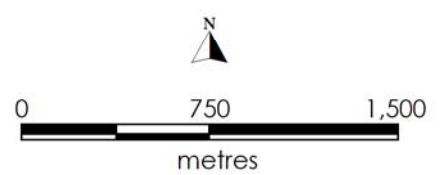
Aerial photography: Google Satellite, April 2020

## Ashburton Salt Vegetation Map 7





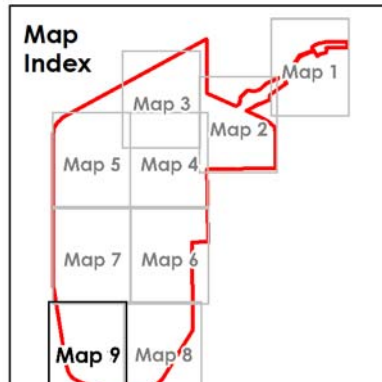
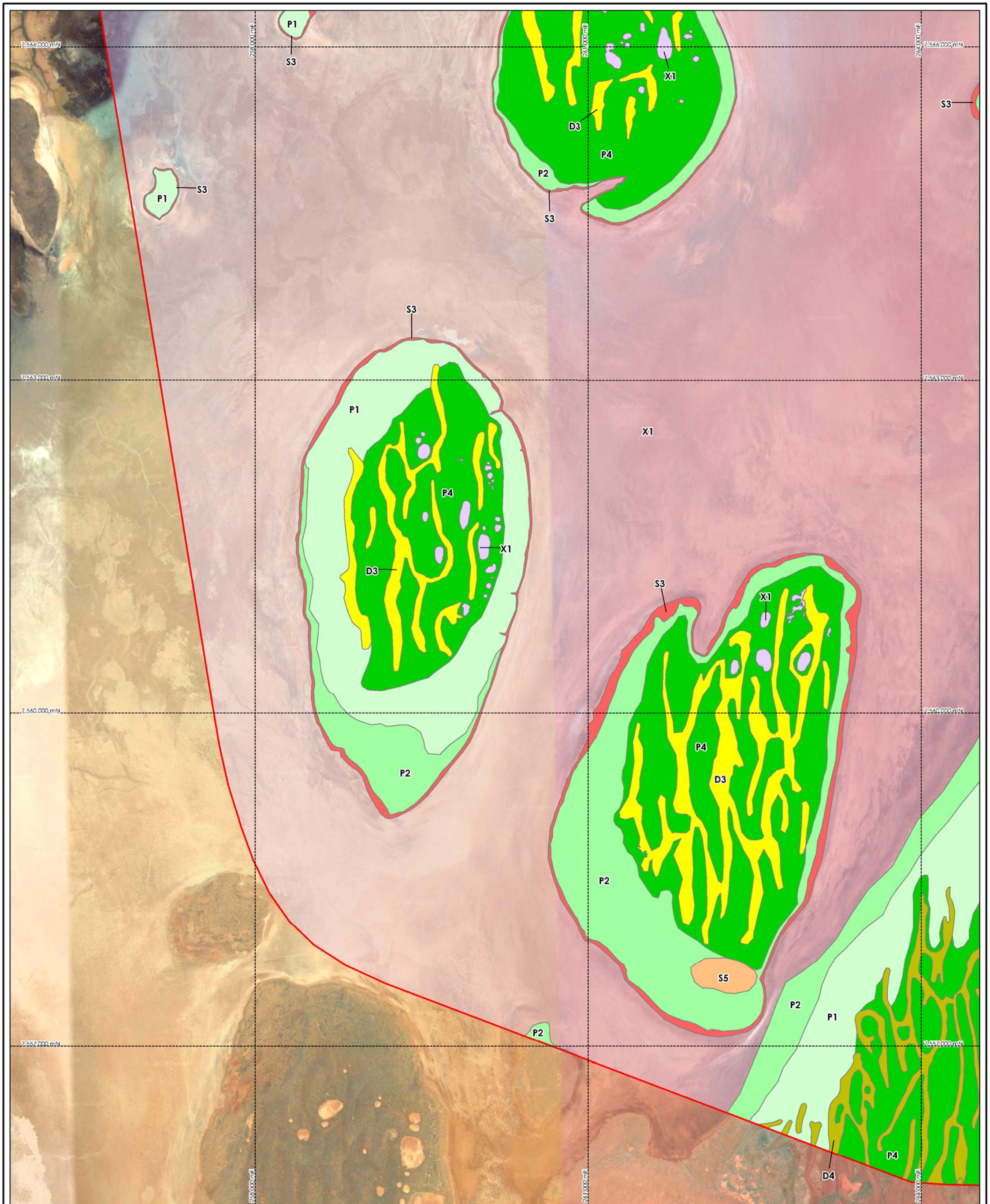
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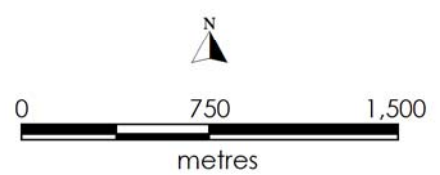
Aerial photography: Google Satellite, April 2020

## Ashburton Salt Vegetation Map 8





 Development envelope



Aerial photography:  
Google Satellite, April 2020

# Ashburton Salt Vegetation Map 9






## Ashburton Salt Project Vegetation Mapping Descriptions

### Vegetation of the Coastal Strand


 B1 *Spinifex longifolius* very open hummock grassland.

### Vegetation of Hypersaline Mudflats and Saline Plains


 S1 *Tecticornia doliiformis*, (*T. indica*, *T. halocnemoides*, *Frankenia ambita*) low shrubland over *Sporobolus mitchellii*, *Eragrostis falcata* very open grassland.

 S2 *Tecticornia indica*, (*T. auriculata*, *T. halocnemoides*) low open shrubland over *Eragrostis falcata* scattered grasses.

 S3 *Tecticornia auriculata*, (*T. indica*, *T. halocnemoides*) low shrubland over *Eragrostis falcata* scattered grasses.


 S4 *Atriplex bunburyana* scattered low shrubs over *A. codonocarpa*, *Sclerolaena recurvicauspis* very open herbland with \**Cenchrus* spp. scattered tussock grasses to very open tussock grassland.


 S5 *Acacia xiphophylla* tall open scrub over *Atriplex bunburyana* scattered low shrubs over \**Cenchrus ciliaris* open tussock grassland.


 S4/S1 Mosaic: *Atriplex bunburyana* scattered low shrubs over *A. codonocarpa*, *Sclerolaena recurvicauspis* very open herbland with \**Cenchrus* spp. scattered tussock grasses to very open tussock grassland/*Tecticornia doliiformis*, (*T. indica*, *T. halocnemoides*, *Frankenia ambita*) low shrubland over *Sporobolus mitchellii*, *Eragrostis falcata* very open grassland.

### Vegetation of Creeklines, Drainage Areas and Clay Plains

 C1 *Eucalyptus victrix* low open woodland over \**Prosopis pallida* scattered tall shrubs over \**Cenchrus ciliaris*, (\**C. setiger*) open tussock grassland.





 C2 *Eucalyptus victrix* low woodland to low open woodland over *Acacia synchronicia*, *A. tetragonophylla* scattered tall shrubs to tall open shrubland over *Eriachne benthamii/flaccida*, (*Eulalia aurea*, *Sporobolus mitchellii*) tussock grassland.

 C3 *Acacia tetragonophylla*, (*A. synchronicia*) tall shrubland over *Eriachne benthamii/flaccida* open to very open tussock grassland with *Triodia epactia* scattered hummock grasses to very open hummock grassland.





 C4 *Acacia synchronicia*, *A. tetragonophylla* scattered tall shrubs over *Eriachne benthamii/flaccida*, (*Sporobolus mitchellii*) closed tussock grassland.

## Ashburton Salt Project Vegetation Mapping Descriptions




### Vegetation of Sand Plains

-  P1 *Acacia tetragonophylla*, *A. synchronicia*, *A. sclerosperma* subsp. *sclerosperma*, (*A. coriacea* subsp. *coriacea*) scattered tall shrubs to tall open shrubland over *A. stellaticeps* scattered low shrubs to low shrubland over *Triodia epactia* hummock grassland with \**Cenchrus ciliaris* very open tussock grassland.
-  P2 *Acacia synchronicia*, *A. tetragonophylla* scattered tall shrubs over *Triodia epactia* very open hummock grassland with \**Cenchrus ciliaris* very open tussock grassland to tussock grassland.
-  P3 *Acacia synchronicia*, *A. tetragonophylla* scattered tall shrubs over *Triodia glabra*, (*T. epactia*) hummock grassland.
-  P4 *Acacia tetragonophylla*, *A. sclerosperma* subsp. *sclerosperma* tall open shrubland over *Triodia glabra*, *T. epactia*, (*T. avenoides*) hummock grassland over \**Cenchrus* spp. very open tussock grassland.

### Vegetation of Sand Dunes

-  D1 *Acacia coriacea* subsp. *coriacea* low open woodland over *Spinifex longifolius* very open to open tussock grassland with *Triodia epactia* scattered hummock grasses.
-  D2 *Acacia coriacea* subsp. *coriacea* low open woodland over *Triodia epactia* open hummock grassland with \**Cenchrus ciliaris* very open tussock grassland.
-  D3 *Grevillea stenobotrya*, *Hakea stenophylla* subsp. *stenophylla*, *Acacia coriacea* subsp. *coriacea* tall open shrubland over *A. stellaticeps*, *Scaevola sericophylla*, *Quoya loxocarpa* low open shrubland over *Triodia epactia* open hummock grassland with \**Cenchrus ciliaris* very open tussock grassland.
-  D4 *Grevillea stenobotrya*, *Hakea stenophylla* subsp. *stenophylla*, (*Acacia coriacea* subsp. *coriacea*) tall open shrubland over *Acacia stellaticeps* open shrubland over *Scaevola sericophylla* low open shrubland over *Triodia avenoides*, (*T. epactia*) hummock grassland.

### Other Mapping Units

-  X1 Bare mudflat/claypan.
-  X2 Dune blowout/mobile dune.
-  X3 Cleared area.

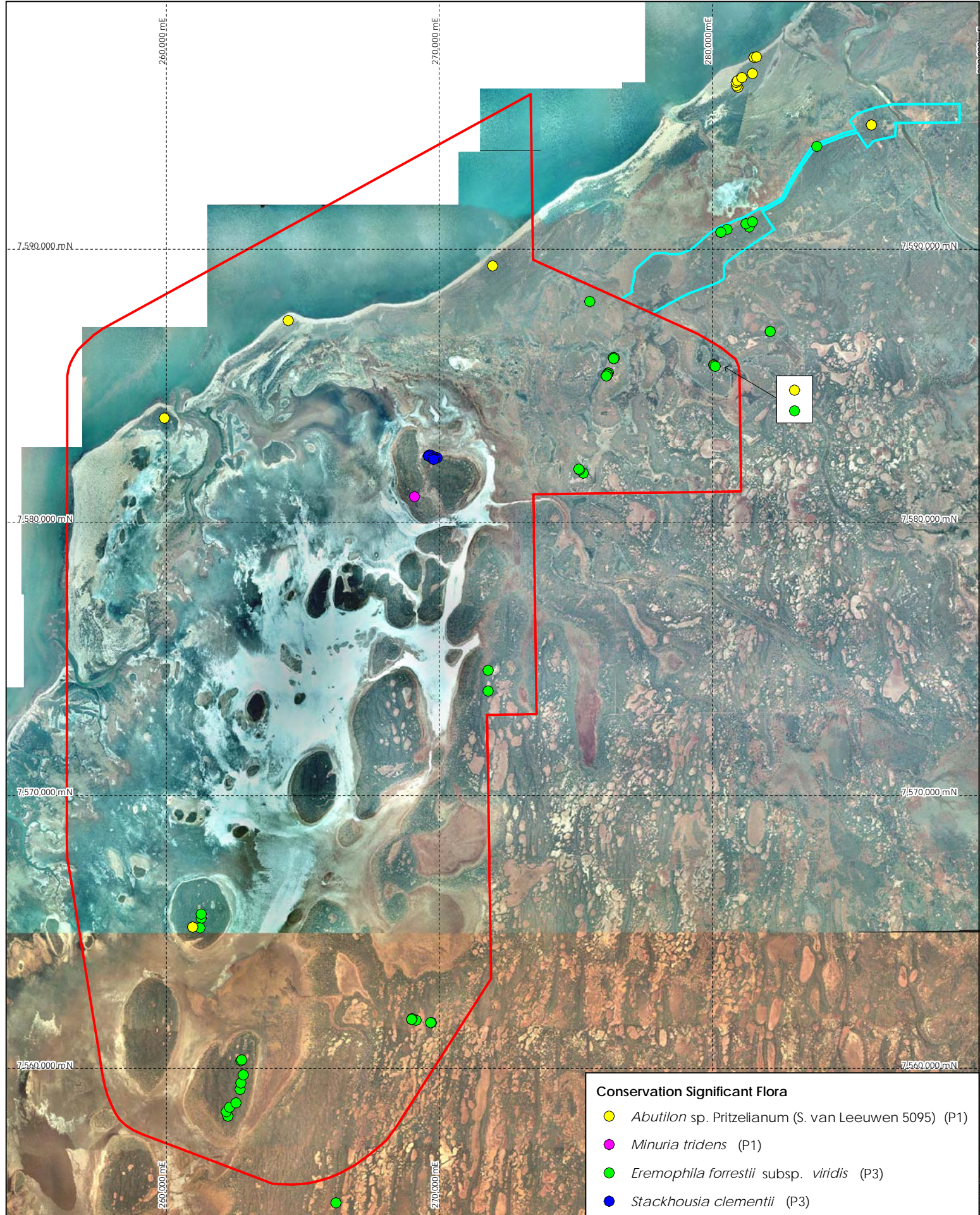
## Appendix 9

### Maps and Locations of Flora of Conservation Significance







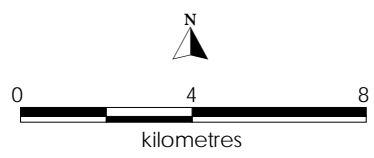


- Conservation Significant Flora**
- *Abutilon* sp. Pritzelianum (S. van Leeuwen 5095) (P1)
  - *Minuria tridens* (P1)
  - *Eremophila forrestii* subsp. *viridis* (P3)
  - *Stackhousia clementii* (P3)



Development envelope

Road survey area



## Ashburton Salt Flora Phase 1 & 2 Conservation Significant Flora





Records in blue shading represent duplicates from previous sampling (only most recent count included in total of individuals); records in grey shading are from outside the study area.

Species	Status	Location (Survey)	Site	Easting	Northing	Date	Number of Individuals	Specimen No.	Notes
<i>Minuria tridens</i>	P1	Study area (Phase 1)	ASH-OPP-RW	269100	7580937	3-Nov-18	1	ASH-RW12	M. Hislop det.; sterile but fairly confident; large range extension.
<i>Abutilon</i> sp. Pritzelianum (S. van Leeuwen 5095)	P3	Study area (Targeted)	OPP-PL	259308	7560617	26-Aug-19	1	ASHA-PL07	
<i>Abutilon</i> sp. Pritzelianum (S. van Leeuwen 5095)	P3	Study area (Phase 2)	OPPS-RW	259937	7583816	14-Apr-19	2	ASH-RW69	M.E. Trudgen det.
<i>Abutilon</i> sp. Pritzelianum (S. van Leeuwen 5095)	P3	Study area (Targeted)	OPP-RW	259993	7584210	26-Aug-19	1	RW07=	
<i>Abutilon</i> sp. Pritzelianum (S. van Leeuwen 5095)	P3	Study area (Targeted)	OPP-RW	260000	7584111	26-Aug-19	1	RW07=	
<i>Abutilon</i> sp. Pritzelianum (S. van Leeuwen 5095)	P3	Study area (Targeted)	OPP-RW	260146	7584002	26-Aug-19	1	RW07	
<i>Abutilon</i> sp. Pritzelianum (S. van Leeuwen 5095)	P3	Study area (Phase 2)	OPPS-RW	260971	7565180	16-Apr-19	1	ASH-RW84	M.E. Trudgen det.
<i>Abutilon</i> sp. Pritzelianum (S. van Leeuwen 5095)	P3	Study area (Targeted)	OPP-PL	263452	7556913	26-Aug-19	1	ASHA-PL16	
<i>Abutilon</i> sp. Pritzelianum (S. van Leeuwen 5095)	P3	Study area (Phase 2)	OPPS-RW	264469	7587385	14-Apr-19	1	ASH-RW70	M.E. Trudgen det.
<i>Abutilon</i> sp. Pritzelianum (S. van Leeuwen 5095)	P3	Study area (Phase 1)	ASH-OPP-MM	271959	7589378	5-Nov-18	5	ASH-MB40	
<i>Abutilon</i> sp. Pritzelianum (S. van Leeuwen 5095)	P3	Study area (Phase 1)	ASH-OPP-MM	280046	7585773	7-Nov-18	5	ASH-MB40=	
<i>Abutilon</i> sp. Pritzelianum (S. van Leeuwen 5095)	P3	Study area (Phase 1)	ASH32	285830	7594545	4-Nov-18	1	ASH32-02	0.1% cover
<i>Abutilon</i> sp. Pritzelianum (S. van Leeuwen 5095)	P3	Study area (Phase 2)	ASH32R	285830	7594545	16-Apr-19	7		0.1% cover
<i>Abutilon</i> sp. Pritzelianum (S. van Leeuwen 5095)	P3	Study area (Targeted)	OPP-RW	285913	7594473	27-Aug-19	3		
<i>Abutilon</i> sp. Pritzelianum (S. van Leeuwen 5095)	P3	Outside (Targeted)	OPP-PL	274881	7590609	27-Aug-19	30		Outside study area.
<i>Abutilon</i> sp. Pritzelianum (S. van Leeuwen 5095)	P3	Outside (Phase 2)	OPPS-RW	280886	7596105	14-Apr-19	1	ASH-RW76=	Outside study area.
<i>Abutilon</i> sp. Pritzelianum (S. van Leeuwen 5095)	P3	Outside (Phase 2)	OPPS-RW	280894	7595983	14-Apr-19	20	ASH-RW76=	Outside study area.
<i>Abutilon</i> sp. Pritzelianum (S. van Leeuwen 5095)	P3	Outside (Phase 2)	OPPS-RW	280926	7596157	14-Apr-19	1	ASH-RW76=	Outside study area.
<i>Abutilon</i> sp. Pritzelianum (S. van Leeuwen 5095)	P3	Outside (Phase 2)	OPPS-RW	280936	7595916	14-Apr-19	3	ASH-RW76	Outside study area; M.E. Trudgen det.
<i>Abutilon</i> sp. Pritzelianum (S. van Leeuwen 5095)	P3	Outside (Phase 2)	OPPS-RW	280989	7595861	14-Apr-19	1	ASH-RW76=	Outside study area.
<i>Abutilon</i> sp. Pritzelianum (S. van Leeuwen 5095)	P3	Outside (Phase 2)	OPPS-RW	281087	7596278	14-Apr-19	2	ASH-RW76=	Outside study area.
<i>Abutilon</i> sp. Pritzelianum (S. van Leeuwen 5095)	P3	Outside (Phase 2)	OPPS-RW	281259	7595142	14-Apr-19	1	ASH-RW76=	Outside study area.
<i>Abutilon</i> sp. Pritzelianum (S. van Leeuwen 5095)	P3	Outside (Phase 2)	OPPS-RW	281270	7595276	14-Apr-19	1	ASH-RW76=	Outside study area.
<i>Abutilon</i> sp. Pritzelianum (S. van Leeuwen 5095)	P3	Outside (Phase 2)	OPPS-RW	281480	7596429	14-Apr-19	2	ASH-RW76=	Outside study area; near road.
<i>Abutilon</i> sp. Pritzelianum (S. van Leeuwen 5095)	P3	Outside (Phase 1)	ASHC02	281539	7597022	6-Nov-18	2	ASHC02-03	Outside study area; number not recorded; assigned N=2. 0.1% cover.
<i>Abutilon</i> sp. Pritzelianum (S. van Leeuwen 5095)	P3	Outside (Phase 2)	ASHC02R	281539	7597022	14-Apr-19	10		Outside study area. 0.1% cover.
<i>Abutilon</i> sp. Pritzelianum (S. van Leeuwen 5095)	P3	Outside (Phase 2)	OPPS-RW	281617	7597035	14-Apr-19	50	ASH-RW77	Outside study area; M.E. Trudgen det.
<i>Abutilon</i> sp. Pritzelianum (S. van Leeuwen 5095)	P3	Outside (Targeted)	OPP-PL	283259	7591776	27-Aug-19	15		Outside study area.
<i>Eremophila forrestii</i> subsp. <i>viridis</i>	P3	Study area (Targeted)	OPP-RW	259171	7560397	26-Aug-19	1		
<i>Eremophila forrestii</i> subsp. <i>viridis</i>	P3	Study area (Targeted)	OPP-RW	259193	7560246	26-Aug-19	3		
<i>Eremophila forrestii</i> subsp. <i>viridis</i>	P3	Study area (Targeted)	OPP-PL	259246	7560600	26-Aug-19	50		
<i>Eremophila forrestii</i> subsp. <i>viridis</i>	P3	Study area (Targeted)	OPP-RW	259409	7560623	26-Aug-19	25		
<i>Eremophila forrestii</i> subsp. <i>viridis</i>	P3	Study area (Targeted)	OPP-RW	259466	7560595	26-Aug-19	25		
<i>Eremophila forrestii</i> subsp. <i>viridis</i>	P3	Study area (Phase 2)	OPPS-RW	260971	7565180	16-Apr-19	5		
<i>Eremophila forrestii</i> subsp. <i>viridis</i>	P3	Study area (Phase 2)	OPPS-RW	261131	7565033	16-Apr-19	4	ASH-RW83	
<i>Eremophila forrestii</i> subsp. <i>viridis</i>	P3	Study area (Phase 2)	OPPS-RW	261233	7565140	16-Apr-19	50		
<i>Eremophila forrestii</i> subsp. <i>viridis</i>	P3	Study area (Phase 2)	OPPS-RW	261276	7565494	16-Apr-19	100	ASH-RW82	
<i>Eremophila forrestii</i> subsp. <i>viridis</i>	P3	Study area (Phase 2)	STR04R	261286	7565650	16-Apr-19	4	STR04-02, -04	0.1% cover.
<i>Eremophila forrestii</i> subsp. <i>viridis</i>	P3	Study area (Phase 2)	OPPS-RW	262205	7558417	10-Apr-19	10		
<i>Eremophila forrestii</i> subsp. <i>viridis</i>	P3	Study area (Phase 2)	OPPS-RW	262253	7558256	10-Apr-19	20		
<i>Eremophila forrestii</i> subsp. <i>viridis</i>	P3	Study area (Phase 2)	OPPS-RW	262323	7558576	10-Apr-19	50		
<i>Eremophila forrestii</i> subsp. <i>viridis</i>	P3	Study area (Phase 2)	OPPS-RW	262560	7558740	10-Apr-19	20		
<i>Eremophila forrestii</i> subsp. <i>viridis</i>	P3	Study area (Phase 2)	OPPS-RW	262699	7559236	10-Apr-19	40		
<i>Eremophila forrestii</i> subsp. <i>viridis</i>	P3	Study area (Phase 2)	OPPS-RW	262730	7559462	10-Apr-19	50		
<i>Eremophila forrestii</i> subsp. <i>viridis</i>	P3	Study area (Phase 2)	OPPS-RW	262739	7560282	10-May-19	10		
<i>Eremophila forrestii</i> subsp. <i>viridis</i>	P3	Study area (Phase 2)	STR07R	262766	7560304	10-Apr-19	1		0.1% cover.
<i>Eremophila forrestii</i> subsp. <i>viridis</i>	P3	Study area (Phase 2)	OPPS-RW	262825	7559770	10-Apr-19	15		
<i>Eremophila forrestii</i> subsp. <i>viridis</i>	P3	Study area (Targeted)	OPP-RW	263429	7557108	26-Aug-19	5		
<i>Eremophila forrestii</i> subsp. <i>viridis</i>	P3	Study area (Targeted)	OPP-PL	263543	7556836	26-Aug-19	1		
<i>Eremophila forrestii</i> subsp. <i>viridis</i>	P3	Study area (Targeted)	OPP-RW	263601	7556861	26-Aug-19	2		

