CPS 9535/1 - Supporting information - Flora and Vegetation Assessment

DETAILED FLORA AND VEGETATION ASSESSMENT

Murujuga Tourism Program

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Detailed flora and vegetation assessment
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- Malcolm Trudgen and Associates, whose detailed study and vegetation mapping of the Burrup Peninsula as part of *A flora, vegetation and floristic survey of the Burrup Peninsula with adjoining areas and part of Dampier Archipelago* has provided extensive information about the existing environment and specifically the flora and vegetation of the Burrup, as well as a useful baseline for the description and delineation of vegetation types within the survey area.

1 Introduction

1.1 Murujuga Tourism Program – background

RPS Australia West Pty Ltd (RPS) was commissioned by the Murujuga Aboriginal Corporation (MAC) to undertake a detailed flora and vegetation survey focussed within a 119.15 hectare (ha) area (the survey area) of the Burrup Peninsula in the vicinity of Conzinc Bay. Conzinc Bay is located on the western side of the Burrup Peninsula, within the Murujuga National Park. The survey area is located approximately 11 kilometres (km) north-east of Dampier, in the City of Karratha's local government area (Figure A).

Murujuga, also known as the Burrup Peninsula, is located on the north-west coast of Western Australia and is a place of significant cultural value. Home to over one million petroglyphs (rock engravings), the landscape is of great importance to the traditional custodians. Declared in 2013, the Murujuga National Park covers just under half of the peninsula and lies entirely within a National Heritage Listing (Figure B). The site's heritage values are managed under state and Commonwealth legislation. RPS notes that both levels of government are actively involved in developing processes to monitor impacts to the local ecology, landscape and importantly the rock art.

Murujuga National Park is privately owned by the MAC, leased to the state, and jointly managed with the Department of Biodiversity, Conservation and Attractions (DBCA).

1.1.1 Conzinc Bay Tourism Precinct

The MAC has decided to pursue a development on a site at Conzinc Bay to deliver the Murujuga Living Knowledge Centre, accommodation, caretaker's residence, jetty and moorings, helicopter landing site, and associated services.

The MAC vision for the tourism development is to:

Build a World Class Living Knowledge Centre, that Celebrates and Educates the Significance of this Country and the Aboriginal Culture.

Figure 1: Conzinc Bay Tourism Precinct artist impression

The MAC's vision for the Conzinc Bay Tourism Precinct is to set a new benchmark for Indigenous tourism in Australia. It is envisaged that the Living Knowledge Centre will become a major attraction for visitors to Murujuga. The objectives of the project are:

- Tourism: Create a high-quality Aboriginal tourism experience and facility to attract visitors to Karratha and to the Murujuga National Park.
- Cultural exchange and education: Build an understanding of Aboriginal culture and land through the Murujuga Living Knowledge Centre, exhibitions, ceremonies, camping and guided tours.
- National Park: Improve accessibility and increase visitation to the Murujuga National Park by locals and visitors.
- Manage the environment: Through an ongoing site presence enabling improved management of the Murujuga National Park; preservation of the rock art; and controlled access to sites of significance.
- Business enterprise: Create a sustainable tourism business to be operated by MAC and traditional owner groups.
- Employment and training: Create ongoing employment opportunities for Aboriginal people in tourism including tour guides; camping ground management, food service; retail and gallery operations and facilities operations. Ongoing training (formal and on-the-job) will be provided for all staff in the venture.

1.2 Assessment objectives

To deliver the MAC's vision and project objectives a holistic view of the potential environmental impacts, inclusive of a detailed flora and vegetation assessment is required to address the state and Commonwealth statutory environmental assessment processes.

The survey results will underpin a robust environmental impact assessment of the tourism precinct, National Park access road, and day-use areas.

The 119.15 ha flora and vegetation survey area envelopes the proposed infrastructure in the Murujuga Tourism Program which includes the following:

- Murujuga Living Knowledge Centre
- Accommodation
- National Park access road and day-use areas
- Helicopter landing site
- Internal roads and footpaths
- Services.

The objectives of this detailed flora and vegetation assessment were to:

- Identify and characterise the flora and vegetation within the survey area, via provision of a comprehensive flora inventory and vegetation unit and condition mapping.
- Identify the presence and extent of conservation significant flora and ecological communities that are currently listed under the *Biodiversity Conservation Act 2016* (BC Act) and the Commonwealth EPBC Act within the survey area.
- Describe the flora and vegetation values present, or likely to be present within the survey area that may be directly or indirectly impacted by the proposal, including an analysis of the significance of flora and vegetation in local, regional and state contexts.
- Map the location and extent of conservation significant flora and vegetation within the survey area.

1.3 Scope of works

This flora and vegetation assessment included:

1. A two-phase detailed flora and vegetation survey
2. A targeted Threatened and Priority flora survey of known or potentially suitable habitat for each of the target species within the survey area at the appropriate time (the documented peak flowering time).

This report documents the methods and outcomes of the desktop study and detailed flora and vegetation survey undertaken between June 2019 and May 2020.

1.3.1 Detailed flora and vegetation survey

The detailed survey was undertaken over two phases:

- Phase 1 was carried out in the dry season over two deployments (the first over one day in June 2019, and the second over three days in July 2019).
- Phase 2 was carried out post-wet over 14 days in April–May 2020.

Phase 1 comprised a reconnaissance level survey while Phase 2 involved the sampling of the full range of vegetation communities and flora within the survey area. A total of eighty-six 50 metre (m) × 50 m (or equivalent) floristic quadrats were sampled. The locations of the quadrats are shown in Figure C.

1.3.2 Targeted conservation significant flora survey

A targeted survey was undertaken concurrently with the Phase 2 detailed survey and involved searches of all potentially suitable habitats for target species within the survey area. Significant flora taxa identified as having a moderate or high likelihood of occurring within the survey area (based on proximity of known records and / or presence of suitable habitat) were the focus of the targeted searches. The targeted searches were undertaken during the documented flowering time of the target species.

1.4 Guiding principles and legislative framework

Commonwealth and state legislation pertaining to the conservation of native flora and vegetation include the EPBC Act, BC Act and EP Act.

The EP Act is the primary legislation that governs environmental impact assessment and protection in Western Australia. The aim of the EP Act is “to provide for an EPA, for the prevention, control and abatement of pollution and environmental harm, for the conservation, preservation, protection, enhancement and management of the environment and for matters incidental to or connected with foregoing”.

The EP Act states that the following principles, applicable to native flora and vegetation should be adhered to in order to protect the environment of Western Australia:

1. The Precautionary Principle – Where there are threats of serious or irreversible damage, lack of full scientific certainty should not be used as a reason for postponing measures to prevent environmental degradation.
2. The Principle of Intergenerational Equity – The present generation should ensure that the health, diversity and productivity of the environment is maintained or enhanced for the benefit of future generations.
3. The Principle of the Conservation of Biological Diversity and Ecological Integrity – Conservation of biological diversity and ecological integrity should be a fundamental consideration.

1.4.1 Flora of conservation significance defined in the legislative framework

Within Western Australia, Threatened Flora (TF) are listed if they are considered to be in danger of extinction, rare or otherwise in need of special protection. These taxa are legally protected under the BC Act. The removal of these taxa or impact to their surroundings is not permitted without prior ministerial approval.

The Department of Biodiversity Conservation and Attractions (DBCA) maintains a list of Priority Flora (PF) species, which may be rare or threatened but for which there are either insufficient survey data to determine accurately their status, or which are rare but not currently considered to be threatened. A PF taxon is assigned to one of five priority categories. TF and PF categories are defined in Appendix A, Table A-1.

Many taxa listed as TF under the BC Act have additional protection as they are also listed as TF under one of six threat categories (Extinct, Extinct in the wild, Critically Endangered, Endangered, Vulnerable or Conservation Dependent) under the EPBC Act.

TF taxa are defined as Matters of National Environmental Significance (MNES) under the EPBC Act and penalties apply for any damage to individuals, populations or habitats of these flora.

The EPBC Act conservation category codes are defined in Appendix A, Table A-2.

1.4.2 Vegetation of conservation significance

Under the BC Act and the EP Act, Threatened Ecological Communities (TECs), classified by DBCA in one of the TEC categories (Appendix A, Table A-3) have limited protection. Other ecological communities are classified by DBCA in the category of Priority Ecological Communities (PECs) (Appendix A, Table A-4) pending further survey and/or definition.

A subset of the DBCA-listed TECs are also listed and protected as MNES under the EPBC Act. The EPBC Act threat categories for TECs are defined in Appendix A, Table A-5.

2 Methods

2.1 Desktop assessment

As a component of the detailed flora and vegetation assessment, RPS undertook a desktop review prior to the field survey work to make the best possible use of existing data from the area and to identify specific flora and vegetation values which may occur in, or in proximity of, the survey area. This involved a review of:

- High resolution aerial imagery
- Available literature including previous flora survey reports and spatial datasets
- Searches results of Commonwealth Government databases for TF and TECs protected under the EPBC Act
- DBCA databases and mapping for TF and PF.

2.1.1 Regional biological surveys

The review of regional surveys that have been undertaken in the vicinity of the survey area included:

- A flora, vegetation and floristic survey of the Burrup Peninsula with adjoining areas and part of Dampier Archipelago, with comparisons to the floristics of areas on the adjoining mainland, Volume 1. Prepared for the Department of Mineral and Petroleum Resources (Trudgen 2002)
- Introduction to the Pilbara Biodiversity Survey, 2002–2007 (McKenzie et al. 2009).

2.1.2 Regional data

The review of publicly available broad-scale vegetation mapping and remnant extent data included:

- Vegetation Association mapping (Beard 1975)
- Surface geology mapping
- Vegetation mapping (Trudgen 2002).

2.1.1 State and Commonwealth Government databases

Interrogation of the following Commonwealth and state databases was undertaken within a 15 to 45 km radius of the survey area:

- Commonwealth DAWE Protected Matters database for MNES including
  - Listed TECs
  - Listed TF species
- Western Australian DBCA Threatened and Priority Flora database, and the Western Australian Herbarium (WAH) specimen database
- Western Australian DBCA TEC/ PEC database
- Western Australian Department of Primary Industries and Regional Development Declared Plants list.

2.2 Field surveys

The field surveys were coordinated by RPS' Managing Botanist Carrie Gill, and conducted primarily by Consultant Botanist Vicki Long of Vicki Long and Associates, with assistance from Carrie for the Phase 1 reconnaissance survey in July 2019 (Table 1). Phase 1 of the detailed flora and vegetation survey was undertaken over four days (and two deployments) in June and July 2019. Phase 2 of the assessment was undertaken over 14 days in April and May 2020.

Table 1: Botanical team personnel

Personnel	Title	Role	Survey	Flora licence
Carrie Gill	Managing Botanist (RPS)	Field survey coordination and HSE management	June 2019 (Phase 1) July 2019 (Phase 1) April–May 2020 (Phase 2)	• SOPP No. SL012440 (2018 – 2019) • Flora Taking - Biological Assessment Licence: FB62000151 (2019 – 2024)
		Field survey	July 2019 (Phase 1)	
Vicki Long	Consultant Botanist	Field survey	June 2019 (Phase 1) July 2019 (Phase 1) April–May 2020 (Phase 2)	• Flora Taking - Biological Assessment Licence: FB62000151 (2019 – 2024) • Authorisation to Take or Disturb Threatened Species: TFL 29-1920 • Reg 4 Written Notice of Lawful Authority for Murujuga National Park: CE005951

2.2.1 Detailed flora and vegetation survey

2.2.1.1 Phase 1

The Phase 1 reconnaissance survey was undertaken in accordance with *Technical Guidance: Flora and Vegetation Surveys for Environmental Impact Assessment* (EPA 2016) and involved selective sampling of the flora and vegetation to define the vegetation units and vegetation condition within the survey area.

The field survey was undertaken by two experienced and qualified botanists, Carrie Gill and Vicki Long, over two deployments: the first over one day in June 2019, and the second over three days in July 2019. The survey involved traversing the survey area by vehicle and on foot to:

- Verify the data from the desktop survey at a local scale.
- Characterise the vegetation throughout the survey area.
- Identify key constraints and potential impacts of development on local flora and vegetation values, or other environmental features.

The Phase 1 reconnaissance survey was undertaken during the dry season (June and July 2019), therefore, it did not involve plot-based sampling of the floristics, compilation of a comprehensive flora inventory, or recording and mapping of conservation significant flora and ecological communities, however any conservation significant perennial flora species and ecological communities encountered during the survey were opportunistically recorded and mapped.

The Phase 1 assessment included a review of the full range of vegetation community types observed within the survey area. For this assessment, the vegetation was described at numerous ‘mapping note’ sites at which the following details were recorded:

- Mapping note code
- Location (GDA94 GPS coordinates)
- Digital photographs of the vegetation
- Landform and soil description
- Vegetation description – dominant growth form, height, cover and species for the three traditional strata (upper, mid and ground)
- Any other location information that might be useful in vegetation classification including slope, aspect, litter, fire history, vegetation/landform/soil correlations
- Assessment of vegetation and description of disturbances
- A list of dominant flora taxa including weeds.

2.2.1.2 Phase 2

The Phase 2 detailed (plot-based) flora survey was undertaken in accordance with *Technical Guidance: Flora and Vegetation Surveys for Environmental Impact Assessment* (EPA 2016).

The field survey was coordinated by RPS botanist Caroline Gill and conducted by Consultant Botanist Vicki Long. The survey was undertaken over 14 days between 16 April and 11 May 2020. The survey methods and sampling quadrat sizes used were based on the requirements for detailed flora and vegetation surveys in the Pilbara bioregion as outlined in EPA (2016). The survey was undertaken at the 'optimal time' for the botanical province as determined by the EPA (2016).

The field survey aimed to sample the full range of flora and vegetation within the survey area by strategically locating the floristic sites to cover the full toposequence of floristic communities present, from the stony hillcrests and slopes, to the stony plains, drainage lines and coastal dunes.

A total of eighty-six 50 m × 50 m quadrats (or equivalent) were established and sampled in intact mature vegetation in areas of best condition (i.e. an effort was made to avoid areas obviously disturbed by weeds, recent fire or vehicle tracks, however this was not always possible, particularly for some of the coastal dune vegetation where disturbance by weeds and vehicle tracks was generally much higher than the remainder of the survey area). Floristic sites were also positioned to avoid the transition zones between floristic community types and environmental gradients, such as changes in substrate type, aspect or hydrology.

The Phase 2 detailed survey involved:

- A targeted search for TF and PF as determined by the database search results, and the likelihood of any TECs or PECs occurring within the survey area
- Comprehensive quadrat-based flora recording and collection. Bounded 50 m × 50 m quadrats were established and sampled in intact, mature vegetation in areas of best condition to provide data for the floristic classification of the vegetation of the survey area
- Collection of information at each quadrat included
  - Site code
  - Location (GDA94 GPS coordinates)
  - Size, shape and orientation of quadrat
  - Photograph/s from north-west corner
  - Landform and soil description
  - Dominant growth form, height, cover and species for the three traditional strata (upper, mid and ground)
  - Any other location information that might be useful in vegetation classification including slope, aspect, litter, fire history, vegetation/landform/soil correlations
  - Assessment of vegetation and description of disturbances
  - A comprehensive species list (annuals and perennials), including weeds
- Opportunistic collections were also recorded to verify that the remnant vegetation has been well characterised and important values identified
- Compilation of a comprehensive vascular flora inventory of all flora species recorded within the survey area including weed species
- Vegetation condition mapping using the recommended EPA (2016) scale adapted from Trudgen (1988) including the location of any Declared Plants listed under the *Biosecurity and Agriculture Management Act 2007* (BAM Act) and Weeds of National Significance (WONS) known to be invasive and threats to biodiversity
- Vegetation unit description and mapping using the National Vegetation Information System (NVIS) (ESCAVI 2003). Vegetation types were described to Association (Level V)
- Identification and mapping of areas of ecological importance (e.g.TF and PF, TECs and PECs) within the survey area.

2.2.2 Targeted threatened and priority flora surveys

Targeted TF and PF searches were conducted as part of the Phase 2 detailed survey and aimed to determine the location and abundance of all significant flora populations or vegetation in the survey area and to place any impacts into context locally and regionally.

All potentially suitable habitats were systematically searched for target species and communities. Significant flora taxa identified as occurring within or having a moderate or high likelihood of occurring within the survey area (based on proximity of known records and / or presence of suitable habitat) were the target of the searches.

2.3 Data analysis

2.3.1 Taxonomic determinations

Flora specimens were either identified in the field, or collected and identified using the keys, publications and databases of the Pilbara Regional Herbarium. Plant specimens were all identified by Vicki Long. Nomenclature was aligned with the current names in FloraBase (Western Australian Herbarium 2020).

2.3.2 Vegetation mapping

The vegetation mapping was conducted using a combination of aerial photo-interpretation, regional and local vegetation mapping (specifically that completed by Trudgen (2002)), on-ground confirmation and vegetation structure data.

Vegetation types were described to Association (Level V) in accordance with the NVIS (ESCAVI 2003) (Appendix A, Table A-6 and Table A-7).

Vegetation condition mapping was undertaken using the recommended EPA (2016) scale for the Eremaean region of Western Australia; that of Trudgen (1988) (Appendix A, Table A-8).

2.3.3 Multivariate analysis of floristic data

All multivariate data analyses followed the procedures outlined in Clarke and Gorley (2006) and were carried out using the appropriate modules of the Primer statistical software package (Plymouth Marine Laboratory-Version 7). Data analyses were conducted using PRIMER v7 modules, including Classification, Similarity Profile Analysis (SIMPROF) (Clarke and Gorley 2006). The analyses aimed to compare the floristic composition of the quadrats sampled for the survey area to identify groups of floristically similar sites to assist in defining the different floristic communities present.

2.3.3.1 Classification and similarity profile analysis (SIMPROF)

Floristic quadrat data (presence / absence) derived from the current survey, in the form of a ‘species by site’ table, were initially analysed to classify the different floristic communities within the survey area. A resemblance (dissimilarity) matrix of the presence/absence data for the dataset was constructed using the Bray-Curtis Similarity Coefficient. A Hierarchical Cluster Analysis was carried out on this matrix using the group average linkage method.

The purpose of classification is to produce a dendrogram that allows patterns (clusters) in the data to be visualised. Dendrograms illustrate the “relatedness” of groups of samples; in this case, based on floristics. A Bray-Curtis similarity matrix of data from the current survey was subjected to hierarchical (group average) assessment to produce a single dendrogram. Further, a “similarity profile” SIMPROF permutation test was carried out at each node of this dendrogram to look for statistically significant clusters in the set of samples (indicated by the black lines on the dendrogram).

2.4 Limitations

2.4.1 Field survey

Practitioners who conduct ecological surveys for environmental impact assessment in Western Australia are obliged to report on the limitations and constraints in such studies. Some potential limitations / constraints on surveys may adversely impact on the scientific rigour, completeness or the validity of the survey results. EPA (2016) identifies standard limitations which can limit and constrain the validity of surveys. These limitations / constraints and their relevance to this assessment are presented in Table 2.

Table 2: Survey limitations

Limitation	Relevance	Details
Availability of contextual information at a regional and local scale	No	Numerous flora and vegetation assessments have been undertaken on the Burrup Peninsula in the past several decades not least Malcolm Trudgen's comprehensive *A flora, vegetation and floristic survey of the Burrup Peninsula with adjoining areas and part of Dampier Archipelago* which involved the survey of the entire Burrup Peninsula in 2000 on behalf of the (then) Department of Mineral and Petroleum Resources. The detailed survey was undertaken between May and September 2000, with vegetation mapped at a scale of 1:5,000. Over 6,000 plant specimens collected and identified and a total of 240 vegetation associations were described for the study's core survey areas.
Competency and experience of the field team	No	Vicki Long has over 34 years of experience in the identification, rehabilitation and management of arid area and coastal vegetation and environments in northern Western Australia. Vicki has performed numerous flora and vegetation surveys since 1986 on the Burrup Peninsula and throughout the Dampier Archipelago.
Proportion of flora recorded and / or collected, and problems with taxonomic determinations	No	Flora taxa recorded were either identified in the field or collected and identified using the keys and resources of the Pilbara Regional Herbarium by Vicki Long. Based on database search results and a review of the historical flora and vegetation reports across the Burrup Peninsula, a total of 390 vascular species have been recorded for the Burrup Peninsula (Weston 1997). This includes flora recorded by van Leeuwen (1996), Blackwell et al. (1979), Vicki Long and Astron Environmental (1997, 1998, 1999, 2000) and Trudgen (2002). A total of 187 taxa were recorded for the current detailed survey which represents almost half of the total number recorded for the peninsula.
The effort and extent of the survey	No	The area was sufficiently surveyed and considered appropriate for the bioregion.
Access restrictions within the survey area	No	All of the survey area was fully accessible to the field survey personnel for the duration of the survey
Survey timing, rainfall, season of survey	No	The surveys were undertaken in autumn, after wet season rain which is the optimal time for ecological surveys in the Pilbara bioregion.
Disturbances that may have affected the results of survey such as fire, vehicle tracks and weeds	Moderate (on the coastal dunes portions of the survey area)	Some areas of the survey area have been affected by fire in recent years, which has impacted vegetation composition and structure; other disturbances such as weed infestation and erosion on the coastal dunes (caused by vehicle tracks and camping) has caused changes in vegetation structure and health. For example, areas of Whiteochloa PEC vegetation have been displaced by weeds and other species.

3 Existing environment

3.1 Historical land use

Murujuga (or the Burrup Peninsula) is a unique ecological, spiritual and archaeological area as it is recognising as possibly containing the world's oldest, largest and most important collections of petroglyphs and ancient rock carvings. The peninsula is part of the Dampier Archipelago and was originally an island accessible only at a very low tide by a connecting sand bar.

The flora and vegetation of the survey area is located along the western coastline of the Burrup Peninsula.

On 3 July 2007, the majority of the Burrup Peninsula and surrounding islands were registered as a National Heritage Place and on 17 January 2013 the Murujuga National Park was created (Figure B).

The Murujuga National Park is owned by the MAC and is jointly managed with the DBCA (MAC 2016). It is anticipated that Murujuga will be formally recognised (based on its outstanding Aboriginal cultural values) on the World Heritage List in 2020 (DBCA 2019b).

3.2 Surrounding land uses

Located adjacent to the Burrup Peninsula is a strategic industrial development node, producing iron ore, petroleum, solar salt, natural gas, liquified natural gas (LNG), liquified petroleum gas (LPG), ammonia, gold and other minerals. It has large ports, private railways and production facilities (Jones 2004; DEC 2013b). The survey area partially overlaps 'Strategic Industry' zoned land under the City of Karratha's Local Planning Scheme No. 8, as shown in Figure B (DPLH 2018).

Industries currently located within the Burrup industrial area include:

- The Woodside-operated North West Shelf Venture LNG
- Woodside's Pluto LNG plant
- The Yara Pilbara Fertilisers plant
- Yara Pilbara Nitrates' ammonium nitrates plant.

Other land uses include tourism, pastoralism and Aboriginal lands (DEC 2013b).

Plate 1: Industrial development on the Burrup Peninsula adjacent to the Murujuga National Park

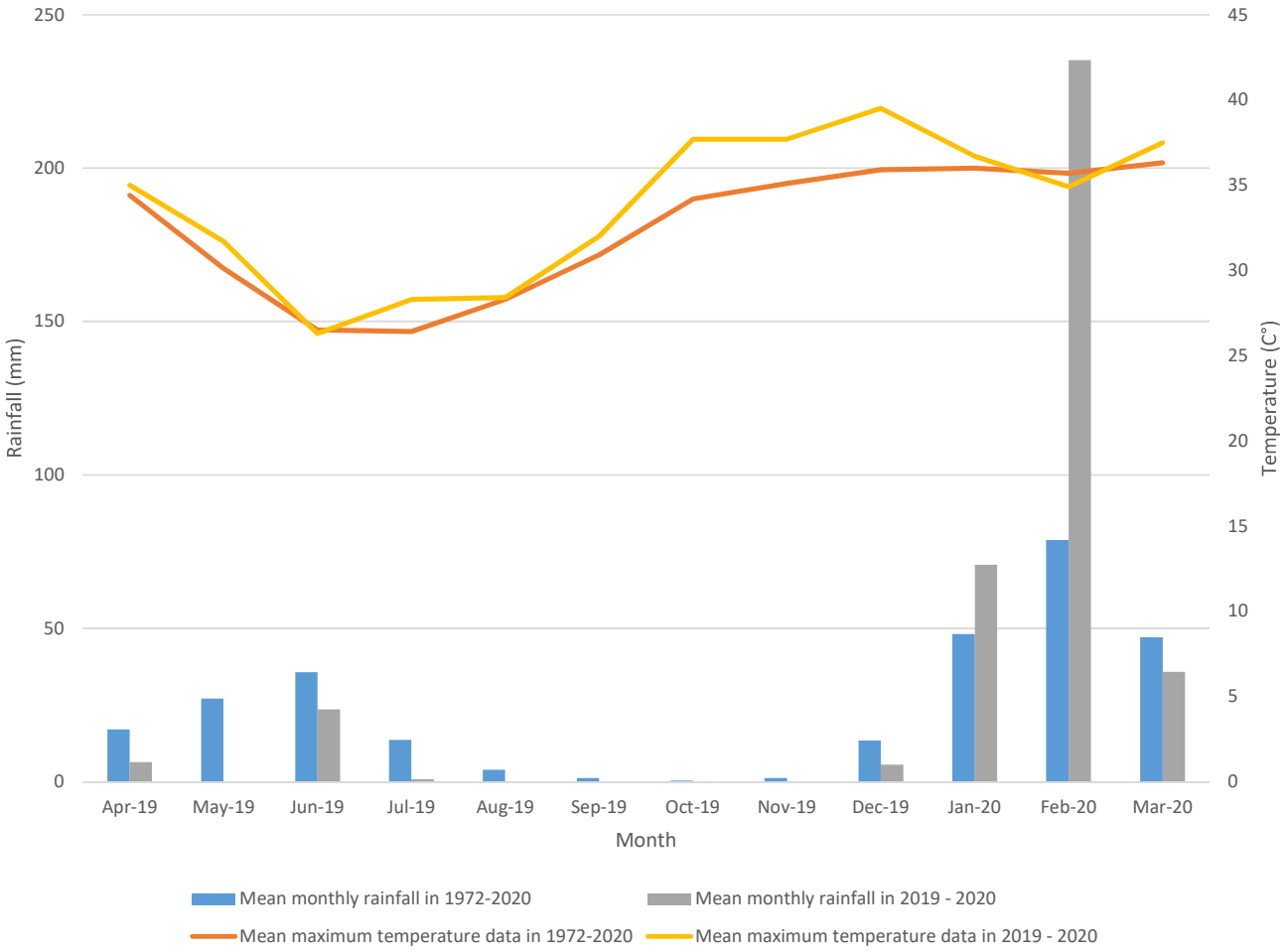
3.3 Climate

The survey area is in the western extent of the semi-desert tropical Pilbara region (DEC 2013b). Its climate is described as almost bi-seasonal, with short, hot, wet summers from December to March, long dry winters from May to November and transitional periods in between (Trudgen 2002). The warm and dry climatic conditions are tempered on the Burrup Peninsula due to its close proximity to the sea (DEC 2013b). Significant rainfall events are associated with summer thunderstorms or tropical cyclones from November to April. Average annual pan evaporation ranges from 3,200 mm to 3,600 mm (Bureau of Meteorology (BoM) 2006).

The BoM weather station closest to the survey area is the Karratha Aero weather station number 004083, located approximately 13 km to the south.

Outside of Severe Tropical Cyclone Veronica's influence there was very little rainfall over Karratha the entire wet season in 2018 to 2019. Rainfall for Karratha in 2018 and 2019 was approximately 145.6 and 110.4 millimetres (mm) (BoM 2020b) which represents approximately 50% and 62% less than the 43-year annual average of 292.4 mm (BoM 2020a). Between March and May 2019, the three months immediately preceding the Phase 1 survey in June and July 2019, a total of 77.4 mm of rain was received which is approximately 15% less than the long-term average for the same period (BoM 2020b). Severe Tropical Cyclone Damien was responsible for a total of 235 mm of rainfall in February 2020 which represents around 300% of the 78.8 mm long-term average for the month. This amount of rainfall received two months prior to the Phase 2 survey resulted in an excellent survey season in April / May 2020.

Historical rainfall data collected from the Karratha Aero weather station is presented in Graph 1 (BoM 2020a; BoM 2020b).



Graph 1: Mean monthly rainfall (mm) and maximum temperature data (°C) for Karratha Aero weather station (004083), and rainfall and temperature data for April 2019 to March 2020

3.4 Interim Biogeographical Regionalisation of Australia

The Interim Biogeographical Regionalisation of Australia (IBRA) currently recognises 89 bioregions and 419 biological subregions within Australia. The survey area lies within the Roebourne subregion (PIL04) of the Pilbara Region (Department of Energy and the Environment 2016).

The Roebourne subregion is 18,910 km^2 in size and it's northern portion is described by McKenzie et al. (2009) as "mostly Quaternary (<10 Mya) alluvial and aeolian coastal and sub-coastal plains. These plains, which are traversed by active floodplains adjacent to the larger rivers systems support sandy to heavy clay substrates and gilgais. They are mostly covered by grassland of mixed bunch grass (*Aristida* spp., *Enneapogon* spp.), tussock grass (*Cenchrus* spp., *Eriachne* spp., *Eragrostis* spp., *Sorghum* spp.) and hummock grass (*Triodia* spp.) and dwarf to open shrubland of snakewood (*Acacia xiphophylla*) and *A. stellaticeps* over soft spinifex, mostly *Triodia pungens* and *T. epactia*."

3.5 Geology, landform and soils

The Fortescue Group sequence unconformably overlies the Pilbara Craton, which is the oldest geological regions in Australia. The Gidley Granophyre is a minor igneous intrusion (mafic sill) of the Fortescue Group and is found in the majority of the Burrup Peninsula (Thorne and Trendall 2001). It has a maximum thickness of 2 km, and encompasses massive granophyre coloured dark-green, dark-blue, purple or black, commonly porphyritic; remelted granite; basal gabbro (Geoscience Australia 2019). The survey area itself is characterised by fine to medium-grained granophyre and is underlain by gabbro (Landgate 2019).

Soils in the Burrup Peninsula are mostly red brown in colour, typically shallow but can reach two metres (m) in depth and overlay fractured bedrock (Trudgen 2002).

Surface geology mapping across the survey area is presented in Figure D.

3.6 Topography

The Abydos Plain, on which the survey area is located, typically consists of flat to gently undulating quaternary alluvium, however the Burrup Peninsula is exceptional in that its topography is rugged with a low range of rocky hills with slopes of boulder scree divided by narrow gullies (Plate 2). The areas of outcropping are popularly referred to as ‘rock piles’ (Trudgen 2002).

Plate 2: Murujuga National Park landscape and geology

3.7 Flora and vegetation

3.7.1 Regional vegetation assessment and mapping

The vegetation of the survey area is within the Fortescue Botanical District of the Eremaean Botanical Province of Western Australia (Beard 1975). This region is further subdivided into eight physiographic units, and the Abydos Plain encompasses the survey area. This subdivision is very broad, extending from Cape Preston to the west and the Great Sandy Desert to the east, with very different vegetation found within (Beard 1975):

- Shrub steppe – the granite plain’s predominant vegetation community is shrub steppe of the *Acacia pyrifolia – Triodia pungens* (now *T. epactia*) association. Generally covered by hummock grasses, interspersed with widely spread out shrubs.
- Dwarf-shrub steppe – sandplains located at the sea-ward edge of the granite plain are predominantly covered by dwarf-shrub steppe, generally hummock grasses (*Triodia pungens* [now *T. epactia*]), interspersed with copious low spreading shrubs of *Acacia translucens* (now *A. stellaticeps*).

- The grass plains – open plains of tussock grass and or mixed grass and spinifex. Clay pans towards the coast have plains with tussock grass only. Patches of shrub steppe (*Acacia pyrifolia – Triodia pungens* [now *T. epactia*]) are found mixed with patches of grass savannah or grass and spinifex are found mixed together.
- The coastal complex – The land gently slopes into the sea with a 5–10 km belt subject to tidal influences, with a maze of tidal lagoons samphire flats and mangroves along it.

Beard's (1975) vegetation mapping of the Pilbara region at a scale of 1:1,000,000 shows a single vegetation association (Shrub steppe) over the survey area (Figure E).

Vegetation Association 117 is described as: Grass-steppe: hummock grassland (*Triodia* spp.) (Landgate 2019).

The current extent of this vegetation association within the Roebourne (PIL04) subregion is presented in Table 3.

Table 3: Regional representation of vegetation association 117: hummock grassland, grass steppe; soft spinifex within the Roebourne (PIL04) subregion

Vegetation association	Pre-European extent (ha)	Present extent (ha) remaining	% of present extent remaining	% of present extent in secure tenure
117: hummock grassland, grass steppe; soft spinifex	50,963	46,902	92*	33

*Above 30% target for biodiversity conservation (Government of Western Australia 2019)

3.7.2 Trudgen (2002) vegetation and floristic survey of the Burrup Peninsula

Malcolm Trudgen and Associates undertook a comprehensive flora and vegetation survey of the entire Burrup Peninsula in 2000 on behalf of the (then) Department of Mineral and Petroleum Resources.

The objective of this detailed flora and vegetation survey of the Burrup Peninsula, Dolphin Island, Angel Island and Gidley Island was to document the flora and vegetation with sufficient detail to assess the botanical conservation values, and to understand the flora and vegetation in a broader context of the mainland. The detailed survey was undertaken between May and September 2000, with vegetation mapped at a scale of 1:5,000. Over 6,000 plant specimens collected and identified.

A total of 240 vegetation associations were described for the study's core survey areas, many of which Trudgen (2002) identified as having a limited distribution and extent. A unique feature of the Burrup Peninsula was the pockets of vegetation supported by rock piles whose species have tropical rainforest affinities (Trudgen 2002). The floristics of the Burrup peninsula are a mix of Pilbara coastal, near coastal, Eremaean, and Northern Botanical Province (Kimberley) species. The vegetation of the Burrup Peninsula is generally in 'very good' or 'excellent' condition.

Fifty-one vegetation units were described and mapped by Trudgen (2002) within the project survey area.

Trudgen (2002) concluded that the vegetation of the Burrup Peninsula is atypical of the vegetation of both the Fortescue Botanical District and the Abydos Plain, and that the 'unique' floristics are the result of climatic influences, unusual geomorphology, and the relative isolation of the peninsula. Many of the vegetation associations recorded on the Burrup have a very limited distribution, as well as limited areas of occurrence, and therefore have a high conservation value.

3.7.3 Conservation reserves

The Pilbara IBRA bioregion has only 6.36% represented in dedicated conservation reserves (IUCN I-IV). At a subregional level, the Roebourne PIL4 has 3.55% in conservation reserve (Government of Western Australia 2019).

The majority of the survey area overlaps the Murujuga National Park (IUCN II). The islands north and west of the Burrup Peninsula are Class A nature reserves (ICUN 1a) and nature reserves (ICUN II).

3.7.4 Regional flora

Trudgen (2002) recorded a total of 392 native and 14 alien (weed) flora taxa within its core survey area (which included the Burrup peninsula, Dolphin, Angel and Gidley Islands).

4 Results

4.1 Desktop survey results

4.1.1 Threatened and priority flora database search results

A search of the DBCA's Threatened and Priority Flora databases was undertaken for known TF and PF records within a 50 km radius of the survey area. No TF were identified but twenty-one PF were returned including four Priority 1 (P1), two Priority 2 (P2), fourteen Priority 3 (P3) and one Priority 4 (P4) species (Table 2). Only six of the species have been recorded on the Burrup Peninsula within a 5 km radius of the survey area. These species are listed at the top of Table 4.

The database search of conservation significant flora is shown spatially in Figure F.

Table 4: DBCA flora database search results

Species	Conservation code* (state)	Conservation code (Commonwealth)
Gymnanthera cunninghamii	P3	-
Rhynchosia bungarensis	P4	-
Schoenus punctatus	P3	-
Stackhousia clementii	P3	-
Terminalia supranitifolia	P3	-
Vigna triodiophila	P3	-
Abutilon sp. Pritzelianum (S. van Leeuwen 5095)	P1	-
Atriplex lindleyi subsp. *conduplicata*	P3	-
Eragrostis lanicaulis	P3	-
Eragrostis surreyana	P3	-
Glycine falcata	P3	-
Gomphrena cucullata	P3	-
Gomphrena leptophylla	P3	-
Goodenia pallida	P1	-
Helichrysum oligochaetum	P1	-
Oldenlandia sp. Hamersley Station (A.A. Mitchell PRP 1479)	P3	-
Pentalepis trichodesmoides subsp. *hispida*	P2	-
Solanum albostellatum	P3	-
Tephrosia rosea var. Port Hedland (A.S. George 1114)	P1	-
Themeda sp. Hamersley Station (M.E. Trudgen 11431)	P3	-
Trianthema sp. Python Pool (G.R. Guerin & M.E. Trudgen GG 1023)	P2	-

* Conservation codes defined in Appendix A (Table A-1)

4.1.2 Threatened and priority ecological community database search results

A search of DBCA's TEC/PEC database for known TEC and PEC records within a 45 km radius of the survey area returned numerous records of three P1 and two P3 ecological communities (Table 5). Only two of these communities: *Burrup Peninsula rock pile communities* (P1); and *Burrup Peninsula rock pool communities* (P1), occur on the Burrup Peninsula in the vicinity of the survey area, these are listed at the top of Table 5. Currently there are no known TECs on the Burrup Peninsula.

The database search results for conservation significant ecological community records are shown in Figure G.

Table 5: DBCA ecological communities database search results

Name	Conservation code* (state)	Conservation code (Commonwealth)
Burrup Peninsula rock pile communities	P1	-
Burrup Peninsula rock pool communities	P1	-
Coastal dune tussock grassland dominated by Whiteochloa airoides	P3	-
Horseflat Land System of the Roebourne Plains	P3	-
Roebourne Plains coastal grasslands with gilgai microrelief on deep cracking clays (Roebourne Plains gilgai grasslands)	P1	-

* Conservation codes defined in Appendix A (Table A-4)

Both Priority 1 PECs on the Burrup Peninsula were listed by DBCA in 2008. The *Burrup Peninsula rock pile communities* are pockets of vegetation in the rock piles and outcrops. The rock piles in particular are important for providing fire and evolutionary refuge for flora (Kendrick & Stanley 2001). The *Burrup Peninsula rock pool communities* are described as “calcareous tufa deposits with interesting aquatic snails” (Trudgen 2002).

4.2 Field survey results

4.2.1 Flora

4.2.1.1 Flora statistics

A total of 187 vascular flora taxa were recorded by the current survey of which 182 (97.3%) were native species and 5 (2.7%) were naturalised alien (weed) species. The list of taxa recorded for the survey area is presented in Appendix B. Species recorded by floristic site (quadrat) are presented in Appendix C, and detailed floristic quadrat data are presented in Appendix D.

The taxa recorded represent 45 families and 115 genera. The families represented by the greatest number of taxa are presented in Table 6. The genera represented by the greatest number of taxa are presented in Table 7.

Table 6: Dominant families within the survey area

Family	Common name	No. of taxa
Fabaceae	Acacias and peas	36
Poaceae	Grasses	18
Malvaceae	Mallows	15
Chenopodiaceae	Goosefoots	11
Euphorbiaceae	Spurges	9
Convolvulaceae	Morning glories	9
Asteraceae	Daisies	8
Amaranthaceae	Amaranth	7
Goodeniaceae	Leschenaultias	6
Cyperaceae	Sedges	5
Zygophyllaceae	Caltrops	5

Table 7: Dominant genera within the survey area

Genus	Common name	No. of taxa
Acacia	Wattles	8
Euphorbia	Spurges	8
Tephrosia	-	5
Abutilon	Lantern bushes	5
Solanum	Nightshades	4
Tribulus	Caltrops	4
Indigofera	-	4
Scaevola	Fan flowers	4

4.2.1.2 Field survey effort

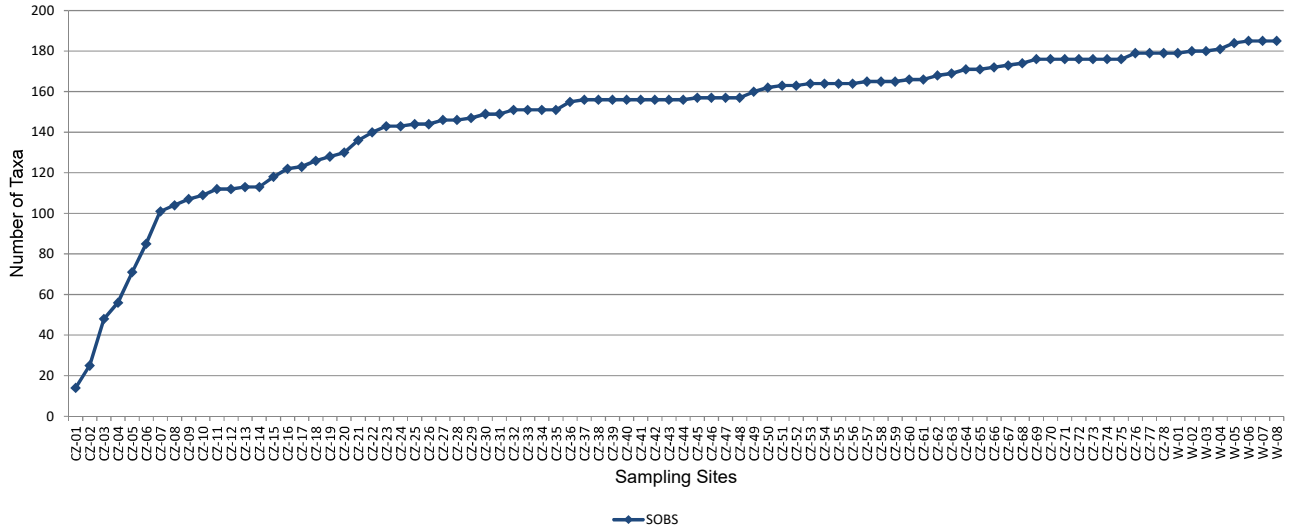
Species accumulation plots were generated for the survey site data using PRIMERv7 SPEC-ACCUM (Graph 2). This expressed the number of species recorded for the field survey as a function of effort (i.e. number of sites sampled).

Initially, the analysis was run on the dataset in the order that the sampling sites (quadrats) were sampled in the field (i.e. chronologically) using the 'Sobs' index. This generated a 'stepped' curve showing the actual cumulative number of taxa recorded as each subsequent floristic site was sampled (Graph 2).

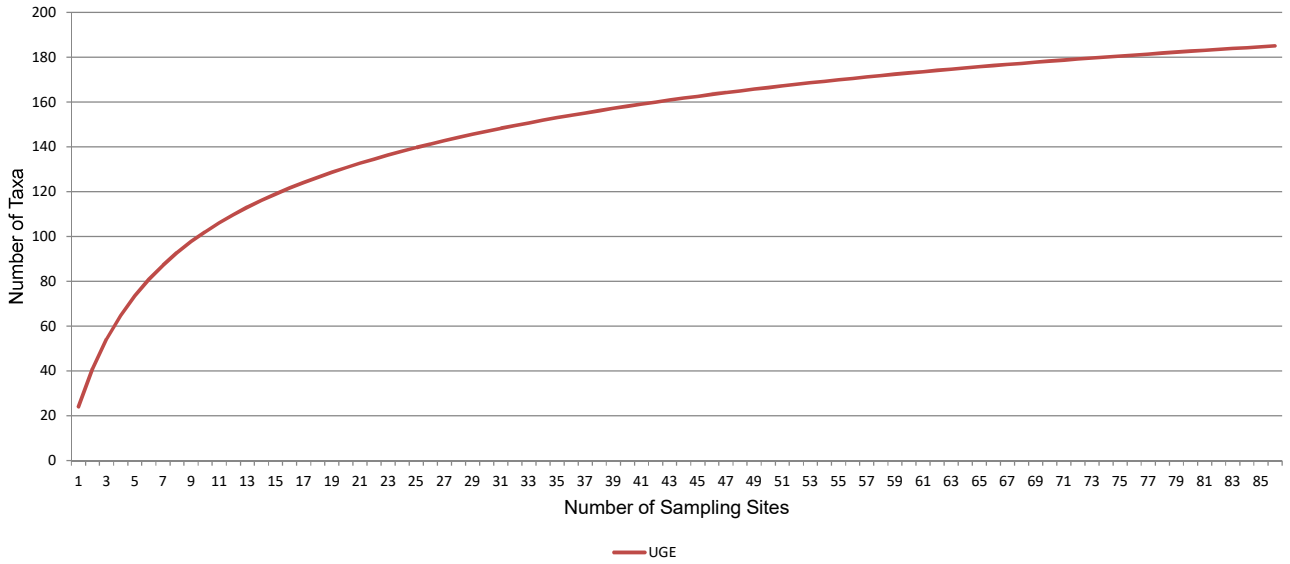
A second analysis was undertaken using the 'UGE' index to generate a smooth curve which was derived from the means of repeated re-sampling of all pooled samples (Graph 3). This curve represents the 'statistical expectation' for the curve shown in Graph 2.

The curves demonstrate that a total of 185 taxa were recorded for the 86 quadrats. The shape of the curve indicates that fewer new species were recorded with the sampling of each additional site and that the number of sites that would have to be sampled to reach the asymptote (theoretical maximum) would be prohibitively large.

It was concluded that the survey effort for the current field survey was very good. It should also be noted that an additional two taxa were recorded opportunistically bringing the actual total to 187.



Graph 2: Species accumulation curve (Sobs index)



Graph 3: Species accumulation curve (UGE index)

4.2.1.3 Threatened and priority flora

No Threatened Flora (TF) species listed under the BC Act or the EPBC Act were recorded within the survey area during the detailed flora and vegetation survey.

Five Priority Flora (PF) species were recorded within the survey area as follows:

- *Terminalia supranitifolia* (P3)
- *Rhynchosia bungarensis* (P4)
- *Gymnanthera cunninghamii* (P3)
- *Vigna triodiophila* (P3)
- *Eragrostis surreyana* (P3).

Descriptions of these species, and their location and abundance within the survey area is discussed in the following sections.

4.2.1.3.1 *Terminalia supranitifolia* (P3)

Terminalia supranitifolia is a low spreading tree or shrub to 3 metres (m) which occurs on basalt rockpiles, outcrops and gullies on the Burrup Peninsula, and near the Chichester Ranges, south of Karratha (WAH 2020; Trudgen 2002) (Plate 1 and Plate 2). The species is associated with the rock piles including the *Burrup Peninsula rock pile communities* PEC (Priority 1). A total of 109 individuals were recorded at 72 locations within the survey area (Figure H). The species was recorded within six of the vegetation units described and mapped for the survey area which were associated with the narrow interrupted small coastal rockpiles, rocky low rises, and the slopes and drainage lines of the rocky hills.

Plate 3: ***Terminalia supranitifolia*** **(P3) growing on a rock pile within the survey area**

Plate 4: ***Terminalia supranitifolia*** **(P3) not associated with rock pile vegetation**

4.2.1.3.2 *Rhynchosia bungarensis* (P4)

This pea is a compact perennial creeper, sometimes forming a dense shrub growing to around 0.5 m, with sticky tri-foliate leaves and yellow flowers (Plate 3 and Plate 4). It occurs on coarse sand amongst boulders and along drainage lines and rocky gullies (WAH 2020; Trudgen 2002). Although not exclusive to it the species is associated with the *Burrup Peninsula rock pile communities* PEC (Priority 1). A total of 83 individuals were recorded at 27 locations within the survey area (Figure H). The species was recorded within five of the vegetation units described and mapped for the survey area which were predominantly associated with the rocky low rises, and the slopes and drainage lines of the rocky hills.

Plate 5: ***Rhynchosia bungarensis*** **(P4) within the survey area**

Plate 6: ***Rhynchosia bungarensis*** **(P4) flower**

4.2.1.3.3 Gymnanthera cunninghamii (P3)

Gymnanthera cunninghamii is an erect shrub growing to 2 m. It flowers January to December and occurs on sandy soils (WAH 2020) (Plate 5 and Plate 6). A total of 24 individuals were recorded at five locations within the survey area (Figure H). The species was recorded within two of the vegetation units described and mapped for the landward side of the coastal dunes on the gently undulating plain, and in adjacent drainage zones.

Plate 7: ***Gymnanthera cunninghamii*** **(P3) within the survey area**

Plate 8: ***Gymnanthera cunninghamii*** **(P3) within the survey area**

4.2.1.3.4 Vigna triodiophila (P3)

Vigna triodiophila is a slender twining vine. Flowers are yellow. The species occurs in soils pockets between rocks on stony plains, rockpiles, hillslopes, crests and plateaus of stony and rocky hills (WAH 2020) (Plate 7 and Plate 8). A total of nine individuals were recorded at four locations within the survey area (Figure H).

Within the survey area the species occurred in *Triodia epactia* hummock grassland with scattered *Hakea lorea subsp lorea, Cullen lachnostachys, Ipomoea costata, Acacia colei* shrubs on the gently undulating stony plain and slopes with small outcroppings and low rockpiles around Conzinc Bay.

Plate 9: ***Vigna triodiophila*** **(P3) within the survey area**

Plate 10: ***Vigna triodiophila*** **(P3) flower**

4.2.1.3.5 Eragrostis surreyana (P3)

Eragrostis surreyana is a small annual tussock grass growing to around 5 cm. It is associated with watercourses and wetlands (WAH 2020) (Plate 9 and Plate 10). A total of 50 individuals were recorded at one location within the survey area (Figure H) along a narrow drainage line in *Terminalia circumalata* and *Eucalyptus victrix* low woodland with *Acacia coriacea, Flueggea virosa* subsp. *melanthesoides* over *Triodia angusta* hummock grassland with patchy *Triodia epactia* with scattered *Cyperus vaginatus* sedges.

Plate 11: ***Eragrostis surreyana*** **(P3) within the survey area**

Plate 12: ***Eragrostis surreyana*** **(P3) and** ***Peplidium*** **sp. E Evol. Fl. Fauna Arid Aust (A.S. Weston 12768) (rarely recorded on the Burrup)**

4.2.1.4 Flora of other conservation significance

There are a number of other criteria (apart from the Commonwealth and Western Australian criteria of TF and PF) under which flora taxa may be considered to be of 'other' conservation significance. These taxa are considered significant in EPA (2016) under various categories which include:

- Locally endemic or association with a restricted habitat type (e.g. surface water or groundwater dependent ecosystems)
- New species or anomalous features that indicate a potential new species
- Representative of the range of a species (particularly, at the extremes of range recently discovered range extensions, or isolated outliers of the main range)
- Unusual species, including restricted subspecies, varieties or naturally occurring hybrids
- Relictual status, being representative of taxonomic groups that no longer occur widely in the broader landscape.

