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Dampier Desalination Plant
Rio Tinto Group
29-Jul-2021
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Flora, Vegetation and Fauna Assessment

Dampier Desalination Plant

Flora, Vegetation and Fauna Assessment

Dampier Desalination Plant

Client: Rio Tinto Iron Ore

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Prepared by

AECOM Australia Pty Ltd
Level 3, 181 Adelaide Terrace, Perth WA 6004, GPO Box B59, Perth WA 6849, Australia
T +61 8 6230 5600 www.aecom.com
ABN 20 093 846 925

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Prepared by F. de Wit, A. Bougher, C. House

Reviewed by Linda Kirchner

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B	27-May-2021	Internal review	Linda Kirchner Team Leader - Environmental Impact Assessment and Permitting	
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0	29-Jul-2021	Final Submission	Linda Kirchner Team Leader - Environmental Impact Assessment and Permitting	

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Acronyms

AECOM	AECOM Australia Pty Ltd
ALA	Atlas of Living Australia
BC Act	Biodiversity Conservation Act
BOM	Bureau of Meteorology
CAR	Comprehensive, Adequate and Reserve System
DAWE	Department of Agricultural, Water and Environment
DBCA	Department of Biodiversity Conservation and Attractions
DPaW	Department of Parks and Wildlife
EPA	Environmental Protection Authority
EPBC Act	Environment Protection and Biodiversity Conservation Act
ESA	Environmentally Sensitive Area
GPS	Global Positioning System
Ha	Hectares
IBRA	Interim Biogeographical Region of Australia
Km	Kilometres
M	Metres
PEC	Priority Ecological Community
PMST	Protected Matters Search Tool
Rio Tinto	Rio Tinto Iron Ore
SRE	Short Range Endemic
TEC	Threatened Ecological Community
WA	Western Australia
WAH	Western Australian Herbarium

Executive Summary

Hamersley Iron, a member of the Rio Tinto Group (Rio Tinto) propose to construct a desalination plant and associated infrastructure adjacent to Parker Point at their Dampier operation utilising existing disturbed, reclaimed and cleared areas where feasible. AECOM Australia Pty Ltd (AECOM) was commissioned to undertake a flora, vegetation and fauna assessment of the proposed footprint to verify existing disturbance and define and map environmental values within a defined survey area.

The Project included a detailed desktop assessment, two field survey phases across two seasons, and reporting. The desktop assessment identified conservation significant flora and fauna species that have the potential to occur in the survey area. The likelihood assessment determined which of these species required targeted searches and informed the field survey sample plan.

The phase I field survey was completed by Floora de Wit and Anthony Bougher between 6 and 11 August 2020. At this time the native vegetation within the survey area was traversed on foot and data collected including 16 flora and vegetation relevés and 12 fauna habitat assessments and deployment of five motion sensor cameras (passive). The phase II field survey was completed by Floora de Wit and Jared Leigh between 12 and 15 April 2021. The survey area was modified to incorporate additional proposed linear infrastructure areas not previously surveyed comprising largely disturbed areas. At this time the previous survey area and new area were traversed on foot. Data collected included 10 flora and vegetation relevés and 9 fauna habitat assessments and deployment of five motion sensor cameras (passive).

Five native vegetation communities and three significantly altered communities were described and mapped. The survey area comprised of largely disturbed areas (76.01 ha) including hardstand cleared (existing rail, road and tracks), and historical extraction areas. Intact native vegetation was homogenous in the area, with vegetation communities observed in better condition outside the survey area. None of the communities represent a Threatened, Priority or geographically restricted ecological community.

Flora species diversity was high, a reflection of the survey effort including two field phases and ideal survey timing. One population of a Priority 3 flora species, *Eragrostis surreyana* was recorded in the Disturbed - Artificial Ephemeral Wetland community comprising 885 individuals. One species, *Hibiscus sturtii* var. *campylochlamys* may represent a range extension, with no records occurring in the region according to Florabase (WAH, 1998). The remaining 122 native flora species recorded are common in the area.

Five fauna habitats (including cleared) were identified and mapped within the survey area. Each fauna habitat provides some value for conservation significant fauna species however none are considered to represent core or critical habitat (as defined in the Department of Agriculture, Water and the Environment's conservation listing advice for these species). Species that may utilise habitat include the Northern Quoll *Dasyurus hallucatus*, Pilbara Olive Python *Liasis olivaceus barroni*, Ghost Bat *Macroderma gigas* and North-western Free-tailed Bat *Mormopterus cobourgianus* and 16 coastal/shoreline bird species.

Two bird species listed as Migratory and Marine under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) and Migratory under the *Biodiversity Conservation Act 2016* (BC Act) were recorded during the surveys. This included the Caspian Tern *Hydroprogne caspia* and the Common Sandpiper *Actitis hypoleucos*. They were observed in the Artificial/ephemeral Wetlands and Rocky Foreshore habitats respectively, neither of which are restricted to the survey area.

Fauna habitats were considered ‘suitable’ and ‘marginal’ for 13 species listed as ‘likely to occur’ and eight species that ‘may occur’ from the desktop assessment. It is expected that none of the identified conservation significant fauna species are likely to be restricted to, or reliant on, the habitat in the survey area.

The majority of the survey area has been either cleared for placement of infrastructure or contains habitats categorised as degraded. It is within these predominantly modified habitats that the proposed desalination plant and associated pipelines would be located.

1.0 Introduction

1.1 Background

Hamersley Iron (Part of the Rio Tinto Group - herein referred to as Rio Tinto) propose to construct a small desalination plant and associated pipelines for transfer of water in the industrial port area of Parker Point (the Proposal) for the supply of water to the Parker Point Port Operations and the township of Dampier. The Proposal options have been designed to be located on existing disturbed or reclaimed areas where possible. The proposed intake pipeline is to be located at the existing intake area of a decommissioned power plant, and outfall will be tethered from the existing fuel wharf.

To support the environmental review of the Proposal, a flora, vegetation and fauna assessment, including field surveys, was required to verify the existing disturbance and define environmental values in the areas of the proposed desalination plant and its associated infrastructure.

1.2 Location

The Proposal is near the town of Dampier in the City of Karratha. The area surveyed is 104 ha and includes a linear corridor that splits into two alignments and several laydown areas. It also contains native vegetation, hardstand clearings (rail alignment, roads), cleared tracks and a small area of rocky intertidal shoreline. Refer to Figure 1 for further details.

1.3 Objectives

The objective of the assessment was to gather information to inform the proposed location options of a desalination plant and associated infrastructure at Parker Point near Dampier in the Pilbara region of Western Australia (WA). The outcomes of the assessment will support formal environmental impact assessments (under the WA *Environmental Protection Act 1986* [EP Act], and under the Commonwealth *Environment and Biodiversity Conservation Act* 1999 [EPBC Act] if required).

The specific objectives of the assessment were to:

- undertake a comprehensive desktop assessment to define the existing significant flora and fauna values of the survey area noting that most of the survey area is already disturbed
- conduct a detailed flora and vegetation assessment in accordance with the Flora Survey Technical Guide (EPA, 2016) including targeted Threatened and Priority flora searches
- conduct a fauna assessment in accordance with the Fauna Survey Technical Guide (EPA, 2020)
- conduct an opportunistic Short Range Endemic (SRE) survey as per EPA Technical Guide (EPA, 2009)
- map environmental values including vegetation, condition, fauna habitats, and any conservation significant flora and fauna species.

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LEGEND
Survey Area

Survey Area

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FLORA, VEGETATION AND FAUNA ASSESSMENT – DAMPIER DESALINATION PROJECT

Figure 1

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2.0 Existing Environment

2.1 Climate

The survey area is located in the City of Karratha which experiences a semi-arid climate. The region is influenced by both northern tropical and southern temperate systems. Semi-arid climates are characterised by areas that receive precipitation below the potential evapotranspiration rates. The climate is intermediate, between desert and humid, and is characterised by hot and dry (sometimes exceptionally hot) summers, with cold winters.

The nearest weather station is Karratha Aero, with the long-term data against the rainfall and mean temperatures received in the months preceding the survey shown in Figure 2 (Bureau of Meteorology [BOM], 2021). The area received significant rainfall from Cyclone Damien in February 2020. Rainfall was also higher than average in July 2020, the month preceding the first field survey, leading to a good flowering season in Karratha during the first survey. Rainfall was above average in December 2020, with close to average conditions for the months preceding the second field survey.

Average maximum temperatures peak between December and March. During the first field survey, temperatures were in the mid-twenties, between 24 °C to 26 °C, which is near average in August (mean maximum temperature is 27.7 °C). Weather conditions during this survey were sunny with mild temperatures. During the second field survey, temperatures peaked in their mid-thirties, between 30 °C to 32 °C, with conditions ranging from sunny to overcast.

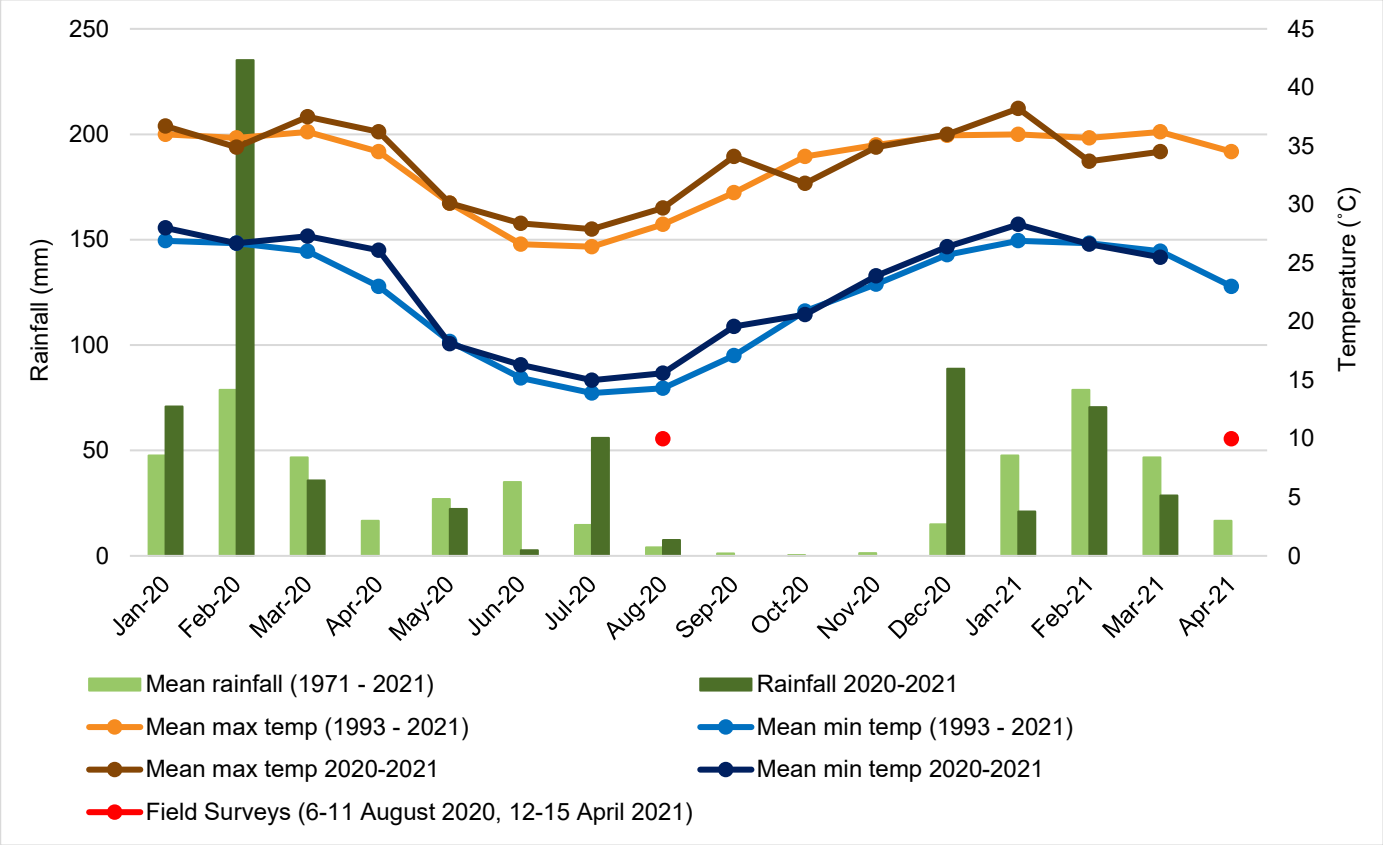


Figure 2 Rainfall Data from Karratha Aero 4083 (BOM, 2021)

2.2 Interim Biogeographical Region of Australia Regions

The largest regional vegetation classification scheme recognised by Environmental Protection Authority (EPA) is the Interim Biogeographical Region of Australia (IBRA). The IBRA regions provide the planning framework for the systematic development of a comprehensive, adequate and representative (CAR) national reserve system. There are 89 recognised IBRA regions across Australia that have been defined based on climate, geology, landforms and characteristic vegetation and fauna (DoEE, 2012).

The Roebourne synopsis, described by Kendrick and Stanley (2001), is the coastal edge of the Pilbara and includes Karratha, Onslow and Port Hedland. The area consists of coastal and sub-coastal plains with grass savannah of mixed bunch and hummock grasses, and dwarf shrub steppe of *Acacia stellaticeps* or *A. pyrifolia* and *A. inaequilatera.* The uplands of the region are dominated by *Triodia* grasslands, and the ephemeral drainage lines are fringed with *Eucalyptus victrix* or *Corymbia hamersleyana* woodlands. Marine alluvial flats and river deltas consist of Samphire and mangal communities. Rare features include the numerous offshore islands, the Burrup Peninsula, and the Cane River swamp community.

2.3 Vegetation

Beard (1975) mapping is used to determine the current extent of remnant vegetation remaining when compared to pre-European vegetation extent (Figure 3). The survey area is situated in vegetation association 117 (Abydos Plain - Roebourne). This association consists of hummock grassland *Triodia* spp. Currently, there is 94.43% of this vegetation association in Western Australia and 99.3% remaining in the Pilbara IBRA region (Govt. of WA 2018).

2.4 Conservation Reserves and Environmentally Sensitive Areas

The survey area is located approximately 1.6 km west of an Environmentally Sensitive Area (ESA) declared under s51B of the EP Act (Figure 3). This ESA is aligned with Murujuga National Park.

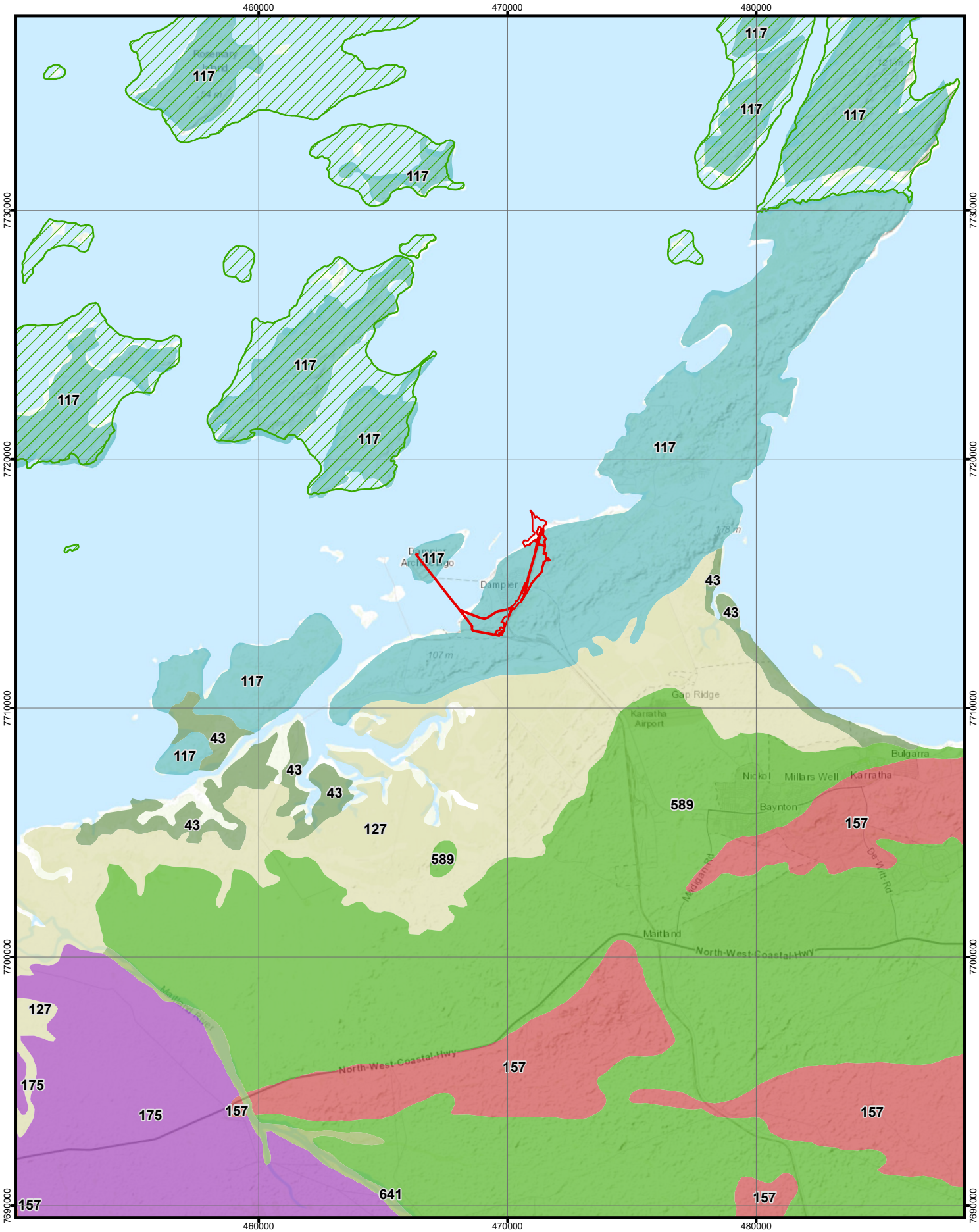
The survey area intersects with the Dampier Archipelago (including Burrup Peninsula) National Heritage Place (Dampier Archipelago NHP). The Dampier Archipelago NHP is listed as a sacred place, home to Indigenous Australians for tens of thousands of years. The rocks are amongst the oldest on earth, formed in the Archaean period more than 2,400 million years ago. Other reasons for listings include:

- petroglyphs such as quarries, middens, fish traps, rock shelters, ceremonial sites, artefact scatters, grinding patches, stone arrangements and engravings
- stone sites including standing stones, complex stone arrangements, fish traps, stone pits, hunting hides and stone cairns
- artistic styles demonstrating connections over vast distances.

2.5 Geology and Landforms

The survey area lies in the Fortescue Province which is described at a regional level by Tille (2006) as hills and ranges (with stony plains and some alluvial plains and sandplains) on the volcanic granitic and sedimentary rocks of the Pilbara Craton. Soils are stony with red loamy earths and red shallow loams (and some red/brown non-cracking clays, red deep sandy duplexes and red deep sands [Tille, 2006]).

One land system has been mapped within the survey area, the Granitic System (286Gr), which is characterised by rugged granitic hills and hill tracts of granitic rocks with pockets of shallow gritty surfaced acidic soils (van Vreeswyk et al., 2004) (Figure 4). Topography in the survey area is typical of the Granitic system with elevations up to 100 m (van Vreeswyk et al., 2004).