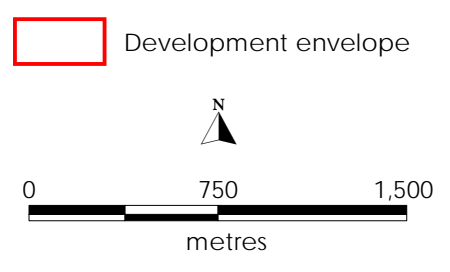
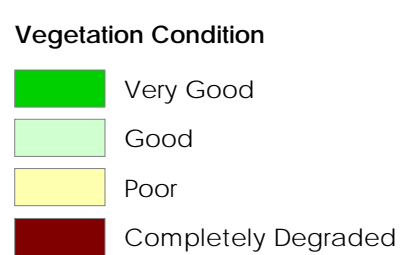
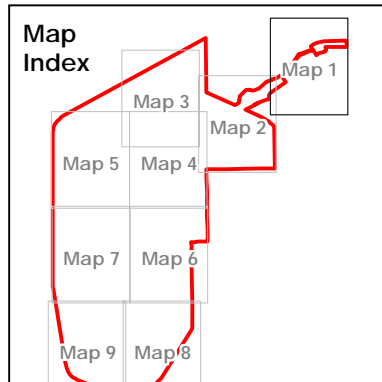
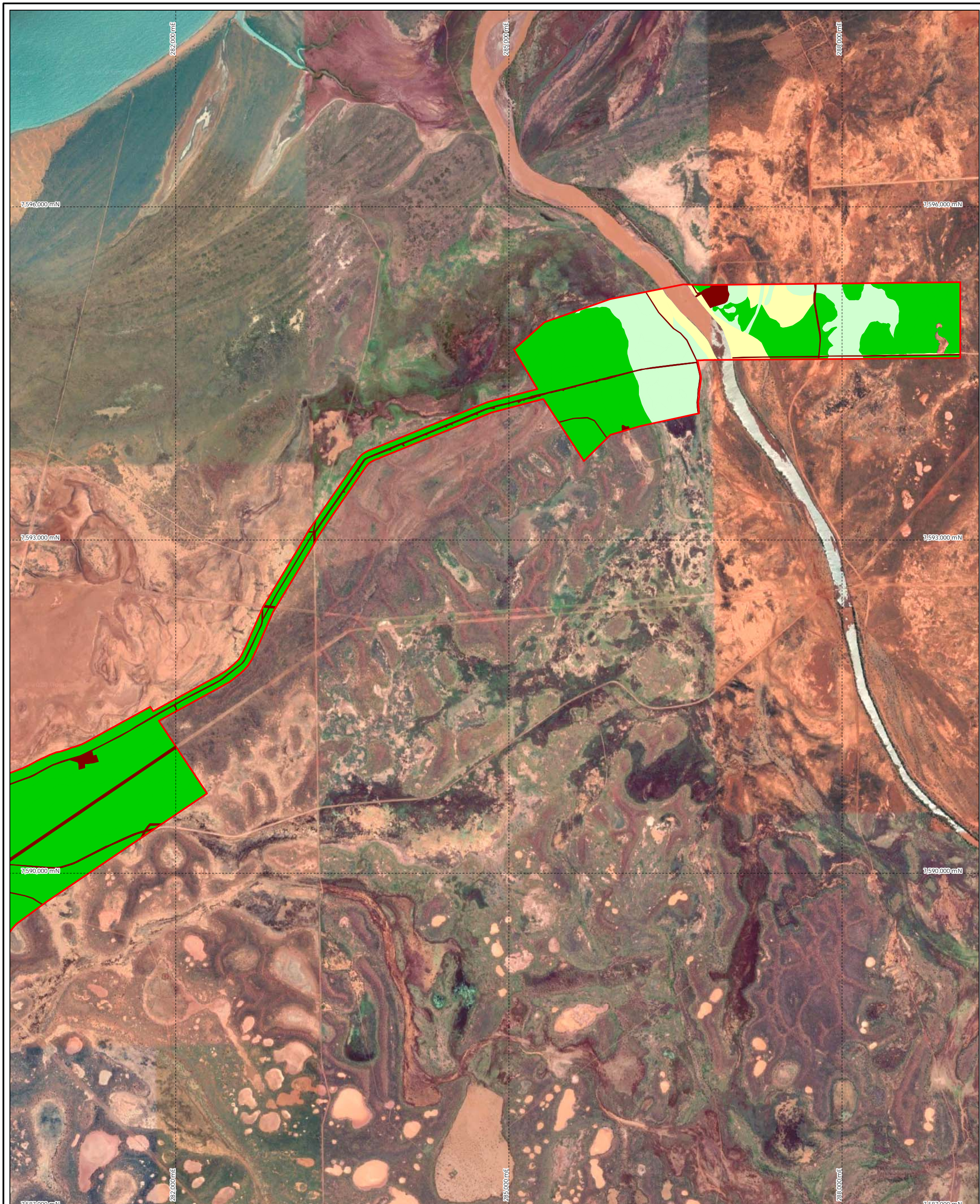
Species	Status	Location (Survey)	Site	Easting	Northing	Date	Number of Individuals	Specimen No.	Notes
<i>Eremophila forrestii</i> subsp. <i>viridis</i>	P3	Study area (Phase 2)	ASH14R	266139	7559693	15-Apr-19	4	ASH14-01	0.1% cover
<i>Eremophila forrestii</i> subsp. <i>viridis</i>	P3	Study area (Phase 2)	STR02R	267938	7571429	9-Apr-19	10	STR02-01	1% cover
<i>Eremophila forrestii</i> subsp. <i>viridis</i>	P3	Study area (Phase 1)	ASH15	268991	7561798	2-Nov-18	10	ASH-MB18=	
<i>Eremophila forrestii</i> subsp. <i>viridis</i>	P3	Study area (Phase 2)	ASH15R	268991	7561798	12-Apr-19	10		1% cover.
<i>Eremophila forrestii</i> subsp. <i>viridis</i>	P3	Study area (Phase 1)	ASH-OPP-MM	269010	7561827	2-Nov-18	30	ASH-MB18=	N=30 in a 50x50 m area.
<i>Eremophila forrestii</i> subsp. <i>viridis</i>	P3	Study area (Phase 1)	ASH-OPP-MM	269148	7561767	2-Nov-18	20	ASH-MB18=	N=20 in a 50x50 m area.
<i>Eremophila forrestii</i> subsp. <i>viridis</i>	P3	Study area (Phase 1)	ASH-OPP-MM	269690	7561675	2-Nov-18	4	ASH-MB18=	
<i>Eremophila forrestii</i> subsp. <i>viridis</i>	P3	Study area (Phase 1)	ASH-OPP-MM	269719	7561673	2-Nov-18	2	ASH-MB18	
<i>Eremophila forrestii</i> subsp. <i>viridis</i>	P3	Study area (Phase 1)	ASH-OPP-MM	271797	7573817	8-Nov-18	50		
<i>Eremophila forrestii</i> subsp. <i>viridis</i>	P3	Study area (Phase 1)	ASH-OPP-MM	271798	7574568	8-Nov-18	190		Track log walked by MM around this patch on east side of track; RM walked around western side.
<i>Eremophila forrestii</i> subsp. <i>viridis</i>	P3	Study area (Targeted)	OPP-PL	273123	7588730	27-Aug-19	9		
<i>Eremophila forrestii</i> subsp. <i>viridis</i>	P3	Study area (Targeted)	OPP-PL	273178	7588813	27-Aug-19	1		
<i>Eremophila forrestii</i> subsp. <i>viridis</i>	P3	Study area (Phase 1)	ASH-OPP-MM	275114	7581938	7-Nov-18	1	ASH-MB61=	
<i>Eremophila forrestii</i> subsp. <i>viridis</i>	P3	Study area (Phase 1)	ASH-OPP-MM	275136	7581920	7-Nov-18	2	ASH-MB61=	
<i>Eremophila forrestii</i> subsp. <i>viridis</i>	P3	Study area (Phase 1)	ASH-OPP-MM	275277	7581795	7-Nov-18	4	ASH-MB61=	
<i>Eremophila forrestii</i> subsp. <i>viridis</i>	P3	Study area (Phase 1)	ASH-OPP-MM	275510	7588073	6-Nov-18	9	ASH-MB42	
<i>Eremophila forrestii</i> subsp. <i>viridis</i>	P3	Study area (Phase 1)	ASH-OPP-MM	276126	7585357	8-Nov-18	1		
<i>Eremophila forrestii</i> subsp. <i>viridis</i>	P3	Study area (Phase 1)	ASH-OPP-BM	276129	7585389	8-Nov-18	2		
<i>Eremophila forrestii</i> subsp. <i>viridis</i>	P3	Study area (Phase 1)	ASH-OPP-MM	276152	7585366	8-Nov-18	1		
<i>Eremophila forrestii</i> subsp. <i>viridis</i>	P3	Study area (Phase 1)	ASH-OPP-MM	276157	7585408	8-Nov-18	16		
<i>Eremophila forrestii</i> subsp. <i>viridis</i>	P3	Study area (Phase 1)	ASH-OPP-MM	276160	7585426	8-Nov-18	3		
<i>Eremophila forrestii</i> subsp. <i>viridis</i>	P3	Study area (Phase 1)	ASH-OPP-BM	276189	7585478	8-Nov-18	7		Flowering.
<i>Eremophila forrestii</i> subsp. <i>viridis</i>	P3	Study area (Phase 1)	ASH-OPP-MM	276368	7586034	8-Nov-18	1		
<i>Eremophila forrestii</i> subsp. <i>viridis</i>	P3	Study area (Phase 1)	ASH52	276387	7585995	8-Nov-18	16	ASH-MB42=	0.1% cover.
<i>Eremophila forrestii</i> subsp. <i>viridis</i>	P3	Study area (Phase 2)	ASH52R	276387	7585995	10-Apr-19	14		0.5% cover.
<i>Eremophila forrestii</i> subsp. <i>viridis</i>	P3	Study area (Phase 1)	ASH-OPP-MM	276421	7586025	8-Nov-18	1		
<i>Eremophila forrestii</i> subsp. <i>viridis</i>	P3	Study area (Phase 1)	ASH-OPP-MM	280061	7585733	7-Nov-18	15	ASH-MB61	
<i>Eremophila forrestii</i> subsp. <i>viridis</i>	P3	Study area (Phase 1)	ASH-OPP-MM	280113	7585707	7-Nov-18	11	ASH-MB61=	
<i>Eremophila forrestii</i> subsp. <i>viridis</i>	P3	Study area (Phase 1)	ASH34	280311	7590612	4-Nov-18	3	ASH34-06	0.1% cover.
<i>Eremophila forrestii</i> subsp. <i>viridis</i>	P3	Study area (Phase 2)	ASH34R	280311	7590612	10-Apr-19	3		0.1% cover.
<i>Eremophila forrestii</i> subsp. <i>viridis</i>	P3	Study area (Phase 1)	ASH-OPP-RW	280543	7590720		3		
<i>Eremophila forrestii</i> subsp. <i>viridis</i>	P3	Study area (Phase 2)	OPPS-RW	281236	7590931	13-Apr-19	1		
<i>Eremophila forrestii</i> subsp. <i>viridis</i>	P3	Study area (Phase 2)	OPPS-RW	281349	7590815	13-Apr-19	9		
<i>Eremophila forrestii</i> subsp. <i>viridis</i>	P3	Study area (Phase 2)	OPPS-RW	281470	7590998	13-Apr-19	4		
<i>Eremophila forrestii</i> subsp. <i>viridis</i>	P3	Study area (Phase 2)	OPPS-RW	283823	7593759	15-Apr-19	6		
<i>Eremophila forrestii</i> subsp. <i>viridis</i>	P3	Outside (Phase 2)	OPPS-RW	266221	7555383	15-Apr-19	2	ASH-RW78	Outside study area.
<i>Eremophila forrestii</i> subsp. <i>viridis</i>	P3	Outside (Phase 1)	ASHC14	282125	7586985	7-Nov-18	5	ASHC14-04	Outside study area; M. Hislop det. 0.1% cover.
<i>Eremophila forrestii</i> subsp. <i>viridis</i>	P3	Outside (Phase 2)	ASHC14R	282125	7586985	9-Apr-19	11		Outside study area. 2% cover.
<i>Stackhousia clementii</i>	P3	Study area (Phase 1)	ASH-OPP-RW	269600	7582429	3-Nov-18	50	ASH-RW17	
<i>Stackhousia clementii</i>	P3	Study area (Phase 1)	ASH-OPP-RW	269609	7582421	7-Nov-18	50	ASH-RW17=	
<i>Stackhousia clementii</i>	P3	Study area (Phase 1)	ASH-OPP-RW	269641	7582464	7-Nov-18	30	ASH-RW17=	
<i>Stackhousia clementii</i>	P3	Study area (Phase 1)	ASH-OPP-RW	269713	7582453	7-Nov-18	20	ASH-RW17=	
<i>Stackhousia clementii</i>	P3	Study area (Phase 1)	ASH-OPP-RW	269744	7582343	7-Nov-18	30	ASH-RW17=	
<i>Stackhousia clementii</i>	P3	Study area (Phase 1)	ASH-OPP-RW	269786	7582300	7-Nov-18	50	ASH-RW17=	
<i>Stackhousia clementii</i>	P3	Study area (Phase 1)	ASH-OPP-RW	269842	7582331	7-Nov-18	50	ASH-RW17=	
<i>Stackhousia clementii</i>	P3	Study area (Phase 1)	ASH-OPP-RW	269885	7582371	3-Nov-18	50	ASH-RW17=	
<i>Stackhousia clementii</i>	P3	Study area (Phase 1)	ASH-OPP-RW	269922	7582361	7-Nov-18	60	ASH-RW17=	
<i>Triumfetta echinata</i>	P3	Study area (Targeted)	OPP-RW	285901	7594472	27-Aug-19	1	ASHA-RW10	On side of track adjacent to crest of medium dune.
<i>Acacia</i> ? <i>ligulata</i>	Unresolved taxon	Study area (Targeted)	OPP-RW	259492	7560397	26-Aug-19	20	ASHA-RW03	Possible hybrid of <i>A. ligulata</i> ; unusual anastomosing venation.

## Appendix 10

### Maps of Vegetation Condition and Indicative Locations of Introduced Flora (Weeds)



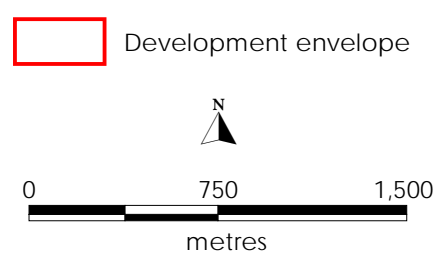
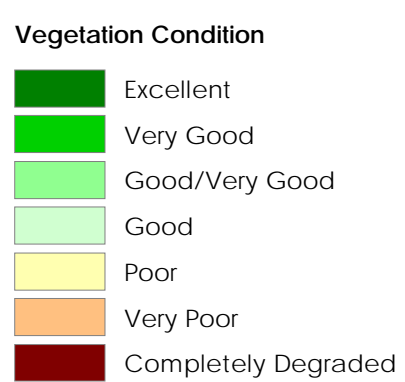
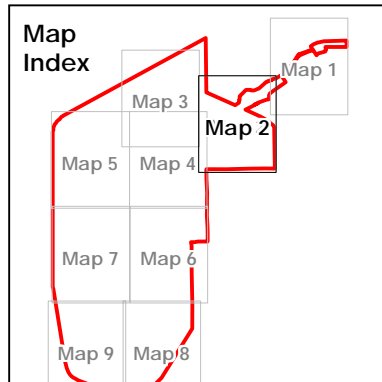




Aerial photography:  
Google Satellite, April 2020

# Ashburton Salt Vegetation Condition Map 1



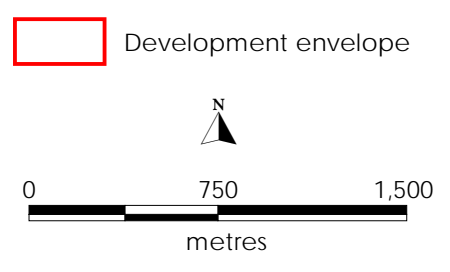
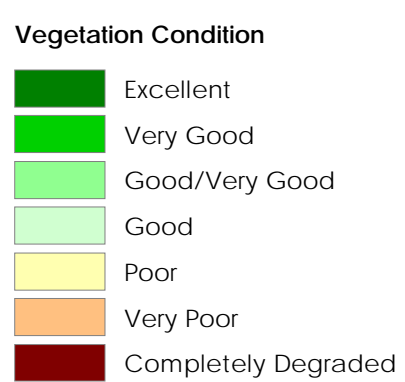
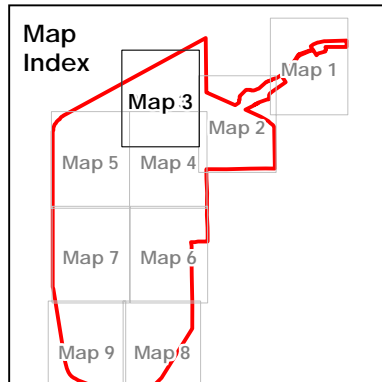
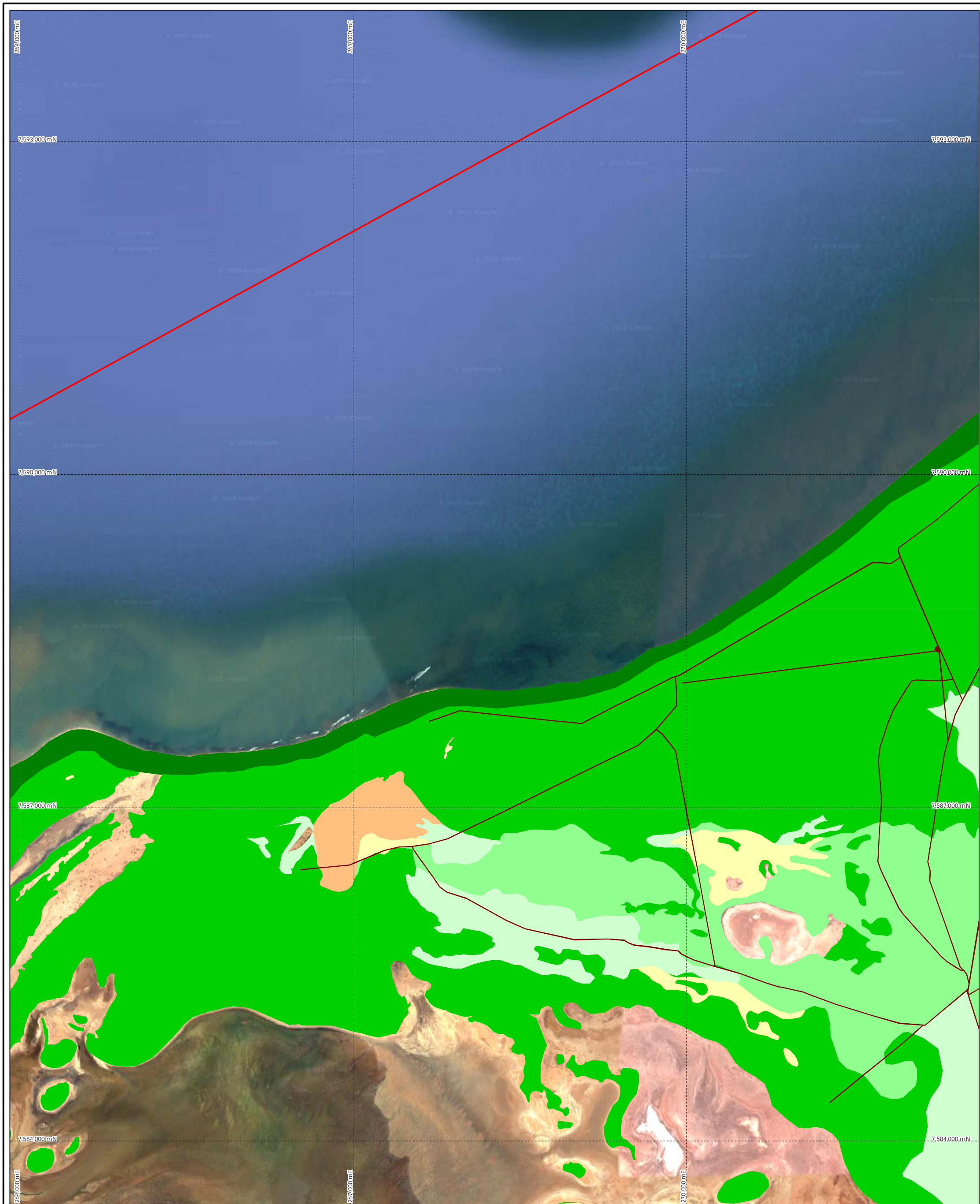


Aerial photography: Google Satellite, April 2020

## Ashburton Salt Vegetation Condition Map 2



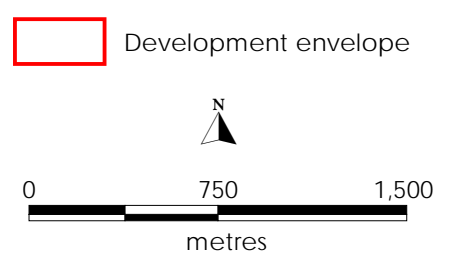
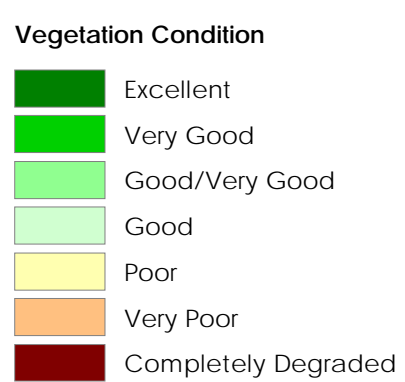
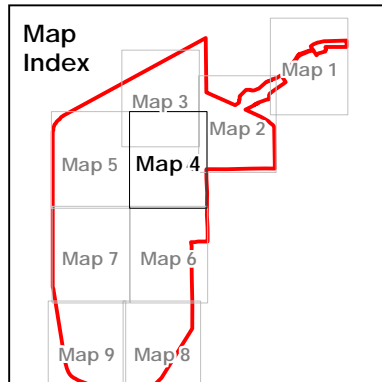
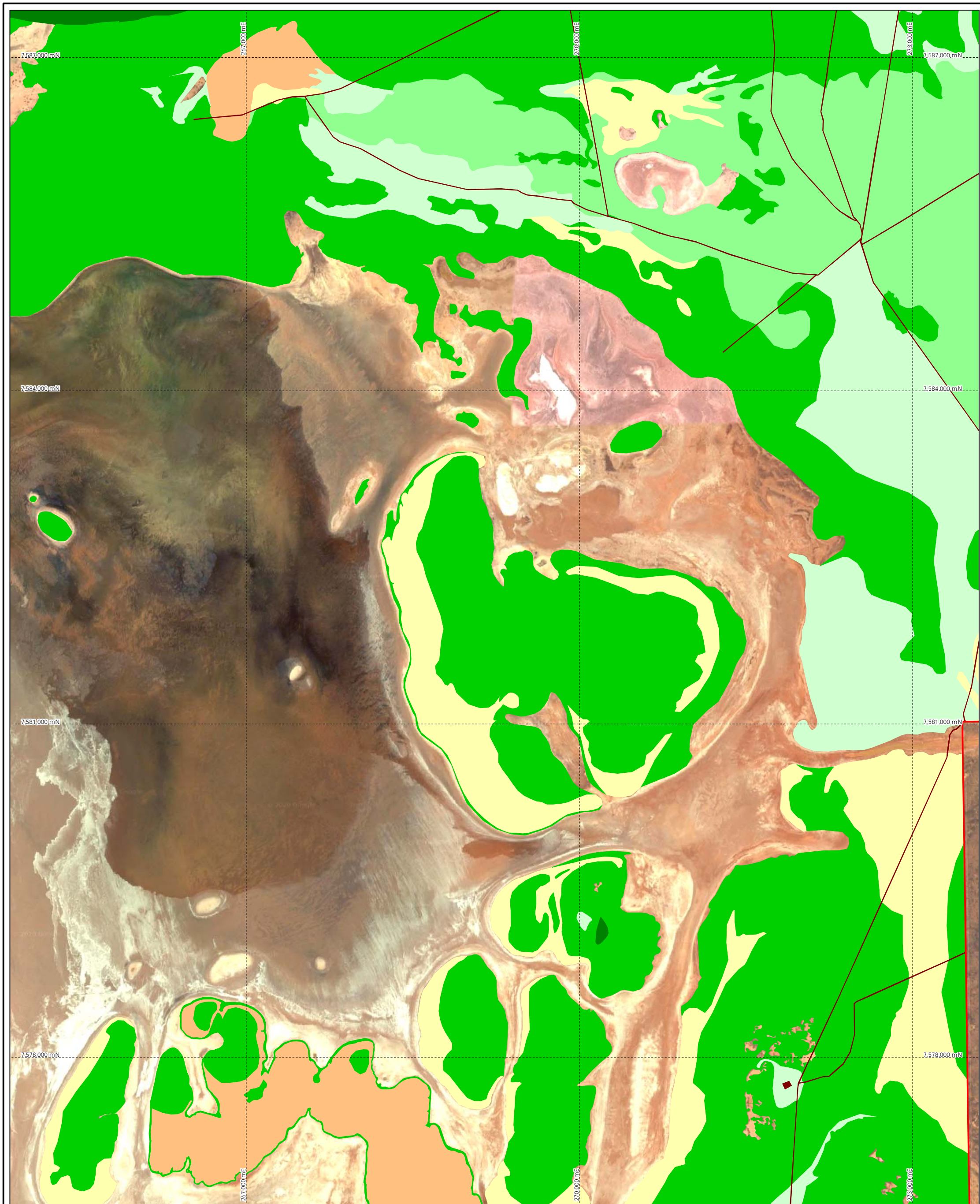




Aerial photography: Google Satellite, April 2020

## Ashburton Salt Vegetation Condition Map 3

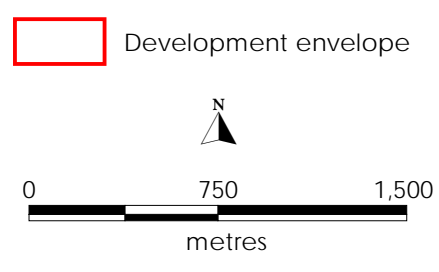
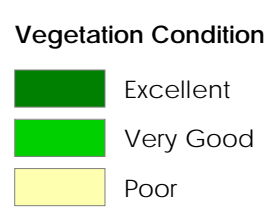
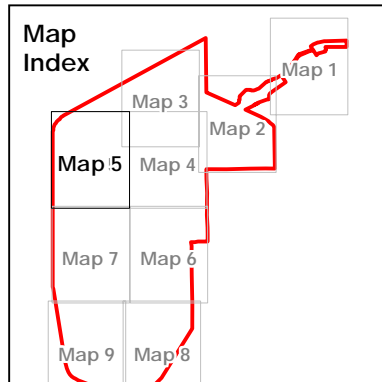




Aerial photography:  
Google Satellite, April 2020

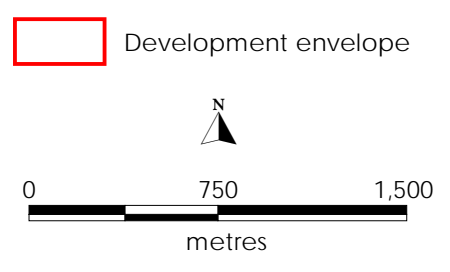
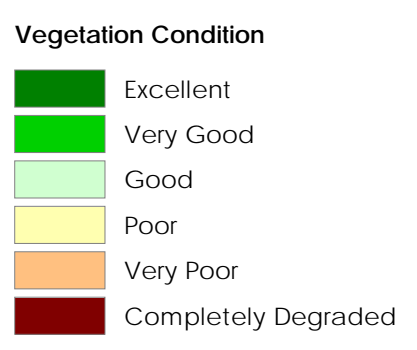
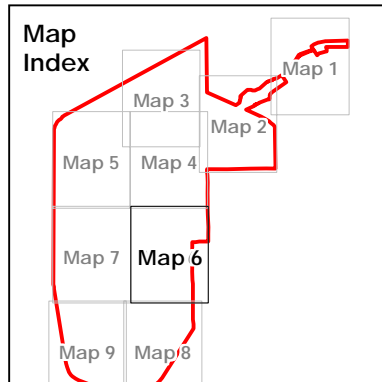
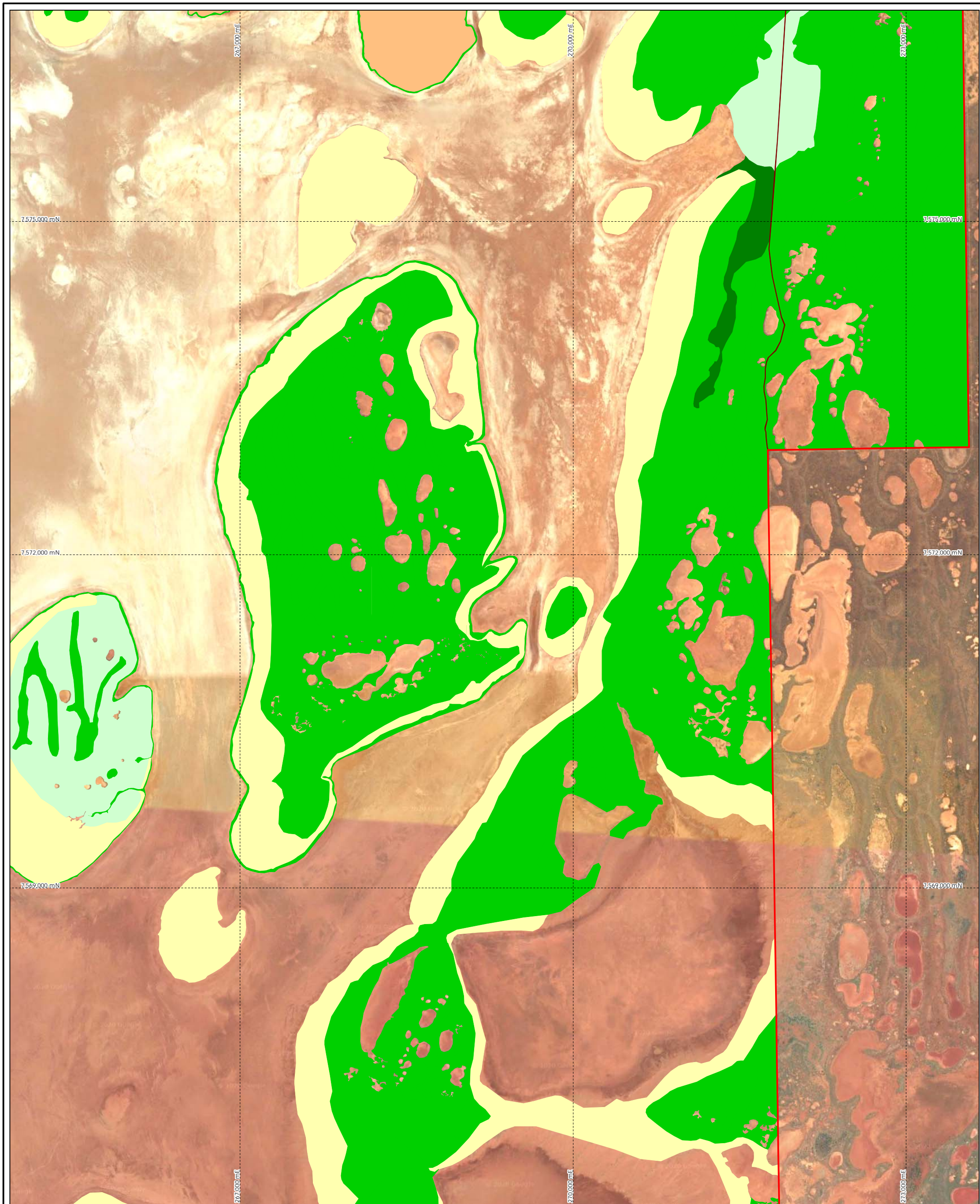
## Ashburton Salt Vegetation Condition Map 4





# Ashburton Salt Vegetation Condition Map 5

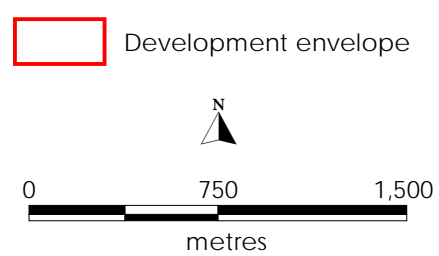
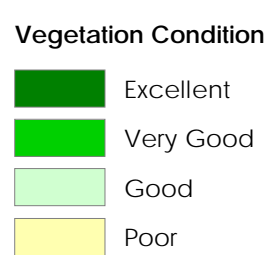
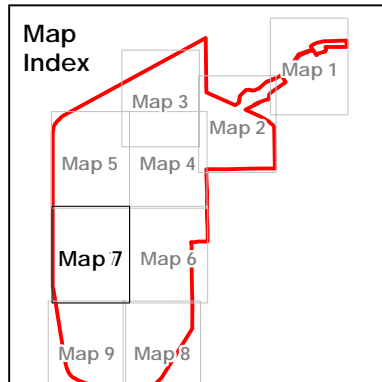
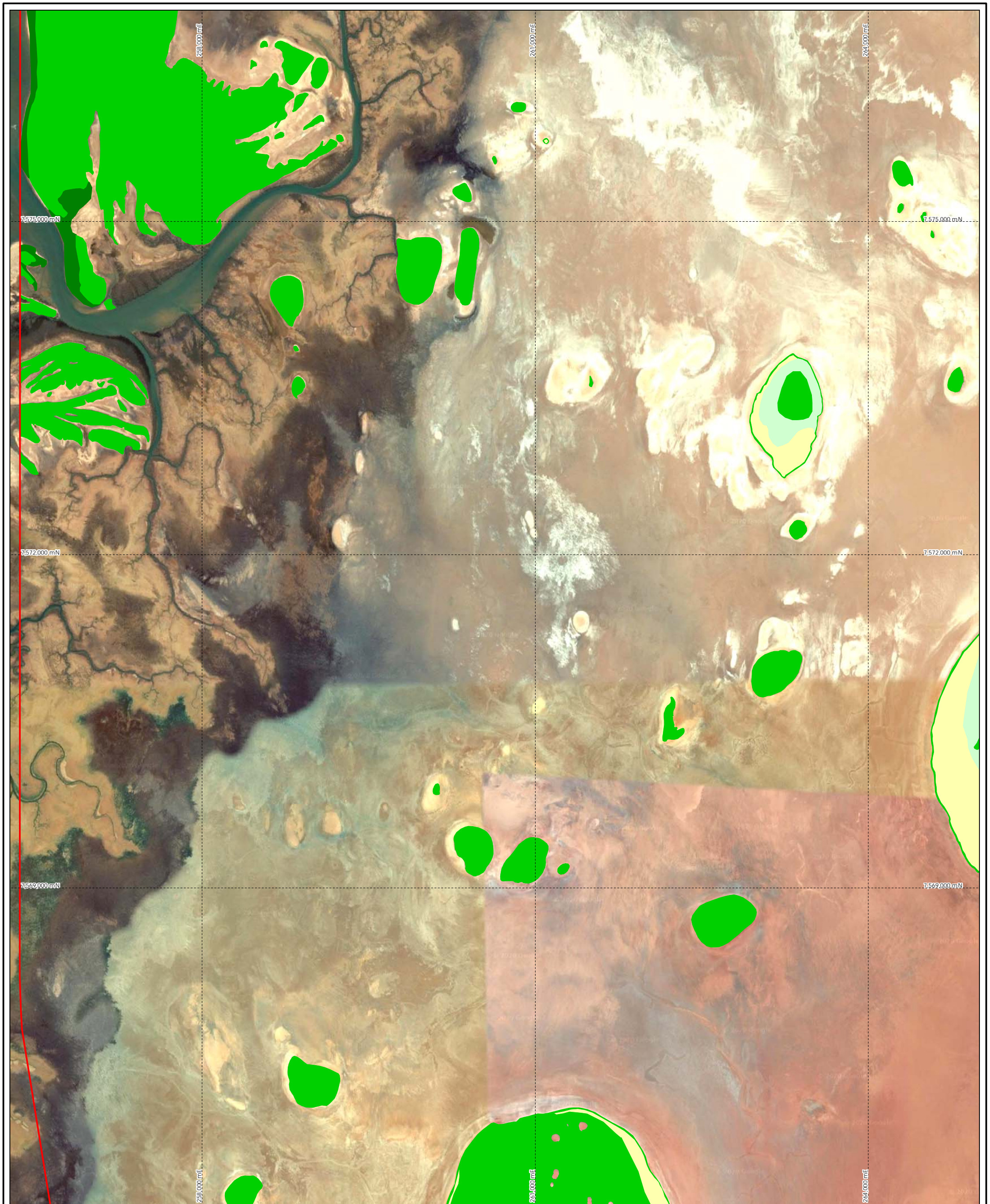