These taxa are not protected under Commonwealth or state legislation but are required to be assessed as part of flora and vegetation assessments.

A total of fifteen flora taxa recorded within the survey area are conservation significant based on one or more of the criteria listed above (Table 8).

Table 8: Flora taxa of 'other' conservation significance within the survey area

Taxon	Other significance*	Detail	Floristic sites
Abutilon oxycarpum subsp. Prostrate	un	A definite prostrate version of *Abutilon oxycarpum* – also represented in the Pilbara Ref Collection as *Abutilon* aff *oxycarpum* S van Leeuwen 1276)	W-05, W-06
Alectryon oleifolius	ra	This represents the northern-most extent of the species' known range	CZ-07, CZ-15, CZ-18, CZ-20, CZ-26, CZ-29, CZ-30, CZ-39, CZ-41, CZ-42, CZ-60, CZ-77
Dicliptera armata	ra	Very disjunct population from the northern Kimberley population. Potentially different species.	CZ-07, CZ-18, C-19, CZ-60, CZ-62, CZ-69

Taxon	Other significance*	Detail	Floristic sites
Dolichandrone occidentalis	ra; un	First time the taxon has been recorded on the Burrup Peninsula since R. Buckley in 1972. The occurrence of *Dolichandrone occidentalis* on the Burrup is also highly unusual – it occurs on the Pilbara coastal flats in the Karratha area (but not commonly). Not recorded during the Trudgen 2002 survey. Recorded on flats where Yara plant now is by V. Long and also Trudgen/Morgan during surveys for that facility. Its occurrence where it was found in rocky coastal habitat is considered highly unusual. (V. Long pers com)	CZ-13, CZ-15, CZ-29
Eragrostis surreyana	en	As well as being a P3 taxon *Eragrostis surreyana* is also association with a restricted habitat type	None (near CZ-36)
Hibiscus sturtii var. *campylochlamys*	ra	Recorded by Trudgen (2002) but not represented on the Burrup on Florabase – this record therefore represents a range extension	CZ-16, CZ-18, CZ-19, CZ-23, CZ-37, CZ-44, CZ-51, CZ-64, CZ-74, W-01, W-02, W-03, W-06
Ipomoea polymorpha	ra	Not previously recorded on the Burrup Peninsula	CZ-66
Peplidium sp. E Evol.fl.fauna Arid Aust (A.S. Weston 12768)	ra	Rarely recorded on the Burrup Peninsula. No records for the Burrup Peninsula on Florabase. Northern extent of known range	None (near CZ-36)
Pluchea ferdinandi-muelleri	ra	Only one Trudgen (2002) record in the vicinity. V. Long has not previously recorded this taxon on the northern Burrup Peninsula	CZ-29
Polygala isingii	ra	No records for the Burrup Peninsula on Florabase (although Trudgen (2002) recorded a Polygala sp. (M23-2))	CZ-16, W-03
Terminalia supranitifolia	en; re	As well as being a P3 taxon *Terminalia supranitifolia* is also associated with a locally restricted habitat type, is fire sensitive, and is relictual	CZ-05, CZ-18, CZ-20, CZ-29, CZ-30, CZ-61, CZ-75
Themeda triandra	un	*Themeda triandra* is currently being reviewed as a species. Trudgen (2002) noted the *Themeda* sp. on the Burrup as an unusual entity and refers to it as *Themeda* sp. Burrup (B84) throughout his report. It has the potential to be a new subspecies.	CZ-07, CZ-23
Vigna triodiophila	en	As well as being a P3 taxon *Vigna triodiophila* is also locally endemic	CZ-45, CZ-63
Zaleya galericulata	ra	First time the taxon has been recorded on the Burrup Peninsula since R. Buckley in 1972	CZ-29
Zornia muelleriana subsp. *congesta*	ra	This is the south western extent of the taxon's known range	W-05

* 'Other' significance criteria

en - locally endemic or association with a restricted habitat type (e.g. surface water or groundwater dependent ecosystems)

n - new species or anomalous features that indicate a potential new species

ra - representative of the range of a species (particularly, at the extremes of range recently discovered range extensions, or isolated outliers of the main range)

un - unusual species, including restricted subspecies, varieties or naturally occurring hybrids

re - relictual status, being representative of taxonomic groups that no longer occur widely in the broader landscape.

4.2.1.5 Introduced flora (weeds)

Five naturalised alien (weed) species were recorded for the survey area, representing 2.7% of the total flora taxa recorded. **Aerva javanica* (kapok) was the most wide-spread weed within the survey area and was recorded in patches throughout the coastal sandy dune vegetation along the access track and around Conzinc Bay. Weed species recorded within the survey area in order of abundance are listed in Table 9 and their location and extent are mapped in Figure I.

Table 9: Weed species recorded within the survey area

Family	Taxon	Common name	Number of sites	% of sites
AMARANTHACEAE	**Aerva javanica*	Kapok	27	31.4
ASTERACEAE	**Flaveria trinervia*	Speedy weed	0 (opportunistic)	0
MALVACEAE	**Malvastrum americanum*	Spiked malvastrum	4	4.7
POACEAE	**Cenchrus ciliaris*	Buffel grass	2	2.3
POACEAE	**Setaria verticillata*	Whorled pidgeon grass	1	1.2

4.2.1.5.1 Declared pests and WONS

The Western Australian Organism List (WAOL) database was searched to determine the legal status of each weed recorded, and any control requirements that may apply under the BAM Act. None of the five species were determined to be Declared Pests or are listed as WONS (Table 10).

Table 10: Weed species recorded within the survey area, their legal status and control requirements under the BAM Act

Name	Legal status	Control / keeping category
**Aerva javanica*	Permitted – s11	
**Malvastrum americanum*	Permitted – s11	
**Cenchrus ciliaris*	Permitted – s11	
**Setaria verticillata*	Permitted – s11	
**Flaveria trinervia*	Permitted – s11	

4.2.2 Vegetation

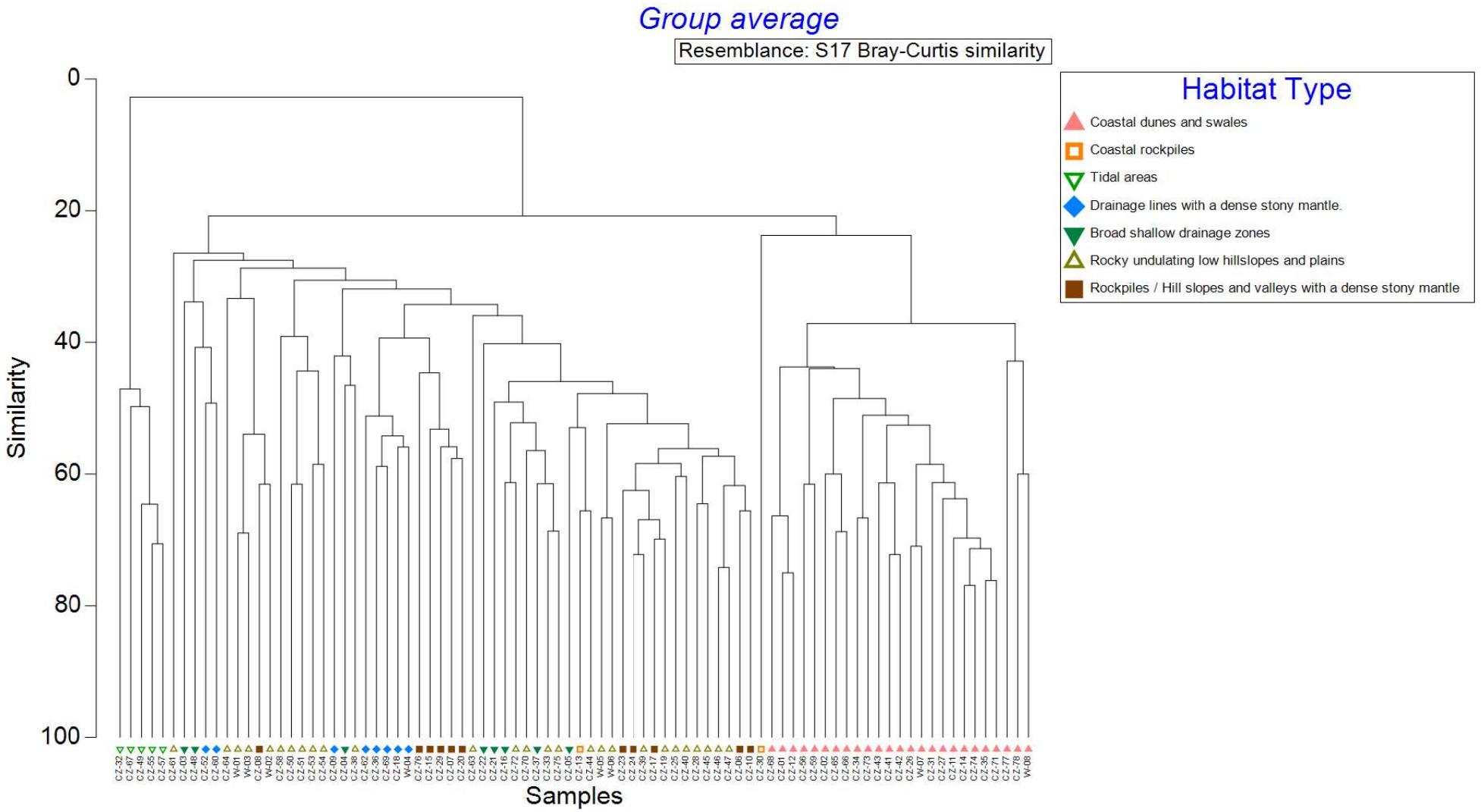
4.2.2.1 Habitat types

The detailed survey identified seven broad habitat types across the range of landforms within the survey area as follows:

- Tidal areas – (mangal and fringing samphire flats subject to tidal inundation)
- Coastal dunes and swales – (primary, secondary and remnant beach dunes)
- Rocky undulating low hillslopes and plains – (stony and rocky low hills and lower hillslopes and flats)
- Broad shallow drainage zones – (low-lying drainage areas / basins on a range of substrates)
- Drainage lines with a dense stony mantle – (shallow to deeply incised drainage lines)
- Rockpiles / hill slopes and valleys with a dense stony mantle – (rocky hills with boulders and outcropping, a dense mantle with vegetated soil pockets)
- Coastal rockpiles – (interrupted small coastal rockpiles on the landward side of beach dunes).

4.2.2.2 Vegetation units

A total of 31 vegetation units were described and mapped for the survey area. Additionally, three other mapping units were defined which represented areas devoid of vegetation (Bare, Sand and Mudflats). The vegetation units were defined from 86 floristic quadrats and 43 mapping notes. As stated in methods, vegetation community mapping was conducted using a combination of aerial photo-interpretation, on-ground confirmation, vegetation structure data, and multivariate analysis of the floristic quadrat data. The hierarchical cluster analysis of the quadrat data determined there to be three floristically distinct groups of sites which correlated with the three broad habitats present within the survey area: coastal; tidal; and rocky hillslopes, plains and drainage lines (Graph 4).



Graph 4: Classification dendrogram showing grouping of the 86 survey quadrats based on floristics and in relation to habitat type

The vegetation unit mapping is presented in Figures J-1 to J-4 at the rear of the report. A brief description of the vegetation units, their extent (ha) within the survey area, and the floristic sites representative of them is presented in Table 11. The vegetation units are described in further detail in the following sections.

Table 11: Vegetation units described and mapped for the survey area

Veg Unit	Description	Area (ha)	Percentage (%)	Quadrats
Coastal dunes and swales				
AbAjTe	*Acacia bivenosa* tall open shrubland over **Aerva javanica* low shrubland to low closed shrubland over *Triodia epactia* low open hummock grassland or isolated clumps of hummock grasses.	1.42	1.19	W-07 W-08 CZ-78
AcAjTe	*Acacia coriacea* tall shrubland over **Aerva javanica* low shrubland over *Triodia epactia* open hummock grassland (sometimes with *Adriana tomentosa* low isolated shrubs).	0.75	0.63	CZ-26 CZ-71 CZ-77
AcAtSlTe	*Acacia coriacea* tall shrubland over *Adriana tomentosa* low open shrubland over *Spinifex longifolius* and *Triodia epactia* low to mid open tussock / hummock grassland.	3.90	3.28	CZ-31 CZ-41 CZ-42
Aj (ScAt)Te	**Aerva javanica* low shrubland (with *Scaevola cunninghamii* and *Adriana tomentosa*) over *Triodia epactia* low open hummock grassland to isolated hummock grasses.	1.21	1.02	CZ-02 CZ-05 CZ-65 CZ-66
AtSlTe	*Adriana tomentosa* low shrubland over *Triodia epactia* (sometimes with *Triodia angusta*) and *Spinifex longifolius* low to mid hummock / tussock grassland.	4.69	3.95	CZ-11 CZ-43 CZ-33 CZ-35
AtTe	*Adriana tomentosa* low shrubland over *Triodia epactia* hummock grassland over a closed annual forbland.	3.60	3.03	CZ-22 CZ-72
AtAjTeSl	*Adriana tomentosa* and **Aerva javanica* low shrubland over *Triodia epactia* or *Spinifex longifolius* low to mid open hummock/ tussock grassland to isolated hummock/tussock grasses (sometimes with *Acacia coriacea* tall to mid isolated shrubs).	4.13	3.48	CZ-27 CZ-14 CZ-74
ScWaSl	*Scaevola cunninghamii* low shrubland over (regenerating) *Whiteochloa airoides*, *Spinifex longifolius* and *Triodia epactia* low to mid open tussock / hummock grassland to isolated grasses.	1.13	0.95	CZ-01 CZ-68
Sl	*Spinifex longifolius* low to mid open tussock grassland.	2.81	2.37	CZ-34 CZ-12 CZ-73
TtTe	*Trianthema turgidifolia* low shrubland over *Triodia epactia* low hummock grassland.	1.61	1.35	CZ-56 CZ-59
Sand	Beach sand – no vegetation	0.13	0.11	-
Bare	Bare areas – no vegetation	1.32	1.11	-
Coastal rockpiles				
AcIcFaTe	*Acacia coriacea, Ipomoea costata, Ficus aculeata* var. *indecora* low woodland (often with *Brachychiton acuminatus, Ficus virens* var. *virens* and *Dichrostachys spicata*) over *Triodia epactia* low open hummock grassland to isolated hummock grasses.	2.84	2.39	CZ-13 CZ-15 CZ-30
Tidal areas				
AmThSd	*Avicennia marina* subsp. *marina* low closed forest fringed with *Tecticornia halocnemoides* subsp. *tenuis, Surreya diandra, Frankenia pauciflora* low closed shrubland.	2.45	2.06	Mapped from mapping notes MN-01 MN-02 MN-29

Veg Unit	Description	Area (ha)	Percentage (%)	Quadrats
AmRsCa	*Avicennia marina* subsp *marina* low closed forest with *Ceriops australis* (landward) and *Rhizophora stylosa* and *Bruguiera exaristata* (seaward).	1.63	1.37	Mapped from mapping notes MN-27 MN-28 MN-32 MN-37
ThTt	*Tecticornia halocnemoides* subsp. *tenuis* and *Trianthema turgidifolia* low shrubland (with *Tecticornia indica* subsp. *leiostachya, Frankenia pauciflora* and *Surreya diandra*) over *Sporobolus virginicus* low sparse tussock grassland to isolated tussock grasses.	3.01	2.53	CZ-32 CZ-49 CZ-55 CZ-57 CZ-67
Mudflat	Tidal mudflat – no vegetation	0.28	0.24	
Rocky undulating low hillslopes and plains				
Ai(GpHl)Te	*Acacia inaequilatera* tall shrubland (often with *Hakea lorea* subsp. *lorea* / *Grevillea pyramidalis*) over *Triodia epactia* low hummock grassland (with *Triodia wiseana* isolated hummock grasses) over an annual closed forbland.	2.66	2.23	CZ-23 CZ-39 W-06
AoTe	*Acacia orthocarpa* open shrubland (with *Stylobasium spathulatum*) over *Triodia epactia* hummock grassland over an annual forbland.	0.66	0.55	CZ-63 CZ-64
GpHlTe/Tw	*Grevillea pyramidalis* tall open shrubland (with *Hakea lorea* subsp. *lorea*) over *Triodia epactia* hummock grassland or *Triodia epactia / T. wiseana* hummock grassland.	23.90	20.10	CZ-19 CZ-24 CZ-28 CZ-40
Te with scattered shrubs	*Triodia epactia* low hummock grassland (with *Hakea lorea* subsp. *lorea, Cullen lachnostachys, Ipomoea costata* and *Acacia colei* mid sparse shrubland to isolated shrubs and *T. wiseana* isolated clumps of hummock grasses over an annual forbland).	13.16	11.07	CZ-06 CZ-10 CZ-45 CZ-46 CZ-47 CZ-44 W-05
TeTa	*Triodia epactia* and *T. angusta* hummock grassland (with isolated shrubs).	3.16	2.66	CZ-50 CZ-51 CZ-54 CZ-61
Tw	*Triodia wiseana* low hummock grassland.	2.85	2.40	W-01 W-02 W-03
TwTaTe	*Triodia wiseana* low hummock grassland (with *T. angusta* and *T. epactia* and *Acacia colei* and *A. bivenosa* mid isolated shrubs and an annual forbland).	2.63	2.21	CZ-25 CZ-70
Te coastal	*Triodia epactia* low hummock grassland.	1.26	1.06	CZ-58 CZ-53
Rockpiles / hillslopes and valleys with a dense stony mantle				
BaAcTsTe	*Brachychiton acuminatus, Acacia coriacea, Terminalia supranitifolia, Flueggea virosa* subsp. *melanthesoides* low woodland (with *Dichrostachys spicata* and *Alectryon oleifolius*) over *Rhagodia eremaea, Scaevola spinescens* (broad form), *Jasminum didymium* subsp. *lineare* over *Triodia epactia* and *Cymbopogon ambiguus* mid isolated hummock / tussock grasses.	4.14	3.48	CZ-07 CZ-29 CZ-20

Veg Unit	Description	Area (ha)	Percentage (%)	Quadrats
ImTwTe(Ta)	*Indigofera monophylla* low open shrubland over *Triodia wiseana, T. epactia* (and sometimes *T. angusta*) low to mid hummock grassland (sometimes with *Hakea lorea* subsp. *lorea, Grevillea pyramidalis* tall to mid isolated shrubs), or small rockpiles with *Brachychiton acuminatus, Ehretia saligna* and *Flueggea virosa* subsp. *melanthesoides*).	14.56	12.25	CZ-08 CZ-16 CZ-17
Drainage lines with a dense stony mantle.				
AaTaTe	*Acacia ampliceps* open tall shrubland over *Triodia angusta* and *T. epactia* low hummock grassland (sometimes with *Myoporum montanum* mid shrubland and a closed annual forbland).	0.79	0.67	CZ-03 CZ-52 CZ-60
TcEvTa/TeCv	*Terminalia circumalata* and *Eucalyptus victrix* low woodland (with *Acacia coriacea, Flueggea virosa* subsp. melanthesoides) over *Triodia angusta* low to mid hummock grassland (with *Triodia epactia* low isolated hummock grasses and *Cyperus vaginatus* isolated sedges).	2.46	2.07	W-04 CZ-36 CZ-69
TcFvBaTs	*Terminalia circumalata* low woodland (with *Flueggea virosa* subsp. *melanthesoides, Brachychiton acuminatus* and *Terminalia supranitifolia*) over *Triodia angusta / T. epactia* low to mid open hummock grassland.	0.09	0.08	CZ-18 CZ-62 CZ-76
Broad shallow drainage zones				
ChAbTaTe	*Corymbia hamersleyana* low open woodland (with some *Flueggea virosa* subsp. *melanthesoides*) over *Triodia epactia* and *T. angusta* low to mid hummock grassland.	0.70	0.59	CZ-21
Ta	*Triodia angusta* low to mid hummock grassland (with *Acacia bivenosa* mid isolated shrubs).	6.00	5.05	CZ-04 CZ-38 CZ-48
Ac(TsGc)Te	*Acacia coriacea* and *Terminalia supranitifolia* (P3) very old trees with *Pittosporum phillyreoides, Gymnanthera cunninghamii* (P4) over *Adriana tomentosa* open shrubland over scattered *Triodia epactia* hummock grasses	0.08	0.07	Mapped from mapping note MN-18
AbTa	*Acacia bivenosa* open tall shrubland over *Triodia angusta hummock* grassland with some *Triodia epactia.* There can be scattered to open shrubland of *Stylobasium spathulatum* with annual herbland.	2.86	2.41	CZ-09 CZ-37 CZ-75

4.2.2.2.1 Coastal dunes and swales

A total of ten vegetation units were defined for the coastal dunes and swales within the survey area.

***AbAjTe - Acacia bivenosa* tall open shrubland over *Aerva javanica low shrubland to low closed shrubland over *Triodia epactia* low open hummock grassland or isolated clumps of hummock grasses**

This unit (Plate 11) was mapped for an area of remnant low beach dune at the southern end of the survey area where the proposed access road intercepts the coastal dunes. This vegetation type was in Poor to Degraded condition due to dense infestation by Kapok (**Aerva javanica*), and disturbance from vehicular traffic.

Associated species include: *Acacia ampliceps, Acacia bivenosa, Acacia coriacea, Adriana tomentosa, *Aerva javanica, Boerhavia schomburgkiana, Cleome viscosa, Corchorus walcottii, Euphorbia australis, Indigofera colutea, Scaevola spinescens* (broad form), *Tephrosia rosea* var. *clementii, Tribulus occidentalis, Trichodesma zeylanicum,* and *Triodia epactia*.

No conservation significant flora species were recorded in this unit.

Plate 13: *AbAjTe* vegetation unit

AcAjTe - *Acacia coriacea* tall shrubland over **Aerva javanica* low shrubland over *Triodia epactia* open hummock grassland (sometimes with *Adriana tomentosa* low isolated shrubs)

This unit (Plate 12) was mapped for the crests and steep slopes of a remnant beach dune at the southern end of the survey area where the proposed access road intercepts the coastal dunes. This vegetation type was in Degraded condition due to dense infestation by Kapok (**Aerva javanica*), and disturbance from vehicular traffic.

Associated species include: *Acacia bivenosa, Acacia coriacea, Adriana tomentosa, *Aerva javanica, Amaranthus undulatus, Boerhavia gardneri, Boerhavia schomburgkiana, Cleome viscosa, Euphorbia drummondii, Euphorbia tannensis* subsp. *eremophila, Euphorbia trigonosperma, Goodenia microptera, Indigofera linifolia, Indigofera monophylla, Rhagodia preissii* subsp. *obovata, Scaevola spinescens* (broad form)*, Spinifex longifolius, Swainsona formosa, Swainsona pterostylis, Tinospora smilacina, Trichodesma zeylanicum, Triodia epactia,* and *Whiteochloa airoides.*

No conservation significant flora species were recorded in this unit.

Plate 14: *AcAjTe* vegetation unit

***AcAtSlTe - Acacia coriacea* tall shrubland over *Adriana tomentosa* low open shrubland over *Spinifex longifolius* and *Triodia epactia* low to mid open tussock / hummock grassland**

This unit (Plate 13) was mapped for the crests of the beach dunes around Conzinc Bay. Where weeds were absent this vegetation type was in Excellent condition. Kapok (**Aerva javanica*) was present at < 2% density at one site (CZ-41). Parts of this vegetation type were highly disturbed by traffic and camping activities.

Associated species include: *Acacia coriacea, Adriana tomentosa, *Aerva javanica, Alectryon oleifolius, Amaranthus undulatus, Boerhavia gardneri, Cleome viscosa, Euphorbia drummondii, Euphorbia tannensis subsp. eremophila, Euphorbia trigonosperma, Indigofera linifolia, Indigofera monophylla, Jasminum didymum subsp. lineare, Pittosporum phillyreoides, Spinifex longifolius,* and *Triodia epactia.*

No conservation significant flora species were recorded in this unit.

Plate 15: *AcAtSlTe* vegetation unit

***Aj(ScAt)Te - *Aerva javanica* low shrubland (with *Scaevola cunninghamii* and *Adriana tomentosa*) over *Triodia epactia* low open hummock grassland to isolated hummock grasses**

This unit (Plate 14) was mapped for a broad drainage zone / secondary dune between a tidal creek and rocky hillslopes at the northern-most end of the survey area on Conzinc Bay. Condition was Poor to Degraded in areas where Kapok (**Aerva javanica*) and Buffel Grass (**Cenchrus ciliaris*) were present at > 2% density.

This vegetation (at CZ-65) would have once represented *Coastal dune native tussock grassland dominated by Whiteochloa airoides* PEC (P3) but has now been degraded by tracks, fire and weeds.

Associated species include: *Adriana tomentosa, *Aerva javanica, Boerhavia gardneri, *Cenchrus ciliaris, Cleome viscosa, Euphorbia drummondii, Euphorbia tannensis subsp. eremophila, Euphorbia trigonosperma, Indigofera linifolia, Pterocaulon sphaeranthoides, Scaevola cunninghamii, Swainsona formosa, Swainsona pterostylis, Tribulus occidentalis, Triodia epactia,* and *Triumfetta clementii.*

One taxon recorded in this vegetation, *Ipomoea polymorpha,* is considered to be of conservation significance having not previously been recorded on the Burrup Peninsula.

Plate 16: *Aj(ScAt)Te* vegetation unit

***AtSlTe - Adriana tomentosa* low shrubland over *Triodia epactia* (sometimes with *Triodia angusta*) and *Spinifex longifolius* low to mid hummock / tussock grassland**

This unit (Plate 15) was mapped for the crest and leeward side of the foredune, swale and hind-dune at the southern end of Conzinc Bay. Condition was Very Good to Excellent but with some disturbance by weeds and vehicle tracks.

Some of this vegetation (at CZ-11) may once have been *Coastal dune native tussock grassland dominated by Whiteochloa airoides* PEC (P3) but due to disturbance it has largely been replaced by opportunistic native and **Aerva javanica* introduced species.

Associated species include: *Acacia coriacea, Adriana tomentosa, *Aerva javanica, Amaranthus undulatus, Boerhavia schomburgkiana, Canavalia rosea, Cleome viscosa, Euphorbia drummondii, Euphorbia tannensis subsp. eremophila, Euphorbia trigonosperma, Indigofera linifolia, Indigofera monophylla, Ipomoea costata, Portulaca filifolia, Pterocaulon sphacelatum, Scaevola cunninghamii, Spinifex longifolius, Swainsona formosa, Synaptantha tillaeacea, Trichodesma zeylanicum, Triodia epactia* and *Whiteochloa airoides.*

No conservation significant flora species were recorded in this unit.

Plate 17: *AtSlTe* vegetation unit

***AtTe - Adriana tomentosa* low shrubland over *Triodia epactia* hummock grassland over a closed annual forbland**

This unit (Plate 16) was mapped for some low-lying areas on the landward side of secondary dunes around Conzinc Bay. Condition ranged from Good to Excellent depending on the presence and abundance of weeds including **Aerva javanica* and **Malvastrum americanum*.

Associated species include: *Acacia bivenosa, Acacia coriacea, Adriana tomentosa, *Aerva javanica, Boerhavia gardneri, Cleome viscosa, Corchorus walcottii, Crotalaria medicaginea, Crotalaria novae-hollandiae subsp. crassipes, Cullen lachnostachys, Dysphania plantaginella, Dysphania rhadinostachya, Euphorbia tannensis subsp. eremophila, Flueggea virosa, Gymnanthera cunninghamii* (P3), *Indigofera linifolia, Ipomoea costata, *Malvastrum americanum, Paspalidium clementii, Portulaca filifolia, Pterocaulon sphacelatum, Pterocaulon sphaeranthoides, Ptilotus fusiformis, Solanum phlomoides, Streptoglossa decurrens, Swainsona formosa, Tephrosia* sp. NW Eremaean (S. van Leeuwen et al. PBS 0356)*, Tephrosia supina, Triodia epactia* and *Triumfetta clementii.*

Priority 3 taxon *Gymnanthera cunninghamii* was recorded within this vegetation unit.

Plate 18: *AtTe* vegetation unit

***AtAjTeSl* - *Adriana tomentosa* and **Aerva javanica* low shrubland over *Triodia epactia* or *Spinifex longifolius* low to mid open hummock / tussock grassland to isolated hummock / tussock grasses (sometimes with *Acacia coriacea* tall to mid isolated shrubs)**

This unit (Plate 17) was mapped for the slopes and swales on the landward side of beach dunes around Conzinc Bay. Condition was generally Poor due to the presence of **Aerva javanica,* and disturbance by vehicle tracks and fire. It is recommended that vehicle access be restricted.

Associated species include: *Acacia bivenosa, Acacia coriacea, Adriana tomentosa, Aerva javanica, Boerhavia schomburgkiana, Cleome viscosa, Crotalaria novae-hollandiae, Cuscuta victoriana, Euphorbia drummondii, Euphorbia tannensis, Goodenia microptera, Indigofera linifolia, Indigofera monophylla, Pterocaulon sphaeranthoides, Swainsona pterostylis, Tribulus terrestris, Trichodesma zeylanicum, Triodia epactia* and *Whiteochloa airoides*

No conservation significant flora species were recorded in this unit.

Plate 19: *AtAjTeSl* vegetation unit

***ScWaSl* - *Scaevola cunninghamii* low shrubland over (regenerating) *Whiteochloa airoides, Spinifex longifolius* and *Triodia epactia* low to mid open tussock / hummock grassland to isolated grasses**

This unit (Plate 18) was mapped for an area of beach dune vegetation at the northern end of the survey area on Conzinc Bay. Vegetation condition was Excellent. It is recommended that access to this area is controlled.

This vegetation represents a remnant of the *Coastal dune native tussock grassland dominated by Whiteochloa airoides community* PEC. The weed species **Aerva javanica* was only found as a low percentage cove on the perimeter of the dune area in association with the mangrove creek. It is therefore considered that this PEC could be fully restored with the exception of an already degarded area for a proposed boardwalk, and thus it is considered as having high conservation significance.

Associated species include: *Adriana tomentosa*, **Aerva javanica, Amaranthus undulatus, Cleome viscosa, Euphorbia drummondii, Euphorbia tannensis, Euphorbia trigonosperma, Pterocaulon sphaeranthoides, Salsola australis, Scaevola cunninghamii, Spinifex longifolius, Synaptantha tillaeacea, Triodia epactia* and *Whiteochloa airoides.*

No conservation significant flora species were recorded in this unit.

Plate 20: *ScWaSl* vegetation unit

***Sl* - *Spinifex longifolius* low to mid open tussock grassland**

This unit (Plate 19) was mapped for much of the coastal foredune vegetation within the survey area, around Conzinc Bay. Vegetation condition ranged from Good to Excellent. **Aerva javanica* was present throughout this vegetation in varying densities. Other disturbances include vehicle tracks, evidence of camping and fire, and erosion which had led to loss of dune stability.

Associated species include: *Acacia coriacea, Adriana tomentosa, *Aerva javanica, Amaranthus undulatus, Boerhavia schomburgkiana, Cleome viscosa, Euphorbia drummondii, Euphorbia tannensis* subsp. *eremophila, Spinifex longifolius, Synaptantha tillaeacea* and *Tribulus occidentalis.*

No conservation significant flora species were recorded in this unit.

Plate 21: *Sl* vegetation unit

***TtTe* - *Trianthema turgidifolia* low shrubland over *Triodia epactia* low hummock grassland**

This unit (Plate 20) occurred on areas of remnant low coastal dunes adjacent to the mangrove lined tidal creek in the vicinity of the 'jump-up', and the tidal mudflat immediately to the north of it.

Associated species include: *Acacia bivenosa, Adriana tomentosa, Cleome viscosa, Cuscuta victoriana, Euphorbia drummondii, Euphorbia tannensis, Euphorbia trigonosperma, Goodenia microptera, Heliotropium cunninghamii, Indigofera linifolia, Portulaca filifolia, Scaevola spinescens (*broad form*), Spinifex longifolius, Swainsona formosa, Swainsona pterostylis, Synaptantha tillaeacea, Trianthema turgidifolia* and *Triodia epactia.*

No conservation significant flora species were recorded in this unit.

Plate 22: *TtTe* vegetation unit

4.2.2.2.2 Coastal rockpiles

***AcIcFaTe - Acacia coriacea, Ipomoea costata, Ficus aculeata* var. *indecora* low woodland (often with *Brachychiton acuminatus, Ficus virens* var. *virens* and *Dichrostachys spicata*) over *Triodia epactia* low open hummock grassland to isolated hummock grasses**

This unit (Plate 21) occurred on Narrow interrupted small coastal rockpiles on the landward side of the beach dunes. Condition ranged from Good (where **Aerva javanica* was present in at 2-15% density) to Excellent.

Associated species include: *Acacia bivenosa, Adriana tomentosa, Cleome viscosa, Cuscuta victoriana, Euphorbia drummondii, Euphorbia tannensis, Euphorbia trigonosperma, Goodenia microptera, Heliotropium cunninghamii, Indigofera linifolia, Portulaca filifolia, Scaevola spinescens (*broad form*), Spinifex longifolius, Swainsona formosa, Swainsona pterostylis, Synaptantha tillaeacea, Trianthema turgidifolia* and *Triodia epactia.*

No conservation significant flora species were recorded in this unit.

Plate 23: *AcIcFaTe* vegetation unit

4.2.2.2.3 Tidal areas

***AmThSd - Avicennia marina* subsp. *marina* low closed forest fringed with *Tecticornia halocnemoides* subsp. *tenuis, Surreya diandra, Frankenia pauciflora* low closed shrubland**

This unit (Plate 22) occurred along the tidal creek at the northern end of the survey area and fringing (on the landward side of) the *AmRsCa* mangrove vegetation unit in the vicinity of the 'jump-up'. Vegetation condition ranged from Very Good (where **Aerva javanica* was present in at < 2% density) to Excellent.

This unit is representative of a conservation significant ecological community.

Associated species include: *Avicennia marina* subsp*. marina, Tecticornia halocnemoides* subsp*. tenuis, Surreya diandra* and *Frankenia pauciflora.*

No conservation significant flora species were recorded in this unit.

Plate 24: *AmThSd* vegetation unit

***AmRsCa - Avicennia marina* subsp. *marina* low closed forest with *Ceriops australis* (landward) and *Rhizophora stylosa* and *Bruguiera exaristata* (seaward)**

This unit (Plate 23) occurred along the tidal creek in the vicinity of the 'jump-up'. Vegetation condition for this unit was Excellent.

This unit is representative of a conservation significant ecological community.

Associated species include: *Avicennia marina* subsp. marina, *Ceriops australis, Rhizophora stylosa* and *Bruguiera exaristata*.

No conservation significant flora species or weed species were recorded in this unit.

Plate 25: *AmRsCa* vegetation unit

***ThTt - Tecticornia halocnemoides* subsp. *tenuis* and *Trianthema turgidifolia* low shrubland (with *Tecticornia indica* subsp. *leiostachya, Frankenia pauciflora* and *Surreya diandra*) over *Sporobolus virginicus* low sparse tussock grassland to isolated tussock grasses**

This unit (Plate 24) occurred on the supratidal creeklines draining into, and the flats fringing the mangal. Vegetation condition was Excellent.

Associated species include: *Dactyloctenium radulans, Dysphania kalpari, Dysphania plantaginella, Eragrostis falcata, Frankenia pauciflora, Muellerolimon salicorniaceum, Neobassia astrocarpa, Sporobolus virginicus, Surreya diandra, Swainsona pterostylis, Tecticornia halocnemoides, Tecticornia indica* subsp*. leiostachya* and *Trianthema turgidifolia*.

No conservation significant flora species or weed species were recorded in this unit.

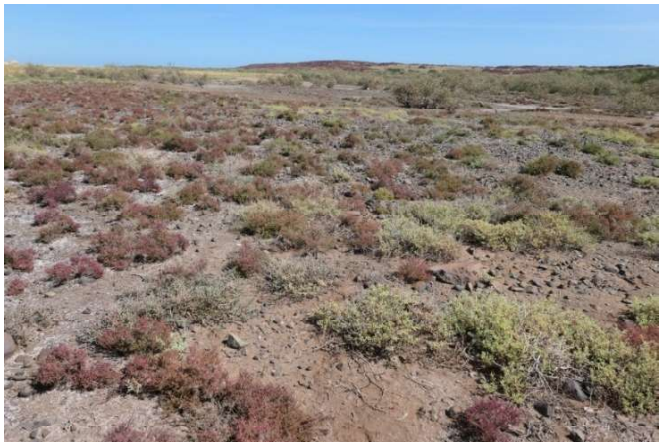


Plate 26: *ThTt* vegetation unit

4.2.2.2.4 Rocky undulating low hillslopes and plains

***Ai(GpHl)Te - Acacia inaequilatera* tall shrubland (often with *Hakea lorea* subsp. *lorea / Grevillea pyramidalis*) over *Triodia epactia* low hummock grassland (with *Triodia wiseana* isolated hummock grasses) over an annual closed forbland**

This unit (Plate 25) occurred on the gently undulating lower hillslopes often at the base of rockpiles. Condition was Excellent.

Associated species include: *Abutilon lepidum, Acacia bivenosa, Acacia colei, Acacia coriacea, Acacia inaequilatera, Alectryon oleifolius, Boerhavia coccinea, Boerhavia gardneri, Bonamia media, Cleome viscosa, Corchorus walcottii, Crotalaria medicaginea, Crotalaria novae-hollandiae, Cullen lachnostachys, Cymbopogon ambiguus, Cynanchum floribundum, Ehretia saligna, Euphorbia coghlanii, Gomphrena cunninghamii, Grevillea pyramidalis, Hakea lorea subsp. lorea, Hybanthus aurantiacus, Indigofera linifolia, Indigofera monophylla, Ipomoea costata, Paspalidium tabulatum, Rhynchosia bungarensis* (P4)*, Rhynchosia minima, Scaevola spinescens (broad form), Solanum phlomoides, Streptoglossa decurrens, Swainsona formosa, Tephrosia densa, Tephrosia* sp. NW Eremaean (S. van Leeuwen et al. PBS 0356)*, Tinospora smilacina, Trichodesma zeylanicum, Trigastrotheca molluginea, Triodia angusta, Triodia epactia, Triodia wiseana, Triumfetta appendiculata* and *Triumfetta clementii.*

The Priority 4 species *Rhynchosia bungarensis* (P4) was recorded in this unit.

Plate 27: *Ai(GpHl)Te* vegetation unit

***AoTe - Acacia orthocarpa* open shrubland (with *Stylobasium spathulatum*) over *Triodia epactia* hummock grassland over an annual forbland**

This unit (Plate 26) was mapped for two portions of the proposed access road on the midslopes and lower slopes of some of the stony hills. Condition was Excellent. No weeds species were recorded in this unit.

Associated species include: *Abutilon lepidum, Acacia orthocarpa, Boerhavia coccinea, Bonamia media, Cleome viscosa, Crotalaria medicaginea, Euphorbia australis, Euphorbia tannensis, Gomphrena cunninghamii, Grevillea pyramidalis, Indigofera monophylla, Rhynchosia bungarensis* (P4), *Solanum lasiophyllum, Stylobasium spathulatum, Trichodesma zeylanicum, Triodia epactia, Triumfetta appendiculata, Triumfetta clementii* and *Vigna triodiophila* (P3).

PF species *Rhynchosia bungarensis* (P4) and *Vigna triodiophila* (P3) were recorded in this unit.

Plate 28: *AoTe* vegetation unit

***GpHITe/Tw - Grevillea pyramidalis* tall open shrubland (with *Hakea lorea* subsp. *lorea*) over *Triodia epactia* hummock grassland or *Triodia epactia / T. wiseana* hummock grassland**

This unit (Plate 27) was mapped for a large portion of the rocky hillslopes and undulating low rises within the survey area. Vegetation within this unit was in Excellent condition. No weeds species were recorded in this unit.

Associated species include: *Abutilon lepidum, Acacia colei, Acacia coriacea, Boerhavia gardneri, Bonamia media, Cleome viscosa, Corchorus walcottii, Crotalaria novae-hollandiae* subsp. *crassipes, Cucumis variabilis, Cullen lachnostachys, Gomphrena cunninghamii, Goodenia microptera, Grevillea pyramidalis, Hakea lorea* subsp. *lorea, Hybanthus aurantiacus, Indigofera colutea, Indigofera linifolia, Indigofera monophylla, Paspalidium clementii, Ptilotus fusiformis, Rhynchosia minima, Scaevola spinescens (broad form), Solanum cleistogamum, Tephrosia* sp. NW Eremaean (S. van Leeuwen et al. PBS 0356), *Trichodesma zeylanicum, Triodia epactia* and *Triumfetta clementii.*

No conservation significant flora species were recorded in this unit.

Plate 29: *GpHITe/Tw* vegetation unit

***Te* with scattered shrubs - *Triodia epactia* low hummock grassland (with *Hakea lorea* subsp. *lorea*, *Cullen lachnostachys, Ipomoea costata* and *Acacia colei* mid sparse shrubland to isolated shrubs and *T. wiseana* isolated clumps of hummock grasses over an annual forbland)**

This unit (Plate 28) occurred on some of the rocky hillslopes and undulating low rises within the survey area. Vegetation within this unit was in Excellent condition. No weeds species were recorded in this unit.

Associated species include: *Abutilon lepidum, Acacia colei, Bonamia media, Bulbostylis barbata, Cleome viscosa, Crotalaria medicaginea, Crotalaria novae-hollandiae, Cullen lachnostachys, Cynanchum floribundum, Gomphrena cunninghamii, Grevillea pyramidalis, Hakea lorea* subsp*. lorea, Hybanthus aurantiacus, Indigofera colutea, Indigofera linifolia, Ipomoea costata, Paspalidium clementii, Portulaca filifolia, Portulaca oleracea, Ptilotus fusiformis, Streptoglossa decurrens, Tephrosia densa, Tephrosia* sp. NW Eremaean (S. van Leeuwen et al. PBS 0356), *Tephrosia supina, Trachymene oleracea, Trichodesma zeylanicum, Trigastrotheca molluginea, Triodia epactia, Triodia wiseana, Triumfetta appendiculata* and *Triumfetta clementii.*

Conservation significant species *Vigna triodiophila* (P3) and *Terminalia supranitifolia* (P3) were recorded within this unit.

Plate 30: *Te* with scattered shrubs vegetation unit

***TeTa* - *Triodia epactia* and *T. angusta* hummock grassland (with isolated shrubs)**

This unit (Plate 29) occurred on the gentle lower slopes tapering to the low remnant dunes and tidal flats north of the ‘jump-up’. Vegetation within this unit was in Excellent condition. No weeds species were recorded in this unit.

Associated species include: *Acacia colei, Acacia coriacea, Bonamia media, Cleome viscosa, Cymbopogon ambiguus, Cynanchum floribundum, Eriachne obtusa, Indigofera linifolia, Indigofera monophylla, Scaevola spinescens, Solanum horridum, Solanum phlomoides, Tephrosia* sp. B Kimberley Flora (C.A. Gardner 7300), *Trichodesma zeylanicum, Trigastrotheca molluginea, Triodia angusta, Triodia epactia, Triumfetta appendiculata* and *Triumfetta clementii.*

Conservation significant species *Terminalia supranitifolia* (P3) was recorded occasionally within this unit.

Plate 31: *TeTa* vegetation unit

***Tw - Triodia wiseana* low hummock grassland**

This unit (Plate 30) occurred on the undulating stony plain at the southern end of the survey area. Vegetation within this unit was in Excellent condition. No weeds species were recorded in this unit.

Associated species include: *Acacia bivenosa, Acacia colei, Boerhavia coccinea, Bonamia media, Cleome viscosa, Crotalaria novae-hollandiae, Euphorbia australis, Goodenia microptera, Hakea lorea* subsp*. lorea, Hibiscus sturtii* var*. campylochlamys, Hybanthus aurantiacus, Indigofera monophylla, Oldenlandia crouchiana, Senna glutinosa* subsp*. glutinosa, Sida* sp. Pilbara (A.A. Mitchell PRP 1543), *Solanum phlomoides, Streptoglossa decurrens, Tephrosia rosea* var*. clementii, Trachymene oleracea, Tribulus hirsutus, Triodia epactia, Triodia wiseana* and *Triumfetta clementii.*

No conservation significant flora species were recorded in this unit.

Plate 32: *Tw* vegetation unit

***TwTaTe - Triodia wiseana* low hummock grassland (with *T. angusta* and *T. epactia* and *Acacia colei* and *A. bivenosa* mid isolated shrubs and an annual forbland)**

This unit (Plate 31) occurred on the undulating gentle slopes and stony plains leading to the coast. Vegetation within this unit was in Excellent condition. No weeds species were recorded in this unit.

Associated species include: *Acacia bivenosa, Acacia colei, Acacia coriacea, Boerhavia gardneri, Bonamia media, Corchorus walcottii, Crotalaria medicaginea, Crotalaria novae-hollandiae, Euphorbia coghlanii, Evolvulus alsinoides* var*. villosicalyx, Grevillea pyramidalis, Indigofera linifolia, Paspalidium clementii, Scaevola spinescens* (broad form), *Streptoglossa decurrens, Swainsona formosa, Trichodesma zeylanicum, Triodia angusta, Triodia epactia, Triodia wiseana* and *Triumfetta clementii.*

No conservation significant flora species were recorded in this unit.

Plate 33: *TwTaTe* vegetation unit

***Te* coastal - *Triodia epactia* low hummock grassland**

This unit (Plate 32) occurred on the low remnant dunes leeward of the mangroves in the vicinity of the 'jump-up'. Vegetation within this unit was in Excellent condition. No weeds species were recorded in this unit.

Associated species include: *Adriana tomentosa, Boerhavia gardneri, Cleome viscosa, Euphorbia tannensis, Euphorbia trigonosperma, Indigofera colutea, Indigofera linifolia, Pterocaulon sphaeranthoides, Solanum phlomoides, Tribulus occidentalis, Triodia epactia* and *Triumfetta appendiculata.*

No conservation significant flora species were recorded in this unit.

Plate 34: *Te* coastal vegetation unit

4.2.2.2.5 Rockpiles / hillslopes and valleys with a dense stony mantle

***BaAcTsTe - Brachychiton acuminatus, Acacia coriacea, Terminalia supranitifolia, Flueggea virosa* subsp. *melanthesoides* low woodland (with *Dichrostachys spicata* and *Alectryon oleifolius*) over *Rhagodia eremaea, Scaevola spinescens* (broad form), *Jasminum didymium* subsp. *lineare* over *Triodia epactia* and *Cymbopogon ambiguus* mid isolated hummock / tussock grasses**

This unit (Plate 33) occurred on the rockpiles around Conzinc Bay. Vegetation within this unit was in Excellent condition. Weeds were present at low densities throughout some portions of this unit.

This unit represents the *Burrup Peninsula rock pile communities* Priority 1 PEC.

Associated species include: *Abutilon fraseri, Abutilon lepidum, Acacia coriacea, Alectryon oleifolius, Amaranthus undulatus, Boerhavia gardneri, Bonamia media, Brachychiton acuminatus, Cleome viscosa, Crotalaria novae-hollandiae, Cymbopogon ambiguus, Dichrostachys spicata, Dolichandrone occidentalis, Ehretia saligna, Flueggea virosa, Gomphrena cunninghamii, Indigofera linifolia, Indigofera monophylla, Ipomoea costata, Jasminum didymum* subsp. *lineare, *Malvastrum americanum, Paspalidium clementii, Paspalidium tabulatum, Phyllanthus maderaspatensis, Polycarpaea longiflora, Portulaca filifolia, Rhagodia*

eremaea, Rhynchosia bungarensis (P4)*, Scaevola spinescens* (broad form), *Streptoglossa decurrens, Terminalia supranitifolia* (P3), *Tinospora smilacina, Triodia epactia, Triumfetta clementii* and *Zaleya galericulata.*

PF species *Terminalia supranitifolia* (P3) and *Rhynchosia bungarensis* (P4) typically occurred within this unit.

Plate 35: *BaAcTsTe* vegetation unit

***ImTwTe(Ta) - Indigofera monophylla* low open shrubland over *Triodia wiseana, T. epactia* (and sometimes *T. angusta*) low to mid hummock grassland (sometimes with *Hakea lorea* subsp. *lorea, Grevillea pyramidalis* tall to mid isolated shrubs), or small rockpiles with *Brachychiton acuminatus, Ehretia saligna* and *Flueggea virosa* subsp. *melanthesoides*).**

This unit (Plate 34) occurred over a large area on the gently undulating hillslopes, and broad shallow drainage lines on the landward side of the coastal dunes around Conzinc Bay. Vegetation within this unit was in Excellent condition. No weeds species were recorded in this unit.

Associated species include: *Abutilon lepidum, Acacia bivenosa, Acacia colei, Boerhavia gardneri, Brachychiton acuminatus, Cleome viscosa, Crotalaria novae-hollandiae, Cucumis variabilis, Cullen lachnostachys, Cymbopogon ambiguus, Dichrostachys spicata, Euphorbia coghlanii, Gomphrena cunninghamii, Goodenia microptera, Grevillea pyramidalis, Hakea lorea* subsp*. lorea, Hybanthus aurantiacus, Indigofera linifolia, Indigofera monophylla, Ipomoea costata, Oldenlandia crouchiana, Paspalidium tabulatum, Portulaca filifolia, Rhynchosia minima, Scaevola spinescens* (broad form), *Streptoglossa decurrens, Tephrosia rosea var. clementii, Tephrosia* sp. NW Eremaean (S. van Leeuwen et al. PBS 0356), *Trachymene oleracea, Trichodesma zeylanicum, Triodia angusta, Triodia epactia, Triodia wiseana, Triumfetta appendiculata* and *Triumfetta clementii.*

No conservation significant flora species were recorded in this unit.

Plate 36: *ImTwTe(Ta)* vegetation unit

4.2.2.2.6 Drainage lines with a dense stony mantle.

***AaTaTe - Acacia ampliceps* open tall shrubland over *Triodia angusta* and *T. epactia* low hummock grassland (sometimes with *Myoporum montanum* mid shrubland and a closed annual forbland)**

This unit (Plate 35) occurred on the stony low drainage lines incising the undulating stony plains and low rises. Condition ranged from Good (where weed species **Malvastrum americanum* and **Flaveria trinervia* were recorded) to Excellent where no weeds or other disturbances were present. Mature *Acacia ampliceps* were often dead but in most cases some regeneration of young plants was occurring. It is a relatively short-lived species.