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Survey Area

Environmentally Sensitive Areas

Pre-European Vegetation

- 43: Mangroves: Low forest (Kimberley) or thicket (Pilbara) mangroves *Avicennia marina, Rhizophora stylosa, Bruguiera exaristata.*
- 117: Grass-steppe: Hummock grassland *Triodia* spp.
- 127: Tidal mud flat:
- 157: Grass-steppe: Hummock grassland *Triodia* spp.
- 175: Grasslands, short bunch-grass savanna: Annual grasses *Enneapogon* spp. *Aristida* spp. etc on dry plains and salt water grasses *Sporobolus virginicus* on the coast
- 589: Short bunch-grass savanna / Grass-steppe:
- 641: Woodland other: Wheatbelt; York gum, salmon gum etc. *Eucalyptus loxophleba, E. salmonophloia.* Goldfields; gimlet, redwood etc. *E. salubris, E. oleosa.* Riverine; rivergum *E. camaldulensis.* Tropical; messmate, woolyb

Pre-European Vegetation and Environmentally Sensitive Areas

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FLORA, VEGETATION AND FAUNA ASSESSMENT – DAMPIER DESALINATION PROJECT

Figure 3

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Survey Area

Soil Landscape Mapping

Cheerawarra System: Sandy coastal plains and saline clay plains supporting soft and hard spinifex grasslands and minor tussock grasslands.

Granitic System: Rugged granitic hills supporting shrubby hard and soft spinifex grasslands.

Littoral System: Bare coastal mudflats (unvegetated), samphire flats, sandy islands, coastal dunes and beaches, supporting samphire low shrublands, sparse acacia shrublands and mangrove forests.

Rocklea System: Basalt hills, plateaux, lower slopes and minor stony plains supporting hard spinifex and occasionally soft spinifex grasslands with scattered shrubs.

Land Systems and Soils

RIO TINTO

FLORA, VEGETATION AND FAUNA ASSESSMENT – DAMPIER DESALINATION PROJECT

Figure

4

3.0 Methodology

3.1 Desktop Assessment

A desktop assessment was undertaken prior to the phase I field survey to identify significant environmental values likely to be present in the survey area including flora, fauna and vegetation communities. Desktop database searches were requested from the following government databases (including a 50 km search radius from the survey area):

- Department of Biodiversity Conservation and Attractions (DBCA) Threatened Species and Communities database including Threatened and Priority flora, fauna and communities (DBCA, 2020a; 2020b; 2020c)
- Western Australian Herbarium (WAH, 1998) records
- NatureMap
- Atlas of Living Australia (ALA, 2021)
- EPBC Act Protected Matters Search Tool (PMST)
- Previous surveys including
    - Dampier Salt Native Vegetation Clearing Permit Report (Biota, 2011)
    - Dampier Resilience Native Vegetation Clearing Permit Supporting Report (Biota, 2018)
    - Botanical Survey of the Dampier Power Station and Sub-station and 33kV Network Connection at 7 Mile (Rio Tinto, 2011).

All conservation significant matters including flora, fauna and communities were reviewed and a likelihood of occurrence was completed based on the categories in Table 1. The results of the desktop assessment were revised following the phase I field surveys (see Section 3.2).

Table 1 Categories of Likelihood of Occurrence for Species and Communities

Likelihood category	Flora	Fauna	Communities
Likely to occur	Habitat is present in the Survey area and the species has been recorded in close proximity to the survey area.	Survey area is within the known distribution of the species, habitat is present in the survey area and the species has been recorded in close proximity to the survey area.	Known occurrences of the community in close proximity to the Survey area. Vegetation looks the same within the known occurrence and survey area based on aerial imagery. Geographic location is similar to the survey area.
May occur	Habitat may be present and/or the species has been recorded in close proximity to the survey area.	Survey area is within the known distribution of the species, marginal habitat may be present and/or the species has been recorded in close proximity to the survey area.	Known occurrence of the community in the local area, and/or vegetation looks the same within known occurrence and survey area based on aerial imagery. Geographic location is similar to the survey area.
Unlikely to occur	No suitable habitat is present and the species has not been recorded in close proximity to the survey area.	Survey area is outside the known distribution for the species, or no suitable habitat is present and the species has not been recorded in close proximity to the survey area.	Known occurrence of the community in close proximity to the Survey area however geographic location does not occur in survey area.

3.2 Flora and Vegetation Assessment

A detailed flora and vegetation assessment was undertaken utilising methods outlined in the *Flora Survey Technical Guide* (EPA, 2016a). The field surveys were undertaken by Floora De Wit (collection permit FB62000137). Floora has 14 years' experience undertaking flora and vegetation assessments. Floora completed a Bachelor of Science in Environmental Biology (Environmental Restoration) and completed a Postgraduate Diploma in Environmental Management and Impact Assessment.

The field survey included two phases:

- Phase I undertaken by Floora de Wit between 6 and 11 August 2020
- Phase II undertaken by Floora de Wit between 12 and 15 April 2021 accompanied by a Murujuga Aboriginal Corporation ranger.

The survey focussed on areas in Good or better condition, with observations made in areas significantly disturbed. Unbounded relevés were used to assess the flora and vegetation, supported by opportunistic collections and observation points.

Data collected from 31 relevés included the presence of plant species, their cover abundance, structural composition of vegetation, physical environment, and presence/absence of disturbance.

Each site was given a unique site number, and the following parameters recorded:

- date
- location using hand-held GPS (WGS 1984 - accuracy of 5 m)
- sample site type and size
- photograph (north-west corner)
- soil details (type, colour, moisture)
- landform
- vegetation condition using the Trudgen (1988) scale and description of disturbance
- fire history
- species list including:
    - estimated height
    - estimated percentage cover (for trees both percentage within relevé and within community was recorded to enable better description of vegetation community).

Survey effort is presented in Figure 5.

3.2.1 Vegetation Mapping

Vegetation communities were described and mapped based on changes in dominant species composition and landform. Vegetation community descriptions were based on the Association Level V in accordance with the National Vegetation Information System (NVIS) Framework (DotEE, 2018). Delineation of vegetation communities was supported by analysing floristic data collected within relevés.

Following phase I, classification of plant communities was carried out based on a species by site matrix of crown cover values. From the options available in the multivariate analysis package PC-ORD (MJM Software Design, 2011), Ward's method of hierarchical grouping was chosen using the relative Euclidian distance measure (Ward, 1963). This is one of two methods recommended by McCune and Grace (2002) as a way of avoiding space distortion and chaining among samples. Analysis considered all floristic data with the Braun-Blanquet scale applied to foliage cover. Following phase II, Primer-e was used to analyse the similarity of relevés from both field phases by applying the Bray-Curtis similarity index. Primer-e was used because it allows for easier manipulation of data and graphs.

Vegetation condition was determined using the scale adapted from Trudgen (1988) as recommended in the *Flora Survey Technical Guide* (EPA, 2016) (Table 2).

Table 2 Bushland Condition Ratings (Trudgen, 1988)

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

3.2.2 Targeted Flora Searches

Targeted searches were undertaken for conservation significant flora species considered likely to occur. The detailed desktop assessment identified four species that were targeted during phase I. Following this survey, the desktop results were refined based on habitat presence and the updated survey area. Habitat predominantly comprised rocky/scree slopes, artificial wetlands and minor ephemeral drainage lines. The targeted species were reduced to three species and included:

- *Vigna triodiophila*
- *Rhynchosia bungarensis*
- *Terminalia supranitifolia.*

Prior to commencing the field surveys, all species were reviewed and field guide booklets made. This included photographs, habitat and identification details of plant, flower and/or fruit. The majority of the survey area, excluding cleared and significantly disturbed areas, were traversed on foot to search for the target species.

In the event that a potential Priority species was encountered, the following was recorded:

- location (using a hand-held GPS accuracy 5m)
- the number of individuals in the immediate population, or an estimate of the size (number) of the population with an estimated radius of its spatial extent plant height
- vegetation condition
- associated dominant species
- soil type and colour
- topography
- additional information relevant to the area including key characteristics and landforms.

3.3 Fauna Assessment

A basic fauna assessment was undertaken including two field surveys:

- Phase I undertaken by Anthony Bougher between 6 and 11 August 2020
- Phase II undertaken by Jared Leigh between 12 and 15 April 2021 accompanied by a Murujuga Aboriginal Corporation ranger.

Both phases included a basic terrestrial fauna assessment in accordance with *Terrestrial Vertebrate Fauna Survey Technical Guide* (EPA, 2020). The survey was conducted concurrently with the detailed flora and vegetation assessment, which enabled consistent mapping of the fauna habitats and vegetation communities.

The surveys primarily focused on mapping of fauna habitat and assessing this habitat for potential utilisation by conservation significant fauna species. Fauna habitats were assessed for specific habitat components, including consideration of structural diversity and refuge opportunities for fauna. The fauna habitat assessments included:

- location
- general habitat description
- habitat condition and disturbance types
- dominant / characteristic flora species and vegetation layers
- presence and abundance of
    - large mature trees
    - small and large hollows
    - varying sizes of fallen logs
    - course and fine litter
    - decorticating bark
    - bare ground
    - grass
    - varying sizes of stones and boulders
    - rock crevices
    - soil cracks
    - cryptogramic crust
    - vines
    - dense shrubs
    - water bodies etc.
- presence of fauna and secondary signs (e.g. scats, digging, tracks, burrows, eggshell, bones, feathers etc.)
- connectivity of habitat.

In addition to the habitat mapping, records of all fauna observed through direct sightings and indirect evidence (e.g. scats, burrows, tracks, feathers, diggings etc) were documented. Particular attention was given to searching for conservation significant species identified in the desktop assessment as having the potential to occur in the area. All observations were made between daylight hours of 0700 and 1600.

The taxonomy and nomenclature of vertebrate species for mammals, reptiles and amphibians is consistent with the Western Australian Museum's Checklist of Vertebrates of Western Australia (2020) and the Department of the Environment and Energy (2021) Australian Faunal Directory for avian species.

Habitat suitability for conservation significant species was categorised according to species habitat preference, desktop assessment results, and species behaviour. The three categories include:

- suitable – species likely to occur, description aligns with species preference
- marginal – species likely to occur and habitat partly represents suitable habitat; or, species may occur, and habitat aligns with species preference
- vagrant visitors for aerial species that may fly over the area.

3.3.1 Short Range Endemic

An opportunistic short range endemic (SRE) survey was undertaken during phase I and phase II of the fauna surveys. The survey area was traversed on foot to assess potential SRE habitat through fauna habitat assessments and opportunistic notes made during the survey. A representative range of micro-habitats or niches were searched for evidence of trapdoor spiders. Reference images showing a range of trapdoor spider burrows and lids were used as a guide when searching.

3.3.2 Motion Sensor Cameras

Motion sensor cameras (BuckEye Cam X7D) were deployed at five locations for phase I and five different locations in phase II to determine whether Northern Quolls utilise the survey area. The total survey effort included 37 trap nights. Cameras were attached to surveyor tripods standing approximately one metre above the ground.

Sites chosen to locate cameras (shown in Figure 5) took consideration of:

- Sun trajectory being relatively low in the north sky during early August – cameras were orientated to face south to minimise sun glare.
- Windy conditions and movement of nearby vegetation that triggers motion cameras to take unnecessary or "blank" images.
- Habitat suitable for the Northern Quoll, including rockpiles and the man-made rockwall based on anecdotal evidence of a sighting.
- Habitat suitable for migratory birds i.e. the artificial wetlands.

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LEGEND
2020 Survey Area
2021 Survey Area

Survey Effort

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FLORA, VEGETATION AND FAUNA ASSESSMENT – DAMPIER DESALINATION PROJECT

Figure 5.1

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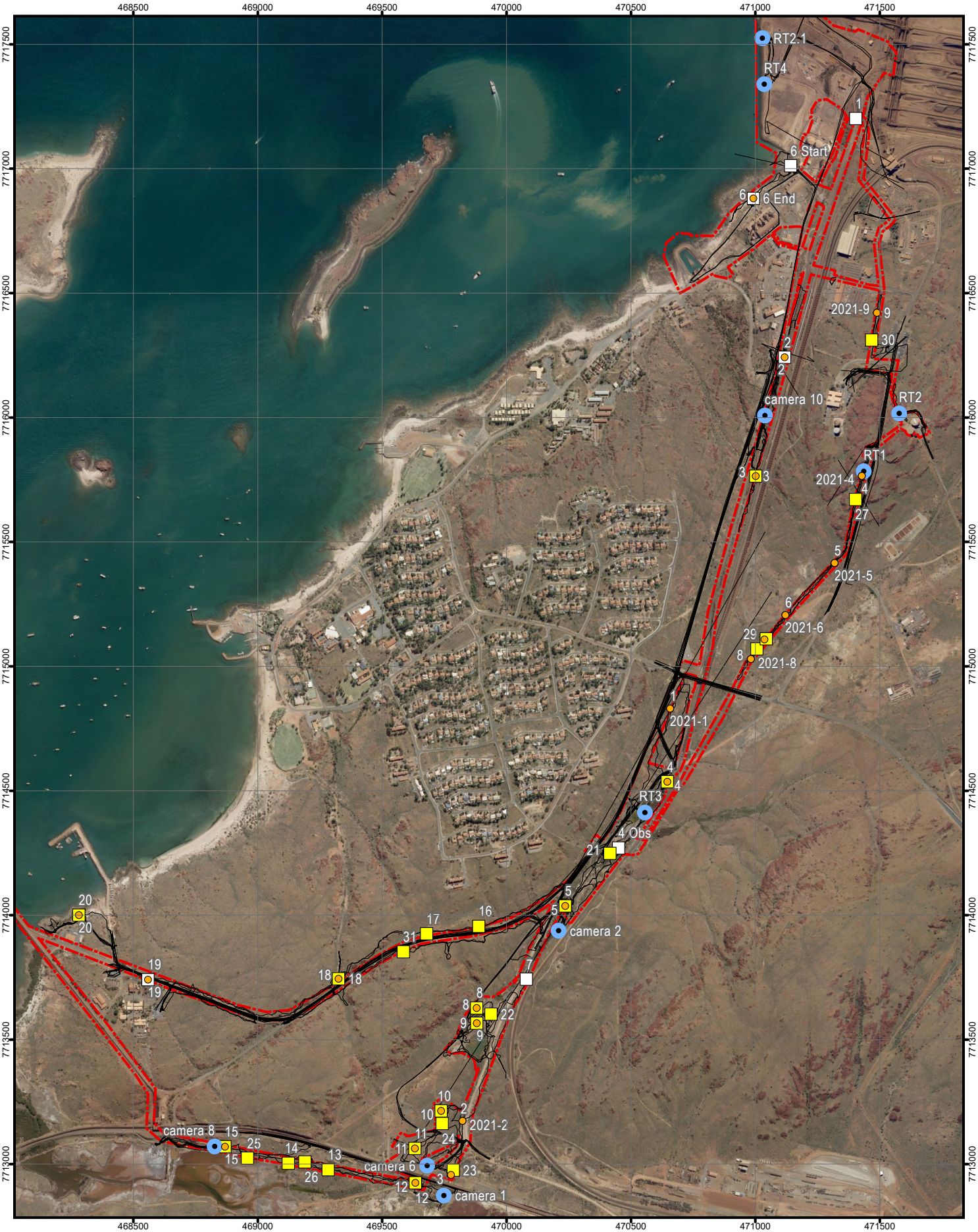

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LEGEND

- Survey Area
- Tracklog
- Habitat Assessment
- Releve
- Vegetation Mapping Note
- Motion Camera (passive)

Survey Effort

RIO TINTO

FLORA, VEGETATION AND FAUNA ASSESSMENT – DAMPIER DESALINATION PROJECT

Figure

5.2

3.4 Limitations

Limitations of the survey are discussed in Table 3.

Table 3 Limitations of the Ecological Surveys

Limitation	Flora and Vegetation Survey	Fauna Survey
Availability of contextual information on the region	**Nil** Sufficient resources for the Pilbara were available to provide contextual information. These included NatureMap and DBCA search results, WA Herbarium specimens, taxonomic guides, the FloraBase database and previous surveys conducted in the region.	**Nil** Sufficient resources were available to provide contextual information. These included NatureMap and DBCA database, ALA, EPBC Act PMST, and Rio Tinto advice.
Competency/experience of consultant conducting survey	**Nil** Phase I and II flora and vegetation surveys were undertaken by Floora de Wit who has more than 14 years' experience conducting surveys of similar scope.	**Nil** Fauna phase I was undertaken by Ecologist Anthony Bougher who has more than 25 years' experience in the environmental industry in WA. Fauna phase II was undertaken by Jared Leigh, an ecologist with over 16 years/ experience in the environment industry including numerous zoology projects associated with Chevron / Wheatstone and similar scopes.
Proportion of flora/fauna identified, recorded and/or collected (based on sampling, timing and intensity)	**Nil** Two field surveys were undertaken including phase I at which time 16 relevés were completed and the survey area traversed on foot to search for significant flora across four days. Phase II included additional targeted searches throughout the entire survey area, and another 12 relevés were completed across three days.	**Nil** The survey effort incorporated one Ecologist traversing the entire survey area on foot, recording fauna habitat descriptions at 14 sample point locations and deploying five motion sensor cameras (22 trap nights total).
Completion (is further work needed)	**Nil** The survey was complete with a search effort that was distributed effectively to provide a representative assessment of the vegetation, target flora species present.	**Minor** The survey effort was considered suitable for assessing the fauna habitats and determine likelihood of fauna utilising the habitats present. Surveys were completed during daylight hours only. Additional survey effort would lead to more sightings of fauna species.
Remoteness and/or access issues	There were no issues with site access and adequate survey coverage was achieved.	

Limitation	Flora and Vegetation Survey	Fauna Survey
Timing, weather, season, cycle	**Nil** The phase I survey coincided with the flowering period of numerous annual and perennial species. The phase II survey coincided with the typical 'ideal survey season' in accordance with EPA (2016) *Flora Survey Technical Guide*.	**Nil** The fauna surveys were undertaken during a suitably cooler time of the year to facilitate opportunistic fauna sightings.
Disturbances (e.g. fire, flood, accidental human intervention) which affected results of the survey	**Nil** No disturbance was observed, not including the anticipated disturbance from historical clearing.	

4.0 Desktop Assessment Results

4.1 Threatened and Priority Ecological Communities

The desktop assessment identified five Priority Ecological Communities (PECs), described in Table 4 and mapped in Figure 6. An analysis of the community descriptions and their distance from the survey determined one PEC may occur and four PECs were unlikely to occur within the survey area.

The Burrup Peninsula rock pile community had potential to occur in the survey area. It is known from several locations 3.5 km from the survey area and aerial imagery determined that similar habitat may be present.