Aerial photography: Google Satellite, April 2020

# Ashburton Salt Vegetation Condition Map 6

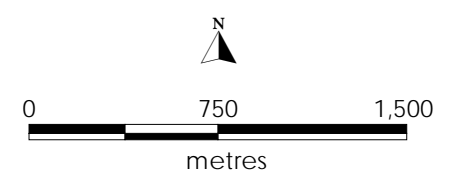
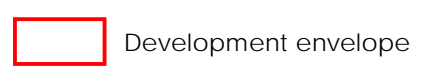
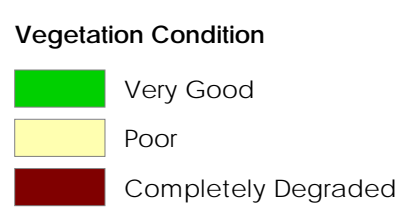
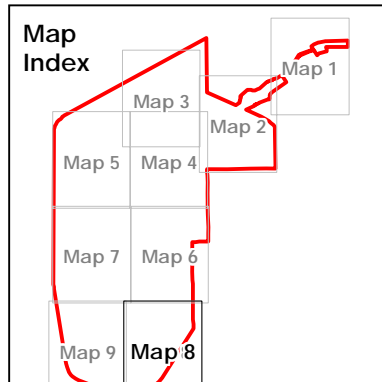
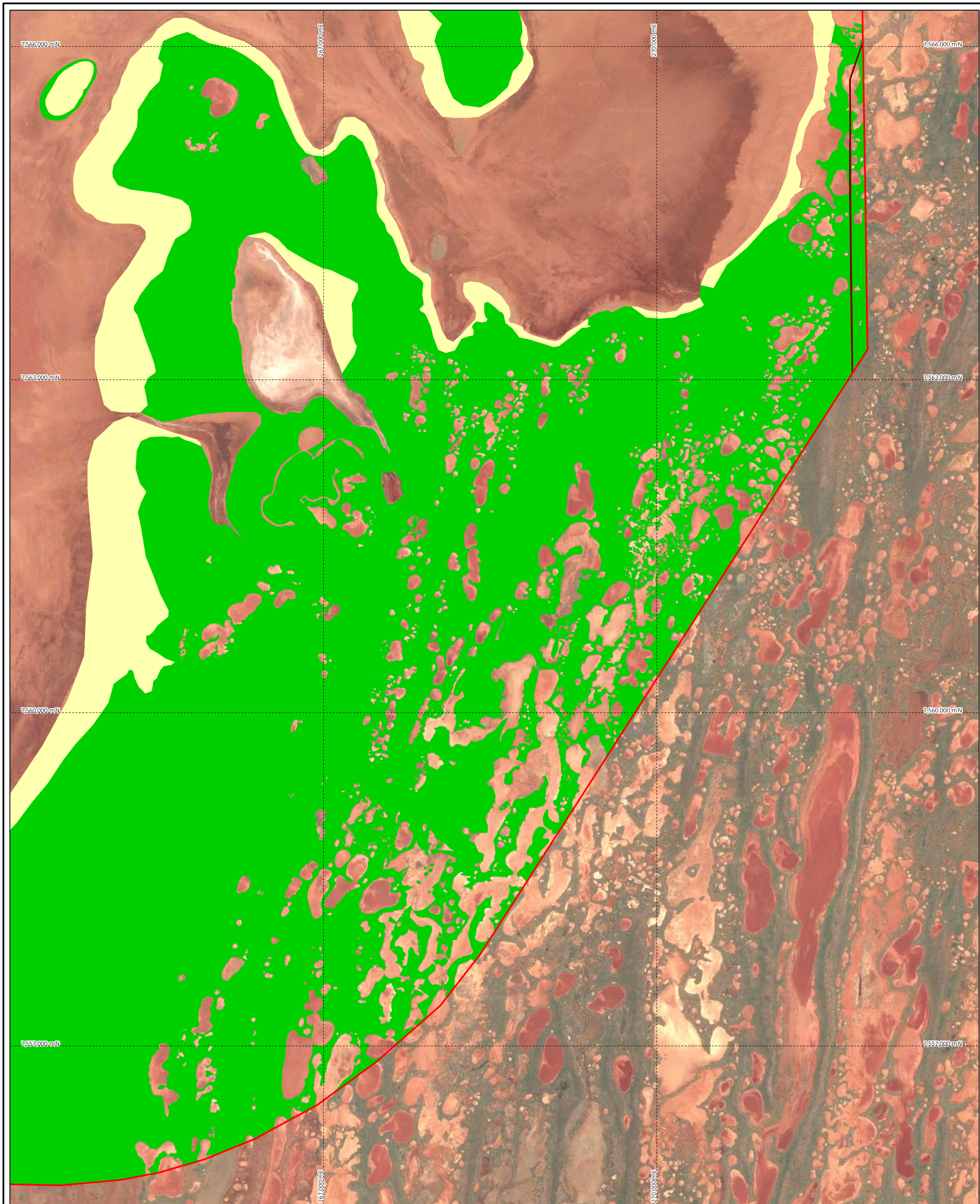




Aerial photography:  
Google Satellite, April 2020

# Ashburton Salt Vegetation Condition Map 7

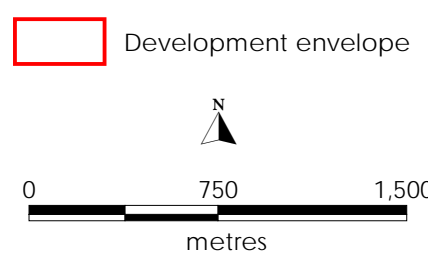
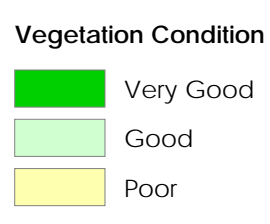
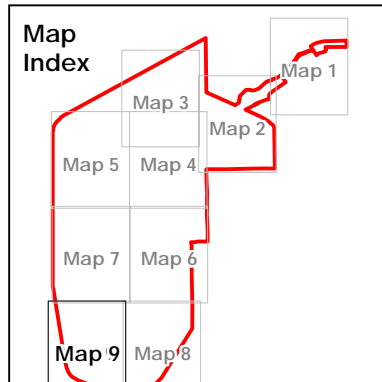
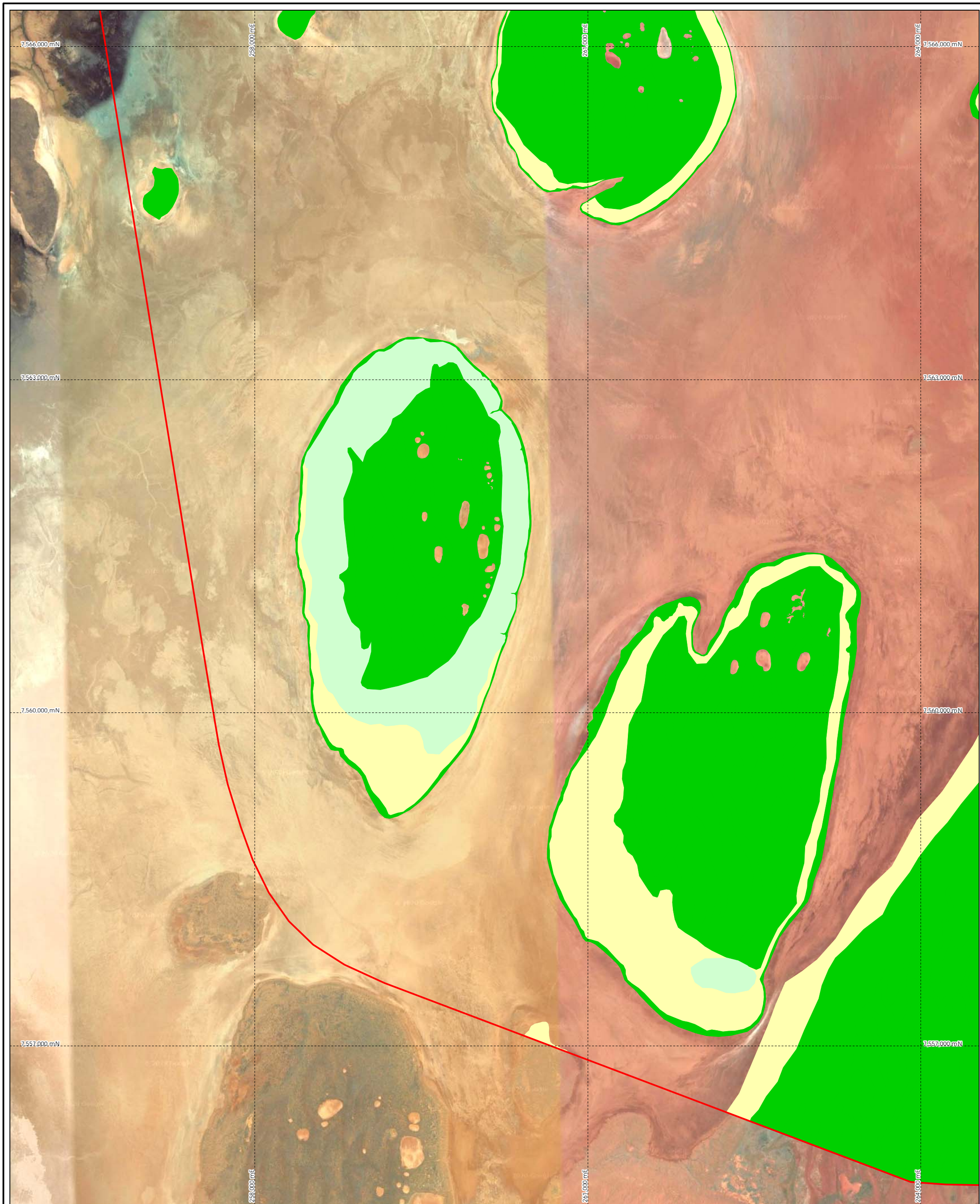




Aerial photography: Google Satellite, April 2020

# Ashburton Salt Vegetation Condition Map 8



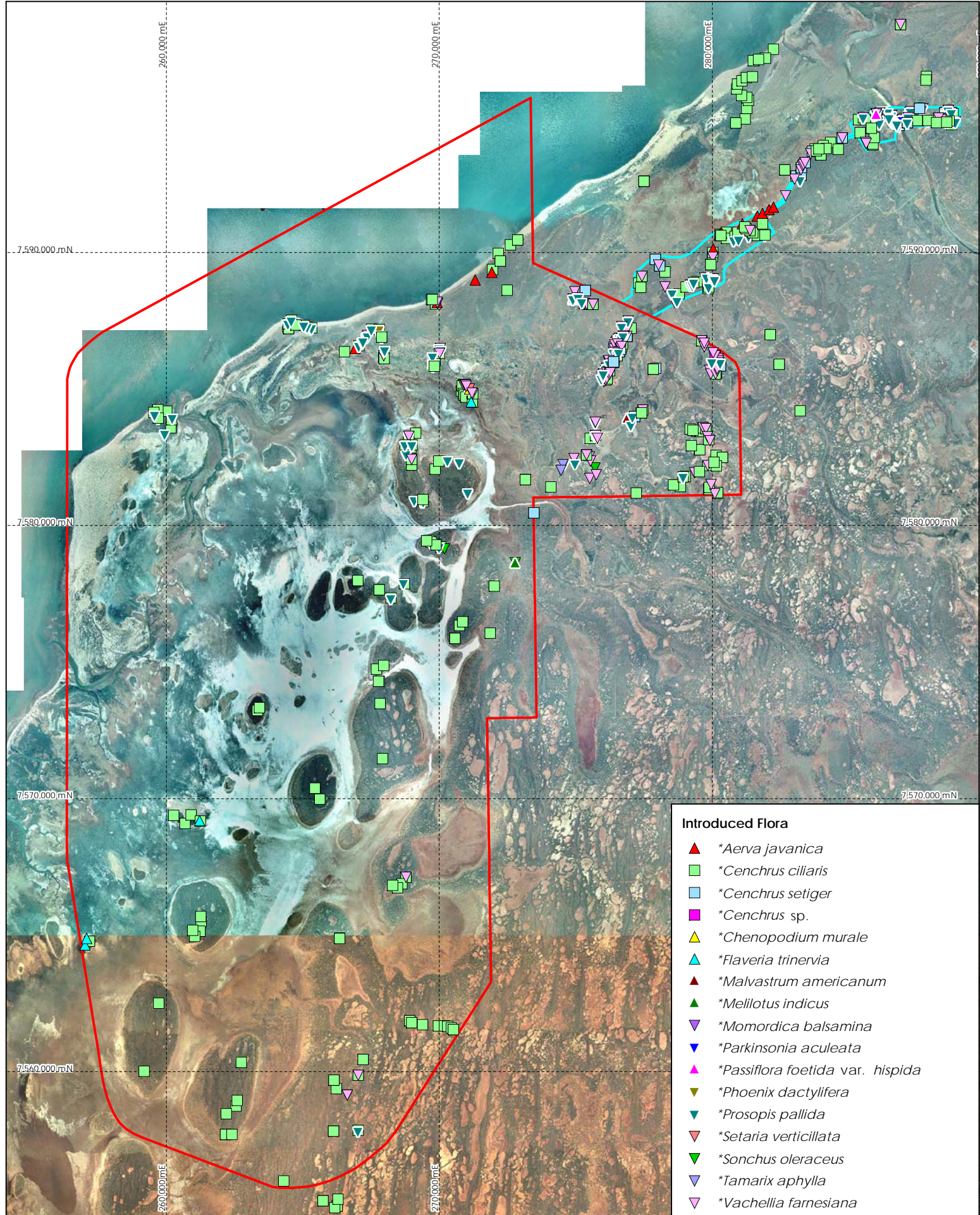


## Ashburton Salt Vegetation Condition Map 9





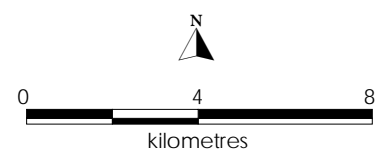




- Introduced Flora**
- ▲ *Aerva javanica*
  - *Cenchrus ciliaris*
  - *Cenchrus setiger*
  - *Cenchrus sp.*
  - ▲ *Chenopodium murale*
  - ▲ *Flaveria trinervia*
  - ▲ *Malvastrum americanum*
  - ▲ *Mellilotus indicus*
  - ▼ *Momordica balsamina*
  - ▼ *Parkinsonia aculeata*
  - ▲ *Passiflora foetida var. hispida*
  - ▼ *Phoenix dactylifera*
  - ▼ *Prosopis pallida*
  - ▼ *Setaria verticillata*
  - ▼ *Sonchus oleraceus*
  - ▼ *Tamarix aphylla*
  - ▼ *Vachellia farnesiana*



Development envelope  
 Road survey area



## Ashburton Salt Flora Phase 1 & 2 Introduced Flora





Records in blue shading represent duplicates from previous sampling (only most recent count included in total of individuals); records in grey shading are from outside the study area.

Family	Species	Location (Survey)	Site	Easting	Northing	Date	Number of Individuals	% Cover	Specimen No.	Notes
Amaranthaceae	* <i>Aerva javanica</i>	Inside (Phase 1)	ASH-OPP-BM	266915	7586484	5-Nov-18	1			
Amaranthaceae	* <i>Aerva javanica</i>	Inside (Phase 1)	ASH-OPP-RW	269924	7588169	1-Nov-18	20			
Amaranthaceae	* <i>Aerva javanica</i>	Inside (Phase 1)	ASH-OPP-MM	271310	7588993	5-Nov-18	1			
Amaranthaceae	* <i>Aerva javanica</i>	Inside (Phase 1)	ASH-OPP-MM	271923	7589274	5-Nov-18	30			
Amaranthaceae	* <i>Aerva javanica</i>	Inside (Phase 1)	ASH-OPP-SW	280030	7590134	4-Nov-18	15			
Amaranthaceae	* <i>Aerva javanica</i>	Inside (Phase 1)	ASH-OPP-SW	280257	7590628	4-Nov-18	2			
Amaranthaceae	* <i>Aerva javanica</i>	Inside (Phase 1)	ASH-OPP-SW	280292	7590670	4-Nov-18	40			
Amaranthaceae	* <i>Aerva javanica</i>	Inside (Phase 1)	ASH-OPP-RW	280293	7590669	4-Nov-18	20			
Amaranthaceae	* <i>Aerva javanica</i>	Inside (Phase 1)	ASH-OPP-SW	280344	7590707	4-Nov-18	20			
Amaranthaceae	* <i>Aerva javanica</i>	Inside (Phase 1)	ASH-OPP-SW	281101	7591045	4-Nov-18	60			
Amaranthaceae	* <i>Aerva javanica</i>	Inside (Phase 1)	ASH-OPP-SW	281655	7591323	4-Nov-18	5			
Amaranthaceae	* <i>Aerva javanica</i>	Inside (Phase 1)	ASH-OPP-SW	281848	7591437	4-Nov-18	40			
Amaranthaceae	* <i>Aerva javanica</i>	Inside (Phase 1)	ASH-OPP-SW	282084	7591570	4-Nov-18	50			
Amaranthaceae	* <i>Aerva javanica</i>	Inside (Phase 1)	ASH-OPP-SW	282247	7591654	4-Nov-18	1			
Arecaceae	* <i>Phoenix dactylifera</i>	Inside (Phase 1)	ASH-OPP-MM	267804	7587177	5-Nov-18	1			Multiple stems.
Asteraceae	* <i>Flaveria trinervia</i>	Inside (Phase 1)	ASH-OPP-RW	257020	7564640	5-Nov-18	15			
Asteraceae	* <i>Flaveria trinervia</i>	Inside (Phase 1)	ASH-OPP-RW	257087	7564874	5-Nov-18	1			
Asteraceae	* <i>Flaveria trinervia</i>	Inside (Phase 1)	ASH-OPP-RW	261218	7569196	5-Nov-18	2			
Asteraceae	* <i>Flaveria trinervia</i>	Inside (Phase 1)	ASH-OPP-MM	271164	7584524	5-Nov-18	10			
Asteraceae	* <i>Flaveria trinervia</i>	Inside (Phase 1)	ASH-OPP-RW	287455	7595099	9-Nov-18	1			
Asteraceae	* <i>Flaveria trinervia</i>	Inside (Phase 1)	ASH-OPP-MM	287483	7595012	4-Nov-18	20			
Asteraceae	* <i>Sonchus oleraceus</i>	Inside (Phase 1)	ASH21	270191	7579147	3-Nov-18	5	0.1	ASH09-06=	
Asteraceae	* <i>Sonchus oleraceus</i>	Inside (Phase 1)	ASH-OPP-MM	272791	7578636	8-Nov-18	4			
Asteraceae	* <i>Sonchus oleraceus</i>	Inside (Phase 1)	ASH09	273163	7581675	1-Nov-18	25	0.1	ASH09-06	
Asteraceae	* <i>Sonchus oleraceus</i>	Inside (Phase 1)	ASH-OPP-MM	275699	7582103	7-Nov-18	1			Very serrate leaves.
Chenopodiaceae	* <i>Chenopodium murale</i>	Inside (Phase 1)	ASH-OPP-MM	271112	7585003	5-Nov-18	3		ASH-MB37	
Cucurbitaceae	* <i>Momordica balsamina</i>	Outside (Phase 1)	ASHC15	277506	7592598	9-Nov-18	1	0.1	ASHC11-03	Outside study area.
Cucurbitaceae	* <i>Momordica balsamina</i>	Outside (Phase 2)	ASHC15R	277506	7592598	10-Apr-19	1	0.1		Outside study area.
Fabaceae	* <i>Melilotus indicus</i>	Inside (Phase 1)	ASH-OPP-MM	272791	7578636	8-Nov-18	5		ASH-MB80	Pea with curved pods.
Fabaceae	* <i>Parkinsonia aculeata</i>	Inside (Phase 1)	ASH30	286015	7595061	4-Nov-18		3		
Fabaceae	* <i>Parkinsonia aculeata</i>	Inside (Phase 2)	ASH30R	286015	7595061	16-Apr-19	17	6		
Fabaceae	* <i>Parkinsonia aculeata</i>	Inside (Phase 1)	ASH-OPP-SW	286788	7594673	4-Nov-18	3			
Fabaceae	* <i>Parkinsonia aculeata</i>	Inside (Phase 1)	ASH-OPP-RW	286833	7594655	4-Nov-18				Dense along creek bank
Fabaceae	* <i>Parkinsonia aculeata</i>	Inside (Phase 1)	ASH-OPP-RW	286952	7594864	9-Nov-18	30			
Fabaceae	* <i>Prosopis pallida</i>	Inside (Phase 2)	OPPS-RW	259577	7584043	14-Apr-19	1			
Fabaceae	* <i>Prosopis pallida</i>	Inside (Phase 2)	OPPS-RW	259710	7583936	14-Apr-19				Scattered.
Fabaceae	* <i>Prosopis pallida</i>	Inside (Phase 1)	ASH-OPP-MM	259940	7583362	4-Nov-18	50			
Fabaceae	* <i>Prosopis pallida</i>	Inside (Phase 2)	OPPS-RW	260222	7583947	14-Apr-19	100			N=100+
Fabaceae	* <i>Prosopis pallida</i>	Inside (Phase 1)	ASH-OPP-MM	264458	7587283	4-Nov-18	10			N=10 in 30x30m area of dune swale.
Fabaceae	* <i>Prosopis pallida</i>	Inside (Phase 2)	OPPS-RW	264469	7587385	14-Apr-19	1			
Fabaceae	* <i>Prosopis pallida</i>	Inside (Phase 2)	OPPS-RW	264590	7587517	14-Apr-19	1			
Fabaceae	* <i>Prosopis pallida</i>	Inside (Phase 2)	OPPS-RW	265053	7587329	14-Apr-19				Tall open shrubland
Fabaceae	* <i>Prosopis pallida</i>	Inside (Phase 2)	OPPS-RW	265170	7587267	14-Apr-19				Scattered.
Fabaceae	* <i>Prosopis pallida</i>	Inside (Phase 2)	OPPS-RW	265331	7587234	14-Apr-19				Scattered.
Fabaceae	* <i>Prosopis pallida</i>	Inside (Phase 1)	ASH-OPP-RW	267039	7557854	5-Nov-18	10			
Fabaceae	* <i>Prosopis pallida</i>	Inside (Phase 1)	ASH-OPP-MM	267066	7586579	5-Nov-18	3			
Fabaceae	* <i>Prosopis pallida</i>	Inside (Phase 1)	ASH-OPP-MM	267177	7586714	5-Nov-18	6			
Fabaceae	* <i>Prosopis pallida</i>	Inside (Phase 1)	ASH-OPP-MM	267209	7586747	5-Nov-18	1			
Fabaceae	* <i>Prosopis pallida</i>	Inside (Phase 1)	ASH-OPP-MM	267336	7586897	5-Nov-18	2			
Fabaceae	* <i>Prosopis pallida</i>	Inside (Phase 1)	ASH-OPP-MM	267375	7586940	5-Nov-18	1			
Fabaceae	* <i>Prosopis pallida</i>	Inside (Phase 1)	ASH-OPP-MM	267528	7587191	5-Nov-18	1			

Family	Species	Location (Survey)	Site	Easting	Northing	Date	Number of Individuals	% Cover	Specimen No.	Notes
Fabaceae	* <i>Prosopis pallida</i>	Inside (Phase 1)	ASH-OPP-MM	267855	7586978	5-Nov-18	1			
Fabaceae	* <i>Prosopis pallida</i>	Inside (Phase 1)	ASH55	267891	7586897	6-Nov-18	3	0.1		
Fabaceae	* <i>Prosopis pallida</i>	Inside (Phase 1)	ASH-OPP-MM	268014	7586417	5-Nov-18	1			
Fabaceae	* <i>Prosopis pallida</i>	Inside (Phase 1)	ASH-OPP-RW	268228	7577347	3-Nov-18	100			
Fabaceae	* <i>Prosopis pallida</i>	Inside (Phase 1)	ASH-OPP-RW	268698	7577897	7-Nov-18				Scattered through island.
Fabaceae	* <i>Prosopis pallida</i>	Inside (Phase 2)	OPPS-RW	268753	7582948	13-Apr-19				Scattered.
Fabaceae	* <i>Prosopis pallida</i>	Inside (Phase 2)	OPPS-RW	268800	7582612	13-Apr-19	200			
Fabaceae	* <i>Prosopis pallida</i>	Inside (Phase 2)	OPPS-RW	268891	7583258	13-Apr-19				Scattered.
Fabaceae	* <i>Prosopis pallida</i>	Inside (Phase 2)	OPPS-RW	269000	7582949	13-Apr-19	10			
Fabaceae	* <i>Prosopis pallida</i>	Inside (Phase 1)	ASH-OPP-RW	269100	7580937	3-Nov-18	50			
Fabaceae	* <i>Prosopis pallida</i>	Inside (Phase 1)	ASH-OPP-RW	269361	7580895	3-Nov-18	2			
Fabaceae	* <i>Prosopis pallida</i>	Inside (Phase 1)	ASH-OPP-RW	269413	7580874	3-Nov-18				Scattered.
Fabaceae	* <i>Prosopis pallida</i>	Inside (Phase 1)	ASH-OPP-MM	269723	7579365	3-Nov-18	20			
Fabaceae	* <i>Prosopis pallida</i>	Inside (Phase 1)	ASH-OPP-MM	269764	7585930	6-Nov-18	2			
Fabaceae	* <i>Prosopis pallida</i>	Inside (Phase 1)	ASH-OPP-MM	269768	7586199	6-Nov-18	1			
Fabaceae	* <i>Prosopis pallida</i>	Inside (Phase 1)	ASH-OPP-MM	269778	7585846	6-Nov-18	1			
Fabaceae	* <i>Prosopis pallida</i>	Inside (Phase 1)	ASH-OPP-MM	269779	7585893	6-Nov-18	1			
Fabaceae	* <i>Prosopis pallida</i>	Inside (Phase 1)	ASH-OPP-MM	269794	7585900	6-Nov-18	1			
Fabaceae	* <i>Prosopis pallida</i>	Inside (Phase 1)	ASH-OPP-MM	270001	7579211	3-Nov-18	1			
Fabaceae	* <i>Prosopis pallida</i>	Inside (Phase 1)	ASH-OPP-MM	270002	7586502	6-Nov-18	2			
Fabaceae	* <i>Prosopis pallida</i>	Inside (Phase 1)	ASH-OPP-MM	270075	7586418	6-Nov-18	4			
Fabaceae	* <i>Prosopis pallida</i>	Inside (Phase 1)	ASH-OPP-RW	270314	7582393	7-Nov-18	1			
Fabaceae	* <i>Prosopis pallida</i>	Inside (Phase 1)	ASH-OPP-SW	270736	7582310	7-Nov-18	150			
Fabaceae	* <i>Prosopis pallida</i>	Inside (Phase 1)	ASH-OPP-SW	271049	7581209	7-Nov-18	400			
Fabaceae	* <i>Prosopis pallida</i>	Inside (Phase 1)	ASH-OPP-MM	274586	7582273	7-Nov-18	1			At Cades Bore.
Fabaceae	* <i>Prosopis pallida</i>	Inside (Phase 1)	ASH-OPP-MM	274904	7588296	6-Nov-18	2			
Fabaceae	* <i>Prosopis pallida</i>	Inside (Phase 1)	ASH-OPP-MM	274985	7582288	7-Nov-18	1			
Fabaceae	* <i>Prosopis pallida</i>	Inside (Phase 1)	ASH-OPP-MM	275098	7588331	6-Nov-18	1			
Fabaceae	* <i>Prosopis pallida</i>	Inside (Phase 1)	ASH-OPP-MM	275228	7588192	6-Nov-18	2			
Fabaceae	* <i>Prosopis pallida</i>	Inside (Phase 1)	ASH08	275727	7583290	1-Nov-18	1	0.1		
Fabaceae	* <i>Prosopis pallida</i>	Inside (Phase 2)	ASH08R	275727	7583290	8-Apr-19	1	0.1		
Fabaceae	* <i>Prosopis pallida</i>	Inside (Phase 2)	OPPS-BMa	275788	7583259	8-Apr-19	2			
Fabaceae	* <i>Prosopis pallida</i>	Inside (Phase 1)	ASH-OPP-MM	275948	7585389	8-Nov-18	1			
Fabaceae	* <i>Prosopis pallida</i>	Inside (Phase 1)	ASH-OPP-MM	275999	7585509	8-Nov-18	1			
Fabaceae	* <i>Prosopis pallida</i>	Inside (Phase 1)	ASH-OPP-MM	276011	7585531	8-Nov-18	2			
Fabaceae	* <i>Prosopis pallida</i>	Inside (Phase 1)	ASH-OPP-MM	276022	7585553	8-Nov-18	1			
Fabaceae	* <i>Prosopis pallida</i>	Inside (Phase 1)	ASH-OPP-MM	276085	7585664	8-Nov-18	1			
Fabaceae	* <i>Prosopis pallida</i>	Inside (Phase 1)	ASH-OPP-MM	276106	7585681	8-Nov-18	1			
Fabaceae	* <i>Prosopis pallida</i>	Inside (Phase 1)	ASH-OPP-MM	276131	7585753	8-Nov-18	2			
Fabaceae	* <i>Prosopis pallida</i>	Inside (Phase 1)	ASH-OPP-BM	276244	7585911	8-Nov-18	1			
Fabaceae	* <i>Prosopis pallida</i>	Inside (Phase 1)	ASH-OPP-MM	276389	7586329	8-Nov-18	1			
Fabaceae	* <i>Prosopis pallida</i>	Inside (Phase 1)	ASH-OPP-MM	276426	7586357	8-Nov-18	1			
Fabaceae	* <i>Prosopis pallida</i>	Inside (Phase 1)	ASH-OPP-MM	276473	7586701	8-Nov-18	2			
Fabaceae	* <i>Prosopis pallida</i>	Inside (Phase 1)	ASH-OPP-BM	276509	7586366	8-Nov-18	1			Flowering.
Fabaceae	* <i>Prosopis pallida</i>	Inside (Phase 1)	ASH-OPP-MM	276528	7586264	8-Nov-18	1			
Fabaceae	* <i>Prosopis pallida</i>	Inside (Phase 1)	ASH-OPP-MM	276566	7586816	8-Nov-18	5			
Fabaceae	* <i>Prosopis pallida</i>	Inside (Phase 1)	ASH-OPP-MM	276579	7586323	8-Nov-18	1			
Fabaceae	* <i>Prosopis pallida</i>	Inside (Phase 1)	ASH-OPP-MM	276596	7586356	8-Nov-18	1			
Fabaceae	* <i>Prosopis pallida</i>	Inside (Phase 1)	ASH-OPP-MM	276612	7586853	8-Nov-18	1			
Fabaceae	* <i>Prosopis pallida</i>	Inside (Phase 1)	ASH-OPP-BM	276682	7586812	8-Nov-18	1			
Fabaceae	* <i>Prosopis pallida</i>	Inside (Phase 1)	ASH-OPP-SW	276686	7587283	31-Oct-18	6			
Fabaceae	* <i>Prosopis pallida</i>	Inside (Phase 1)	ASH-OPP-MM	276746	7586934	8-Nov-18	1			