Associated species include: *Acacia ampliceps, Adriana tomentosa, Alectryon oleifolius, Amaranthus undulatus, Bonamia media, Cleome viscosa, Corchorus walcottii, Corymbia hamersleyana, Crotalaria medicaginea, Cucumis variabilis, Cymbopogon ambiguus, Dicliptera armata, Eucalyptus victrix, Euphorbia tannensis, Hybanthus aurantiacus, Indigofera colutea, Indigofera monophylla, Myoporum montanum, Paspalidium clementii, Paspalidium tabulatum, Pittosporum phillyreoides, Pluchea rubelliflora, Polymeria calycina, Portulaca filifolia, Portulaca oleracea, Rhagodia preissii subsp. obovata, Rhynchosia bungarensis* (P4), *Senna venusta, Sesbania cannabina, Stemodia grossa, Streptoglossa decurrens, Swainsona formosa, Tephrosia* sp. B Kimberley Flora (C.A. Gardner 7300), *Tephrosia supina, Trianthema turgidifolium, Tribulus occidentalis, Trigastrotheca molluginea, Triodia angusta, Triodia epactia, Triumfetta appendiculata* and *Triumfetta clementii.*

Priority taxon *Rhynchosia bungarensis* (P4) was recorded within this vegetation unit.

Plate 37: *AaTaTe* vegetation unit

***TcEvTa/TeCv - Terminalia circumalata* and *Eucalyptus victrix* low woodland (with *Acacia coriacea, Flueggea virosa* subsp. *melanthesoides*) over *Triodia angusta* low to mid hummock grassland (with *Triodia epactia* low isolated hummock grasses and *Cyperus vaginatus* isolated sedges)**

This unit (Plate 36) occurred on the rocky drainage lines and zones incising the undulating stony plains and low slopes throughout the survey area. Vegetation within this unit was in Excellent condition.

Associated species include: *Acacia coriacea, Acacia pyrifolia, Acacia pyrifolia var. morrisonii, Adriana tomentosa, Boerhavia coccinea, Brachychiton acuminatus, Capparis spinosa, Cassytha capillaris, Cleome viscosa, Clerodendrum tomentosum, Corchorus walcottii, Cucumis variabilis, Cymbopogon ambiguus, Cyperus bifax, Cyperus vaginatus, Dichrostachys spicata, Dicliptera armata, Ehretia saligna, Eriachne tenuiculmis, Eucalyptus victrix, Flueggea virosa, Gossypium australe, Indigofera colutea, Indigofera linifolia, Jasminum didymum subsp. lineare, *Malvastrum americanum, Operculina aequisepala, Paspalidium tabulatum, Phyllanthus maderaspatensis, Polymeria calycina, Portulaca filifolia, Rhagodia preissii* subsp. *obovata, Rhynchosia bungarensis* (P4), *Scaevola spinescens (broad form), Sesbania cannabina, Tephrosia* sp. NW Eremaean (S. van Leeuwen et al. PBS 0356), *Terminalia circumalata, Tinospora smilacina, Trachymene oleracea, Triodia angusta, Triodia epactia, Triumfetta appendiculata, Triumfetta clementii* and *Waltheria indica.*

Priority taxon *Rhynchosia bungarensis* (P4) was recorded within this vegetation unit.

Plate 38: *TcEvTa/TeCv* vegetation unit

***TcFvBaTs - Terminalia circumalata* low woodland (with *Flueggea virosa* subsp. *melanthesoides*, *Brachychiton acuminatus* and *Terminalia supranitifolia*) over *Triodia angusta / T. epactia* low to mid open hummock grassland**

This unit (Plate 37) occurred on one large granite boulder outcrop and in some of the narrow rocky drainage lines between hillslopes. Vegetation within this unit was in Excellent condition. No weed species were recorded in this vegetation unit.

This unit is associated with the *Burrup Peninsula rock pool communities* Priority 1 PEC.

Associated species include: *Acacia bivenosa, Acacia coriacea, Acacia pyrifolia, Acacia pyrifolia* var. *morrisonii, Alectryon oleifolius, Ammannia baccifera, Boerhavia gardneri, Bonamia media, Brachychiton acuminatus, Cassytha capillaris, Cleome viscosa, Corchorus walcottii, Crotalaria medicaginea, Cucumis variabilis, Cymbopogon ambiguus, Cyperus bifax, Cyperus vaginatus, Dichrostachys spicata, Dicliptera armata, Eriachne tenuiculmis, Ficus aculeata var. indecora, Flueggea virosa, Grevillea pyramidalis, Hibiscus sturtii var. campylochlamys, Indigofera linifolia, Ipomoea costata, Operculina aequisepala, Pittosporum phillyreoides, Pluchea rubelliflora, Rhynchosia bungarensis* (P4), *Scaevola spinescens, Sesbania cannabina, Stemodia grossa, Swainsona formosa, Terminalia circumalata, Terminalia supranitifolia* (P3), *Triodia angusta, Triodia epactia* and *Triumfetta clementii.*

PF species *Terminalia supranitifolia* (P3) and *Rhynchosia bungarensis* (P4) occurred in this vegetation unit.

Plate 39: *TcFvBaTs* vegetation unit

4.2.2.2.7 Broad shallow drainage zones

***ChAbTaTe* - *Corymbia hamersleyana* low open woodland (with some *Flueggea virosa* subsp. *melanthesoides*) over *Triodia epactia* and *T. angusta* low to mid hummock grassland**

This unit (Plate 38) occurred in broad shallow drainage zones on the gently undulating stony low hills and plains within the survey area. Vegetation within this unit was in Excellent condition. No weed species were recorded in this vegetation unit.

Associated species include: *Acacia bivenosa, Acacia colei, Acacia coriacea, Adriana tomentosa, Boerhavia coccinea, Bonamia media, Cassytha capillaris, Corchorus walcottii, Corymbia hamersleyana, Crotalaria medicaginea, Cucumis variabilis, Cullen lachnostachys, Dichrostachys spicata, Euphorbia australis, Euphorbia biconvexa, Euphorbia coghlanii, Euphorbia tannensis, Euphorbia tannensis* subsp. *eremophila, Flueggea virosa* subsp. *melanthesoides, Goodenia microptera, Grevillea pyramidalis, Jasminum didymum subsp. lineare, Paspalidium clementii, Paspalidium tabulatum, Phyllanthus maderaspatensis, Pittosporum phillyreoides, Pterocaulon sphaeranthoides, Rhagodia eremaea, Scaevola spinescens* (broad form), *Senna glutinosa subsp. glutinosa, Senna notabilis, Solanum cleistogamum, Solanum lasiophyllum, Solanum phlomoides, Streptoglossa decurrens, Streptoglossa odora, Stylobasium spathulatum, Swainsona formosa, Tephrosia rosea* var. *clementii, Tinospora smilacina, Trichodesma zeylanicum, Trichosanthes cucumerina, Triodia angusta, Triodia epactia, Triumfetta appendiculata* and *Triumfetta clementii.*

No conservation significant flora species were recorded in this unit.

Plate 40: *ChAbTaTe* vegetation unit

***Ta* - *Triodia angusta* low to mid hummock grassland (with *Acacia bivenosa* mid isolated shrubs)**

This unit (Plate 39) occurred on low-lying catchments and basins draining into the stony plains from surrounding hillslopes. Vegetation within this unit was in Excellent condition. No weed species were recorded in this vegetation unit.

Associated species include: *Acacia bivenosa, Acacia coriacea, Acacia pyrifolia, Corchorus walcottii, Crotalaria novae-hollandiae subsp. crassipes, Cucumis variabilis, Cullen lachnostachys, Cynanchum floribundum, Cyperus vaginatus, Eucalyptus victrix, Goodenia lamprosperma, Hakea lorea subsp. lorea, Indigofera linifolia, Rhynchosia minima, Streptoglossa odora, Tephrosia sp. NW Eremaean (S. van Leeuwen et al. PBS 0356), Trichodesma zeylanicum, Triodia angusta, Triodia epactia, Triumfetta appendiculata* and *Triumfetta clementii.*

No conservation significant flora species were recorded in this unit.

Plate 41: *Ta* vegetation unit

***Ac(TsGc)Te Acacia coriacea* and *Terminalia supranitifolia* (P3) very old trees with *Pittosporum phillyreoides, Gymnanthera cunninghamii* (P4) over *Adriana tomentosa* open shrubland over scattered *Triodia epactia* hummock grasses**

This unit (Plate 40) occupies a small area along the base of the rockpile and extending out about 15 m on to the plain. This unit is conservation significant due to the presence of two PF species (*Terminalia supranitifolia* and *Gymnanthera cunninghamii*), and the fact that the *Terminalia supranitifolia* and *Acacia coriacea* trees are unusually large and old examples of their species**.** Vegetation within this unit was in Very Good condition. No weed species were recorded in this vegetation unit.

This unit is representative of a conservation significant ecological community, and is vulnerable to disturbance.

Associated species include: *Acacia bivenosa, Acacia coriacea, Pittosporum phillyreoides, Gymnanthera cunninghamii (P4), Adriana tomentosa* and *Triodia epactia.*

PF species *Terminalia supranitifolia* (P3) and *Gymnanthera cunninghamii* (P3) occur as dominants in this vegetation unit**.**

Plate 42: *Ac(TsGc)Te* vegetation unit

***AbTa - Acacia bivenosa* open tall shrubland over *Triodia angusta* hummock grassland with some *Triodia epactia.* There can be scattered to open shrubland of *Stylobasium spathulatum* with annual herbland**

This unit (Plate 41) occurred on low-lying catchments and basins draining into the stony plains from surrounding hillslopes. Vegetation within this unit was in Excellent condition.

Associated species include: *Acacia ampliceps, Acacia bivenosa, Acacia colei, Acacia coriacea, Adriana tomentosa, Boerhavia gardneri, Bonamia media, Cassytha capillaris, Cleome viscosa, Corchorus walcottii, Crotalaria novae-hollandiae, Cucumis variabilis, Cullen lachnostachys, Cymbopogon ambiguus, Cynanchum*

floribundum, Cyperus vaginatus, Enneapogon lindleyanus, Euphorbia biconvexa, Euphorbia coghlanii, Euphorbia tannensis subsp. eremophila, Flueggea virosa, Grevillea pyramidalis, Hakea lorea subsp. lorea, Hibiscus sturtii var. campylochlamys, Indigofera monophylla, Paspalidium clementii, Paspalidium tabulatum, Pluchea dentex, Pterocaulon sphaeranthoides, Scaevola spinescens (broad form), *Senna notabilis, Stemodia grossa, Streptoglossa decurrens, Stylobasium spathulatum, Swainsona formosa, Tephrosia rosea* var. *clementii, Trachymene oleracea, Trichodesma zeylanicum, Triodia angusta, Triodia epactia, Triodia wiseana, Triumfetta appendiculata* and *Triumfetta clementii.*

No conservation significant flora species were recorded in this unit.

Plate 43: *AbTa* vegetation unit

4.2.2.3 Vegetation condition

Vegetation condition within the survey area ranged from Excellent to Completely Degraded (Figures K-1 to K-4, and Table 12). The vegetation on the rockpiles, stony and rocky hillslopes and the gently undulating plain inland of the coastal dunes which accounts for most of the survey area was predominantly in Excellent condition with little or no infestation from weeds or disturbance from other factors, however, the coastal dunes were in poorer condition with areas highly disturbed by weeds (predominantly **Aerva javanica)* and vehicle tracks which has caused beach dune erosion and subsequent loss of dune stability. Vegetation condition was also compromised in the drainage lines where **Malvastrum americanum* was recorded in some areas at densities of 10% cover. **Aerva javanica* and **Malvastrum americanum* should be prioritised for control throughout the survey area.

Table 12: Vegetation condition within the survey area

Vegetation condition		Survey area	
		Hectares (ha)	Percentage (%)
E	Excellent	95.00	79.74
VG	Very Good	3.44	2.89
G	Good	3.59	3.02
P	Poor	6.99	5.87
D	Degraded	4.36	3.66
CD	Completely Degraded	5.74	4.82

4.2.2.4 Vegetation of conservation significance within the survey area

Six of the vegetation units defined for the survey area have high conservation significance (Table 13). One is representative of the *Burrup Peninsula rock pile communities* listed by DBCA as a P1 PEC; one represents the *Burrup Peninsula rock pool communities*, also a P1 PEC; one represents the *Coastal dune native tussock grassland dominated by Whiteochloa airoides community*, a P3 PEC; and three, although not DBCA-listed PECs, are still considered to be of high conservation significance. The *Ac(TsGc)Te* unit is conservation significant due to the fact that two PF species (*Terminalia supranitifolia* and *Gymnanthera cunninghamii*) occur in this community as dominants, and the *Terminalia supranitifolia* and *Acacia coriacea* trees are

unusually large and old examples of their species. The *AvRsCa* and *AmThSd* vegetation units represent Mangrove forest. Mangroves are considered ecologically important ecosystems that provide important feeding and breeding habitat for birds, fish and crustaceans, a buffer from storms and cyclones, as well as reducing erosion and maintaining water quality (DAWE 2020).

The location of these records within the survey area is presented in Figure L.

Table 13: Conservation significant vegetation within the survey area

Vegetation unit		Ecological community	Conservation significance
BaAcTsTe	Brachychiton acuminatus, Acacia coriacea, Terminalia supranitifolia, Flueggea virosa subsp. melanthesoides low woodland (with Dichrostachys spicata and Alectryon oleifolius) over Rhagodia eremaea, Scaevola spinescens (broad form), Jasminum didymium subsp. lineare over Triodia epactia and Cymbopogon ambiguus mid isolated hummock / tussock grasses.	Burrup Peninsula rock pile communities	Priority 1 PEC
TcFvBaTs	*Terminalia circumalata* low woodland with *Flueggea virosa* tall shrubland with scattered *Brachychiton acuminatus, Terminalia supranitifolia* (P3), *Ficus brachypoda, Acacia coriacea, and Dichrostachys spicata* over scattered *Triodia angusta* and / or *Cyperus vaginatus* grasses / sedges.	Burrup Peninsula rock pool communities	Priority 1 PEC
ScWaSl	*Scaevola cunninghamii* low shrubland over (regenerating) *Whiteochloa airoides, Spinifex longifolius* and *Triodia epactia* low to mid open tussock / hummock grassland to isolated grasses	Coastal dune native tussock grassland dominated by *Whiteochloa airoides*	Priority 3 PEC
Ac(TsGc)Te	*Acacia coriacea* and *Terminalia supranitifolia* (P3) very old trees with *Pittosporum phillyreoides, Gymnanthera cunninghamii* (P4) over *Adriana tomentosa* open shrubland over scattered *Triodia epactia* hummock grasses	-	Other significance
AmRsCa	*Avicennia marina* subsp. *marina* low closed forest with *Ceriops australis* (landward) and *Rhizophora stylosa* and *Bruguiera exaristata* (seaward).	-	Other significance
AmThSd	*Avicennia marina* subsp. *marina* low closed forest fringed with *Tecticornia halocnemoides* subsp. *tenuis, Surreya diandra, Frankenia pauciflora* low closed shrubland.	-	Other significance

4.2.2.5 Other significant values recorded for the survey area

Other conservation significant values relating to heritage and fauna habitat were recorded within the survey area and are shown in Figure M. Three areas identified as having Aboriginal heritage significance, and three inactive Pebble Mound Mouse mounds were observed, and their locations recorded.

5 Discussion

5.1 Floristic diversity and representation

In assessing the conservation significance of flora within the survey area, consideration is given to rarity, biodiversity, endemism and representativeness of the flora in the area.

5.1.1 Rarity and endemism

The rarity of the flora was assessed via the various categories of TF (protected under the BC Act and under the EPBC Act) and PF (listed by DBCA), as well as via other criteria relating to range, endemism, restricted habitat or other anomalies (according to EPA 2016).

No TF or putative new taxa were recorded within the survey area for the current survey.

Five PF species as currently listed by DBCA were recorded within the survey area – *Terminalia supranitifolia* (P3), *Rhynchosia bungarensis* (P4), *Gymnanthera cunninghamii* (P3), *Vigna triodiophila* (P3) and *Eragrostis surreyana* (P3). *Terminalia supranitifolia* and *Rhynchosia bungarensis* were fairly abundant and widespread throughout the survey area with 109 and 83 individuals recorded, respectively. Although there is a high number of *Terminalia supranitifolia* in the survey area, the abundance of this species varies considerably over the Burrup Peninsula itself according to geology, and it is only found in very small isolated populations elsewhere in the Pilbara. *T. supranitifolia* is not represented in the northern tropics where the terminalia species is typically found. *Gymnanthera cunninghamii* is not a commonly occurring species on the Burrup (the Trudgen survey only recorded two occurrences). *Eragrostis surreyana* has been very rarely recorded on the Burrup or Pilbara generally. This may be due to the fact that it is a small annual species.

Additionally, a total of 15 flora taxa of 'other' conservation significance based on one or more criteria listed in EPA (2016) were recorded within the survey area. Three of these taxa are considered locally endemic, ten represented extremes or extensions of known ranges, three are 'unusual' either in form or habitat, and one (*Terminalis supranitifolia*) has relictual status. Three of these 15 taxa are also listed PF. Two of the taxa representing range anomalies were widespread throughout the survey area; *Hibiscus sturtii* var. *campylochlamys,* not recorded on Florabase as occurring on the Burrup Peninsula, and *Alectryon oleifolius,* recorded here at the extent of its known range, were recorded in 13 and 12 floristic quadrats, respectively.

Rarity of the flora within the survey area was assessed as high, based on the number of conservation significant taxa, and their abundance and extent throughout the survey area.

5.1.2 Biodiversity

Trudgen (2002) recorded a total of 392 native taxa within their core survey area (which included the Burrup Peninsula, Dolphin, Angel and Gidley islands). A total of 182 native vascular flora taxa (species, subspecies, varieties and forms) were recorded from 86 quadrats for the current survey which represents 46% of Trudgen's (2002) flora total.

Floral biodiversity within the survey area was assessed as high.

5.2 Vegetation conservation significance

5.2.1 Regional representation

Trudgen (2002) concluded that the vegetation of the Burrup Peninsula is unique and atypical of (and in fact with relatively little in common with) the vegetation of both the Fortescue Botanical District and the Abydos Plain and because of this, at a subregional level, Trudgen (2002) considered the vegetation of the Burrup Peninsula to have a "very high level" of conservation significance.

In terms of the rockpile or rock pocket vegetation on the Burrup Peninsula (which is well represented within this study's survey area and in the immediate vicinity) Trudgen (2002) noted that it was regionally important because it was "the best development of this type of vegetation within the Fortescue Botanical District in terms of the number of patches in the landscape (abundance), and the diversity of species from the Kimberley group of species within them". The conservation value of the Burrup rockpile vegetation also acknowledges the fact that its component species are protected from fire and therefore includes fire sensitive species which are being increasingly impacted by fire in other areas.

Many of the other vegetation associations recorded on the Burrup Peninsula also have a very limited distribution and areas of occurrence, and therefore have a high conservation value.

5.2.2 Commonwealth-listed threatened ecological communities

No known records of any Commonwealth-listed TECs occur within the survey area, nor is any of the vegetation described and mapped for the survey area likely to represent a Commonwealth-listed TEC.

5.2.3 State-listed threatened and priority ecological communities

No known records of any state-listed TECs occur within the survey area, nor is any of the vegetation described and mapped for the survey area likely to represent a state-listed TEC.

Three state-listed PECs were recorded within the survey area including 36 records of *Burrup Peninsula rock pile communities* and two records of *Burrup Peninsula rock pool communities,* both Priority 1 PECs, and two records of *Coastal dune native tussock grassland dominated by Whiteochloa airoides community*, a Priority 3 PEC.

5.2.4 Vegetation of 'other' conservation significance

Although not TECs or PECs, three other vegetation units described and mapped for the survey area are considered to be of high conservation significance. The *Ac(TsGc)Te* unit represents rare, conservation significant vegetation due to the presence of PF species as dominants, and the age of the large trees. The two mangal vegetation units (*AvRsCa* and *AmThSd*) are considered ecologically important ecosystems.

Vegetation conservation significance within the survey area was assessed as very high.

6 Conclusions and recommendations

The conservation significance of the vegetation and flora of the survey area is considered to be very high. Conservation significant values relating to flora and vegetation recorded within the survey area should be preserved. This recommendation should apply not only to the survey area, but should be addressed to help mitigate the potential indirect impact to the wider Burrup once it is opened up to increased visitation as this will allow increased access to areas further north of the proposed visitor centre. Direct and indirect impacts to the PF and other conservation flora, and to vegetation of conservation significance including *Burrup Peninsula rock pile communities*, *Burrup Peninsula rock pool communities* and *Coastal dune native tussock grassland dominated by Whiteochloa airoides community* PECs should be protected and conserved where possible. It is recommended that areas of the coastal dune vegetation that have become degraded be rehabilitated and access controlled in an effort to manage weeds (primarily **Aerva javanica).* It is recommended that vehicle access and unauthorised camping in these vulnerable areas be prohibited to enable natural recovery of the dune vegetation. This is particularly important in those areas mapped as remnant *Coastal dune native tussock grassland dominated by Whiteochloa airoides community* PEC. Additionally, infestations of **Malvastrum americanum* in the creek lines and broad drainage zones should be prioritised for control.

7 References

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FIGURES

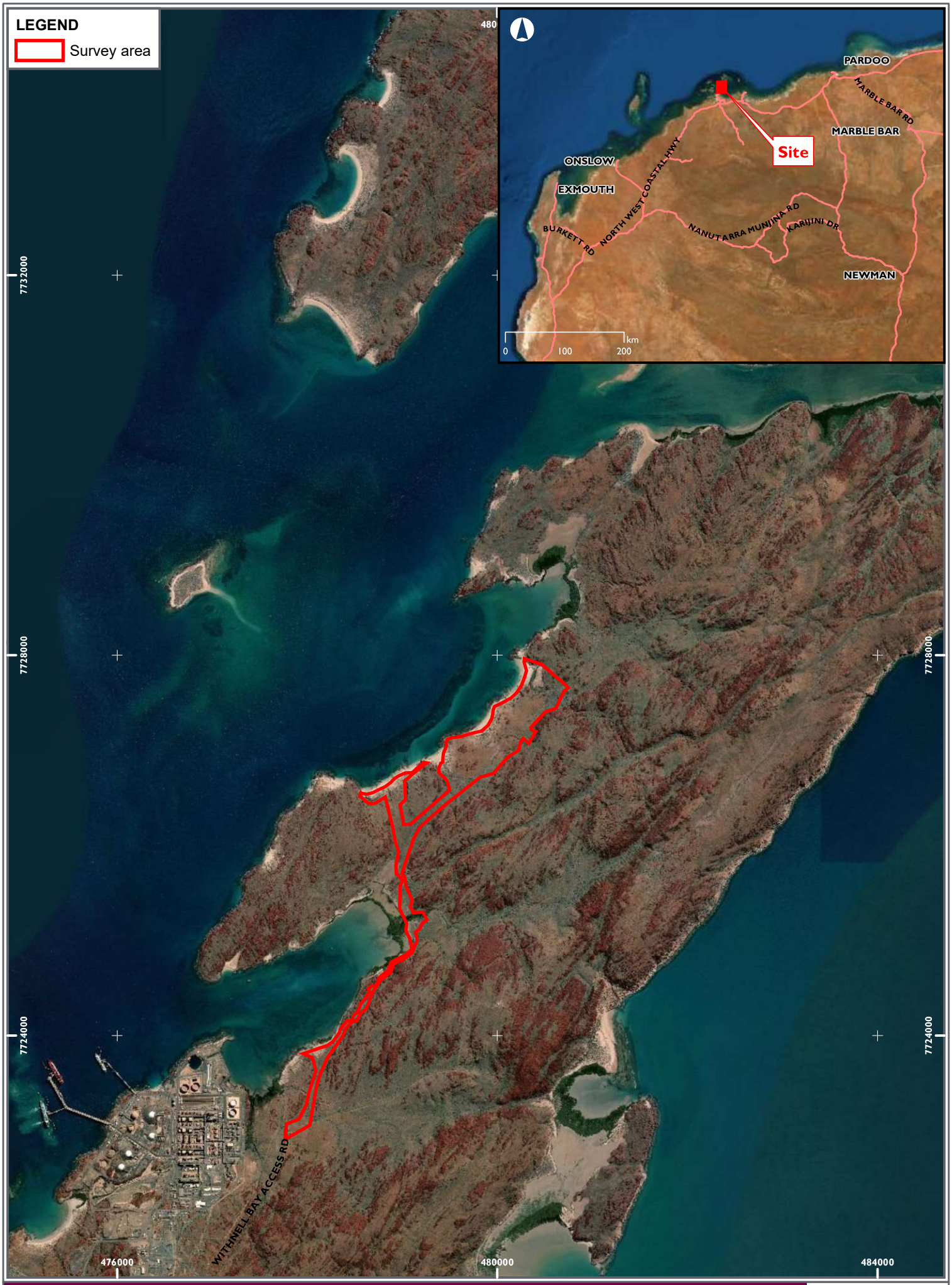

Figure A

Regional location

GDA 1994 MGA Zone 50

0 0.5 1 2 km

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Doc Number: 001
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Created by: MA
Source: Imagery - Landgate

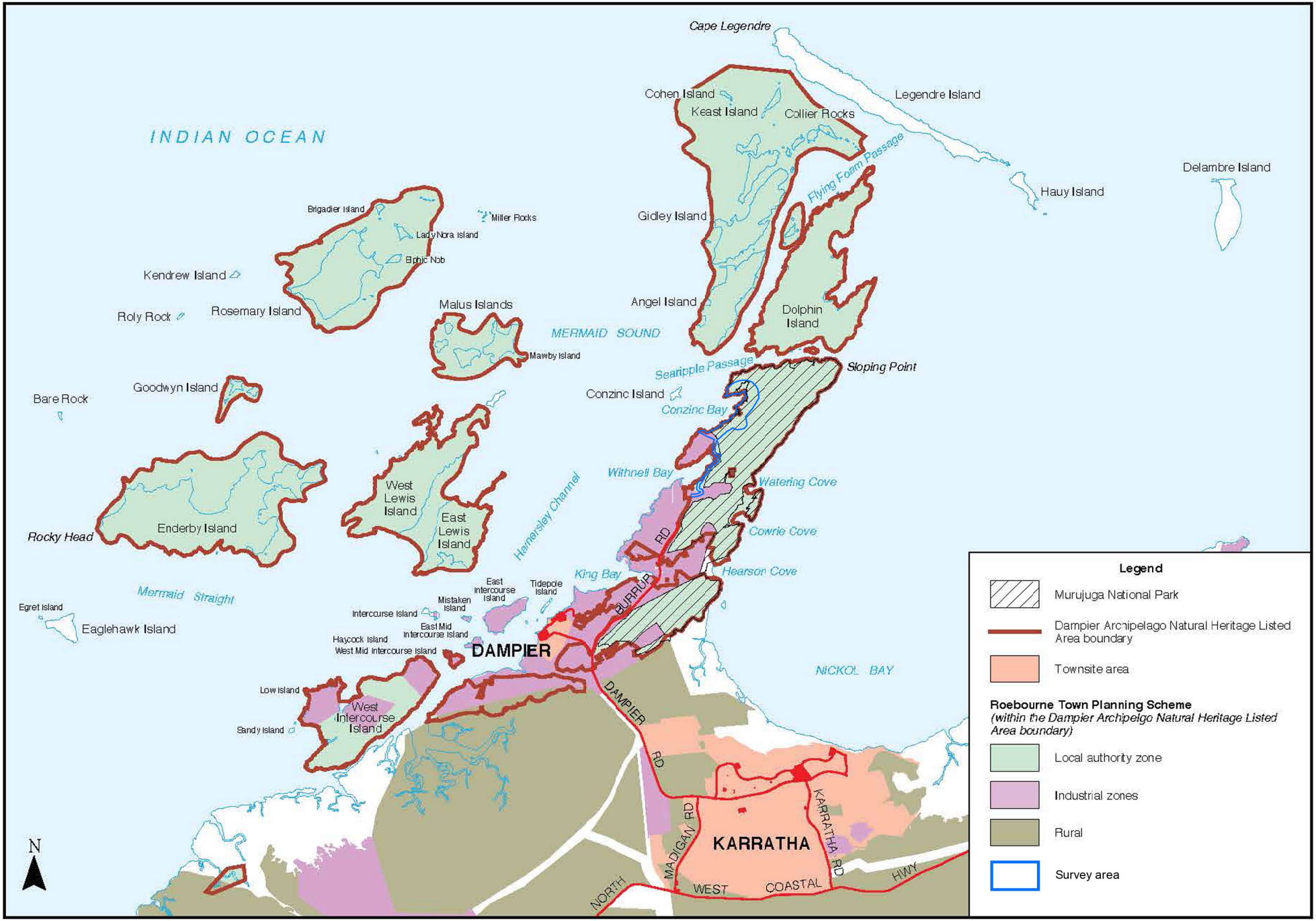

Figure B

Regional land uses and context

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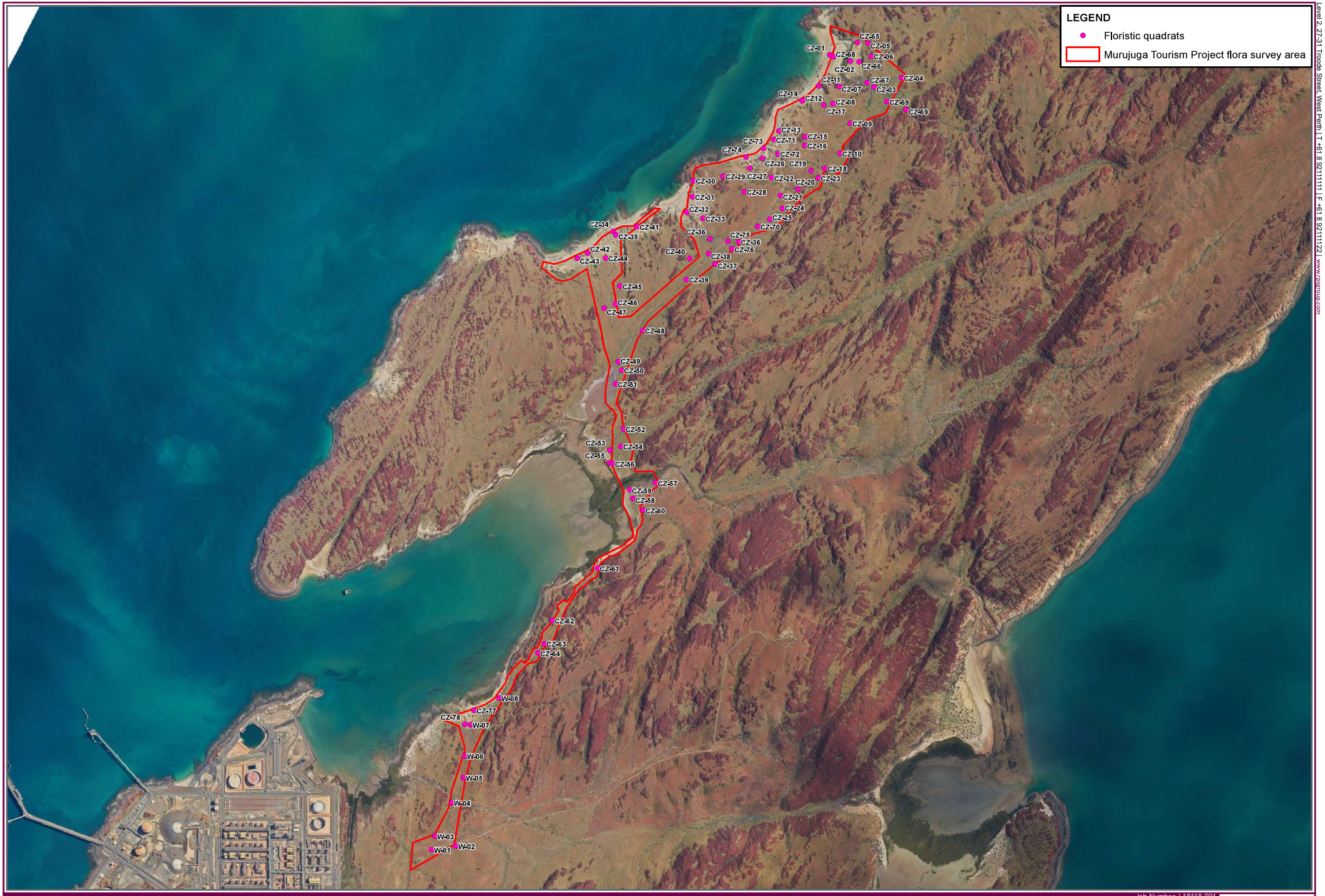

Figure C

Floristic quadrats

GDA 1994 MGA Zone 50

0 0,25 0,5 1 km

Job Number: L18118-001
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Date: 20.07.20
Scale: 1:20,000 @ A3
Created by: MA
Source: Orthophoto - Landgate, 2020

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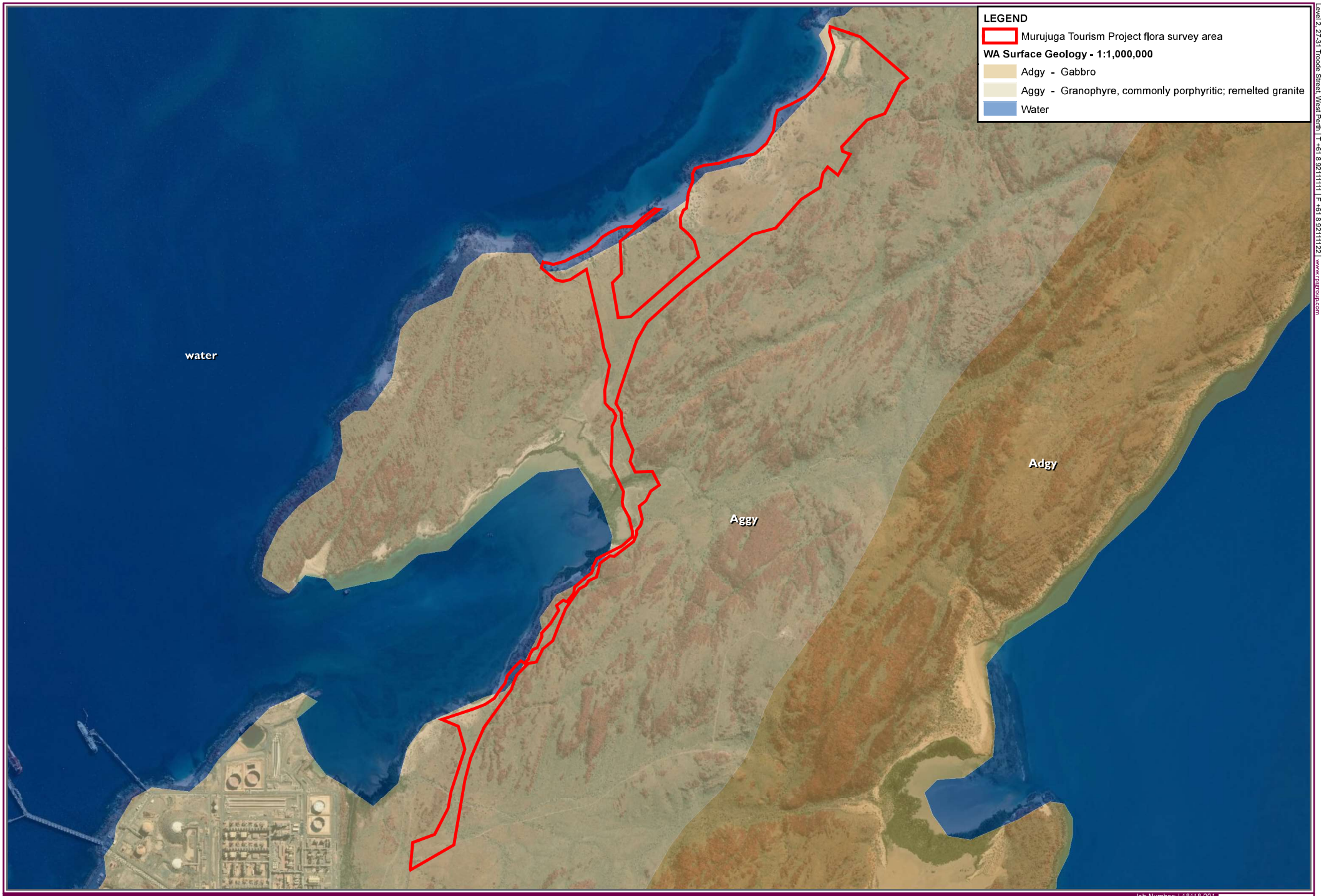

Figure D

Surface geology

GDA 1994 MGA Zone 50

0 200 400 800 m

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Doc Number: 004
Date: 20.07.20
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Source: Orthophoto - Esri

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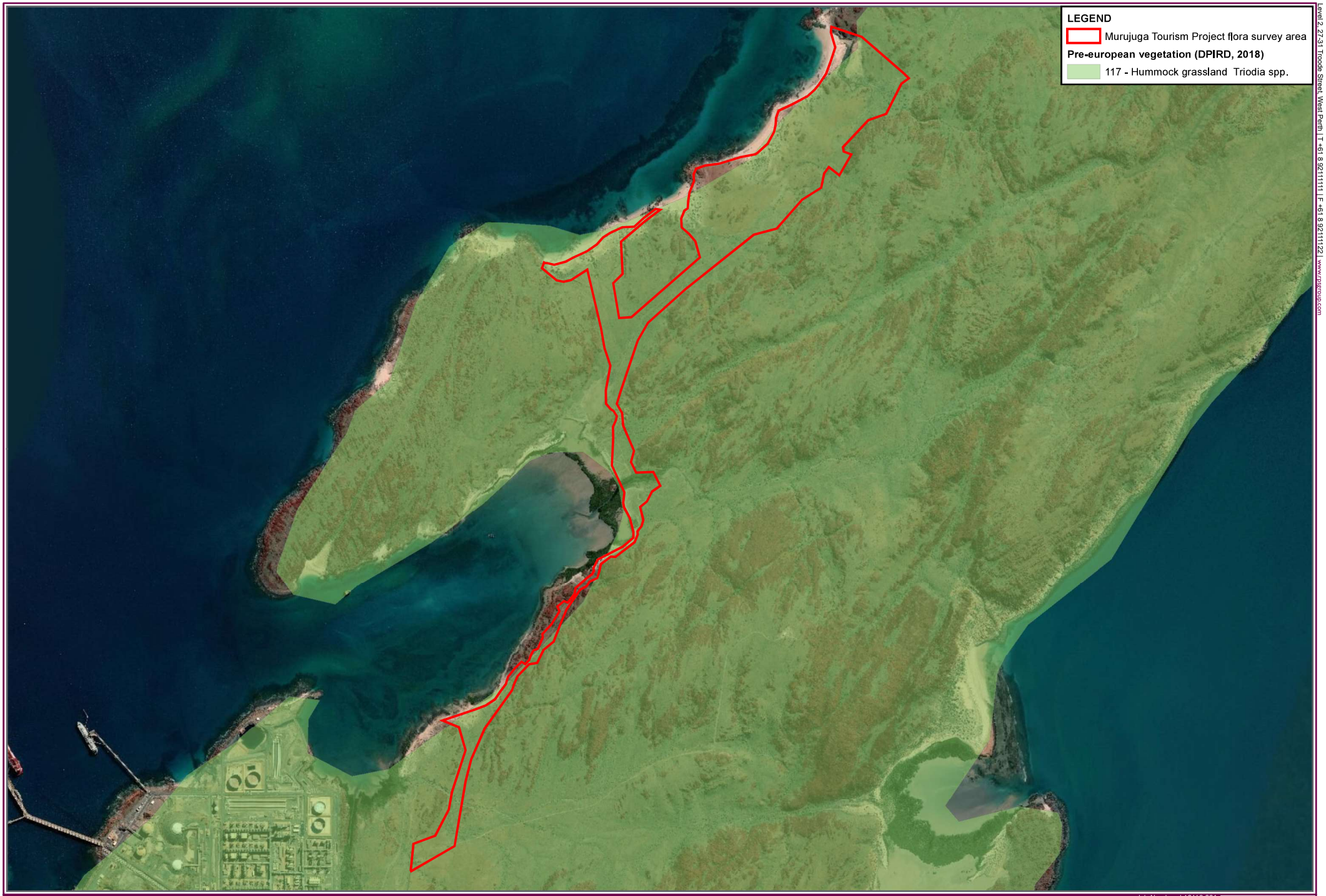

Figure E

Pre-European vegetation mapping

GDA 1994 MGA Zone 50

0 200 400 800 m

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Created by: MA
Source: Orthophoto - Landgate

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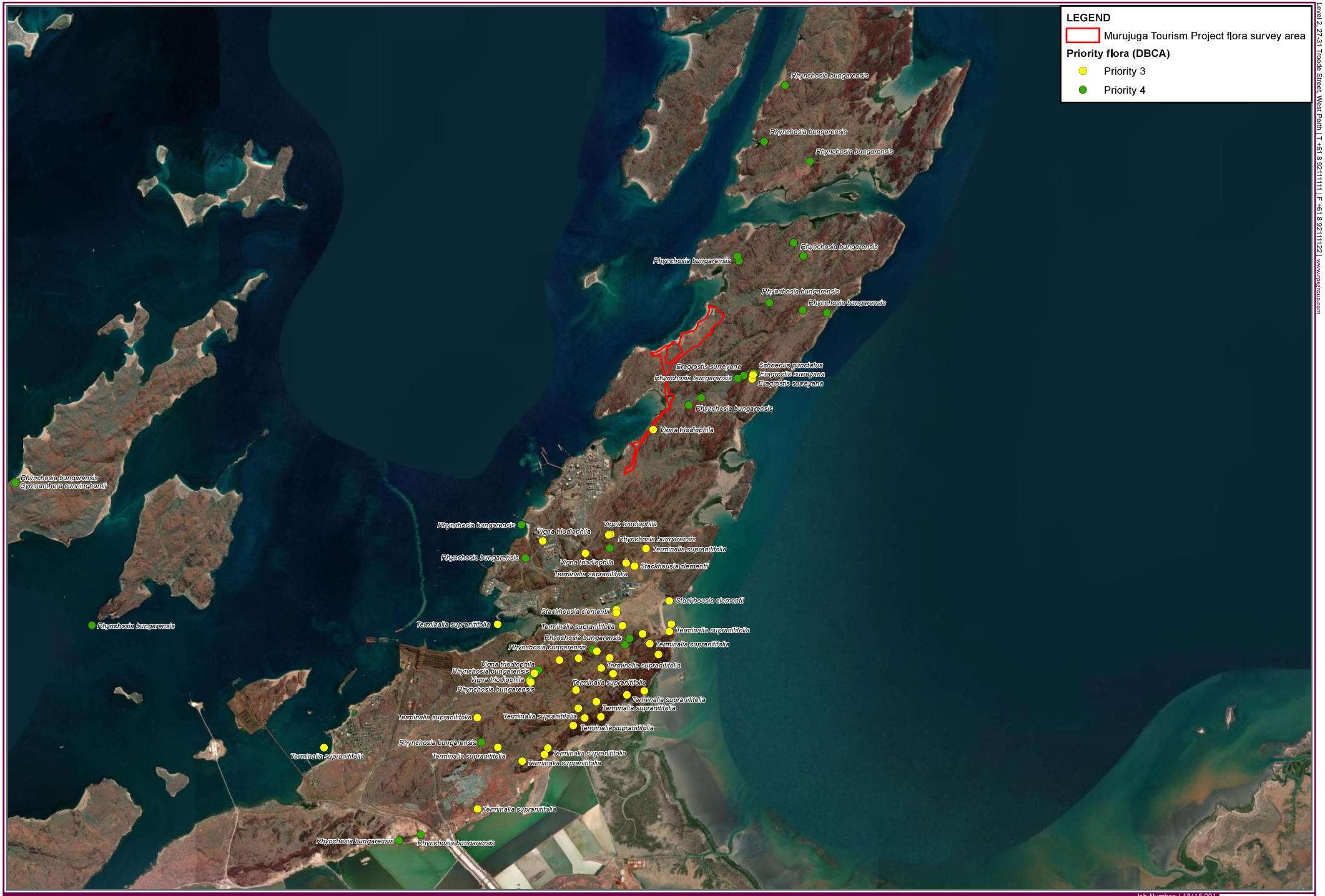

Figure F

Conservation significant flora database search results

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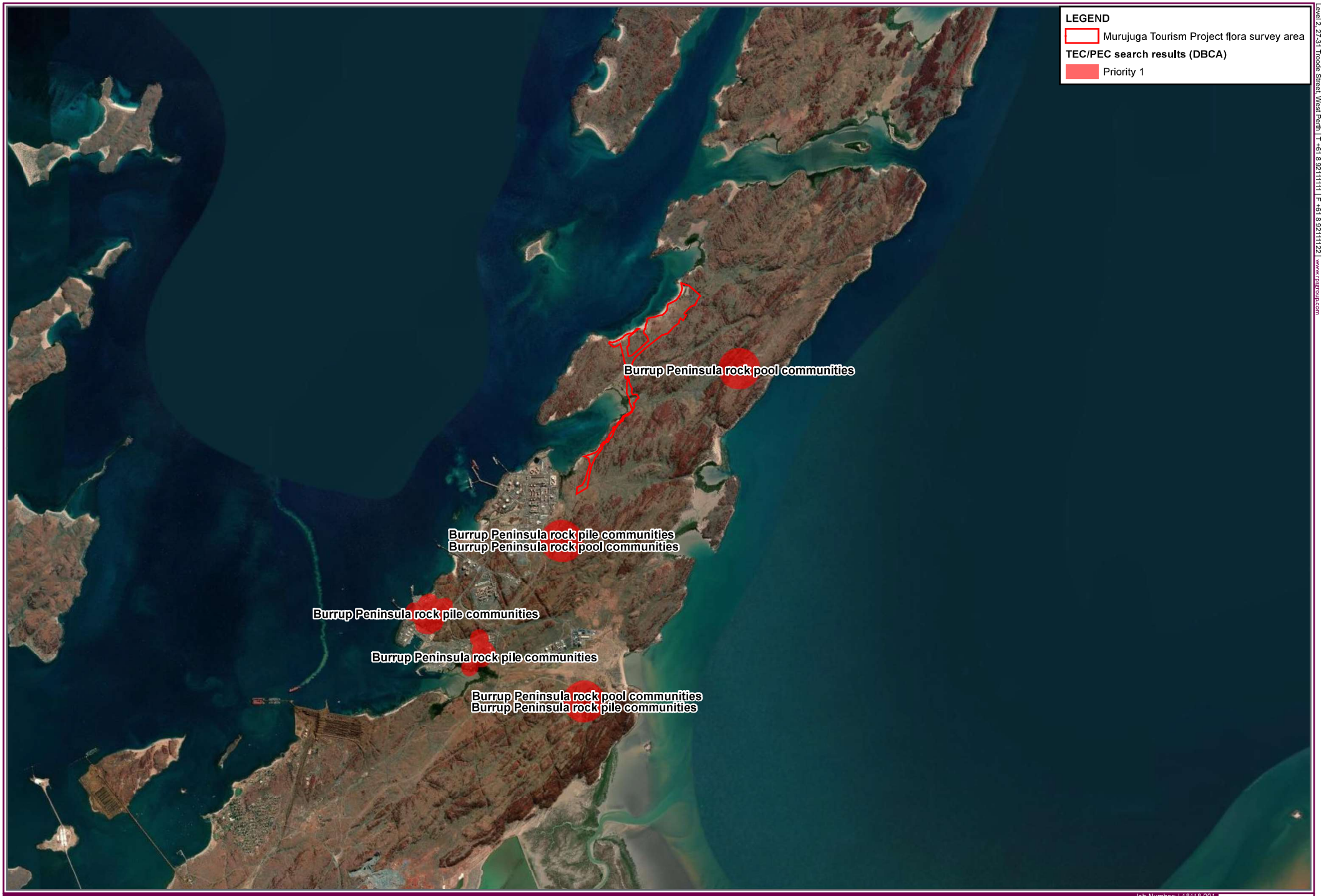

Figure G

Conservation significant ecological communities database search results

GDA 1994 MGA Zone 50

0 1 2 4 km

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Source: Orthophoto - Landgate

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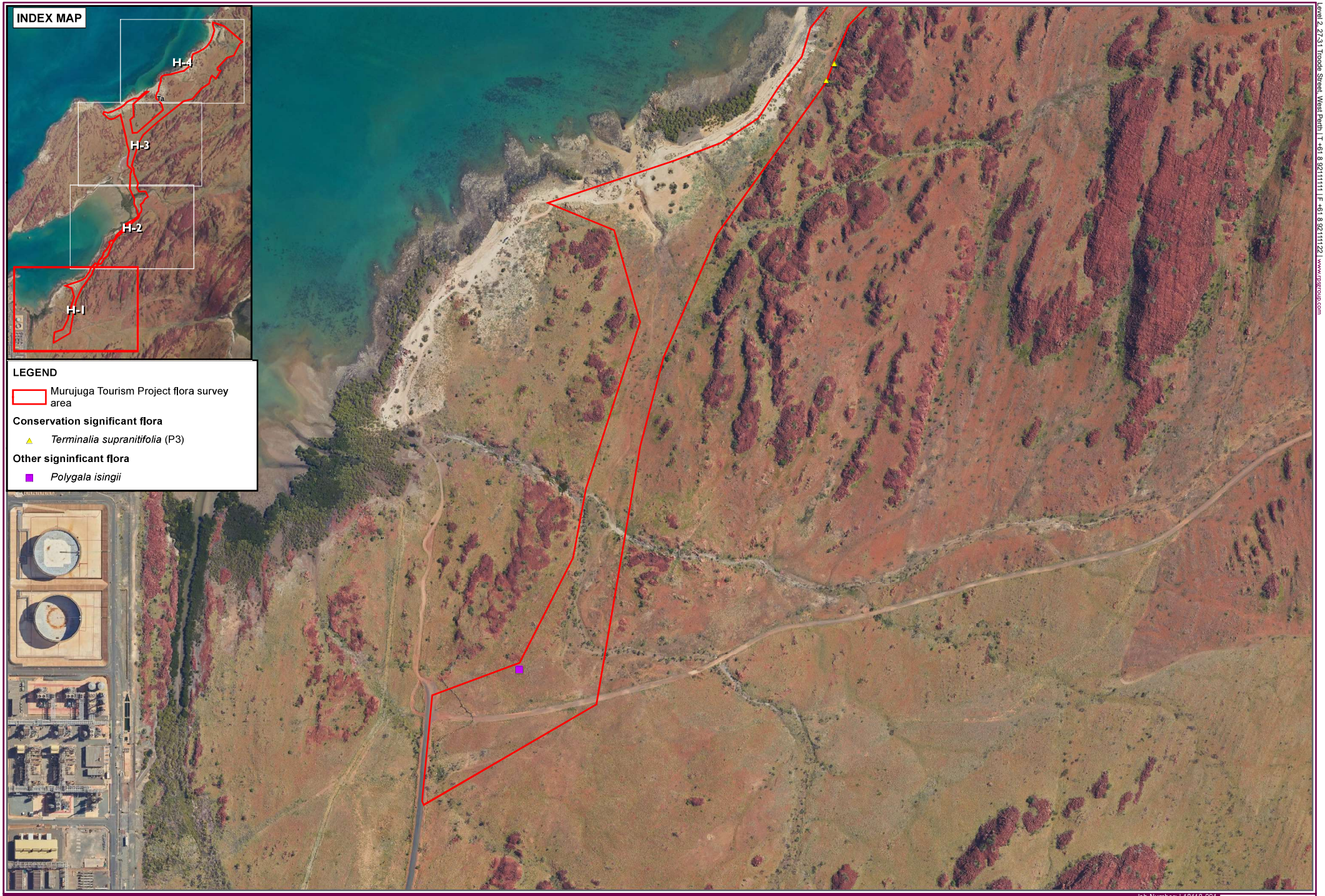