Table 4 Priority Ecological Communities Identified in the Desktop Assessment

Community Name and Description[1]	Cons. Status		Distance from Survey Area	Likelihood
	EPBC	WA		
Roebourne Plains coastal grasslands with gilgai micro-relief on deep cracking clays	**-**	**P1**	**7.3 km**	**Unlikely**
The Roebourne Plains coastal grasslands with gilgai micro-relief occur on deep cracking clays that are self-mulching and emerge on depositional surfaces. The Roebourne Plains gilgai grasslands occur on microrelief of deep cracking clays, surrounded by clay plains/flats and sandy coastal and alluvial plains. The gilgai depressions supports ephemeral and perennial tussock grasslands dominated by Sorghum sp. and *Eragrostis xerophila* (Roebourne Plains grass) along with other native species including *Astrebla pectinata* (Barley Mitchell grass), *Eriachne benthamii* (swamp wanderrie grass), *Chrysopogon fallax* (golden beard grass) and *Panicum decompositum* (native millet). Restricted to the Karratha area, this community differs from the surrounding clay flats of the Horseflat land system which are dominated by *Eragrostis xerophila* and other perennial tussock grass species (*Eragrostis* mostly). Threats: grazing, clearing for mining and infrastructure and urban development, weed invasion, basic raw material extraction.				
Horseflat Land System	**-**	**P3**	**8.8 km**	**Unlikely**
The Horseflat Land System of the Roebourne Plains are extensive, weakly gilgaied clay plains dominated by tussock grasslands on mostly alluvial non-gilgaied, red clay loams or heavy clay loams. Perennial tussock grasses include *Eragrostis xerophila* (Roebourne Plains grass) and other *Eragrostis* spp., *Eriachne* spp. and *Dichanthium* spp. The community also supports a suite of annual grasses including *Sorghum* spp. and rare *Astrebela* spp. The community extends from Cape Preston to Balla surrounding the towns of Karratha and Roebourne. This community incorporates Unit 3 (Gilgai plains), Unit 5 (Alluvial Plains) with some Unit 7 (Drainage Depressions) described in van Vreeswyk et al. 2004. Threats: grazing, weed invasion, fragmentation.				
Burrup Peninsula rock pile communities	**-**	**P1**	**3.5 km**	**May**
Pockets of vegetation in rock piles, rock pockets and outcrops. Comprise a mixture of Pilbara and Kimberley species, communities are different from those of the Hamersley and Chichester Ranges. Short range endemic land snails. Threats: industrial development dust emissions. Weed invasion including Buffel Grass, *Passiflora foetida*.				
Coastal dune native tussock grassland dominated by *Whiteochloa airoides*	**-**	**P3**	**17.5 km**	**Unlikely**
Tussock grassland of Whiteochloa airoides occurs on the landward side of fore dunes, hind dunes or remnant dunes with white or pinkish white medium sands with marine fragments. There may be occasional Spinifex longifolius tussock or *Triodia epactia* hummock grasses and scattered low shrubs of *Olearia* sp. Kennedy Range (*Scaevola spinescens, S. cunninghamii, Trianthema turgidifolia* and Corchorus species (*C. walcottii, C. laniflorus*). Occurs on Barrow Island and possibly some unaffected littoral areas in west Pilbara. Threats: weed invasion especially Buffel Grass and kapok, basic raw material extraction.				
Burrup Peninsula rock pool communities	**-**	**P1**	**6.8 km**	**Unlikely**
Calcareous tufa deposits. Interesting aquatic snails. Threats: recreational impacts, and potential development; possibly NOX and SOX emissions, weed invasion including *Passiflora foetida* (stinking passion flower).				

4.2 Conservation Significant Flora

The desktop study identified 618 native flora species and 35 weed species. The most common families are Fabaceae (104 species), Poaceae (76 species) and Malvaceae (42 species). The most common genera include *Acacia* (29 species), *Euphorbia* (17 species) and *Ptilotus* (17 species).

No Threatened flora were identified in the desktop assessment. Twenty two Priority flora species were identified as potentially occurring including:

- three species that are likely to occur
- one species may occur
- 18 species are unlikely to occur.

Following phase I surveys, *Themeda* sp. Hamersley Station (M.E. Trudgen 11431) which was originally considered likely to occur, was reduced to unlikely to occur. Species considered likely or may occur are defined in Table 5 and all records are shown in Figure 7. The comprehensive species list of the desktop flora results, including habitat, flowering period, latest count date and likelihood of occurrence is presented in Appendix A and includes the Protected Matters Search and NatureMap results.

Table 5 Conservation Significant Flora Species that May or are Likely to Occur

Species	WA	Habitat[1]	Count Date	Likelihood of Occurrence
Rhynchosia bungarensis	P4	Associated with rocky slopes, rockpiles, rock pools and gullies.	2010	Likely, numerous records nearby, suitable habitat.
Rostellularia adscendens var. *latifolia*	P3	Ironstone soils. Near creeks, rocky hills.	2007[2]	May, suitable habitat, one record nearby from previous survey.
Terminalia supranitifolia	P3	Rocky outcrops, slopes, piles. Among basalt rocks and on sand.	2003	Likely, numerous records nearby associated with rocky outcrops.
Vigna triodiophila	P3	Scree and rockpiles.	2009	Likely, records nearby. Suitable habitat.

1. Habitat derived from Pilbara Flora (Rio Tinto & DPAW, 2015) and WAH (1998) Florabase
2. Location provided by Rio Tinto

4.3 Conservation Significant Fauna

The desktop assessment identified 751 native fauna species including 4 amphibian, 204 bird, 230 fish, 173 invertebrate, 43 mammal and 109 reptile species.

A total of 55 conservation significant fauna species that could potentially occur within the survey area. This included two reptile, 47 bird, and six mammal species. The likelihood of occurrence of fauna species was determined by assessing the likely presence of suitable habitat in the survey area and reviewing the recent records and distribution of the species. This assessment determined that:

- 13 species are ‘likely to occur’ including one mammal, two reptiles and 10 birds
- 31 species ‘may occur’ including three mammals and 28 birds
- 11 species are ‘unlikely to occur’ including two mammals and nine birds.

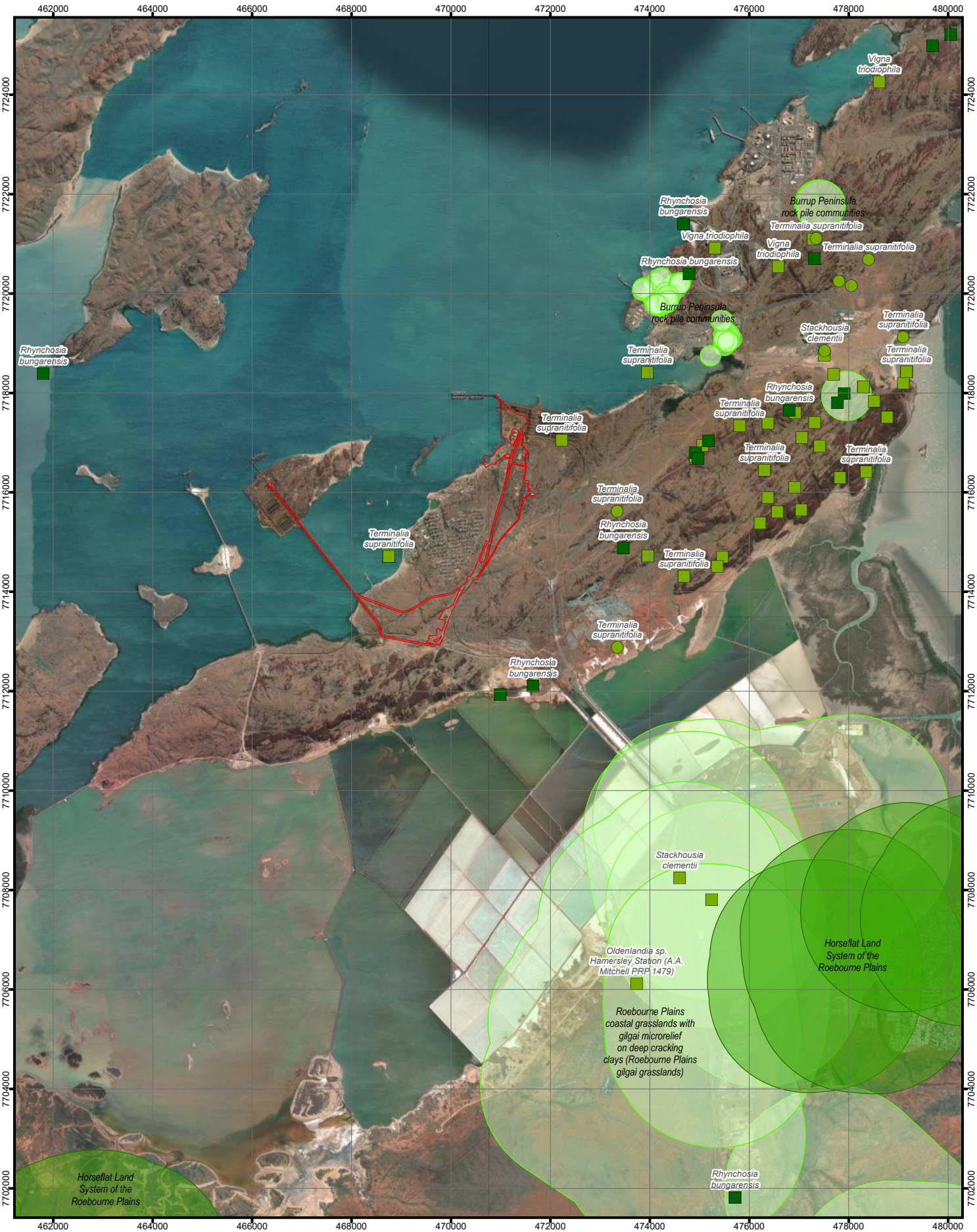
The 13 species considered likely to occur are described in Table 6 and all records are shown in Figure 7. The comprehensive desktop results are presented in Appendix A.

Table 6 Conservation Significant Fauna Species that are Likely to Occur

Taxon	Common Name	Cons. Status[1]		Habitat[2]	Number of Records	Distance from Survey Area
		EPBC Act	DBCA / BC Act			
Birds						
Actitis hypoleucos	Common Sandpiper	Mi, Ma	MI	The Common Sandpiper is widespread in small numbers utilising a wide range of coastal wetlands and some inland wetlands where it forages in muddy margins or rocky shores and rarely on mudflats. The Common Sandpiper has been recorded in estuaries and deltas of streams, as well as on banks farther upstream; around lakes, pools, billabongs, reservoirs, dams and claypans, and occasionally piers and jetties. Areas of national importance within Western Australia include Nuytsland Nature Reserve and Roebuck Bay (Watkins, 1993).	25	1 km
Arenaria interpres	Ruddy Turnstone	Mi, Ma	MI	The Ruddy Turnstone are mainly found on exposed rocks or reefs, often with shallow pools, and on beaches. In the north, they are found in a wider range of habitats, including mudflats.	28	1 km
Charadrius leschenaultii	Large Sand Plover	VU, Mi, Ma	VU	This species inhabits littoral and estuarine habitats, sheltered sandy shelly or muddy beaches with large intertidal mudflats or sandbanks, and sandy estuarine lagoons, inshore reefs, rock platforms, small rocky islands or sand cays on coral reefs. Important areas of habitat in Western Australia include Eighty Mile Beach, Roebuck Bay and Ashmore Reef (DAWE, 2020).	22	1 km
Charadrius mongolus	Lesser Sand Plover	EN, Mi, Ma	EN	This species occurs in littoral and estuarine environments, large intertidal sandflats or mudflats, sandy ocean beaches, coral reefs, wave-cut rock platforms and rocky outcrops. Important Western Australian sites include Eighty Mile Beach, Roebuck Bay, Broome and Port Hedland Saltworks.	8	7 km
Falco peregrinus	Peregrine Falcon	-	OS	A well-known falcon, the Peregrine inhabits a vast array of environs in Australia. Usually uncommon and migratory (Pizzey & Knight, 2007). This species lays its eggs in recesses of cliff faces, tree hollows or large abandoned nests (Bamford, 2009).	7	8 km
Hydroprogne caspia	Caspian Tern	Mi, Ma	MI	The largest tern in Australia, the Caspian Tern is widespread in coastal regions, breeding on variable types of sites including low islands, cays, spits, banks, ridges, beaches of sand or shell, terrestrial wetlands and stony or rocky islets or banks.	30	0 km
Limosa lapponica	Bar-tailed Godwit	Mi, Ma	MI	The Bar-tailed Godwit is found in coastal habitats, particularly large intertidal sandflats, banks, mudflats, estuaries, inlets, harbours, coastal lagoons and bays.	26	1 km

Taxon	Common Name	Cons. Status[1]		Habitat[2]	Number of Records	Distance from Survey Area
		EPBC Act	DBCA / BC Act			
Pluvialis fulva	Pacific Golden Plover	Mi, Ma	MI	The Pacific Golden Plover usually forages on sandy or muddy shores (including mudflats and sandflats) or margins of sheltered areas such as estuaries and lagoons, though it also feeds on rocky shores, islands or reefs. In addition, Pacific Golden Plovers occasionally forage among vegetation, such as saltmarsh, mangroves or in pasture or crops.	5	1 km
Thalasseus bergii	Crested Tern	Mi, Ma	MI	This large tern is predominantly found offshore and coastal, on beaches, bays, inlets, tidal rivers, salt swamps, lakes and larger rivers (Pizzey & Knight, 2010).The Crested Tern is usually a strictly coastal species, though there are occasional records in the arid interior of Australia, where birds were possibly blown by passing tropical cyclones (Birdlife Australia, 2020).	24	1 km
Tringa brevipes	Grey-tailed Tattler	Mi, Ma	P4	The Grey-tailed Tattler is found on sheltered coasts with reefs and rock platforms or with intertidal mudflats. Also found on intertidal rocky, coral or stony reefs, platforms and islets that are exposed at low tide.	33	1 km
Mammals						
Dasyurus hallucatus	Northern Quoll	EN	EN	This species occupies a wide range of habitats including, rocky areas, deserts, eucalypt forests and woodlands, hummock grass (*Plechtrachne* sp.), basalt hills, mesas, high and low plateaux, lower slopes, occasional tor fields and stony plains supporting either hard or soft spinifex grasslands (Braithwaite & Griffiths, 1994; van Vreeswyk et al., 2004). Northern Quolls on the Burrup Peninsula are likely to inhabit complex landforms of rocky outcrops, which can afford greater cover from predators than more open areas (Cardno, 2019). They will usually den in hollow trees or small caves and crevices in rocky outcrops.	39	4 km
Reptiles						
Liasis olivaceus barroni	Pilbara Olive Python	VU	VU	The Olive Python (Pilbara subspecies) is known to occur at 17 locations in the Pilbara, mostly in the Hammersley Range and Dampier Archipelago and is terrestrial and rock-inhabiting (Wilson & Swan, 2010). It is often associated with rockpiles around permanent water pools and seasonal creek. On the Burrup Peninsula they prefer granophyre rock piles and occasionally are found in neighbouring spinifex grasslands (Cardno, 2019).	20	1 km
Notoscincus butleri	Lined Soil-crevice Skink (Dampier)		P4	Usually found in hummock grasslands on stony or sandy ground. A relatively poorly known species that has been collected in the Hearson Cove - King Bay area of the Burrup Peninsula.	12	6 km

1. Conservation status: VU Vulnerable, Mi/MI Migratory, Ma Marine, P Priority, EN Endangered, CR/CE Critically Endangered, OS Other specially protected fauna
2. Habitat information derived from the DAWE (2020) Species Profiles and Threats Database unless otherwise referenced.



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LEGEND

Survey Area

PECs
- Priority 1
- Priority 3

WA Herb
- Priority 3
- Priority 4

Threatened and Priority Flora Database
- Priority 3

Desktop Results – Flora and Communities

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FLORA, VEGETATION AND FAUNA ASSESSMENT – DAMPIER DESALINATION PROJECT

Figure 6

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Survey Area

Desktop Results – Fauna

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FLORA, VEGETATION AND FAUNA ASSESSMENT – DAMPIER DESALINATION PROJECT

Figure
7

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4.3.1 Short Range Endemic Species

Taxonomic groups with known or likely SRE taxa in Western Australia are defined in EPA (2009) *Short Range Endemic Invertebrate Fauna* and include:

- Mollusca – freshwater mussels and snails, land snails
- Annelida – earthworms
- Onychophora – velvet worms
- Arthropoda –spiders, pseudoscorptions, schizomids, mites, slaters, freshwater crayfish, millipedes.

The ALA (2021) online database shows a record of *Idiosoma* sp. and *Kwonkan* sp. (trapdoor spider species) occurring in the vicinity of the survey area. Both genera are known to support SRE fauna species.

Idiosoma sp. was recorded in 1998, described as being near the Hamersley Iron Technical Services Building. Other records in the region are from Dixon Island and the wider Wickham area, more than 35 km east of the survey area.

Kwonkan sp. was recorded in 2009 approximately 3 km northeast of the survey area, near Murujuga National Park and another record located 13 km south of the survey area.

Neither of these species are listed as conservation significant fauna under the BC Act or listed as a Priority species by DBCA.

5.0 Field Survey Results

5.1 Vegetation

5.1.1 Conservation Significant Vegetation

No vegetation communities listed as Threatened Ecological Communities (TECs) under the EPBC Act or BC Act were recorded during the field survey. The survey area skirts the edge of several rockpiles which have similar characteristics to the Burrup Peninsula Rock Pile Priority Ecological Community (PEC). The PEC is described as pockets of vegetation in rock piles, rock pockets and outcrops (DBCA, 2017) and represents fire and evolutionary refugia with high habitat diversity for plants (Kendrick & Stanley 2001).

5.1.2 Vegetation Communities

Nine vegetation communities were described and mapped across the 104 ha (excluding cleared areas and ocean) within the survey area. These included:

- Hummock Grasslands – three communities on scree slopes and flats, and rockpiles
- Disturbed Areas – including artificial wetlands, disturbed roadside, and cleared
- Wetlands / tidal areas – two ephemeral creeks and two intertidal / shoreline communities.

Analysis of floristic data from relevés was analysed using dendrograms (Appendix C). The dendrograms determined that many sites were statistically very similar to one another, leading to the grouping of many sites in one vegetation community (notably, ToAlTe).

The vegetation communities recorded in the survey area are described in Table 7 and mapped in Figure 8.