Family	Species	Location (Survey)	Site	Easting	Northing	Date	Number of Individuals	% Cover	Specimen No.	Notes
Fabaceae	* <i>Prosopis pallida</i>	Inside (Phase 1)	ASH-OPP-BM	276775	7586904	8-Nov-18	1			
Fabaceae	* <i>Prosopis pallida</i>	Inside (Phase 1)	ASH02	276920	7587493	31-Oct-18	1	0.1		
Fabaceae	* <i>Prosopis pallida</i>	Inside (Phase 1)	ASH-OPP-SW	277025	7583677	31-Oct-18	85			
Fabaceae	* <i>Prosopis pallida</i>	Inside (Phase 1)	ASH-OPP-SW	277088	7583996	31-Oct-18	2			
Fabaceae	* <i>Prosopis pallida</i>	Inside (Phase 1)	ASH-OPP-RW	278531	7588494	8-Nov-08				Scattered.
Fabaceae	* <i>Prosopis pallida</i>	Inside (Phase 1)	ASH-OPP-RW	278710	7588230	8-Nov-08	2			
Fabaceae	* <i>Prosopis pallida</i>	Inside (Phase 1)	ASH06	278941	7581775	1-Nov-18	3;	0.1		
Fabaceae	* <i>Prosopis pallida</i>	Inside (Phase 2)	ASH06R	278941	7581775	11-Apr-19	11	0.1		
Fabaceae	* <i>Prosopis pallida</i>	Inside (Phase 1)	ASH-OPP-SW	279200	7588804	7-Nov-18	1			
Fabaceae	* <i>Prosopis pallida</i>	Inside (Phase 1)	ASH-OPP-SW	279277	7588816	7-Nov-18	6			
Fabaceae	* <i>Prosopis pallida</i>	Inside (Phase 1)	ASH-OPP-SW	279322	7588895	7-Nov-18	6			
Fabaceae	* <i>Prosopis pallida</i>	Inside (Phase 1)	ASH-OPP-SW	279800	7589095	7-Nov-18	10			
Fabaceae	* <i>Prosopis pallida</i>	Inside (Phase 1)	ASH-OPP-SW	279876	7588736	7-Nov-18	20			
Fabaceae	* <i>Prosopis pallida</i>	Inside (Phase 1)	ASH-OPP-SW	279926	7589028	7-Nov-18	2			
Fabaceae	* <i>Prosopis pallida</i>	Inside (Phase 1)	ASH48	279990	7585975	7-Nov-18	1	0.1		
Fabaceae	* <i>Prosopis pallida</i>	Inside (Phase 2)	ASH48R	279990	7585975	8-Apr-19	1	0.1		
Fabaceae	* <i>Prosopis pallida</i>	Inside (Phase 1)	ASH-OPP-SW	280030	7589030	7-Nov-18	6			
Fabaceae	* <i>Prosopis pallida</i>	Inside (Phase 1)	ASH-OPP-SW	280099	7588996	7-Nov-18	2			
Fabaceae	* <i>Prosopis pallida</i>	Inside (Phase 1)	ASH-OPP-SW	280298	7585969	31-Oct-18	1			
Fabaceae	* <i>Prosopis pallida</i>	Inside (Phase 1)	ASH-OPP-RW	280792	7590447	4-Nov-18	1			
Fabaceae	* <i>Prosopis pallida</i>	Inside (Phase 1)	ASH-OPP-RW	280970	7590489	5-Nov-18	2			
Fabaceae	* <i>Prosopis pallida</i>	Inside (Phase 1)	ASH-OPP-RW	281342	7590597	5-Nov-18	2			
Fabaceae	* <i>Prosopis pallida</i>	Inside (Phase 2)	OPPS-RW	281936	7590633	13-Apr-19	2			
Fabaceae	* <i>Prosopis pallida</i>	Inside (Phase 1)	ASH-OPP-RW	285537	7594934	4-Nov-18	1			
Fabaceae	* <i>Prosopis pallida</i>	Inside (Phase 1)	ASH30	286015	7595061	4-Nov-18	1	0.1		
Fabaceae	* <i>Prosopis pallida</i>	Inside (Phase 2)	ASH30R	286015	7595061	16-Apr-19	1	0.1		
Fabaceae	* <i>Prosopis pallida</i>	Inside (Phase 1)	ASH-OPP-RW	286065	7594776	4-Nov-18	5			
Fabaceae	* <i>Prosopis pallida</i>	Inside (Phase 1)	ASH-OPP-SW	286067	7594920	4-Nov-18	1			
Fabaceae	* <i>Prosopis pallida</i>	Inside (Phase 1)	ASH-OPP-SW	286074	7594965	4-Nov-18	1			
Fabaceae	* <i>Prosopis pallida</i>	Inside (Phase 1)	ASH-OPP-SW	286091	7594997	4-Nov-18	1			
Fabaceae	* <i>Prosopis pallida</i>	Inside (Phase 1)	ASH-OPP-SW	286108	7594842	4-Nov-18	3			
Fabaceae	* <i>Prosopis pallida</i>	Inside (Phase 1)	ASH-OPP-RW	286125	7594721	4-Nov-18				Scattered.
Fabaceae	* <i>Prosopis pallida</i>	Inside (Phase 1)	ASH-OPP-RW	286138	7595113	4-Nov-18				Scattered.
Fabaceae	* <i>Prosopis pallida</i>	Inside (Phase 1)	ASH-OPP-SW	286227	7595198	4-Nov-18	10			
Fabaceae	* <i>Prosopis pallida</i>	Inside (Phase 1)	ASH-OPP-SW	286240	7595171	4-Nov-18	1			
Fabaceae	* <i>Prosopis pallida</i>	Inside (Phase 1)	ASH-OPP-SW	286294	7595130	4-Nov-18	20			
Fabaceae	* <i>Prosopis pallida</i>	Inside (Phase 1)	ASH-OPP-SW	286356	7595072	4-Nov-18	1			
Fabaceae	* <i>Prosopis pallida</i>	Inside (Phase 1)	ASH-OPP-SW	286360	7595060	4-Nov-18	4			
Fabaceae	* <i>Prosopis pallida</i>	Inside (Phase 1)	ASH-OPP-SW	286435	7594994	4-Nov-18	1			
Fabaceae	* <i>Prosopis pallida</i>	Inside (Phase 1)	ASH-OPP-RW	286437	7595145	4-Nov-18	1			
Fabaceae	* <i>Prosopis pallida</i>	Inside (Phase 1)	ASH-OPP-SW	286455	7594981	4-Nov-18	14			
Fabaceae	* <i>Prosopis pallida</i>	Inside (Phase 1)	ASH-OPP-SW	286483	7594933	4-Nov-18	6			
Fabaceae	* <i>Prosopis pallida</i>	Inside (Phase 1)	ASH-OPP-SW	286521	7594874	4-Nov-18	2			
Fabaceae	* <i>Prosopis pallida</i>	Inside (Phase 1)	ASH-OPP-SW	286554	7594851	4-Nov-18	1			
Fabaceae	* <i>Prosopis pallida</i>	Inside (Phase 1)	ASH-OPP-SW	286566	7594815	4-Nov-18	1			
Fabaceae	* <i>Prosopis pallida</i>	Inside (Phase 1)	ASH-OPP-RW	286579	7595002	4-Nov-18				Scattered.
Fabaceae	* <i>Prosopis pallida</i>	Inside (Phase 1)	ASH-OPP-SW	286651	7594760	4-Nov-18	4			
Fabaceae	* <i>Prosopis pallida</i>	Inside (Phase 1)	ASH-OPP-SW	286715	7594729	4-Nov-18	5			
Fabaceae	* <i>Prosopis pallida</i>	Inside (Phase 1)	ASH-OPP-SW	286761	7594689	4-Nov-18	1			
Fabaceae	* <i>Prosopis pallida</i>	Inside (Phase 1)	ASH-OPP-SW	286788	7594673	4-Nov-18	10			
Fabaceae	* <i>Prosopis pallida</i>	Inside (Phase 1)	ASH56	287149	7594759	9-Nov-18		1		
Fabaceae	* <i>Prosopis pallida</i>	Inside (Phase 2)	ASH56R	287149	7594759	13-Apr-19		3		

Family	Species	Location (Survey)	Site	Easting	Northing	Date	Number of Individuals	% Cover	Specimen No.	Notes
Fabaceae	* <i>Prosopis pallida</i>	Inside (Phase 1)	ASH-OPP-MM	287178	7594938	4-Nov-18	10			
Fabaceae	* <i>Prosopis pallida</i>	Inside (Phase 1)	ASH-OPP-MM	287197	7595011	4-Nov-18	3			
Fabaceae	* <i>Prosopis pallida</i>	Inside (Phase 1)	ASH-OPP-MM	287246	7595121	4-Nov-18	1			
Fabaceae	* <i>Prosopis pallida</i>	Inside (Phase 1)	ASH-OPP-MM	287274	7595149	4-Nov-18	2			
Fabaceae	* <i>Prosopis pallida</i>	Inside (Phase 1)	ASH-OPP-MM	287329	7595147	4-Nov-18	3			
Fabaceae	* <i>Prosopis pallida</i>	Inside (Phase 1)	ASH-OPP-MM	287377	7595142	4-Nov-18	2			
Fabaceae	* <i>Prosopis pallida</i>	Inside (Phase 1)	ASH-OPP-MM	287382	7595098	4-Nov-18	9			
Fabaceae	* <i>Prosopis pallida</i>	Inside (Phase 1)	ASH-OPP-MM	287425	7595067	4-Nov-18	1			
Fabaceae	* <i>Prosopis pallida</i>	Inside (Phase 1)	ASH-OPP-MM	287437	7594939	4-Nov-18	1			
Fabaceae	* <i>Prosopis pallida</i>	Inside (Phase 1)	ASH-OPP-MM	287440	7595043	4-Nov-18	2			
Fabaceae	* <i>Prosopis pallida</i>	Inside (Phase 1)	ASH-OPP-MM	287448	7595020	4-Nov-18	2			
Fabaceae	* <i>Prosopis pallida</i>	Inside (Phase 1)	ASH-OPP-MM	287469	7594942	4-Nov-18	1			
Fabaceae	* <i>Prosopis pallida</i>	Inside (Phase 1)	ASH-OPP-MM	287479	7594987	4-Nov-18	7			
Fabaceae	* <i>Prosopis pallida</i>	Inside (Phase 1)	ASH-OPP-MM	287493	7594916	4-Nov-18	1			
Fabaceae	* <i>Prosopis pallida</i>	Inside (Phase 1)	ASH-OPP-MM	287589	7594991	4-Nov-18	1			
Fabaceae	* <i>Prosopis pallida</i>	Inside (Phase 1)	ASH-OPP-RW	287639	7595100	9-Nov-18				Scattered.
Fabaceae	* <i>Prosopis pallida</i>	Inside (Phase 1)	ASH-OPP-MM	287718	7595261	4-Nov-18	20			
Fabaceae	* <i>Prosopis pallida</i>	Inside (Phase 2)	OPPS-RW	287906	7594830	13-Apr-19	20			
Fabaceae	* <i>Prosopis pallida</i>	Inside (Phase 2)	OPPS-RW	288401	7594863	13-Apr-19	3			
Fabaceae	* <i>Prosopis pallida</i>	Inside (Phase 1)	ASH-OPP-MM	288574	7595125	4-Nov-18	18			
Fabaceae	* <i>Prosopis pallida</i>	Inside (Phase 2)	OPPS-RW	288584	7594765	13-Apr-19	5			
Fabaceae	* <i>Prosopis pallida</i>	Inside (Phase 1)	ASH-OPP-MM	288620	7595065	4-Nov-18	10			
Fabaceae	* <i>Prosopis pallida</i>	Inside (Phase 1)	ASH-OPP-MM	288644	7595205	4-Nov-18	5			
Fabaceae	* <i>Prosopis pallida</i>	Inside (Phase 1)	ASH-OPP-MM	288677	7595038	4-Nov-18	20			
Fabaceae	* <i>Prosopis pallida</i>	Inside (Phase 1)	ASH-OPP-MM	288771	7595113	4-Nov-18	1			
Fabaceae	* <i>Prosopis pallida</i>	Inside (Phase 1)	ASH-OPP-MM	288847	7594832	4-Nov-18	11			
Fabaceae	* <i>Prosopis pallida</i>	Inside (Phase 1)	ASH-OPP-MM	288914	7594785	4-Nov-18	15			
Fabaceae	* <i>Prosopis pallida</i>	Outside (Phase 1)	ASH-OPP-SW	283216	7592646	4-Nov-18	1			Outside study area.
Fabaceae	* <i>Vachellia farnesiana</i>	Inside (Phase 1)	ASH-OPP-RW	266633	7559146	2-Nov-18	2			
Fabaceae	* <i>Vachellia farnesiana</i>	Inside (Phase 1)	ASH-OPP-RW	267040	7559864	2-Nov-18	1			
Fabaceae	* <i>Vachellia farnesiana</i>	Inside (Phase 1)	ASH-OPP-MM	267372	7586954	5-Nov-18	2			
Fabaceae	* <i>Vachellia farnesiana</i>	Inside (Phase 1)	ASH-OPP-MM	267961	7586218	5-Nov-18	1			
Fabaceae	* <i>Vachellia farnesiana</i>	Inside (Phase 1)	ASH19	268785	7567120	2-Nov-18	1	0.1		
Fabaceae	* <i>Vachellia farnesiana</i>	Inside (Phase 2)	ASH19R	268785	7567120	16-Apr-19	1	0.1		
Fabaceae	* <i>Vachellia farnesiana</i>	Inside (Phase 2)	OPPS-RW	268891	7583258	13-Apr-19	2			
Fabaceae	* <i>Vachellia farnesiana</i>	Inside (Phase 2)	OPPS-RW	268990	7582422	13-Apr-19	2			
Fabaceae	* <i>Vachellia farnesiana</i>	Inside (Phase 1)	ASH-OPP-RW	269924	7588169	1-Nov-18	1			
Fabaceae	* <i>Vachellia farnesiana</i>	Inside (Phase 1)	ASH-OPP-MM	270019	7586303	6-Nov-18	20			
Fabaceae	* <i>Vachellia farnesiana</i>	Inside (Phase 1)	ASH-OPP-MM	270042	7586475	6-Nov-18	1			
Fabaceae	* <i>Vachellia farnesiana</i>	Inside (Phase 1)	ASH-OPP-MM	270888	7585159	5-Nov-18	10			
Fabaceae	* <i>Vachellia farnesiana</i>	Inside (Phase 1)	ASH-OPP-MM	270900	7585127	5-Nov-18	2			
Fabaceae	* <i>Vachellia farnesiana</i>	Inside (Phase 1)	ASH-OPP-MM	270935	7585160	5-Nov-18	20			
Fabaceae	* <i>Vachellia farnesiana</i>	Inside (Phase 1)	ASH-OPP-MM	270963	7585149	5-Nov-18	10			
Fabaceae	* <i>Vachellia farnesiana</i>	Inside (Phase 1)	ASH-OPP-MM	270996	7585110	5-Nov-18	1			
Fabaceae	* <i>Vachellia farnesiana</i>	Inside (Phase 1)	ASH-OPP-MM	271204	7584846	5-Nov-18	1			
Fabaceae	* <i>Vachellia farnesiana</i>	Inside (Phase 1)	ASH-OPP-MM	271229	7584817	5-Nov-18	5			
Fabaceae	* <i>Vachellia farnesiana</i>	Inside (Phase 1)	ASH-OPP-MM	274904	7588296	6-Nov-18	1			
Fabaceae	* <i>Vachellia farnesiana</i>	Inside (Phase 1)	ASH-OPP-MM	274904	7588296	6-Nov-18	2			
Fabaceae	* <i>Vachellia farnesiana</i>	Inside (Phase 1)	ASH-OPP-MM	274941	7582443	7-Nov-18	1			
Fabaceae	* <i>Vachellia farnesiana</i>	Inside (Phase 1)	ASH-OPP-MM	274967	7588560	6-Nov-18	1			
Fabaceae	* <i>Vachellia farnesiana</i>	Inside (Phase 1)	ASH-OPP-MM	275056	7588332	6-Nov-18	1			
Fabaceae	* <i>Vachellia farnesiana</i>	Inside (Phase 1)	ASH-OPP-MM	275260	7588145	6-Nov-18	2			

Family	Species	Location (Survey)	Site	Easting	Northing	Date	Number of Individuals	% Cover	Specimen No.	Notes
Fabaceae	* <i>Vachellia farnesiana</i>	Inside (Phase 1)	ASH-OPP-MM	275319	7588123	6-Nov-18	1			
Fabaceae	* <i>Vachellia farnesiana</i>	Inside (Phase 1)	ASH50	275399	7582589	5-Nov-18	1	0.1		
Fabaceae	* <i>Vachellia farnesiana</i>	Inside (Phase 2)	ASH50R	275399	7582589	8-Apr-19		0.1		
Fabaceae	* <i>Vachellia farnesiana</i>	Inside (Phase 1)	ASH-OPP-MM	275405	7588103	6-Nov-18	3			
Fabaceae	* <i>Vachellia farnesiana</i>	Inside (Phase 1)	ASH-OPP-MM	275492	7582502	7-Nov-18	1			
Fabaceae	* <i>Vachellia farnesiana</i>	Inside (Phase 1)	ASH-OPP-MM	275513	7581726	7-Nov-18	20			
Fabaceae	* <i>Vachellia farnesiana</i>	Inside (Phase 1)	ASH-OPP-MM	275544	7582357	7-Nov-18	1			
Fabaceae	* <i>Vachellia farnesiana</i>	Inside (Phase 1)	ASH51	275629	7588103	6-Nov-18	1	0.1		
Fabaceae	* <i>Vachellia farnesiana</i>	Inside (Phase 2)	ASH51R	275629	7588103	10-Apr-19	1	0.1		
Fabaceae	* <i>Vachellia farnesiana</i>	Inside (Phase 1)	ASH08	275727	7583290	1-Nov-18	1	0.1		
Fabaceae	* <i>Vachellia farnesiana</i>	Inside (Phase 2)	ASH08R	275727	7583290	8-Apr-19	3	0.1		
Fabaceae	* <i>Vachellia farnesiana</i>	Inside (Phase 1)	ASH-OPP-MM	275750	7581858	7-Nov-18	2			
Fabaceae	* <i>Vachellia farnesiana</i>	Inside (Phase 2)	OPPS-BMa	275797	7583188	8-Apr-19	10			
Fabaceae	* <i>Vachellia farnesiana</i>	Inside (Phase 1)	ASH-OPP-MM	275953	7585423	8-Nov-18	1			
Fabaceae	* <i>Vachellia farnesiana</i>	Inside (Phase 1)	ASH-OPP-MM	275999	7585509	8-Nov-18	3			
Fabaceae	* <i>Vachellia farnesiana</i>	Inside (Phase 1)	ASH-OPP-MM	276022	7585553	8-Nov-18	1			
Fabaceae	* <i>Vachellia farnesiana</i>	Inside (Phase 1)	ASH-OPP-BM	276027	7585261	8-Nov-18	2			Flowering.
Fabaceae	* <i>Vachellia farnesiana</i>	Inside (Phase 1)	ASH-OPP-BM	276042	7585383	8-Nov-18	10			Flowering.
Fabaceae	* <i>Vachellia farnesiana</i>	Inside (Phase 1)	ASH-OPP-MM	276113	7585330	8-Nov-18	1			
Fabaceae	* <i>Vachellia farnesiana</i>	Inside (Phase 1)	ASH-OPP-BM	276129	7585600	8-Nov-18	2			Flowering.
Fabaceae	* <i>Vachellia farnesiana</i>	Inside (Phase 1)	ASH-OPP-BM	276129	7585389	8-Nov-18	1			Flowering.
Fabaceae	* <i>Vachellia farnesiana</i>	Inside (Phase 1)	ASH-OPP-MM	276213	7585990	8-Nov-18	1			
Fabaceae	* <i>Vachellia farnesiana</i>	Inside (Phase 1)	ASH-OPP-MM	276217	7586036	8-Nov-18	1			
Fabaceae	* <i>Vachellia farnesiana</i>	Inside (Phase 1)	ASH-OPP-BM	276224	7585585	8-Nov-18	3			Flowering.
Fabaceae	* <i>Vachellia farnesiana</i>	Inside (Phase 1)	ASH-OPP-MM	276239	7585538	8-Nov-18	5			
Fabaceae	* <i>Vachellia farnesiana</i>	Inside (Phase 1)	ASH-OPP-BM	276244	7585911	8-Nov-18	2			Flowering.
Fabaceae	* <i>Vachellia farnesiana</i>	Inside (Phase 1)	ASH-OPP-MM	276275	7585596	8-Nov-18	2			
Fabaceae	* <i>Vachellia farnesiana</i>	Inside (Phase 1)	ASH-OPP-MM	276280	7585671	8-Nov-18	1			
Fabaceae	* <i>Vachellia farnesiana</i>	Inside (Phase 1)	ASH-OPP-MM	276297	7585709	8-Nov-18	1			
Fabaceae	* <i>Vachellia farnesiana</i>	Inside (Phase 1)	ASH-OPP-MM	276368	7586273	8-Nov-18	8			
Fabaceae	* <i>Vachellia farnesiana</i>	Inside (Phase 1)	ASH-OPP-MM	276374	7586237	8-Nov-18	1			
Fabaceae	* <i>Vachellia farnesiana</i>	Inside (Phase 1)	ASH-OPP-MM	276389	7586329	8-Nov-18	1			
Fabaceae	* <i>Vachellia farnesiana</i>	Inside (Phase 1)	ASH-OPP-MM	276403	7586460	8-Nov-18	1			
Fabaceae	* <i>Vachellia farnesiana</i>	Inside (Phase 1)	ASH-OPP-MM	276406	7585919	8-Nov-18	2			
Fabaceae	* <i>Vachellia farnesiana</i>	Inside (Phase 1)	ASH-OPP-BM	276407	7586208	8-Nov-18	3			Flowering.
Fabaceae	* <i>Vachellia farnesiana</i>	Inside (Phase 1)	ASH-OPP-BM	276407	7585935	8-Nov-18	2			Flowering.
Fabaceae	* <i>Vachellia farnesiana</i>	Inside (Phase 1)	ASH-OPP-BM	276414	7586168	8-Nov-18	3			Flowering.
Fabaceae	* <i>Vachellia farnesiana</i>	Inside (Phase 1)	ASH-OPP-MM	276419	7586038	8-Nov-18	1			
Fabaceae	* <i>Vachellia farnesiana</i>	Inside (Phase 1)	ASH-OPP-MM	276438	7586613	8-Nov-18	3			
Fabaceae	* <i>Vachellia farnesiana</i>	Inside (Phase 1)	ASH-OPP-MM	276473	7586701	8-Nov-18	3			
Fabaceae	* <i>Vachellia farnesiana</i>	Inside (Phase 1)	ASH-OPP-MM	276505	7586749	8-Nov-18	6			
Fabaceae	* <i>Vachellia farnesiana</i>	Inside (Phase 1)	ASH-OPP-MM	276506	7586139	8-Nov-18	1			
Fabaceae	* <i>Vachellia farnesiana</i>	Inside (Phase 1)	ASH-OPP-MM	276528	7586264	8-Nov-18	4			
Fabaceae	* <i>Vachellia farnesiana</i>	Inside (Phase 1)	ASH-OPP-BM	276542	7586640	8-Nov-18	8			Flowering.
Fabaceae	* <i>Vachellia farnesiana</i>	Inside (Phase 1)	ASH-OPP-MM	276543	7586291	8-Nov-18	2			
Fabaceae	* <i>Vachellia farnesiana</i>	Inside (Phase 1)	ASH-OPP-MM	276566	7586816	8-Nov-18	1			
Fabaceae	* <i>Vachellia farnesiana</i>	Inside (Phase 1)	ASH-OPP-MM	276596	7586356	8-Nov-18	8			
Fabaceae	* <i>Vachellia farnesiana</i>	Inside (Phase 1)	ASH-OPP-MM	276612	7586853	8-Nov-18	2			
Fabaceae	* <i>Vachellia farnesiana</i>	Inside (Phase 1)	ASH-OPP-MM	276633	7586451	8-Nov-18	6			
Fabaceae	* <i>Vachellia farnesiana</i>	Inside (Phase 1)	ASH-OPP-MM	276639	7586469	8-Nov-18	2			
Fabaceae	* <i>Vachellia farnesiana</i>	Inside (Phase 1)	ASH-OPP-BM	276657	7586491	8-Nov-18	10			Flowering.
Fabaceae	* <i>Vachellia farnesiana</i>	Inside (Phase 1)	ASH-OPP-BM	276675	7586833	8-Nov-18	5			Flowering.