Figure H-1

Conservation significant flora recorded for the survey

GDA 1994 MGA Zone 50

0 50 100 200 m

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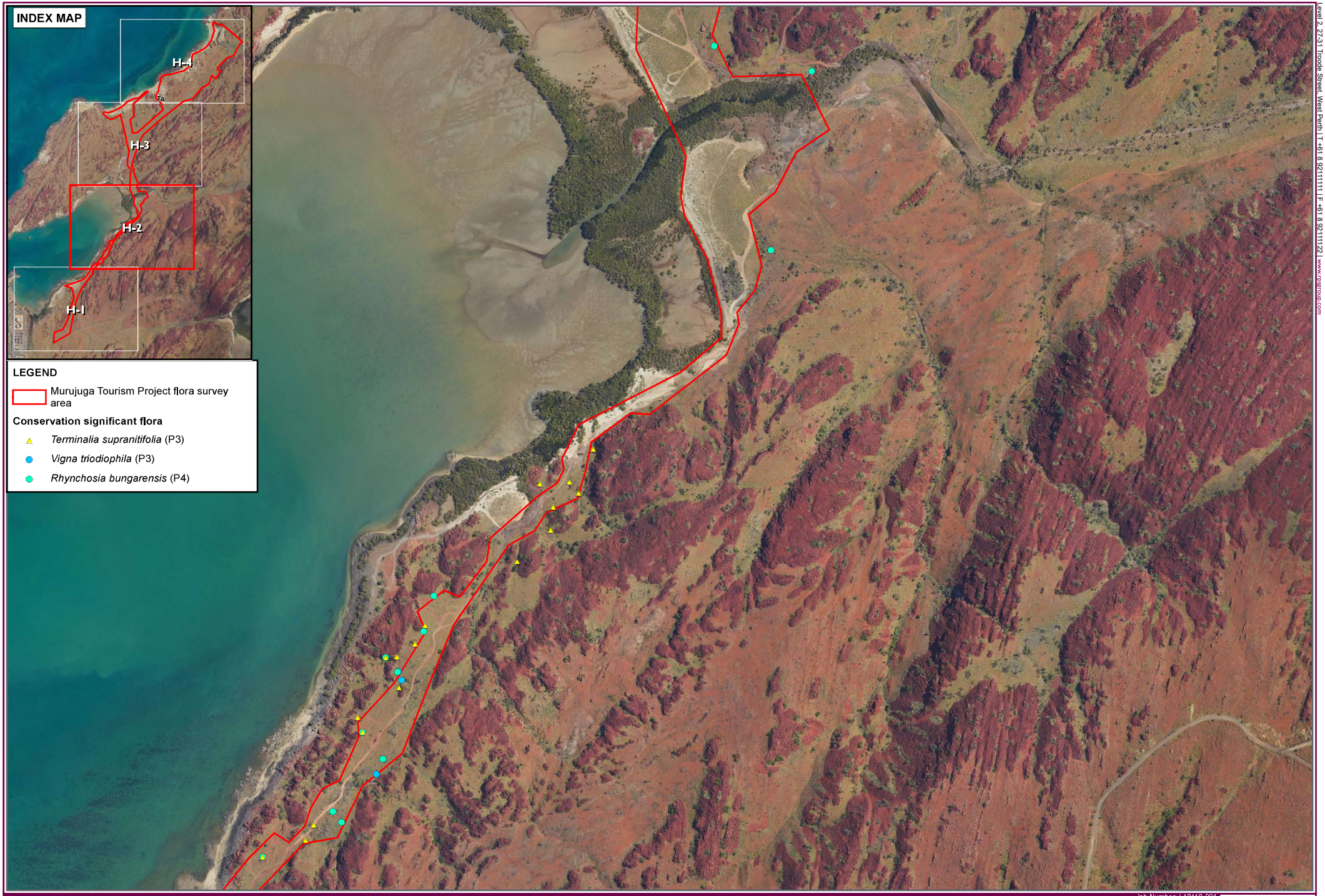

Figure H-2

Conservation significant flora recorded for the survey

GDA 1994 MGA Zone 50

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Figure H-3

Conservation significant flora recorded for the survey

GDA 1994 MGA Zone 50

0 50 100 200 m

Job Number: L18118-001
Doc Number: 008
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Figure H-4

Conservation significant flora recorded for the survey

GDA 1994 MGA Zone 50

0 50 100 200 m

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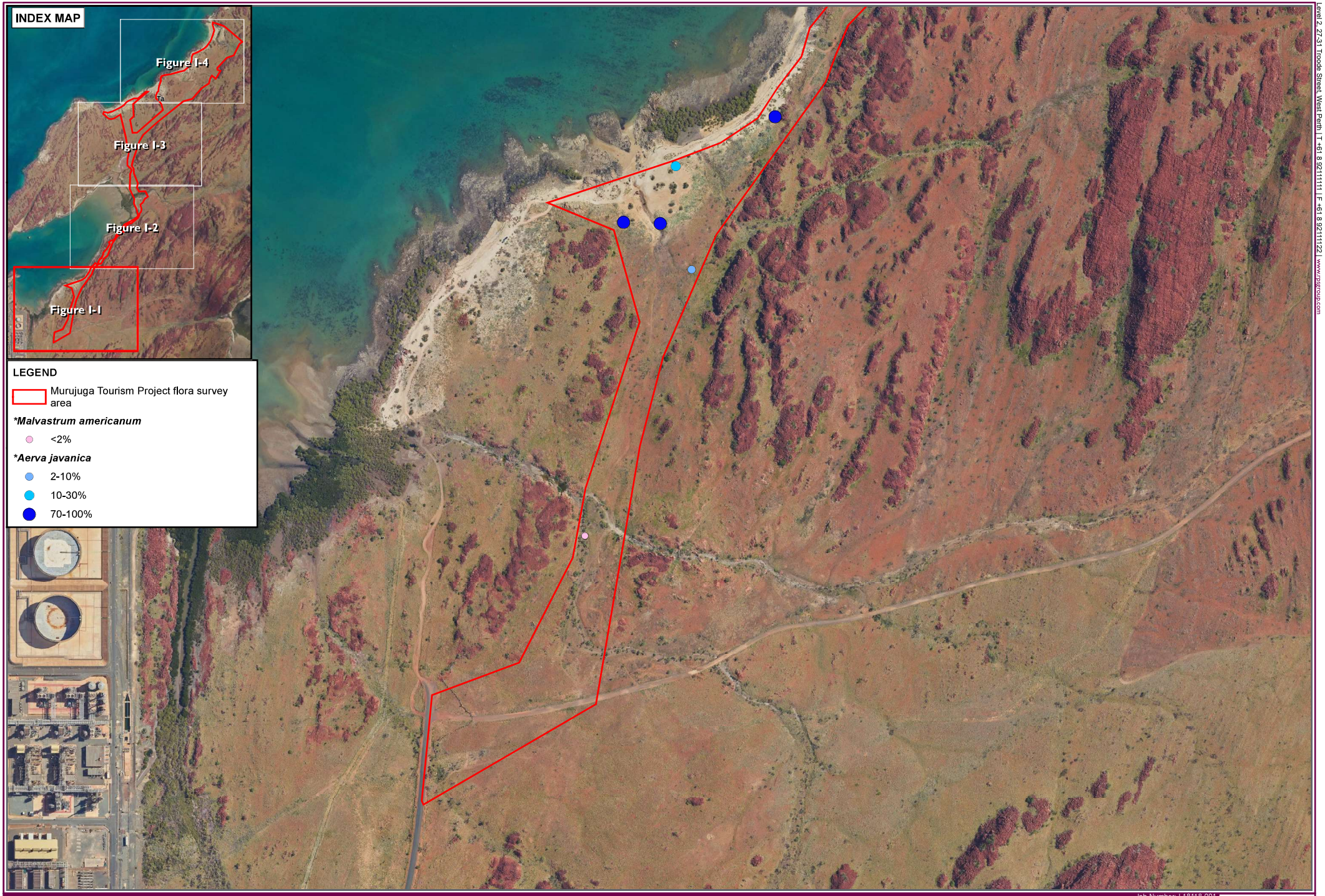

Figure I-1

Weeds recorded for the survey

GDA 1994 MGA Zone 50

0 50 100 200 m

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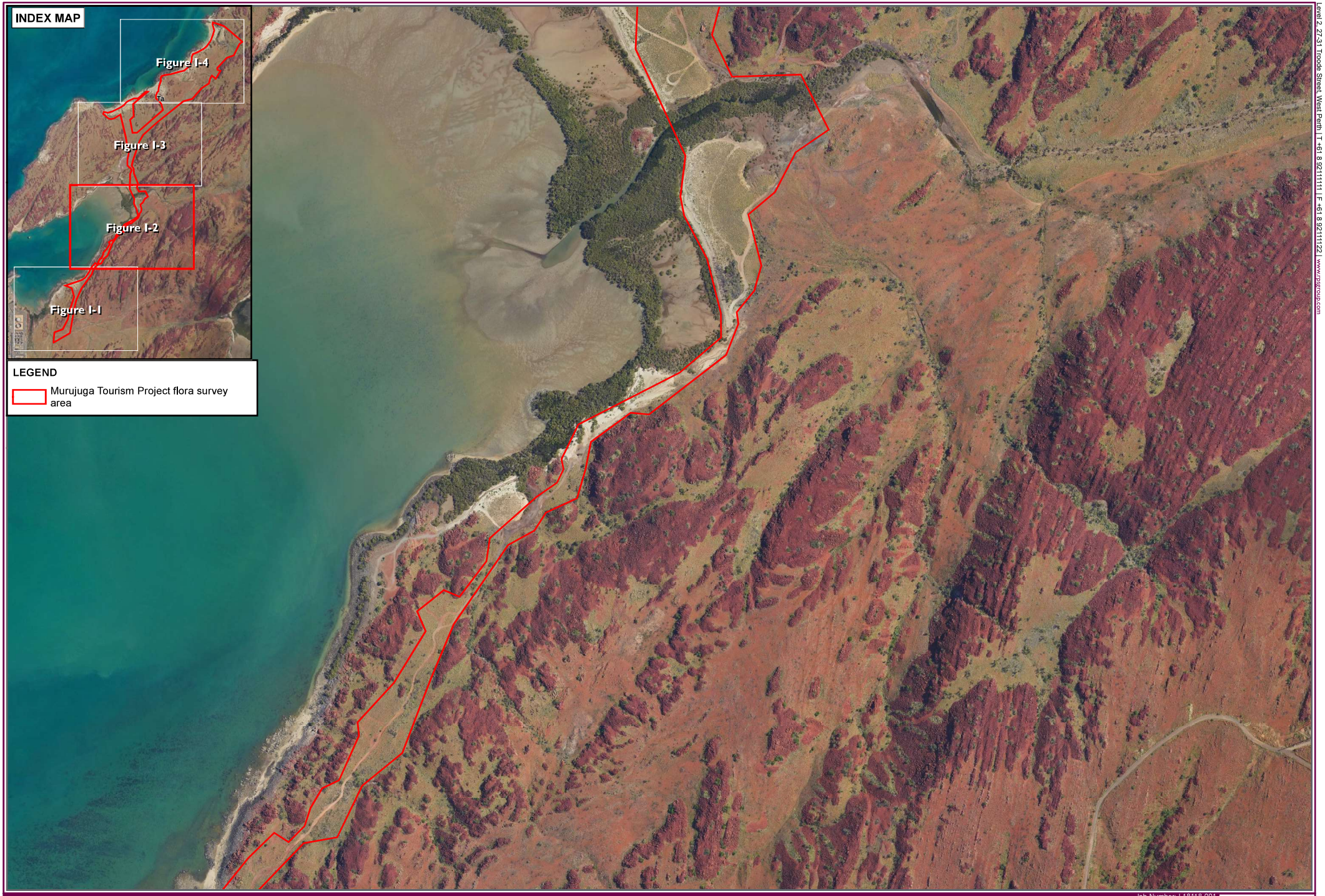

Figure I-2

Weeds recorded for the survey

GDA 1994 MGA Zone 50

0 50 100 200 m

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Figure I-3

Weeds recorded for the survey

GDA 1994 MGA Zone 50

0 50 100 200 m

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Figure I-4

Weeds recorded for the survey

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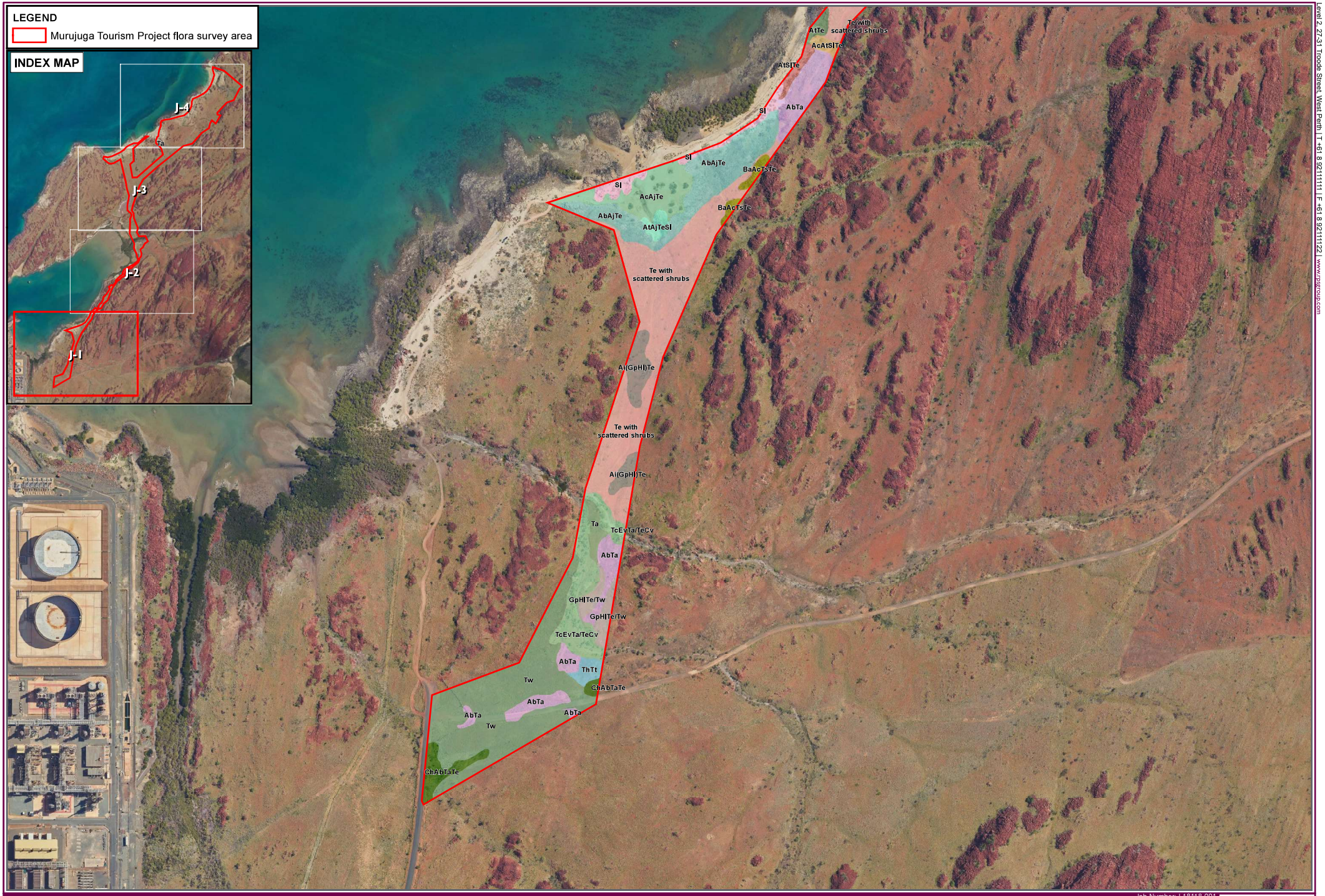

Figure J-1

RPS vegetation unit mapping

GDA 1994 MGA Zone 50

0 50 100 200 m

Job Number: L18118-001
Doc Number: 010
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Scale: 1:5,000 @ A3
Created by: MA
Source: Orthophoto - Landgate, 2020

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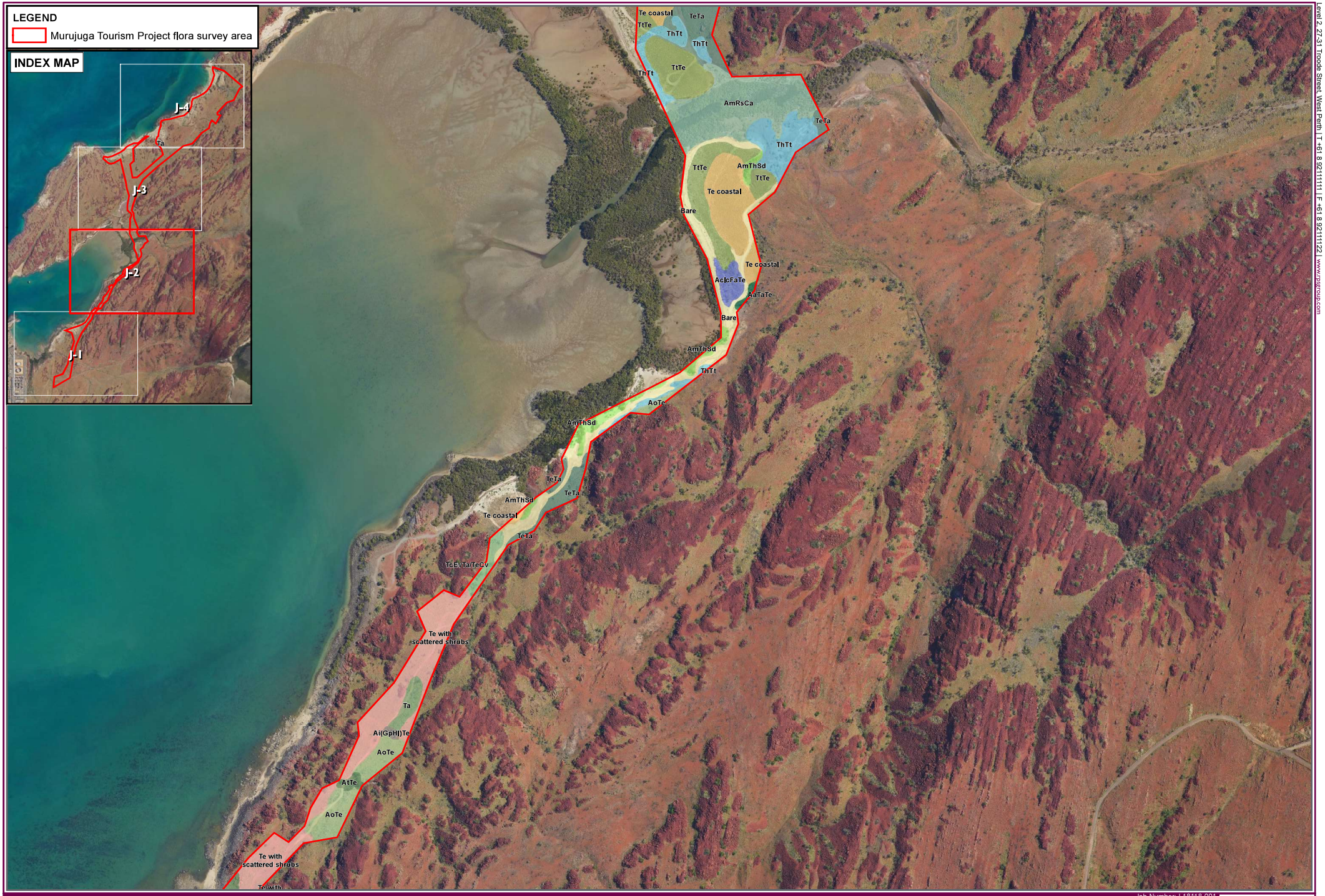

Figure J-2

RPS vegetation unit mapping

GDA 1994 MGA Zone 50

0 50 100 200 m

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Document Path: G:\Jobs\L_Jobs\L18118 - Murujuga Technical Studies\Figures L18118-001\L18118-001_G_010_FigJ1-4 RPS vegetation units_200120.mxd

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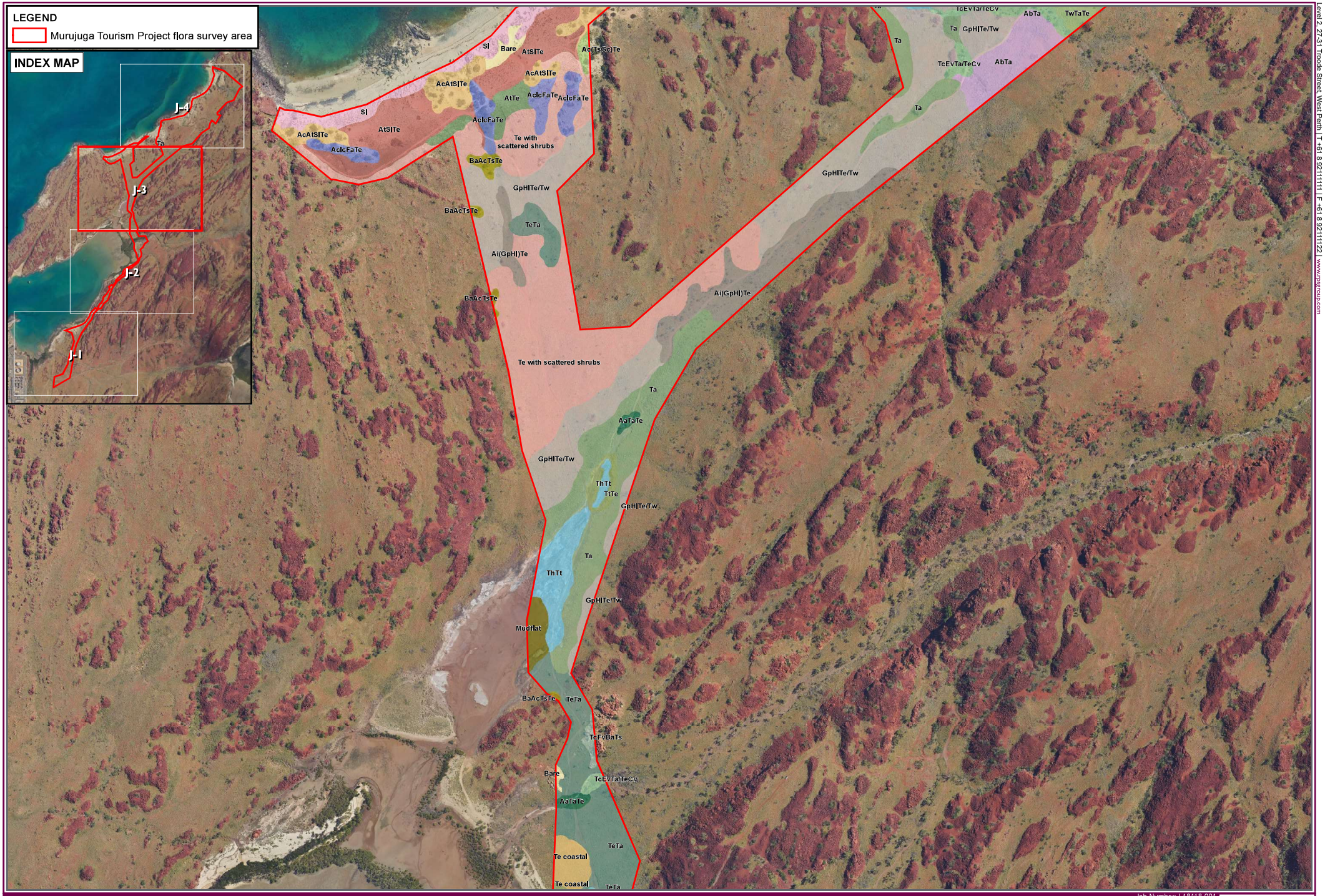

Figure J-3

RPS vegetation unit mapping

GDA 1994 MGA Zone 50

0 50 100 200 m

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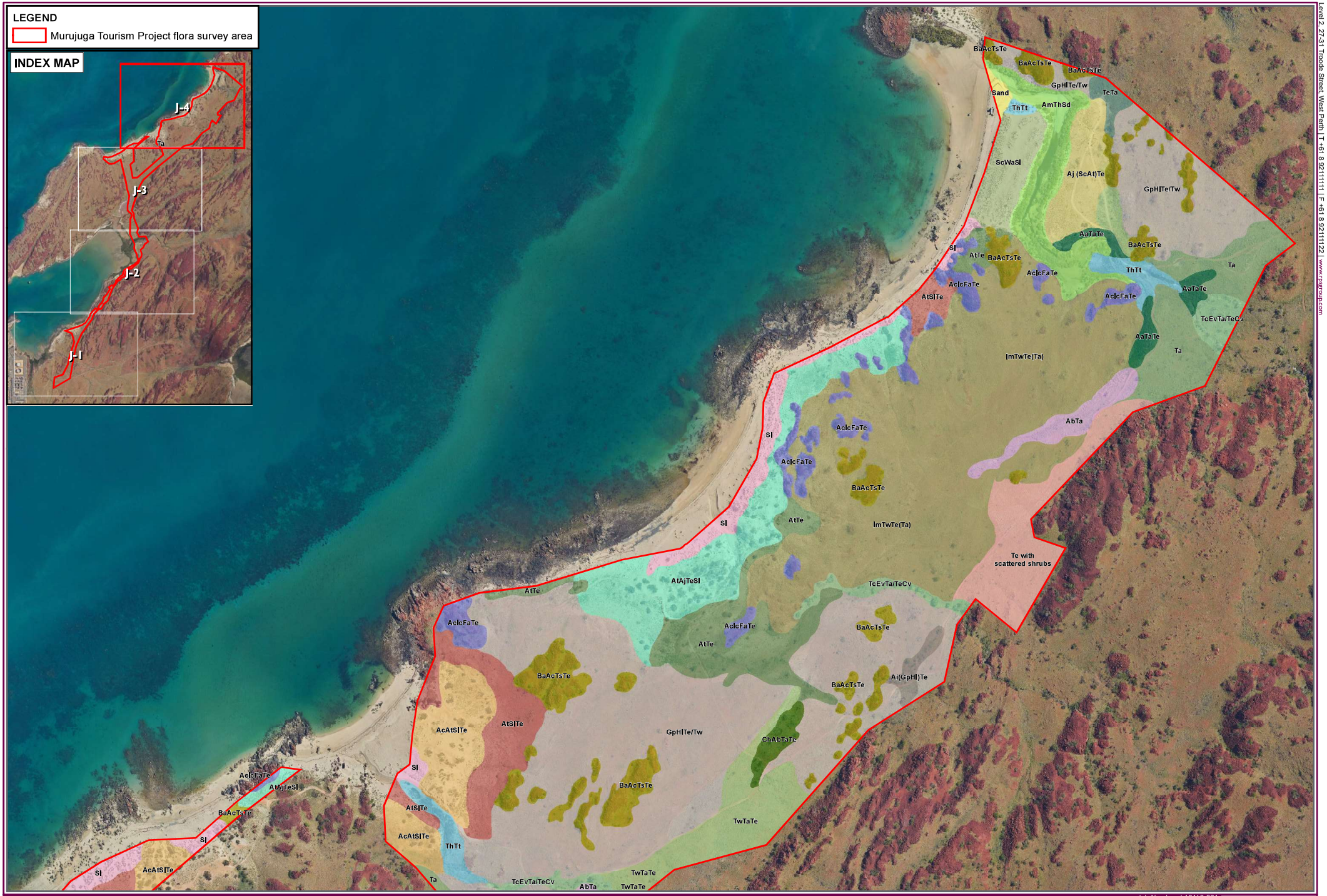

Figure J-4

RPS vegetation unit mapping

GDA 1994 MGA Zone 50

0 50 100 200 m

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Veg Unit	Description
Coastal dunes and swales	
AbAjTe	*Acacia bivenosa* tall open shrubland over **Aerva javanica* low shrubland to low closed shrubland over *Triodia epactia* low open hummock grassland or isolated clumps of hummock grasses.
AcAjTe	*Acacia coriacea* tall shrubland over **Aerva javanica* low shrubland over *Triodia epactia* open hummock grassland (sometimes with *Adriana tomentosa* low isolated shrubs).
AcAtSlTe	*Acacia coriacea* tall shrubland over *Adriana tomentosa* low open shrubland over *Spinifex longifolius* and *Triodia epactia* low to mid open tussock / hummock grassland.
Aj (ScAt)Te	**Aerva javanica* low shrubland (with *Scaevola cunninghamii* and *Adriana tomentosa*) over *Triodia epactia* low open hummock grassland to isolated hummock grasses.
AtSlTe	*Adriana tomentosa* low shrubland over *Triodia epactia* (sometimes with *Triodia angusta*) and *Spinifex longifolius* low to mid hummock / tussock grassland.
AtTe	*Adriana tomentosa* low shrubland over *Triodia epactia* hummock grassland over a closed annual forbland.
AtAjTeSl	*Adriana tomentosa* and **Aerva javanica* low shrubland over *Triodia epactia* or *Spinifex longifolius* low to mid open hummock / tussock grassland to isolated hummock / tussock grasses (sometimes with *Acacia coriacea* tall to mid isolated shrubs).
ScWaSl	*Scaevola cunninghamii* low shrubland over (regenerating) *Whiteochloa airoides*, *Spinifex longifolius* and *Triodia epactia* low to mid open tussock / hummock grassland to isolated grasses.
Sl	*Spinifex longifolius* low to mid open tussock grassland.
TtTe	*Trianthema turgidifolia* low shrubland over *Triodia epactia* low hummock grassland.
Sand	Beach sand – no vegetation
Bare	Bare areas – no vegetation
Coastal rockpiles	
AcIcFaTe	*Acacia coriacea, Ipomoea costata, Ficus aculeata* var. *indecora* low woodland (often with *Brachychiton acuminatus, Ficus virens* var. *virens* and *Dichrostachys spicata*) over *Triodia epactia* low open hummock grassland to isolated hummock grasses.
Tidal areas	
AmThSd	*Avicennia marina* subsp. *marina* low closed forest fringed with *Tecticornia halocnemoides* subsp. *tenuis, Surreya diandra, Frankenia pauciflora* low closed shrubland.
AmRsCa	*Avicennia marina* subsp *marina* low closed forest with *Ceriops australis* (landward) and *Rhizophora stylosa* and *Bruguiera exaristata* (seaward).
ThTt	*Tecticornia halocnemoides* subsp. *tenuis* and *Trianthema turgidifolia* low shrubland (with *Tecticornia indica* subsp. *leiostachya, Frankenia pauciflora* and *Surreya diandra*) over *Sporobolus virginicus* low sparse tussock grassland to isolated tussock grasses.
Mudflat	Tidal mudflat – no vegetation

Veg Unit	Description
Rocky undulating low hillslopes and plains	
Ai(GpHl)Te	*Acacia inaequilatera* tall shrubland (often with *Hakea lorea* subsp. *lorea* / *Grevillea pyramidalis*) over *Triodia epactia* low hummock grassland (with *Triodia wiseana* isolated hummock grasses) over an annual closed forbland.
AoTe	*Acacia orthocarpa* open shrubland (with *Stylobasium spathulatum*) over *Triodia epactia* hummock grassland over an annual forbland.
GpHlTe/Tw	*Grevillea pyramidalis* tall open shrubland (with *Hakea lorea* subsp. *lorea*) over *Triodia epactia* hummock grassland or *Triodia epactia / T. wiseana* hummock grassland.
Te with scattered shrubs	*Triodia epactia* low hummock grassland (with *Hakea lorea* subsp. *lorea, Cullen lachnostachys, Ipomoea costata* and *Acacia colei* mid sparse shrubland to isolated shrubs and *T. wiseana* isolated clumps of hummock grasses over an annual forbland).
TeTa	*Triodia epactia* and *T. angusta* hummock grassland (with isolated shrubs).
Tw	*Triodia wiseana* low hummock grassland.
TwTaTe	*Triodia wiseana* low hummock grassland (with *T. angusta* and *T. epactia* and *Acacia colei* and *A. bivenosa* mid isolated shrubs and an annual forbland).
Te coastal	*Triodia epactia* low hummock grassland.
Rockpiles / hillslopes and valleys with a dense stony mantle	
BaAcTsTe	*Brachychiton acuminatus, Acacia coriacea, Terminalia supranitifolia, Flueggea virosa* subsp. *melanthesoides* low woodland (with *Dichrostachys spicata* and *Alectryon oleifolius*) over *Rhagodia eremaea, Scaevola spinescens* (broad form), *Jasminum didymium* subsp. *lineare* over *Triodia epactia* and *Cymbopogon ambiguus* mid isolated hummock / tussock grasses.
ImTwTe(Ta)	*Indigofera monophylla* low open shrubland over *Triodia wiseana, T. epactia* (and sometimes *T. angusta*) low to mid hummock grassland (sometimes with *Hakea lorea* subsp. *lorea, Grevillea pyramidalis* tall to mid isolated shrubs), or small rockpiles with *Brachychiton acuminatus, Ehretia saligna* and *Flueggea virosa* subsp. *melanthesoides*).
Drainage lines with a dense stony mantle.	
AaTaTe	*Acacia ampliceps* open tall shrubland over *Triodia angusta* and *T. epactia* low hummock grassland (sometimes with *Myoporum montanum* mid shrubland and a closed annual forbland).
TcEvTa/TeCv	*Terminalia circumalata* and *Eucalyptus victrix* low woodland (with *Acacia coriacea, Flueggea virosa* subsp. melanthesoides) over *Triodia angusta* low to mid hummock grassland (with *Triodia epactia* low isolated hummock grasses and *Cyperus vaginatus* isolated sedges).
TcFvBaTs	*Terminalia circumalata* low woodland (with *Flueggea virosa* subsp. *melanthesoides, Brachychiton acuminatus* and *Terminalia supranitifolia*) over *Triodia angusta / T. epactia* low to mid open hummock grassland.
Broad shallow drainage zones	
ChAbTaTe	*Corymbia hamersleyana* low open woodland (with some *Flueggea virosa* subsp. *melanthesoides*) over *Triodia epactia* and *T. angusta* low to mid hummock grassland.
Ta	*Triodia angusta* low to mid hummock grassland (with *Acacia bivenosa* mid isolated shrubs).
Ac(TsGc)Te	*Acacia coriacea* and *Terminalia supranitifolia* (P3) very old trees with *Pittosporum phillyreoides, Gymnanthera cunninghamii* (P4) over *Adriana tomentosa* open shrubland over scattered *Triodia epactia* hummock grasses.
AbTa	*Acacia bivenosa* open tall shrubland over *Triodia angusta hummock* grassland with some *Triodia epactia*. There can be scattered to open shrubland of *Stylobasium spathulatum* with annual herbland.

Figure J-a

Vegetation unit mapping legend

Job Number: L18118-001
Doc Number: 010a
Date: 20.01.20
Scale: NTS @ A4
Created by: MA
Source: RPS 2020

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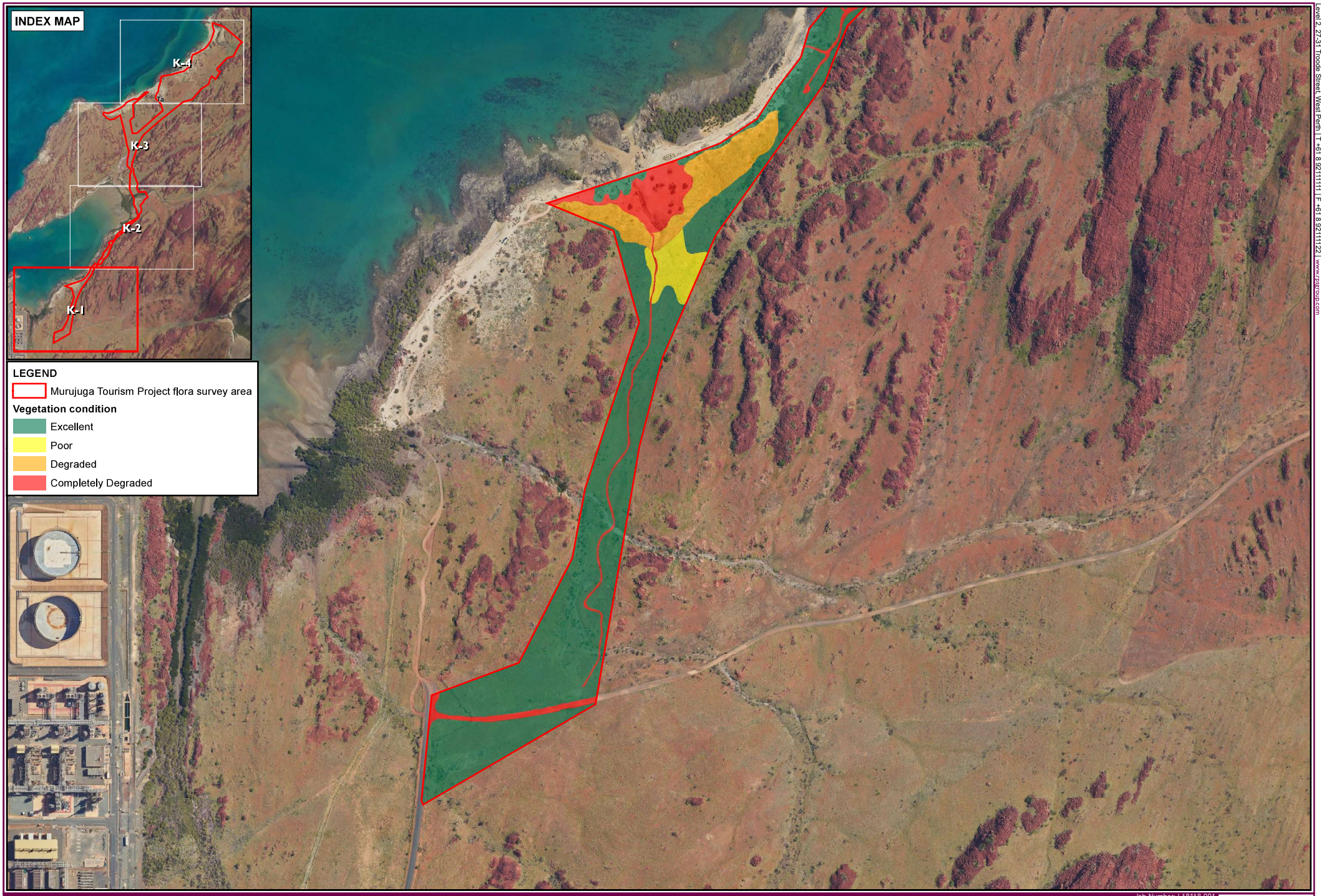

Figure K-1

RPS vegetation condition mapping

GDA 1994 MGA Zone 50

0 50 100 200 m

Job Number: L18118-001
Doc Number: 011
Date: 20.07.20
Scale: 1:5,000 @ A3
Created by: MA
Source: Orthophoto - Landgate, 2020

Document Path: G:\Jobs\L_Jobs\L18118 - Murujuga Technical Studies\Figures L18118-001\L18118-001_G_011_FigK1-4 RPS vegetation condition_200120.mxd

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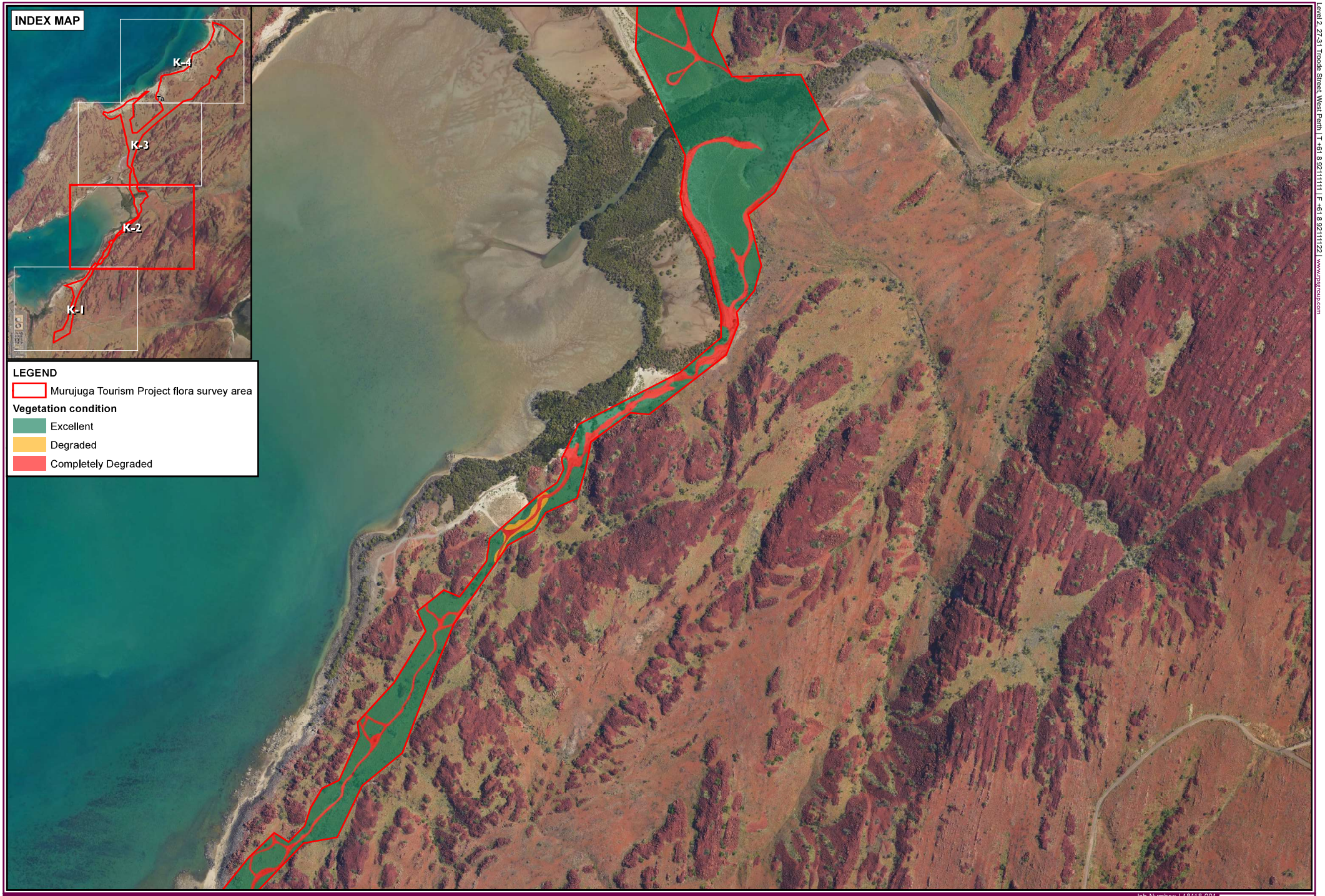

Figure K-2

RPS vegetation condition mapping

GDA 1994 MGA Zone 50

0 50 100 200 m

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Doc Number: 011
Date: 20.07.20
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Created by: MA
Source: Orthophoto - Landgate, 2020

Document Path: G:\Jobs\L_Jobs\L18118 - Murujuga Technical Studies\Figures L18118-001\L18118-001_G_011_FigK1-4 RPS vegetation condition_200120.mxd

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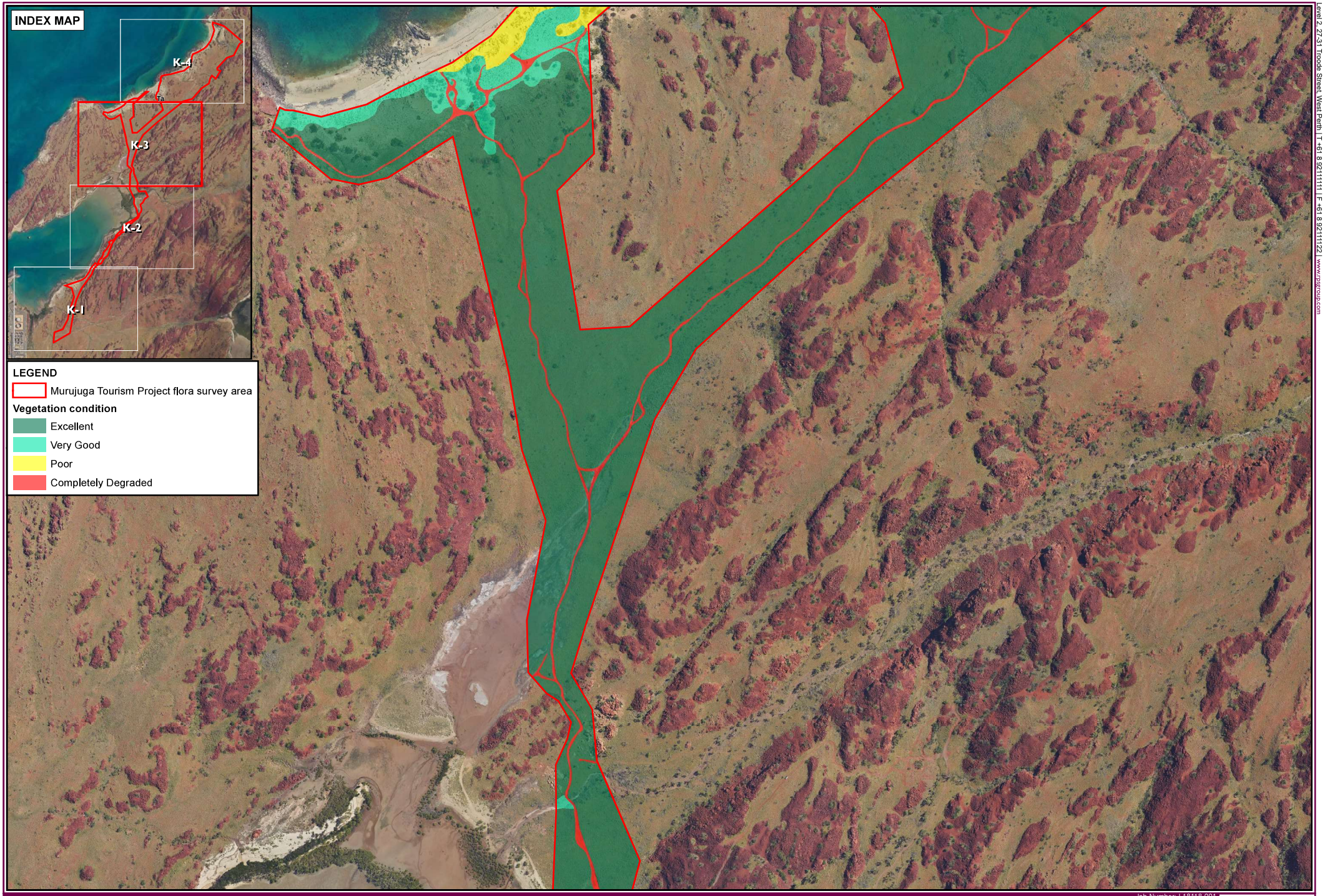

Figure K-3

RPS vegetation condition mapping

GDA 1994 MGA Zone 50

0 50 100 200 m

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Doc Number: 011
Date: 20.07.20
Scale: 1:5,000 @ A3
Created by: MA
Source: Orthophoto - Landgate, 2020

Document Path: G:\Jobs\L_Jobs\L18118 - Murujuga Technical Studies\Figures L18118-001\L18118-001_G_011_FigK1-4 RPS vegetation condition_200120.mxd