Table 7 Vegetation Community Descriptions and Photographs

Description	Additional Detail	Photograph
Wetlands / Tidal		
EcScCc **Minor Flowline** *Eucalyptus camaldulensis* and *Melaleuca lasiandra* low woodland over *Sesbania cannabina, Acacia coriacea* and *Solanum horridum* mid open shrubland over **Cenchrus ciliaris* low open tussock grassland. This community includes a layer of herbs including *Rhynchosia minima, Pluchea rubelliflora, Cucumis variabilis* and 13 more species.	Survey effort: 12, 19, 23, 28 Extent: 1.54 ha Species richness: 44 native and one weed species Condition: Good	
GpTzTa **Minor Flowline** *Grevillea pyramidalis* and *Terminalia canescens* low isolated trees over *Trichodesma zeylanicum* var. *zeylanicum, Pluchea rubelliflora* and *Streptoglossa decurrens* tall herbland over *Triodia angusta* and **Cenchrus ciliaris* tall mixed Hummock and Tussock grassland. Restricted to one location where flowline intersects with the road. Floristics are very similar to adjacent rocky slopes, and was largely barren in April 2021.	Survey effort: 18 Extent: 0.22 ha Species richness: 22 native and one weed species Condition: Good	

Description	Additional Detail	Photograph
FvTdIc **Tidal/Shoreline** *Flueggea virosa* subsp. *melanthesoides, Rhizophora stylosa* and *Avicennia marina* scattered mangrove patches with *Typha domingensis, Cyperus vaginatus* and *Spinifex longifolius* low scattered sedges with *Ipomoea costata* and **Passiflora foetida* scattered climbers. Recorded along the mid to upper levels of shoreline where plants occurred sporadically. Low levels of the shoreline were devoid of vegetation.	Survey effort: 6, 20 Extent: 3.25 ha Species richness: 23 native and three weed species Condition: Good	
PaTiEo **Tidal Flats** *Pittosporum phillyreoides* and *Acacia coriacea* scattered tall trees over *Tecticornia indica, Enchylaena tomentosa* and *Acacia ampliceps* low open shrubland over *Eriachne obtusa* and **Cenchrus ciliaris* low open tussock grassland. Associated with tidal flats on clay soils that responds rapidly to rainfall, varying between large barren areas to open herbland.	Survey effort: 14, 25 Extent: 0.30 ha Species richness: Nine native and one weed species Condition: Good	

Description	Additional Detail	Photograph
Hummock Grasslands		
AbEtTa **Hummock Grassland** *Acacia bivenosa, Salsola australis* and *Corchorus walcottii* mid to low open shrubland over *Euphorbia tannensis* subsp. *eremophila, Euphorbia australis* and *Tribulus hirsutus* low open herbland over *Triodia angusta* and *Triodia epactia* tall Hummock Grassland Recorded on flat clay soils with some rocks on lower slopes.	Survey effort: 13, 17, 26 Extent: 1.94 ha Species richness: 50 native and one weed species Condition: Good	
SdSfTe **Hummock Grassland** *Solanum diversifolium, Indigofera monophylla* and *Acacia synchronicia* mid to low open shrubland with *Swainsona formosa, Boerhavia coccinea* and *Euphorbia australis* mid to low open herbland over *Triodia epactia* Hummock Grassland. Recorded on skeletal soils on lower slopes. This community is very similar to ToAlTe as shown in Appendix C similarity dendrograms. This is particularly evident following the April 2021 survey.	Survey effort: 7, 8, 11 Extent: 7.10 ha Species richness: 32 native and two weed species Condition: Good to Very Good	

Description	Additional Detail	Photograph
ToAlTe **Hummock Grassland** *Trachymene oleracea* subsp. *oleracea, Trichodesma zeylanicum* var. *zeylanicum* and *Swainsona formosa* mid to tall herbland with *Abutilon lepidum*, *Crotalaria novae-hollandiae* and *Senna notabilis* low shrubland over *Triodia epactia* tall hummock grassland. Recorded on skeletal soils on flats, slopes and around rockpiles. Trees including *Terminalia canescens* growing from rockpiles.	Survey effort: 3, 10, 15, 16, 24, 27, 29, 30 Extent: 14.26 ha Species richness: 73 native and three weed species Condition: Very Good	
Disturbed – significantly altered		
Rocky Shore Shoreline comprised of partially man-made, partially natural rocks, boulders and sand.	Extent: 2.19 ha	

Description	Additional Detail	Photograph
AaEgPr **Disturbed - Artificial Ephemeral Wetland** *Acacia ampliceps* and *Sesbania cannabina* medium open shrubland over *Eleocharis geniculata, Schoenus falcatus* and *Cyperus vaginatus* low open sedgeland over *Pluchea rubelliflora, Samolus repens* and *Stemodia grossa* low open herbland. Represents artificial ephemeral wetlands. Wetter areas include *Typha domingensis*. Supports Priority 3 *Eragrostis surreyana* population. Presence of water likely to vary throughout the year.	Survey effort: 4, 5, 9, 21, 22 Extent: 9.66 ha Species richness: 37 native and six weed species Condition: Degraded	
CL Cleared – devoid of native vegetation, includes hardstand roads and rail as well as roadside with weeds.	Extent: 63.50 ha	N/A
Water Open water	Extent: 0.18 ha	N/A

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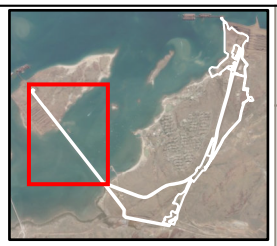
LEGEND

Survey Area

Vegetation Communities

FvTdLc

Cleared



Vegetation Communities

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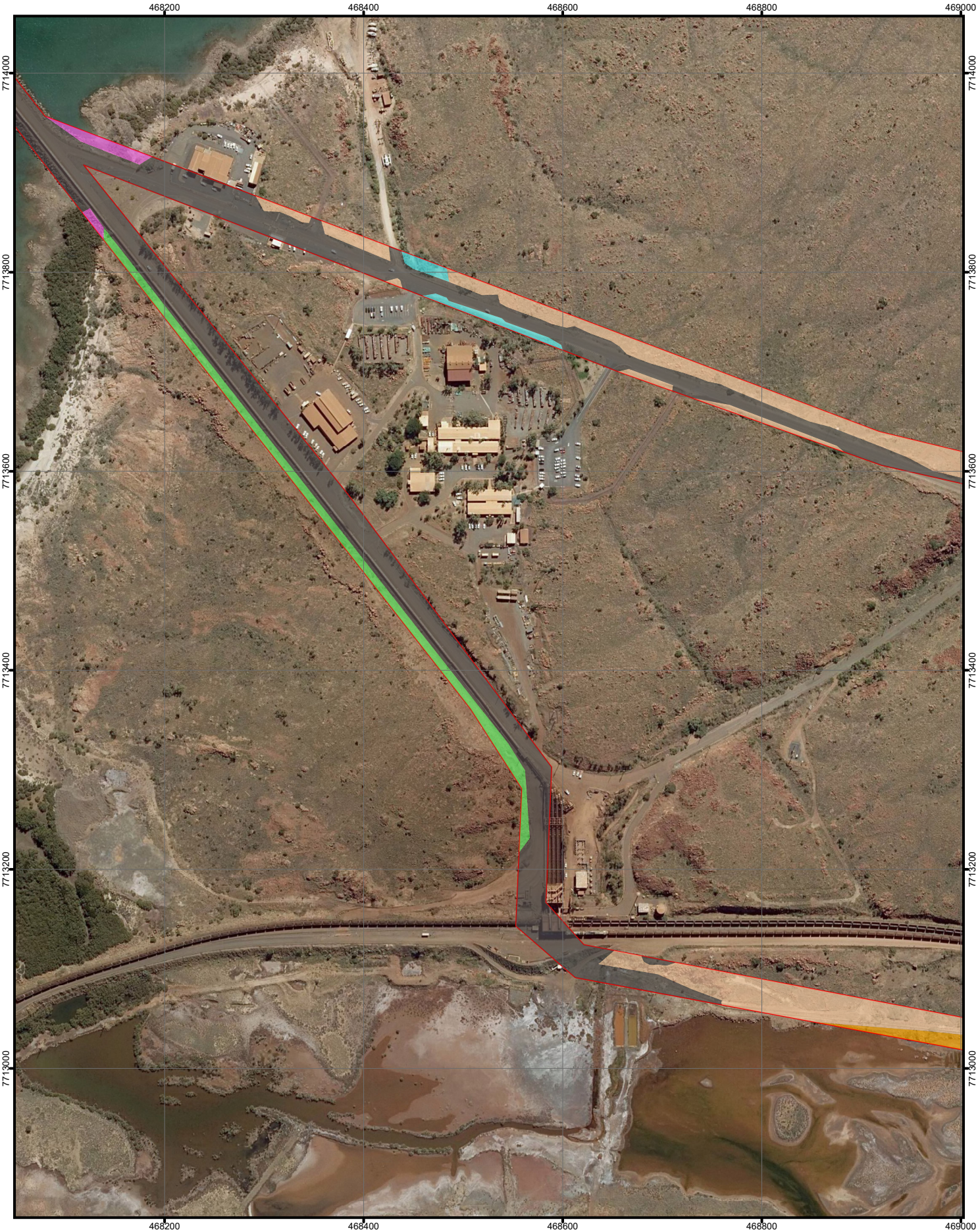
Figure 8.1



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LEGEND

Survey Area

Vegetation Communities

- AbEtTa
- EcScCc
- FvTdLc
- PaTiEo
- ToAlTe
- Cleared

Vegetation Communities

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FLORA, VEGETATION AND FAUNA ASSESSMENT – DAMPIER DESALINATION PROJECT

Figure 8.2

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LEGEND

Survey Area

Vegetation Communities

- AaEgPr
- AbEtTa
- EcScCc
- GpTzTa
- PaTiEo
- SdSfTe
- ToAlTe
- Cleared

Vegetation Communities

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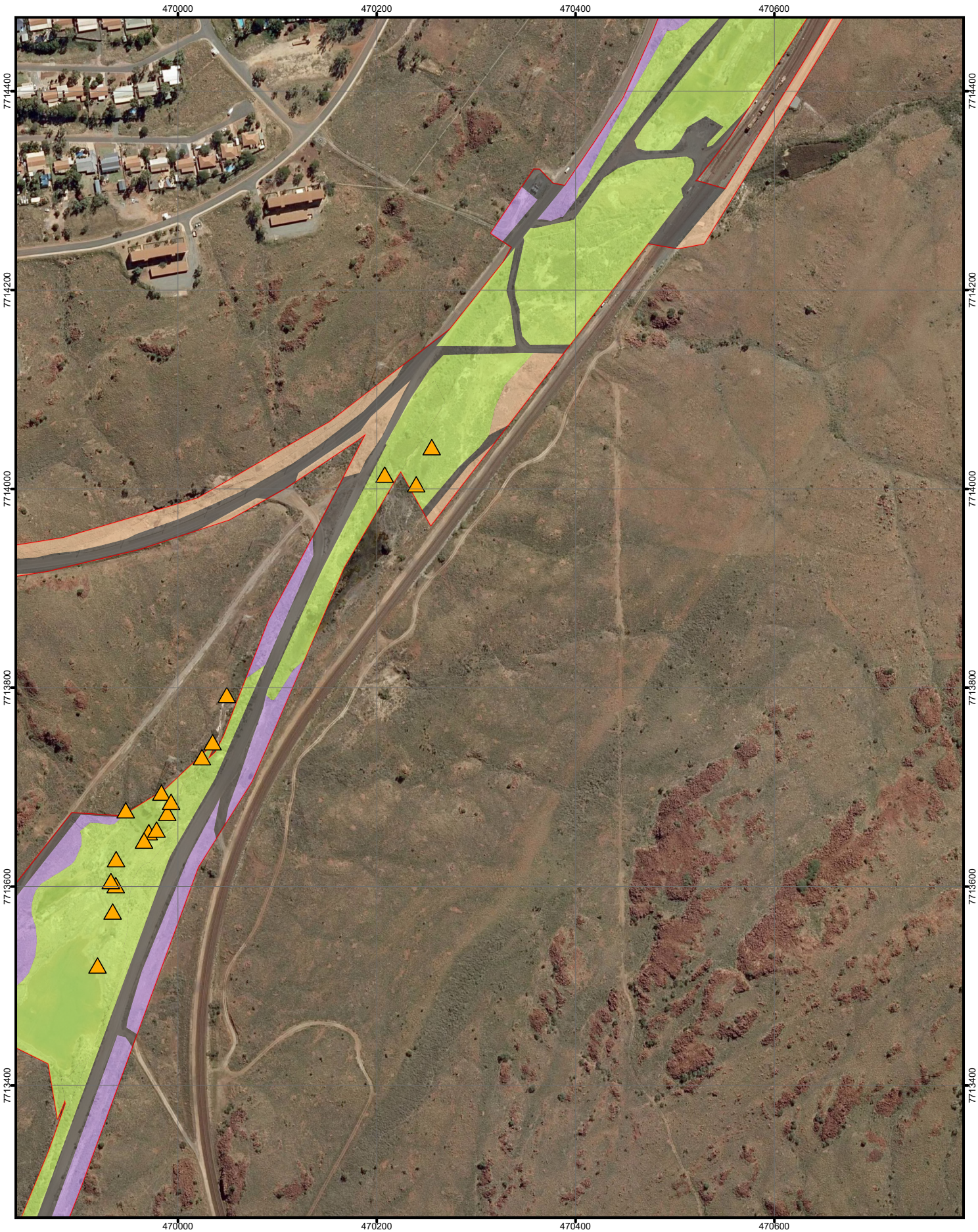
FLORA, VEGETATION AND FAUNA ASSESSMENT – DAMPIER DESALINATION PROJECT

Figure

8.3



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0 25 50 75 100
metres

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LEGEND

- Survey Area
- *Eragrostis surreyana* (P3)
- Vegetation Communities
  - AaEgPr
  - SdSfTe
  - ToAlTe
  - Cleared

Vegetation Communities

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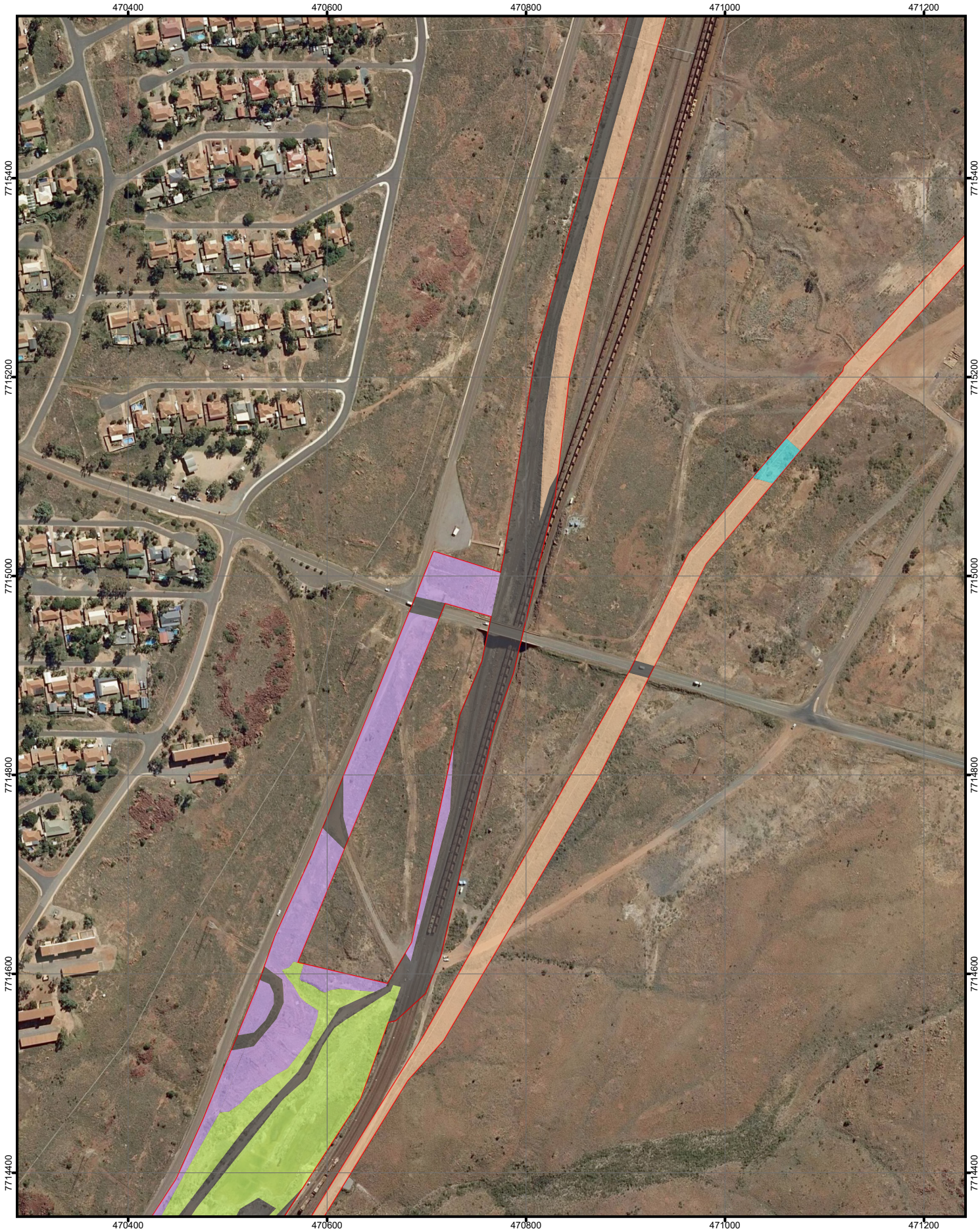
FLORA, VEGETATION AND FAUNA ASSESSMENT – DAMPIER DESALINATION PROJECT

Figure 8.4



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LEGEND

Survey Area

Vegetation Communities

- AaEgPr
- EcScCc
- SdSfTe
- ToAlTe
- Cleared

Vegetation Communities

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FLORA, VEGETATION AND FAUNA ASSESSMENT – DAMPIER DESALINATION PROJECT

Figure 8.5

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LEGEND

Survey Area

Vegetation Communities

SdSfTe

ToAlTe

Cleared

Vegetation Communities

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FLORA, VEGETATION AND FAUNA ASSESSMENT – DAMPIER DESALINATION PROJECT

Figure
8.6

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LEGEND

- Survey Area
- Vegetation Communities
  - FvTdLc
  - Rocky shore
  - SdSfTe
  - ToAlTe
  - Cleared
  - Water

Vegetation Communities

RIO TINTO

FLORA, VEGETATION AND FAUNA ASSESSMENT – DAMPIER DESALINATION PROJECT

Figure 8.7

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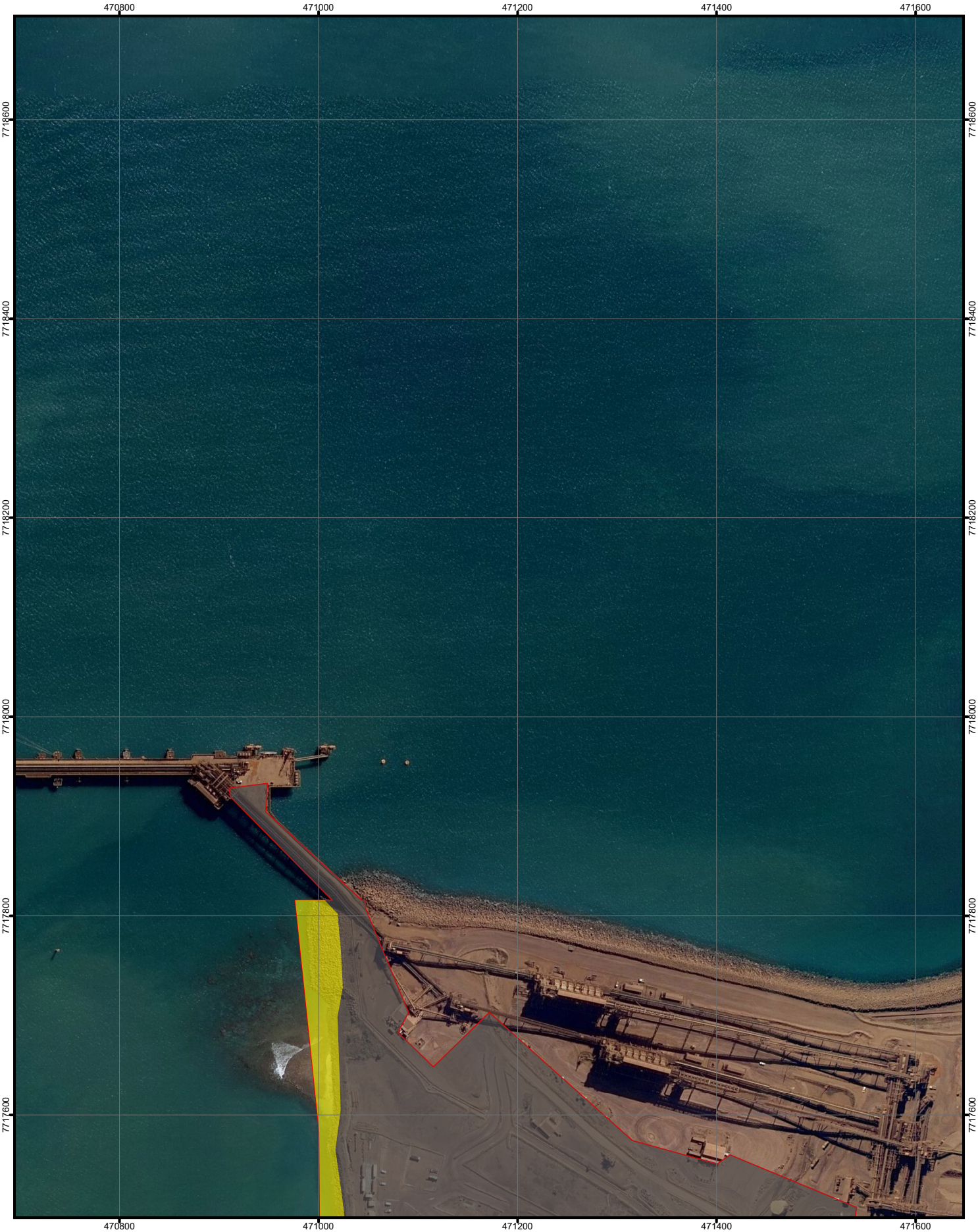

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LEGEND

Survey Area

Vegetation Communities

Rocky shore

Cleared

Vegetation Communities

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FLORA, VEGETATION AND FAUNA ASSESSMENT – DAMPIER DESALINATION PROJECT

Figure

8.8

5.1.3 Condition

Vegetation condition was mapped as Completely Degraded to Very Good throughout the survey area (Figure 9). The majority of the survey area has been disturbed to some degree from existing infrastructure. The Completely Degraded area comprises 63% of the survey area, followed by 'Poor' condition vegetation at 13%, and Degraded at 12%. Of the 104 ha of vegetation, 1.83 ha (2%) represents vegetation in Very Good condition.