Family	Species	Location (Survey)	Site	Easting	Northing	Date	Number of Individuals	% Cover	Specimen No.	Notes
Fabaceae	* <i>Vachellia farnesiana</i>	Inside (Phase 1)	ASH-OPP-MM	276685	7586549	8-Nov-18	1			
Fabaceae	* <i>Vachellia farnesiana</i>	Inside (Phase 1)	ASH-OPP-SW	276686	7587283	31-Oct-18	40			
Fabaceae	* <i>Vachellia farnesiana</i>	Inside (Phase 1)	ASH-OPP-BM	276730	7586869	8-Nov-18	10			Flowering.
Fabaceae	* <i>Vachellia farnesiana</i>	Inside (Phase 1)	ASH-OPP-MM	276746	7586934	8-Nov-18	1			
Fabaceae	* <i>Vachellia farnesiana</i>	Inside (Phase 1)	ASH-OPP-BM	276775	7586904	8-Nov-18	5			Flowering.
Fabaceae	* <i>Vachellia farnesiana</i>	Inside (Phase 1)	ASH-OPP-BM	276870	7586931	8-Nov-18	5			Flowering.
Fabaceae	* <i>Vachellia farnesiana</i>	Inside (Phase 1)	ASH-OPP-SW	276879	7587179	31-Oct-18	60			
Fabaceae	* <i>Vachellia farnesiana</i>	Inside (Phase 1)	ASH02	276920	7587493	31-Oct-18	1	0.1		
Fabaceae	* <i>Vachellia farnesiana</i>	Inside (Phase 2)	ASH02R	276920	7587493	9-Apr-19		0.1		
Fabaceae	* <i>Vachellia farnesiana</i>	Inside (Phase 1)	ASH-REL06	277428	7589114	8-Nov-18	1	0.1		
Fabaceae	* <i>Vachellia farnesiana</i>	Inside (Phase 1)	ASH-OPP-RW	277451	7584226	31-Oct-18				Scattered.
Fabaceae	* <i>Vachellia farnesiana</i>	Inside (Phase 1)	ASH01	277839	7585724	31-Oct-18	1	0.1		
Fabaceae	* <i>Vachellia farnesiana</i>	Inside (Phase 1)	ASH-OPP-SW	278033	7589535	7-Nov-18	1			
Fabaceae	* <i>Vachellia farnesiana</i>	Inside (Phase 1)	ASH-OPP-RW	278264	7588732	2-Nov-18	1			
Fabaceae	* <i>Vachellia farnesiana</i>	Inside (Phase 1)	ASH-REL04	278625	7588151	8-Nov-18	1	0.1		
Fabaceae	* <i>Vachellia farnesiana</i>	Inside (Phase 2)	ASH06R	278941	7581775	11-Apr-19	1	0.1		
Fabaceae	* <i>Vachellia farnesiana</i>	Inside (Phase 1)	ASH-OPP-SW	279200	7588804	7-Nov-18	1			
Fabaceae	* <i>Vachellia farnesiana</i>	Inside (Phase 1)	ASH-OPP-SW	279277	7588816	7-Nov-18	4			
Fabaceae	* <i>Vachellia farnesiana</i>	Inside (Phase 2)	OPPS-RW	279353	7581934	11-Apr-19	3			
Fabaceae	* <i>Vachellia farnesiana</i>	Inside (Phase 1)	ASH03	279627	7586766	31-Oct-18	5	0.5		
Fabaceae	* <i>Vachellia farnesiana</i>	Inside (Phase 1)	ASH05	279665	7583577	1-Nov-18	20	0.5		Dead adults.
Fabaceae	* <i>Vachellia farnesiana</i>	Inside (Phase 1)	ASH-OPP-MM	279710	7586536	31-Oct-18	10			
Fabaceae	* <i>Vachellia farnesiana</i>	Inside (Phase 1)	ASH-OPP-MM	279715	7586669	31-Oct-18	5			
Fabaceae	* <i>Vachellia farnesiana</i>	Inside (Phase 1)	ASH-OPP-SW	279731	7589058	7-Nov-18	1			
Fabaceae	* <i>Vachellia farnesiana</i>	Inside (Phase 1)	ASH-REL01	279766	7583549	1-Nov-18	2	0.1		Dead.
Fabaceae	* <i>Vachellia farnesiana</i>	Inside (Phase 1)	ASH-OPP-MM	279830	7583254	1-Nov-18	2			Dead, evidence of borers.
Fabaceae	* <i>Vachellia farnesiana</i>	Inside (Phase 2)	OPPS-RW	279841	7582201	11-Apr-19	1			
Fabaceae	* <i>Vachellia farnesiana</i>	Inside (Phase 1)	ASH-OPP-MM	279901	7585681	7-Nov-18	1			
Fabaceae	* <i>Vachellia farnesiana</i>	Inside (Phase 1)	ASH-OPP-MM	279912	7583094	1-Nov-18	1			
Fabaceae	* <i>Vachellia farnesiana</i>	Inside (Phase 1)	ASH-OPP-SW	279926	7589028	7-Nov-18	4			
Fabaceae	* <i>Vachellia farnesiana</i>	Inside (Phase 1)	ASH42	279940	7589546	5-Nov-18	1	0.1		
Fabaceae	* <i>Vachellia farnesiana</i>	Inside (Phase 2)	ASH42R	279940	7589546	10-Apr-19	1	0.1		
Fabaceae	* <i>Vachellia farnesiana</i>	Inside (Phase 1)	ASH-OPP-MM	279947	7585541	7-Nov-18	2			
Fabaceae	* <i>Vachellia farnesiana</i>	Inside (Phase 2)	OPPS-RW	279955	7581503	11-Apr-19	1			
Fabaceae	* <i>Vachellia farnesiana</i>	Inside (Phase 1)	ASH-OPP-MM	280012	7585892	7-Nov-18	1			
Fabaceae	* <i>Vachellia farnesiana</i>	Inside (Phase 1)	ASH-OPP-SW	280014	7589818	4-Nov-18	4			
Fabaceae	* <i>Vachellia farnesiana</i>	Inside (Phase 1)	ASH-OPP-SW	280030	7589030	7-Nov-18	6			
Fabaceae	* <i>Vachellia farnesiana</i>	Inside (Phase 1)	ASH-OPP-MM	280035	7586322	31-Oct-18	50			
Fabaceae	* <i>Vachellia farnesiana</i>	Inside (Phase 2)	OPPS-RW	280096	7581160	11-Apr-19	1			
Fabaceae	* <i>Vachellia farnesiana</i>	Inside (Phase 1)	ASH-OPP-MM	280114	7586221	31-Oct-18	5			
Fabaceae	* <i>Vachellia farnesiana</i>	Inside (Phase 1)	ASH-OPP-MM	280130	7585551	7-Nov-18	1			
Fabaceae	* <i>Vachellia farnesiana</i>	Inside (Phase 1)	ASH-OPP-MM	280177	7585662	7-Nov-18	1			
Fabaceae	* <i>Vachellia farnesiana</i>	Inside (Phase 1)	ASH-OPP-MM	280179	7585738	7-Nov-18	10			
Fabaceae	* <i>Vachellia farnesiana</i>	Inside (Phase 1)	ASH-OPP-MM	280211	7586114	31-Oct-18	5			
Fabaceae	* <i>Vachellia farnesiana</i>	Inside (Phase 1)	ASH-OPP-MM	280223	7586039	31-Oct-18	30			
Fabaceae	* <i>Vachellia farnesiana</i>	Inside (Phase 1)	ASH-OPP-MM	280238	7585959	31-Oct-18	5			
Fabaceae	* <i>Vachellia farnesiana</i>	Inside (Phase 2)	OPPS-RW	281387	7590798	13-Apr-19	1			
Fabaceae	* <i>Vachellia farnesiana</i>	Inside (Phase 1)	ASH-OPP-SW	282694	7592073	4-Nov-18	1			
Fabaceae	* <i>Vachellia farnesiana</i>	Inside (Phase 1)	ASH-OPP-SW	283016	7592685	4-Nov-18	3			
Fabaceae	* <i>Vachellia farnesiana</i>	Inside (Phase 1)	ASH-OPP-SW	283247	7593017	4-Nov-18	1			
Fabaceae	* <i>Vachellia farnesiana</i>	Inside (Phase 1)	ASH-OPP-SW	283317	7593174	4-Nov-18	25			
Fabaceae	* <i>Vachellia farnesiana</i>	Inside (Phase 1)	ASH-OPP-SW	283340	7593207	4-Nov-18	6			



Family	Species	Location (Survey)	Site	Easting	Northing	Date	Number of Individuals	% Cover	Specimen No.	Notes
Fabaceae	* <i>Vachellia farnesiana</i>	Inside (Phase 1)	ASH-OPP-SW	283399	7593291	4-Nov-18	3			
Fabaceae	* <i>Vachellia farnesiana</i>	Inside (Phase 1)	ASH-OPP-SW	283602	7593618	4-Nov-18	3			
Fabaceae	* <i>Vachellia farnesiana</i>	Inside (Phase 1)	ASH-OPP-RW	284762	7594194	4-Nov-18	1			
Fabaceae	* <i>Vachellia farnesiana</i>	Inside (Phase 1)	ASH-OPP-RW	285537	7594934	4-Nov-18				Scattered.
Fabaceae	* <i>Vachellia farnesiana</i>	Inside (Phase 1)	ASH-OPP-SW	285615	7594034	4-Nov-18	2			
Fabaceae	* <i>Vachellia farnesiana</i>	Inside (Phase 1)	ASH-REL03	285644	7593985	4-Nov-18	15	0.5		
Fabaceae	* <i>Vachellia farnesiana</i>	Inside (Phase 1)	ASH30	286015	7595061	4-Nov-18		1.5		
Fabaceae	* <i>Vachellia farnesiana</i>	Inside (Phase 2)	ASH30R	286015	7595061	16-Apr-19	20	2		
Fabaceae	* <i>Vachellia farnesiana</i>	Inside (Phase 1)	ASH-OPP-RW	286065	7594776	4-Nov-18	10			
Fabaceae	* <i>Vachellia farnesiana</i>	Inside (Phase 1)	ASH-OPP-SW	286067	7594920	4-Nov-18	1			
Fabaceae	* <i>Vachellia farnesiana</i>	Inside (Phase 1)	ASH-OPP-SW	286068	7594908	4-Nov-18	1			
Fabaceae	* <i>Vachellia farnesiana</i>	Inside (Phase 1)	ASH-OPP-SW	286074	7594954	4-Nov-18	1			
Fabaceae	* <i>Vachellia farnesiana</i>	Inside (Phase 1)	ASH-OPP-SW	286074	7594898	4-Nov-18	4			
Fabaceae	* <i>Vachellia farnesiana</i>	Inside (Phase 1)	ASH-OPP-SW	286078	7594947	4-Nov-18	1			
Fabaceae	* <i>Vachellia farnesiana</i>	Inside (Phase 1)	ASH-OPP-SW	286091	7594997	4-Nov-18	5			
Fabaceae	* <i>Vachellia farnesiana</i>	Inside (Phase 1)	ASH-OPP-SW	286094	7594979	4-Nov-18	1			
Fabaceae	* <i>Vachellia farnesiana</i>	Inside (Phase 1)	ASH-OPP-SW	286108	7594842	4-Nov-18	35			
Fabaceae	* <i>Vachellia farnesiana</i>	Inside (Phase 1)	ASH-OPP-SW	286121	7594788	4-Nov-18	15			
Fabaceae	* <i>Vachellia farnesiana</i>	Inside (Phase 1)	ASH-OPP-RW	286125	7594721	4-Nov-18				Scattered.
Fabaceae	* <i>Vachellia farnesiana</i>	Inside (Phase 1)	ASH-OPP-RW	286138	7595113	4-Nov-18				Scattered.
Fabaceae	* <i>Vachellia farnesiana</i>	Inside (Phase 1)	ASH-OPP-RW	286579	7595002	4-Nov-18				Scattered.
Fabaceae	* <i>Vachellia farnesiana</i>	Inside (Phase 1)	ASH-OPP-RW	286833	7594655	4-Nov-18	20			
Fabaceae	* <i>Vachellia farnesiana</i>	Inside (Phase 1)	ASH-OPP-RW	286952	7594864	9-Nov-18	2			
Fabaceae	* <i>Vachellia farnesiana</i>	Inside (Phase 1)	ASH-OPP-MM	287178	7594938	4-Nov-18	7			
Fabaceae	* <i>Vachellia farnesiana</i>	Inside (Phase 1)	ASH-OPP-MM	287211	7595031	4-Nov-18	5			
Fabaceae	* <i>Vachellia farnesiana</i>	Inside (Phase 1)	ASH-OPP-MM	287246	7595121	4-Nov-18	1			
Fabaceae	* <i>Vachellia farnesiana</i>	Inside (Phase 1)	ASH-OPP-MM	287274	7595149	4-Nov-18	1			
Fabaceae	* <i>Vachellia farnesiana</i>	Inside (Phase 1)	ASH-OPP-MM	287329	7595147	4-Nov-18	2			
Fabaceae	* <i>Vachellia farnesiana</i>	Inside (Phase 1)	ASH-OPP-MM	287382	7595098	4-Nov-18	2			
Fabaceae	* <i>Vachellia farnesiana</i>	Inside (Phase 1)	ASH-OPP-MM	287448	7595020	4-Nov-18	2			
Fabaceae	* <i>Vachellia farnesiana</i>	Inside (Phase 1)	ASH-OPP-MM	287491	7595002	4-Nov-18	1			
Fabaceae	* <i>Vachellia farnesiana</i>	Inside (Phase 1)	ASH-OPP-RW	287639	7595100	9-Nov-18				Scattered.
Fabaceae	* <i>Vachellia farnesiana</i>	Inside (Phase 1)	ASH-OPP-MM	287718	7595261	4-Nov-18	30			N=30 in 50x50m patch.
Fabaceae	* <i>Vachellia farnesiana</i>	Inside (Phase 2)	OPPS-RW	288286	7594919	13-Apr-19	1			
Fabaceae	* <i>Vachellia farnesiana</i>	Inside (Phase 2)	OPPS-RW	288401	7594863	13-Apr-19	2			
Fabaceae	* <i>Vachellia farnesiana</i>	Inside (Phase 1)	ASH-OPP-MM	288514	7595111	4-Nov-18	10			
Fabaceae	* <i>Vachellia farnesiana</i>	Inside (Phase 1)	ASH-OPP-MM	288574	7595125	4-Nov-18	12			
Fabaceae	* <i>Vachellia farnesiana</i>	Inside (Phase 2)	OPPS-RW	288584	7594765	13-Apr-19	40			
Fabaceae	* <i>Vachellia farnesiana</i>	Inside (Phase 1)	ASH-OPP-MM	288644	7595205	4-Nov-18	3			
Fabaceae	* <i>Vachellia farnesiana</i>	Inside (Phase 1)	ASH-OPP-MM	288677	7595038	4-Nov-18	5			
Fabaceae	* <i>Vachellia farnesiana</i>	Inside (Phase 1)	ASH-OPP-MM	288771	7595113	4-Nov-18	6			
Fabaceae	* <i>Vachellia farnesiana</i>	Inside (Phase 1)	ASH-OPP-MM	288854	7594757	4-Nov-18	1			
Fabaceae	* <i>Vachellia farnesiana</i>	Inside (Phase 1)	ASH-OPP-MM	288914	7594785	4-Nov-18	1			
Fabaceae	* <i>Vachellia farnesiana</i>	Outside (Phase 1)	ASHC10	286904	7598336	7-Nov-18	2	0.1		Outside study area.
Fabaceae	* <i>Vachellia farnesiana</i>	Outside (Phase 2)	ASHC10R	286904	7598336	13-Apr-19	2	0.1		Outside study area.
Malvaceae	* <i>Malvastrum americanum</i>	Inside (Phase 1)	ASH-OPP-MM	269764	7585930	6-Nov-18	1			
Malvaceae	* <i>Malvastrum americanum</i>	Inside (Phase 1)	ASH-OPP-MM	269807	7585979	6-Nov-18	1			
Malvaceae	* <i>Malvastrum americanum</i>	Inside (Phase 1)	ASH-OPP-MM	271112	7585003	5-Nov-18	10			
Malvaceae	* <i>Malvastrum americanum</i>	Inside (Phase 1)	ASH-OPP-MM	274904	7588296	6-Nov-18	1			
Malvaceae	* <i>Malvastrum americanum</i>	Inside (Phase 1)	ASH-OPP-MM	274932	7588316	6-Nov-18	1			
Malvaceae	* <i>Malvastrum americanum</i>	Inside (Phase 1)	ASH-OPP-SW	276895	7583928	31-Oct-18	450			
Malvaceae	* <i>Malvastrum americanum</i>	Inside (Phase 1)	ASH-OPP-SW	279850	7589085	7-Nov-18	2			

Family	Species	Location (Survey)	Site	Easting	Northing	Date	Number of Individuals	% Cover	Specimen No.	Notes
Malvaceae	* <i>Malvastrum americanum</i>	Inside (Phase 1)	ASH30	286015	7595061	4-Nov-18	1	0.1		
Malvaceae	* <i>Malvastrum americanum</i>	Inside (Phase 2)	ASH30R	286015	7595061	16-Apr-19		0.1		
Malvaceae	* <i>Malvastrum americanum</i>	Inside (Phase 1)	ASH-OPP-RW	286066	7595054	4-Nov-18	1			
Passifloraceae	* <i>Passiflora foetida</i> var. <i>hispida</i>	Inside (Phase 1)	ASH-OPP-MM	274904	7588296	6-Nov-18	2			
Passifloraceae	* <i>Passiflora foetida</i> var. <i>hispida</i>	Inside (Phase 1)	ASH-OPP-MM	276224	7585585	8-Nov-18	1			
Passifloraceae	* <i>Passiflora foetida</i> var. <i>hispida</i>	Inside (Phase 1)	ASH-OPP-MM	276275	7585596	8-Nov-18	2			
Passifloraceae	* <i>Passiflora foetida</i> var. <i>hispida</i>	Inside (Phase 1)	ASH-OPP-MM	276543	7586291	8-Nov-18	1			
Passifloraceae	* <i>Passiflora foetida</i> var. <i>hispida</i>	Inside (Phase 1)	ASH-OPP-MM	276612	7586853	8-Nov-18	4			
Passifloraceae	* <i>Passiflora foetida</i> var. <i>hispida</i>	Inside (Phase 1)	ASH-OPP-MM	280035	7586322	31-Oct-18	1			
Passifloraceae	* <i>Passiflora foetida</i> var. <i>hispida</i>	Inside (Phase 1)	ASH-OPP-MM	280223	7586039	31-Oct-18	4			
Passifloraceae	* <i>Passiflora foetida</i> var. <i>hispida</i>	Inside (Phase 1)	ASH-OPP-MM	280238	7585959	31-Oct-18	2			
Passifloraceae	* <i>Passiflora foetida</i> var. <i>hispida</i>	Inside (Phase 1)	ASH30	286015	7595061	4-Nov-18	1	0.1	ASH30-10	
Passifloraceae	* <i>Passiflora foetida</i> var. <i>hispida</i>	Inside (Phase 2)	ASH30R	286015	7595061	16-Apr-19	7	0.1		
Passifloraceae	* <i>Passiflora foetida</i> var. <i>hispida</i>	Inside (Phase 1)	ASH-OPP-MM	288574	7595125	4-Nov-18	5			
Passifloraceae	* <i>Passiflora foetida</i> var. <i>hispida</i>	Inside (Phase 2)	OPPS-RW	288584	7594765	13-Apr-19	2		ASH-RW63	
Passifloraceae	* <i>Passiflora foetida</i> var. <i>hispida</i>	Inside (Phase 1)	ASH-OPP-MM	288620	7595065	4-Nov-18	5			
Passifloraceae	* <i>Passiflora foetida</i> var. <i>hispida</i>	Inside (Phase 1)	ASH-OPP-MM	288677	7595038	4-Nov-18	5			
Poaceae	* <i>Cenchrus ciliaris</i>	Inside (Phase 1)	ASH38	257189	7564780	5-Nov-18	20	0.1		
Poaceae	* <i>Cenchrus ciliaris</i>	Inside (Phase 2)	STR06R	259207	7559978	11-Apr-19		9		
Poaceae	* <i>Cenchrus ciliaris</i>	Inside (Phase 2)	OPPS-RW	259549	7584132	14-Apr-19				Moderately dense.
Poaceae	* <i>Cenchrus ciliaris</i>	Inside (Phase 2)	OPPS-RW	259693	7584242	14-Apr-19				Scattered.
Poaceae	* <i>Cenchrus ciliaris</i>	Inside (Phase 2)	OPPS-RW	259710	7583936	14-Apr-19				Moderately dense in <i>Triodia epactia</i> hummock grassland.
Poaceae	* <i>Cenchrus ciliaris</i>	Inside (Phase 2)	STR05R	259750	7562474	11-Apr-19		0.5		
Poaceae	* <i>Cenchrus ciliaris</i>	Inside (Phase 2)	OPPS-RW	260013	7584187	14-Apr-19				Scattered.
Poaceae	* <i>Cenchrus ciliaris</i>	Inside (Phase 1)	ASH37	260165	7583578	4-Nov-18	1000	3		
Poaceae	* <i>Cenchrus ciliaris</i>	Inside (Phase 2)	ASH37R	260165	7583578	14-Apr-19		2		
Poaceae	* <i>Cenchrus ciliaris</i>	Inside (Phase 2)	OPPS-RW	260200	7583869	14-Apr-19				Scattered.
Poaceae	* <i>Cenchrus ciliaris</i>	Inside (Phase 1)	ASH-OPP-RW	260276	7569388	5-Nov-18	50			
Poaceae	* <i>Cenchrus ciliaris</i>	Inside (Phase 1)	ASH-OPP-RW	260691	7569095	5-Nov-18				Scattered.
Poaceae	* <i>Cenchrus ciliaris</i>	Inside (Phase 1)	ASH-OPP-RW	260903	7569399	5-Nov-18	50			
Poaceae	* <i>Cenchrus ciliaris</i>	Inside (Phase 2)	OPPS-RW	260971	7565180	16-Apr-19				Open tussock grassland.
Poaceae	* <i>Cenchrus ciliaris</i>	Inside (Phase 2)	OPPS-RW	261047	7564960	16-Apr-19				Open tussock grassland.
Poaceae	* <i>Cenchrus ciliaris</i>	Inside (Phase 2)	OPPS-RW	261233	7565140	16-Apr-19	50			
Poaceae	* <i>Cenchrus ciliaris</i>	Inside (Phase 1)	ASH-REL02	261246	7569178	5-Nov-18		0.1		
Poaceae	* <i>Cenchrus ciliaris</i>	Inside (Phase 2)	OPPS-RW	261276	7565494	16-Apr-19				Scattered.
Poaceae	* <i>Cenchrus ciliaris</i>	Inside (Phase 2)	STR04R	261286	7565650	16-Apr-19		5		
Poaceae	* <i>Cenchrus ciliaris</i>	Inside (Phase 1)	ASH18	262165	7557712	2-Nov-18		17		
Poaceae	* <i>Cenchrus ciliaris</i>	Inside (Phase 2)	ASH18R	262165	7557712	10-Apr-19		12		
Poaceae	* <i>Cenchrus ciliaris</i>	Inside (Phase 2)	STR08R	262228	7558428	10-Apr-19		8		
Poaceae	* <i>Cenchrus ciliaris</i>	Inside (Phase 2)	OPPS-RW	262401	7557699	10-Apr-19				Scattered.
Poaceae	* <i>Cenchrus ciliaris</i>	Inside (Phase 2)	OPPS-RW	262560	7558740	10-Apr-19				Scattered.
Poaceae	* <i>Cenchrus ciliaris</i>	Inside (Phase 2)	OPPS-RW	262599	7558950	10-Apr-19				Moderately dense on dune.
Poaceae	* <i>Cenchrus ciliaris</i>	Inside (Phase 2)	STR07R	262766	7560304	10-Apr-19		4		
Poaceae	* <i>Cenchrus ciliaris</i>	Inside (Phase 1)	ASH-OPP-RW	263334	7573222	5-Nov-18	1000			
Poaceae	* <i>Cenchrus ciliaris</i>	Inside (Phase 1)	ASH36	263422	7573335	5-Nov-18	20	0.1		
Poaceae	* <i>Cenchrus ciliaris</i>	Inside (Phase 1)	ASH20	264312	7556004	2-Nov-18	20	0.1		
Poaceae	* <i>Cenchrus ciliaris</i>	Inside (Phase 1)	ASH-OPP-MM	264458	7587283	4-Nov-18	10000			
Poaceae	* <i>Cenchrus ciliaris</i>	Inside (Phase 2)	OPPS-RW	264469	7587385	14-Apr-19				Open tussock grassland.
Poaceae	* <i>Cenchrus ciliaris</i>	Inside (Phase 1)	ASH39	264487	7587207	4-Nov-18	1000	0.5		
Poaceae	* <i>Cenchrus ciliaris</i>	Inside (Phase 2)	ASH39R	264487	7587207	14-Apr-19		3		
Poaceae	* <i>Cenchrus ciliaris</i>	Inside (Phase 2)	OPPS-RW	264590	7587517	14-Apr-19				Open tussock grassland.
Poaceae	* <i>Cenchrus ciliaris</i>	Inside (Phase 2)	OPPS-RW	264756	7587345	14-Apr-19				Dense.

Family	Species	Location (Survey)	Site	Easting	Northing	Date	Number of Individuals	% Cover	Specimen No.	Notes
Poaceae	* <i>Cenchrus ciliaris</i>	Inside (Phase 2)	OPPS-RW	265053	7587329	14-Apr-19				Scattered.
Poaceae	* <i>Cenchrus ciliaris</i>	Inside (Phase 2)	OPPS-RW	265170	7587267	14-Apr-19				Moderately dense.
Poaceae	* <i>Cenchrus ciliaris</i>	Inside (Phase 2)	OPPS-RW	265331	7587234	14-Apr-19				Open tussock grassland.
Poaceae	* <i>Cenchrus ciliaris</i>	Inside (Phase 2)	STR03R	265472	7570342	15-Apr-19		12		
Poaceae	* <i>Cenchrus ciliaris</i>	Inside (Phase 2)	OPPS-RW	265622	7569986	15-Apr-19				Open tussock grassland.
Poaceae	* <i>Cenchrus ciliaris</i>	Inside (Phase 1)	ASH46	266127	7557829	6-Nov-18		2		
Poaceae	* <i>Cenchrus ciliaris</i>	Inside (Phase 2)	ASH46R	266127	7557829	15-Apr-19		1		
Poaceae	* <i>Cenchrus ciliaris</i>	Inside (Phase 1)	ASH14	266139	7559693	2-Nov-18		3		
Poaceae	* <i>Cenchrus ciliaris</i>	Inside (Phase 2)	ASH14R	266139	7559693	15-Apr-19		1		
Poaceae	* <i>Cenchrus ciliaris</i>	Inside (Phase 1)	ASH-OPP-RW	266237	7559380	2-Nov-18				Scattered.
Poaceae	* <i>Cenchrus ciliaris</i>	Inside (Phase 1)	ASH17	266351	7564888	2-Nov-18	500	1.5		
Poaceae	* <i>Cenchrus ciliaris</i>	Inside (Phase 2)	ASH17R	266351	7564888	11-Apr-19		1		
Poaceae	* <i>Cenchrus ciliaris</i>	Inside (Phase 1)	ASH10	266535	7586369	2-Nov-18	20	0.1		
Poaceae	* <i>Cenchrus ciliaris</i>	Inside (Phase 1)	ASH28	267019	7577990	3-Nov-18		1.5		
Poaceae	* <i>Cenchrus ciliaris</i>	Inside (Phase 2)	ASH28R	267019	7577990	11-Apr-19		1		
Poaceae	* <i>Cenchrus ciliaris</i>	Inside (Phase 1)	ASH-OPP-RW	267039	7557854	5-Nov-18	1000			
Poaceae	* <i>Cenchrus ciliaris</i>	Inside (Phase 1)	ASH-OPP-RW	267040	7559864	2-Nov-18	50			
Poaceae	* <i>Cenchrus ciliaris</i>	Inside (Phase 1)	ASH-OPP-MM	267066	7586579	5-Nov-18	1000			
Poaceae	* <i>Cenchrus ciliaris</i>	Inside (Phase 1)	ASH16	267204	7560452	2-Nov-18		4		
Poaceae	* <i>Cenchrus ciliaris</i>	Inside (Phase 2)	ASH16R	267204	7560452	15-Apr-19		2		
Poaceae	* <i>Cenchrus ciliaris</i>	Inside (Phase 1)	ASH-OPP-MM	267528	7587191	5-Nov-18	3000			
Poaceae	* <i>Cenchrus ciliaris</i>	Inside (Phase 1)	ASH-OPP-RW	267703	7574745	5-Nov-18				Open tussock grassland.
Poaceae	* <i>Cenchrus ciliaris</i>	Inside (Phase 1)	ASH-OPP-MM	267804	7587177	5-Nov-18				Only small amounts, as scattered plants and in some patches.
Poaceae	* <i>Cenchrus ciliaris</i>	Inside (Phase 1)	ASH26	267805	7577646	3-Nov-18		45		
Poaceae	* <i>Cenchrus ciliaris</i>	Inside (Phase 2)	ASH26R	267805	7577646	11-Apr-19		40		
Poaceae	* <i>Cenchrus ciliaris</i>	Inside (Phase 1)	ASH40	267805	7574301	5-Nov-18	20	0.1		
Poaceae	* <i>Cenchrus ciliaris</i>	Inside (Phase 2)	ASH40R	267805	7574301	9-Apr-19		0.1		
Poaceae	* <i>Cenchrus ciliaris</i>	Inside (Phase 2)	STR01R	267866	7573439	9-Apr-19		1		
Poaceae	* <i>Cenchrus ciliaris</i>	Inside (Phase 1)	ASH55	267891	7586897	6-Nov-18	500	0.1		
Poaceae	* <i>Cenchrus ciliaris</i>	Inside (Phase 2)	ASH55R	267891	7586897	9-Apr-19		0.1		
Poaceae	* <i>Cenchrus ciliaris</i>	Inside (Phase 2)	STR02R	267938	7571429	9-Apr-19		0.1		
Poaceae	* <i>Cenchrus ciliaris</i>	Inside (Phase 1)	ASH-OPP-RW	267963	7574877	5-Nov-18	2000			
Poaceae	* <i>Cenchrus ciliaris</i>	Inside (Phase 1)	ASH-OPP-MM	267973	7586151	5-Nov-18				Moderate amounts.
Poaceae	* <i>Cenchrus ciliaris</i>	Inside (Phase 1)	ASH43	267987	7586115	5-Nov-18	1000+.	11		
Poaceae	* <i>Cenchrus ciliaris</i>	Inside (Phase 2)	ASH43R	267987	7586115	9-Apr-19		13		
Poaceae	* <i>Cenchrus ciliaris</i>	Inside (Phase 1)	ASH-OPP-RW	268228	7577347	3-Nov-18	1000			
Poaceae	* <i>Cenchrus ciliaris</i>	Inside (Phase 2)	OPPS-RW	268300	7566828	16-Apr-19				Open tussock grassland.
Poaceae	* <i>Cenchrus ciliaris</i>	Inside (Phase 2)	OPPS-RW	268472	7566733	16-Apr-19	100			
Poaceae	* <i>Cenchrus ciliaris</i>	Inside (Phase 2)	OPPS-RW	268631	7566881	16-Apr-19	20			
Poaceae	* <i>Cenchrus ciliaris</i>	Inside (Phase 1)	ASH-OPP-RW	268729	7577873	7-Nov-18	1000			
Poaceae	* <i>Cenchrus ciliaris</i>	Inside (Phase 2)	OPPS-RW	268753	7582948	13-Apr-19	10000			
Poaceae	* <i>Cenchrus ciliaris</i>	Inside (Phase 1)	ASH19	268785	7567120	2-Nov-18	500	2.5		
Poaceae	* <i>Cenchrus ciliaris</i>	Inside (Phase 2)	ASH19R	268785	7567120	16-Apr-19		2.5		
Poaceae	* <i>Cenchrus ciliaris</i>	Inside (Phase 2)	OPPS-RW	268891	7583258	13-Apr-19	30			
Poaceae	* <i>Cenchrus ciliaris</i>	Inside (Phase 1)	ASH13	268911	7561876	2-Nov-18	35	0.1		
Poaceae	* <i>Cenchrus ciliaris</i>	Inside (Phase 2)	ASH13R	268911	7561876	12-Apr-19		0.1		
Poaceae	* <i>Cenchrus ciliaris</i>	Inside (Phase 2)	OPPS-RW	268954	7582846	13-Apr-19	50			
Poaceae	* <i>Cenchrus ciliaris</i>	Inside (Phase 1)	ASH24	268987	7582216	3-Nov-18	20	0.1		
Poaceae	* <i>Cenchrus ciliaris</i>	Inside (Phase 2)	ASH24R	268987	7582216	13-Apr-19		0.1		
Poaceae	* <i>Cenchrus ciliaris</i>	Inside (Phase 2)	OPPS-RW	268990	7582422	13-Apr-19				Scattered.
Poaceae	* <i>Cenchrus ciliaris</i>	Inside (Phase 1)	ASH15	268991	7561798	2-Nov-18	20	0.1		
Poaceae	* <i>Cenchrus ciliaris</i>	Inside (Phase 2)	ASH15R	268991	7561798	12-Apr-19		0.1		