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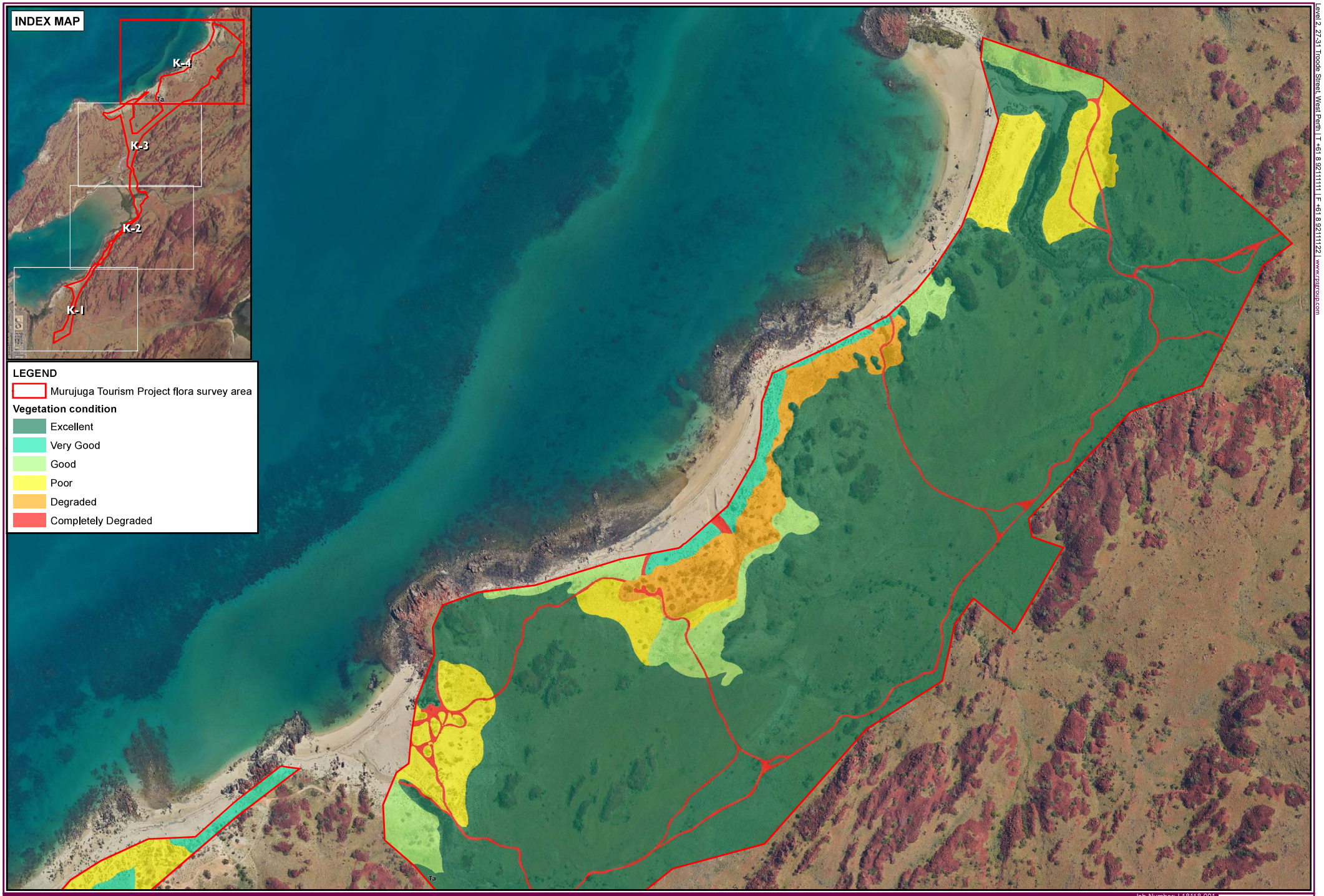

Figure K-4

RPS vegetation condition mapping

Job Number: L18118-001
Doc Number: 011
Date: 20.07.20
Scale: 1:5,000 @ A3
Created by: MA
Source: Orthophoto - Landgate, 2020

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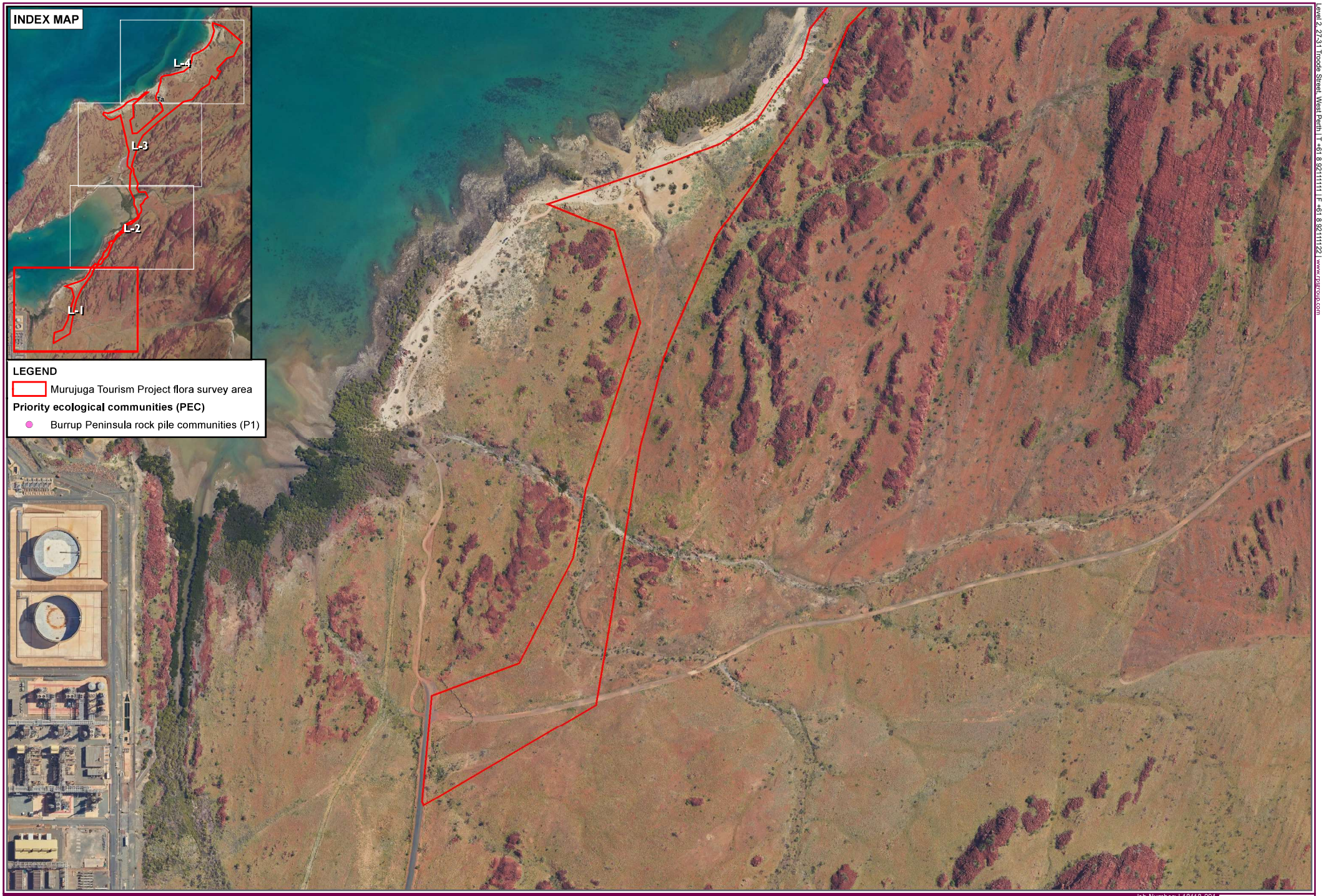

Figure L-1

Conservation significant ecological communities recorded for the survey

GDA 1994 MGA Zone 50

0 50 100 200 m

Job Number: L18118-001
Doc Number: 010
Date: 20.07.20
Scale: 1:5,000 @ A3
Created by: MA
Source: Orthophoto - Landgate, 2020

Document Path: G:\Jobs\L_Jobs\L18118 - Murujuga Technical Studies\Figures L18118-001\L18118-001_G_012_FigL1-4 Significant eco communities survey_200120.mxd

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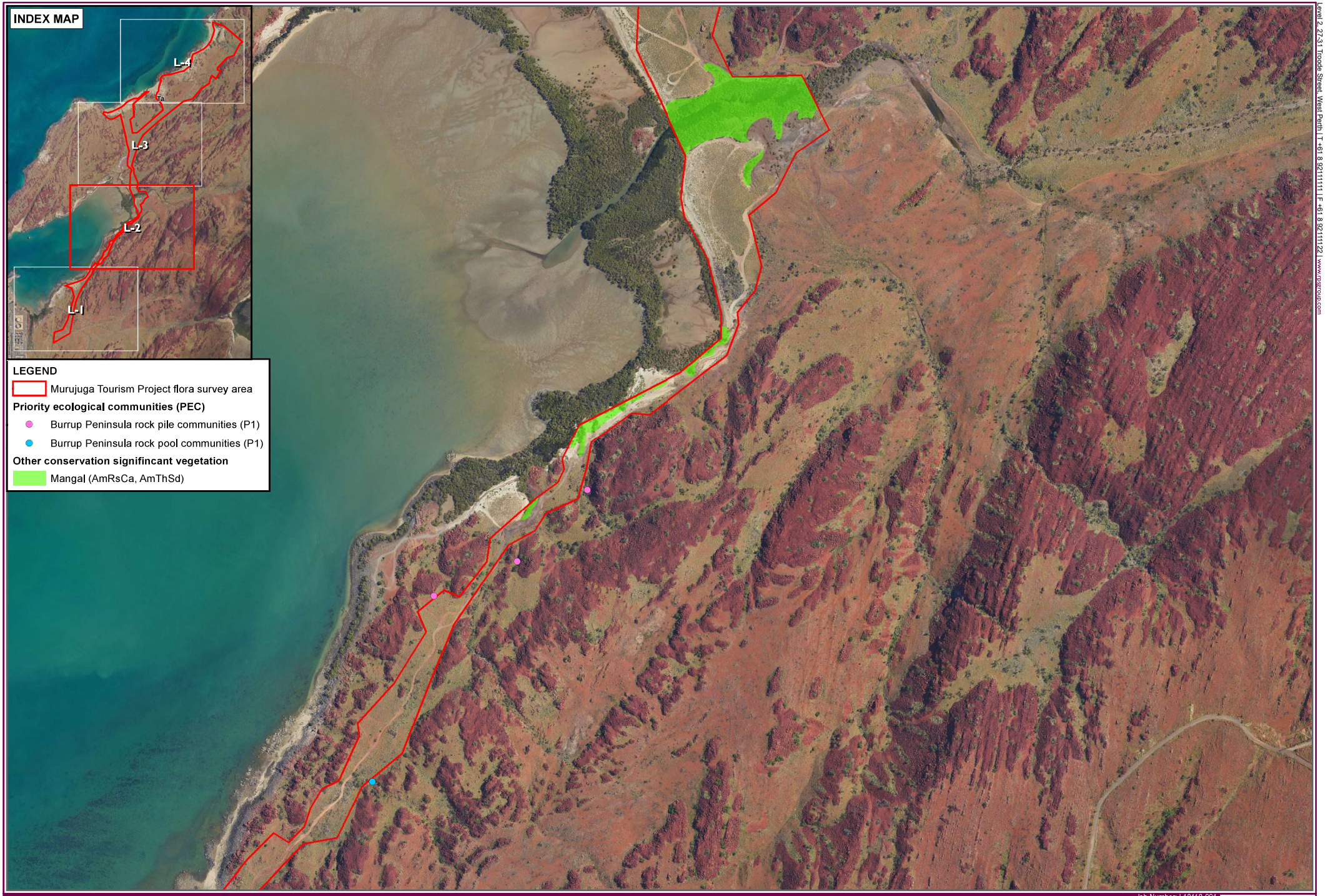

Figure L-2

Conservation significant ecological communities recorded for the survey

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Doc Number: 010
Date: 20.07.20
Scale: 1:5,000 @ A3
Created by: MA
Source: Orthophoto - Landgate, 2020

Document Path: G:\Jobs\L_Jobs\L18118 - Murujuga Technical Studies\Figures L18118-001\L18118-001_G_012_FigL1-4 Significant eco communities survey_200120.mxd

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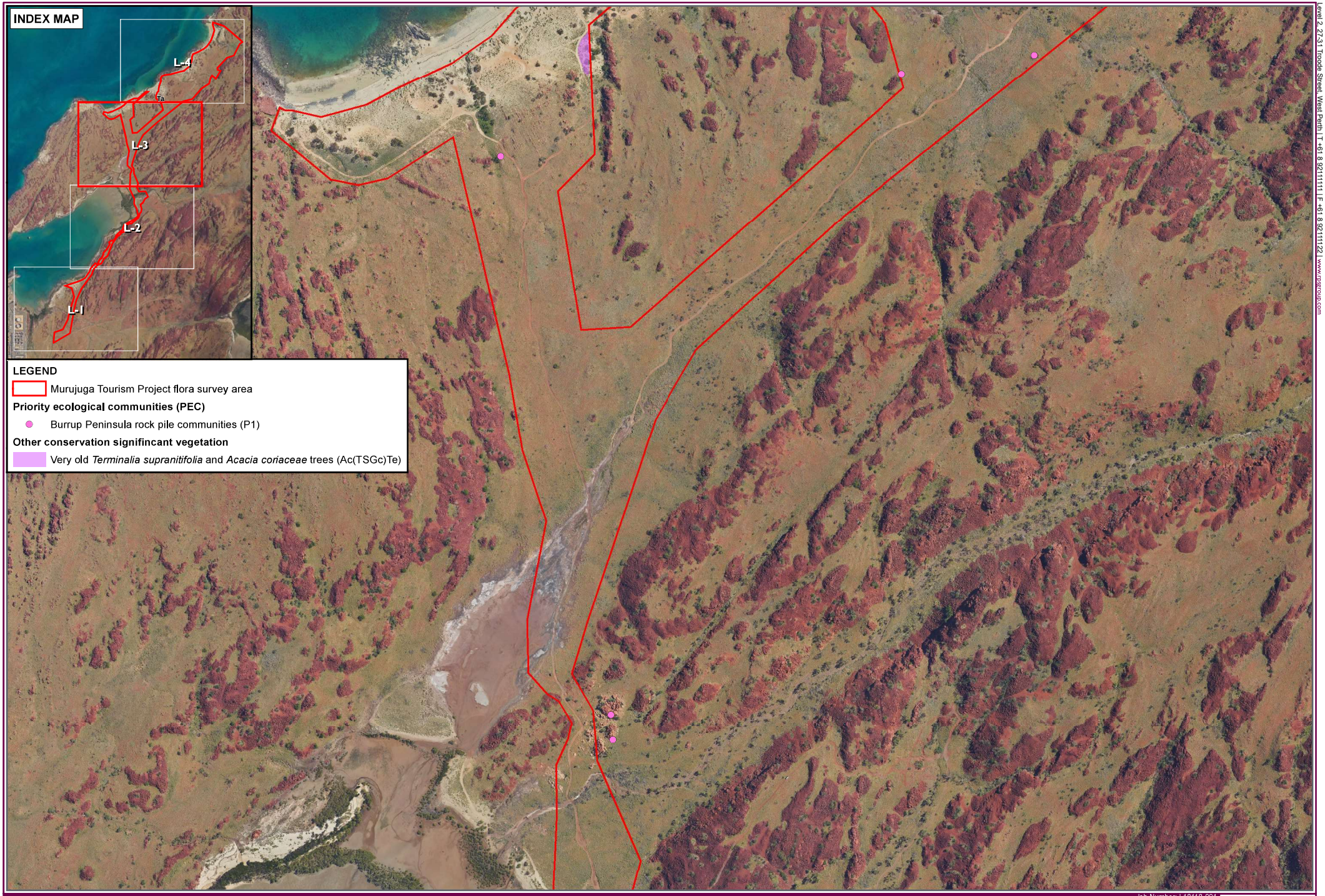

Figure L-3

Conservation significant ecological communities recorded for the survey

GDA 1994 MGA Zone 50

0 50 100 200 m

Job Number: L18118-001
Doc Number: 010
Date: 20.07.20
Scale: 1:5,000 @ A3
Created by: MA
Source: Orthophoto - Landgate, 2020

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Figure L-4

Conservation significant ecological communities recorded for the survey

GDA 1994 MGA Zone 50

0 50 100 200 m

Job Number: L18118-001
Doc Number: 010
Date: 20.07.20
Scale: 1:5,000 @ A3
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Source: Orthophoto - Landgate, 2020

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Figure M

Other significant values recorded for the survey

GDA 1994 MGA Zone 50

0 0,25 0,5 1 km

Job Number: L18118-001
Doc Number: 013
Date: 20.07.20
Scale: 1:20,000 @ A3
Created by: MA
Source: Orthophoto - Landgate, 2020

Document Path: G:\Jobs\L_Jobs\L18118 - Murujuga Technical Studies\Figures L18118-001\L18118-001_G_013_FigM Other values survey_200120.mxd

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Appendix A
Definitions

APPENDIX A: DEFINITIONS

Table A-1: Conservation codes for Western Australian flora (DBCA 2019a)

Category	Definition
T	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 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 – 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". • EN: Endangered – 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" • VU: Vulnerable – 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".
EX	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 the Wildlife Conservation (Rare Flora) Notice 2018 for extinct flora.
EW	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 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.
P1	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.
P2	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.
P3	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.
P4	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.

Table A-2: EPBC Act conservation categories (IUCN Red List 2014)

Category	Definition
EX	**Extinct** A taxon is Extinct when there is no reasonable doubt that the last individual has died. A taxon is presumed Extinct when exhaustive surveys in known and/or expected habitat, at appropriate times (diurnal, seasonal, annual) throughout its historic range have failed to record an individual. Surveys should be over a time frame appropriate to the taxon's life cycle and life form.
EW	**Extinct in the Wild** A taxon is Extinct in the Wild when it is known only to survive in cultivation, in captivity or as a naturalised population (or populations) well outside the past range. A taxon is presumed Extinct in the Wild when exhaustive surveys in known and/or expected habitat, at appropriate times (diurnal, seasonal, annual) throughout its historic range have failed to record an individual. Surveys should be over a time frame appropriate to the taxon's life cycle and life form.
CR	**Critically Endangered** A taxon is Critically Endangered when the best available evidence indicates that it meets any of the criteria A to E for Critically Endangered (see Section V), and it is therefore considered to be facing an extremely high risk of extinction in the wild.
EN	**Endangered** A taxon is Endangered when the best available evidence indicates that it meets any of the criteria A to E for Endangered (see Section V), and it is therefore considered to be facing a very high risk of extinction in the wild.
VU	**Vulnerable** A taxon is Vulnerable when the best available evidence indicates that it meets any of the criteria A to E for Vulnerable (see Section V), and it is therefore considered to be facing a high risk of extinction in the wild.
NT	**Near Threatened** A taxon is Near Threatened when it has been evaluated against the criteria but does not qualify for Critically Endangered, Endangered or Vulnerable now, but is close to qualifying for or is likely to qualify for a threatened category in the near future.
LC	**Least Concern** A taxon is Least Concern when it has been evaluated against the criteria and it does not qualify for Critically Endangered, Endangered, Vulnerable or Near Threatened. Widespread and abundant taxa are included in this category.
DD	**Data Deficient** A taxon is Data Deficient when there is inadequate information to make a direct, or indirect, assessment of its risk of extinction based on its distribution and/or population status. A taxon in this category may be well studied, and its biology well known, but appropriate data on abundance and/or distribution are lacking. Data Deficient is therefore not a category of threat. Listing of taxa in this category indicates that more information is required and acknowledges the possibility that future research will show that threatened classification is appropriate. It is important to make positive use of whatever data are available. In many cases, great care should be exercised in choosing between DD and a threatened status. If the range of a taxon is suspected to be relatively circumscribed, and a considerable period has elapsed since the last record of the taxon, threatened status may well be justified.
NE	**Not Evaluated** A taxon is Not Evaluated when it has not yet been evaluated against the criteria.

Table A-3: Threatened Ecological Communities Category of Threat (English and Blyth 1997)

Category	Definition
Presumed Totally Destroyed (PD)	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: 1. Records within the last 50 years have not been confirmed despite thorough searches or known or likely habitats or; 2. All occurrences recorded within the last 50 years have since been destroyed.
Critically Endangered (CR)	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: 1. 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: – 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 five years). – Modification throughout its range is continuing such that in the immediate future (within approximately five years) the community is unlikely to be capable of being substantially rehabilitated. 2. Current distribution is limited, and **one or more** of the following apply (a, b or c): a. 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 five years). b. There are very few occurrences, each of which is small and/or isolated and extremely vulnerable to known threatening processes. c. 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. 3. The ecological community exists only as highly modified occurrences which may be capable of being rehabilitated if such work begins in the immediate future (within approximately five years).
Endangered (EN)	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 (1, 2, or 3): 1. The estimated geographic range, and/or total area occupied, and/or number of discrete occurrences since European settlement have been reduced by at least 70% and either or both of the following apply (a or b): a. 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 (within approximately 10 years). b. Modification throughout its range is continuing such that in the short term future (within approximately 10 years) the community is unlikely to be capable of being substantially restored or rehabilitated. 2. Current distribution is limited, and one or more of the following apply (a, b or c): a. 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 10 years). b. There are very few occurrences, each of which is small and/or isolated and extremely vulnerable to known threatening processes. c. 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. 3. The ecological community exists only as highly modified occurrences which may be capable of being rehabilitated if such work begins in the short term future (within approximately 10 years).

Vulnerable (VU)	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 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 (1, 2 or 3): 1. The ecological community exists largely as modified occurrences which are likely to be capable of being substantially restored or rehabilitated. 2. The ecological community can be modified or destroyed and would be vulnerable to threatening processes, is restricted in area and/or range and/or is only found at a few locations. 3. The ecological community may still be 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.
Data Deficient (DD)	An ecological community which has not been adequately evaluated with respect to status or where there is currently insufficient information to assign it to a particular category. (An ecological community with poorly known distribution or biology that is suspected to belong to any of the above categories. These ecological communities have a high priority for survey and/or research.)
Lower Risk (LR)	An ecological community that has been adequately surveyed and does not qualify for any of the above categories of threat and appears unlikely to be under threat of significant modification or destruction in the short to medium term future.

Table A-4: Priority ecological communities category definitions (DEC 2013)

Category	Definition
P1	**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.
P2	**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.
P3	**Priority Three: Poorly known ecological communities** 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: 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; Communities made up of large, and/or widespread occurrences that may or not be represented in the reserve system, but are under threat of modification across much of their range from processes such as grazing by domestic and/or feral stock, and inappropriate fire regimes. Communities may be included if they are comparatively well known from several localities but do not meet adequacy of survey requirements and/or are not well defined, and known threatening processes exist that could affect them.
P4	**Priority Four: Ecological communities that are adequately known, rare but not threatened or meet criteria for Near Threatened or that have been recently removed from the threatened list. These communities require regular monitoring.** 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. 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. Ecological communities that have been removed from the list of threatened communities during the past five years.
P5	**Priority Five: Conservation Dependent ecological communities** Ecological communities that are not threatened but are subject to a specific conservation program, the cessation of which would result in the community becoming threatened within five years.

Table A-5: EPBC Act listed threatened ecological communities' category of threat

Category	Definition
CR	**Critically Endangered** If an ecological community is facing an extremely high risk of extinction in the wild in the immediate future.
EN	**Endangered** If an ecological community is not Critically Endangered but is facing a very high risk of extinction in the wild in the immediate future.
VU	**Vulnerable** If an ecological community is not Critically Endangered or Endangered but is facing a very high risk of extinction in the wild in the medium term future.

Table A-6: NVIS vegetation structure classes (ESCAVI 2003)

Stratum	Growth Form	Height	Structural formation classes (% Cover)					
		Foliage cover *	70-100	30-70	10-30	<10	0-5	~0
		Percentage cover †	>80	50-80	20-50	0.25-20	0-5	<0.25
U	Tree, palm	Tall; Mid; Low	Closed forest	Open forest	Woodland	Open woodland	Isolated clumps of trees	Isolated trees
	Tree mallee	Tall; Mid; Low	Closed mallee forest	Open mallee forest	Mallee woodland	Open mallee woodland	Isolated clumps of mallee trees	Isolated mallee trees
M	Shrub, cycad, grass-tree, tree-fern	Tall; Mid; Low	Closed shrubland	Shrubland	Open shrubland	Sparse shrubland	Isolated clumps of shrubs	Isolated shrubs
	Mallee shrub	Tall; Mid; Low	Closed mallee shrubland	Mallee shrubland	Open mallee shrubland	Sparse mallee shrubland	Isolated clumps of mallee shrubs	Isolated mallee shrubs
	Heath shrub	Tall; Mid; Low	Closed heathland	Heathland	Open heathland	Sparse heathland	Isolated clumps of heath shrubs	Isolated heath shrubs
	Chenopod shrub	Tall; Mid; Low	Closed chenopod shrubland	Chenopod shrubland	Open chenopod shrubland	Sparse chenopod shrubland	Isolated clumps of chenopod shrubs	Isolated chenopod shrubs
	Samphire shrub	Mid; Low	Closed samphire shrubland	Samphire shrubland	Open samphire shrubland	Sparse samphire shrubland	Isolated clumps of samphire shrubs	Isolated samphire shrubs
G	Hummock grass	Mid; Low	Closed hummock grassland	Hummock grassland	Open hummock grassland	Sparse hummock grassland	Isolated clumps of hummock grasses	Isolated hummock grasses
	Tussock grass	Mid; Low	Closed tussock grassland	Tussock grassland	Open tussock grassland	Sparse tussock grassland	Isolated clumps of tussock grasses	Isolated tussock grasses
	Other grass	Mid; Low	Closed grassland	Grassland	Open grassland	Sparse grassland	Isolated clumps of grasses	Isolated grasses
	Sedge	Mid; Low	Closed sedgeland	Sedgeland	Open sedgeland	Sparse sedgeland	Isolated clumps of sedges	Isolated sedges
	Rush	Mid; Low	Closed rushland	Rushland	Open rushland	Sparse rushland	Isolated clumps of rushes	Isolated rushes
	Forb (Herb)	Mid; Low	Closed forbland	Forbland	Open forbland	Sparse forbland	Isolated clumps of forbs	Isolated forbs

* Foliage Cover is defined for each stratum as 'the proportion of the ground, which would be shaded if sunshine came from directly overhead'. It includes branches and leaves and is similar to the Crown type of Walker & Hopkins (1990) but is applied to a stratum or plot rather than an individual crown. It is generally not directly measured in the field for the upper stratum, although it can be measured by various line interception methods for ground layer vegetation. For the attribute COVER CODE in the Stratum table, the ground cover category refers to ground foliage cover not percentage cover.

† The percentage cover is defined as the percentage of a strictly defined plot area, covered by vegetation. This can be an estimate and is a less precise measure than using, for example, a point intercept transect methods on ground layer, or overstorey vegetative cover. That is for precisely measured values (e.g. crown densitometer or point intercept transects) the value measured would be 'foliage' cover. Where less precise or qualitative measures are used these will most probably be recorded as 'percentage' cover.

Table A-7: NVIS vegetation height classes (ESCAVI 2003)

Height	Growth form				
Height class	Height range (M)	Tree, vine (M and U), palm (single-stemmed)	Shrub, heath shrub, chenopod shrub, ferns, samphire shrub, cycad, tree-fern, grass-tree, palm (multi-stemmed)	Tree mallee, mallee shrub	Tussock grass, hummock grass, other grass, sedge, rush, forbs, vine (G)
8	>30	Tall			
7	10-30	Mid		Tall	
6	<10	Low		Mid	
5				Low	
4	>2		Tall		Tall
3	1-2		Mid		Tall
2	0.5-1		Low		Mid
1	<0.5		Low		Low

Table A-8: Vegetation condition scale for the Eremaen and Northern botanical provinces

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

(Source: adapted from Trudgen 1988)

Appendix B
Flora inventory

APPENDIX B: FLORA INVENTORY

Family	Weed	Taxon	Conservation significance
ACANTHACEAE		*Avicennia marina* subsp. *marina*	
		Dicliptera armata	ra
AIZOACEAE		*Trianthema turgidifolium*	
		Zaleya galericulata	ra
AMARANTHACEAE		*Surreya diandra*	
		Amaranthus undulatus	
		Gomphrena cunninghamii	
		Ptilotus auriculifolius	
		Ptilotus fusiformis	
		Ptilotus villosiflorus	
	*	*Aerva javanica*	
APOCYNACEAE		*Cynanchum floribundum*	
		Gymnanthera cunninghamii	P3
ARALIACEAE		*Trachymene oleracea*	
ASTERACEAE	*	*Flaveria trinervia*	
		Pluchea dentex	
		Pluchea ferdinandi-muelleri	ra
		Pluchea rubelliflora	
		Pterocaulon sphacelatum	
		Pterocaulon sphaeranthoides	
		Streptoglossa decurrens	
		Streptoglossa odora	
BIGNONIACEAE		*Dolichandrone occidentalis*	ra
BORAGINACEAE		*Ehretia saligna*	
		Heliotropium cunninghamii	
		Heliotropium tenuifolium	
		Trichodesma zeylanicum	
CAPPARACEAE		*Capparis spinosa*	
CARYOPHYLLACEAE		*Polycarpaea longiflora*	
CHENOPODIACEAE		*Dysphania kalpari*	
		Dysphania plantaginella	
		Dysphania rhadinostachya	
		Enchylaena tomentosa	
		Neobassia astrocarpa	
		Rhagodia eremaea	
		Rhagodia preissii subsp. *obovata*	
		Salsola australis	
		Tecticornia halocnemoides	
		Tecticornia indica subsp. *leiostachya*	
		Threlkeldia diffusa	
CLEOMACEAE		*Cleome viscosa*	
COMBRETACEAE		*Terminalia circumalata*	
		Terminalia supranitifolia	P3, en, re
CONVOLVULACEAE		*Bonamia media*	
		Cuscuta victoriana	
		Evolvulus alsinoides var. *villosicalyx*	
		Ipomoea coptica	

Family	Weed	Taxon	Conservation significance
		Ipomoea costata	
		Ipomoea polymorpha	ra
		Operculina aequisepala	
		Polymeria ambigua	
		Polymeria calycina	
CUCURBITACEAE		*Cucumis variabilis*	
		Trichosanthes cucumerina	
CYPERACEAE		*Bulbostylis barbata*	
		Cyperus bifax	
		Cyperus cunninghamii	
		Cyperus vaginatus	
		Fimbristylis aff. littoralis	
EUPHORBIACEAE		*Adriana tomentosa*	
		Euphorbia australis	
		Euphorbia biconvexa	
		Euphorbia careyi	
		Euphorbia coghlanii	
		Euphorbia drummondii	
		Euphorbia tannensis	
		Euphorbia tannensis subsp. *eremophila*	
		Euphorbia trigonosperma	
FABACEAE		*Acacia ampliceps*	
		Acacia bivenosa	
		Acacia colei	
		Acacia coriacea	
		Acacia inaequilatera	
		Acacia orthocarpa	
		Acacia pyrifolia	
		Acacia pyrifolia var. *morrisonii*	
		Cajanus cinereus	
		Canavalia rosea	
		Crotalaria medicaginea	
		Crotalaria novae-hollandiae	
		Crotalaria novae-hollandiae subsp. *crassipes*	
		Cullen lachnostachys	
		Dichrostachys spicata	
		Erythrina vespertilio	
		Indigofera colutea	
		Indigofera linifolia	
		Indigofera linnaei	
		Indigofera monophylla	
		Rhynchosia bungarensis	P4
		Rhynchosia minima	
		Senna glutinosa subsp. *glutinosa*	
		Senna notabilis	
		Senna venusta	
		Sesbania cannabina	
		Swainsona formosa	
		Swainsona pterostylis	
		Tephrosia densa	

Family	Weed	Taxon	Conservation significance
		Tephrosia rosea var. *clementii*	
		Tephrosia sp. B Kimberley Flora (C.A. Gardner 7300)	
		Tephrosia sp. NW Eremaean (S. van Leeuwen et al. PBS 0356)	
		Tephrosia supina	
		Vigna triodiophila	P3, en
		Zornia muelleriana subsp. *congesta*	ra
FRANKENIACEAE		*Frankenia pauciflora*	
GOODENIACEAE		*Goodenia lamprosperma*	
		Goodenia microptera	
		Scaevola cunninghamii	
		Scaevola spinescens	
		Scaevola spinescens (broad form)	
		Scaevola spinescens (narrow form)	
LAMIACEAE		*Clerodendrum tomentosum*	
LAURACEAE		*Cassytha capillaris*	
LYTHRACEAE		*Ammannia baccifera*	
MALVACEAE		*Abutilon cunninghamii*	
		Abutilon fraseri	
		Abutilon lepidum	
		Abutilon oxycarpum	
		Abutilon oxycarpum subsp. Prostrate	un
		Brachychiton acuminatus	
		Corchorus walcottii	
		Gossypium australe	
		Hibiscus sturtii var. *campylochlamys*	ra
		Sida fibulifera	
		Sida sp. Pilbara (A.A. Mitchell PRP 1543)	
		Triumfetta appendiculata	
		Triumfetta clementii	
		Waltheria indica	
	*	*Malvastrum americanum*	
MENISPERMACEAE		*Tinospora smilacina*	
MOLLUGINACEAE		*Trigastrotheca molluginea*	
MORACEAE		*Ficus aculeata* var. *indecora*	
MYRTACEAE		*Corymbia hamersleyana*	
		Eucalyptus victrix	
NYCTAGINACEAE		*Boerhavia coccinea*	
		Boerhavia gardneri	
		Boerhavia schomburgkiana	
		Commicarpus australis	
OLEACEAE		*Jasminum didymum* subsp. *lineare*	
PHYLLANTHACEAE		*Flueggea virosa*	
		Flueggea virosa subsp. *melanthesoides*	
		Phyllanthus erwinii	
		Phyllanthus maderaspatensis	
PHRYMACEAE		*Peplidium* sp. E Evol. Fl. Fauna Arid Aust. (A.S. Weston 12768)	ra
PITTOSPORACEAE		*Pittosporum phillyreoides*	
PLANTAGINACEAE		*Stemodia grossa*	
PLUMBAGINACEAE		*Muellerolimon salicorniaceum*	
		Plumbago zeylanica	

Family	Weed	Taxon	Conservation significance
POACEAE		*Cymbopogon ambiguus*	
		Dactyloctenium radulans	
		Enneapogon caerulescens	
		Enneapogon lindleyanus	
		Eragrostis falcata	
		Eragrostis surreyana	P3, en
		Eriachne obtusa	
		Eriachne tenuiculmis	
		Paspalidium clementii	
		Paspalidium tabulatum	
		Spinifex longifolius	
		Sporobolus virginicus	
		Themeda triandra	un
		Triodia angusta	
		Triodia epactia	
		Triodia wiseana	
		Whiteochloa airoides	
	*	*Cenchrus ciliaris*	
	*	*Setaria verticillata*	
POLYGALACEAE		*Polygala isingii*	ra
PORTULACACEAE		*Portulaca filifolia*	
		Portulaca oleracea	
PROTEACEAE		*Grevillea pyramidalis*	
		Hakea lorea	
RUBIACEAE		*Oldenlandia crouchiana*	
		Synaptantha tillaeacea	
SAPINDACEAE		*Alectryon oleifolius*	ra
SCROPHULARIACEAE		*Myoporum montanum*	
SOLANACEAE		*Solanum cleistogamum*	
		Solanum horridum	
		Solanum lasiophyllum	
		Solanum phlomoides	
SURIANACEAE		*Stylobasium spathulatum*	
VIOLACEAE		*Hybanthus aurantiacus*	
ZYGOPHYLLACEAE		*Tribulopis angustifolia*	
		Tribulus hirsutus	
		Tribulus occidentalis	
		Tribulus platypterus	
	*	*Tribulus terrestris*	

P3 - 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.

P4 - 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; 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; Species that have been removed from the list of threatened species during the past five years for reasons other than taxonomy.

en - locally endemic or association with a restricted habitat type (e.g. surface water or groundwater dependent ecosystems)

n - new species or anomalous features that indicate a potential new species

ra - representative of the range of a species (at the extremes of range recently discovered range extensions, or isolated outliers of the main range)

un - unusual species, including restricted subspecies, varieties or naturally occurring hybrids

re - relictual status, being representative of taxonomic groups that no longer occur widely in the broader landscape.

Appendix C
Species by site

APPENDIX C: SPECIES BY SITE

Taxon	CZ-01	CZ-02	CZ-03	CZ-04	CZ-05	CZ-06	CZ-07	CZ-08	CZ-09	CZ-10	CZ-11	CZ-12	CZ-13	CZ-14	CZ-15	CZ-16	CZ-17	CZ-18	CZ-19	CZ-20	CZ-21	CZ-22	CZ-23	CZ-24	CZ-25	CZ-26	CZ-27	CZ-28	CZ-29	CZ-30	CZ-31	CZ-32	CZ-33	CZ-34	CZ-35	CZ-36	CZ-37	CZ-38	CZ-39	CZ-40	CZ-41	CZ-42
Abutilon cunninghamii															x																											
Abutilon fraseri							x													x									x												
Abutilon lepidum				x		x				x			x		x	x	x		x	x			x	x	x			x	x				x					x	x		
Abutilon oxycarpum																																										
Abutilon oxycarpum subsp. *Prostrate*																																										
Acacia ampliceps			x																												x				x						
Acacia bivenosa		x		x	x				x	x				x		x	x	x	x		x	x	x	x	x	x	x	x					x		x		x	x	x		
Acacia colei						x											x		x		x				x	x								x				x		x	x		
Acacia coriacea							x			x	x		x	x	x	x		x	x	x	x	x	x	x	x	x	x		x	x	x				x	x	x	x	x	x	x	x
Acacia inaequilatera									x														x	x															x				
Acacia orthocarpa																																										
Acacia pyrifolia					x													x																			x					
Acacia pyrifolia var. *morrisonii*									x									x																	x							
Adriana tomentosa	x		x	x	x				x		x	x		x							x	x				x			x	x		x	x	x	x	x			x	x
Aerva javanica	x	x		x	x		x				x	x	x	x	x							x				x	x			x				x	x					x	
Alectryon oleifolius							x								x			x		x						x			x	x							x		x	x
Amaranthus undulatus	x	x			x		x				x			x												x			x										x	x
Ammannia baccifera																		x																			x				
Avicennia marina subsp. *marina*																																									
Boerhavia coccinea			x		x	x	x	x		x			x		x					x	x														x			x			
Boerhavia gardneri		x			x		x						x			x	x	x	x			x	x	x	x			x	x				x			x	x		x	x	x	x
Boerhavia schomburgkiana											x			x												x	x				x				x	x						
Bonamia media						x		x	x	x			x			x		x	x		x		x	x			x	x				x		x		x		x	x		
Brachychiton acuminatus							x						x		x		x	x	x	x			x						x	x	x										
Bulbostylis barbata						x				x																																
Cajanus cinereus																																										
Canavalia rosea											x																															
Capparis spinosa																																										
Cassytha capillaris				x					x									x			x									x			x			x	x				
Cenchrus ciliaris		x																																								
Cleome viscosa	x	x			x	x	x			x	x	x	x	x	x		x	x	x	x		x	x	x	x	x	x		x		x		x	x	x	x	x	x	x	x	x
Clerodendrum tomentosum															x																											
Commicarpus australis							x								x																											
Corchorus walcottii					x	x			x									x	x		x	x	x	x				x				x		x	x	x	x	x		x
Corymbia hamersleyana																				x	x																				
Crotalaria medicaginea			x		x					x			x		x	x		x	x	x	x	x	x	x													x				
Crotalaria novae-hollandiae						x		x								x	x		x							x		x		x			x				x		x			
Crotalaria novae-hollandiae subsp. *crassipes*																						x						x										x		x		
Cucumis variabilis			x	x					x					x	x		x	x	x		x															x	x	x		x		
Cullen lachnostachys															x	x	x		x		x	x	x		x												x	x	x	x	x		
Cuscuta victoriana																											x															
Cymbopogon ambiguus					x	x	x		x	x			x		x		x	x	x	x			x	x					x				x			x		x			
Cynanchum floribundum		x		x									x																				x			x	x	x	x			
Cyperus bifax			x	x														x																								
Cyperus cunninghamii																																										
Cyperus vaginatus			x						x									x																			x	x	x				
Dactyloctenium radulans			x																													x										
Dichrostachys spicata					x	x	x			x			x		x		x	x	x	x	x							x	x							x						
Dicliptera armata							x											x	x																							
Dolichandrone occidentalis													x		x														x													
Dysphania kalpari			x																													x										
Dysphania plantaginella																						x																				
Dysphania rhadinostachya																						x																				

Taxon	CZ-01	CZ-02	CZ-03	CZ-04	CZ-05	CZ-06	CZ-07	CZ-08	CZ-09	CZ-10	CZ-11	CZ-12	CZ-13	CZ-14	CZ-15	CZ-16	CZ-17	CZ-18	CZ-19	CZ-20	CZ-21	CZ-22	CZ-23	CZ-24	CZ-25	CZ-26	CZ-27	CZ-28	CZ-29	CZ-30	CZ-31	CZ-32	CZ-33	CZ-34	CZ-35	CZ-36	CZ-37	CZ-38	CZ-39	CZ-40	CZ-41	CZ-42
Ehretia saligna																			x	x			x						x										x			
Enchylaena tomentosa							x																																			
Enneapogon caerulescens																																										
Enneapogon lindleyanus																							x														x					
Eragrostis falcata																																										
Eriachne obtusa																																										
Eriachne tenuiculmis																		x																	x							
Erythrina vespertilio																																										
Eucalyptus victrix																																			x		x				
Euphorbia australis																					x		x			x															
Euphorbia biconvexa																			x		x		x					x								x					
Euphorbia careyi						x				x					x																										
Euphorbia coghlanii																	x			x	x			x										x		x	x		x			
Euphorbia drummondii	x	x									x	x	x	x												x	x				x			x	x					x	x
Euphorbia tannensis	x				x								x	x					x		x		x		x		x													
Euphorbia tannensis subsp. *eremophila*		x		x			x				x					x			x		x	x				x					x		x		x				x	x
Euphorbia trigonosperma	x			x							x	x		x													x							x	x					x	x
Evolvulus alsinoides var. *villosicalyx*							x																x					x												
Ficus aculeata var. indecora					x										x			x											x											
Fimbristylis aff. littoralis																																				x					
Flaveria trinervia																																				x					
Flueggea virosa							x						x		x			x	x	x		x	x						x	x						x			x		x
Flueggea virosa subsp. *melanthesoides*																					x																				
Frankenia pauciflora																																										
Gomphrena cunninghamii						x				x							x		x					x				x	x									x	x		
Goodenia lamprosperma				x					x																										x		x				
Goodenia microptera				x	x	x			x							x	x				x				x		x						x								
Gossypium australe																																										
Grevillea pyramidalis						x		x	x	x						x	x	x	x	x	x		x	x	x			x							x	x		x	x		
Gymnanthera cunninghamii (P3)																						x																			
Hakea lorea						x			x	x						x	x		x				x	x	x			x								x	x	x	x		
Heliotropium cunninghamii																																										
Heliotropium tenuifolium					x																							x													
Hibiscus sturtii var. *campylochlamys*																x		x	x				x													x					
Hybanthus aurantiacus					x	x			x				x			x	x								x			x										x	x		
Indigofera colutea										x									x					x															x		
Indigofera linifolia				x	x	x		x		x	x		x	x		x	x	x	x			x	x	x	x	x	x	x		x		x		x		x	x	x	x	x
Indigofera linnaei		x				x																																			
Indigofera monophylla					x	x		x		x	x		x	x		x	x		x				x	x		x	x	x	x		x		x		x			x		x	
Ipomoea coptica																																										
Ipomoea costata						x	x				x		x		x	x	x	x	x	x		x	x						x	x						x			x	
Ipomoea polymorpha																																										
Jasminum didymum subsp. *lineare*															x						x								x										x	x
Malvastrum americanum			x																			x							x											
Muellerolimon salicorniaceum																																										
Myoporum montanum			x																																						
Neobassia astrocarpa			x																												x										
Oldenlandia crouchiana								x									x																								
Operculina aequisepala			x															x																	x						
Paspalidium clementii		x				x													x		x	x		x	x				x						x	x			x		x
Paspalidium tabulatum					x	x	x						x		x		x		x	x	x		x					x	x							x		x			
Phyllanthus erwinii																																										
Phyllanthus maderaspatensis					x				x												x		x						x							x					
Pittosporum phillyreoides							x								x			x	x		x																			x	
Pluchea dentex																																					x					
Pluchea ferdinandi-muelleri																														x												

Taxon	CZ-01	CZ-02	CZ-03	CZ-04	CZ-05	CZ-06	CZ-07	CZ-08	CZ-09	CZ-10	CZ-11	CZ-12	CZ-13	CZ-14	CZ-15	CZ-16	CZ-17	CZ-18	CZ-19	CZ-20	CZ-21	CZ-22	CZ-23	CZ-24	CZ-25	CZ-26	CZ-27	CZ-28	CZ-29	CZ-30	CZ-31	CZ-32	CZ-33	CZ-34	CZ-35	CZ-36	CZ-37	CZ-38	CZ-39	CZ-40	CZ-41	CZ-42
Pluchea rubelliflora			x															x																	x						
Plumbago zeylanica																																											
Polycarpaea longiflora							x																	x				x	x													
Polygala isingii																x																										
Polymeria ambigua																																										
Polymeria calycina																																				x						
Portulaca filifolia			x								x		x			x	x		x			x						x	x						x						
Portulaca oleracea																							x																			
Pterocaulon sphacelatum											x											x																				x
Pterocaulon sphaeranthoides	x	x							x							x			x		x	x	x				x						x				x					
Ptilotus auriculifolius																																										
Ptilotus fusiformis						x										x						x						x											x		
Ptilotus villosiflorus																																										
Rhagodia eremaea							x													x	x								x	x											x
Rhagodia preissii subsp. *obovata*																														x	x										
Rhynchosia bungarensis (P4)							x											x		x									x									x			
Rhynchosia minima					x	x		x		x			x	x			x		x				x	x	x			x					x				x	x	x		
Salsola australis	x																																									
Scaevola cunninghamii	x	x									x	x		x																												
Scaevola spinescens									x									x																							
Scaevola spinescens (broad form)															x	x	x		x		x		x						x							x	x		x	x		
Scaevola spinescens (narrow form)					x		x																																			
Senna glutinosa subsp. *glutinosa*																				x	x																					
Senna notabilis																					x																x					
Senna venusta																																										
Sesbania cannabina			x															x																	x						
Setaria verticillata																																										
Sida fibulifera																							x																		
Sida sp. Pilbara (A.A. Mitchell PRP 1543)																																										
Solanum cleistogamum					x	x													x		x				x														x		
Solanum horridum							x									x							x					x													
Solanum lasiophyllum																					x																				
Solanum phlomoides		x						x								x					x	x	x		x								x						x		
Spinifex longifolius	x	x									x	x		x																	x		x	x						
Sporobolus virginicus			x																												x									
Stemodia grossa			x	x					x									x																	x	x					
Streptoglossa decurrens				x	x	x	x	x	x				x			x	x		x		x	x	x	x	x			x	x				x			x	x		x		
Streptoglossa odora																					x																	x			
Stylobasium spathulatum																					x															x	x				
Surreya diandra			x																																						
Swainsona formosa			x		x						x	x		x		x		x			x	x	x	x	x									x	x	x		x			
Swainsona pterostylis		x		x										x													x				x	x			x						
Synaptantha tillaeacea	x										x																														
Tecticornia halocnemoides																																x									
Tecticornia indica subsp. *leiostachya*																																x									
Tephrosia densa						x													x				x					x										x			
Tephrosia rosea var. *clementii*								x	x							x	x				x		x										x			x	x				
Tephrosia sp. B Kimberley Flora (C.A. Gardner 7300)																																									
Tephrosia sp. NW Eremaean (S. van Leeuwen et al. PBS 0356)					x	x				x						x	x		x			x		x	x			x									x	x	x		
Tephrosia supina										x									x			x																			
Terminalia circumalata																		x																		x					
Terminalia supranitifolia (P3)						x												x		x									x	x										
Themeda triandra							x																x																		
Threlkeldia diffusa			x				x																																		
Tinospora smilacina					x	x	x						x		x	x			x		x								x	x	x					x			x		
Trachymene oleracea						x		x	x	x							x		x					x	x											x	x				

Taxon	CZ-01	CZ-02	CZ-03	CZ-04	CZ-05	CZ-06	CZ-07	CZ-08	CZ-09	CZ-10	CZ-11	CZ-12	CZ-13	CZ-14	CZ-15	CZ-16	CZ-17	CZ-18	CZ-19	CZ-20	CZ-21	CZ-22	CZ-23	CZ-24	CZ-25	CZ-26	CZ-27	CZ-28	CZ-29	CZ-30	CZ-31	CZ-32	CZ-33	CZ-34	CZ-35	CZ-36	CZ-37	CZ-38	CZ-39	CZ-40	CZ-41	CZ-42
Trianthema turgidifolium		x	x	x																												x	x									
Tribulopis angustifolia																																											
Tribulus hirsutus																x																											
Tribulus occidentalis		x												x												x																	
Tribulus platypterus																x																											
Tribulus terrestris																											x																
Trichodesma zeylanicum			x	x	x	x				x	x			x	x		x				x		x	x	x		x						x			x	x	x	x		x
Trichosanthes cucumerina							x														x																					
Trigastrotheca molluginea						x				x																		x											x			
Triodia angusta			x	x	x		x		x						x	x	x	x	x	x	x				x							x	x			x	x	x	x			
Triodia epactia	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x		x		x	x	x	x	x	x	x	x
Triodia wiseana								x								x	x		x				x	x	x			x									x		x			
Triumfetta appendiculata				x			x	x		x			x			x	x		x	x	x		x	x				x					x			x	x	x			
Triumfetta clementii				x	x	x	x	x	x	x			x	x	x	x	x	x	x	x	x	x	x	x	x			x	x				x		x		x	x	x	x		
Vigna triodiophila (P3)																																										
Waltheria indica			x						x																										x							
Whiteochloa airoides	x										x	x		x												x	x															
Zaleya galericulata																													x													
Zornia muelleriana subsp. *congesta*																																										

Taxon	CZ-43	CZ-44	CZ-45	CZ-46	CZ-47	CZ-48	CZ-49	CZ-50	CZ-51	CZ-52	CZ-53	CZ-54	CZ-55	CZ-56	CZ-57	CZ-58	CZ-59	CZ-60	CZ-61	CZ-62	CZ-63	CZ-64	CZ-65	CZ-66	CZ-67	CZ-68	CZ-69	CZ-70	CZ-71	CZ-72	CZ-73	CZ-74	CZ-75	CZ-76	CZ-77	CZ-78	W-01	W-02	W-03	W-04	W-05	W-06	W-07	W-08
Abutilon cunninghamii																																											
Abutilon fraseri																																												
Abutilon lepidum		x		x	x					x										x	x											x						x				
Abutilon oxycarpum																																	x										
Abutilon oxycarpum subsp. Prostrate																																							x	x		
Acacia ampliceps						x				x		x						x		x																							x
Acacia bivenosa		x				x						x		x			x					x		x				x	x	x			x				x	x	x	x		x	x	x
Acacia colei		x		x	x			x	x										x			x						x					x				x	x					
Acacia coriacea	x	x						x											x	x							x	x	x	x	x	x	x	x	x				x			x	x
Acacia inaequilatera																																									x		
Acacia orthocarpa																					x	x																			x		
Acacia pyrifolia																											x						x										
Acacia pyrifolia var. *morrisonii*																				x							x			x			x						x				
Adriana tomentosa	x	x								x						x	x	x					x	x			x		x	x	x	x	x								x	x	x
Aerva javanica																							x	x					x	x	x	x			x	x						x	x
Alectryon oleifolius																		x																	x								
Amaranthus undulatus	x									x								x							x				x		x				x	x						x	
Ammannia baccifera																																												
Avicennia marina subsp. *marina*															x										x																		
Boerhavia coccinea					x							x									x						x									x	x	x					
Boerhavia gardneri	x	x			x	x				x						x				x			x	x				x	x	x			x								x		
Boerhavia schomburgkiana																												x		x	x			x	x							x	x
Bonamia media		x	x	x				x	x									x			x	x					x					x			x		x	x	x		x		
Brachychiton acuminatus		x																		x		x					x							x								x		
Bulbostylis barbata				x	x																																						
Cajanus cinereus																				x																								
Canavalia rosea																																												
Capparis spinosa																											x																
Cassytha capillaris		x							x											x		x					x						x										
Cenchrus ciliaris																							x																				
Cleome viscosa	x	x	x	x	x	x		x	x	x	x	x		x		x	x	x	x	x	x		x	x			x		x		x	x	x	x	x	x		x		x	x	x	x