There are numerous areas of disturbance including cleared hardstand for permanent infrastructure (rail, road, buildings), roadside clearing and drainage, pipelines and powerlines with regrowth vegetation underneath, and historical borrow pits which have developed into artificial wetlands. Some examples of this is shown in Plate 1.

Table 8 Vegetation Condition Extent

Condition rating	Extent (ha)	Percent of Total Area (%)
Very Good	1.83	2
Good	10.71	10
Poor	13.14	13
Degraded	12.39	12
Completely Degraded/Cleared	65.90	63
Total	104.00	100

Note: Water represents 0.18 ha and is not included in calculations

Plate 1 Evidence of disturbance from top right clockwise: pipeline, man-made rock wall, roadside drainage, earthworks

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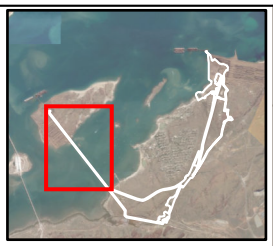
LEGEND

Survey Area

Vegetation Condition

0.1 - Completely Degraded

0.6 - Good



Vegetation Condition

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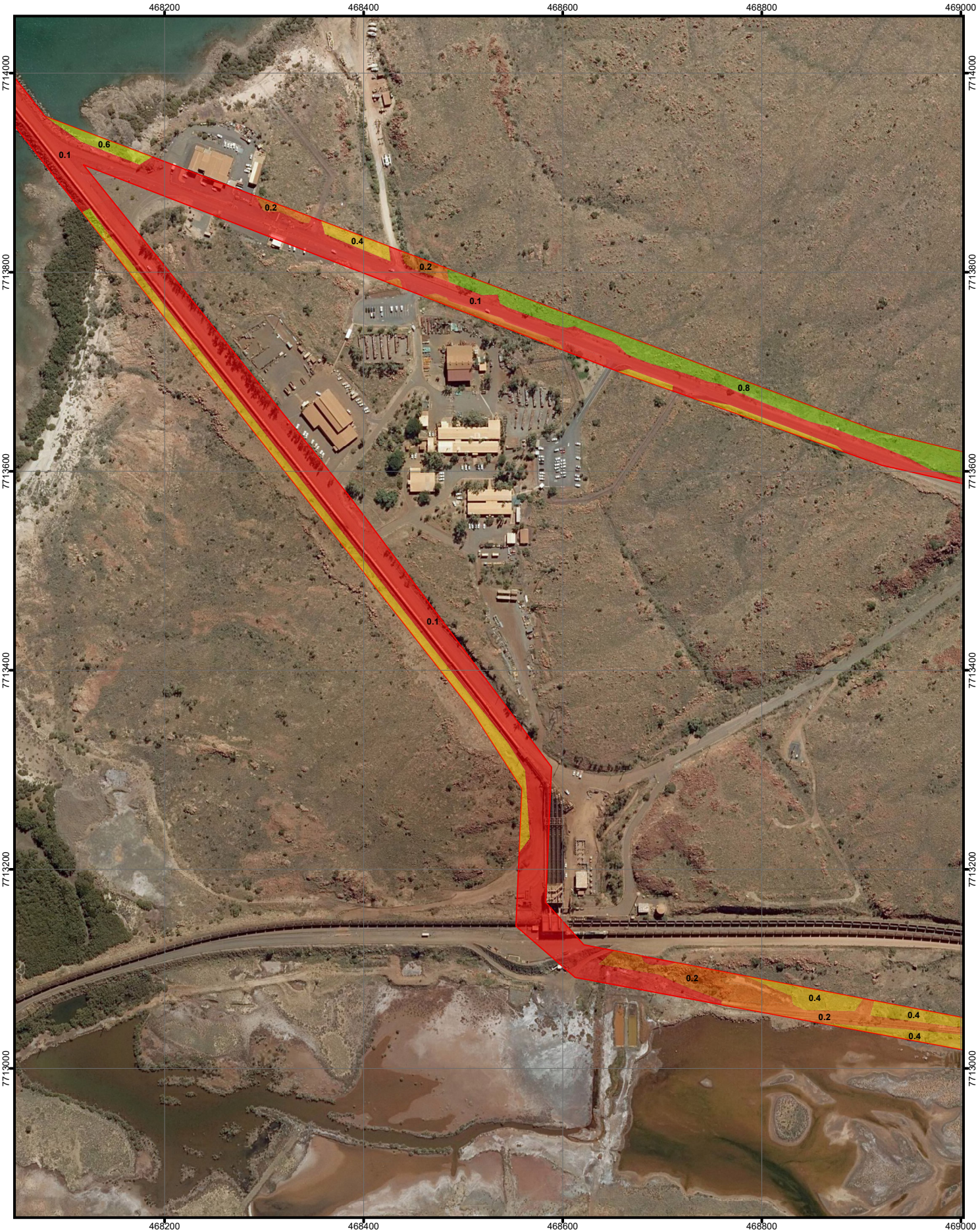
FLORA, VEGETATION AND FAUNA ASSESSMENT – DAMPIER DESALINATION PROJECT

Figure

9.1



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LEGEND
Survey Area
Vegetation Condition
0.1 - Completely Degraded
0.2 - Degraded
0.4 - Poor
0.6 - Good
0.8 - Very Good

Vegetation Condition

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FLORA, VEGETATION AND FAUNA ASSESSMENT – DAMPIER DESALINATION PROJECT

Figure
9.2

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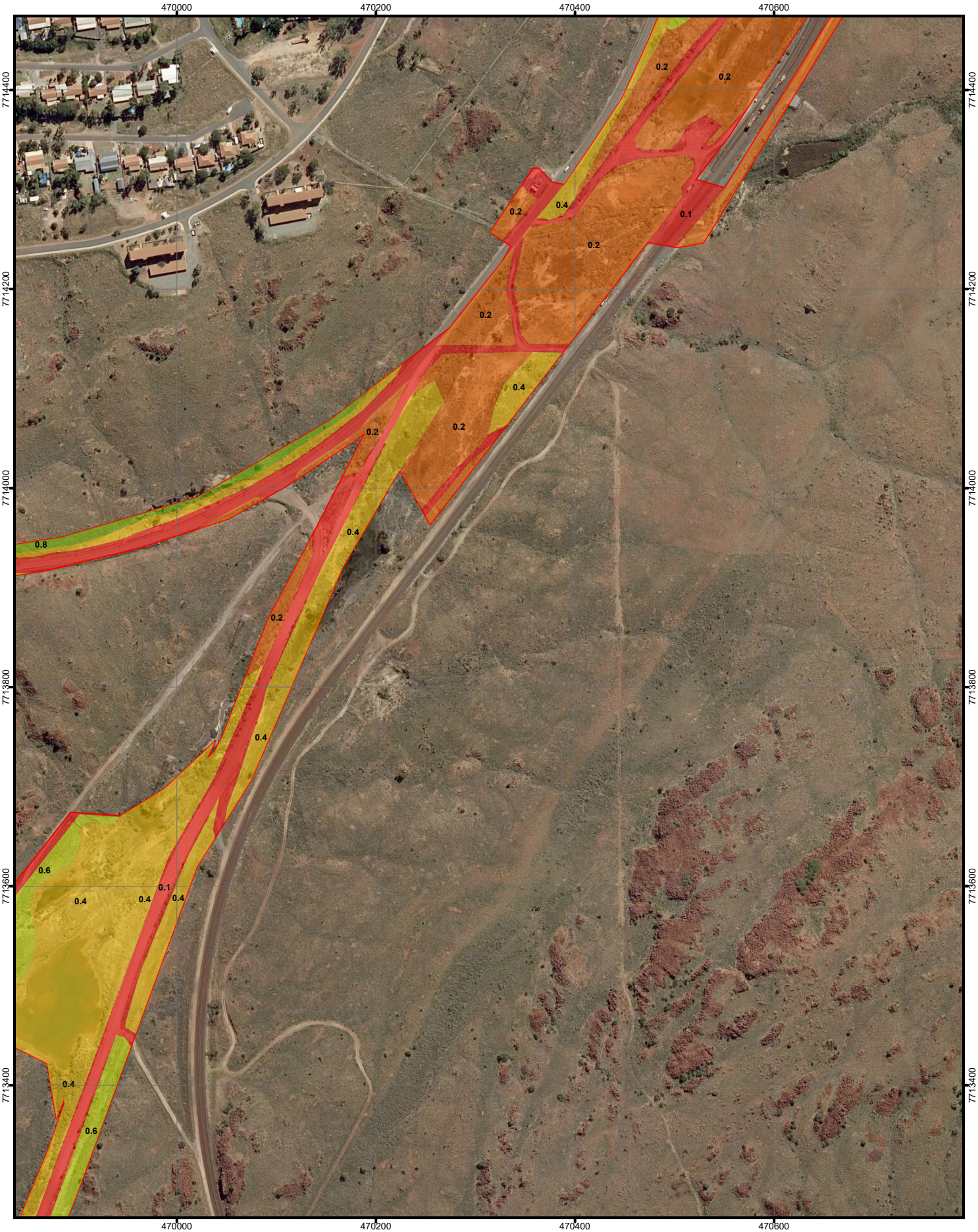
LEGEND
Survey Area
Vegetation Condition
0.1 - Completely Degraded
0.2 - Degraded
0.4 - Poor
0.6 - Good
0.8 - Very Good

Vegetation Condition

RIO TINTO

FLORA, VEGETATION AND FAUNA ASSESSMENT – DAMPIER DESALINATION PROJECT

Figure
9.3



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metres

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LEGEND
- Survey Area
- Vegetation Condition
  - 0.1 - Completely Degraded
  - 0.2 - Degraded
  - 0.4 - Poor
  - 0.6 - Good
  - 0.8 - Very Good

Vegetation Condition

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FLORA, VEGETATION AND FAUNA ASSESSMENT – DAMPIER DESALINATION PROJECT

Figure 9.4

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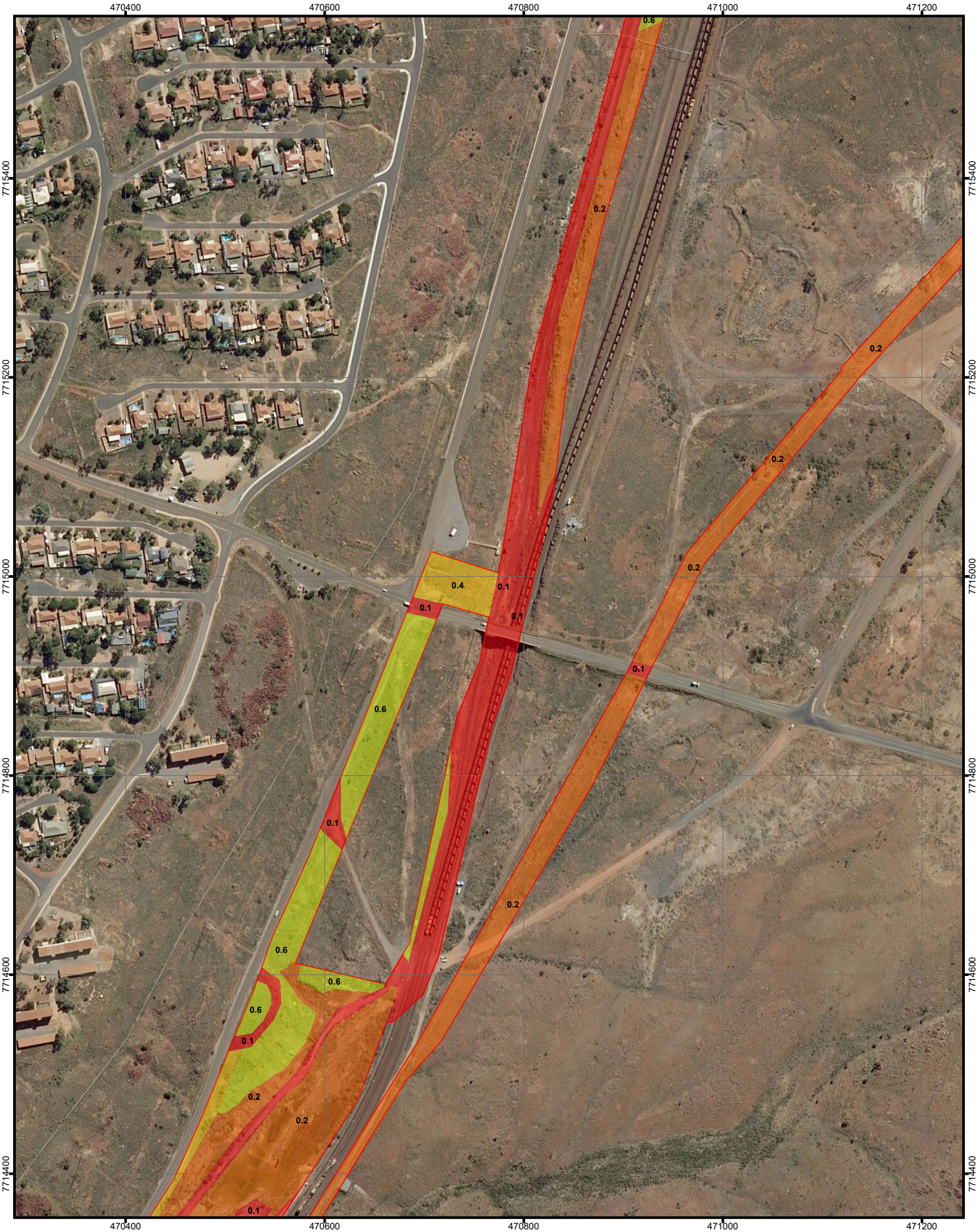

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metres

Data sources:

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LEGEND

- Survey Area

Vegetation Condition

- 0.1 - Completely Degraded
- 0.2 - Degraded
- 0.4 - Poor
- 0.6 - Good

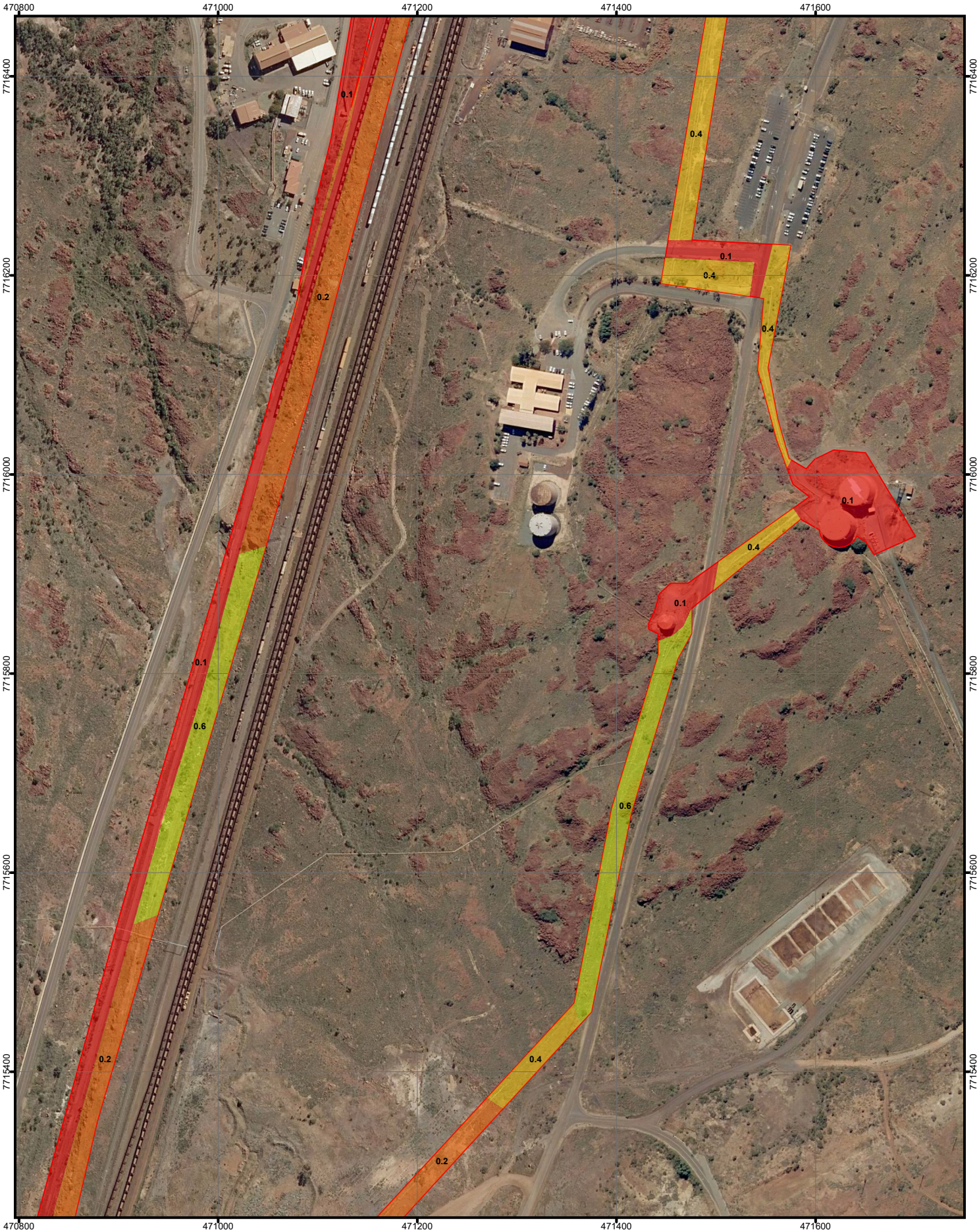
Vegetation Condition

RIO TINTO

FLORA, VEGETATION AND FAUNA ASSESSMENT – DAMPIER DESALINATION PROJECT

Figure

9.5



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Data sources:

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LEGEND
Survey Area
Vegetation Condition
0.1 - Completely Degraded
0.2 - Degraded
0.4 - Poor
0.6 - Good