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Poaceae	* <i>Cenchrus ciliaris</i>	Inside (Phase 2)	OPPS-RW	269000	7582949	13-Apr-19	50			
Poaceae	* <i>Cenchrus ciliaris</i>	Inside (Phase 2)	OPPS-RW	269143	7583389	13-Apr-19	50			
Poaceae	* <i>Cenchrus ciliaris</i>	Inside (Phase 1)	ASH-OPP-MM	269383	7561725	2-Nov-18	15			
Poaceae	* <i>Cenchrus ciliaris</i>	Inside (Phase 1)	ASH22	269412	7580959	3-Nov-18	20	0.1		
Poaceae	* <i>Cenchrus ciliaris</i>	Inside (Phase 2)	ASH22R	269412	7580959	12-Apr-19		0.1		
Poaceae	* <i>Cenchrus ciliaris</i>	Inside (Phase 1)	ASH-OPP-RW	269413	7580874	3-Nov-18				Scattered.
Poaceae	* <i>Cenchrus ciliaris</i>	Inside (Phase 1)	ASH25	269544	7579441	3-Nov-18	1500	3		
Poaceae	* <i>Cenchrus ciliaris</i>	Inside (Phase 2)	ASH25R	269544	7579441	12-Apr-19		5		
Poaceae	* <i>Cenchrus ciliaris</i>	Inside (Phase 1)	ASH-OPP-MM	269624	7579453	3-Nov-18	1000			
Poaceae	* <i>Cenchrus ciliaris</i>	Inside (Phase 1)	ASH-OPP-MM	269702	7579402	3-Nov-18				Western edge of dense area.
Poaceae	* <i>Cenchrus ciliaris</i>	Inside (Phase 1)	ASH12	269717	7588271	1-Nov-18	20	0.1		
Poaceae	* <i>Cenchrus ciliaris</i>	Inside (Phase 2)	ASH12R	269717	7588271	12-Apr-19		0.5		
Poaceae	* <i>Cenchrus ciliaris</i>	Inside (Phase 1)	ASH53	269814	7585824	6-Nov-18	2000	3		
Poaceae	* <i>Cenchrus ciliaris</i>	Inside (Phase 2)	ASH53R	269814	7585824	9-Apr-19		2		
Poaceae	* <i>Cenchrus ciliaris</i>	Inside (Phase 1)	ASH-OPP-MM	269831	7579299	3-Nov-18				Along edge of samphire.
Poaceae	* <i>Cenchrus ciliaris</i>	Inside (Phase 1)	ASH-OPP-MM	269848	7586055	6-Nov-18				Very open tussock grassland throughout this area.
Poaceae	* <i>Cenchrus ciliaris</i>	Inside (Phase 1)	ASH-REL05	269848	7582064	7-Nov-18	20	0.1		
Poaceae	* <i>Cenchrus ciliaris</i>	Inside (Phase 1)	ASH-OPP-RW	269861	7588113	1-Nov-18	1000			
Poaceae	* <i>Cenchrus ciliaris</i>	Inside (Phase 1)	ASH23	269880	7579293	3-Nov-18	100	0.1		
Poaceae	* <i>Cenchrus ciliaris</i>	Inside (Phase 2)	ASH23R	269880	7579293	12-Apr-19		0.1		
Poaceae	* <i>Cenchrus ciliaris</i>	Inside (Phase 1)	ASH-OPP-MM	269970	7561685	2-Nov-18	50			
Poaceae	* <i>Cenchrus ciliaris</i>	Inside (Phase 1)	ASH-OPP-RW	269981	7582362	7-Nov-18	100			
Poaceae	* <i>Cenchrus ciliaris</i>	Inside (Phase 1)	ASH-OPP-MM	270019	7586303	6-Nov-18				Scattered.
Poaceae	* <i>Cenchrus ciliaris</i>	Inside (Phase 1)	ASH-OPP-MM	270050	7579210	3-Nov-18				Dense patches.
Poaceae	* <i>Cenchrus ciliaris</i>	Inside (Phase 1)	ASH-OPP-MM	270189	7561684	2-Nov-18	2000			Tiny plants.
Poaceae	* <i>Cenchrus ciliaris</i>	Inside (Phase 1)	ASH-OPP-MM	270316	7561670	2-Nov-18	500			N=500 along edge of this strip of plain.
Poaceae	* <i>Cenchrus ciliaris</i>	Inside (Phase 1)	ASH-OPP-MM	270447	7561609	2-Nov-18	1000			N=1000 in concentrated patches in this area.
Poaceae	* <i>Cenchrus ciliaris</i>	Inside (Phase 1)	ASH11	270514	7561545	2-Nov-18	63	0.1		
Poaceae	* <i>Cenchrus ciliaris</i>	Inside (Phase 2)	ASH11R	270514	7561545	12-Apr-19		0.1		
Poaceae	* <i>Cenchrus ciliaris</i>	Inside (Phase 1)	ASH27	270576	7575873	3-Nov-18	1000	5		
Poaceae	* <i>Cenchrus ciliaris</i>	Inside (Phase 2)	ASH27R	270576	7575873	11-Apr-19		5		
Poaceae	* <i>Cenchrus ciliaris</i>	Inside (Phase 1)	ASH-OPP-MM	270738	7576335	3-Nov-18				Dense.
Poaceae	* <i>Cenchrus ciliaris</i>	Inside (Phase 1)	ASH-OPP-MM	270809	7584924	5-Nov-18	2000			
Poaceae	* <i>Cenchrus ciliaris</i>	Inside (Phase 1)	ASH-OPP-MM	270846	7585119	5-Nov-18	2000			
Poaceae	* <i>Cenchrus ciliaris</i>	Inside (Phase 1)	ASH29	270864	7576476	3-Nov-18	100	0.1		
Poaceae	* <i>Cenchrus ciliaris</i>	Inside (Phase 2)	ASH29R	270864	7576476	11-Apr-19		0.1		
Poaceae	* <i>Cenchrus ciliaris</i>	Inside (Phase 1)	ASH-OPP-MM	270885	7584830	5-Nov-18	500			N=500 at north end of sandy 'finger'.
Poaceae	* <i>Cenchrus ciliaris</i>	Inside (Phase 1)	ASH-OPP-MM	270912	7584784	5-Nov-18	100			
Poaceae	* <i>Cenchrus ciliaris</i>	Inside (Phase 1)	ASH-OPP-MM	270977	7584708	5-Nov-18	2000			N=2000 at south end of sandy 'finger' with a lot of Buffel Grass.
Poaceae	* <i>Cenchrus ciliaris</i>	Inside (Phase 1)	ASH-OPP-MM	271204	7584846	5-Nov-18	30			
Poaceae	* <i>Cenchrus ciliaris</i>	Inside (Phase 1)	ASH-OPP-MM	271212	7584513	5-Nov-18	2			Only very occasional plants on 'islands' within the samphire.
Poaceae	* <i>Cenchrus ciliaris</i>	Inside (Phase 1)	ASH-OPP-MM	271229	7584817	5-Nov-18	50			
Poaceae	* <i>Cenchrus ciliaris</i>	Inside (Phase 1)	ASH-OPP-MM	271863	7576062	8-Nov-18	1000			Large patches of Buffel Grass; area seems 'scalded'.
Poaceae	* <i>Cenchrus ciliaris</i>	Inside (Phase 1)	ASH-OPP-MM	271959	7589378	5-Nov-18	100			
Poaceae	* <i>Cenchrus ciliaris</i>	Inside (Phase 1)	ASH-OPP-MM	272013	7577773	8-Nov-18	1000			Dense Buffel Grass around Higgins Tank.
Poaceae	* <i>Cenchrus ciliaris</i>	Inside (Phase 1)	ASH-OPP-MM	272169	7589966	5-Nov-18	5			
Poaceae	* <i>Cenchrus ciliaris</i>	Inside (Phase 1)	ASH45	272231	7589688	5-Nov-18	2000	5		
Poaceae	* <i>Cenchrus ciliaris</i>	Inside (Phase 2)	ASH45R	272231	7589688	9-Apr-19	2000	3		
Poaceae	* <i>Cenchrus ciliaris</i>	Inside (Phase 1)	ASH-OPP-MM	272606	7590276	5-Nov-18	20			
Poaceae	* <i>Cenchrus ciliaris</i>	Inside (Phase 1)	ASH49	272877	7590448	5-Nov-18	50	0.1		
Poaceae	* <i>Cenchrus ciliaris</i>	Inside (Phase 2)	ASH49R	272877	7590448	12-Apr-19		0.1		
Poaceae	* <i>Cenchrus ciliaris</i>	Inside (Phase 1)	ASH09	273163	7581675	1-Nov-18	1000	0.5		Juveniles.

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Poaceae	* <i>Cenchrus ciliaris</i>	Inside (Phase 2)	ASH09R	273163	7581675	10-Apr-19		0.1		
Poaceae	* <i>Cenchrus ciliaris</i>	Inside (Phase 1)	ASH-OPP-MM	273468	7580456	8-Nov-18	2000			Sea of Buffel Grass.
Poaceae	* <i>Cenchrus ciliaris</i>	Inside (Phase 1)	ASH-OPP-MM	274092	7581404	8-Nov-18	2000			Area has high densities of Buffel Grass.
Poaceae	* <i>Cenchrus ciliaris</i>	Inside (Phase 1)	ASH-OPP-MM	275319	7588123	6-Nov-18	3000			East edge of sea of Buffel Grass; very degraded.
Poaceae	* <i>Cenchrus ciliaris</i>	Inside (Phase 1)	ASH-OPP-MM	275348	7588606	6-Nov-18				Scattered
Poaceae	* <i>Cenchrus ciliaris</i>	Inside (Phase 1)	ASH50	275399	7582589	5-Nov-18	200	4		
Poaceae	* <i>Cenchrus ciliaris</i>	Inside (Phase 2)	ASH50R	275399	7582589	8-Apr-19		1		
Poaceae	* <i>Cenchrus ciliaris</i>	Inside (Phase 1)	ASH-OPP-MM	275405	7588103	6-Nov-18				Present throughout, as patches not fields; not recording numbers.
Poaceae	* <i>Cenchrus ciliaris</i>	Inside (Phase 1)	ASH-OPP-RW	275524	7583195	1-Nov-18	100			
Poaceae	* <i>Cenchrus ciliaris</i>	Inside (Phase 1)	ASH51	275629	7588103	6-Nov-18	1000	3		
Poaceae	* <i>Cenchrus ciliaris</i>	Inside (Phase 2)	ASH51R	275629	7588103	10-Apr-19		1		
Poaceae	* <i>Cenchrus ciliaris</i>	Inside (Phase 1)	ASH08	275727	7583290	1-Nov-18	20	0.1		
Poaceae	* <i>Cenchrus ciliaris</i>	Inside (Phase 1)	ASH-OPP-MM	276022	7585553	8-Nov-18				Only scattered through here, but forms a sea of Buffel Grass from just west of the track going east onto the dune.
Poaceae	* <i>Cenchrus ciliaris</i>	Inside (Phase 1)	ASH-OPP-MM	276038	7585440	7-Nov-18				Completely infested with Cenchrus all along this fence track, from Cades Bore to here and beyond.
Poaceae	* <i>Cenchrus ciliaris</i>	Inside (Phase 1)	ASH-OPP-MM	276085	7585664	8-Nov-18	20			
Poaceae	* <i>Cenchrus ciliaris</i>	Inside (Phase 1)	ASH-OPP-MM	276113	7585330	8-Nov-18	3000			Sea of Buffel Grass from here on.
Poaceae	* <i>Cenchrus ciliaris</i>	Inside (Phase 1)	ASH-OPP-MM	276131	7585753	8-Nov-18	10			
Poaceae	* <i>Cenchrus ciliaris</i>	Inside (Phase 1)	ASH-OPP-MM	276152	7585366	8-Nov-18				Buffel Grass throughout this area.
Poaceae	* <i>Cenchrus ciliaris</i>	Inside (Phase 1)	ASH-OPP-MM	276235	7585665	8-Nov-18	1000			Seeding; N=1000+.
Poaceae	* <i>Cenchrus ciliaris</i>	Inside (Phase 1)	ASH-OPP-MM	276362	7585964	8-Nov-18				Dense Buffel Grass at northern end.
Poaceae	* <i>Cenchrus ciliaris</i>	Inside (Phase 1)	ASH52	276387	7585995	8-Nov-18	2000	5		
Poaceae	* <i>Cenchrus ciliaris</i>	Inside (Phase 2)	ASH52R	276387	7585995	10-Apr-19		5		
Poaceae	* <i>Cenchrus ciliaris</i>	Inside (Phase 1)	ASH-OPP-MM	276414	7586168	8-Nov-18	1000			N=1000+
Poaceae	* <i>Cenchrus ciliaris</i>	Inside (Phase 1)	ASH-OPP-MM	276522	7586213	8-Nov-18				Scattered individuals, to patches.
Poaceae	* <i>Cenchrus ciliaris</i>	Inside (Phase 1)	ASH-OPP-MM	276542	7586640	8-Nov-18	1000			Flowering; N=1000+.
Poaceae	* <i>Cenchrus ciliaris</i>	Inside (Phase 1)	ASH-OPP-MM	276596	7586356	8-Nov-18	5			
Poaceae	* <i>Cenchrus ciliaris</i>	Inside (Phase 1)	ASH-OPP-MM	276633	7586451	8-Nov-18				Sea of Buffel Grass.
Poaceae	* <i>Cenchrus ciliaris</i>	Inside (Phase 1)	ASH-OPP-MM	276657	7586491	8-Nov-18	1000			Seeding; N=1000+.
Poaceae	* <i>Cenchrus ciliaris</i>	Inside (Phase 1)	ASH-OPP-MM	276665	7586694	8-Nov-18	1000			Seeding; N=1000+.
Poaceae	* <i>Cenchrus ciliaris</i>	Inside (Phase 1)	ASH-OPP-MM	276685	7586549	8-Nov-18				Sea of Buffel Grass.
Poaceae	* <i>Cenchrus ciliaris</i>	Inside (Phase 1)	ASH-OPP-MM	276707	7586641	8-Nov-18				Buffel Grass quite extensive; not as bad to east, but a sea to west.
Poaceae	* <i>Cenchrus ciliaris</i>	Inside (Phase 1)	ASH-OPP-MM	276870	7586931	8-Nov-18	1000			seeding; N=1000+.
Poaceae	* <i>Cenchrus ciliaris</i>	Inside (Phase 1)	ASH-OPP-MM	276873	7586931	8-Nov-18				Patch.
Poaceae	* <i>Cenchrus ciliaris</i>	Inside (Phase 1)	ASH-OPP-SW	277018	7587229	31-Oct-18	200			
Poaceae	* <i>Cenchrus ciliaris</i>	Inside (Phase 1)	ASH-OPP-SW	277157	7583996	31-Oct-18	5000			
Poaceae	* <i>Cenchrus ciliaris</i>	Inside (Phase 1)	ASH-OPP-RW	277211	7581187	31-Oct-18	1000			
Poaceae	* <i>Cenchrus ciliaris</i>	Inside (Phase 1)	ASH-OPP-RW	277301	7588880	8-Nov-08				Dense
Poaceae	* <i>Cenchrus ciliaris</i>	Inside (Phase 1)	ASH-OPP-RW	277387	7588715	8-Nov-08	1000			
Poaceae	* <i>Cenchrus ciliaris</i>	Inside (Phase 1)	ASH04	277401	7584122	31-Oct-18		0.5		
Poaceae	* <i>Cenchrus ciliaris</i>	Inside (Phase 2)	ASH04R	277401	7584122	8-Apr-19		0.5		
Poaceae	* <i>Cenchrus ciliaris</i>	Inside (Phase 1)	ASH-REL06	277428	7589114	8-Nov-18	20	0.1		
Poaceae	* <i>Cenchrus ciliaris</i>	Inside (Phase 1)	ASH-OPP-RW	277451	7584226	31-Oct-18				Scattered.
Poaceae	* <i>Cenchrus ciliaris</i>	Inside (Phase 1)	ASH01	277839	7585724	31-Oct-18		45		
Poaceae	* <i>Cenchrus ciliaris</i>	Inside (Phase 2)	ASH01R	277839	7585724	8-Apr-19		40		
Poaceae	* <i>Cenchrus ciliaris</i>	Inside (Phase 1)	ASH-OPP-SW	277919	7589747	7-Nov-18	250			
Poaceae	* <i>Cenchrus ciliaris</i>	Inside (Phase 1)	ASH-OPP-SW	278077	7589501	7-Nov-18	350			
Poaceae	* <i>Cenchrus ciliaris</i>	Inside (Phase 1)	ASH-OPP-SW	278265	7589284	7-Nov-18	400			
Poaceae	* <i>Cenchrus ciliaris</i>	Inside (Phase 1)	ASH-OPP-RW	278584	7581481	1-Nov-18				Scattered.
Poaceae	* <i>Cenchrus ciliaris</i>	Inside (Phase 1)	ASH-OPP-RW	278793	7588486	8-Nov-08				Scattered.
Poaceae	* <i>Cenchrus ciliaris</i>	Inside (Phase 1)	ASH-OPP-RW	278834	7581422	1-Nov-18	30			
Poaceae	* <i>Cenchrus ciliaris</i>	Inside (Phase 1)	ASH06	278941	7581775	1-Nov-18	20	0.5		

Family	Species	Location (Survey)	Site	Easting	Northing	Date	Number of Individuals	% Cover	Specimen No.	Notes
Poaceae	* <i>Cenchrus ciliaris</i>	Inside (Phase 2)	ASH06R	278941	7581775	11-Apr-19		0.1		
Poaceae	* <i>Cenchrus ciliaris</i>	Inside (Phase 1)	ASH-OPP-RW	279006	7581795	1-Nov-18				Scattered.
Poaceae	* <i>Cenchrus ciliaris</i>	Inside (Phase 1)	ASH-OPP-SW	279047	7588735	7-Nov-18	10000			
Poaceae	* <i>Cenchrus ciliaris</i>	Inside (Phase 1)	ASH-OPP-MM	279191	7583530	1-Nov-18	5			
Poaceae	* <i>Cenchrus ciliaris</i>	Inside (Phase 1)	ASH-OPP-MM	279231	7582928	1-Nov-18	50			
Poaceae	* <i>Cenchrus ciliaris</i>	Inside (Phase 1)	ASH-OPP-MM	279300	7583485	1-Nov-18	15			
Poaceae	* <i>Cenchrus ciliaris</i>	Inside (Phase 1)	ASH-OPP-SW	279322	7588895	7-Nov-18	10000			
Poaceae	* <i>Cenchrus ciliaris</i>	Inside (Phase 1)	ASH-OPP-MM	279434	7583463	1-Nov-18	15			
Poaceae	* <i>Cenchrus ciliaris</i>	Inside (Phase 1)	ASH-OPP-SW	279448	7588931	7-Nov-18				Very open tussock grassland.
Poaceae	* <i>Cenchrus ciliaris</i>	Inside (Phase 1)	ASH-OPP-MM	279525	7582777	1-Nov-18	200			
Poaceae	* <i>Cenchrus ciliaris</i>	Inside (Phase 2)	OPPS-RW	279535	7581978	11-Apr-19	30			
Poaceae	* <i>Cenchrus ciliaris</i>	Inside (Phase 1)	ASH-OPP-MM	279544	7583457	1-Nov-18		10-20		10-20% cover overall.
Poaceae	* <i>Cenchrus ciliaris</i>	Inside (Phase 1)	ASH-OPP-MM	279545	7582772	1-Nov-18	20			Scattered.
Poaceae	* <i>Cenchrus ciliaris</i>	Inside (Phase 1)	ASH-OPP-MM	279592	7583448	1-Nov-18		3		~3% cover overall.
Poaceae	* <i>Cenchrus ciliaris</i>	Inside (Phase 1)	ASH03	279627	7586766	31-Oct-18	100	0.1		
Poaceae	* <i>Cenchrus ciliaris</i>	Inside (Phase 1)	ASH05	279665	7583577	1-Nov-18	100	0.1		
Poaceae	* <i>Cenchrus ciliaris</i>	Inside (Phase 1)	ASH-REL01	279766	7583549	1-Nov-18	1	0.1		
Poaceae	* <i>Cenchrus ciliaris</i>	Inside (Phase 1)	ASH-OPP-SW	279836	7588677	7-Nov-18				Open tussock grassland.
Poaceae	* <i>Cenchrus ciliaris</i>	Inside (Phase 2)	OPPS-RW	279841	7582201	11-Apr-19				Scattered.
Poaceae	* <i>Cenchrus ciliaris</i>	Inside (Phase 2)	OPPS-RW	279871	7581323	11-Apr-19				Scattered.
Poaceae	* <i>Cenchrus ciliaris</i>	Inside (Phase 1)	ASH-OPP-SW	279876	7588736	7-Nov-18	2000			
Poaceae	* <i>Cenchrus ciliaris</i>	Inside (Phase 1)	ASH-OPP-MM	279879	7583146	1-Nov-18	30			
Poaceae	* <i>Cenchrus ciliaris</i>	Inside (Phase 2)	OPPS-RW	279887	7581393	11-Apr-19				Scattered.
Poaceae	* <i>Cenchrus ciliaris</i>	Inside (Phase 1)	ASH42	279940	7589546	5-Nov-18		0.5		
Poaceae	* <i>Cenchrus ciliaris</i>	Inside (Phase 2)	ASH42R	279940	7589546	10-Apr-19		0.25		
Poaceae	* <i>Cenchrus ciliaris</i>	Inside (Phase 1)	ASH-OPP-SW	280008	7589844	4-Nov-18				Open tussock grassland.
Poaceae	* <i>Cenchrus ciliaris</i>	Inside (Phase 1)	ASH-OPP-SW	280018	7589991	4-Nov-18				Very open tussock grassland.
Poaceae	* <i>Cenchrus ciliaris</i>	Inside (Phase 1)	ASH-OPP-MM	280022	7585830	7-Nov-18		30		North edge of dune with ~30% cover.
Poaceae	* <i>Cenchrus ciliaris</i>	Inside (Phase 2)	OPPS-RW	280071	7582323	10-Apr-19	50			
Poaceae	* <i>Cenchrus ciliaris</i>	Inside (Phase 1)	ASH-OPP-MM	280114	7586221	31-Oct-18	10			Sterile.
Poaceae	* <i>Cenchrus ciliaris</i>	Inside (Phase 1)	ASH-OPP-MM	280130	7585551	7-Nov-18	100			In patches.
Poaceae	* <i>Cenchrus ciliaris</i>	Inside (Phase 1)	ASH-OPP-MM	280135	7582571	1-Nov-18	300	2-3		
Poaceae	* <i>Cenchrus ciliaris</i>	Inside (Phase 2)	OPPS-RW	280150	7582187	11-Apr-19	30			
Poaceae	* <i>Cenchrus ciliaris</i>	Inside (Phase 1)	ASH-OPP-MM	280159	7585568	7-Nov-18	1000			Dense Buffel Grass at this end of dune.
Poaceae	* <i>Cenchrus ciliaris</i>	Inside (Phase 1)	ASH44	280193	7581194	5-Nov-18		1		
Poaceae	* <i>Cenchrus ciliaris</i>	Inside (Phase 2)	ASH44R	280193	7581194	11-Apr-19		0.1		
Poaceae	* <i>Cenchrus ciliaris</i>	Inside (Phase 1)	ASH-OPP-RW	280293	7590669	4-Nov-18	20			
Poaceae	* <i>Cenchrus ciliaris</i>	Inside (Phase 1)	ASH-OPP-SW	280295	7585846	31-Oct-18	3000			
Poaceae	* <i>Cenchrus ciliaris</i>	Inside (Phase 1)	ASH34	280311	7590612	4-Nov-18	100	0.1		
Poaceae	* <i>Cenchrus ciliaris</i>	Inside (Phase 2)	ASH34R	280311	7590612	10-Apr-19		0.5		
Poaceae	* <i>Cenchrus ciliaris</i>	Inside (Phase 1)	ASH07	280379	7582494	1-Nov-18	200	1		
Poaceae	* <i>Cenchrus ciliaris</i>	Inside (Phase 2)	ASH07R	280379	7582494	11-Apr-19		0.1		
Poaceae	* <i>Cenchrus ciliaris</i>	Inside (Phase 1)	ASH-OPP-RW	280512	7590740	5-Nov-18	50			
Poaceae	* <i>Cenchrus ciliaris</i>	Inside (Phase 1)	ASH-OPP-RW	280520	7590517	4-Nov-18				Scattered.
Poaceae	* <i>Cenchrus ciliaris</i>	Inside (Phase 1)	ASH-OPP-RW	280832	7590585	5-Nov-18	50			
Poaceae	* <i>Cenchrus ciliaris</i>	Inside (Phase 1)	ASH-OPP-RW	280945	7590732	5-Nov-18				Scattered.
Poaceae	* <i>Cenchrus ciliaris</i>	Inside (Phase 2)	OPPS-RW	281192	7590931	13-Apr-19	50			
Poaceae	* <i>Cenchrus ciliaris</i>	Inside (Phase 2)	OPPS-RW	281230	7590864	13-Apr-19	10000			
Poaceae	* <i>Cenchrus ciliaris</i>	Inside (Phase 2)	OPPS-RW	281387	7590798	13-Apr-19				Scattered.
Poaceae	* <i>Cenchrus ciliaris</i>	Inside (Phase 2)	OPPS-RW	281487	7590721	13-Apr-19	100			
Poaceae	* <i>Cenchrus ciliaris</i>	Inside (Phase 2)	OPPS-RW	281650	7590611	13-Apr-19				Scattered.
Poaceae	* <i>Cenchrus ciliaris</i>	Inside (Phase 2)	OPPS-RW	281851	7591044	13-Apr-19	100			