Taxon	CZ-43	CZ-44	CZ-45	CZ-46	CZ-47	CZ-48	CZ-49	CZ-50	CZ-51	CZ-52	CZ-53	CZ-54	CZ-55	CZ-56	CZ-57	CZ-58	CZ-59	CZ-60	CZ-61	CZ-62	CZ-63	CZ-64	CZ-65	CZ-66	CZ-67	CZ-68	CZ-69	CZ-70	CZ-71	CZ-72	CZ-73	CZ-74	CZ-75	CZ-76	CZ-77	CZ-78	W-01	W-02	W-03	W-04	W-05	W-06	W-07	W-08
Clerodendrum tomentosum																											x							x										
Commicarpus australis																																													
Corchorus walcottii	x					x					x	x						x	x	x		x					x	x				x	x		x		x	x					x
Corymbia hamersleyana																		x																										
Crotalaria medicaginea		x		x														x			x							x		x			x	x					x	x			
Crotalaria novae-hollandiae				x								x																x					x					x					
Crotalaria novae-hollandiae subsp. *crassipes*			x																																		x							
Cucumis variabilis						x						x						x									x							x										
Cullen lachnostachys			x	x	x																																							
Cuscuta victoriana																	x																												
Cymbopogon ambiguus		x	x					x	x									x		x							x					x	x		x			x	x	x			
Cynanchum floribundum		x	x	x				x											x													x											
Cyperus bifax																											x																	
Cyperus cunninghamii																																		x										
Cyperus vaginatus						x														x							x												x				
Dactyloctenium radulans																																												
Dichrostachys spicata		x	x		x														x	x							x							x					x	x	x		
Dicliptera armata																		x		x							x																
Dolichandrone occidentalis																																												
Dysphania kalpari																																												
Dysphania plantaginella													x		x																													
Dysphania rhadinostachya																																												
Ehretia saligna																				x							x							x										
Enchylaena tomentosa																																												
Enneapogon caerulescens																						x																						
Enneapogon lindleyanus																																												
Eragrostis falcata							x																																					
Eriachne obtusa								x	x		x	x																																
Eriachne tenuiculmis																				x							x												x				
Erythrina vespertilio																																									x			
Eucalyptus victrix																		x		x							x							x					x				
Euphorbia australis																					x												x		x	x	x	x		x	x	x	x
Euphorbia biconvexa																																								x				
Euphorbia careyi																																												
Euphorbia coghlanii			x		x																	x					x														x		
Euphorbia drummondii	x													x			x						x	x		x			x	x	x	x										
Euphorbia tannensis		x			x					x	x	x				x	x	x			x	x									x								x			
Euphorbia tannensis subsp. *eremophila*	x					x						x											x	x				x	x	x		x			x	x				x		
Euphorbia trigonosperma												x		x		x	x						x			x		x			x											
Evolvulus alsinoides var. *villosicalyx*		x																									x														x		
Ficus aculeata var. *indecora*																																												
Fimbristylis aff. littoralis																																												
Flaveria trinervia										x																																		
Flueggea virosa		x																		x							x							x	x				x				
Flueggea virosa subsp. *melanthesoides*																																												
Frankenia pauciflora							x						x		x																													
Gomphrena cunninghamii			x	x	x															x	x													x					x	x	x		
Goodenia lamprosperma																				x																								
Goodenia microptera																	x											x	x			x					x							
Gossypium australe																											x										x		x					
Grevillea pyramidalis		x	x	x	x	x													x		x							x					x							x	x		
Gymnanthera cunninghamii (P3)																																												
Hakea lorea			x	x					x																													x			x	x		

Taxon	CZ-43	CZ-44	CZ-45	CZ-46	CZ-47	CZ-48	CZ-49	CZ-50	CZ-51	CZ-52	CZ-53	CZ-54	CZ-55	CZ-56	CZ-57	CZ-58	CZ-59	CZ-60	CZ-61	CZ-62	CZ-63	CZ-64	CZ-65	CZ-66	CZ-67	CZ-68	CZ-69	CZ-70	CZ-71	CZ-72	CZ-73	CZ-74	CZ-75	CZ-76	CZ-77	CZ-78	W-01	W-02	W-03	W-04	W-05	W-06	W-07	W-08
Heliotropium cunninghamii									x								x																										
Heliotropium tenuifolium																																												
Hibiscus sturtii var. *campylochlamys*		x							x													x										x				x	x	x			x		
Hybanthus aurantiacus		x	x	x														x											x			x					x				x		
Indigofera colutea		x		x	x	x				x		x				x		x								x							x		x					x		x
Indigofera linifolia			x	x	x			x	x		x	x		x		x	x						x	x			x	x	x	x		x	x	x				x		x	x	
Indigofera linnaei																																											
Indigofera monophylla		x	x		x			x			x	x						x	x	x	x			x				x	x		x	x	x				x				x		
Ipomoea coptica																																							x					
Ipomoea costata		x	x	x	x						x									x		x							x				x					x	x			
Ipomoea polymorpha																								x																			
Jasminum didymum subsp. *lineare*																											x							x									
Malvastrum americanum																																								x				
Muellerolimon salicorniaceum							x								x																												
Myoporum montanum																		x	x						x																		
Neobassia astrocarpa													x		x										x																		
Oldenlandia crouchiana																																					x	x	x					
Operculina aequisepala																											x																	
Paspalidium clementii				x	x					x								x		x								x											x	x			
Paspalidium tabulatum		x	x			x				x								x		x							x			x				x					x	x			
Phyllanthus erwinii											x																																	
Phyllanthus maderaspatensis			x																	x							x						x						x				
Pittosporum phillyreoides																		x		x																							
Pluchea dentex											x	x																																
Pluchea ferdinandi-muelleri																																												
Pluchea rubelliflora																		x																						x				
Plumbago zeylanica																																		x										
Polycarpaea longiflora			x		x																													x						x	x			
Polygala isingii																																							x					
Polymeria ambigua																																										x		
Polymeria calycina																		x									x																
Portulaca filifolia				x	x												x	x									x			x				x						x	x	x	
Portulaca oleracea				x	x													x																						x	x		
Pterocaulon sphacelatum																																												
Pterocaulon sphaeranthoides									x	x	x	x				x							x																				
Ptilotus auriculifolius																						x																					
Ptilotus fusiformis			x	x																																				x	x		
Ptilotus villosiflorus																										x																	
Rhagodia eremaea						x				x										x														x							x		
Rhagodia preissii subsp. *obovata*																		x						x			x		x												x		
Rhynchosia bungarensis (P4)																		x		x	x	x					x																
Rhynchosia minima			x			x																											x						x	x			
Salsola australis																										x																	
Scaevola cunninghamii																							x	x		x																	
Scaevola spinescens								x																																				
Scaevola spinescens (broad form)																	x										x	x	x	x			x		x					x		x
Scaevola spinescens (narrow form)																																												
Senna glutinosa subsp. *glutinosa*																						x																x	x			x		
Senna notabilis																																												
Senna venusta																		x																									
Sesbania cannabina										x								x		x					x		x													x			
Setaria verticillata																									x																		
Sida fibulifera																																												

Taxon	CZ-43	CZ-44	CZ-45	CZ-46	CZ-47	CZ-48	CZ-49	CZ-50	CZ-51	CZ-52	CZ-53	CZ-54	CZ-55	CZ-56	CZ-57	CZ-58	CZ-59	CZ-60	CZ-61	CZ-62	CZ-63	CZ-64	CZ-65	CZ-66	CZ-67	CZ-68	CZ-69	CZ-70	CZ-71	CZ-72	CZ-73	CZ-74	CZ-75	CZ-76	CZ-77	CZ-78	W-01	W-02	W-03	W-04	W-05	W-06	W-07	W-08
Sida sp. Pilbara (A.A. Mitchell PRP 1543)																																					x						
Solanum cleistogamum										x												x								x										x	x		
Solanum horridum								x																																				
Solanum lasiophyllum		x			x																x																							
Solanum phlomoides	x							x	x		x					x																x					x							
Spinifex longifolius	x																x									x			x		x	x			x								
Sporobolus virginicus													x												x																			
Stemodia grossa						x												x																						x				
Streptoglossa decurrens			x	x	x					x		x						x				x					x		x			x		x	x	x		x		x			
Streptoglossa odora																																												
Stylobasium spathulatum																				x	x	x																						
Surreya diandra							x						x												x																			
Swainsona formosa		x				x				x		x					x	x				x	x				x	x	x			x					x		x	x		
Swainsona pterostylis	x										x	x	x	x			x						x	x				x			x												
Synaptantha tillaeacea	x																x									x					x	x											
Tecticornia halocnemoides						x	x						x		x										x																			
Tecticornia indica subsp. *leiostachya*							x						x		x										x																			
Tephrosia densa			x	x	x																																							
Tephrosia rosea var. clementii		x	x																										x						x		x		x				x
Tephrosia sp. B Kimberley Flora (C.A. Gardner 7300)								x										x															x										
Tephrosia sp. NW Eremaean (S. van Leeuwen et al. PBS 0356)			x	x	x																					x														x	x		
Tephrosia supina			x	x	x				x		x							x														x	x							x	x		
Terminalia circumalata																				x						x							x						x				
Terminalia supranitifolia (P3)																			x													x											
Themeda triandra																																												
Threlkeldia diffusa																								x	x																			
Tinospora smilacina		x	x																							x		x					x	x						x			
Trachymene oleracea		x		x					x	x																x						x	x					x	x	x		
Trianthema turgidifolium						x	x		x	x			x	x	x		x	x	x						x		x																
Tribulopis angustifolia																				x																							
Tribulus hirsutus																													x			x					x						
Tribulus occidentalis			x													x		x					x	x						x	x			x						x	x	
Tribulus platypterus																																												
Tribulus terrestris																																												
Trichodesma zeylanicum		x	x	x	x	x		x	x			x									x						x	x	x			x						x		x	
Trichosanthes cucumerina										x																																	
Trigastrotheca molluginea			x	x	x			x			x	x						x															x						x			
Triodia angusta						x		x	x	x	x	x						x	x							x	x					x							x		x		
Triodia epactia	x	x	x	x	x			x	x	x	x	x		x		x	x	x	x	x	x	x	x	x		x	x	x	x		x	x	x	x	x	x	x	x	x	x	x	x	x
Triodia wiseana			x	x	x																						x		x			x	x	x		x	x	x				
Triumfetta appendiculata		x	x	x	x	x		x	x	x	x					x		x		x	x					x							x			x			x	x		
Triumfetta clementii		x		x	x			x	x	x	x							x			x	x	x			x	x		x			x			x	x	x	x	x	x	x		
Vigna triodiophila (P3)			x																		x																						
Waltheria indica																						x				x								x						x	x		
Whiteochloa airoides																										x			x			x											
Zaleya galericulata																																												
Zornia muelleriana subsp. *congesta*																																								x				

Appendix D
Detailed site data

APPENDIX D: DETAILED SITE DATA

Site CZ-01

Described by	Vicki Long	Date	16/04/2020	Type	Quadrat	80 x 30
Season	E					
Location	Conzinc Bay					
MGA Zone	50	480278	mE	7727793	mN	
Habitat	Crest of sand foredune					
Soil	Fine white beach sands with marine fragments					
Vegetation	ScWaSl - *Scaevola cunninghamii* low shrubland over (regenerating) *Whiteochloa airoides* and *Spinifex longifolius* with *Triodia epactia* open to scattered tussock grassland.					
Veg Condition	Excellent					
Fire Age	2 years					
Notes	**Aerva javanica* present; regenerating after fire; remnant (recovering after fire) of *Whiteochloa airoides* grassland PEC					

Species list	Cover	Height
Adriana tomentosa	2	60
**Aerva javanica*	<2	40
Amaranthus undulatus	<2	30
Cleome viscosa	<2	40
Euphorbia drummondii	<2	20
Euphorbia tannensis	<2	40
Euphorbia trigonosperma	<2	40
Pterocaulon sphaeranthoides	<2	30
Salsola australis	<2	20
Scaevola cunninghamii	30	20-25
Spinifex longifolius	2-5	40
Synaptantha tillaeacea	<2	20
Triodia epactia	<2	40
Whiteochloa airoides	2-5	30

Site CZ-02

Described by	Vicki Long	Date	16/04/2020	Type	Quadrat	50 x 50
Season	E					
Location	Conzinc Bay					
MGA Zone	50	480402	mE	7727756	mN	
Habitat	Remnant secondary dune					
Soil	Pink-pale brown fine to medium sands					
Vegetation	Aj(ScAt)Te - **Aerva javanica* low shrubland with *Scaevola cunninghamii, Adriana tomentosa* over *Triodia epactia* open or scattered hummock grassland.					
Veg Condition	Poor					
Fire Age	2 years					
Notes	High weed load - **Aerva javanica* and **Cenchrus ciliaris*					

Species list	Cover	Height
Acacia bivenosa	<2	25-30
**Aerva javanica*	35	35-40
Amaranthus undulatus	<2	25
Boerhavia gardneri	<2	25
**Cenchrus ciliaris*	<2	25
Cleome viscosa	<2	35
Cynanchum floribundum	<2	25
Euphorbia drummondii	<2	15-20
Euphorbia tannensis subsp. *eremophila*	<2	25
Indigofera linnaei	5	15-20
Paspalidium clementii	<2	15-20
Pterocaulon sphaeranthoides	<2	25-30
Scaevola cunninghamii	2-5	25
Solanum phlomoides	<2	25-30
Spinifex longifolius	<2	25
Swainsona pterostylis	2	35
Trianthema turgidifolia	<2	25
Tribulus occidentalis	<2	15-20
Triodia epactia	5-15	25-30

Site CZ-03

Described by	Vicki Long	Date	16/04/2020	Type	Quadrat	200 x 20
Season	E					
Location	Conzinc Bay					
MGA Zone	50	480544	mE	7727600	mN	
Habitat	Low drainage zone. semi-saline near tidal creek					
Soil	Grey alluvial silts, stony in sections					
Vegetation	AaTaTe - *Acacia ampliceps* open tall shrubland over *Triodia angusta/T. epactia* hummock					
Veg Condition	Good					
Fire Age	2 years					
Notes	**Malvastrum americanum* 2% - should be prioritised for control					

Species list	Cover	Height
Acacia ampliceps	<2	5-300
Adriana tomentosa	5	50
Boerhavia coccinea	<2	25
Crotalaria medicaginea	<2	30
Cucumis variabilis	2	30
Cyperus bifax	<2	40
Cyperus vaginatus	<2	30
Dactyloctenium radulans	2	20
Dysphania kalpari	2	15
**Malvastrum americanum*	2	30-50
Myoporum montanum	10	40-150
Neobassia astrocarpa	10	30
Operculina aequisepala	<2	25
Pluchea rubelliflora	<2	30
Portulaca filifolia	2	30
Sesbania cannabina	2	40-150
Sporobolus virginicus	5	30
Stemodia grossa	2	30
Surreya diandra	2	25
Swainsona formosa	<2	25
Threlkeldia diffusa	2	30
Trianthema turgidifolium	5	35
Trichodesma zeylanicum	<2	30
Triodia angusta	20	40
Triodia epactia	10	30
Waltheria indica	<2	30

Site CZ-04

Described by	Vicki Long	Date	16/04/2020	Type	Quadrat	60 x 40/20
Season	E					
Location	Conzinc Bay					
MGA Zone	50	489708	mE	7727657	mN	
Habitat	Low-lying basin					
Soil	Scattered stones and rocks over grey-brown alluvial silts					
Vegetation	Ta - *Triodia angusta* hummock grassland. There can be scattered *Acacia bivenosa* shrubs.					
Veg Condition	Excellent					
Fire Age	5 years					
Notes	Three **Aerva javanica* removed - check for regeneration from seed and control					

Species list	Cover	Height
Abutilon lepidum	<2	25
Acacia bivenosa	<2	100
Adriana tomentosa	2	60
**Aerva javanica*	<2	40
Cassytha capillaris	<2	cr
Cucumis variabilis	<2	cr
Cynanchum floribundum	<2	cr
Cyperus bifax	<2	40
Euphorbia tannensis subsp. *eremophila*	<2	40
Euphorbia trigonosperma	<2	40
Goodenia lamprosperma	<2	20
Goodenia microptera	<2	15
Indigofera linifolia	2	40
Stemodia grossa	<2	40
Streptoglossa decurrens	<2	30
Swainsona pterostylis	<2	25
Trianthema turgidifolium	<2	40
Trichodesma zeylanicum	<2	60
Triodia angusta	65	40
Triodia epactia	5	40
Triumfetta appendiculata	<2	30
Triumfetta clementii	<2	40

Site CZ-05

Described by	Vicki Long	Date	17/04/2020	Type	Quadrat	70 x 15
Season	E					
Location	Conzinc Bay					
MGA Zone	50	480508	mE	7727864	mN	
Habitat	Broad drainage zone between coastal dune and rocky hillslopes					
Soil	Grey sands with stony mantle					
Vegetation	Aj(ScAt)Te - **Aerva javanica* low shrubland with *Scaevola cunninghamii, Adriana tomentosa* over *Triodia epactia* open or scattered hummock grassland.					
Veg Condition	Excellent					
Fire Age	5 years					
Notes	Variable but generally high weed load - **Aerva javanica*					

Species list	Cover	Height
Acacia bivenosa	<2	100
Acacia pyrifolia	<2	35
Adriana tomentosa	<2	80
**Aerva javanica*	10	60
Amaranthus undulatus	<2	30
Boerhavia coccinea	<2	30
Boerhavia gardneri	<2	30
Cleome viscosa	<2	40
Corchorus walcottii	2	30
Crotalaria medicaginea	<2	80
Cymbopogon ambiguus	<2	60
Dichrostachys spicata	<2	100
Euphorbia tannensis	<2	30
Ficus aculeata var. *indecora*	<2	120
Goodenia microptera	<2	20
Heliotropium tenuifolium	<2	30
Hybanthus aurantiacus	<2	30
Indigofera linifolia	25	40
Indigofera monophylla	<2	50
Paspalidium tabulatum	<2	80

Phyllanthus maderaspatensis	<2	30
Rhynchosia minima	<2	20
Scaevola spinescens (narrow form)	2	80
Solanum cleistogamum	<2	30
Streptoglossa decurrens	25	40
Swainsona formosa	<2	25
Tephrosia sp. NW Eremaean (S. van Leeuwen et al. PBS 0356)	<2	30
Tinospora smilacina	<2	cr
Trichodesma zeylanicum	<2	40
Triodia angusta	25	40
Triodia epactia	20	35
Triumfetta clementii	<2	30

Site CZ-06

Described by	Vicki Long	Date	17/04/2020	Type	Quadrat	50 x 50
Season	E					
Location	Conzinc Bay					
MGA Zone	50	480527	mE	7729786	mN	
Habitat	Gentle rocky hillslope with rock and stony mantle and small outcrops					
Vegetation	Te scattered shrubs - *Triodia epactia* hummock grassland. There are scattered *Hakea lorea* subsp *lorea, Cullen lachnostachys, Ipomoea costata, Acacia colei* and patchy *Triodia wiseana*. Annual herbland.					
Veg Condition	Excellent					
Fire Age	2-5 years					
Notes	**Aerva javanica* present at < 2 % - should be prioritised for control; Priority Flora					

Species list	Cover	Height
Abutilon lepidum	<2	30
Acacia colei	<2	200
Boerhavia coccinea	<2	25
Bonamia media	<2	30
Bulbostylis barbata	<2	30
Cleome viscosa	<2	50
Corchorus walcottii	<2	30
Crotalaria novae-hollandiae	<2	35-40
Cymbopogon ambiguus	<2	60
Dichrostachys spicata	<2	150
Euphorbia careyi	<2	30
Gomphrena cunninghamii	<2	25
Goodenia microptera	<2	20
Grevillea pyramidalis	<2	250
Hakea lorea	<2	300
Hybanthus aurantiacus	<2	30
Indigofera linifolia	<2	35-40
Indigofera linnaei	<2	35
Indigofera monophylla	<2	50
Ipomoea costata	<2	100

Paspalidium clementii	<2	50
Paspalidium tabulatum	<2	50
Ptilotus fusiformis	<2	35-4025
Rhynchosia minima	<2	35
Solanum cleistogamum	<2	30
Streptoglossa decurrens	<2	30
Tephrosia densa	<2	30
Tephrosia sp. NW Eremaean (S. van Leeuwen et al. PBS 0356)	<2	30
Terminalia supranitifolia (P3)	<2	250
Tinospora smilacina	<2	cr
Trachymene oleracea	<2	35-40
Trichodesma zeylanicum	<2	50
Trigastrotheca molluginea	<2	25
Triodia epactia	65	35-40
Triumfetta clementii	<2	30

Site CZ-07

Described by	Vicki Long	Date	17/04/2020	Type	Quadrat	65 x 40
Season	E					
Location	Conzinc Bay					
MGA Zone	50	480336	mE	7727603	mN	
Habitat	Rockpile					
Soil	Stony soil in pockets					
Rock Type	Medium to large granophyre					
Vegetation	BaAcTsTe - *Brachychiton acuminatus, Acacia coriacea, Terminalia supranitifolia* (P3)*, Flueggea virosa* subs *melanthesoides* pocket low woodland with *Dichrostachys spicata, Alectryon oleifolius*, over *Rhagodia eremea, Scaevola spinescens* (broad form), *Jasminum didymium* subsp. *lineare* over scattered *Triodia epactia* and *Cymbopogon ambiguus* grasses.					
Veg Condition	Excellent					
Fire Age	2 years					
Notes	**Aerva javanica* present at < 2 % - should be prioritised for control; Priority Flora; PEC					

Species list	Cover	Height
Abutilon fraseri	<2	40
Acacia coriacea	2	250
**Aerva javanica*	1	40
Alectryon oleifolius	2	250
Amaranthus undulatus	<2	25
Boerhavia coccinea	<2	25
Boerhavia gardneri	<2	30
Brachychiton acuminatus	5	200
Cleome viscosa	<2	40
Commicarpus australis	<2	100
Cymbopogon ambiguus	<2	60
Dichrostachys spicata	2	150
Dicliptera armata	<2	2
Enchylaena tomentosa	<2	40
Euphorbia tannensis subsp. *eremophila*	<2	30
Evolvulus alsinoides var. *villosicalyx*	<2	30
Flueggea virosa	2	150
Ipomoea costata	<2	100

Paspalidium tabulatum	<2	50
Pittosporum phillyreoides	2	300
Polycarpaea longiflora	<2	25
Rhagodia eremaea	<2	150
Rhynchosia bungarensis (P4)	<2	40
Scaevola spinescens (narrow form)	<2	100
Solanum horridum	<2	30
Streptoglossa decurrens	<2	40
Themeda triandra	<2	60
Threlkeldia diffusa	<2	40
Tinospora smilacina	<2	cr
Trichosanthes cucumerina	<2	cr
Triodia angusta	<2	40
Triodia epactia	2	40
Triumfetta appendiculata	<2	30
Triumfetta clementii	<2	30

Site CZ-08

Described by	Vicki Long	Date	17/04/2020	Type	Quadrat	50 x 50
Season	E					
Location	Conzinc Bay					
MGA Zone	50	480298	mE	7727501	mN	
Habitat	Rocky hillslope, domed crest of low rise					
Soil	Stony mantle					
Vegetation	ImTwTe - *Indigofera monophylla* open low shrubland over mixed *Triodia wiseana, Triodia epactia* and sometimes *Triodia angusta* hummock grassland. There can be scattered *Hakeo lorea*, *Grevillea pyramidalis*. There can be small rockpiles with *Brachychiton acuminatus, Ehretia saligna, Flueggea virosa* subsp *melanthesoides*.					
Veg Condition	Excellent					
Fire Age	5 years					
Notes	No weeds					

Species list	Cover	Height
Boerhavia coccinea	<2	30
Bonamia media	<2	35
Crotalaria novae-hollandiae	<2	20
Grevillea pyramidalis	<2	250
Indigofera linifolia	<2	25
Indigofera monophylla	5	50
Oldenlandia crouchiana	<2	20
Rhynchosia minima	<2	25
Solanum phlomoides	<2	35
Streptoglossa decurrens	<2	35
Tephrosia rosea var. *clementii*	<2	35
Trachymene oleracea	<2	25
Triodia epactia	30	35
Triodia wiseana	35	50
Triumfetta appendiculata	<2	30
Triumfetta clementii	<2	30

Site CZ-09

Described by	Vicki Long	Date	17/04/2020	Type	Quadrat	100 x 25
Season	E					
Location	Conzinc Bay					
MGA Zone	50	480399	mE	7727384	mN	
Habitat	Shallow drainage line					
Soil	Stony floor with red-brown alluvial silts					
Vegetation	AbTa - *Acacia bivenosa* open tall shrubland over *Triodia angusta* hummock grassland with some *Triodia epactia*. There can be scattered to open shrubland of *Stylobasium spathulatum* with annual herbland.					
Veg Condition	Excellent					
Fire Age	5 years					
Notes	No weeds					

Species list	Cover	Height
Acacia bivenosa	35	100-160
Acacia inaequilatera	<2	300
Acacia pyrifolia var. *morrisonii*	<2	250
Adriana tomentosa	<2	60
Bonamia media	<2	30
Cassytha capillaris	<2	cr
Corchorus walcottii	<2	30
Cucumis variabilis	<2	cr
Cymbopogon ambiguus	<2	50
Cyperus vaginatus	<2	30
Goodenia lamprosperma	<2	20
Goodenia microptera	<2	20
Grevillea pyramidalis	<2	250
Hakea lorea subsp. *lorea*	<2	350
Hybanthus aurantiacus	<2	30
Phyllanthus maderaspatensis	<2	30
Pterocaulon sphaeranthoides	<2	30
Scaevola spinescens	<2	90
Stemodia grossa	<2	30
Streptoglossa decurrens	<2	35
Tephrosia rosea var. *clementii*	<2	30
Trachymene oleracea	<2	20
Triodia angusta	50	40-50
Triodia epactia	10	40
Triumfetta clementii	<2	30
Waltheria indica	<2	30

Site CZ-10

Described by	Vicki Long	Date	17/04/2020	Type	Quadrat	50 x 50
Season	E					
Location	Conzinc Bay					
MGA Zone	50	480338	mE	7727203	mN	
Habitat	Stony and rocky hillslope					
Soil	Dense stone and rock mantle over red-brown silts					
Vegetation	Te scattered shrubs - *Triodia epactia* hummock grassland. There are scattered *Hakea lorea* subsp. *lorea, Cullen lachnostachys, Ipomoea costata, Acacia colei* and patchy *Triodia wiseana*. Annual herbland.					
Veg Condition	Excellent					
Fire Age	5 years					
Notes	No weeds					

Species list	Cover	Height
Abutilon lepidum	<2	30
Acacia bivenosa	<2	100
Acacia coriacea	<2	250
Boerhavia coccinea	<2	25
Bonamia media	<2	30
Bulbostylis barbata	<2	30
Cleome viscosa	<2	50
Crotalaria medicaginea	<2	50
Cymbopogon ambiguus	<2	60
Dichrostachys spicata	2	180
Euphorbia careyi	<2	30
Gomphrena cunninghamii	<2	25
Grevillea pyramidalis	<2	250
Hakea lorea subsp. *lorea*	<2	300
Indigofera colutea	<2	30
Indigofera linifolia	<2	30
Indigofera monophylla	2	50
Rhynchosia minima	<2	30
Tephrosia sp. NW Eremaean (S. van Leeuwen et al. PBS 0356)	<2	30
Tephrosia supina	<2	30
Trachymene oleracea	<2	25
Trichodesma zeylanicum	<2	60
Trigastrotheca molluginea	<2	25
Triodia epactia	65-70	40
Triumfetta appendiculata	<2	30
Triumfetta clementii	<2	30

Site CZ-11

Described by	Vicki Long	Date	20/04/2020	Type	Quadrat	85/70 x 35
Season	E					
Location	Conzinc Bay					
MGA Zone	50	480214	mE	7727606	mN	
Habitat	Beach dune					
Soil	Medium to course grey-white sands with shell fragments					
Vegetation	AtSlTe - *Adriana tomentosa* low shrubland over *Triodia epactia* hummock and *Spinifex longifolius* tussock grassland, sometimes with *Triodia angusta*.					
Veg Condition	Very Good					
Fire Age	2-3 years					
Notes	**Aerva javanica* present; this may once have been *Whiteochloa airoides* PEC but due to fire and other disturbances it has been replaced by the species listed.					

Species list	Cover	Height
Acacia coriacea	<2	200
Adriana tomentosa	15	60
**Aerva javanica*	2	40
Amaranthus undulatus	<2	25
Boerhavia schomburgkiana	<2	25
Canavalia rosea	<2	30
Cleome viscosa	<2	40
Euphorbia drummondii	<2	10
Euphorbia tannensis subsp. *eremophila*	<2	30
Euphorbia trigonosperma	<2	30
Indigofera linifolia	<2	30
Indigofera monophylla	<2	50
Ipomoea costata	<2	90
Portulaca filifolia	<2	15
Pterocaulon sphacelatum	<2	30
Scaevola cunninghamii	<2	30
Spinifex longifolius	15	40
Swainsona formosa	<2	25
Synaptantha tillaeacea	<2	10
Trichodesma zeylanicum	<2	50
Triodia epactia	15	40
Whiteochloa airoides	<2	60

Site CZ-12

Described by	Vicki Long	Date	20/04/2020	Type	Quadrat	250 x 10
Season	E					
Location	Conzinc Bay					
MGA Zone	50	480116	mE	7727522	mN	
Habitat	Narrow beach foredune					
Soil	Grey-white medium to course sands with marine fragments					
Vegetation	Sl - *Spinifex longifolius* open tussock grassland.					
Veg Condition	Good					
Fire Age	2 years					
Notes	**Aerva javanica* present at < 2 % - should be prioritised for control					

Species list	Cover	Height
Adriana tomentosa	<2-2	40-60
**Aerva javanica*	<2	40-60
Cleome viscosa	<2	40-60
Euphorbia drummondii	<2	20
Euphorbia trigonosperma	<2	20
Scaevola cunninghamii	<2	30
Spinifex longifolius	15-20	40
Swainsona formosa	<2	30
Triodia epactia	<2	40
Whiteochloa airoides	<2	40

Site CZ-13

Described by	Vicki Long	Date	20/04/2020	Type	Quadrat	irregular
Season	E					
Location	Conzinc Bay					
MGA Zone	50	479974	mE	7727337	mN	
Habitat	Narrow interrupted small coastal rockpiles on landward side of beach dune					
Vegetation	AcIcFaTe - *Acacia coriacea, Ipomoea costata, Ficus aculeata* var. *indecora*, pocket low woodland with frequent *Brachychiton acuminatus, Ficus virens* var. *virens, Dichrostachys spicata* over *Triodia epactia* open to scattered hummock grassland.					
Veg Condition	Good					
Fire Age	2 years					
Notes	**Aerva javanica* present at 2-15 % - should be prioritised for control					

Species list	Cover	Height
Abutilon lepidum	<2	30
Acacia coriacea	2-5	200
**Aerva javanica*	2	50
Boerhavia coccinea	<2	25
Boerhavia gardneri	<2	25
Bonamia media	<2	30
Brachychiton acuminatus	<2	200
Cleome viscosa	<2	40
Crotalaria medicaginea	<2	40
Cymbopogon ambiguus	<2	50
Cynanchum floribundum	<2	cr
Dichrostachys spicata	<2	120
Dolichandrone occidentalis	<2	130
Euphorbia drummondii	<2	20
Euphorbia tannensis	<2	25
Flueggea virosa	<2	200
Hybanthus aurantiacus	<2	30
Indigofera linifolia	<2	30
Indigofera monophylla	<2	40
Ipomoea costata	<2	100
Paspalidium tabulatum	<2	50
Portulaca filifolia	<2	15
Rhynchosia minima	<2	30
Streptoglossa decurrens	<2	30
Tinospora smilacina	<2	cr
Triodia epactia	<2	50
Triumfetta appendiculata	<2	30
Triumfetta clementii	<2	30

Site CZ-14

Described by	Vicki Long	Date	20/04/2020	Type	Quadrat	120 x 20
Season	E					
Location	Conzinc Bay					
MGA Zone	50	480113	mE	7727518	mN	
Habitat	Beach dune					
Soil	Pink medium to course sand with shell fragments					
Vegetation	AtAjTeSl - *Adriana tomentosa* and **Aerva javanica* low shrubland over *Triodia epactia* or *Spinifex longifolius* scattered, sometimes open grasses. There can be scattered *Acacia coriacea*.					
Veg Condition	Poor					
Fire Age	5 years					
Notes	**Aerva javanica* present					

Species list	Cover	Height
Acacia bivenosa	<2	100
Acacia coriacea	<2-2	100
Adriana tomentosa	15	35-40
**Aerva javanica*	20	40-50
Amaranthus undulatus	<2	40-50
Boerhavia schomburgkiana	<2	30
Cleome viscosa	<2	40
Cucumis variabilis	<2	cr
Euphorbia drummondii	<2	20
Euphorbia tannensis	<2	30
Euphorbia trigonosperma	<2	20
Indigofera linifolia	<2	30
Indigofera monophylla	<2	50
Rhynchosia minima	<2	20
Scaevola cunninghamii	<2	40
Spinifex longifolius	5	40-55
Swainsona formosa	<2	25
Swainsona pterostylis	<2	25
Tribulus occidentalis	<2	15
Trichodesma zeylanicum	<2	50
Triodia epactia	15	25-30
Triumfetta clementii	<2	30
Whiteochloa airoides	<2	60

Site CZ-15

Described by	Vicki Long	Date	20/04/2020	Type	Quadrat	25 x 25
Season	E					
Location	Conzinc Bay					
MGA Zone	50	480132	mE	7727302	mN	
Habitat	Rockpile					
Soil	Medium to large granophyre rocks					
Vegetation	AcIcFaTe - *Acacia coriacea, Ipomoea costata, Ficus aculeata* var. *indecora*, pocket low woodland with frequent *Brachychiton acuminatus, Ficus virens* var. virens, *Dichrostachys spicata* over *Triodia epactia* open to scattered hummock grassland.					
Veg Condition	Excellent					
Fire Age	5 years					
Notes	**Aerva javanica* present, remove ASAP					

Species list	Cover	Height
Abutilon cunninghamii	<2	30
Abutilon lepidum	<2	20
Acacia coriacea	15	350
**Aerva javanica*	<1	50
Alectryon oleifolius	<2	250
Boerhavia coccinea	<2	255
Brachychiton acuminatus	5	300
Cleome viscosa	<2	50
Clerodendrum tomentosum	<2	300
Commicarpus australis	<2	30
Crotalaria medicaginea	<2	30
Cucumis variabilis	<2	cr
Cullen lachnostachys	<2	35
Cymbopogon ambiguus	<2-2	50
Dichrostachys spicata	2	120
Dolichandrone occidentalis	<2	100
Euphorbia careyi	<2-2	30
Ficus aculeata var. *indecora*	<2-2	300
Flueggea virosa	2	200
Ipomoea costata	2	100
Jasminum didymum subsp. *lineare*	<2	cr
Paspalidium tabulatum	<2	50
Pittosporum phillyreoides	<2	250
Scaevola spinescens (broad form)	<2	90
Tinospora smilacina	<2	cr
Trichodesma zeylanicum	<2	40
Triodia angusta	1	50
Triodia epactia	5	40
Triumfetta clementii	<2	30

Site CZ-16

Described by	Vicki Long	Date	20/04/2020	Type	Quadrat	50 x 50
Season	E					
Location	Conzinc Bay					
MGA Zone	50	480128	mE	7727250	mN	
Habitat	Hillslope to broad shallow drainage zone					
Soil	Dense rocky mantle with brown alluvial soils					
Vegetation	ImTwTe - *Indigofera monophylla* open low shrubland over mixed *Triodia wiseana, Triodia epactia* and sometimes *Triodia angusta* hummock grassland. There can be scattered *Hakeo lorea, Grevillea pyramidalis.* There can be small rockpiles with *Brachychiton acuminatus, Ehretia saligna, Flueggea virosa* subsp. *melanthesoides*.					
Veg Condition	Excellent					
Fire Age	2 years					
Notes	No weeds; regenerating after fire					

Species list	Cover	Height
Abutilon lepidum	<2	30
Acacia bivenosa	<2	150
Acacia coriacea	<2	250
Boerhavia gardneri	<2	25
Bonamia media	<2	30
Crotalaria medicaginea	<2	50
Crotalaria novae-hollandiae	<2	20
Cullen lachnostachys	2	60
Euphorbia tannensis subsp. *eremophila*	<2	30
Goodenia microptera	<2	15
Grevillea pyramidalis	<2	250
Hakea lorea subsp. lorea	<2-2	300
Hibiscus sturtii var. *campylochlamys*	<2	60
Hybanthus aurantiacus	<2	30
Indigofera linifolia	<2	30
Indigofera monophylla	10	50
Ipomoea costata	<2	100
Polygala isingii	<2	25
Portulaca filifolia	<2	15

Pterocaulon sphaeranthoides	<2	30
Ptilotus fusiformis	<2	25
Scaevola spinescens (broad form)	<2	90
Solanum horridum	<2	25
Solanum phlomoides	<2	30
Streptoglossa decurrens	<2	30
Swainsona formosa	<2	25
Tephrosia rosea var. *clementii*	2	40
Tephrosia sp. NW Eremaean (S. van Leeuwen et al. PBS 0356)	<2	30
Tinospora smilacina	<2	cr
Tribulus hirsutus	<2	20
Tribulus platypterus	<2	15
Triodia angusta	5	50
Triodia epactia	30	40
Triodia wiseana	20	40
Triumfetta appendiculata	<2	20
Triumfetta clementii	<2-2	30

Site CZ-17

Described by	Vicki Long	Date	20/04/2020	Type	Quadrat	50 x 50
Season	E					
Location	Conzinc Bay					
MGA Zone	50	480242	mE	7727493	mN	
Habitat	Undulating slopes and small rock outcrops					
Soil	Stony mantle					
Vegetation	ImTwTe - *Indigofera monophylla* open low shrubland over mixed *Triodia wiseana, Triodia epactia* and sometimes *Triodia angusta* hummock grassland. There can be scattered *Hakeo lorea, Grevillea pyramidalis.* There can be small rockpiles with *Brachychiton acuminatus, Ehretia saligna, Flueggea virosa* subsp *melanthesoides*.					
Veg Condition	Excellent					
Fire Age	> 5 years					
Notes	No weeds					

Species list	Cover	Height
Abutilon lepidum	<2	30
Acacia bivenosa	<2	120
Acacia colei	<2	180
Boerhavia gardneri	<2	30
Brachychiton acuminatus	<2	150
Cleome viscosa	<2	40
Crotalaria novae-hollandiae	<2	80
Cucumis variabilis	<2	cr
Cullen lachnostachys	<2	80
Cymbopogon ambiguus	<2	60
Dichrostachys spicata	<2	80
Euphorbia coghlanii	<2	25
Gomphrena cunninghamii	<2	30
Goodenia microptera	<2	20
Grevillea pyramidalis	<2-2	100
Hakea lorea subsp. *lorea*	<2-2	100-150
Hybanthus aurantiacus	<2	30
Indigofera linifolia	<2	30
Indigofera monophylla	5-10	30

Ipomoea costata	<2	80
Oldenlandia crouchiana	<2	30
Paspalidium tabulatum	<2	50
Portulaca filifolia	<2	10
Rhynchosia minima	<2	25
Scaevola spinescens (broad form)	<2	80
Streptoglossa decurrens	<2	30
Tephrosia rosea var. *clementii*	<2	30
Tephrosia sp. NW Eremaean (S. van Leeuwen et al. PBS 0356)	<2	40
Trachymene oleracea	<2	20
Trichodesma zeylanicum	<2	50
Triodia angusta	5	45
Triodia epactia	20	35
Triodia wiseana	5-35	35
Triumfetta appendiculata	<2	30
Triumfetta clementii	<2	30

Site CZ-18

Described by	Vicki Long	Date	21/04/2020	Type	Quadrat	125 x 20
Season	E					
Location	Conzinc Bay					
MGA Zone	50	480249	mE	7727114	mN	
Habitat	Narrow drainage line between hillslopes					
Soil	Dense washed stones and rocks					
Vegetation	TcFvBaTs - *Terminalia circumalata* low woodland with *Flueggea virosa* subsp. *melanthesoides*, *Brachychiton acuminatus, Terminalia supranitifolia* (P3) over *Triodia angusta / T. epactia* open hummock grassland.					
Veg Condition	Excellent					
Fire Age	2 years					
Notes	No weeds					

Species list	Cover	Height
Acacia bivenosa	<2	100
Acacia coriacea	<2	150
Acacia pyrifolia	<2	100
Acacia pyrifolia var. *morrisonii*	<2	100
Alectryon oleifolius	<2	100
Ammannia baccifera	<2	30
Boerhavia gardneri	<2	25
Bonamia media	<2	30
Brachychiton acuminatus	ADJ	200
Cassytha capillaris	<2	cr
Cleome viscosa	<2	30
Corchorus walcottii	<2	30
Crotalaria medicaginea	<2	60
Cucumis variabilis	<2	cr
Cymbopogon ambiguus	2	60
Cyperus bifax	2	30
Cyperus vaginatus	<2	40
Dichrostachys spicata	2	150
Dicliptera armata	<2	100

Eriachne tenuiculmis	2	35
Ficus aculeata var. *indecora*	<2	150
Flueggea virosa	5	200-300
Grevillea pyramidalis	<2	150
Hibiscus sturtii var. *campylochlamys*	<2	50
Indigofera linifolia	<2	30
Ipomoea costata	<2	100
Operculina aequisepala	<2	vine
Pittosporum phillyreoides	<2	250
Pluchea rubelliflora	<2	40
Rhynchosia bungarensis (P4)	<2	30
Scaevola spinescens	<2	90
Sesbania cannabina	<2	120
Stemodia grossa	<2	30
Swainsona formosa	<2	25
Terminalia circumalata	40	300-400
Terminalia supranitifolia (P3)	<2	300
Triodia angusta	20	30-45
Triodia epactia	2	30
Triumfetta clementii	<2	30

Site CZ-19

Described by	Vicki Long	Date	21/04/2020	Type	Quadrat	50 x 50
Season	E					
Location	Conzinc Bay					
MGA Zone	50	480166	mE	7727099	mN	
Habitat	Rocky undulating low rises					
Soil	Dense rocky mantle, numerous small rockpiles and outcrops					
Vegetation	GpHlTeTw - *Grevillea pyramidalis* open tall shrubland with *Hakea lorea*, over *Triodia epactia* hummock grassland or *Triodia epactia/Triodia wiseana* mixed hummock grassland.					
Veg Condition	Excellent					
Fire Age	> 5 years					
Notes	No weeds; Priority Flora; Rockpile PEC					

Species list	Cover	Height
Abutilon lepidum	<2	30
Acacia bivenosa	<2	100
Acacia colei	<2	130
Acacia coriacea	2	200
Boerhavia gardneri	<2	35
Bonamia media	<2	30
Brachychiton acuminatus	2	200
Cleome viscosa	<2	35
Corchorus walcottii	<2	35
Crotalaria medicaginea	<2	35
Crotalaria novae-hollandiae	<2	15
Cucumis variabilis	<2	cr
Cullen lachnostachys	<2	35
Cymbopogon ambiguus	<2	60
Dichrostachys spicata	2	90
Dicliptera armata	<2	5
Ehretia saligna	5	120
Euphorbia biconvexa	<2	35
Euphorbia tannensis	<2	35
Euphorbia tannensis subsp. *eremophila*	<2	35

Flueggea virosa	5	150
Gomphrena cunninghamii	<2	35
Grevillea pyramidalis	2	30-125
Hakea lorea subsp. *lorea*	5	30-125
Hibiscus sturtii var. *campylochlamys*	<2	50
Indigofera colutea	<2	35
Indigofera linifolia	<2	30
Indigofera monophylla	<2	50
Ipomoea costata	2	100
Paspalidium clementii	<2	35
Paspalidium tabulatum	<2	60
Pittosporum phillyreoides	<2	200
Portulaca filifolia	<2	20
Pterocaulon sphaeranthoides	<2	35
Rhynchosia minima	<2	35
Scaevola spinescens (broad form)	<2	100
Solanum cleistogamum	<2	35
Streptoglossa decurrens	<2	35
Tephrosia densa	<2-2	30
Tephrosia sp. NW Eremaean (S. van Leeuwen et al. PBS 0356)	<2	30
Tephrosia supina	2	35
Tinospora smilacina	<2	cr
Trachymene oleracea	<2	25
Triodia angusta	5	35
Triodia epactia	30	25-30
Triodia wiseana	30	35
Triumfetta appendiculata	<2-2	30
Triumfetta clementii	<2	30

Site CZ-20

Described by	Vicki Long	Date	21/04/2020	Type	Quadrat	25 x 20
Season	E					
Location	Conzinc Bay					
MGA Zone	50	480088	mE	7726988	mN	
Habitat	Small rockpile					
Rock Type	Medium to large granophyre rocks					
Vegetation	BaAcTsTe - *Brachychiton acuminatus, Acacia coriacea, Terminalia supranitifolia* (P3), *Flueggea virosa* subsp. *melanthesoides* pocket low woodland with *Dichrostachys spicata, Alectryon oleifolius*, over *Rhagodia eremea, Scaevola spinescens* (broad form), *Jasminum didymium* subsp. *lineare* over scattered *Triodia epactia* and *Cymbopogon ambiguus* grasses.					
Veg Condition	Excellent					
Fire Age	> 10 years					
Notes	No weeds; Priority Flora					

Species list	Cover	Height
Abutilon fraseri	<2	30
Abutilon lepidum	<2	30
Acacia coriacea	2	350
Alectryon oleifolius	<2	300
Boerhavia coccinea	<2	25
Brachychiton acuminatus	2	200
Cleome viscosa	<2	40
Corymbia hamersleyana	<2	600
Crotalaria medicaginea	<2	50
Cymbopogon ambiguus	<2	60
Dichrostachys spicata	<2	150
Ehretia saligna	2	150
Euphorbia coghlanii	2	25
Flueggea virosa	10	200
Grevillea pyramidalis	<2	300
Ipomoea costata	2	150
Paspalidium tabulatum	<2	60
Rhagodia eremaea	<2	100
Rhynchosia bungarensis (P4)	<2	40
Senna glutinosa subsp. *glutinosa*	<2	120
Terminalia supranitifolia (P3)	10	600
Triodia angusta	2	40
Triodia epactia	<2	40
Triumfetta appendiculata	<2	40
Triumfetta clementii	<2	30

Site CZ-21

Described by	Vicki Long	Date	21/04/2020	Type	Quadrat	80 x 20/40
Season	E					
Location	Conzinc Bay					
MGA Zone	50	479983	mE	7726949	mN	
Habitat	Broad shallow drainage zone					
Soil	Grey alluvial silts					
Rock Type	Moderate to sparse stones and rocks					
Vegetation	ChAbTaTe - *Corymbia hamersleyana* open low woodland with some *Flueggea virosa* subsp. *melanthesoides*, over mixed *Triodia epactia, Triodia angusta* hummock grassland.					
Veg Condition	Excellent					
Fire Age	2 years					
Notes	No weeds; Old Pebble Mound Mouse mound					

Species list	Cover	Height
Acacia bivenosa	<2-2	150
Acacia colei	<2	120
Acacia coriacea	<2	150
Adriana tomentosa	2	70
Boerhavia coccinea	<2	25
Bonamia media	<2	30
Cassytha capillaris	<2	cr
Corchorus walcottii	<2	30
Corymbia hamersleyana	25	300
Crotalaria medicaginea	<2	50
Cucumis variabilis	<2	cr
Cullen lachnostachys	<2	35
Dichrostachys spicata	<2	120
Euphorbia australis	<2	15
Euphorbia biconvexa	<2	35
Euphorbia coghlanii	<2	25
Euphorbia tannensis	<2	30
Euphorbia tannensis subsp. *eremophila*	<2	30
Flueggea virosa subsp. *melanthesoides*	2	150

Goodenia microptera	<2	15
Grevillea pyramidalis	<2	200
Jasminum didymum subsp. *lineare*	<2	cr
Paspalidium clementii	<2	60
Paspalidium tabulatum	<2	50
Phyllanthus maderaspatensis	<2	30
Pittosporum phillyreoides	<2	300
Pterocaulon sphaeranthoides	<2	30
Rhagodia eremaea	<2	100
Scaevola spinescens (broad form)	<2	80
Senna glutinosa subsp. *glutinosa*	<2	150
Senna notabilis	<2	35
Solanum cleistogamum	<2	30
Solanum lasiophyllum	<2	35
Solanum phlomoides	<2	35
Streptoglossa decurrens	<2	30
Streptoglossa odora	<2	30
Stylobasium spathulatum	<2	35
Swainsona formosa	<2	25
Tephrosia rosea var. *clementii*	<2	40
Tinospora smilacina	<2	cr
Trichodesma zeylanicum	<2	50
Trichosanthes cucumerina	<2	cr
Triodia angusta	25	35
Triodia epactia	15	35
Triumfetta appendiculata	<2	30
Triumfetta clementii	<2	30