Vegetation Condition

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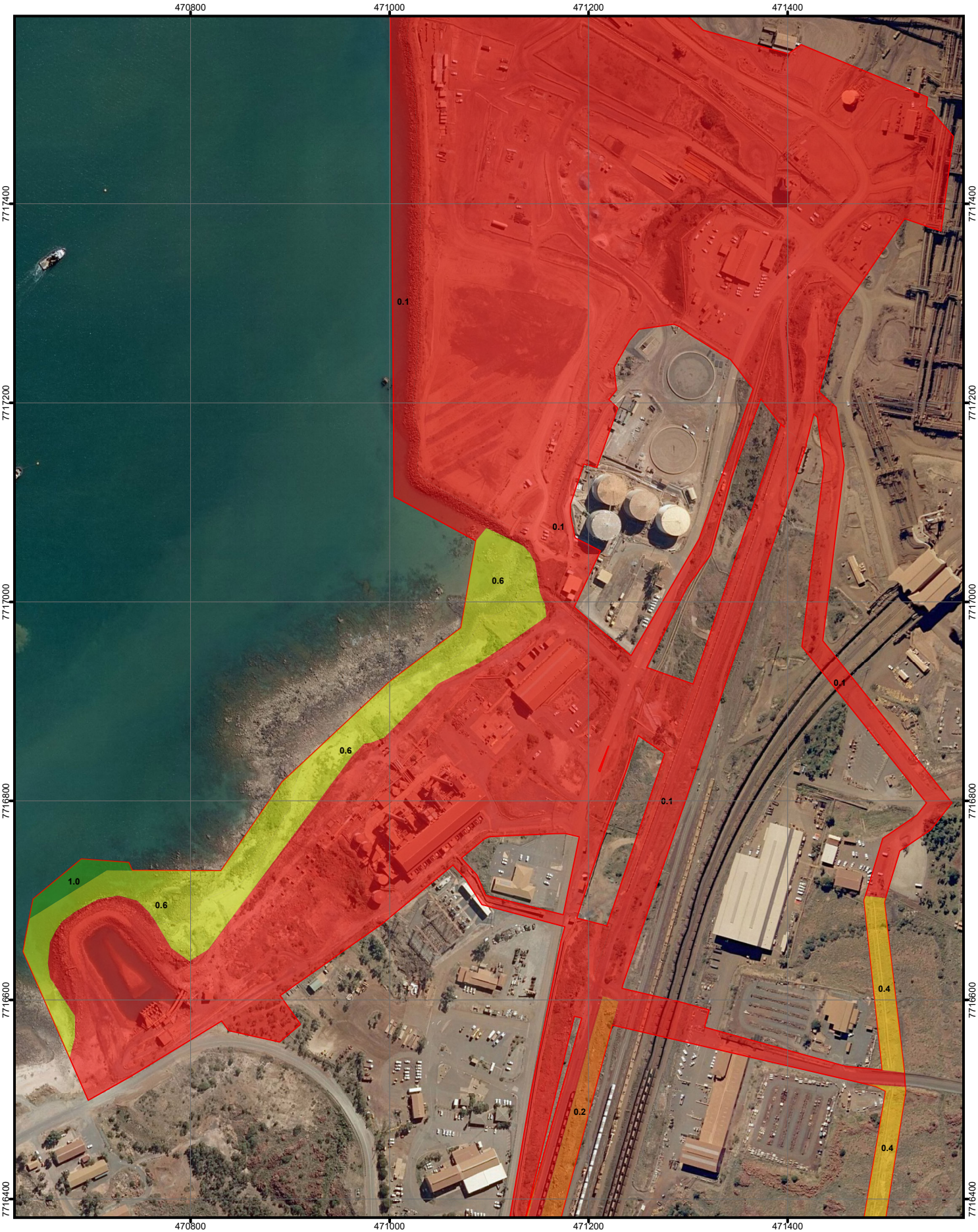
FLORA, VEGETATION AND FAUNA ASSESSMENT – DAMPIER DESALINATION PROJECT

Figure
9.6



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Data sources:

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LEGEND

Survey Area

Vegetation Condition

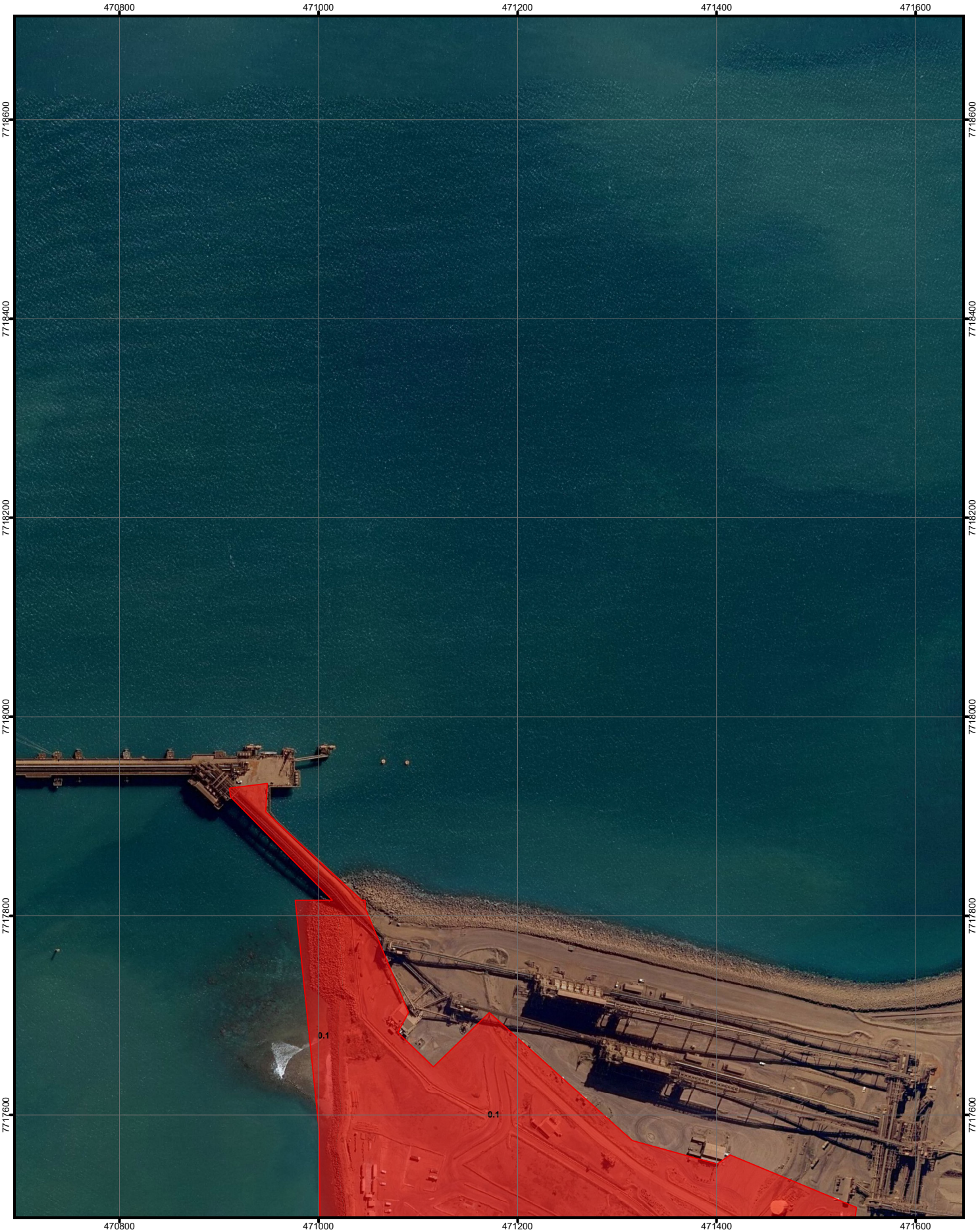
- 0.1 - Completely Degraded
- 0.2 - Degraded
- 0.4 - Poor
- 0.6 - Good
- 1 - Excellent

Vegetation Condition

RIO TINTO

FLORA, VEGETATION AND FAUNA ASSESSMENT – DAMPIER DESALINATION PROJECT

Figure
9.7



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LEGEND

Survey Area

Vegetation Condition

0.1 - Completely Degraded

Vegetation Condition

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FLORA, VEGETATION AND FAUNA ASSESSMENT – DAMPIER DESALINATION PROJECT

Figure 9.8

5.2 Flora

5.2.1 Conservation Significant Flora

No species listed as Threatened under *the Biodiversity Conservation Act 2016* (BC Act), or under the EPBC Act were recorded in the survey area. One Priority 3 flora species listed by DBCA was recorded.

One population of *Eragrostis surreyana* (Priority 3) was recorded, comprising approximately 885 individuals. The population occurs within the Disturbed - Artificial Ephemeral Wetland (AaEgPr), shown on Figure 8 and presented in Appendix E.

Plate 2 ***Eragrostis surreyana*** **(P3) habit (top) and habitat (bottom)**

One species, *Hibiscus sturtii* var. *campylochlamys* may represent a range extension according to the Florabase (WAH, 1998) distribution. This species is highly variable (U. Sirisena *pers comm.*) and may have been previously identified as the group collective of *Hibiscus sturtii* of which there are three records within the Karratha area. It was recorded at five locations (relevés 8, 15, 16, 24 and 31). This species was not recorded in previous surveys (Biota, 2011; 2018), however Naturemap show it as occurring in the region. It is therefore unlikely to represent a significant occurrence.

5.2.2 Flora Inventory

A total of 124 native species from 88 genera, and 39 families were recorded within the survey area. Species richness was higher in phase I where 108 native species were recorded compared to 74 native species in phase II.

The best represented family was Fabaceae (30 native species), followed by Poaceae (12 native species) and Malvaceae (11 native species).

Six weed species were recorded, all of which are considered common in the Pilbara region. The most common weed was **Cenchrus ciliaris* (Buffel Grass). Two weed species were recorded only in phase II, including **Stylosanthes hamata* recorded along roadsides, and **Flaveria trinervia* recorded in the Disturbed – Artificial Ephemeral Wetland community. None of the weeds that were recorded are listed as Declared Pests under the BAM Act, or are of National Significance.

The comprehensive list of vascular flora species recorded and representative communities in which they occur in are presented in Appendix D. Qualitative data recorded from individual quadrats is presented in Appendix B.

5.3 Fauna Habitats

Five fauna habitats (including Cleared) were described and mapped from 21 Fauna Habitat Assessments. Fauna habitats have been described in their entirety within and adjacent to the survey area. Although some features may not be present in all locations, they still form part of the overall habitat description and complexity (i.e. mature trees and rock piles). Descriptions of the fauna habitats are provided in Table 9 and mapped in Figure 10. Fauna habitats generally aligned with the vegetation community mapping. Fauna Habitat Assessments are presented in Appendix D.

None of the five fauna habitats represent core habitat for conservation significant fauna species that potentially occur in the survey area. Habitat was considered ‘suitable’ and ‘marginal’ for 13 species listed as ‘likely to occur’ and eight species that ‘may occur’ from the desktop assessment.

5.3.1 Short Range Endemic

The survey area was traversed on foot (twice), and opportunistic searches conducted for SREs. No opportunistic observations of SREs, including trapdoor spiders, were observed in the survey area. No suitable habitat was identified in the survey area. The survey area largely comprises disturbed or previously cleared areas, and stony skeletal soils with substrates that would be difficult for burrowing spiders to penetrate.

Table 9 Fauna Habitats of the Survey Area

Description	Conservation Significant Fauna Habitat	Photograph
Disturbed - Artificial wetlands Standing water (seasonal), occasional mature tree, sedges, herbs and low shrubs provide moderate ground cover. It appears that these relatively flat areas were created by earthworks (e.g. excavation of fill material) associated with the construction of nearby rail/road infrastructure. Moderate complexity when water is present. This habitat is a result of historical earthworks (likely for sourcing fill). Due to significant rainfall in July 2020, these relatively flat areas contained ponded water. It would be expected that surface water would be temporary, and these areas would be dry for much of the year. Area: 2.54 ha	Suitable foraging habitat for the Common Sandpiper and Caspian Tern, which were directly observed within this habitat during the survey. Provide marginal foraging habitat for the Pacific Golden Plover and Crested Tern Vagrant visitors: - Peregrine Falcon - Ghost Bat - Whimbrel - Little Whimbrel - Oriental Pratincole	 

Description	Conservation Significant Fauna Habitat	Photograph
Triodia grasslands on rocky slopes and flats Grasslands with moderate to high ground cover on rocky slopes and flat areas. Includes some tall shrubs over diverse low herbs, shrubs and grasses. Occurs on skeletal rocky slopes and around rock piles. Varies in complexity from high to low in the absence of rock piles to provide shelter. Recorded on skeletal slopes. Area: 23.10 ha	Considered suitable foraging habitat for the Northern Quoll and Lined Soil-crevice Skink. Rock piles provides suitable denning habitat for the Northern Quoll. Marginal habitat for the Western Pebble-mound Mouse and Pilbara Olive Python Vagrant visitors include: - Peregrine Falcon - Barn Swallow - Ghost Bat - Whimbrel - Little Whimbrel - Oriental Pratincole	 

Description	Conservation Significant Fauna Habitat	Photograph
Minor creeks Ephemeral creeks that intersect existing railway. Includes mature trees in varying densities (no hollows observed), low log litter and moderate density groundcover of tussock grasses, herbs and shrubs. Recorded on skeletal rocky soils. Complexity is moderate to high with the presence of under-mid and upper-storey vegetation. Area: 1.76 ha	Marginal foraging habitat for the North-western Free-tailed Bat. Vagrant visitors include: - Peregrine Falcon - Oriental Pratincole - Whimbrel - Barn Swallow - Little Whimbrel - Ghost Bat	 

Description	Conservation Significant Fauna Habitat	Photograph
Shoreline Rocky/boulder shoreline sloping from existing infrastructure (port) into subtidal areas. Intertidal areas were dominated by oyster encrusted rocks and there were no low tidal sand or mud mudflats exposed seaward of the rocky shoreline (i.e. no mudflat habitat suitable as foraging areas for shorebirds). Isolated patches of mangroves (predominantly *Avicennia marina*) occurred on mid-upper levels of the rocky shoreline. Complexity is low with minimal ground cover. Area: 5.44 ha	Suitable foraging and resting habitat for: - Common Sandpiper - Ruddy Turnstone - Caspian Tern - Large Sand Plover - Lesser Sand Plover - Pacific Golden Plover - Broad-billed Sandpiper Marginal roosting habitat for migratory species including: - Common Tern - Grey-tailed Tattler Marginal foraging habitat for vagrant species including: - Peregrine Falcon - Barn Swallow - North-western Free-tailed Bat - Bar-tailed Godwit	 

Description	Conservation Significant Fauna Habitat	Photograph
Cleared Rail, road and port infrastructure providing minimal habitat. Includes some escarpments of rocks along the rail corridor. Area: 63.71 ha	Marginal habitat from man-made rock walls and rock piles for: - Northern Quoll - Pilbara Olive Python Vagrant visitors include: - Barn Swallow - Peregrine Falcon - Ghost Bat	

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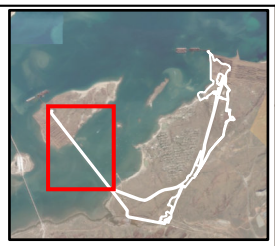
LEGEND
- Survey Area
- Fauna Habitat
- Cleared
- Shoreline



Fauna Habitats

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FLORA, VEGETATION AND FAUNA ASSESSMENT – DAMPIER DESALINATION PROJECT

Figure
10.1

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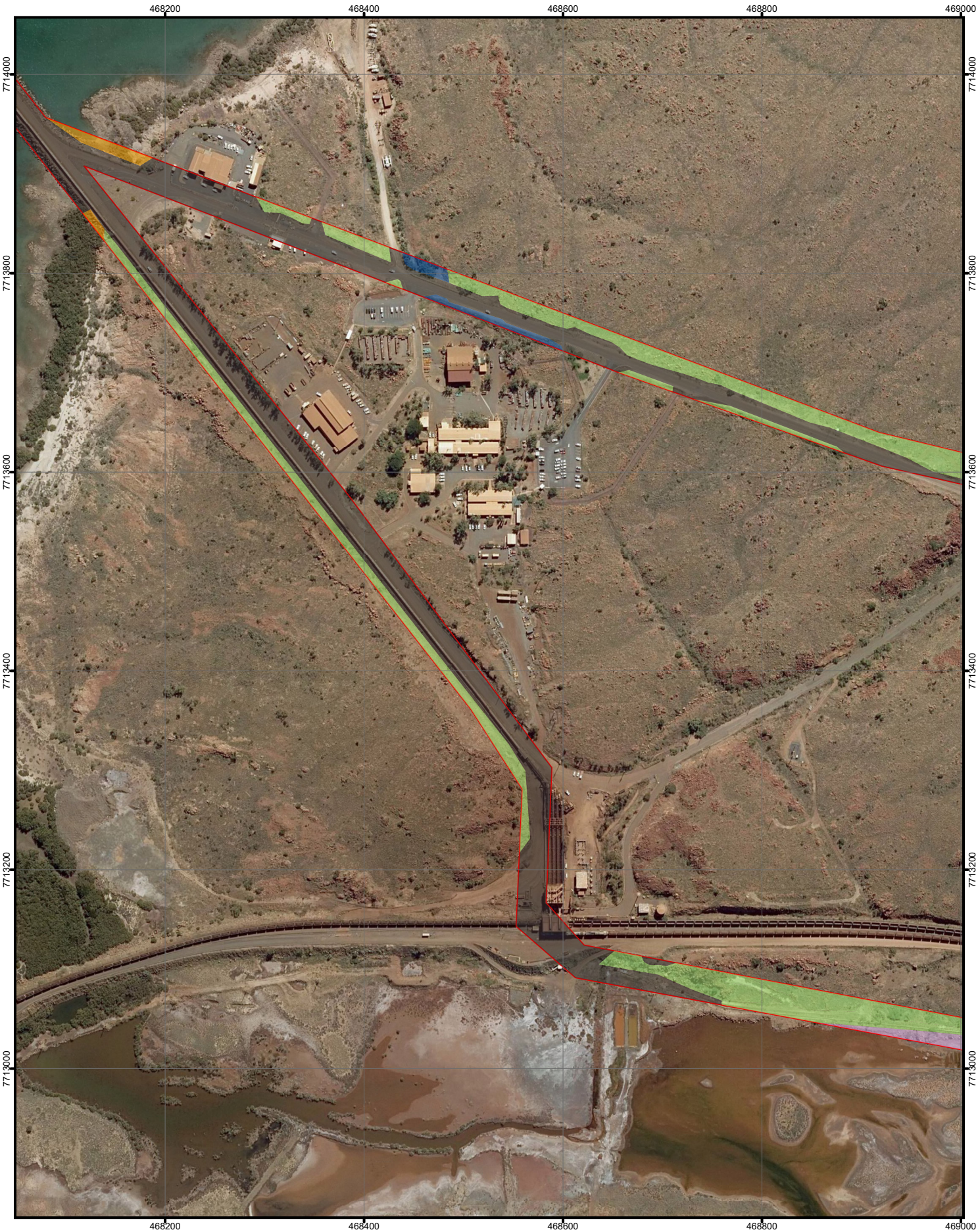

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LEGEND

- Survey Area
- Fauna Habitat
  - Cleared
  - Disturbed - Artificial Wetland
  - Minor Creeks
  - Shoreline
  - *Triodia* on Rocky Slopes

Fauna Habitats

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FLORA, VEGETATION AND FAUNA ASSESSMENT – DAMPIER DESALINATION PROJECT

Figure
10.2

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LEGEND

- Survey Area

Fauna Habitat

- Cleared
- Disturbed - Artificial Wetland
- Minor Creeks
- *Triodia* on Rocky Slopes

Fauna Habitats

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FLORA, VEGETATION AND FAUNA ASSESSMENT – DAMPIER DESALINATION PROJECT