Family	Species	Location (Survey)	Site	Easting	Northing	Date	Number of Individuals	% Cover	Specimen No.	Notes
Poaceae	* <i>Cenchrus ciliaris</i>	Inside (Phase 2)	OPPS-RW	281936	7590633	13-Apr-19	1000			
Poaceae	* <i>Cenchrus ciliaris</i>	Inside (Phase 1)	ASH-OPP-SW	283076	7592795	4-Nov-18				Very open tussock grassland.
Poaceae	* <i>Cenchrus ciliaris</i>	Inside (Phase 1)	ASH-OPP-SW	283269	7593108	4-Nov-18				Closed tussock grassland.
Poaceae	* <i>Cenchrus ciliaris</i>	Inside (Phase 1)	ASH-OPP-SW	283399	7593291	4-Nov-18				Open tussock grassland.
Poaceae	* <i>Cenchrus ciliaris</i>	Inside (Phase 1)	ASH-OPP-SW	283670	7593695	4-Nov-18	15			
Poaceae	* <i>Cenchrus ciliaris</i>	Inside (Phase 1)	ASH-OPP-RW	283775	7593784	4-Nov-18	100			
Poaceae	* <i>Cenchrus ciliaris</i>	Inside (Phase 2)	OPPS-RW	283904	7593797	15-Apr-19	30			
Poaceae	* <i>Cenchrus ciliaris</i>	Inside (Phase 1)	ASH-OPP-RW	284063	7593908	4-Nov-18				Scattered.
Poaceae	* <i>Cenchrus ciliaris</i>	Inside (Phase 1)	ASH-OPP-RW	284337	7594027	4-Nov-18	1000			
Poaceae	* <i>Cenchrus ciliaris</i>	Inside (Phase 1)	ASH-OPP-RW	284762	7594194	4-Nov-18	20			
Poaceae	* <i>Cenchrus ciliaris</i>	Inside (Phase 1)	ASH-OPP-RW	285364	7594860	4-Nov-18	50			
Poaceae	* <i>Cenchrus ciliaris</i>	Inside (Phase 1)	ASH-OPP-RW	285412	7594379	4-Nov-18	50			
Poaceae	* <i>Cenchrus ciliaris</i>	Inside (Phase 1)	ASH-OPP-RW	285537	7594934	4-Nov-18	100			
Poaceae	* <i>Cenchrus ciliaris</i>	Inside (Phase 1)	ASH-OPP-RW	285605	7594858	4-Nov-18	100			
Poaceae	* <i>Cenchrus ciliaris</i>	Inside (Phase 1)	ASH32	285830	7594545	4-Nov-18		1		
Poaceae	* <i>Cenchrus ciliaris</i>	Inside (Phase 2)	ASH32R	285830	7594545	16-Apr-19		7		
Poaceae	* <i>Cenchrus ciliaris</i>	Inside (Phase 1)	ASH-OPP-SW	285875	7593933	4-Nov-18	50			N=50/1m
Poaceae	* <i>Cenchrus ciliaris</i>	Inside (Phase 1)	ASH-OPP-SW	285885	7593966	4-Nov-18	250			
Poaceae	* <i>Cenchrus ciliaris</i>	Inside (Phase 1)	ASH-OPP-SW	285932	7594208	4-Nov-18	400			
Poaceae	* <i>Cenchrus ciliaris</i>	Inside (Phase 1)	ASH-OPP-RW	286002	7594897	4-Nov-18				Scattered.
Poaceae	* <i>Cenchrus ciliaris</i>	Inside (Phase 2)	ASH30R	286015	7595061	16-Apr-19		0.5		
Poaceae	* <i>Cenchrus ciliaris</i>	Inside (Phase 1)	ASH-OPP-RW	286138	7595113	4-Nov-18				Scattered.
Poaceae	* <i>Cenchrus ciliaris</i>	Inside (Phase 1)	ASH-OPP-RW	286833	7594655	4-Nov-18				Dense
Poaceae	* <i>Cenchrus ciliaris</i>	Inside (Phase 1)	ASH-OPP-RW	286952	7594864	9-Nov-18	500			
Poaceae	* <i>Cenchrus ciliaris</i>	Inside (Phase 1)	ASH-OPP-RW	287039	7594903	9-Nov-18	1000			
Poaceae	* <i>Cenchrus ciliaris</i>	Inside (Phase 1)	ASH56	287149	7594759	9-Nov-18		18		
Poaceae	* <i>Cenchrus ciliaris</i>	Inside (Phase 2)	ASH56R	287149	7594759	13-Apr-19		25		
Poaceae	* <i>Cenchrus ciliaris</i>	Inside (Phase 1)	ASH-OPP-MM	287377	7595142	4-Nov-18	500			
Poaceae	* <i>Cenchrus ciliaris</i>	Inside (Phase 1)	ASH-OPP-MM	287382	7595098	4-Nov-18	10			
Poaceae	* <i>Cenchrus ciliaris</i>	Inside (Phase 1)	ASH-OPP-MM	287425	7595067	4-Nov-18	500			
Poaceae	* <i>Cenchrus ciliaris</i>	Inside (Phase 1)	ASH-OPP-MM	287437	7594939	4-Nov-18	10			
Poaceae	* <i>Cenchrus ciliaris</i>	Inside (Phase 1)	ASH-OPP-MM	287448	7595020	4-Nov-18	300			
Poaceae	* <i>Cenchrus ciliaris</i>	Inside (Phase 1)	ASH-OPP-MM	287469	7594942	4-Nov-18	200			
Poaceae	* <i>Cenchrus ciliaris</i>	Inside (Phase 1)	ASH-OPP-MM	287479	7594987	4-Nov-18	1000			
Poaceae	* <i>Cenchrus ciliaris</i>	Inside (Phase 1)	ASH-OPP-MM	287483	7595012	4-Nov-18	1000			
Poaceae	* <i>Cenchrus ciliaris</i>	Inside (Phase 1)	ASH-OPP-MM	287491	7595002	4-Nov-18	200			
Poaceae	* <i>Cenchrus ciliaris</i>	Inside (Phase 1)	ASH-OPP-MM	287493	7594916	4-Nov-18	200			
Poaceae	* <i>Cenchrus ciliaris</i>	Inside (Phase 1)	ASH35	287506	7594832	4-Nov-18	200	0.1		
Poaceae	* <i>Cenchrus ciliaris</i>	Inside (Phase 2)	ASH35R	287506	7594832	13-Apr-19		0.1		
Poaceae	* <i>Cenchrus ciliaris</i>	Inside (Phase 1)	ASH33	287604	7595272	4-Nov-18	500	1.5		
Poaceae	* <i>Cenchrus ciliaris</i>	Inside (Phase 2)	ASH33R	287604	7595272	13-Apr-19		4		
Poaceae	* <i>Cenchrus ciliaris</i>	Inside (Phase 2)	OPPS-RW	287906	7594830	13-Apr-19				Open tussock grassland.
Poaceae	* <i>Cenchrus ciliaris</i>	Inside (Phase 2)	OPPS-RW	288224	7594757	13-Apr-19				Very open tussock grassland.
Poaceae	* <i>Cenchrus ciliaris</i>	Inside (Phase 2)	OPPS-RW	288286	7594919	13-Apr-19				Open tussock grassland.
Poaceae	* <i>Cenchrus ciliaris</i>	Inside (Phase 2)	OPPS-RW	288356	7594893	13-Apr-19				Very open tussock grassland.
Poaceae	* <i>Cenchrus ciliaris</i>	Inside (Phase 1)	ASH-OPP-MM	288514	7595111	4-Nov-18	300			
Poaceae	* <i>Cenchrus ciliaris</i>	Inside (Phase 2)	OPPS-RW	288584	7594765	13-Apr-19				Open tussock grassland.
Poaceae	* <i>Cenchrus ciliaris</i>	Inside (Phase 1)	ASH-OPP-MM	288644	7595205	4-Nov-18	100			
Poaceae	* <i>Cenchrus ciliaris</i>	Inside (Phase 2)	OPPS-RW	288673	7594813	13-Apr-19				Open tussock grassland.
Poaceae	* <i>Cenchrus ciliaris</i>	Inside (Phase 1)	ASH-OPP-MM	288771	7595113	4-Nov-18	1000			
Poaceae	* <i>Cenchrus ciliaris</i>	Inside (Phase 1)	ASH-OPP-MM	288772	7594681	4-Nov-18		10-30		10-30% along road verge, then in patches through the plain.
Poaceae	* <i>Cenchrus ciliaris</i>	Inside (Phase 1)	ASH31	288831	7595075	4-Nov-18	100	0.1		

Family	Species	Location (Survey)	Site	Easting	Northing	Date	Number of Individuals	% Cover	Specimen No.	Notes
Poaceae	* <i>Cenchrus ciliaris</i>	Outside (Phase 1)	ASHC09	265738	7555270	8-Nov-18	1000	1		Outside study area.
Poaceae	* <i>Cenchrus ciliaris</i>	Outside (Phase 2)	ASHC09R	265738	7555270	15-Apr-19		1		Outside study area.
Poaceae	* <i>Cenchrus ciliaris</i>	Outside (Phase 2)	OPPS-RW	266170	7555021	15-Apr-19				Outside study area.
Poaceae	* <i>Cenchrus ciliaris</i>	Outside (Phase 1)	ASHC07	266266	7555079	8-Nov-18	1000	1		Outside study area.
Poaceae	* <i>Cenchrus ciliaris</i>	Outside (Phase 2)	ASHC07R	266266	7555079	15-Apr-19		1.5		Outside study area.
Poaceae	* <i>Cenchrus ciliaris</i>	Outside (Phase 2)	OPPS-RW	266296	7555337	15-Apr-19	100			Outside study area.
Poaceae	* <i>Cenchrus ciliaris</i>	Outside (Phase 1)	ASHC15	277506	7592598	9-Nov-18		3		Outside study area.
Poaceae	* <i>Cenchrus ciliaris</i>	Outside (Phase 2)	ASHC15R	277506	7592598	10-Apr-19		2		Outside study area.
Poaceae	* <i>Cenchrus ciliaris</i>	Outside (Phase 1)	ASHC13	280871	7594738	8-Nov-18	20	0.1		Outside study area.
Poaceae	* <i>Cenchrus ciliaris</i>	Outside (Phase 2)	ASHC13R	280871	7594738	14-Apr-19		2		Outside study area.
Poaceae	* <i>Cenchrus ciliaris</i>	Outside (Phase 2)	OPPS-RW	280894	7595983	14-Apr-19				Scattered; outside study area.
Poaceae	* <i>Cenchrus ciliaris</i>	Outside (Phase 2)	OPPS-RW	280926	7596157	14-Apr-19				Outside study area.
Poaceae	* <i>Cenchrus ciliaris</i>	Outside (Phase 2)	OPPS-RW	281066	7595741	14-Apr-19				Outside study area.
Poaceae	* <i>Cenchrus ciliaris</i>	Outside (Phase 2)	OPPS-RW	281087	7596278	14-Apr-19				Moderately dense; outside study area.
Poaceae	* <i>Cenchrus ciliaris</i>	Outside (Phase 2)	OPPS-RW	281207	7594891	14-Apr-19	30			Outside study area.
Poaceae	* <i>Cenchrus ciliaris</i>	Outside (Phase 2)	OPPS-RW	281247	7596395	14-Apr-19				Very dense; outside study area.
Poaceae	* <i>Cenchrus ciliaris</i>	Outside (Phase 2)	OPPS-RW	281262	7595671	14-Apr-19				Dense patch 50 x 50 m; outside study area.
Poaceae	* <i>Cenchrus ciliaris</i>	Outside (Phase 2)	OPPS-RW	281270	7595276	14-Apr-19	30			Outside study area.
Poaceae	* <i>Cenchrus ciliaris</i>	Outside (Phase 2)	OPPS-RW	281330	7595572	14-Apr-19				Dense patch ~ 30 x 30 m; outside study area.
Poaceae	* <i>Cenchrus ciliaris</i>	Outside (Phase 2)	OPPS-RW	281480	7596429	14-Apr-19				Scattered; outside study area.
Poaceae	* <i>Cenchrus ciliaris</i>	Outside (Phase 1)	ASHC02	281539	7597022	6-Nov-18		1.5		Outside study area.
Poaceae	* <i>Cenchrus ciliaris</i>	Outside (Phase 2)	ASHC02R	281539	7597022	14-Apr-19		0.1		Outside study area.
Poaceae	* <i>Cenchrus ciliaris</i>	Outside (Phase 2)	OPPS-RW	281697	7597061	14-Apr-19				Moderately dense; outside study area.
Poaceae	* <i>Cenchrus ciliaris</i>	Outside (Phase 2)	OPPS-RW	281946	7597112	14-Apr-19				Dense; outside study area.
Poaceae	* <i>Cenchrus ciliaris</i>	Outside (Phase 1)	ASHC14	282125	7586985	7-Nov-18		1		Outside study area.
Poaceae	* <i>Cenchrus ciliaris</i>	Outside (Phase 2)	ASHC14R	282125	7586985	9-Apr-19		8		Outside study area.
Poaceae	* <i>Cenchrus ciliaris</i>	Outside (Phase 2)	OPPS-RW	282239	7597442	14-Apr-19				Moderately dense; outside study area.
Poaceae	* <i>Cenchrus ciliaris</i>	Outside (Phase 1)	ASHC03	282445	7585905	7-Nov-18	200	0.5		Outside study area.
Poaceae	* <i>Cenchrus ciliaris</i>	Outside (Phase 2)	ASHC03R	282445	7585905	9-Apr-19		1		Outside study area.
Poaceae	* <i>Cenchrus ciliaris</i>	Outside (Phase 1)	ASHC04	282654	7593026	6-Nov-18	20	0.1		Outside study area.
Poaceae	* <i>Cenchrus ciliaris</i>	Outside (Phase 2)	ASHC04R	282654	7593026	13-Apr-19		0.1		Outside study area.
Poaceae	* <i>Cenchrus ciliaris</i>	Outside (Phase 1)	ASHC05	283221	7584202	7-Nov-18	1000	0.5		Outside study area.
Poaceae	* <i>Cenchrus ciliaris</i>	Outside (Phase 1)	ASH-OPP-SW	283249	7592826	4-Nov-18				Open tussock grassland; outside study area.
Poaceae	* <i>Cenchrus ciliaris</i>	Outside (Phase 2)	OPPS-RW	283815	7593722	15-Apr-19	100			Outside study area.
Poaceae	* <i>Cenchrus ciliaris</i>	Outside (Phase 1)	ASHC06	283983	7593572	6-Nov-18	20	0.1		Outside study area.
Poaceae	* <i>Cenchrus ciliaris</i>	Outside (Phase 2)	ASHC06R	283983	7593572	15-Apr-19		2		Outside study area.
Poaceae	* <i>Cenchrus ciliaris</i>	Outside (Phase 2)	OPPS-RW	284167	7593805	15-Apr-19	1000			Outside study area.
Poaceae	* <i>Cenchrus ciliaris</i>	Outside (Phase 2)	OPPS-RW	284616	7593781	15-Apr-19	100			Outside study area.
Poaceae	* <i>Cenchrus ciliaris</i>	Outside (Phase 1)	ASHC10	286904	7598336	7-Nov-18		3		Outside study area.
Poaceae	* <i>Cenchrus ciliaris</i>	Outside (Phase 2)	ASHC10R	286904	7598336	13-Apr-19		1		Outside study area.
Poaceae	* <i>Cenchrus ciliaris</i>	Outside (Phase 2)	OPPS-RW	287835	7596313	13-Apr-19				Scattered; outside study area.
Poaceae	* <i>Cenchrus ciliaris</i>	Outside (Phase 1)	ASHC08	287849	7596448	7-Nov-18	1	0.1		Outside study area.
Poaceae	* <i>Cenchrus setiger</i>	Inside (Phase 1)	ASH-OPP-MM	273468	7580456	8-Nov-18	100			
Poaceae	* <i>Cenchrus setiger</i>	Inside (Phase 1)	ASH-OPP-MM	275319	7588123	6-Nov-18	200			
Poaceae	* <i>Cenchrus setiger</i>	Inside (Phase 1)	ASH-OPP-MM	275348	7588606	6-Nov-18				Scattered all through this area; no dense infestations.
Poaceae	* <i>Cenchrus setiger</i>	Inside (Phase 1)	ASH-OPP-MM	276085	7585664	8-Nov-18	10			
Poaceae	* <i>Cenchrus setiger</i>	Inside (Phase 1)	ASH-OPP-MM	276131	7585753	8-Nov-18	20			
Poaceae	* <i>Cenchrus setiger</i>	Inside (Phase 1)	ASH-OPP-MM	276368	7586034	8-Nov-18				Occasional.
Poaceae	* <i>Cenchrus setiger</i>	Inside (Phase 1)	ASH52	276387	7585995	8-Nov-18	1	0.1		
Poaceae	* <i>Cenchrus setiger</i>	Inside (Phase 2)	ASH52R	276387	7585995	10-Apr-19		0.5		
Poaceae	* <i>Cenchrus setiger</i>	Inside (Phase 1)	ASH-OPP-MM	276405	7586526	8-Nov-18	20			On track.
Poaceae	* <i>Cenchrus setiger</i>	Inside (Phase 1)	ASH-OPP-MM	276470	7586666	8-Nov-18	5			



Family	Species	Location (Survey)	Site	Easting	Northing	Date	Number of Individuals	% Cover	Specimen No.	Notes
Poaceae	* <i>Cenchrus setiger</i>	Inside (Phase 1)	ASH-OPP-BM	276480	7586468	8-Nov-18	500			
Poaceae	* <i>Cenchrus setiger</i>	Inside (Phase 1)	ASH-OPP-BM	276542	7586640	8-Nov-18	150			Flowering.
Poaceae	* <i>Cenchrus setiger</i>	Inside (Phase 1)	ASH-OPP-MM	276596	7586356	8-Nov-18	5			
Poaceae	* <i>Cenchrus setiger</i>	Inside (Phase 1)	ASH-OPP-MM	276633	7586451	8-Nov-18	3000			
Poaceae	* <i>Cenchrus setiger</i>	Inside (Phase 1)	ASH-OPP-BM	276870	7586931	8-Nov-18	200			
Poaceae	* <i>Cenchrus setiger</i>	Inside (Phase 1)	ASH-OPP-MM	276873	7586931	8-Nov-18				Patch.
Poaceae	* <i>Cenchrus setiger</i>	Inside (Phase 1)	ASH-OPP-SW	277157	7583996	31-Oct-18	5000			
Poaceae	* <i>Cenchrus setiger</i>	Inside (Phase 1)	ASH-OPP-SW	277919	7589747	7-Nov-18	250			
Poaceae	* <i>Cenchrus setiger</i>	Inside (Phase 1)	ASH-OPP-MM	277930	7585756	31-Oct-18	10			Track by fence.
Poaceae	* <i>Cenchrus setiger</i>	Inside (Phase 1)	ASH-OPP-SW	278077	7589501	7-Nov-18	350			
Poaceae	* <i>Cenchrus setiger</i>	Inside (Phase 1)	ASH-OPP-SW	280295	7585846	31-Oct-18	3000			
Poaceae	* <i>Cenchrus setiger</i>	Inside (Phase 1)	ASH-OPP-SW	283076	7592795	4-Nov-18				Very open tussock grassland.
Poaceae	* <i>Cenchrus setiger</i>	Inside (Phase 1)	ASH-OPP-SW	283269	7593108	4-Nov-18				Closed tussock grassland.
Poaceae	* <i>Cenchrus setiger</i>	Inside (Phase 1)	ASH-OPP-SW	283399	7593291	4-Nov-18				Open tussock grassland.
Poaceae	* <i>Cenchrus setiger</i>	Inside (Phase 1)	ASH-OPP-SW	283670	7593695	4-Nov-18	35			N=35/1m
Poaceae	* <i>Cenchrus setiger</i>	Inside (Phase 1)	ASH-OPP-RW	284762	7594194	4-Nov-18	20			
Poaceae	* <i>Cenchrus setiger</i>	Inside (Phase 1)	ASH-OPP-RW	286833	7594655	4-Nov-18				Scattered.
Poaceae	* <i>Cenchrus setiger</i>	Inside (Phase 1)	ASH56	287149	7594759	9-Nov-18		5		
Poaceae	* <i>Cenchrus setiger</i>	Inside (Phase 2)	ASH56R	287149	7594759	13-Apr-19		2		
Poaceae	* <i>Cenchrus setiger</i>	Inside (Phase 1)	ASH33	287604	7595272	4-Nov-18	500	1.5		
Poaceae	* <i>Cenchrus setiger</i>	Inside (Phase 2)	ASH33R	287604	7595272	13-Apr-19		1		
Poaceae	* <i>Cenchrus setiger</i>	Outside (Phase 1)	ASH-OPP-SW	283249	7592826	4-Nov-18				Open tussock grassland; outside study area.
Poaceae	* <i>Setaria verticillata</i>	Inside (Phase 1)	ASH-OPP-RW	266633	7559146	2-Nov-18				Dense.
Poaceae	* <i>Setaria verticillata</i>	Inside (Phase 1)	ASH16	267204	7560452	2-Nov-18	1	0.1		
Poaceae	* <i>Setaria verticillata</i>	Inside (Phase 1)	ASH-OPP-MM	271112	7585003	5-Nov-18	40			
Poaceae	* <i>Setaria verticillata</i>	Inside (Phase 1)	ASH03	279627	7586766	31-Oct-18	5	0.1	ASH03-02	
Tamaricaceae	* <i>Tamarix aphylla</i>	Inside (Phase 1)	ASH-OPP-RW	269934	7588125	1-Nov-18	1			
Tamaricaceae	* <i>Tamarix aphylla</i>	Inside (Phase 1)	ASH-OPP-SW	274455	7582016	1-Nov-18	1			
Tamaricaceae	* <i>Tamarix aphylla</i>	Inside (Phase 1)	ASH-OPP-MM	274529	7582228	1-Nov-18	1			



# Appendix 11

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## Selected Inputs and Outputs of the Floristic Analyses





**Table 1: List of taxa that were omitted or treated as other taxa for the purposes of the floristic analysis.**

<b>Taxon</b>	<b>Name Referred to for Analysis</b>
<i>Abutilon</i> ? <i>cunninghamii</i>	<i>Abutilon cunninghamii</i>
<i>Abutilon</i> aff. <i>lepidum</i> (1) (MET 15 352)	<i>Abutilon lepidum</i>
<i>Abutilon</i> aff. <i>lepidum</i> (4)	<i>Abutilon lepidum</i>
<i>Abutilon</i> aff. sp. <i>Dioicum</i> (A.A. Mitchell PRP 1618)	<i>Abutilon</i> sp. <i>Dioicum</i> (A.A. Mitchell PRP 1618)
<i>Abutilon amplum</i>	omitted; singleton
<i>Abutilon malvifolium</i>	omitted; singleton
<i>Abutilon</i> sp.	omitted; may refer to multiple species
<i>Abutilon</i> sp. Onslow (F. Smith s.n. 10/9/61)	omitted; singleton
<i>Acacia bivenosa</i> x <i>sclerosperma</i>	<i>Acacia bivenosa</i>
<i>Acacia colei</i> var. <i>ileocarpa</i>	<i>Acacia colei</i> var. <i>colei</i>
<i>Acacia coriacea</i>	<i>Acacia coriacea</i> subsp. <i>coriacea</i>
<i>Acacia dictyophleba</i>	omitted; singleton
<i>Acacia hemiteles</i>	omitted; singleton
<i>Acacia ligulata</i>	omitted; singleton
<i>Acacia minyura</i>	omitted; singleton
<i>Acacia monticola</i>	omitted; singleton
<i>Acacia nigripilosa</i> subsp. <i>nigripilosa</i>	omitted; singleton
<i>Acacia pyrifolia</i> var. <i>morrisonii</i>	<i>Acacia pyrifolia</i>
<i>Acacia sclerosperma</i>	<i>Acacia sclerosperma</i> subsp. <i>sclerosperma</i>
<i>Acacia sibirica</i>	omitted; singleton
<i>Acacia sphaerostachya</i>	omitted; singleton
<i>Acacia trachycarpa</i> x <i>tumida</i> var. <i>pilbarensis</i>	<i>Acacia trachycarpa</i>
<i>Acacia wiseana</i>	omitted; singleton
<i>Alyogyne pinoniana</i>	<i>Alyogyne pinoniana</i> var. <i>pinoniana</i>
<i>Amaranthus</i> aff. <i>interruptus</i> (MATHB-117)	<i>Amaranthus interruptus</i>
<i>Amaranthus</i> aff. <i>interruptus</i> (MET 16,114)	<i>Amaranthus interruptus</i>
<i>Amaranthus</i> sp.	omitted; may refer to multiple species
<i>Ammannia auriculata</i>	omitted; singleton
<i>Ammannia baccifera</i>	omitted; singleton
<i>Amyema miraculosa</i> subsp. <i>boormanii</i>	omitted; mistletoe
<i>Amyema preissii</i>	omitted; mistletoe
<i>Argemone ochroleuca</i> subsp. <i>ochroleuca</i>	omitted; weed
<i>Aristida holathera</i> var. <i>holathera</i>	<i>Aristida holathera</i>
<i>Aristida holathera</i> var. <i>latifolia</i>	<i>Aristida holathera</i>
<i>Atriplex isatidea</i>	omitted; singleton
<i>Atriplex quinii</i>	omitted; singleton
<i>Atriplex</i> sp.	omitted; may refer to multiple species
<i>Avicennia marina</i>	<i>Avicennia marina</i> subsp. <i>marina</i>
<i>Bergia pedicellaris</i>	omitted; singleton
<i>Bergia perennis</i> subsp. <i>exigua</i>	<i>Bergia perennis</i>
<i>Bidens bipinnata</i>	omitted; weed
<i>Bonamia linearis</i>	<i>Bonamia alatisemina</i>
<i>Brachyscome</i> sp.	<i>Roebuckiella cheilocarpa</i> var. <i>cheilocarpa</i>
<i>Calandrinia pumila</i>	omitted; singleton
<i>Calandrinia</i> sp.	omitted; may refer to multiple species
<i>Calocephalus beardii</i>	omitted; singleton
<i>Calocephalus</i> sp.	omitted; singleton
<i>Calotis</i> sp.	omitted; may refer to multiple species
<i>Calytrix truncatifolia</i>	omitted; singleton
<i>Cassytha aurea</i> var. <i>aurea</i>	<i>Cassytha capillaris</i>
<i>Cassytha filiformis</i>	<i>Cassytha capillaris</i>
<i>Cassytha racemosa</i>	<i>Cassytha capillaris</i>
<i>Cephalopterum drummondii</i>	omitted; singleton
<i>Chenopodium</i> ? <i>gaudichaudianum</i>	<i>Chenopodium gaudichaudianum</i>
<i>Citrullus colocynthis</i>	omitted; weed
<i>Citrullus lanatus</i>	omitted; weed
<i>Convolvulus</i> sp.	<i>Convolvulus clementii</i>
<i>Corchorus</i> aff. <i>walcottii</i>	omitted; singleton
<i>Corchorus sidoides</i> subsp. aff. <i>vermicularis</i> (MATH15-02)	<i>Corchorus sidoides</i> subsp. <i>vermicularis</i>
<i>Corchorus</i> sp.	omitted; may refer to multiple species
<i>Crassula colorata</i>	<i>Crassula colorata</i> var. <i>colorata</i>

<b>Taxon</b>	<b>Name Referred to for Analysis</b>
<i>Crotalaria novae-hollandiae</i> subsp. <i>novae-hollandiae</i>	omitted; singleton
<i>Crotalaria</i> sp.	omitted; may refer to multiple species
<i>Cullen</i> aff. <i>lachnostachys</i> (MET 15,154)	<i>Cullen lachnostachys</i>
<i>Cullen</i> sp.	omitted; may refer to multiple species
<i>Cymbopogon obtectus</i>	omitted; singleton
<i>Cymbopogon procerus</i>	omitted; singleton
<i>Cynodon dactylon</i>	omitted; weed
<i>Cyperus bifax</i>	omitted; singleton
<i>Cyperus difformis</i>	omitted; singleton
<i>Cyperus</i> sp.	omitted; may refer to multiple species
<i>Datura leichhardtii</i>	omitted; weed
<i>Daucus glochidiatus</i>	omitted; singleton
<i>Dichanthium fecundum</i>	omitted; singleton
<i>Dicladantha</i> sp.	<i>Dicladantha forrestii</i>
<i>Dicrastylis cordifolia</i>	omitted; singleton
<i>Digitaria brownii</i>	omitted; singleton
<i>Dipteracanthus australasicus</i>	<i>Dipteracanthus australasicus</i> subsp. <i>australasicus</i>
<i>Dysphania glomulifera</i> subsp. <i>eremaea</i>	omitted; singleton
<i>Dysphania rhadinostachya</i>	<i>Dysphania rhadinostachya</i> subsp. <i>rhadinostachya</i>
<i>Echinochloa colona</i>	omitted; weed
<i>Eleocharis atropurpurea</i>	omitted; singleton
<i>Eleocharis geniculata</i>	omitted; singleton
<i>Eleocharis papillosa</i>	omitted; singleton
<i>Enchylaena</i> sp.	<i>Enchylaena tomentosa</i> var. <i>tomentosa</i>
<i>Eragrostis</i> ? <i>barrelieri</i>	omitted; singleton
<i>Eragrostis</i> aff. <i>falcata</i>	<i>Eragrostis falcata</i>
<i>Eragrostis</i> aff. <i>setifolia</i>	<i>Eragrostis setifolia</i>
<i>Eragrostis</i> sp.	omitted; may refer to multiple species
<i>Eremophila forrestii</i>	<i>Eremophila forrestii</i> subsp. <i>forrestii</i>
<i>Eremophila forrestii</i> subsp. <i>hastieana</i>	omitted; singleton
<i>Eremophila fraseri</i> subsp. <i>fraseri</i>	omitted; singleton
<i>Eremophila glabra</i>	omitted; singleton
<i>Eremophila latrobei</i>	<i>Eremophila latrobei</i> subsp. <i>latrobei</i>
<i>Eremophila youngii</i> subsp. <i>youngii</i>	<i>Eremophila youngii</i>
<i>Eriachne</i> aff. <i>festucacea</i>	omitted; singleton
<i>Eriachne benthamii</i>	<i>Eriachne</i> aff. <i>benthamii</i>
<i>Eriachne flaccida</i>	<i>Eriachne</i> aff. <i>benthamii</i>
<i>Eriachne</i> sp.	omitted; may refer to multiple species
<i>Eriochiton sclerolaenoides</i>	omitted; singleton
<i>Erodium</i> sp.	<i>Erodium cygnorum</i>
<i>Euphorbia</i> ? <i>biconvexa</i>	<i>Euphorbia biconvexa</i>
<i>Euphorbia</i> aff. <i>coghlanii</i>	<i>Euphorbia coghlanii</i>
<i>Euphorbia</i> aff. <i>drummondii</i> (M87)	<i>Euphorbia drummondii</i>
<i>Euphorbia</i> aff. <i>drummondii</i> (MET 15,211)	<i>Euphorbia drummondii</i>
<i>Euphorbia alsiniflora</i>	<i>Euphorbia trigonosperma</i>
<i>Euphorbia australis</i> (mid-green form)	<i>Euphorbia australis</i>
<i>Euphorbia australis</i> var. <i>hispidula</i>	<i>Euphorbia australis</i>
<i>Euphorbia boophthona</i> (large seed form)	<i>Euphorbia boophthona</i>
<i>Euphorbia hirta</i>	omitted; weed
<i>Euphorbia</i> sp.	omitted; may refer to multiple species
<i>Euphorbia</i> sp. ( <i>boophthona/tannensis</i> )	omitted; may refer to multiple species
<i>Euphorbia</i> sp. (MJB-05)	omitted; may refer to multiple species
<i>Euphorbia</i> sp. (site 1089)	omitted; may refer to multiple species
<i>Euphorbia tannensis</i>	<i>Euphorbia tannensis</i> subsp. <i>eremophila</i>
<i>Euphorbia tannensis</i> subsp. <i>eremophila</i> (Hamersley form)	<i>Euphorbia tannensis</i> subsp. <i>eremophila</i>
<i>Euphorbia tannensis</i> subsp. <i>eremophila</i> (Panorama form)	<i>Euphorbia tannensis</i> subsp. <i>eremophila</i>
<i>Evolvulus alsinoides</i> var. <i>decumbens</i>	<i>Evolvulus alsinoides</i>
<i>Evolvulus alsinoides</i> var. <i>villosicalyx</i>	<i>Evolvulus alsinoides</i>
<i>Ficus aculeata</i> var. <i>indecora</i>	omitted; singleton
<i>Ficus brachypoda</i>	omitted; singleton
<i>Fimbristylis microcarya</i>	omitted; singleton
<i>Fimbristylis rara</i>	omitted; singleton