Site CZ-22

Described by	Vicki Long	Date	21/04/2020	Type	Quadrat	80 x 30
Season	E					
Location	Conzinc Bay					
MGA Zone	50	479930	mE	7727056	mN	
Habitat	Low-lying basin					
Soil	Pale greyish sands with incised erosion channels					
Vegetation	AtTe - *Adriana tomentosa* low shrubland over *Triodia epactia* hummock grassland with dense annual herbland.					
Veg Condition	Good					
Fire Age	2 years					
Notes	**Aerva javanica* and **Malvastrum americanum* present; Priority Flora					

Species list	Cover	Height
Acacia bivenosa	<2	100
Acacia coriacea	2	250
Adriana tomentosa	5	80
**Aerva javanica*	2	40
Boerhavia gardneri	2-5	25
Cleome viscosa	5	50
Corchorus walcottii	2	30
Crotalaria medicaginea	25	50
Crotalaria novae-hollandiae subsp. *crassipes*	<2	15
Cullen lachnostachys	2	30
Dysphania plantaginella	<2	5
Dysphania rhadinostachya	<2	5
Euphorbia tannensis subsp. *eremophila*	<2	30
Flueggea virosa	<2	150
Gymnanthera cunninghamii (P3)	<2	90
Indigofera linifolia	2	30
Ipomoea costata	2	150
**Malvastrum americanum*	15	30
Paspalidium clementii	<2	60
Portulaca filifolia	<2	10

Pterocaulon sphacelatum	2	30
Pterocaulon sphaeranthoides	2	30
Ptilotus fusiformis	1	25
Solanum phlomoides	1	30
Streptoglossa decurrens	2	30
Swainsona formosa	<2	25
Tephrosia sp. NW Eremaean (S. van Leeuwen et al. PBS 0356)	2	30
Tephrosia supina	<2	30
Triodia epactia	15-20	40
Triumfetta clementii	5	30

Site CZ-23

Described by	Vicki Long	Date	22/04/2020	Type	Quadrat	100 x 25
Season	E					
Location	Conzinc Bay					
MGA Zone	50	480210	mE	7727056	mN	
Habitat	Rocky hillslope					
Soil	Stony mantle over grey-brown silts					
Vegetation	Ai(GpHl)Te - *Acacia inaequilatera* tall shrubland often with *Hakea lorea* subsp. *lorea* / *Grevillea pyramidalis* over *Triodia epactia* hummock grassland with patchy *Triodia wiseana* over dense annual herbland.					
Veg Condition	Excellent					
Fire Age	2 years					
Notes	No weeds; Priority Flora					

Species list	Cover	Height
Abutilon lepidum	<2	30
Acacia bivenosa	<2	100
Acacia coriacea	<2	200
Acacia inaequilatera	15	200
Boerhavia gardneri	<2	30
Bonamia media	<2	30
Brachychiton acuminatus	2	300
Cleome viscosa	<2	30
Corchorus walcottii	<2	30
Crotalaria medicaginea	<2	50
Cullen lachnostachys	2	40
Cymbopogon ambiguus	<2	30
Ehretia saligna	2	150
Enneapogon lindleyanus	2	25
Euphorbia australis	<2	15
Euphorbia biconvexa	<2	25
Euphorbia tannensis	<2	30
Evolvulus alsinoides var. *villosicalyx*	<2	30
Flueggea virosa	2	125

Grevillea pyramidalis	<2	125
Hakea lorea subsp. *lorea*	ADJ	400
Hibiscus sturtii var. *campylochlamys*	<2	60
Indigofera linifolia	<2	30
Indigofera monophylla	2	50
Ipomoea costata	2	100
Paspalidium tabulatum	<2	50
Phyllanthus maderaspatensis	<2	50
Portulaca oleracea	<2	10
Pterocaulon sphaeranthoides	<2	40
Rhynchosia minima	<2	15
Scaevola spinescens (broad form)	<2	100
Sida fibulifera	<2	30
Solanum horridum	<2	30
Solanum phlomoides	2	30
Streptoglossa decurrens	<2	30
Swainsona formosa	2	25
Tephrosia densa	<2	30
Tephrosia rosea var. *clementii*	<2	30
Themeda triandra	2	50
Trichodesma zeylanicum	2	70
Triodia epactia	25	30
Triodia wiseana	20	30
Triumfetta appendiculata	2	30
Triumfetta clementii	<2	30

Site CZ-24

Described by	Vicki Long	Date	22/04/2020	Type	Quadrat	50 x 50
Season	E					
Location	Conzinc Bay					
MGA Zone	50	479994	mE	7726872	mN	
Habitat	Rocky upper hillslope					
Soil	Stony mantle over red-brown silts					
Vegetation	GpHlTeTw - *Grevillea pyramidalis* open tall shrubland with *Hakea lorea*, over *Triodia epactia* hummock grassland or *Triodia epactia/Triodia wiseana* mixed hummock grassland.					
Veg Condition	Excellent					
Fire Age	5 years					
Notes	No weeds					

Species list	Cover	Height
Abutilon lepidum	<2	30
Acacia bivenosa	<2	100
Acacia colei	<2	120
Acacia coriacea	<2	250
Acacia inaequilatera	<2	350
Boerhavia gardneri	<2	25
Bonamia media	<2	30
Cleome viscosa	<2	40
Corchorus walcottii	<2	30
Crotalaria medicaginea	<2	50
Cymbopogon ambiguus	<2	60
Euphorbia coghlanii	<2	20
Gomphrena cunninghamii	<2	25
Grevillea pyramidalis	2-5	150-200
Hakea lorea subsp. *lorea*	<2	200
Indigofera colutea	<2	30
Indigofera linifolia	<2	30
Indigofera monophylla	<2	40
Paspalidium clementii	<2	60
Polycarpaea longiflora	<2	25

Rhynchosia minima	<2	25
Streptoglossa decurrens	<2	30
Swainsona formosa	<2	25
Tephrosia sp. NW Eremaean (S. van Leeuwen et al. PBS 0356)	<2	30
Trachymene oleracea	<2	20
Trichodesma zeylanicum	<2	50
Triodia epactia	45	40
Triodia wiseana	15	40
Triumfetta appendiculata	<2	25
Triumfetta clementii	<2	30

Site CZ-25

Described by	Vicki Long	Date	22/04/2020	Type	Quadrat	50 x 50
Season	E					
Location	Conzinc Bay					
MGA Zone	50	479920	mE	7726809	mN	
Habitat	Valley gentle slopes and floors leading to coast					
Soil	Slopes with stony mantle; fllors pinky-brown silts, scattered stones					
Vegetation	TwTaTe - *Triodia wiseana* hummock grassland with *Triodia angusta, Triodia epactia*. Scattered *Acacia colei, A. bivenosa* and annual herbland.					
Veg Condition	Excellent					
Fire Age	?					
Notes	No weeds					

Species list	Cover	Height
Abutilon lepidum	<2	30
Acacia bivenosa	<2	100
Acacia colei	<2	150
Acacia coriacea	<2	300
Cleome viscosa	<2	40
Crotalaria novae-hollandiae	<2	30
Cullen lachnostachys	<2	30
Euphorbia tannensis	<2	30
Goodenia microptera	<2	15
Grevillea pyramidalis	<2	300
Hakea lorea subsp. *lorea*	<2	350
Hybanthus aurantiacus	<2	30
Indigofera linifolia	<2	30
Paspalidium clementii	<2	40
Rhynchosia minima	<2	20
Solanum ceistogamum	<2	30
Solanum phlomoides	<2	30
Streptoglossa decurrens	<2	30
Swainsona formosa	<2	25
Tephrosia sp. NW Eremaean (S. van Leeuwen et al. PBS 0356)	<2	30
Trachymene oleracea	<2	25
Trichodesma zeylanicum	<2	40
Triodia angusta	15	40
Triodia epactia	15	30
Triodia wiseana	35	35
Triumfetta clementii	<2	30

Site CZ-26

Described by	Vicki Long	Date	22/04/2020	Type	Quadrat	25 x 50
Season	E					
Location	Conzinc Bay					
MGA Zone	50	479875	mE	7727174	mN	
Habitat	Steep narrow degraded coastal dune					
Soil	Pinky-grey white medium to course beach sands with marine fragments					
Vegetation	AcAjTe - *Acacia coriacea* tall shrubland over **Aerva javanica* low shrubland over *Triodia epactia* open hummock grassland. There can be scattered *Adriana tomentosa*.					
Veg Condition	Degraded					
Fire Age	5 years					
Notes	**Aerva javanica* present; vehicle tracks					

Species list	Cover	Height
Acacia bivenosa	<2	40-80
Acacia coriacea	35	150-200
**Aerva javanica*	15	40-80
Alectryon oleifolius	<2	40-80
Amaranthus undulatus	<2	25-30
Boerhavia schomburgkiana	<2	25-30
Cleome viscosa	<2	25-30
Euphorbia australis	<2	40-80
Euphorbia drummondii	<2	25-30
Euphorbia tannensis subsp. *eremophila*	<2	40-80
Euphorbia trigonosperma	<2	25-30
Indigofera linifolia	<2	40-80
Indigofera monophylla	<2	40-80
Tribulus occidentalis	<2	40-80
Triodia epactia	15-20	25-30
Whiteochloa airoides	<2	40-80

Site CZ-27

Described by	Vicki Long	Date	22/04/2020	Type	Quadrat	80 x 30
Season	E					
Location	Conzinc Bay					
MGA Zone	50	479799	mE	7727114	mN	
Habitat	Hinddune and swale					
Soil	Pink-grey white sands					
Vegetation	AtAjTeSl - *Adriana tomentosa* and **Aerva javanica* low shrubland over *Triodia epactia* or *Spinifex longifolius* scattered, sometimes open grasses. There can be scattered *Acacia coriacea*.					
Veg Condition	Very Good					
Fire Age	2 years					
Notes	**Aerva javanica* present 2-10%; burnt					

Species list	Cover	Height
Acacia bivenosa	<2-2	80
Acacia coriacea	<2	200
Adriana tomentosa	15	40-60
**Aerva javanica*	2-5	40-60
Boerhavia schomburgkiana	2	30
Cleome viscosa	2-5	40
Crotalaria novae-hollandiae	<2	15
Cuscuta victoriana	<2	cr
Euphorbia drummondii	<2	30
Euphorbia tannensis	<2	40
Goodenia microptera	<2	15
Indigofera linifolia	2	30
Indigofera monophylla	2	50
Pterocaulon sphaeranthoides	<2	30
Swainsona pterostylis	<2	20
Tribulus terrestris	<2	20
Trichodesma zeylanicum	<2	20-25
Triodia epactia	15	20-25
Whiteochloa airoides	<2	60

Site CZ-28

Described by	Vicki Long	Date	22/04/2020	Type	Quadrat	50 x 50
Season	E					
Location	Conzinc Bay					
MGA Zone	50	479766	mE	7726973	mN	
Habitat	Gentle hillslope					
Soil	Dense rock and stony mantle over red-brown silts					
Vegetation	GpHlTeTw - *Grevillea pyramidalis* open tall shrubland with *Hakea lorea*, over *Triodia epactia* hummock grassland or *Triodia epactia/Triodia wiseana* mixed hummock grassland.					
Veg Condition	Excellent					
Fire Age	2 years					
Notes	No weeds					

Species list	Cover	Height
Abutilon lepidum	<2	10
Acacia bivenosa	<2	100
Boerhavia gardneri	<2	35
Bonamia media	<2	35
Corchorus walcottii	<2	30
Crotalaria novae-hollandiae subsp. *crassipes*	<2	10
Dichrostachys spicata	<2	30
Euphorbia biconvexa	<2	10
Evolvulus alsinoides var. *villosicalyx*	<2	35
Gomphrena cunninghamii	<2	35
Grevillea pyramidalis	5-10	200
Hakea lorea subsp. *lorea*	<2	20
Heliotropium tenuifolium	<2	35
Hybanthus aurantiacus	<2	35
Indigofera linifolia	<2	30
Indigofera monophylla	2	35
Paspalidium tabulatum	<2	35
Polycarpaea longiflora	<2	30
Ptilotus fusiformis	<2	35
Rhynchosia minima	<2	35
Solanum horridum	<2	20
Streptoglossa decurrens	<2	10
Tephrosia densa	<2	30
Tephrosia sp. NW Eremaean (S. van Leeuwen et al. PBS 0356)	<2	10
Trigastrotheca molluginea	<2	35
Triodia epactia	15	30
Triodia wiseana	50	35
Triumfetta appendiculata	<2	30
Triumfetta clementii	2	30

Site CZ-29

Described by	Vicki Long	Date	23/04/2020	Type	Quadrat	84/54 x 35/30
Season	E					
Location	Conzinc Bay					
MGA Zone	50	479639	mE	7727067	mN	
Habitat	Rockpile					
Rock Type	Medium to large granophyre rocks					
Vegetation	BaAcTsTe - *Brachychiton acuminatus, Acacia coriacea, Terminalia supranitifolia* (P3), *Flueggea virosa* subsp. *melanthesoides* pocket low woodland with *Dichrostachys spicata, Alectryon oleifolius*, over *Rhagodia eremea, Scaevola spinescens* (broad form), *Jasminum didymium* subsp. *lineare* over scattered *Triodia epactia* and *Cymbopogon ambiguus* grasses.					
Veg Condition	Excellent					
Fire Age	> 10 years					
Notes	**Malvastrum americanum* <2%; PEC; numerous Priority Flora; flora of 'other' significance					

Species list	Cover	Height
Abutilon fraseri	<2	25
Abutilon lepidum	<2	30
Acacia coriacea	5	300
Alectryon oleifolius	2	250
Amaranthus undulatus	<2	20
Boerhavia gardneri	2-5	30
Bonamia media	<2	30
Brachychiton acuminatus	5	300
Cleome viscosa	2	50
Crotalaria novae-hollandiae	<2	15
Cymbopogon ambiguus	2	50
Dichrostachys spicata	2	120
Dolichandrone occidentalis	<2	300
Ehretia saligna	<2	100
Flueggea virosa	2	160
Gomphrena cunninghamii	<2	20
Indigofera linifolia	<2	30
Indigofera monophylla	<2	50
Ipomoea costata	<2	100

Jasminum didymum subsp. *lineare*	<2	cr
**Malvastrum americanum*	<2	40
Paspalidium clementii	<2	50
Paspalidium tabulatum	<2	60
Phyllanthus maderaspatensis	<2	30
Polycarpaea longiflora	2-5	25
Portulaca filifolia	2-5	10
Rhagodia eremaea	<2	100
Rhynchosia bungarensis (P4)	<2	40
Scaevola spinescens (broad form)	<2	100
Streptoglossa decurrens	<2	30
Terminalia supranitifolia (P3)	5	300
Tinospora smilacina	<2	cr
Triodia epactia	2-5	40
Triumfetta clementii	2-5	30
Zaleya galericulata	<2	30

Site CZ-30

Described by	Vicki Long	Date	23/04/2020	Type	Quadrat	30/60 x 60/30
Season	E					
Location	Conzinc Bay					
MGA Zone	50	479460	mE	7727040	mN	
Habitat	Coastal rockpiles on crest of dune					
Vegetation	AcIcFaTe - *Acacia coriacea, Ipomoea costata, Ficus aculeata* var. *indecora*, pocket low woodland with frequent *Brachychiton acuminatus, Ficus virens* var. *virens, Dichrostachys spicata* over *Triodia epactia* open to scattered hummock grassland.					
Veg Condition	Excellent					
Fire Age	5 years					
Notes	**Aerva javanica* 2% present. Control; Priority Flora					

Species list	Cover	Height
Acacia coriacea	20	400
Adriana tomentosa	2	50
**Aerva javanica*	<1	50
Alectryon oleifolius	<2	300
Brachychiton acuminatus	2	250
Cassytha capillaris	<2	cr
Ficus aculeata var. *indecora*	2	300
Flueggea virosa	2	300
Ipomoea costata	5	100
Pluchea ferdinandi-muelleri	<2	30
Portulaca filifolia	<2	15
Rhagodia eremaea	<2	90
Rhagodia preissii subsp. *obovata*	<2	100
Terminalia supranitifolia (P3)	<2	400
Tinospora smilacina	<2	cr
Triodia epactia	10	50

Site CZ-31

Described by	Vicki Long	Date	23/04/2020	Type	Quadrat	50 x 50
Season	E					
Location	Conzinc Bay					
MGA Zone	50	479456	mE	7726943	mN	
Habitat	Crest of beach dune					
Soil	Pinky-grey white medium to course beach sands with marine fragments					
Vegetation	AcAtSlTe - *Acacia coriacea* tall shrubland over *Adriana tomentosa* open low shrubland over *Spinifex longifolius* tussock and *Triodia epactia* hummock mixed open grassland.					
Veg Condition	Poor					
Fire Age	2 years					
Notes	No weeds; highly disturbed by traffic; evidence of camping					

Species list	Cover	Height
Acacia coriacea	10	200-250
Adriana tomentosa	10	35
Boerhavia schomburgkiana	5	25
Brachychiton acuminatus	<2	150
Cleome viscosa	5	40
Euphorbia drummondii	5	20
Euphorbia tannensis subsp. *eremophila*	5	30
Indigofera linifolia	5	30
Indigofera monophylla	5	35
Rhagodia preissii subsp. *obovata*	<2	90
Spinifex longifolius	15	35-45
Swainsona pterostylis	<2	25
Tinospora smilacina	<2	cr
Triodia epactia	5	20

Site CZ-32

Described by	Vicki Long	Date	23/04/2020	Type	Quadrat	20 x 100
Season	E					
Location	Conzinc Bay					
MGA Zone	50	479421	mE	7726849	mN	
Habitat	Supratidal sandy creek bed					
Soil	Grey-brown soft sandy soils					
Vegetation	ThTt - *Tecticornia halocnemoides* subsp. *tenuis, Trianthema turgidifolia* low shrubland, with *Tecticornia indica* subsp. *leiostachya, Frankenia pauciflora, Surreya diandra* over very open *Sporobolus virginicus* tussock grassland, sometimes scattered.					
Veg Condition	Excellent					
Fire Age	?					
Notes	No weeds					

Species list	Cover	Height
Acacia ampliceps	<1	150
Dactyloctenium radulans	<2	20
Dysphania kalpari	<1	10
Neobassia astrocarpa	<2	30
Sporobolus virginicus	<2	25
Swainsona pterostylis	<1	25
Tecticornia halocnemoides	5	30
Tecticornia indica subsp. *leiostachya*	80	40
Trianthema turgidifolia	5	30
Triodia angusta	<2	40

Site CZ-33

Described by	Vicki Long	Date	28/04/2020	Type	Quadrat	100 x 25
Season	E					
Location	Conzinc Bay					
MGA Zone	50	479518	mE	7726813	mN	
Habitat	Hinddune and gentle rocky lower hillslopes behind beach dune					
Soil	Grey-white course sand to rocky slope over silts					
Vegetation	AtSlTe - *Adriana tomentosa* low shrubland over *Triodia epactia* hummock and *Spinifex longifolius* tussock grassland, sometimes with *Triodia angusta*.					
Veg Condition	Excellent					
Fire Age	2 years					
Notes	No weeds					

Species list	Cover	Height
Abutilon lepidum	<2	30
Acacia bivenosa	<2	100
Acacia colei	<2	150
Adriana tomentosa	15-20	80
Boerhavia gardneri	<2	30
Bonamia media	<2	30
Cassytha capillaris	<2	cr
Cleome viscosa	<2	40
Corchorus walcottii	<2	30
Crotalaria novae-hollandiae	<2	15
Cymbopogon ambiguus	<2	50
Cynanchum floribundum	<2	cr
Euphorbia coghlanii	<2	25
Euphorbia tannensis subsp. *eremophila*	<2	40
Goodenia microptera	<2	15
Indigofera linifolia	<2	30
Indigofera monophylla	2	40
Pterocaulon sphaeranthoides	<2	25
Rhynchosia minima	<2	20
Solanum phlomoides	<2	30
Streptoglossa decurrens	<2	30
Tephrosia rosea var. *clementii*	<2	40
Trianthema turgidifolium	<2	30
Trichodesma zeylanicum	<2	60
Triodia angusta	20	50
Triodia epactia	30	40
Triumfetta appendiculata	<2	40
Triumfetta clementii	<2	25

Site CZ-34

Described by	Vicki Long	Date	23/04/2020	Type	Quadrat	80 x 20
Season	E					
Location	Conzinc Bay					
MGA Zone	50	478981	mE	7726735	mN	
Habitat	Crest and face of beach foredune					
Soil	Pink-white fine to medium beach sands with shell fragments					
Vegetation	Sl - *Spinifex longifolius* open tussock grassland.					
Veg Condition	Excellent					
Fire Age	2 years					
Notes	Numerous tracks; one **Aerva javanica* plant removed but check for regeneration from seed					

Species list	Cover	Height
Adriana tomentosa	<2	60
**Aerva javanica*	<1	60
Boerhavia schomburgkiana	<2	30
Cleome viscosa	<2	40
Euphorbia drummondii	<2	20
Euphorbia trigonosperma	<2	30
Spinifex longifolius	35-40	60

Site CZ-35

Described by	Vicki Long	Date	25/04/2020	Type	Quadrat	80 x 30
Season	E					
Location	Conzinc Bay					
MGA Zone	50	478997	mE	7726714	mN	
Habitat	Leeward side of foredune and swale					
Soil	Pink-white medium to fine beach sands					
Vegetation	AtSlTe - *Adriana tomentosa* low shrubland over *Triodia epactia* hummock and *Spinifex longifolius* tussock grassland, sometimes with *Triodia angusta*.					
Veg Condition	Very Good					
Fire Age	2 years					
Notes	High disturbance from vehicle tracks, weeds and toilet paper					

Species list	Cover	Height
Acacia bivenosa	<2	100
Acacia coriacea	<2	250
Adriana tomentosa	20	80
**Aerva javanica*	<2	40
Boerhavia schomburgkiana	<2	20
Bonamia media	<2	30
Cleome viscosa	<2	40
Corchorus walcottii	<2	35
Euphorbia drummondii	<2	20
Euphorbia tannensis subsp. *eremophila*	<2	30
Euphorbia trigonosperma	<2	25
Indigofera linifolia	<2	35
Indigofera monophylla	<2	50
Spinifex longifolius	15	50
Swainsona formosa	<2	25
Swainsona pterostylis	<2	25
Trichodesma zeylanicum	<2	50
Triodia epactia	15	40
Triumfetta clementii	<2	30

Site CZ-36

Described by	Vicki Long	Date	28/04/2020	Type	Quadrat	120 x 20
Season	E					
Location	Conzinc Bay					
MGA Zone	50	479731	mE	7726673	mN	
Habitat	Narrow creekline					
Soil	Washed stones and rocks					
Vegetation	TcEvTaTeCv - *Terminalia circumalata* and *Eucalyptus victrix* low woodland with *Acacia coriacea, Flueggea virosa* subsp. *melanthesoides* over *Triodia angusta* hummock grassland with patchy *Triodia epactia* with scattered *Cyperus vaginatus* sedges.					
Veg Condition	Excellent					
Fire Age	2 years					
Notes	No weeds; Priority Flora; flora of other significance					

Species list	Cover	Height
Acacia coriacea	2	150
Acacia pyrifolia var. *morrisonii*	<2	120
Adriana tomentosa	ADJ	60
Ammannia baccifera	ADJ	30
Boerhavia coccinea	<2	35
Boerhavia gardneri	<2	25
Cassytha capillaris	<2	cr
Cleome viscosa	<2	40
Corchorus walcottii	<2	30
Cucumis variabilis	<2	cr
Cullen lachnostachys	<2	60
Cynanchum floribundum	<2	cr
Cyperus vaginatus	<2-5	50
Dichrostachys spicata	<2	100
Eriachne tenuiculmis	<2	30
Eucalyptus victrix	2	300-400
Euphorbia coghlanii	<2	20
Fimbristylis aff. *littoralis*	ADJ	30
**Flaveria trinervia*	ADJ	20

Goodenia lamprosperma	<2	15
Grevillea pyramidalis	<2	250
Indigofera linifolia	<2	30
Ipomoea costata	<2	100
Operculina aequisepala	<2	30
Paspalidium clementii	<2	50
Phyllanthus maderaspatensis	<2	30
Pluchea rubelliflora	ADJ	30
Polymeria calycina	<2	25
Portulaca filifolia	<2	10
Scaevola spinescens (broad form)	<2	100
Sesbania cannabina	<2	100
Stemodia grossa	<2	30
Streptoglossa decurrens	<2	150
Stylobasium spathulatum	ADJ	100
Swainsona formosa	<2	35
Tephrosia rosea var. *clementii*	<2	50
Terminalia circumalata	15-20	300-400
Tinospora smilacina	<2	cr
Trachymene oleracea	<2	20
Triodia angusta	35	40
Triodia epactia	5	35
Waltheria indica	<2	30

Site CZ-37

Described by	Vicki Long	Date	28/04/2020	Type	Quadrat	70 x 35
Season	E					
Location	Conzinc Bay					
MGA Zone	50	479591	mE	7726541	mN	
Habitat	Broad drainage area and lower slopes					
Soil	Grey-brown colluvial silts with rocks and stones					
Vegetation	AbTa - *Acacia bivenosa* open tall shrubland over *Triodia angusta* hummock grassland with some *Triodia epactia*. There can be scattered to open shrubland of *Stylobasium spathulatum* with annual herbland.					
Veg Condition	Excellent					
Fire Age	2 years					
Notes	No weeds					

Species list	Cover	Height
Acacia ampliceps	2	125
Acacia bivenosa	2	15-200
Acacia colei	<2	60
Acacia coriacea	<2	150
Adriana tomentosa	2	60
Boerhavia gardneri	<2	25
Bonamia media	<2	40-6030
Cassytha capillaris	<2	cr
Cleome viscosa	<2	40
Corchorus walcottii	<2	40-90
Crotalaria novae-hollandiae	<2	20
Cucumis variabilis	<2	cr
Cullen lachnostachys	<2	30
Cymbopogon ambiguus	<2	50
Cynanchum floribundum	<2	cr
Cyperus vaginatus	<2	25
Enneapogon lindleyanus	<2	25
Euphorbia biconvexa	<2	25
Euphorbia coghlanii	<2	30

Euphorbia tannensis subsp. *eremophila*	<2	35-40
Flueggea virosa	<2	160
Grevillea pyramidalis	<2	250
Hakea lorea subsp. *lorea*	<2	100
Hibiscus sturtii var. *campylochlamys*	<2	60
Indigofera monophylla	<2	50
Paspalidium clementii	<2	50
Paspalidium tabulatum	<2	50
Pluchea dentex	<2	25
Pterocaulon sphaeranthoides	<2	30
Scaevola spinescens (broad form)	<2	90
Senna notabilis	<2	80
Stemodia grossa	<2	30
Streptoglossa decurrens	<2	30
Stylobasium spathulatum	10	50-100
Swainsona formosa	<2	25
Tephrosia rosea var. *clementii*	<2	30
Trachymene oleracea	<2	25
Trichodesma zeylanicum	<2	60
Triodia angusta	45	40-90
Triodia epactia	15	45
Triodia wiseana	5	40
Triumfetta appendiculata	<2	30
Triumfetta clementii	<2	30

Site CZ-38

Described by	Vicki Long	Date	28/04/2020	Type	Quadrat	30 x 60
Season	E					
Location	Conzinc Bay					
MGA Zone	50	479552	mE	7726601	mN	
Habitat	Narrow valley floor					
Soil	Stones and rocks over grey-brown colluvial silts					
Vegetation	Ta - *Triodia angusta* hummock grassland. There can be scattered *Acacia bivenosa* shrubs.					
Veg Condition	Excellent					
Fire Age	2 years					
Notes	No weeds					

Species list	Cover	Height
Acacia bivenosa	2	200
Acacia coriacea	<2	125
Acacia pyrifolia	2	100
Corchorus walcottii	<2	35
Crotalaria novae-hollandiae subsp. *crassipes*	<2	50
Cucumis variabilis	<2	cr
Cullen lachnostachys	<2	35
Cynanchum floribundum	2	cr
Cyperus vaginatus	<2	35
Eucalyptus victrix	2	500
Goodenia lamprosperma	<2	35
Hakea lorea subsp. lorea	<2	125
Indigofera linifolia	<2	30
Rhynchosia minima	<2	35
Streptoglossa odora	2	30
Tephrosia sp. NW Eremaean (S. van Leeuwen et al. PBS 0356)	<2	35
Trichodesma zeylanicum	<2	50
Triodia angusta	60	10-100
Triodia epactia	15	35
Triumfetta appendiculata	<2	35
Triumfetta clementii	<2	30

Site CZ-39

Described by	Vicki Long	Date	28/04/2020	Type	Quadrat	50 x 50
Season	E					
Location	Conzinc Bay					
MGA Zone	50	479419	mE	7726447	mN	
Habitat	Gentle lower hillslope, base of rockpile					
Soil	Stony mantle with pockets of red-brown silts					
Vegetation	Ai(GpHl)Te - *Acacia inaequilatera* tall shrubland often with *Hakea lorea* subsp. *lorea* / *Grevillea pyramidalis* over *Triodia epactia* hummock grassland with patchy *Triodia wiseana* over dense annual herbland.					
Veg Condition	Excellent					
Fire Age	2 years					
Notes	No weeds; Priority Flora					

Species list	Cover	Height
Abutilon lepidum	<2	30
Acacia bivenosa	<2	120
Acacia colei	<2	150
Acacia coriacea	2	300
Acacia inaequilatera	10	300
Alectryon oleifolius	<2	300
Boerhavia coccinea	<2	30
Boerhavia gardneri	<2	30
Bonamia media	<2	30
Cleome viscosa	<2	40
Corchorus walcottii	<2	30
Crotalaria medicaginea	<2	40
Crotalaria novae-hollandiae	<2	30
Cullen lachnostachys	<2	30
Cymbopogon ambiguus	<2	50
Cynanchum floribundum	<2	cr
Ehretia saligna	<2	120
Euphorbia coghlanii	<2	20
Gomphrena cunninghamii	<2	25

Grevillea pyramidalis	ADJ	250
Hakea lorea subsp. *lorea*	2	350
Hybanthus aurantiacus	<2	30
Indigofera linifolia	<2	30
Indigofera monophylla	<2	30
Ipomoea costata	<2	120
Paspalidium tabulatum	<2	50
Rhynchosia bungarensis (P4)	<2	30
Rhynchosia minima	<2	30
Scaevola spinescens (broad form)	<2	90
Solanum phlomoides	<2	30
Streptoglossa decurrens	<2	30
Swainsona formosa	<2	25
Tephrosia densa	<2	30
Tephrosia sp. NW Eremaean (S. van Leeuwen et al. PBS 0356)	<2	35
Tinospora smilacina	<2	cr
Trichodesma zeylanicum	<2	40
Trigastrotheca molluginea	<2	20
Triodia angusta	5	40
Triodia epactia	65	40
Triodia wiseana	2	40
Triumfetta appendiculata	<2	25
Triumfetta clementii	<2	30

Site CZ-40

Described by	Vicki Long	Date	28/04/2020	Type	Quadrat	50 x 50
Season	E					
Location	Conzinc Bay					
MGA Zone	50	479439	mE	7726572	mN	
Habitat	Rocky hillslope					
Soil	Large rocks and stony mantle over red-brown silts					
Vegetation	GpHlTeTw - *Grevillea pyramidalis* open tall shrubland with *Hakea lorea*, over *Triodia epactia* hummock grassland or *Triodia epactia/Triodia wiseana* mixed hummock grassland.					
Veg Condition	Excellent					
Fire Age	2-5 years					
Notes	No weeds					

Species list	Cover	Height
Abutilon lepidum	<2	30
Acacia colei	<2	120
Acacia coriacea	<2	250
Boerhavia gardneri	<2	25
Bonamia media	<2	30
Cleome viscosa	5	40
Corchorus walcottii	<2	30
Crotalaria novae-hollandiae subsp. *crassipes*	<2	15
Cucumis variabilis	<2	cr
Cullen lachnostachys	2	30
Gomphrena cunninghamii	<2	25
Goodenia microptera	<2	20
Grevillea pyramidalis	2	200
Hakea lorea subsp. lorea	<2	300
Hybanthus aurantiacus	<2	30
Indigofera colutea	<2	40
Indigofera linifolia	<2	30
Indigofera monophylla	<2	40
Paspalidium clementii	<2	50
Ptilotus fusiformis	<2	25
Rhynchosia minima	<2	30
Scaevola spinescens (broad form)	<2	100
Solanum cleistogamum	<2	30
Tephrosia sp. NW Eremaean (S. van Leeuwen et al. PBS 0356)	<2	35-40
Trichodesma zeylanicum	<2	60
Triodia epactia	65	35-40
Triumfetta clementii	<2	30

Site CZ-41

Described by	Vicki Long	Date	28/04/2020	Type	Quadrat	80 x 20
Season	E					
Location	Conzinc Bay					
MGA Zone	50	479123	mE	7726764	mN	
Habitat	Crest of beach dune					
Soil	Pinky-grey medium to fine beach sands with marine fragments					
Vegetation	AcAtSlTe - *Acacia coriacea* mid shrubland over *Adriana tomentosa* open low shrubland over *Spinifex longifolius* tussock and *Triodia epactia* hummock mixed open grassland.					
Veg Condition	Very Good					
Fire Age	2 years					
Notes	**Aerva javanica* 2% present. Control.					

Species list	Cover	Height
Acacia coriacea	40	100-250
Adriana tomentosa	2	30
**Aerva javanica*	2	60
Alectryon oleifolius	<2	200
Amaranthus undulatus	<2	30
Boerhavia gardneri	<2	30
Cleome viscosa	<2	30
Euphorbia drummondii	<2	30
Euphorbia tannensis subsp. *eremophila*	<2	30
Euphorbia trigonosperma	<2	20
Indigofera linifolia	<2	60
Indigofera monophylla	<2	40
Jasminum didymum subsp. *lineare*	<2	cr
Pittosporum phillyreoides	<2	150
Spinifex longifolius	10	30-40
Triodia epactia	10	40

Site CZ-42

Described by	Vicki Long	Date	28/04/2020	Type	Quadrat	50 x 50
Season	E					
Location	Conzinc Bay					
MGA Zone	50	478827	mE	7726605	mN	
Habitat	Crest of beach dune					
Soil	Pinky-grey medium to fine beach sands with marine fragments					
Vegetation	AcAtSlTe - *Acacia coriacea* mid shrubland over *Adriana tomentosa* open low shrubland over *Spinifex longifolius* tussock and *Triodia epactia* hummock mixed open grassland.					
Veg Condition	Excellent					
Fire Age	< 5 years					
Notes	No weeds					

Species list	Cover	Height
Acacia coriacea	35	100-150
Adriana tomentosa	2	50
Alectryon oleifolius	<2	150
Amaranthus undulatus	<2	25
Boerhavia gardneri	<2	25
Cleome viscosa	1	25-30
Corchorus walcottii	<2	30
Euphorbia drummondii	<2	25-30
Euphorbia tannensis subsp. *eremophila*	<2	30
Euphorbia trigonosperma	<2	30
Flueggea virosa	<2	200
Indigofera linifolia	<2	30
Ipomoea costata	<2	100
Jasminum didymum subsp. *lineare*	<2	cr
Paspalidium clementii	<2	35
Pterocaulon sphacelatum	<2	30
Rhagodia eremaea	<2	100
Spinifex longifolius	5	30-45
Trichodesma zeylanicum	<2	40
Triodia epactia	10	25-30

Site CZ-43

Described by	Vicki Long	Date	28/04/2020	Type	R	70 x 35
Season	E					
Location	Conzinc Bay					
MGA Zone	50	478765	mE	7726573	mN	
Habitat	Crest and leeward side of beach dune					
Soil	Pink-grey white sand					
Vegetation	AtSlTe - *Adriana tomentosa* low shrubland over *Triodia epactia* hummock and *Spinifex longifolius* tussock grassland, sometimes with *Triodia angusta*.					
Veg Condition	Excellent					
Fire Age	2 years					
Notes	No weeds					

Species list	Cover	Height
Acacia coriacea	<2	200
Adriana tomentosa	25	35-40
Amaranthus undulatus	<2	25
Boerhavia gardneri	<2	25
Cleome viscosa	<2	35
Corchorus walcottii	<2	30
Euphorbia drummondii	<2	15
Euphorbia tannensis subsp. *eremophila*	<2	30
Solanum phlomoides	<2	35
Spinifex longifolius	20	30-45
Swainsona pterostylis	<2	25
Synaptantha tillaeacea	<2	15
Triodia epactia	15	25-35

Site CZ-44

Described by	Vicki Long	Date	29/04/2020	Type	Quadrat	80 x 30
Season	E					
Location	Conzinc Bay					
MGA Zone	50	478935	mE	7726575	mN	
Habitat	Gentle undulating plain with small outcropping rockpiles merging with coastal hinddune					
Vegetation	Te scattered shrubs - *Triodia epactia* hummock grassland. There are scattered *Hakea lorea* subsp. *lorea, Cullen lachnostachys, Ipomoea costata, Acacia colei* and patchy *Triodia wiseana*. Annual herbland.					
Veg Condition	Excellent					
Fire Age	2-5 years					
Notes	No weeds					

Species list	Cover	Height
Abutilon lepidum	<2	30
Acacia bivenosa	<2	120
Acacia colei	2	180
Acacia coriacea	<2	150
Adriana tomentosa	<2	60
Boerhavia gardneri	<2	25
Bonamia media	<2	30
Brachychiton acuminatus	<2	200
Cassytha capillaris	<2	cr
Cleome viscosa	<2	50
Crotalaria medicaginea	<2	60
Cymbopogon ambiguus	<2	60
Cynanchum floribundum	<2	cr
Dichrostachys spicata	<2	80
Euphorbia tannensis	<2	40
Evolvulus alsinoides var. *villosicalyx*	<2	25
Flueggea virosa	<2	180
Grevillea pyramidalis	<2	250
Hibiscus sturtii var. *campylochlamys*	<2	50
Hybanthus aurantiacus	<2	30

Indigofera colutea	<2	30
Indigofera monophylla	<2	50
Ipomoea costata	2	100
Paspalidium tabulatum	<2	50
Solanum lasiophyllum	<2	30
Swainsona formosa	<2	25
Tephrosia rosea var. *clementii*	<2	40
Tinospora smilacina	<2	cr
Trachymene oleracea	<2	25
Trichodesma zeylanicum	<2	50
Triodia epactia	50	25-30
Triumfetta appendiculata	<2	30
Triumfetta clementii	<2	30

Site CZ-45

Described by	Vicki Long	Date	29/04/2020	Type	Quadrat	50 x 50
Season	E					
Location	Conzinc Bay					
MGA Zone	50	479021	mE	7726407	mN	
Habitat	Gentle undulating rocky slopes with boulders					
Soil	Rocky mantle, small rocky outcrops, red-brown silts					
Vegetation	Te scattered shrubs - *Triodia epactia* hummock grassland. There are scattered *Hakea lorea* subsp. *lorea, Cullen lachnostachys, Ipomoea costata, Acacia colei* and patchy *Triodia wiseana*. Annual herbland.					
Veg Condition	Excellent					
Fire Age	2-5 years					
Notes	Priority Flora					

Species list	Cover	Height
Bonamia media	<2	30
Cleome viscosa	<2	50
Crotalaria novae-hollandiae subsp. *crassipes*	<2	40
Cullen lachnostachys	<2-2	40
Cymbopogon ambiguus	<2	60
Cynanchum floribundum	<2	cr
Dichrostachys spicata	<2	90
Euphorbia coghlanii	<2	25
Gomphrena cunninghamii	<2	25
Grevillea pyramidalis	<2	250
Hakea lorea subsp. *lorea*	<2	300
Hybanthus aurantiacus	<2	30
Indigofera linifolia	<2	40
Indigofera monophylla	<2	50
Ipomoea costata	<2	100
Paspalidium tabulatum	<2	50
Phyllanthus maderaspatensis	<2	30
Polycarpaea longiflora	<2	25
Ptilotus fusiformis	<2	25

Rhynchosia minima	<2	20
Streptoglossa decurrens	<2	30
Tephrosia densa	<2	40
Tephrosia rosea var. *clementii*	<2	40
Tephrosia sp. NW Eremaean (S. van Leeuwen et al. PBS 0356)	<2	30
Tephrosia supina	<2	40
Tinospora smilacina	<2	cr
Tribulus occidentalis	<2	15
Trichodesma zeylanicum	<2	40
Trigastrotheca molluginea	<2	15
Triodia epactia	70	40
Triodia wiseana	5	50
Triumfetta appendiculata	<2	30
Vigna triodiophila (P3)	<2	30

Site CZ-46

Described by	Vicki Long	Date	29/04/2020	Type	Quadrat	50 x 50
Season	E					
Location	Conzinc Bay					
MGA Zone	50	478993	mE	7726299	mN	
Habitat	Gentle undulating rocky slopes with boulders					
Soil	Rocky mantle, small rocky outcrops, red-brown silts					
Vegetation	Te scattered shrubs - *Triodia epactia* hummock grassland. There are scattered *Hakea lorea* subsp. *lorea, Cullen lachnostachys, Ipomoea costata, Acacia colei* and patchy *Triodia wiseana*. Annual herbland.					
Veg Condition	Excellent					
Fire Age	2-5 years					
Notes	No weeds					

Species list	Cover	Height
Abutilon lepidum	<2	30
Acacia colei	<2	120
Bonamia media	<2	30
Bulbostylis barbata	<2	30
Cleome viscosa	<2	50
Crotalaria medicaginea	<2	50
Crotalaria novae-hollandiae	<2	40
Cullen lachnostachys	2	40
Cynanchum floribundum	<2	cr
Gomphrena cunninghamii	<2	25
Grevillea pyramidalis	<2	250
Hakea lorea subsp. *lorea*	<2	300
Hybanthus aurantiacus	<2	30
Indigofera colutea	<2	40
Indigofera linifolia	<2	30
Ipomoea costata	2	100
Paspalidium clementii	<2	50
Portulaca filifolia	<2	30
Portulaca oleracea	<2	20

Ptilotus fusiformis	<2	25
Streptoglossa decurrens	<2	30
Tephrosia densa	<2	30
Tephrosia sp. NW Eremaean (S. van Leeuwen et al. PBS 0356)	<2	30
Tephrosia supina	<2	30
Trachymene oleracea	<2	25
Trichodesma zeylanicum	<2	50
Trigastrotheca molluginea	<2	20
Triodia epactia	60	40
Triodia wiseana	10	40
Triumfetta appendiculata	<2	30
Triumfetta clementii	<2	30

Site CZ-47

Described by	Vicki Long	Date	29/04/2020	Type	Quadrat	30 x 80
Season	E					
Location	Conzinc Bay					
MGA Zone	50	478926	mE	7726275	mN	
Habitat	Gentle undulating rocky slopes with boulders					
Soil	Rocky mantle, small rocky outcrops, red-brown silts					
Vegetation	Te scattered shrubs - *Triodia epactia* hummock grassland. There are scattered *Hakea lorea* subsp. *lorea, Cullen lachnostachys, Ipomoea costata, Acacia colei* and patchy *Triodia wiseana*. Annual herbland.					
Veg Condition	Excellent					
Fire Age	2-5 years					
Notes	No weeds					

Species list	Cover	Height
Abutilon lepidum	<2	30
Acacia colei	2	100
Boerhavia coccinea	<2	25
Boerhavia gardneri	<2	25
Bulbostylis barbata	<2	30
Cleome viscosa	<2	50
Cullen lachnostachys	2-5	40-100
Dichrostachys spicata	<2	100
Euphorbia coghlanii	<2	25
Euphorbia tannensis	<2	35
Gomphrena cunninghamii	<2	25
Grevillea pyramidalis	<2	250
Indigofera colutea	<2	30
Indigofera linifolia	<2	30
Indigofera monophylla	<2	50
Ipomoea costata	<2	100
Paspalidium clementii	<2	50
Polycarpaea longiflora	<2	25
Portulaca filifolia	<2	30

Portulaca oleracea	<2	10
Solanum lasiophyllum	<2	30
Streptoglossa decurrens	<2	30
Tephrosia densa	<2	30
Tephrosia sp. NW Eremaean (S. van Leeuwen et al. PBS 0356)	<2	30
Tephrosia supina	<2	30
Trichodesma zeylanicum	<2	50
Trigastrotheca molluginea	<2	20
Triodia epactia	50	35
Triodia wiseana	10	40
Triumfetta appendiculata	<2	30
Triumfetta clementii	<2	30

Site CZ-48

Described by	Vicki Long	Date	30/04/2020	Type	Quadrat	70 x 35
Season	E					
Location	Conzinc Bay					
MGA Zone	50	479157	mE	7726142	mN	
Habitat	Broad low catchment area draining into flat from surrounding hillslopes					
Soil	Pink-brown alluvial silts					
Vegetation	Ta - *Triodia angusta* hummock grassland. There can be scattered *Acacia bivenosa* shrubs.					
Veg Condition	Excellent					
Fire Age	> 10 years					
Notes	No weeds					

Species list	Cover	Height
Acacia ampliceps	<2	125
Acacia bivenosa	<2	125
Boerhavia gardneri	<2	25
Cleome viscosa	<2	50
Corchorus walcottii	<2	35
Cucumis variabilis	<2	cr
Cyperus vaginatus	<2	25
Euphorbia tannensis subsp. *eremophila*	<2	40
Grevillea pyramidalis	<2	125
Indigofera colutea	<2	50
Paspalidium tabulatum	<2	50
Rhagodia eremaea	<2	90
Rhynchosia minima	<2	25
Stemodia grossa	<2	30
Swainsona formosa	<2	25
Tecticornia halocnemoides	<2	40
Trianthema turgidifolium	<2	35
Trichodesma zeylanicum	<2	50
Triodia angusta	45	50
Triumfetta appendiculata	<2	30

Site CZ-49

Described by	Vicki Long	Date	30/04/2020	Type	Quadrat	70 x 35
Season	E					
Location	Conzinc Bay					
MGA Zone	50	479011	mE	7725954	mN	
Habitat	Outer edge and tidal supratidal saline flat					
Soil	Edges with stony mantle, tidal flat brown-grey silts, scattered stones					
Vegetation	ThTt - *Tecticornia halocnemoides* subsp. *tenuis, Trianthema turgidifolia* low shrubland, with *Tecticornia indica* subsp. *leiostachya, Frankenia pauciflora*, *Surreya diandra* over very open *Sporobolus virginicus* tussock grassland, sometimes scattered.					
Veg Condition	Excellent					
Fire Age	> 10 years					
Notes	No weeds					

Species list	Cover	Height
Eragrostis falcata	<2	15
Frankenia pauciflora	<2	35
Muellerolimon salicorniaceum	<2	30
Surreya diandra	<2	25
Tecticornia halocnemoides	35	20
Tecticornia indica subsp. *leiostachya*	<2	35
Trianthema turgidifolia	15	30

Site CZ-50

Described by	Vicki Long	Date	30/04/2020	Type	Quadrat	50 x 50
Season	E					
Location	Conzinc Bay					
MGA Zone	50	479031	mE	7725903	mN	
Habitat	Gentle lower slope tapering to tidal flats					
Soil	Dense stony mantle					
Vegetation	TeTa - *Triodia epactia, Triodia angusta* hummock grassland. Scattered shrubs.					
Veg Condition	Excellent					
Fire Age	?					
Notes	No weeds; Priority Flora					

Species list	Cover	Height
Acacia colei	<2	250
Acacia coriacea	<2	350
Bonamia media	<2	30
Cleome viscosa	<2	50
Cymbopogon ambiguus	<2	50
Cynanchum floribundum	<2	cr
Eriachne obtusa	<2	25
Indigofera linifolia	<2	35
Indigofera monophylla	2	40
Scaevola spinescens	<2	90
Solanum horridum	<2	30
Solanum phlomoides	<2	30
Tephrosia sp. B Kimberley Flora (C.A. Gardner 7300)	<2	30
Trichodesma zeylanicum	<2	50
Trigastrotheca molluginea	<2	30
Triodia angusta	20	50
Triodia epactia	40	40
Triumfetta appendiculata	<2	35
Triumfetta clementii	<2	30

Site CZ-51

Described by	Vicki Long	Date	30/04/2020	Type	Quadrat	50 x 30/45
Season	E					
Location	Conzinc Bay					
MGA Zone	50	478993	mE	7725821	mN	
Habitat	Edge of saline tidal flat and lower hillslope					
Soil	Stony mantle					
Vegetation	TeTa - *Triodia epactia, Triodia angusta* hummock grassland. Scattered shrubs.					
Veg Condition	Excellent					
Fire Age	> 5 years					
Notes	No weeds					

Species list	Cover	Height
Acacia colei	<2	100
Bonamia media	<2	30
Cassytha capillaris	<2	cr
Cleome viscosa	<2	40
Cymbopogon ambiguus	<2	50
Eriachne obtusa	<2	25
Hakea lorea subsp. *lorea*	<2	300
Heliotropium cunninghamii	<2	25
Hibiscus sturtii var. *campylochlamys*	<2	50
Indigofera linifolia	<2	30
Pterocaulon sphaeranthoides	<2	30
Solanum phlomoides	<2	25
Tephrosia supina	<2	40
Trachymene oleracea	<2	20
Trianthema turgidifolia	<2	35
Trichodesma zeylanicum	<2	40
Triodia angusta	20	50
Triodia epactia	35	40
Triumfetta appendiculata	<2	30
Triumfetta clementii	<2	30

Site CZ-52

Described by	Vicki Long	Date	30/04/2020	Type	Quadrat	100 x 25
Season	E					
Location	Conzinc Bay					
MGA Zone	50	479040	mE	7725552	mN	
Habitat	Stony drainage line with sharply incised stony banks					
Soil	Dense stone floor of washed rocks leading to tidal flat					
Vegetation	AaTaTe - *Acacia ampliceps* open mid shrubland over *Triodia angusta/T. epactia* hummock					
Veg Condition	Very Good					
Fire Age	> 5 years					
Notes	**Flaveria trinervia* present					

Species list	Cover	Height
Abutilon lepidum	<2	30
Acacia ampliceps	10	100-200
Adriana tomentosa	<2	60
Amaranthus undulatus	<2	25
Boerhavia gardneri	<2	25
Cleome viscosa	<2	50
Euphorbia tannensis	<2	35
**Flaveria trinervia*	<2	30
Indigofera colutea	<2	30
Paspalidium clementii	<2	50
Paspalidium tabulatum	<2	50
Pterocaulon sphaeranthoides	<2	30
Rhagodia eremaea	<2	90
Sesbania cannabina	<2	120
Solanum cleistogamum	<2	35
Streptoglossa decurrens	<2	30
Swainsona formosa	<2	25
Trachymene oleracea	<2	25
Trianthema turgidifolium	<2	30
Trichosanthes cucumerina	<2	25
Triodia angusta	20	50
Triodia epactia	10	40
Triumfetta appendiculata	<2	30
Triumfetta clementii	<2	30