Figure
10.3

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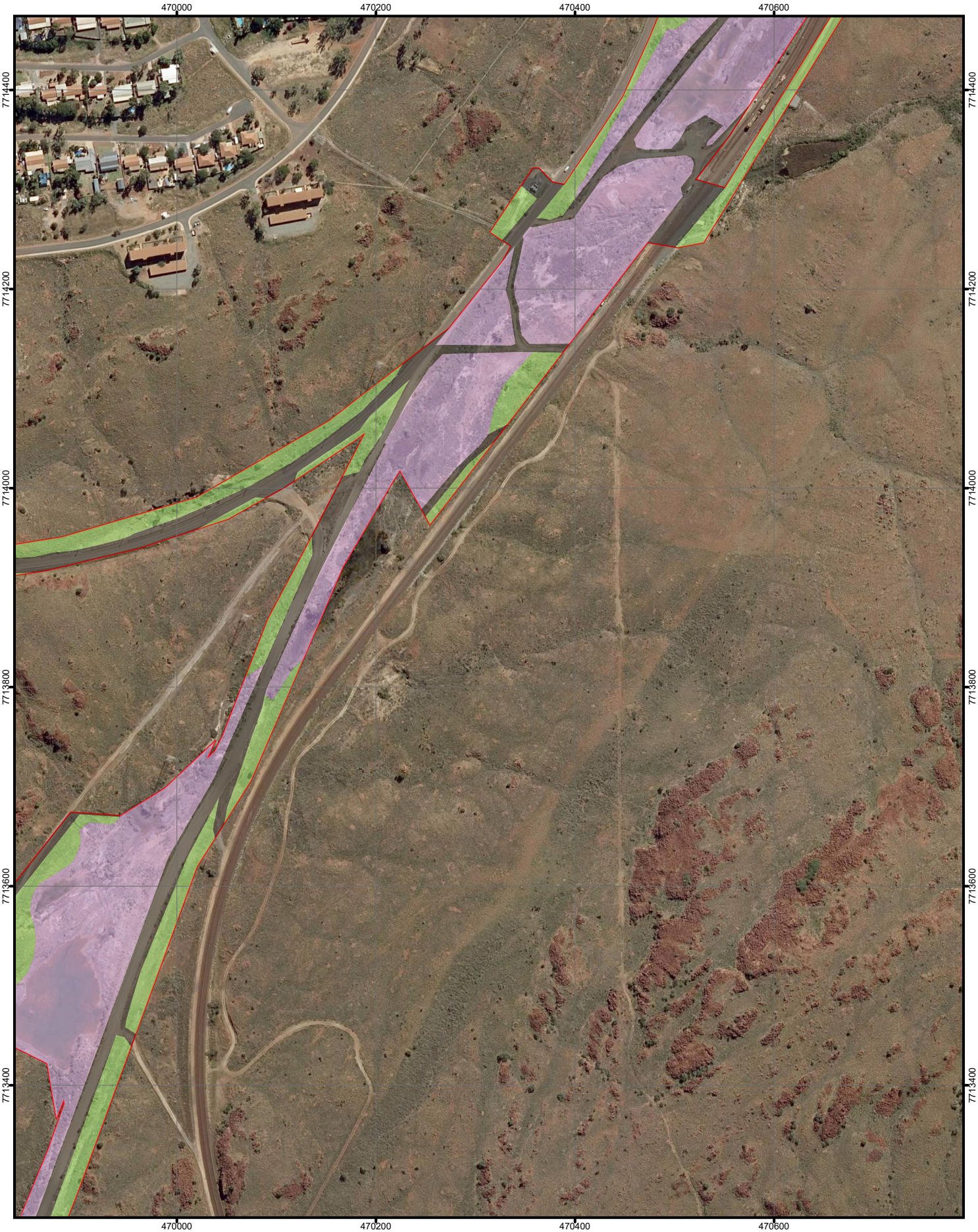

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LEGEND

- Survey Area
- Fauna Habitat
- Cleared
- Disturbed - Artificial Wetland
- *Triodia* on Rocky Slopes

Fauna Habitats

RIO TINTO

FLORA, VEGETATION AND FAUNA ASSESSMENT – DAMPIER DESALINATION PROJECT

Figure

10.4

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LEGEND

- Survey Area
- Fauna Habitat
- Cleared
- Disturbed - Artificial Wetland
- Minor Creeks
- *Triodia* on Rocky Slopes

Fauna Habitats

RIO TINTO

FLORA, VEGETATION AND FAUNA ASSESSMENT – DAMPIER DESALINATION PROJECT

Figure

10.5

PROJECT ID 60657149
CREATED BY WYATTK2
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(when printed at A4)

Datum: GDA 1994 MGA Zone 50
0 25 50 75 100
metres

Data sources:

Base Data: (c) Based on information provided by and with the permission of the Western Australian Land Information Authority trading as Landgate (2010).Geoscience Australia, Streetpro

LEGEND
- Survey Area
- Fauna Habitat
- Cleared
- *Triodia* on Rocky Slopes

Fauna Habitats

RIO TINTO

FLORA, VEGETATION AND FAUNA ASSESSMENT – DAMPIER DESALINATION PROJECT

Figure
10.6

PROJECT ID 60657149
CREATED BY WYATTK2
APPROVED BY F.DEWIT
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Datum: GDA 1994 MGA Zone 50
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metres

Data sources:

Base Data: (c) Based on information provided by and with the permission of the Western Australian Land Information Authority trading as Landgate (2010).Geoscience Australia, Streetpro

LEGEND
- Survey Area
- Fauna Habitat
- Cleared
- Shoreline
- *Triodia* on Rocky Slopes
- Water

Fauna Habitats

RIO TINTO

FLORA, VEGETATION AND FAUNA ASSESSMENT – DAMPIER DESALINATION PROJECT

Figure 10.7

Project: \\AUPER1FP001.AU.AECOMNET.COM\Projects\606X\60657149\900_CAD_GIS\920_GIS\02_MXDs\01_ArcGISPro\60657149_06_Dampier_Desal_Surveys.aprx (wyattk2), Layout: 60657149_Fig10_FaunaHabitats_A4P_v1, Last exported: 3/06/2021 4:08 PM

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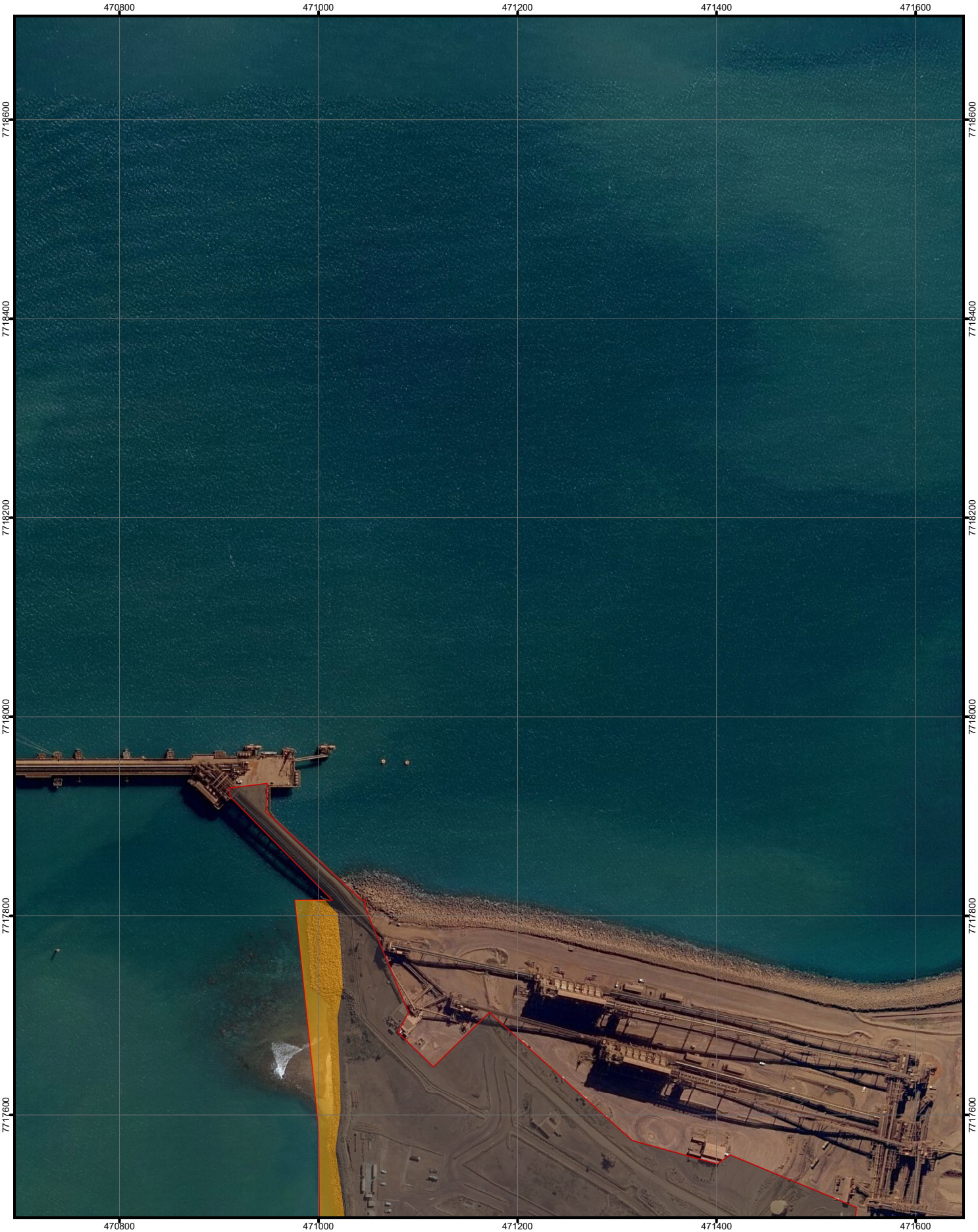

PROJECT ID 60657149
CREATED BY WYATTK2
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Datum: GDA 1994 MGA Zone 50

0 25 50 75 100
metres

Data sources:

Base Data: (c) Based on information provided by and with the permission of the Western Australian Land Information Authority trading as Landgate (2010).Geoscience Australia, Streetpro

LEGEND
- Survey Area
- Fauna Habitat
- Cleared
- Shoreline

Fauna Habitats

RIO TINTO

FLORA, VEGETATION AND FAUNA ASSESSMENT – DAMPIER DESALINATION PROJECT

Figure 10.8

5.4 Fauna Species

A total of 61 fauna species were recorded during the field surveys including six mammal, six reptile, and 49 bird species. Fauna species observed and the habitats they were recorded in are listed in Appendix F.

Two bird species listed as Migratory and Marine under the EPBC Act and Migratory under the BC Act were observed including the Caspian Tern *Hydroprogne caspia* and the Common Sandpiper *Actitis hypoleucos*. Both species were recorded in the Artificial/ephemeral Wetland and Rocky Shoreline habitats respectively, mapped in Figure 10.

Six mammal species were recorded. The Euro *Osphranter robustus* was regularly observed and scats were recorded throughout the survey area. Short-Beaked Echidna *Tachyglossus aculeatus* scats were frequently observed in grassland and creek habitats, and one individual was recorded. One rodent species was captured on motion sensor camera along the man-made wall. The image was unable to provide adequate detail for confident identification. Several bat images were captured that were unable to be confidently identified to species. Other mammal species recorded included the introduced Wild Dog *Canis familiaris* and Feral Cat *Felis catus*,

Six reptile species were recorded including the Ring-tailed Dragon *Ctenophorus caudicinctus caudicinctus*, Bynoe's Gecko *Heteronotia bynoei*, Eastern Pilbara Lined Ctenotus *Ctenotus duricola*, Barred Wedgesnout Ctenotus *Ctenotus schomburgkii* and the Lined Firetail Skink *Morethia ruficauda.* Tracks of a medium sized monitor (*Varanus* sp.) were also noted at one location, with an unidentified dragon species captured on camera in the rocky shoreline habitat.

Forty-nine bird species were recorded, with more recorded during phase I (39 species) compared to phase II (33 species). Thirty of these bird species are predominantly terrestrial based and were observed within or over grasslands and minor creek lines. A few waterbird/wetland species, including Hoary-headed Grebe (*Poliocephalus poliocephalus*), Straw-necked Ibis (*Threskiornis spinicollis*), White-necked Heron (*Ardea pacifica*), Black-fronted Dotterel (*Elseyornis melanops*) were recorded within the Artificial/ephemeral Wetlands habitat.

6.0 Discussion

6.1 Vegetation

Vegetation within the survey are has been largely impacted to some extent by the construction of infrastructure including pipelines, powerlines, road, and altered drainage.

The PEC Burrup Peninsula rock pile communities was identified in the desktop assessment as potentially occurring. Known occurrences of this PEC are approximately 3.3 km from the survey area. The survey area skirts edges of rockpiles that have similar characteristics to the PEC however the survey area follows existing tracks and pipelines that avoid all significant rock piles. The rockpiles in the survey area are not considered to represent this PEC and it has not been recorded previously in the survey area (Biota, 2018; Rio Tinto, 2011).

Seven vegetation communities were identified including five intact and three significantly altered communities. The diversity is typical of linear corridors, and areas where degradation has made determination of the pre-disturbance community difficult. None of the intact vegetation communities are restricted to the survey area.

The Disturbed – Artificial Wetlands community is restricted to the survey area and supports a population of the Priority 3 *Eragrostis surreyana* species. The significance of this artificial community is not considered elevated because it supports a Priority 3 flora population.

6.2 Flora

Flora was considered diverse, with 124 native and six introduced species recorded within a 104 ha area compared to 618 native species known from within a 20 km radius. The diversity reflects the various landforms encountered including wetland/creeks, shoreline, grasslands and rocky slopes. According to the desktop assessment, three flora species of conservation significance were considered ‘likely to occur’ and one ‘may occur’. Each species is briefly outlined below.

***Eragrostis surreyana* (P3)**

E. surreyana was collected during field phase II in the Disturbed – Artificial Wetlands vegetation community (locations presented in Appendix D). The subsequent targeted survey counted approximately 885 individuals in the population. It is likely that population size varies with water availability. This species was considered unlikely to occur in the desktop assessment due to lack of suitable habitat, which is described as “seepage areas near or on sheet rock and on fine alluvial sands on the banks of seasonal streams and drainage lines” (DPaW & Rio Tinto, 2015).

The *E. surreyana* population is restricted to the survey area where it is associated with the standing water in the artificial wetland created in a historical material extraction pit.

***Rhynchosia bungarensis* (P4)**

This species is associated with rocky slopes, rockpiles, rock pools and gullies (WAH, 1998). Suitable habitat within the survey area occurs near Kangaroo Hill Administration Office buildings. Targeted surveys were undertaken however this species was not recorded. Suitable habitat was largely disturbed to some extent from infrastructure, clearing and weed invasion. Due to comprehensive survey efforts and good seasonal conditions, it is considered unlikely that this species occurs in the survey area.

***Rostellularia adscendens* var. *latifolia* (P3)**

This species is known from ironstone soils and rocky hills (WAH, 1998) represented by communities Hummock Grasslands (AbEtTa and SdSfTe) in the survey area. There is a known record of this species from 2007 approximately 7 km southeast of the survey area (Rio Tinto, 2010). There are no DBCA database records within 40 km of the survey area as it is generally associated with the Hamersley Ranges (WAH, 1998). This species is considered unlikely to occur due to lack of suitable habitat.

***Terminalia supranitifolia* (P3)**

This species is associated with the Burrup Peninsula rock formations, rock piles and slopes, with populations recorded 4 km from the survey area. Marginal habitat was present in the survey area, however no individuals were recorded. This species is readily identified in the field as a perennial small tree readily distinguishable from other common species. As such, it is considered unlikely to occur.

***Vigna triodiophila* (P3)**

There are eight records of this species in the vicinity of the survey area, associated with rockpiles and rockpile habitats (Rio Tinto & DPaW, 2015). Suitable habitat in the survey area includes Hummock Grasslands (AbEtTa) near Kangaroo Hill Administration Offices including the edge of rock piles. Targeted searches were undertaken, however no individuals were recorded.

6.3 Fauna Habitats

Four fauna habitats were defined and mapped within the survey area:

- Disturbed - Artificial Ephemeral Wetlands – Seasonally ponded water, occasional mature tree, sedges, herbs and low shrubs provide moderate ground cover. It appears that these relatively flat areas were created by earthworks (e.g. excavation of fill material) associated with the construction of nearby rail/road infrastructure. The value of these areas to fauna is temporary in nature and would be limited to periods when surface water is present, following sufficient rainfall. During these periods, it may provide suitable foraging habitat for the Ghost Bat and some migratory/marine species.
- *Triodia* on rocky slopes – Grasslands with moderate to high ground cover on rocky slopes. Includes some tall shrubs over diverse low herbs, shrubs and grasses. Occurs on skeletal rocky slopes and around rock piles. Varies in complexity from moderate to low in the absence of rock piles to provide shelter. The Grasslands habitat has the potential to be utilised by the conservation significant Northern Quoll, Ghost Bat, Pilbara Olive Python, Lined Soil-crevice Skink (Dampier), Peregrine Falcon and Barn Swallow.
- Minor creek lines – Ephemeral creeks that intersect existing railway. Includes mature trees in varying densities (no hollows observed), low log litter and moderate density groundcover of tussock grasses, herbs and shrubs. The minor creek lines habitat may provide marginal foraging habitat for the Ghost Bat, North-western Free-tailed Bat and some migratory/marine species.
- Rocky shorelines (intertidal) – Rocky/boulder shoreline sloping from existing infrastructure (port) into subtidal areas. Intertidal areas were dominated by oyster encrusted rocks and there were no low tidal sand or mud mudflats exposed seaward of the rocky shoreline (i.e. no mudflat habitat suitable as foraging areas for shorebirds). Isolated patches of mangroves (predominantly *Avicennia marina*) occurred on mid-upper levels of the rocky shoreline. This habitat may provide suitable foraging habitat for some migratory/marine bird species.

Habitats are widespread on the Burrup Peninsula. No fauna species are therefore likely to be restricted to or reliant on the habitats present. The relative value to fauna of habitats within the survey area should be considered in the context of the considerable historical and ongoing disturbance from the construction and operation of infrastructure (rail, road, power and water). The majority of the survey area has been either cleared for placement of infrastructure or contains habitats categorised as degraded. It is within these predominantly modified habitats that the proposed desalination plant and associated pipelines would be located.

6.4 Fauna Species

The Burrup Peninsula supports a diverse terrestrial vertebrate fauna assemblage, with representatives of both the Eyrean and Torresian zoogeographic regions. It is populated with species that have typically adapted to high temperatures and intermittent rainfall (Astron, 2003). When considering its small area by comparison with the overall Pilbara, the species diversity of the Burrup Peninsula is comparatively high. This is partly due to a range of different macrohabitats found on the Burrup Peninsula, but also the diversity of micro-habitats providing food and shelter within each habitat type.

As many as 43 species of mammal, 204 species of bird and 109 species of reptile may inhabit or visit the area and surrounding coastal fringes. Few of these species are restricted to the Burrup Peninsula alone, however some key species are endemic to the Pilbara with several species on the Burrup Peninsula representing isolated populations.

6.4.1 Conservation Significant Fauna

Conservation significant fauna species that either totally or predominantly occur within terrestrial habitats and are likely to occur are discussed in further detail below.

Northern Quoll – *Dasyurus hallucatus*

Northern Quolls on the Burrup Peninsula are likely to inhabit complex landforms of rocky outcrops, which can afford greater cover from predators than more open areas. They will usually den in hollow trees or small caves and crevices in rocky outcrops (DAWE, 2020). According to the DBCA database the nearest record is from 2015, approximately three kilometres from the survey area, and associated with rock piles on the Burrup Peninsula.

Suitable habitat for the Northern Quoll includes the Hummock Grasslands, with marginal habitat present in the Disturbed areas including man-made rock walls, and potentially the Rocky Shoreline. The majority of the rocky outcrops that are present in the survey area are in close proximity to existing infrastructure. It is recognised that there are man-made rocky habitats such as rockwalls/seawalls and road/rail embankments that may be used by Northern Quolls (as per the RTIO personnel anecdotal observation), however these areas are likely to be less important than the rock piles and rocky outcrops adjacent to the survey area that are less subject to disturbance and provide greater connectivity between areas of relatively secure habitat.

There were no opportunistic observations (including motion camera captures) or other evidence (e.g. den sites and scats) collected of this species during the survey.

Ghost Bat - *Macroderma gigas*

This species has been recorded from recent surveys in the King Bay-Hearson Cove area of the Burrup Peninsula (Cardno, 2019) and is known to have a wide distribution along the Pilbara coast and up to 400 km inland. During the daytime they typically roost in caves and rock fissures where temperatures are relatively stable No roosting habitat was observed within the survey area.