<b>Taxon</b>	<b>Name Referred to for Analysis</b>
Flaveria trinervia	omitted; weed
Gnephosis brevifolia	omitted; singleton
Gnephosis eriocephala	omitted; singleton
Gnephosis sp.	omitted; may refer to multiple species
Gomphrena sordida	omitted; singleton
Goodenia ? lamprosperma	Goodenia lamprosperma
Goodenia cusackiana	omitted; singleton
Goodenia maideniana	omitted; singleton
Goodenia sp.	omitted; may refer to multiple species
Gossypium australe (Burrup Peninsula form)	Gossypium australe
Gossypium australe (Whim Creek form)	Gossypium australe
Grevillea wickhamii subsp. aprica	Grevillea wickhamii
Grevillea wickhamii subsp. hispidula	Grevillea wickhamii
Grevillea wickhamii subsp. macrodonta	Grevillea wickhamii
Halgania cyanea	omitted; singleton
Haloragis gossei var. gossei	Haloragis gossei
Haloragis gossei var. inflata	Haloragis gossei
Haloragis gossei x trigonocarpa	Haloragis gossei
Heliotropium ? inexplicitum	Heliotropium inexplicitum
Heliotropium chrysocarpum	omitted; singleton
Hibiscus aff. burtonii	Hibiscus burtonii
Hibiscus aff. coatesii (MET 16,542)	Hibiscus coatesii
Hibiscus aff. coatesii (site 664)	Hibiscus coatesii
Hibiscus aff. platyklamys (2MATC2-4)	Hibiscus sturtii
Hibiscus aff. sturtii	Hibiscus sturtii
Hibiscus sp.	omitted; may refer to multiple species
Hibiscus sturtii var. ?	Hibiscus sturtii
Hibiscus sturtii var. aff. campylochlamys (site 172)	Hibiscus sturtii
Hibiscus sturtii var. aff. grandiflorus	Hibiscus sturtii
Hibiscus sturtii var. aff. grandiflorus (MATB-57)	Hibiscus sturtii
Hibiscus sturtii var. aff. platyklamys	Hibiscus sturtii
Hibiscus sturtii var. campylochlamys	Hibiscus sturtii
Hibiscus sturtii var. platyklamys	Hibiscus sturtii
Hibiscus sturtii var. truncatus	Hibiscus sturtii
Indigofera monophylla (Burrup form)	Indigofera monophylla
Indigofera monophylla (grey/green leaflet form)	Indigofera monophylla
Indigofera monophylla (MJOPP-2)	Indigofera monophylla
Indigofera sessiliflora	omitted; weed
Indigofera sp.	omitted; may refer to multiple species
Indigofera sp. Chamaeclada (G.J. Keighery & N. Gibson 1224)	Indigofera chamaeclada subsp. pubens
Indigofera trita	Indigofera trita subsp. trita
Ipomoea sp.	omitted; may refer to multiple species
Iseilema vaginiflorum	omitted; singleton
Ixioclamys sp.	omitted; may refer to multiple species
Jasminum sp. Exmouth (G. Marsh 77)	omitted; singleton
Lawrencia sp.	omitted; may refer to multiple species
Lepidium sp.	omitted; may refer to multiple species
Lipocarpha microcephala	omitted; singleton
Lobelia arnhemiaca	omitted; singleton
Lotus australis	omitted; singleton
Lotus sp.	omitted; may refer to multiple species
Lysiana casuarinae	omitted; mistletoe
Maireana ? lobiflora	Maireana lobiflora
Maireana ? tomentosa	Maireana tomentosa subsp. tomentosa
Maireana aff. lobiflora	Maireana lobiflora
Maireana melanocoma	omitted; singleton
Maireana sp.	omitted; may refer to multiple species
Maireana triptera	omitted; singleton
Malvastrum americanum	omitted; weed
Melhania sp. Robe Valley (MJI-35)	Melhania oblongifolia
Melochia pyramidata	omitted; weed

<b>Taxon</b>	<b>Name Referred to for Analysis</b>
<i>Minuria integerrima</i>	omitted; singleton
<i>Mirbelia viminalis</i>	omitted; singleton
<i>Momordica balsamina</i>	omitted; weed
<i>Myoporum insulare</i>	<i>Myoporum montanum</i>
<i>Nicotiana occidentalis</i> subsp. <i>obliqua</i>	<i>Nicotiana occidentalis</i>
<i>Nicotiana occidentalis</i> subsp. <i>occidentalis</i>	<i>Nicotiana occidentalis</i>
<i>Nicotiana</i> sp.	omitted; may refer to multiple species
<i>Oldenlandia galioides</i>	omitted; singleton
<i>Oldenlandia</i> sp. Hamersley Station (A.A. Mitchell PRP 1479)	omitted; singleton
<i>Parkinsonia aculeata</i>	omitted; weed
<i>Paspalidium basicladum</i>	omitted; singleton
<i>Paspalidium jubiflorum</i>	omitted; singleton
<i>Paspalidium</i> sp.	omitted; may refer to multiple species
<i>Passiflora foetida</i> var. <i>hispida</i>	omitted; weed
<i>Peplidium muelleri</i>	omitted; singleton
<i>Peripleura hispidula</i> var. <i>setosa</i>	omitted; singleton
<i>Peripleura virgata</i>	omitted; singleton
<i>Perotis rara</i>	omitted; singleton
<i>Petalostylis cassioides</i>	omitted; singleton
<i>Phyllanthus exilis</i>	omitted; singleton
<i>Pileanthus septentrionalis</i>	omitted; singleton
<i>Podaxis pistillaris</i>	omitted; fungi
<i>Polygala</i> aff. <i>isingii</i>	<i>Polygala glaucifolia</i>
<i>Polymeria ambigua/calycina</i>	<i>Polymeria ambigua</i>
<i>Polymeria</i> sp. (Site 1365)	<i>Polymeria ambigua</i>
<i>Polypogon monspeliensis</i>	omitted; singleton
<i>Polypogon</i> sp.	omitted; may refer to multiple species
<i>Portulaca oleracea</i>	<i>Portulaca oleracea/intraterranea</i>
<i>Portulaca pilosa</i>	omitted; weed
<i>Potamogeton tricarinatus</i>	omitted; singleton
<i>Prosopis glandulosa</i>	<i>Prosopis pallida</i>
<i>Pterocaulon</i> ? <i>sphacelatum</i>	<i>Pterocaulon</i> sp.
<i>Pterocaulon sphacelatum</i>	<i>Pterocaulon</i> sp.
<i>Pterocaulon sphaeranthoides</i>	<i>Pterocaulon</i> sp.
<i>Pterocaulon sphaeranthoides</i> x <i>sphacelatum</i>	<i>Pterocaulon</i> sp.
<i>Ptilotus</i> sp.	omitted; may refer to multiple species
<i>Rhagodia baccata</i>	omitted; singleton
<i>Rhagodia</i> sp.	omitted; may refer to multiple species
<i>Rhodanthe floribunda</i>	omitted; singleton
<i>Rhodanthe margarethae</i>	omitted; singleton
<i>Rhodanthe</i> sp.	omitted; may refer to multiple species
<i>Roebuckiella cheilocarpa</i>	<i>Roebuckiella cheilocarpa</i> var. <i>cheilocarpa</i>
<i>Roebuckiella ciliocarpa</i>	<i>Roebuckiella cheilocarpa</i> var. <i>cheilocarpa</i>
<i>Roepera</i> sp.	omitted; may refer to multiple species
<i>Rotala diandra</i>	omitted; singleton
<i>Samolus</i> sp. Millstream (M.I.H. Brooker 2076)	omitted; singleton
<i>Scaevola anchusifolia</i>	omitted; singleton
<i>Scaevola</i> sp.	omitted; may refer to multiple species
<i>Scaevola spinescens</i> (broad form)	<i>Scaevola spinescens</i>
<i>Schizachyrium fragile</i>	omitted; singleton
<i>Schoenoplectus dissachanthus</i>	omitted; singleton
<i>Sclerolaena gardneri</i>	omitted; singleton
<i>Sclerolaena</i> sp.	omitted; may refer to multiple species
<i>Senna artemisioides</i> subsp. ? <i>oligophylla</i> x	<i>Senna artemisioides</i> subsp. <i>oligophylla</i> x
<i>Senna artemisioides</i> subsp. aff. <i>oligophylla</i>	<i>Senna artemisioides</i> subsp. <i>oligophylla</i> x
<i>Senna artemisioides</i> subsp. <i>oligophylla</i> (thinly sericeous form MET 15,035) x subsp. <i>helmsii</i>	<i>Senna artemisioides</i> subsp. <i>oligophylla</i> (thinly sericeous form MET 15,035)
<i>Senna artemisioides</i> subsp. <i>oligophylla</i> x <i>S.</i> sp. Meekatharra (E. Bailey 1-26)	<i>Senna artemisioides</i> subsp. <i>oligophylla</i> x
<i>Senna glutinosa</i> subsp. ? <i>chatelainiana</i>	<i>Senna glutinosa</i> subsp. <i>chatelainiana</i> x
<i>Senna glutinosa</i> subsp. ? <i>chatelainiana</i> x subsp. <i>glutinosa</i>	<i>Senna glutinosa</i> subsp. <i>chatelainiana</i> x



<b>Taxon</b>	<b>Name Referred to for Analysis</b>
<i>Senna glutinosa</i> subsp. x <i>luerssenii</i> x <i>S. stricta</i>	omitted; singleton
<i>Setaria verticillata</i>	omitted; weed
<i>Sida</i> aff. <i>fibulifera</i>	<i>Sida fibulifera</i>
<i>Sida</i> aff. <i>fibulifera</i> (B64-13B)	<i>Sida fibulifera</i>
<i>Sida</i> aff. <i>fibulifera</i> (HD12-39)	<i>Sida fibulifera</i>
<i>Sida</i> aff. <i>fibulifera</i> (HD148-13)	<i>Sida fibulifera</i>
<i>Sida</i> aff. <i>fibulifera</i> (HD237-9)	<i>Sida fibulifera</i>
<i>Sida</i> aff. <i>fibulifera</i> (M69.12)	<i>Sida fibulifera</i>
<i>Sida</i> aff. <i>fibulifera</i> (MET 16,494)	<i>Sida fibulifera</i>
<i>Sida</i> aff. <i>fibulifera</i> (MET Site 1308)	<i>Sida fibulifera</i>
<i>Sida</i> aff. <i>fibulifera</i> (MET Site 1346)	<i>Sida fibulifera</i>
<i>Sida</i> aff. <i>fibulifera</i> (oblong; MET 15 220)	<i>Sida fibulifera</i>
<i>Sida</i> aff. <i>fibulifera</i> (site 1394)	<i>Sida fibulifera</i>
<i>Sida calyxhymenia</i>	omitted; singleton
<i>Sida kingii</i>	omitted; singleton
<i>Sida</i> sp.	omitted; may refer to multiple species
<i>Sida</i> sp. Articulation below (A.A. Mitchell PRP 1605)	omitted; singleton
<i>Sida</i> sp. <i>Excedentifolia</i> (J.L. Egan 1925)	omitted; singleton
<i>Sida</i> sp. L (A.M. Ashby 4202)	omitted; singleton
<i>Sida</i> sp. <i>Pilbara</i> (A.A. Mitchell PRP 1543) (ferruginous form)	<i>Sida</i> sp. <i>Pilbara</i> (A.A. Mitchell PRP 1543)
<i>Sida spinosa</i>	omitted; singleton
<i>Solanum gabriellae</i>	omitted; singleton
<i>Sonchus oleraceus</i>	omitted; weed
<i>Sporobolus</i> sp.	omitted; may refer to multiple species
<i>Stackhousia intermedia</i>	omitted; singleton
<i>Stemodia viscosa</i>	omitted; singleton
<i>Streptoglossa</i> ? <i>decurrens</i>	<i>Streptoglossa decurrens</i>
<i>Streptoglossa</i> sp.	omitted; may refer to multiple species
<i>Swainsona</i> sp.	omitted; may refer to multiple species
<i>Tephrosia</i> ?aff. <i>clelandii</i> (MATRM-45)	omitted; singleton
<i>Tephrosia</i> aff. <i>clementii</i>	omitted; singleton
<i>Tephrosia</i> aff. <i>rosea</i>	<i>Tephrosia rosea</i> var. <i>clementii</i>
<i>Tephrosia</i> aff. <i>supina</i>	<i>Tephrosia supina</i>
<i>Tephrosia</i> aff. <i>supina</i> (BUN18-09)	<i>Tephrosia supina</i>
<i>Tephrosia</i> aff. <i>supina</i> (HD133-20)	<i>Tephrosia supina</i>
<i>Tephrosia</i> aff. <i>supina</i> (HD254-5)	<i>Tephrosia supina</i>
<i>Tephrosia</i> aff. <i>supina</i> (MET 12,357)	<i>Tephrosia supina</i>
<i>Tephrosia rosea</i>	<i>Tephrosia rosea</i> var. <i>clementii</i>
<i>Tephrosia</i> sp.	omitted; may refer to multiple species
<i>Terminalia circumalata</i>	omitted; singleton
<i>Thysanotus</i> sp.	Likely to refer to <i>Thysanotus exfimbriatus</i>
<i>Trachymene</i> sp.	omitted; may refer to multiple species
<i>Tribulus</i> sp.	omitted; may refer to multiple species
<i>Tribulus terrestris</i>	omitted; weed
<i>Triglochin hexagona</i>	omitted; singleton
<i>Triodia basedowii</i>	<i>Triodia glabra</i>
<i>Triodia brizoides</i>	omitted; singleton
<i>Triodia pungens</i>	<i>Triodia epactia</i>
<i>Triodia</i> sp.	omitted; may refer to multiple species
<i>Triodia</i> sp. <i>Peedamulla</i> (A.A. Mitchell PRP 1636)	<i>Triodia glabra</i>
<i>Triumfetta</i> aff. <i>chaetocarpa</i> (H123-10)	<i>Triumfetta chaetocarpa</i>
<i>Triumfetta</i> aff. <i>chaetocarpa</i> (PAN3/4)	<i>Triumfetta chaetocarpa</i>
<i>Triumfetta maconochieana</i>	omitted; singleton
<i>Triumfetta</i> sp.	omitted; may refer to multiple species
<i>Triumfetta tenuiseta</i>	omitted; singleton
<i>Vigna lanceolata</i>	<i>Vigna lanceolata</i> var. <i>lanceolata</i>
<i>Vigna</i> sp.	omitted; may refer to multiple species
<i>Vittadinia</i> sp.	omitted; may refer to multiple species
<i>Wahlenbergia</i> sp.	<i>Wahlenbergia tumidifruca</i>

Sites from current study only (group average method based on cover, inc weeds and singletons)

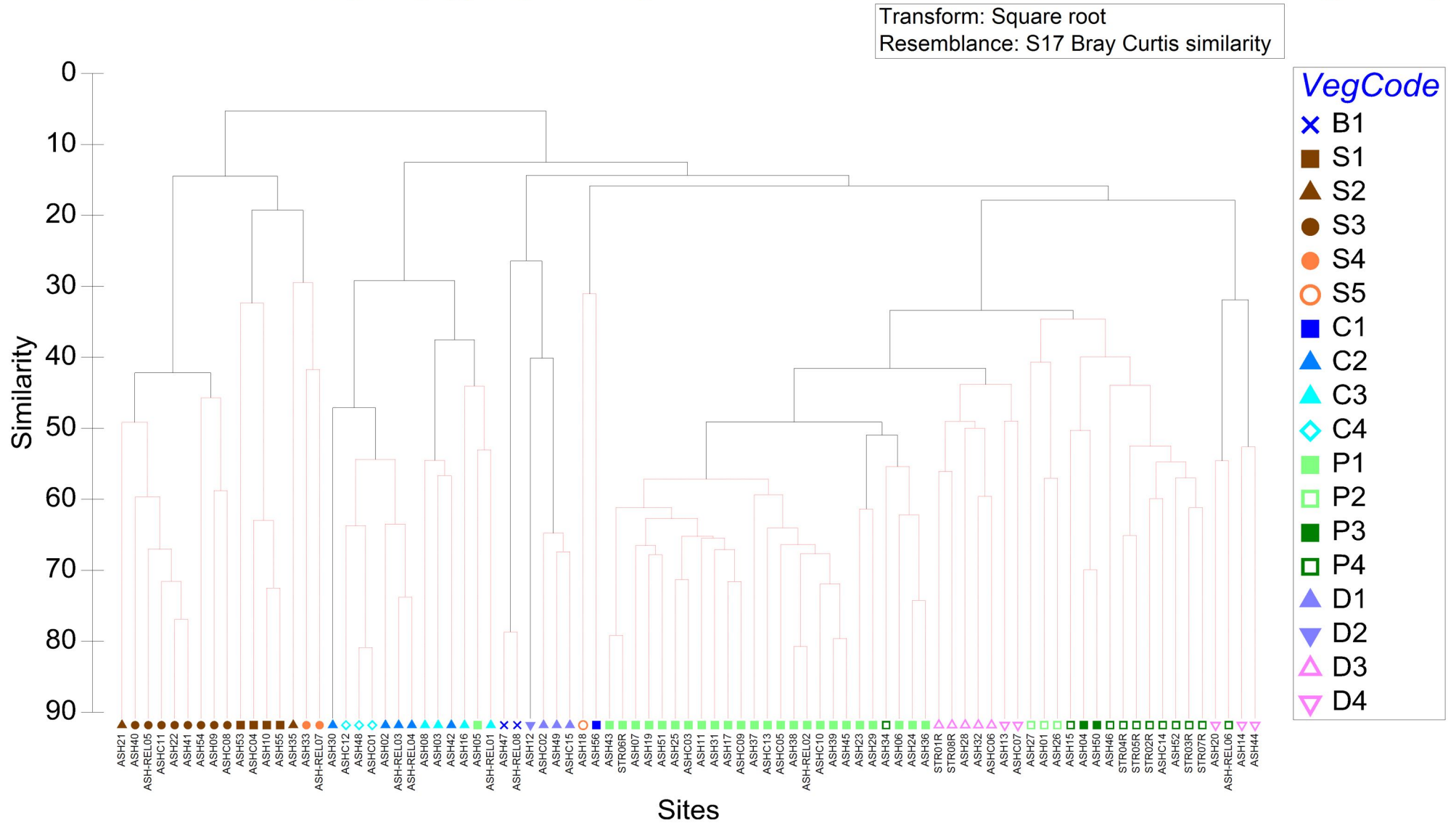


Figure 1: Dendrogram based on percent cover of all species at each site sampled during the current survey work.

Current study\_cover inc weeds and singletons

Transform: Square root  
Resemblance: S17 Bray Curtis similarity

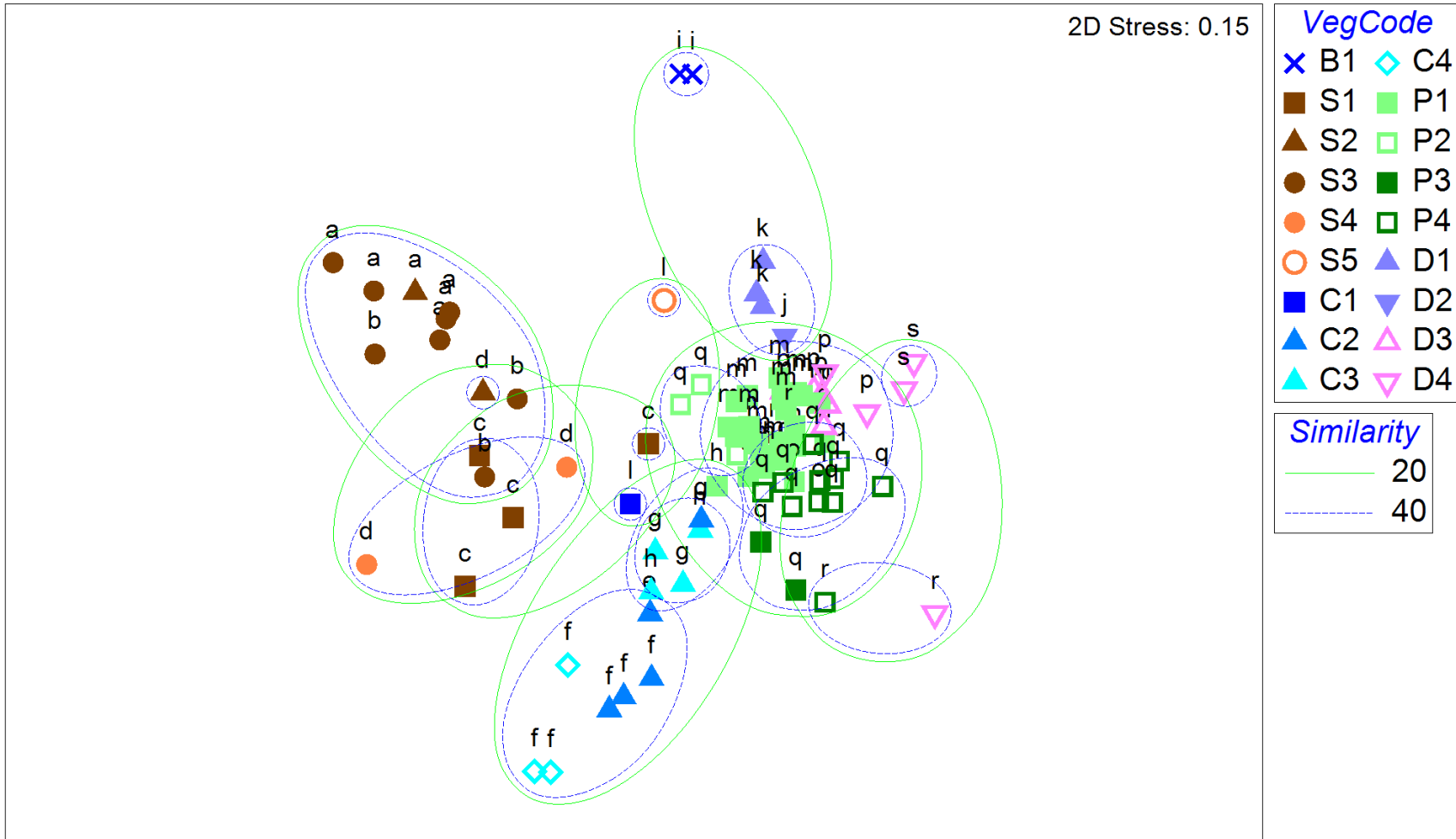


Figure 2: NMDS plot based on percent cover of all species at each site sampled during the current survey work.



**Table 4: Indicator species for the floristic groups identified from the current surveys (based on cover of all species), together with sites in each vegetation type.**

Floristic Group	SIMPER Indicator Species (maximum of top 4) (Cumulative Similarity)	Veg Code	Sites
a	<i>Tecticornia auriculata</i> , <i>Neobassia astrocarpa</i> (90%)	S2	ASH21
		S3	ASH22, ASH40, ASH41, ASH-RELO5, ASHC11
b	<i>Tecticornia auriculata</i> , <i>Tecticornia indica</i> , <i>Angianthus milnei</i> , <i>Atriplex codonocarpa</i> (77%)	S3	ASH09, ASH54, ASHC08
c	<i>Tecticornia doliiformis</i> , <i>Frankenia ambita</i> , <i>Eragrostis falcata</i> , <i>Sporobolus mitchellii</i> (49%)	S1	ASH10, ASH53, ASH55, ASHC04
d	<i>Atriplex codonocarpa</i> , <i>Sclerolaena recurvicauspis</i> , <i>Tecticornia indica</i> , <i>Eragrostis falcata</i> (66%)	S2	ASH35
		S4	ASH33, ASH-RELO7
e	N/A (single site) but the dominant species at this site were <i>Eriachne</i> aff. <i>benthamii</i> , <i>Eulalia aurea</i> , <i>Eucalyptus victrix</i> , <i>Sporobolus mitchellii</i>	C2	ASH30
f	<i>Eriachne</i> aff. <i>benthamii</i> , <i>Sporobolus mitchellii</i> , <i>Eucalyptus victrix</i> , <i>Marsilea hirsuta</i> (94%)	C3	ASH02, ASH-RELO3, ASH-RELO4
		C4	ASH48, ASHC01, ASHC12
g	<i>Eucalyptus victrix</i> , <i>Acacia tetragonophylla</i> , <i>Eriachne</i> aff. <i>benthamii</i> , <i>Sporobolus mitchellii</i> (62%)	C2	ASH42
		C3	ASH03, ASH08
h	<i>Acacia tetragonophylla</i> , <i>Eriachne</i> aff. <i>benthamii</i> , <i>Triodia epactia</i> , <i>Acacia synchronicia</i> (61%)	C3	ASH16, ASH-RELO1
		P1	ASH05
i	<i>Spinifex longifolius</i> , <i>Eriachne gardneri</i> , <i>Ptilotus villosiflorus</i> , <i>Salsola australis</i> (79%)	B1	ASH47, ASH-RELO8
j	N/A (single site) but the dominant species at this site were <i>Triodia epactia</i> , <i>Corynotheca pungens</i> , <i>Indigofera bovipерda</i> subsp. <i>bovipерda</i> , <i>Acacia coriacea</i> subsp. <i>coriacea</i>	D2	ASH12
k	<i>Spinifex longifolius</i> , <i>Acacia coriacea</i> subsp. <i>coriacea</i> , <i>Triodia epactia</i> , <i>*Cenchrus ciliaris</i> (82%)	D1	ASH49, ASHC02, ASHC15
l	<i>*Cenchrus ciliaris</i> , <i>Enchylaena tomentosa</i> var. <i>tomentosa</i> , <i>Scaevola spinescens</i> (94%)	C1	ASH56
		S5	ASH18
m	<i>Triodia epactia</i> , <i>*Cenchrus ciliaris</i> , <i>Acacia stellaticeps</i> , <i>Acacia tetragonophylla</i> (88%)	P1	ASH07, ASH11, ASH17, ASH19, ASH25, ASH31, ASH37, ASH38, ASH39, ASH43, ASH45, ASH51, ASH-RELO2, ASHC03, ASHC05, ASHC09, ASHC10, ASHC13, STR06R
n	<i>Triodia epactia</i> , <i>Acacia stellaticeps</i> , <i>Acacia tetragonophylla</i> , <i>Acacia coriacea</i> subsp. <i>coriacea</i> (65%)	P1	ASH23, ASH29
o	<i>Triodia epactia</i> , <i>Acacia sclerosperma</i> subsp. <i>sclerosperma</i> , <i>Acacia tetragonophylla</i> , <i>Acacia synchronicia</i> (78%)	P1	ASH06, ASH24, ASH36
		P4	ASH34
p	<i>Triodia epactia</i> , <i>*Cenchrus ciliaris</i> , <i>Scaevola sericophylla</i> , <i>Grevillea stenobotrya</i> (70%)	D3	ASH28, ASH32, ASHC06, STR01R, STR08R
		D4	ASH13, ASHC07
q	<i>Triodia epactia</i> , <i>*Cenchrus ciliaris</i> , <i>Triodia glabra</i> , <i>Acacia tetragonophylla</i> (79%)	P2	ASH01, ASH26, ASH27
		P3	ASH04, ASH50
		P4	ASH15, ASH46, ASH52, ASHC14, STR02R, STR03R, STR04R, STR05R, STR07R
r	<i>Triodia avenoides</i> , <i>Acacia sclerosperma</i> subsp. <i>sclerosperma</i> (90%)	P4	ASH-RELO6
		D4	ASH20
s	<i>Triodia avenoides</i> , <i>Acacia stellaticeps</i> , <i>*Cenchrus ciliaris</i> , <i>Grevillea stenobotrya</i> (74%)	D4	ASH14, ASH44