Site CZ-53

Described by	Vicki Long	Date	30/04/2020	Type	Quadrat	46/50 x 30/50
Season	E					
Location	Conzinc Bay					
MGA Zone	50	478960	mE	7725424	mN	
Habitat	Low remnant dune leeward of mangroves					
Soil	Pale brown fine sands with shell fragments					
Vegetation	Te coastal - *Triodia epactia* hummock grassland.					
Veg Condition	Excellent					
Fire Age	> 5 years					
Notes	No weeds					

Species list	Cover	Height
Cleome viscosa	<2	50
Corchorus walcottii	<2	45
Eriachne obtusa	<2	30
Euphorbia tannensis	<2	45
Indigofera linifolia	<2	30
Indigofera monophylla	<2	30
Ipomoea costata	<2	100
Phyllanthus erwinii	<2	45
Pluchea dentex	<2	45
Pterocaulon sphaeranthoides	<2	30
Solanum phlomoides	<2	30
Swainsona pterostylis	<2	45
Tephrosia supina	<2	45
Trigastrotheca molluginea	<2	45
Triodia angusta	<2	45
Triodia epactia	50	35
Triumfetta appendiculata	<2	45
Triumfetta clementii	<2	45

Site CZ-54

Described by	Vicki Long	Date	30/04/2020	Type	Quadrat	50 x 50
Season	E					
Location	Conzinc Bay					
MGA Zone	50	479026	mE	7725447	mN	
Habitat	Gentle slope tapering to low remnant dune					
Soil	Moderate to sparse stones over brown silts					
Vegetation	TeTa - *Triodia epactia, Triodia angusta* hummock grassland. Scattered shrubs.					
Veg Condition	Excellent					
Fire Age	> 5 years					
Notes	No weeds; Priority Flora					

Species list	Cover	Height
Acacia ampliceps	<2	250
Acacia bivenosa	<2	140
Boerhavia coccinea	<2	25
Cleome viscosa	<2	50
Corchorus walcottii	<2	30
Crotalaria novae-hollandiae	<2	30
Cucumis variabilis	<2	cr
Eriachne obtusa	<2	25
Euphorbia tannensis	<2	40
Euphorbia tannensis subsp. *eremophila*	<2	40
Euphorbia trigonosperma	<2	20
Indigofera colutea	<2	30
Indigofera linifolia	<2	30
Indigofera monophylla	<2	40
Pluchea dentex	<2	30
Pterocaulon sphaeranthoides	<2	30
Streptoglossa decurrens	<2	30
Swainsona formosa	<2	25
Swainsona pterostylis	<2	25
Trichodesma zeylanicum	<2	40
Trigastrotheca molluginea	<2	30
Triodia angusta	30	50
Triodia epactia	30	40

Site CZ-55

Described by	Vicki Long	Date	4/05/2020	Type	Quadrat	125 x 10
Season	E					
Location	Conzinc Bay					
MGA Zone	50	478956	mE	7725348	mN	
Habitat	Perimeter of mangal					
Soil	Grey fine sand					
Vegetation	ThTt - *Tecticornia halocnemoides* subsp. *tenuis, Trianthema turgidifolia* low shrubland, with *Tecticornia indica* subsp. *leiostachya, Frankenia pauciflora, Surreya diandra* over very open *Sporobolus virginicus* tussock grassland, sometimes scattered.					
Veg Condition	Excellent					
Fire Age	> 10 years					
Notes	No weeds					

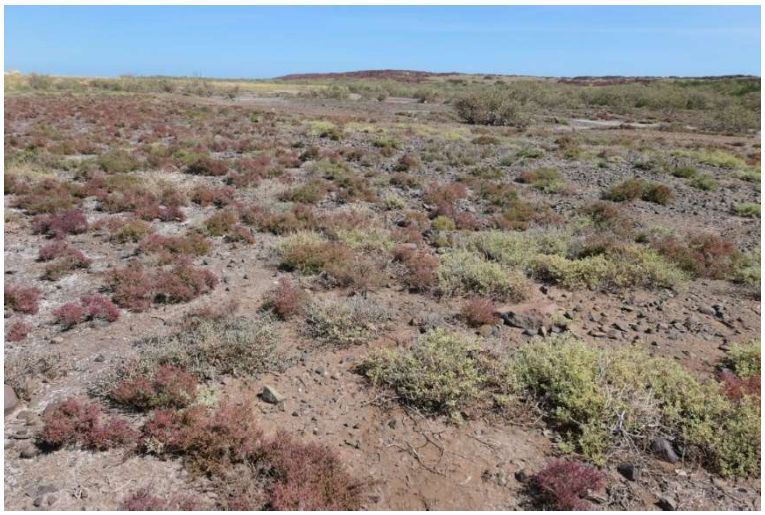
Species list	Cover	Height
Dysphania plantaginella	1	10
Frankenia pauciflora	<2	25
Neobassia astrocarpa	<2	25
Sporobolus virginicus	45	25
Surreya diandra	2	25
Swainsona pterostylis	<2	25
Tecticornia halocnemoides	2	30
Tecticornia indica subsp. *leiostachya*	2	35
Trianthema turgidifolia	10	30

Site CZ-56

Described by	Vicki Long	Date	4/05/2020	Type	Quadrat	60 x 40
Season	E					
Location	Conzinc Bay					
MGA Zone	50	478976	mE	7725343	mN	
Habitat	Low remnant coastal dune, now a plain					
Soil	Light grey fine sands with marine fragments					
Vegetation	TtTe - *Trianthema turgidifolia* low shrubland over *Triodia epactia* hummock grassland.					
Veg Condition	Excellent					
Fire Age	> 10 years					
Notes	No weeds					

Species list	Cover	Height
Acacia bivenosa	<2	100
Cleome viscosa	<2	40
Euphorbia drummondii	<2	20
Euphorbia trigonosperma	<2	20
Indigofera linifolia	<2	30
Swainsona pterostylis	<2	25
Trianthema turgidifolia	10	30
Triodia epactia	60	40

Site CZ-57



Described by	Vicki Long	Date	4/05/2020	Type	Quadrat	40 x 40
Season	E					
Location	Conzinc Bay					
MGA Zone	50	479233	mE	7725228	mN	
Habitat	Supratidal area fringing mangal					
Soil	Grey-brown fine sandy silt with scattered to moderate surface stones					
Vegetation	ThTt - *Tecticornia halocnemoides* subsp *tenuis, Trianthema turgidifolia* low shrubland, with *Tecticornia indica* subsp. *leiostachya, Frankenia pauciflora, Surreya diandra* over very open *Sporobolus virginicus* tussock grassland, sometimes scattered.					
Veg Condition	Excellent					
Fire Age	> 10 years					
Notes	No weeds					

Species list	Cover	Height
Avicennia marina subsp. *marina*	<2	400
Dysphania plantaginella	<2	10
Frankenia pauciflora	<2	30
Muellerolimon salicorniaceum	<2	30
Neobassia astrocarpa	<2	30
Tecticornia halocnemoides	20	30
Tecticornia indica subsp. *leiostachya*	<2	40
Trianthema turgidifolia	2	30

Site CZ-58

Described by	Vicki Long	Date	4/05/2020	Type	Quadrat	50 x 30
Season	E					
Location	Conzinc Bay					
MGA Zone	50	479098	mE	7725134	mN	
Habitat	Low remnant dune fringing mangroves					
Soil	Pale brown fine sands with shell fragments					
Vegetation	Te coastal - *Triodia epactia* hummock grassland.					
	Te coastal					
Veg Condition	Excellent					
Fire Age	> 5 years					
Notes	No weeds					

Species list	Cover	Height
Adriana tomentosa	<2	60
Boerhavia gardneri	<2	25
Cleome viscosa	<2	40
Euphorbia tannensis	<2	40
Euphorbia trigonosperma	<2	20
Indigofera colutea	<2	30
Indigofera linifolia	<2	30
Pterocaulon sphaeranthoides	<2	30
Solanum phlomoides	<2	30
Tribulus occidentalis	<2	20
Triodia epactia	45	25-40
Triumfetta appendiculata	<2	30

Site CZ-59

Described by	Vicki Long	Date	4/05/2020	Type	Quadrat	150 x 20
Season	E					
Location	Conzinc Bay					
MGA Zone	50	479078	mE	7725187	mN	
Habitat	Remnant low coastal dune fringing mangal					
Soil	Pale grey fine to medium sands with marine fragments					
Vegetation	TtTe - *Trianthema turgidifolia* low shrubland over *Triodia epactia* hummock grassland.					
Veg Condition	Excellent					
Fire Age	> 5 years					
Notes	No weeds					

Species list	Cover	Height
Acacia bivenosa	<2	100
Adriana tomentosa	<2	40
Cleome viscosa	<2	40
Cuscuta victoriana	<2	cr
Euphorbia drummondii	<2	15
Euphorbia tannensis	<2	30
Euphorbia trigonosperma	<2	25
Goodenia microptera	<2	20
Heliotropium cunninghamii	<2	15
Indigofera linifolia	<2	20
Portulaca filifolia	<2	15
Scaevola spinescens (broad form)	<2	80
Spinifex longifolius	<2	40
Swainsona formosa	<2	25
Swainsona pterostylis	<2	25
Synaptantha tillaeacea	<2	30
Trianthema turgidifolia	10	30
Triodia epactia	45	35

Site CZ-60

Described by	Vicki Long	Date	4/05/2020	Type	Quadrat	100 x 25
Season	E					
Location	Conzinc Bay					
MGA Zone	50	479159	mE	7725064	mN	
Habitat	Narrow drainage line					
Soil	Brown-grey silty sands					
Vegetation	AaTaTe - *Acacia ampliceps* open tall shrubland over *Triodia angusta/T. epactia* hummock					
Veg Condition	Excellent					
Fire Age	2 years					
Notes	No weeds; Priority Flora					

Species list	Cover	Height
Acacia ampliceps	15	250-300
Adriana tomentosa	<2	50
Alectryon oleifolius	<2	250
Amaranthus undulatus	<2	25
Bonamia media	<2	35
Cleome viscosa	<2	50
Corchorus walcottii	<2	35
Corymbia hamersleyana	<2-2	300
Crotalaria medicaginea	<2	60
Cucumis variabilis	<2	cr
Cymbopogon ambiguus	<2	60
Dicliptera armata	<2	15
Eucalyptus victrix	<2	300
Euphorbia tannensis	<2	50
Hybanthus aurantiacus	<2	35
Indigofera colutea	<2	35
Indigofera monophylla	<2	35
Myoporum montanum	2	120
Paspalidium clementii	<2	50
Paspalidium tabulatum	<2	60
Pittosporum phillyreoides	<2	350

Pluchea rubelliflora	<2	30
Polymeria calycina	<2	35
Portulaca filifolia	<2	20
Portulaca oleracea	<2	35
Rhagodia preissii subsp. *obovata*	<2	100
Rhynchosia bungarensis (P4)	<2	35
Senna venusta	2	40-80
Sesbania cannabina	<2	120
Stemodia grossa	<2	30
Streptoglossa decurrens	<2	30
Swainsona formosa	<2	25
Tephrosia sp. B Kimberley Flora (C.A. Gardner 7300)	<2	35
Tephrosia supina	<2	35
Trianthema turgidifolium	<2	35
Tribulus occidentalis	<2	20
Trigastrotheca molluginea	<2	20
Triodia angusta	2	40
Triodia epactia	10	50
Triumfetta appendiculata	<2	35
Triumfetta clementii	<2	35

Site CZ-61

Described by	Vicki Long	Date	4/05/2020	Type	Quadrat	120 x 15
Season	E					
Location	Conzinc Bay					
MGA Zone	50	478886	mE	7724717	mN	
Habitat	Gentle lower stony and rocky slopes tapering into mangal with intercepting rockpile ridge					
Vegetation	TeTa - *Triodia epactia, Triodia angusta* hummock grassland. Scattered shrubs.					
Veg Condition	Excellent					
Fire Age	2 years					
Notes	No weeds; Priority Flora					

Species list	Cover	Height
Acacia colei	<2	160
Acacia coriacea	<2	350
Cleome viscosa	<2	40
Corchorus walcottii	<2	30
Cynanchum floribundum	<2	cr
Dichrostachys spicata	2	150
Grevillea pyramidalis	<2	240
Indigofera monophylla	1	30
Myoporum montanum	<2	180
Terminalia supranitifolia (P3)	<2	300
Trianthema turgidifolia	<2	30
Triodia angusta	30	40
Triodia epactia	35	30

Site CZ-62

Described by	Vicki Long	Date	5/05/2020	Type	Quadrat	90/85 x 20
Season	E					
Location	Conzinc Bay					
MGA Zone	50	478614	mE	7724403	mN	
Habitat	Incised rocky narrow drainage line					
Soil	Dense rocks and stones					
Vegetation	TcFvBaTs - *Terminalia circumalata* low woodland with *Flueggea virosa* subsp. *melanthesoides, Brachychiton acuminatus, Terminalia supranitifolia* (P3) over *Triodia angusta / T. epactia* open hummock grassland.					
Veg Condition	Excellent					
Fire Age	> 5 years					
Notes	No weeds; Priority Flora					

Species list	Cover	Height
Abutilon lepidum	<2	20
Acacia ampliceps	2-5	250
Acacia coriacea	5	150
Acacia pyrifolia var. *morrisonii*	<2	200
Boerhavia gardneri	<2	25
Brachychiton acuminatus	<2	250
Cajanus cinereus	<2	120
Cassytha capillaris	<2	cr
Cleome viscosa	<2	50
Corchorus walcottii	<2	30
Cymbopogon ambiguus	<2	60
Cyperus vaginatus	<2	30
Dichrostachys spicata	<2	100
Dicliptera armata	<2	10
Ehretia saligna	<2	150
Eriachne tenuiculmis	<2	30
Eucalyptus victrix	<2	450
Flueggea virosa	2-5	150
Gomphrena cunninghamii	<2	20

Goodenia lamprosperma	<2	20
Indigofera monophylla	<2	50
Ipomoea costata	<2	100
Paspalidium clementii	<2	50
Paspalidium tabulatum	<2	50
Phyllanthus maderaspatensis	2-5	40
Pittosporum phillyreoides	<2	300
Rhagodia eremaea	<2	80
Rhynchosia bungarensis (P4)	<2	40
Sesbania cannabina	<2	120
Stylobasium spathulatum	<2	90
Terminalia circumalata	20	300-400
Tribulopis angustifolia	50	40
Triodia epactia	2-5	40
Triumfetta appendiculata	<2	30

Site CZ-63

Described by	Vicki Long	Date	5/05/2020	Type	Quadrat	50 x 50/20
Season	E					
Location	Conzinc Bay					
MGA Zone	50	478566	mE	7724263	mN	
Habitat	Mid slope of rocky hill					
Soil	Dense stony mantle over red-brown silts					
Vegetation	AoTe - *Acacia orthocarpa* open shrubland with *Stylobasium spathulatum* over *Triodia epactia* hummock grassland over annual herbland.					
Veg Condition	Excellent					
Fire Age	5 years					
Notes	No weeds; Priority Flora					

Species list	Cover	Height
Abutilon lepidum	<2	30
Acacia orthocarpa	2	100-125
Boerhavia coccinea	<2	25
Bonamia media	<2	30
Cleome viscosa	<2	40
Crotalaria medicaginea	<2	50
Euphorbia australis	<2	20
Euphorbia tannensis	<2	30
Gomphrena cunninghamii	<2	20
Grevillea pyramidalis	<2	250
Indigofera monophylla	<2	25-35
Rhynchosia bungarensis (P4)	<2	30
Solanum lasiophyllum	<2	30
Stylobasium spathulatum	<2-2	100
Trichodesma zeylanicum	<2	60
Triodia epactia	60	25-35
Triumfetta appendiculata	<2	30
Triumfetta clementii	<2	30
Vigna triodiophila (P3)	<2	30

Site CZ-64

Described by	Vicki Long	Date	5/05/2020	Type	Quadrat	50 x 25/30
Season	E					
Location	Conzinc Bay					
MGA Zone	50	478529	mE	7724208	mN	
Habitat	Lower slope of rocky hill					
Soil	Dense stoney mantle					
Vegetation	AoTe - *Acacia orthocarpa* open shrubland with *Stylobasium spathulatum* over *Triodia epactia* hummock grassland over annual herbland.					
Veg Condition	Excellent					
Fire Age	5 years					
Notes	No weeds; Priority Flora					

Species list	Cover	Height
Acacia bivenosa	<2	100
Acacia colei	<2	200
Acacia orthocarpa	10	200
Bonamia media	<2	30
Brachychiton acuminatus	<2	150
Cassytha capillaris	<2	cr
Corchorus walcottii	<2	40
Enneapogon caerulescens	<2	25
Euphorbia coghlanii	<2	40
Euphorbia tannensis	<2	40
Hibiscus sturtii var. *campylochlamys*	<2	40
Ipomoea costata	<2	100
Ptilotus auriculifolius	<2	30
Rhynchosia bungarensis (P4)	<2	40
Senna glutinosa subsp. *glutinosa*	<2	150
Solanum cleistogamum	<2	30
Streptoglossa decurrens	<2	30
Stylobasium spathulatum	15	150
Swainsona formosa	<2	25
Triodia epactia	65	40
Triumfetta clementii	<2	30
Waltheria indica	<2	30

Site CZ-65

Described by	Vicki Long	Date	6/05/2020	Type	Quadrat	50 x 25
Season	E					
Location	Conzinc Bay					
MGA Zone	50	480444	mE	7727867	mN	
Habitat	Secondary dune between hillslopes and tidal creek					
Soil	Light grey - pink fine sands					
Vegetation	Aj(ScAt)Te - **Aerva javanica* low shrubland with *Scaevola cunninghamii, Adriana tomentosa* over *Triodia epactia* open or scattered hummock grassland.					
Veg Condition	Poor					
Fire Age	2 years					
Notes	Weeds - **Aerva javanica* and **Cenchrus ciliaris*. Degraded Whitocloa PEC					

Species list	Cover	Height
Adriana tomentosa	2-5	60
**Aerva javanica*	10	40
Boerhavia gardneri	<2	25
**Cenchrus ciliaris*	2	30
Cleome viscosa	<2	40
Euphorbia drummondii	<2	10
Euphorbia tannensis subsp. *eremophila*	5	30
Euphorbia trigonosperma	<2	50
Indigofera linifolia	<2	30
Pterocaulon sphaeranthoides	<2	30
Scaevola cunninghamii	15	40
Swainsona formosa	<2	25
Swainsona pterostylis	2	25
Tribulus occidentalis	<2	10
Triodia epactia	10	40
Triumfetta clementii	<2	30

Site CZ-66

Described by	Vicki Long	Date	6/05/2020	Type	Quadrat	50 x 50
Season	E					
Location	Conzinc Bay					
MGA Zone	50	480454	mE	7727751	mN	
Habitat	Secondary dune between hillslopes and tidal creek					
Soil	Light grey - pink fine to medium sands					
Vegetation	Aj(ScAt)Te - **Aerva javanica* low shrubland with *Scaevola cunninghamii, Adriana tomentosa* over *Triodia epactia* open or scattered hummock grassland.					
Veg Condition	Poor - Degraded					
Fire Age	2 years					
Notes	*Ipomoea polymorpha* - not previously collected on the Burrup					

Species list	Cover	Height
Acacia bivenosa	<2	100
Adriana tomentosa	<2	70
**Aerva javanica*	35-40	40-100
Boerhavia gardneri	<2	20
Cleome viscosa	<2	40
Euphorbia drummondii	<2	10
Euphorbia tannensis subsp. *eremophila*	2	40
Indigofera linifolia	<2	30
Indigofera monophylla	<2	50
Ipomoea polymorpha	<2	20
Rhagodia preissii subsp. *obovata*	<2	100
Scaevola cunninghamii	<2	40
Swainsona pterostylis	2	20
Threlkeldia diffusa	<2	40
Tribulus occidentalis	<2	15
Triodia epactia	15	40

Site CZ-67

Described by	Vicki Long	Date	6/05/2020	Type	Quadrat	55/45 x 40/20
Season	E					
Location	Conzinc Bay					
MGA Zone	50	480503	mE	7727627	mN	
Habitat	Supratidal creekline draining from hills into mangal					
Soil	Semi-saline dark grey silty sands					
Vegetation	ThTt - *Tecticornia halocnemoides* subsp. *tenuis, Trianthema turgidifolia* low shrubland, with *Tecticornia indica* subsp. *leiostachya, Frankenia pauciflora, Surreya diandra* over very open *Sporobolus virginicus* tussock grassland, sometimes scattered.					
Veg Condition	Excellent					
Fire Age	2 years					
Notes	No weeds; Priority Flora					

Species list	Cover	Height
Amaranthus undulatus	<2	25
Avicennia marina subsp. *marina*	<2	100
Myoporum montanum	<2	100
Neobassia astrocarpa	5	35
Sesbania cannabina	<2	30
**Setaria verticillata*	<2	30
Sporobolus virginicus	2	15
Surreya diandra	10	30
Tecticornia halocnemoides	15	20
Tecticornia indica subsp. *leiostachya*	10	35
Threlkeldia diffusa	2	35
Trianthema turgidifolia	5	35

Site CZ-68

Described by	Vicki Long	Date	6/05/2020	Type	Quadrat	60 x 40
Season	E					
Location	Conzinc Bay					
MGA Zone	50	480300	mE	7727782	mN	
Habitat	Steep linear primary beach dune and tidal creek					
Soil	White beach sand					
Vegetation	ScWaSl - Scaevola cunninghamii low shrubland over (regenerating) Whiteochloa airoides and Spinifex longifolius with Triodia epactia open to scattered tussock grassland.					
Veg Condition	Excellent					
Fire Age	2 years					
Notes	Remnant *Whiteochloa airoides* grassland PEC but impacted by disturbance from tracks and camp fires. Recommended to be closed off to public for regeneration; **Aerva javanica* fringing the mangroves should be controlled; Do not burn					

Species list	Cover	Height
Euphorbia drummondii	<2	20
Euphorbia trigonosperma	<2	20
Ptilotus villosiflorus	<2	30-40
Salsola australis	<2	20
Scaevola cunninghamii	35	35
Spinifex longifolius	10	40-60
Synaptantha tillaeacea	<2	20
Triodia epactia	5	25
Whiteochloa airoides	2-5	30-40

Site CZ-69

Described by	Vicki Long	Date	6/05/2020	Type	Quadrat	120 x 20/15
Season	E					
Location	Conzinc Bay					
MGA Zone	50	480621	mE	7727513	mN	
Habitat	Drainage line					
Vegetation	TcEvTaTeCv - *Terminalia circumalata* and *Eucalyptus victrix* low woodland with *Acacia coriacea, Flueggea virosa* subsp. *melanthesoides* over *Triodia angusta* hummock grassland with patchy *Triodia epactia* with scattered *Cyperus vaginatus* sedges.					
Veg Condition	Excellent					
Fire Age	5-10 years					
Notes	No weeds; Priority Flora					

Species list	Cover	Height
Acacia coriacea	2	200
Acacia pyrifolia	<2	300
Acacia pyrifolia var. *morrisonii*	<2	300
Adriana tomentosa	<2	60
Boerhavia coccinea	<2	25
Brachychiton acuminatus	<2	300
Capparis spinosa	<2	90
Cassytha capillaris	<2	cr
Cleome viscosa	<2	50
Clerodendrum tomentosum	<2	300
Corchorus walcottii	<2	30
Cucumis variabilis	<2	cr
Cymbopogon ambiguus	<2	60
Cyperus bifax	<2	35
Cyperus vaginatus	2	100
Dichrostachys spicata	<2	100
Dicliptera armata	<2	30
Ehretia saligna	<2	80
Eriachne tenuiculmis	2	35
Eucalyptus victrix	10	400-500

Flueggea virosa	2-5	200
Gossypium australe	<2	60
Indigofera colutea	<2	40
Indigofera linifolia	<2	30
Jasminum didymum subsp. *lineare*	<2	cr
Operculina aequisepala	<2	cr
Paspalidium tabulatum	<2	50
Phyllanthus maderaspatensis	<2	35
Polymeria calycina	<2	20
Portulaca filifolia	<2	20
Rhagodia preissii subsp. obovata	<2	100
Rhynchosia bungarensis (P4)	<2	30
Scaevola spinescens (broad form)	<2	70
Sesbania cannabina	<2	100
Tephrosia sp. NW Eremaean (S. van Leeuwen et al. PBS 0356)	<2	30
Terminalia circumalata	1520	400-500
Tinospora smilacina	<2	cr
Trachymene oleracea	<2	20
Triodia angusta	25	40
Triodia epactia	2	40
Triumfetta appendiculata	<2	30
Triumfetta clementii	<2	60
Waltheria indica	<2	40

Site CZ-70

No Photo

Described by	Vicki Long	Date	6/05/2020	Type	Quadrat	50 x 50
Season	E					
Location	Conzinc Bay					
MGA Zone	50	479847	mE	7726765	mN	
Habitat	Undulating stony plain					
Vegetation	TwTaTe - *Triodia wiseana* hummock grassland with *Triodia angusta, Triodia epactia*. Scattered *Acacia colei, A. bivenosa* and annual herbland.					
Veg Condition	Excellent					
Fire Age	?					
Notes	No weeds					

Species list	Cover	Height
Acacia bivenosa	<2	120
Acacia colei	<2	200
Acacia coriacea	<2	350
Boerhavia gardneri	<2	25
Bonamia media	<2	30
Corchorus walcottii	<2	30
Crotalaria medicaginea	<2	30
Crotalaria novae-hollandiae	<2	30
Euphorbia coghlanii	<2	25
Evolvulus alsinoides var. *villosicalyx*	<2	25
Grevillea pyramidalis	<2	250
Indigofera linifolia	<2	30
Paspalidium clementii	<2	50
Scaevola spinescens (broad form)	<2	120
Streptoglossa decurrens	<2	30
Swainsona formosa	<2	25
Trichodesma zeylanicum	<2	30
Triodia angusta	10	40
Triodia epactia	10	30
Triodia wiseana	40	30
Triumfetta clementii	<2	30

Site CZ-71

Described by	Vicki Long	Date	11/05/2020	Type	Quadrat	50/70 x 40/35
Season	E					
Location	Conzinc Bay					
MGA Zone	50	479942	mE	7727286	mN	
Habitat	Crest of steep, linear, interrupted coastal dune with deep swale					
Soil	Pinky-grey white medium to course beach sands					
Vegetation	AcAjTe - *Acacia coriacea* tall shrubland over **Aerva javanica* low shrubland over *Triodia epactia* open hummock grassland. There can be scattered *Adriana tomentosa*.					
Veg Condition	Poor					
Fire Age	2 years					
Notes	**Aerva javanica* 20 %; vehicle tracks.					

Species list	Cover	Height
Acacia bivenosa	<2	60
Acacia coriacea	15	125-175
Adriana tomentosa	2-5	50
**Aerva javanica*	20	30-40
Amaranthus undulatus	<2	25
Boerhavia gardneri	<2	25
Boerhavia schomburgkiana	<2	30
Cleome viscosa	<2	40
Euphorbia drummondii	<2	20
Euphorbia tannensis subsp. *eremophila*	<2	40
Euphorbia trigonosperma	<2	30
Goodenia microptera	<2	15
Indigofera linifolia	<2	20
Indigofera monophylla	<2	30
Rhagodia preissii subsp. *obovata*	<2	60
Scaevola spinescens (broad form)	<2	60
Spinifex longifolius	5	40
Swainsona formosa	<2	25
Swainsona pterostylis	<2	30
Tinospora smilacina	<2	cr
Trichodesma zeylanicum	<2	30
Triodia epactia	15	30
Whiteochloa airoides	<2	30

Site CZ-72

Described by	Vicki Long	Date	11/05/2020	Type	Quadrat	25 x 25
Season	E					
Location	Conzinc Bay					
MGA Zone	50	479966	mE	7727199	mN	
Habitat	Landward side of secondary dune					
Soil	Light grey - pink veneer of sand over deeper pink-brown sands					
Vegetation	AtTe - *Adriana tomentosa* low shrubland over *Triodia epactia* hummock grassland with dense annual herbland.					
Veg Condition	Excellent					
Fire Age	2 years					
Notes	**Aerva javanica* <2% present. Control.					

Species list	Cover	Height
Acacia bivenosa	<2	15-40
Acacia coriacea	<2	200
Acacia pyrifolia var. *morrisonii*	<2	35
Adriana tomentosa	20	30-50
**Aerva javanica*	<2	35
Boerhavia gardneri	<2	25
Crotalaria medicaginea	<2	30
Euphorbia drummondii	<2	35
Euphorbia tannensis subsp. *eremophila*	<2	35
Goodenia microptera	<2	35
Hybanthus aurantiacus	<2	30
Indigofera linifolia	<2	35
Indigofera monophylla	5	35
Ipomoea costata	<2	250
Paspalidium tabulatum	<2	30
Portulaca filifolia	<2	30
Scaevola spinescens (broad form)	<2	30
Solanum cleistogamum	<2	35
Streptoglossa decurrens	<2	35
Swainsona formosa	<2	35
Tephrosia rosea var. *clementii*	<2	30
Tribulus hirsutus	<2	35
Trichodesma zeylanicum	<2	50
Triodia epactia	20	20
Triodia wiseana	2	30
Triumfetta clementii	<2	35

Site CZ-73

Described by	Vicki Long	Date	11/05/2020	Type	Quadrat	110 x 15
Season	E					
Location	Conzinc Bay					
MGA Zone	50	479881	mE	7727233	mN	
Habitat	Beach berm					
Soil	Grey-white fine to medium beach sand with marine fragments					
Vegetation	Sl - *Spinifex longifolius* open tussock grassland.					
Veg Condition	Very Good					
Fire Age	2 years					
Notes	**Aerva javanica* <2% present. Control. Condition impacted by numerous tracks and evidence of camping and fire - loss of vegetation and subsequent dune stability					

Species list	Cover	Height
Acacia coriacea	<2	250
Adriana tomentosa	<2-5	60
**Aerva javanica*	<2	50
Amaranthus undulatus	<2	25
Boerhavia schomburgkiana	<2	25
Cleome viscosa	<2	35
Euphorbia drummondii	<2	25
Euphorbia tannensis subsp. *eremophila*	<2	35
Spinifex longifolius	30	35-45
Synaptantha tillaeacea	<2	25
Tribulus occidentalis	<2	20

Site CZ-74

Described by	Vicki Long	Date	11/05/2020	Type	Quadrat	45/35 x 10/15
Season	E					
Location	Conzinc Bay					
MGA Zone	50	479777	mE	7727181	mN	
Habitat	Coastal dune abutting headland					
Soil	Pink-brown-grey fine to medium sands with shell fragments					
Vegetation	AtAjTeSl - *Adriana tomentosa* and **Aerva javanica* low shrubland over *Triodia epactia* or *Spinifex longifolius* scattered, sometimes open grasses. There can be scattered *Acacia coriacea*.					
Veg Condition	Poor					
Fire Age	2 years					
Notes	**Aerva javanica* present; dune heavily impacted by vehicle tracks and fire					

Species list	Cover	Height
Acacia coriacea	<2	200
Adriana tomentosa	15	80
**Aerva javanica*	5	60
Boerhavia schomburgkiana	<2	30
Cleome viscosa	<2	40
Euphorbia drummondii	<2	20
Euphorbia tannensis	<2	30
Euphorbia trigonosperma	<2	30
Indigofera linifolia	<2	30
Indigofera monophylla	<2	50
Spinifex longifolius	10	40
Swainsona pterostylis	<2	25
Synaptantha tillaeacea	<2	30
Tribulus occidentalis	<2	10
Triodia epactia	<2	40
Whiteochloa airoides	<2	60

Site CZ-75

Described by	Vicki Long	Date	11/05/2020	Type	Quadrat	50 x 50
Season	E					
Location	Conzinc Bay					
MGA Zone	50	479667	mE	7726677	mN	
Habitat	Gently sloping undulating plain intercepted by small drainage line					
Soil	Dense stony mantle					
Vegetation	AbTa - *Acacia bivenosa* open tall shrubland over *Triodia angusta* hummock grassland with some *Triodia epactia*. There can be scattered to open shrubland of *Stylobasium spathulatum* with annual herbland.					
Veg Condition	Excellent					
Fire Age	2 years					
Notes	No weeds					

Species list	Cover	Height
Abutilon lepidum	<2	30
Acacia bivenosa	5	150
Acacia colei	2	150
Acacia coriacea	<2	120
Acacia pyrifolia	2	150
Acacia pyrifolia var. *morrisonii*	<2	200
Adriana tomentosa	<2	70
Boerhavia gardneri	<2	25
Bonamia media	<2	30
Cassytha capillaris	<2	cr
Cleome viscosa	<2	50
Corchorus walcottii	<2	35-40
Crotalaria medicaginea	<2	30
Crotalaria novae-hollandiae	<2	40
Cymbopogon ambiguus	<2	50
Cynanchum floribundum	<2	cr
Euphorbia australis	<2	20
Euphorbia tannensis subsp. *eremophila*	<2	40
Goodenia microptera	<2	15

Grevillea pyramidalis	2	150
Hibiscus sturtii var. *campylochlamys*	<2	50
Hybanthus aurantiacus	<2	30
Indigofera linifolia	<2	30
Indigofera monophylla	<2	35
Phyllanthus maderaspatensis	<2	30
Rhynchosia minima	<2	30
Scaevola spinescens (broad form)	<2	80
Solanum phlomoides	<2	30
Streptoglossa decurrens	<2	30
Swainsona formosa	<2	25
Tephrosia supina	<2	30
Terminalia supranitifolia (P3)	ADJ	300
Trachymene oleracea	<2	20
Tribulus hirsutus	<2	20
Trichodesma zeylanicum	<2	50
Triodia angusta	35-45	45
Triodia epactia	20	35-40
Triodia wiseana	15	40
Triumfetta clementii	<2	30

Site CZ-76

Described by	Vicki Long	Date	11/05/2020	Type	Quadrat	40/35 x 30/35
Season	E					
Location	Conzinc Bay					
MGA Zone	50	479693	mE	7726632	mN	
Habitat	Large granite boulder outcrop					
Vegetation	TcFvBaTs - *Terminalia circumalata* low woodland with *Flueggea virosa* subsp. *melanthesoides, Brachychiton acuminatus, Terminalia supranitifolia* (P3) over *Triodia angusta / T. epactia* open hummock grassland.					
Veg Condition	Excellent					
Fire Age	?					
Notes	No weeds; Priority Flora; PEC					

Species list	Cover	Height
Abutilon oxycarpum	<2	30
Acacia coriacea	<2	300
Brachychiton acuminatus	2	300
Cleome viscosa	<2	40
Clerodendrum tomentosum	<2	200
Corchorus walcottii	<2	40
Crotalaria medicaginea	<2	40
Cymbopogon ambiguus	<2	40
Cyperus cunninghamii	<2	40
Dichrostachys spicata	2	200
Ehretia saligna	<2	300
Eucalyptus victrix	<2	300
Flueggea virosa	5	300
Gomphrena cunninghamii	<2	40
Indigofera colutea	<2	40
Indigofera linifolia	<2	40
Indigofera monophylla	<2	40
Ipomoea costata	<2	100
Jasminum didymum subsp. *lineare*	<2	40
Paspalidium tabulatum	<2	40

Plumbago zeylanica	<2	40
Polycarpaea longiflora	<2	20
Portulaca filifolia	<2	40
Rhagodia eremaea	<2	80
Tephrosia sp. B Kimberley Flora (C.A. Gardner 7300)	2	40
Tephrosia supina	<2	40
Terminalia circumalata	15	200-400
Tinospora smilacina	<2	cr
Trachymene oleracea	<2	40
Trigastrotheca molluginea	<2	40
Triodia epactia	15	40
Triumfetta appendiculata	<2	40
Waltheria indica	<2	30

Site CZ-77

Described by	Vicki Long	Date	11/05/2020	Type	Quadrat	40/20 x 60/56
Season	E					
Location	Conzinc Bay					
MGA Zone	50	478147	mE	7723864	mN	
Habitat	Remnant dune					
Soil	Compacted grey-brown sands					
Vegetation	AcAjTe - *Acacia coriacea* tall shrubland over **Aerva javanica* low shrubland over *Triodia epactia* open hummock grassland. There can be scattered *Adriana tomentosa*.					
Veg Condition	Degraded					
Fire Age	?					
Notes	**Aerva javanica* 15-20%; very disturbed by vehicle tracks					

Species list	Cover	Height
Acacia coriacea	10	250
**Aerva javanica*	15-20	60
Alectryon oleifolius	<2	150
Amaranthus undulatus	<2	25
Boerhavia schomburgkiana	<2	25
Cleome viscosa	<2	40
Cucumis variabilis	<2	cr
Flueggea virosa	<2	80
Scaevola spinescens (broad form)	<2	100
Spinifex longifolius	<2	40
Tinospora smilacina	<2	cr
Tribulus occidentalis	2	20
Triodia epactia	<2	40

Site CZ-78

Described by	Vicki Long	Date	11/05/2020	Type	Quadrat	45 x 40/25
Season	E					
Location	Conzinc Bay					
MGA Zone	50	478091	mE	7723781	mN	
Habitat	Remnant secondary coastal dune					
Soil	Light brown medium to course sands with shell fragments					
Vegetation	AcAjTe - *Acacia coriacea* tall shrubland over **Aerva javanica* low shrubland over *Triodia epactia* open hummock grassland. There can be scattered *Adriana tomentosa*.					
Veg Condition	Poor					
Fire Age	2 years					
Notes	Dense **Aerva javanica* infestation					

Species list	Cover	Height
Acacia bivenosa	5	200
**Aerva javanica*	40	100
Amaranthus undulatus	<2	25
Boerhavia schomburgkiana	15	25
Cleome viscosa	15	50
Corchorus walcottii	15	30
Cymbopogon ambiguus	15	50
Euphorbia australis	15	15
Euphorbia tannensis subsp. *eremophila*	15	40
Indigofera colutea	15	30
Streptoglossa decurrens	15	30
Swainsona formosa	15	25
Tephrosia rosea var. *clementii*	15	40
Triodia epactia	15	40
Triumfetta clementii	15	30

Site W-01

Described by	Vicki Long	Date	18/04/2020	Type	Quadrat	85 x 30
Season	E					
Location	Wongama					
MGA Zone	50	477892	mE	7723029	mN	
Habitat	Undulating stony plain					
Soil	Dense stony mantle intercepted by shallow drainage lines					
Vegetation	Tw - *Triodia wiseana* hummock grassland.					
Veg Condition	Excellent					
Fire Age	5 years					
Notes	No weeds					

Species list	Cover	Height
Acacia bivenosa	<2	100
Acacia colei	<2	150
Boerhavia coccinea	<2	25
Bonamia media	<2	30
Euphorbia australis	<2	20
Euphorbia tannensis subsp. *eremophila*	<2	30
Gossypium australe	<2	80
Hibiscus sturtii var. *campylochlamys*	<2	50
Oldenlandia crouchiana	<2	20
Streptoglossa decurrens	<2	30
Triodia epactia	<2	40
Triodia wiseana	45	30
Triumfetta appendiculata	<2	30
Triumfetta clementii	<2	30

Site W-02

Described by	Vicki Long	Date	18/04/2020	Type	Quadrat	50 x 50
Season	E					
Location	Wongama					
MGA Zone	50	478037	mE	7723051	mN	
Habitat	Undulating stony plain					
Soil	Dense stony mantle intercepted by shallow drainage lines					
Vegetation	Tw - *Triodia wiseana* hummock grassland.					
Veg Condition	Excellent					
Fire Age	5 years					
Notes	No weeds					

Species list	Cover	Height
Acacia bivenosa	<2	120
Acacia colei	<2	250
Boerhavia coccinea	<2	30
Bonamia media	<2	25
Cleome viscosa	<2	40
Crotalaria novae-hollandiae	<2	30
Euphorbia australis	<2	15
Goodenia microptera	<2	20
Hakea lorea subsp. *lorea*	<2	400
Hibiscus sturtii var. *campylochlamys*	<2	50
Hybanthus aurantiacus	<1	30
Indigofera monophylla	<2	40
Oldenlandia crouchiana	<2	20
Senna glutinosa subsp. *glutinosa*	<2	250
Sida sp. Pilbara (A.A. Mitchell PRP 1543)	<2	30
Solanum phlomoides	<2	30
Streptoglossa decurrens	<2	30
Tephrosia rosea var. *clementii*	<2	40
Trachymene oleracea	<2	25
Tribulus hirsutus	<2	20
Triodia epactia	10	40
Triodia wiseana	55	40
Triumfetta clementii	<2	30

Site W-03

Described by	Vicki Long	Date	18/04/2020	Type	Quadrat	50 x 35
Season	E					
Location	Wongama					
MGA Zone	50	477912	mE	7723110	mN	
Habitat	Undulating stony plain					
Vegetation	Tw - Triodia wiseana hummock grassland.					
Veg Condition	Excellent					
Fire Age	5 years					
Notes	No weeds					

Species list	Cover	Height
Acacia bivenosa	<2	150
Boerhavia coccinea	<2	25
Bonamia media	<2	30
Corchorus walcottii	<2	30
Cucumis variabilis	<2	cr
Euphorbia australis	<2	15
Gossypium australe	<2	70
Hibiscus sturtii var. *campylochlamys*	<2	60
Oldenlandia crouchiana	<2	30
Polygala isingii	<2	25
Senna glutinosa subsp. *glutinosa*	<2	100
Trachymene oleracea	<2	25
Triodia epactia	5	35
Triodia wiseana	45	40
Triumfetta clementii	<2	30

Site W-04

Described by	Vicki Long	Date	18/04/2020	Type	Quadrat	125 x 20
Season	E					
Location	Wongama					
MGA Zone	50	478011	mE	7723310	mN	
Habitat	Rocky drainage line					
Soil	Dense washed stones and rocks					
Vegetation	TcEvTaTeCv - *Terminalia circumalata* and *Eucalyptus victrix* low woodland with *Acacia coriacea, Flueggea virosa* subsp. *melanthesoides* over *Triodia angusta* hummock grassland with patchy *Triodia epactia* with scattered *Cyperus vaginatus* sedges.					
Veg Condition	Excellent					
Fire Age	?					
Notes	**Malvastrum americanum* present but no Kapok or Buffel; Avoid impact to this area which feeds into major drainage with Rock pool PEC to the north					

Species list	Cover	Height
Abutilon lepidum	<2	30
Acacia bivenosa	<2	100
Acacia coriacea	2	200
Acacia pyrifolia var. *morrisonii*	<2	100
Cleome viscosa	<2	40
Corchorus walcottii	<2	30
Cymbopogon ambiguus	<2	60
Cyperus vaginatus	2	25
Dichrostachys spicata	<2	80
Eriachne tenuiculmis	2	30
Eucalyptus victrix	15	600
Euphorbia biconvexa	<2	20
Flueggea virosa	<2	150
Gomphrena cunninghamii	<2	255
Indigofera linifolia	<2	30
Ipomoea coptica	<2	100
**Malvastrum americanum*	<2	30
Phyllanthus maderaspatensis	<2	30
Pluchea rubelliflora	<2	40

Sesbania cannabina	<2	100
Stemodia grossa	<2	30
Streptoglossa decurrens	<2	30
Swainsona formosa	<2	25
Tephrosia rosea var. *clementii*	<2	30
Terminalia circumalata	20	400
Trachymene oleracea	<2	30
Triodia angusta	35	50
Triodia epactia	<2	40
Triumfetta clementii	<2	30

Site W-05

Described by	Vicki Long	Date	18/04/2020	Type	Quadrat	50/40 x 50/40
Season	E					
Location	Wongama					
MGA Zone	50	478083	mE	7723460	mN	
Habitat	Gentle hillslopes with dense stone and rock mantle with frequent small rockpiles					
Vegetation	Te scattered shrubs - *Triodia epactia* hummock grassland. There are scattered *Hakea lorea* subsp. *lorea, Cullen lachnostachys, Ipomoea costata, Acacia colei* and patchy *Triodia wiseana*. Annual herbland.					
Veg Condition	Excellent					
Fire Age	2 years					
Notes	No weeds; numerous herbs due to recent fire					

Species list	Cover	Height
Abutilon oxycarpum subsp. Prostrate (A.A. Mitchell PRP 1266)	<2	20-30
Bonamia media	<2	10
Cleome viscosa	<2	50
Crotalaria medicaginea	<2	20-30
Crotalaria novae-hollandiae	<2	10
Cymbopogon ambiguus	<2	20-30
Dichrostachys spicata	<2	80
Erythrina vespertilio	<2	250
Euphorbia australis	<2	15
Gomphrena cunninghamii	<2	20-30
Grevillea pyramidalis	2	100-200
Hakea lorea subsp. *lorea*	<2	200
Indigofera colutea	<2	10
Ipomoea costata	<2	100
Paspalidium clementii	<2	20-30
Paspalidium tabulatum	<2	20-30
Polycarpaea longiflora	<2	20-30
Portulaca filifolia	<2	20-30
Portulaca oleracea	<2	20-30
Ptilotus fusiformis	<2	20-30

Rhynchosia minima	<2	10
Solanum cleistogamum	<2	20-30
Tephrosia sp. NW Eremaean (S. van Leeuwen et al. PBS 0356)	<2	20-30
Tephrosia supina	<2	20-30
Trigastrotheca molluginea	<2	20-30
Triodia epactia	35	20-30
Triodia wiseana	10	15-20
Triumfetta appendiculata	<2	20-30
Triumfetta clementii	<2	30
Waltheria indica	<2	10
Zornia muelleriana subsp. *congesta*	<2	20-30

Site W-06

Described by	Vicki Long	Date	18/04/2020	Type	Quadrat	50 x 50
Season	E					
Location	Wongama					
MGA Zone	50	478090	mE	7723591	mN	
Habitat	Rockpile					
Soil	Stony mantle over brown silts					
Vegetation	Ai(GpHl)Te - *Acacia inaequilatera* tall shrubland often with *Hakea lorea* subsp. *lorea / Grevillea pyramidalis* over *Triodia epactia* hummock grassland with patchy *Triodia wiseana* over dense annual herbland.					
Veg Condition	Excellent					
Fire Age	< 2 years					
Notes	No weeds; abundant herbs					

Species list	Cover	Height
Abutilon oxycarpum subsp. Prostrate (A.A. Mitchell PRP 1266)	<2	20
Acacia bivenosa	<2	120
Acacia inaequilatera	15	300
Acacia orthocarpa	<2	200
Boerhavia gardneri	<2	25
Brachychiton acuminatus	<2	200
Cleome viscosa	10	40
Crotalaria medicaginea	<2	30
Cymbopogon ambiguus	<2	50
Dichrostachys spicata	<2	150
Euphorbia australis	<2	20
Euphorbia coghlanii	<2	20
Euphorbia tannensis	<2	30
Evolvulus alsinoides var. *villosicalyx*	<2	30
Gomphrena cunninghamii	<2	25
Grevillea pyramidalis	<2	250
Hakea lorea subsp. *lorea*	2	350
Hibiscus sturtii var. *campylochlamys*	<2	60
Indigofera colutea	<2	30

Indigofera linifolia	<2	30
Indigofera monophylla	<2	40
Ipomoea costata	<2	120
Paspalidium clementii	<2	40
Paspalidium tabulatum	<2	40
Polycarpaea longiflora	<2	25
Polymeria ambigua	<2	20
Portulaca filifolia	<2	15
Portulaca oleracea	<2	15
Ptilotus fusiformis	<2	25
Rhagodia eremaea	<2	100
Rhynchosia minima	<2	30
Scaevola spinescens (broad form)	2	100
Senna glutinosa subsp. glutinosa	<2	200
Solanum cleistogamum	<2	30
Streptoglossa decurrens	<2	30
Swainsona formosa	<2	25
Tephrosia sp. NW Eremaean (S. van Leeuwen et al. PBS 0356)	<2	25
Tephrosia supina	<2	25
Tinospora smilacina	<2	cr
Trichodesma zeylanicum	<2	40
Triodia epactia	35	40
Triumfetta appendiculata	<2	30
Triumfetta clementii	2	30
Waltheria indica	<2	40

Site W-07

Described by	Vicki Long	Date	18/04/2020	Type	Quadrat	100 x 25
Season	E					
Location	Wongama					
MGA Zone	50	478124	mE	7723778	mN	
Habitat	Remnant low beach dune					
Soil	Pink medium sands and marine fragments					
Vegetation	AbAjTe - *Acacia bivenosa* tall open shrubland over **Aerva javanica* low shrubland to low closed shrubland over *Triodia epactia* open hummock grassland or scattered hummocks.					
Veg Condition	Degraded					
Fire Age	5 years					
Notes	Dense **Aerva javanica* infestation					

Species list	Cover	Height
Acacia bivenosa	2-5	200
Acacia coriacea	<2	300
Adriana tomentosa	<2	60
**Aerva javanica*	85	40-60
Amaranthus undulatus	<2	40
Boerhavia schomburgkiana	<2	40
Cleome viscosa	<2	30
Euphorbia australis	<2	15
Euphorbia tannensis subsp. *eremophila*	<2	40
Indigofera linifolia	<2	35
Portulaca filifolia	<2	10
Swainsona formosa	<2	30
Tribulus occidentalis	<2	20
Triodia angusta	2	50
Triodia epactia	2	40

Site W-08

Described by	Vicki Long	Date	18/04/2020	Type	Quadrat	100 x 20/10
Season	E					
Location	Wongama					
MGA Zone	50	478296	mE	7723938	mN	
Habitat	Remnant low beach dune					
Soil	Pink medium sands and marine fragments					
Vegetation	AbAjTe - *Acacia bivenosa* tall open shrubland over **Aerva javanica* low shrubland to low closed shrubland over *Triodia epactia* open hummock grassland or scattered hummocks.					
Veg Condition	Degraded					
Fire Age	5 years					
Notes	Dense **Aerva javanica* infestation					

Species list	Cover	Height
Acacia ampliceps	<2	300
Acacia bivenosa	10	200
Acacia coriacea	<2	250
Adriana tomentosa	<2	50
**Aerva javanica*	85	60-90
Boerhavia schomburgkiana	<2	25
Cleome viscosa	2	50
Corchorus walcottii	<2	35
Euphorbia australis	<2	20
Indigofera colutea	<2	35
Scaevola spinescens (broad form)	<2	80
Tephrosia rosea var. clementii	<2	35
Tribulus occidentalis	<2	15
Trichodesma zeylanicum	<2	60
Triodia epactia	15	35