The Ghost Bat may forage in all of the fauna habitats mapped in the survey area including the Disturbed - Artificial Wetlands, Hummock Grasslands, Minor Creeks and Disturbed areas.

North-western Free-tailed Bat - *Mormopterus cobourgianus*

This bat species is commonly associated with mangrove habitat, roosts in the hollows of those trees and are known to seek food in that habitat. The species has been recorded from recent biological surveys on the Burrup Peninsula (Hearson Cove – King Bay area) (GHD, 2020).

Isolated mangrove trees were observed along the Rocky Shoreline and this is considered marginal habitat for this species. No roosting habitat was observed within the survey area. The Minor Creek habitat is also considered marginal habitat as it supports larger trees that may provide suitable hollows.

There is extensive suitable habitat for this species south of East Intercourse Island causeway, directly south of the survey area. The North-western Free-tailed Bat is likely to forage in the survey area, but unlikely to depend on this habitat for survival.

Pilbara Olive Python - *Liasis olivaceus barroni*

The Pilbara Olive Python prefers rocky environments such as escarpments, gorges, rock piles and associated water holes, and is terrestrial and rock-inhabiting (Wilson & Swan, 2010). On the Burrup Peninsula they prefer granophyre rock piles and occasionally are found in neighbouring spinifex grasslands (Cardno, 2019). The nearest record is from 2005 located near the Dampier townsite approximately one kilometre from the survey area, however there is anecdotal evidence of this species sighted on two occasions along constructed rock walls (Rio Tinto *pers comm.*). The majority of DBCA records of this species are from the rock formations northeast of the survey area.

No evidence of this species was recorded during the survey. Marginal habitat is available including the Hummock Grasslands on skeletal soils which includes the edge of rock piles and rocky outcrops, and the Disturbed habitat which incorporates man-made rockpiles.

Lined Soil-crevice Skink (Dampier) - *Notoscincus butleri*

The Lined Soil-crevice Skink (Dampier) has been recorded on West Intercourse Island, approximately five kilometres from the survey area. It is generally associated with areas dominated by Hummock grassland near creek and river margins (Biota, 2013).

The Hummock Grasslands fauna habitat in the survey area is considered suitable habitat for this species. No evidence of the species was recorded; however it may utilise this area.

Peregrine Falcon - *Falco peregrinus*

This species is widespread through the Pilbara region and inhabits a variety of environments, including habitats present in the survey area. There are seven records in the vicinity of the survey area on the DBCA database. This species may be a vagrant visitor to the survey area however it is unlikely to be reliant on the habitats present.

6.4.2 Marine and Migratory Species

Field phase I coincided with the annual migratory wader visitation period (October-April), indicating that the results are likely to reflect shorebird usage in the survey area. Two species listed as Migratory and Marine under the EPBC Act and Migratory under the BC Act were observed during the field surveys, including the Caspian Tern *Hydroprogne caspia* and the Common Sandpiper *Actitis hypoleucos*. These species were recorded in the Artificial Wetlands and Rocky Foreshore habitats as per Section 5.4.

Further to this, another seven migratory species were determined as ‘likely to occur’ and 28 ‘may occur’ in the desktop assessment. The majority of species within this category are migratory shorebirds that are protected by international migratory bird agreements such the China-Australia Migratory Bird Agreement (CAMBA), Republic of Korea-Australia Migratory Bird Agreement (ROKAMBA) and the Japan-Australia Migratory Bird Agreement (JAMBA).

The Shoreline habitat is considered to represent suitable to marginal habitat for 13 species listed as Migratory and Marine. The habitat is characterised by boulders, man-made rock walls, and sandy substrates that slope into the subtidal zone. The survey area lacks significant mud or sand flats due to the slope of the beach. The Shoreline habitat does not represent suitable nesting/breeding habitat for Migratory and Marine species. Typically, these species visit the west coast of Australia to feed and rest during their non-breeding period (October to April). This habitat is unlikely to represent ‘core habitat’ for any of these species and is well represented outside the survey area.

The Disturbed – Artificial Wetlands habitat provides suitable foraging habitat for the Common Sandpiper and Caspian Tern, as well as marginal foraging habitat for Pacific Golden Plover and Crested Tern, and vagrant visitors. The value of this habitat is represented by available water. Field phase I and II supported considerable bodies of standing water, however it is expected that these would be seasonally dry.

6.4.3 Short Range Endemic

SREs are species with a patchy distribution of less than 10,000 km^2, generally have slow growth, low fecundity, and poor dispersal capabilities (Harvey, 2002). The EPA have recognised the need to conserve SREs due to their small spatial scales, they are at greater risk of changes in conservation status (EPA, 2009).

Two trapdoor spider species, *Idiosoma* sp., and *Kwonkan* sp., were considered to potentially occur in the survey area based on the desktop assessment (as informed by ALA). Both genera are known to support SRE species, hence they were targeted during the field survey. No suitable habitats for supporting trapdoor species and no evidence of their occurrence was observed in the survey area as almost all areas searched comprised of rocky hard surface unsuitable for burrowing spiders.

7.0 Conclusion

A flora, vegetation and fauna habitat assessment was completed by AECOM on behalf of Rio Tinto for the Dampier Desalination Project. The survey area included a linear corridor with several larger construction areas for the Dampier Desalination Project.

A detailed desktop assessment, two field phases across two seasons, and a reporting component was completed, in summary:

- Five native vegetation communities and three altered communities were described and mapped. None are considered representative of a Threatened or Priority Ecological Community. The community Disturbed – Artificial Ephemeral Wetland is restricted to the survey area and supports a Priority 3 flora population. All intact vegetation communities are considered common and widespread on the Burrup Peninsula.
- The majority of the survey area has been either previously cleared for placement of infrastructure; reclaimed (plant area); or habitats categorised as degraded. It is within predominantly modified habitats that the proposed desalination plant and associated pipelines would be located.
- Flora diversity was high, a reflection of the numerous landforms encountered which is typical of linear survey areas.
- One population of a Priority 3 flora species, *Eragrostis surreyana* was recorded in the 'Disturbed – Artificial Ephemeral Wetland' community comprising 885 individuals. Total population size is likely to vary over time dependent on water availability and seasonality.
- Five fauna habitats were mapped. Fauna habitats were considered 'suitable' and 'marginal' for 13 species listed as 'likely to occur' and eight species that 'may occur' from the desktop assessment. It is expected that none of the identified conservation significant species are likely to be restricted to, or reliant on, the habitat in the survey area.
- Two species listed as Migratory and Marine under the EPBC Act and Migratory under the BC Act were observed during the field surveys, including the Caspian Tern *Hydroprogne caspia* and the Common Sandpiper *Actitis hypoleucos*.
- The relative value to fauna of habitats within the survey area also needs to be considered in the context of the considerable historical and ongoing disturbance from the construction and operation of existing port related infrastructure (rail, road, power and water).

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Appendix A

Desktop Results

A1: Conservation Significant Flora

A2: Conservation Significant Fauna

A3: Naturemap Species List

A4: EPBC Protected Matters Search Report

Appendix A

A1: Conservation Significant Flora
A2: Conservation Significant Fauna
A3: Naturemap Species List
A4: EPBC Protected Matters Search Report

Species	Cons.Status		Habitat[1]	Count Date	Likelihood of Occurrence	Justification
	EPBC	WA				
Abutilon sp. Pritzelianum (S. van Leeuwen 5095)		P3	Coastal to near coastal sand dunes, margins of estuaries, coastal plains in open scrubby vegetation (DPaW & Rio Tinto, 2015).	1982	Unlikely	No suitable habitat.
Atriplex lindleyi subsp. *conduplicata*		P3	Edge of crabhole plain. Sprase tussock grassland of Eragrostis xerophila.	1996	Unlikely	No suitable habitat.
Corchorus congener		P3	Sand, red sandy loam with limestone. Sand dunes, plains.	No records, naturemap only	Unlikely	No suitable habitat, no records nearby.
Cucumis sp. Barrow Island (D.W. Goodall 1264)		P2	Lower footslope of a basalt hill. Area burnt. Limestone plateau. Swale in a sandplain. Wide, 3m deep wash in a limestone landscape. Gentle calcrete slope. Red, sandy loam.	2011 (Rio Tinto)	Unlikely	No suitable habitat.
Eragrostis surreyana		P3	Seasonally wet areas. Shallow soils over rock and deep fine alluvial sands of creeks.	2009	Unlikely	No suitable habitat.
Euphorbia australis var. *glabra*		P2	Floodplains or edge of dry creek.	No records, naturemap only	Unlikely	No suitable habitat, no records nearby.
Glycine falcata		P3	Stony loam or cracking clays, typically in grassland in low lying areas.	2011	Unlikely	No suitable habitat.
Gomphrena cucullata		P3	Plains, red soils (loam/sand) in grassland. Open floodplains.	2012	Unlikely	No suitable habitat. Records from further inland.
Gomphrena leptophylla		P3	Sandy open flats in *Acacia* low open woodland with *Eremophila* spp. and grasses, sandy creek beds and floodplains with *E. camaldulensis*, sandy or clayey loam with *Melaaleuca* spp. and *Triodia* spp., on edges of saltpans and marshes or in low scrub and spinifex (DPaW & Rio Tinto, 2015).	2004	Unlikely	No suitable habitat.
Goodenia pallida		P1	Red soils. Annual grassland.	2001	Unlikely	No suitable habitat.
Gymnanthera cunninghamii		P3	Known from areas surrounding permanent or semi-permanent water-courses in sandy soils.	1987	Unlikely	No suitable habitat.
Oldenlandia sp. Hamersley Station (A.A. Mitchell PRP 1479)		P3	Cracking clay, basalt. Gently undulating plain with large surface rocks, flat crabholed plain.	2005	Unlikely	No suitable habitat.
Rhynchosia bungarensis		P4	Associated with rocky slopes, rockpiles, rock pools and gullies.	2010	Likely	Numerous records nearby associated with linear rock formation. Suitable habitat may be present in survey area.
Rostellularia adscendens var. *latifolia*		P3	Ironstone soils. Near creeks, rocky hills.	2007 (Rio Tinto)	May	One record (2007), suitable habitat potentially present. Not been associated with Dampier Peninsula previously.
Schoenus punctatus		P3	Mud. Watercourses.	1999	Unlikely	No suitable habitat.
Solanum albostellatum		P3	Cracking clay soils on open floodplains in open scrubland over grasses.	2011	Unlikely	No suitable habitat.
Stackhousia clementii		P3	Saline soil over limestone or sandy loam clay flats.	2013	Unlikely	No suitable habitat.
Tephrosia rosea var. Port Hedland (A.S. George 1114)		P1	Coastal ridge, pale orange dune sands.	2012	Unlikely	No suitable habitat.
Terminalia supranitifolia		P3	Rocky outcrops, slopes, piles. Among basalt rocks and on sand.	2003	Likely	Numerous records nearby associated with linear rock formation. Suitable habitat may be present in survey area.
Themeda sp. Hamersley Station (M.E. Trudgen 11431)		P3	Drainage lines, clay flats, crabhole flats and self mulching clays.	2007	Unlikely	No suitable habitat.
Trianthema sp. Python Pool (G.R. Guerin & M.E. Trudgen GG 1023)		P2	Floodplain, undulating hills, low-lying sandy areas and gibber plains.	2004	Unlikely	No suitable habitat.
Vigna triodiophila		P3	Scree and rockpiles.	2009	Likely	Numerous records nearby associated with linear rock formation. Suitable habitat may be present in survey area.

Scientific Name	Common Name	Cons. Status		Last Record	Count	Distance from Survey Area of	Ecology	Likelihood of Occurrence	Justification
		EPBC Act	DBCA / BC Act						
Birds									
Actitis hypoleucos	Common Sandpiper	Mi, Ma	MI	2017	24	1 km	The Common Sandpiper is widespread in small numbers utilising a wide range of coastal wetlands and some inland wetlands where it forages in muddy margins or rocky shores and rarely on mudflats. The Common Sandpiper has been recorded in estuaries and deltas of streams, as well as on banks farther upstream; around lakes, pools, billabongs, reservoirs, dams and claypans, and occasionally piers and jetties . Areas of national importance within Western Australia include Nuytsland Nature Reserve and Roebuck Bay (Watkins, 1993).	Likely to occur	Suitable habitat present, numerous records in vicinity.
Anous stolidus	Common Noddy (Brown Noddy)	Mi, Ma	MI	1988	2	9 km	The Common Noddy occupies blue-water seas, usually far from the mainland and is distributed in Western Australia from northern seas south to Lancelin Island (Johnstone & Storr, 1998).	Unlikely to occur	Habitat in survey area restricted to coastline. No recent records.
Apus pacificus	Pacific Swift (Fork-tailed Swift)	Mi, Ma	MI	-		-	The Fork-tailed Swift is widespread in coastal and subcoastal areas between Augusta and Carnarvon and sparsely scattered inland and along the coast from Augusta to Carnarvon and south-west Pilbara to the north and east Kimberley region. It is almost exclusively aerial, and a non-breeding visitor to Australia. They mostly occur over inland plains over dry or open habitats, including riparian woodland and tea-tree swamps, low scrub, heathland or saltmarsh but sometimes above foothills or in coastal areas.	Unlikely to occur	No known records in vicinity. Suitable habitat present.
Ardenna pacifica	Wedge-tailed Shearwater	Mi, Ma	MI	1981	4	7 km	The Wedge-tailed Shearwater is a pelagic, marine bird known from tropical and subtropical waters. In Australia, the species breeds on offshore islands and both the east and west coast.	Unlikely to occur	No recent records. Habitat in survey area unlikely to be significant for this species.
Arenaria interpres	Ruddy Turnstone	Mi, Ma	MI	2017	28	1 km	The Ruddy Turnstone are mainly found on exposed rocks or reefs, often with shallow pools, and on beaches. In the north, they are found in a wider range of habitats, including mudflats.	Likely to occur	Suitable habitat present, numerous records in vicinity.
Calidris acuminata	Sharp-tailed Sandpiper	Mi, Ma	MI	2017	15	5 km	The Sharp-tailed Sandpiper are widespread in Western Australia from the Pilbara region to the south-west. They prefer muddy edges of shallow fresh or brackish wetlands, with inundated or emergent sedges, grass, saltmarsh or other low vegetation.	May occur	Suitable habitat present, represented by disturbed - artificial wetlands. Several recent records.
Calidris alba	Sanderling	Mi, Ma	MI	2017	7	5 km	The Sanderling is almost always found on the coast where they forage in the wave-wash zone and in rotting seaweed. This species occurs from the coast near Eyre to Derby, however is more common on the southern and south-west coasts.	May occur	Potentially suitable habitat present, recent records in vicinity.
Calidris canutus	Red Knot	EN, Mi, Ma	EN	2016	3	5 km	The Red Knot mainly inhabits intertidal mudflats, sand flats, in estuaries, bays and lagoons. They are occasionally seen on inland salt lakes and wetlands but hardly ever use freshwater swamps.	May occur	Marginal intertidal mudflats, few records nearby
Calidris ferruginea	Curlew Sandpiper	CR, Ma, Mi	CE	2017	21	5 km	Curlew Sandpipers mainly occur on intertidal mudflats in sheltered coastal areas and less often recorded inland around ephemeral and permanent lakes, dams, waterholes and bore drains, usually with bare edges of mud or sand.	May occur	Potentially suitable habitat present, numerous records in vicinity.
Calidris melanotos	Pectoral sandpiper	Mi, Ma	MI	-		-	The Pectoral Sandpiper occupies shallow, fresh waters often containing low grass or other small herbs. It is also observed in swamp margins, flooded pastures and saltmarshes. This species breeds in the northern hemisphere and is a regular though uncommon summer visitor to Australia (Pizzey & Knight, 2007). Rarely recorded in Western Australia .	Unlikely to occur	No records of the species in vicinity, uncommon in Western Australia.
Calidris ruficollis	Red-necked Stint	Mi, Ma	MI	2017	19	3 km	The Red-necked Stint is found in coastal areas including sheltered inlets, bays, lagoons and estuaries with intertidal mudflats.	May occur	Marginal intertidal mudflat habitat. Only one record in vicinity.
Calidris subminuta	Long-toed Stint	Mi, Ma	MI	2016	5	7 km	The Long-toed Stint occurs in terrestrial wetlands. They prefer shallow freshwater or brackish wetlands. It has also been found on muddy shorelines, growths of short grass, weeds, sedges, low or floating aquatic vegetation, reeds, rushes and occasionally stunted samphire.	May occur	Vagrant visitor, one record from vicinity.
Calidris tenuirostris	Great Knot	CR, Ma, Mi	CE	2017	8	7 km	Restricted to coastal habitats around Australia utilising sheltered coastal habitats with large intertidal mudflats or sandflats (inlets, bays, harbours, estuaries, lagoons) .	May occur	Vagrant visitor. Marginal intertidal mudflats, few records nearby
Calonectris leucomelas	Streaked Shearwater	Mi, Ma	MI	-		-	Common and widespread around much of the northern coast of Australia the Streaked Shearwater rarely ventures inland (Knight & Pizzey 2007)	Unlikely to occur	No known records in vicinity.
Charadrius leschenaultii	Large Sand Plover	VU, Mi, Ma	VU	2017	22	1 km	It inhabits littoral and estuarine habitats, sheltered sandy shelly or muddy beaches with large intertidal mudflats or sandbanks, and sandy estuarine lagoons, inshore reefs, rock platforms, small rocky islands or sand cays on coral reefs . Important areas of habitat in WA include Eighty Mile Beach, Roebuck Bay and Ashmore Reef (DAWE, 2020).	Likely to occur	Suitable habitat present, numerous records in vicinity.

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Charadrius mongolus	Lesser Sand Plover	EN, Mi, Ma	EN	2017	8	7 km	It occurs in littoral and estuarine environments, large intertidal sandflats or mudflats, sandy ocean beaches, coral reefs, wave-cut rock platforms and rocky outcrops . Important WA sites include Eighty Mile Beach, Roebuck Bay, Broome and Port Hedland Saltworks .	Likely to occur	Suitable habitat present, numerous records in vicinity.
Charadrius veredus	Oriental Plover, Oriental Dotterel	Mi, Ma	MI	2016	4	7 km	The Oriental Plover are common in coastal and northern inland Australia, this species can venture far from water and has been observed frequenting ploughed land, bare claypans, coastal margins and open plains (Pizzey & Knight, 2007).	May occur	Potentially suitable habitat present, numerous records in vicinity.
Cuculus optatus	Oriental Cuckoo, Horsfield's Cuckoo	Mi	MI	1977	1	9 km	The Oriental cuckoo occurs along the north coast from Karratha to the Northern Territory border. The Oriental Cuckoos are found mostly in forest and woodland.	Unlikely to occur	No suitable habitat, one record inland.
Falco peregrinus	Peregrine Falcon		OS	2012	7	8 km	A well-known falcon, the Peregrine inhabits a vast array of environs in Australia. Usually uncommon and migratory (Pizzey & Knight, 2007). This species lays its eggs in recesses of cliff faces, tree hollows or large abandoned nests (Bamford, 2009)	Likely to occur	Suitable habitat present, several records in vicinity.
Fregata ariel	Lesser Frigatebird, Least Frigatebird	Mi, Ma	MI	1981	4	9 km	The Lesser Frigatebird is a breeding visitor to the tropical/subtropical waters of Western Australia with breeding colonies on Christmas island. Only seen on the mainland's north coast prior to cyclonic events (Lindsey, 1986; DAWE, 2021).	Unlikely to occur	Vagrant visitor, known records in vicinity. May forage in survey area.
Gelochelidon nilotica	Gull-billed Tern	Mi	MI	2017	4	8 km	The Gull-billed Terns are found in freshwater swamps, brackish and salt lakes, beaches and estuarine mudflats, floodwaters, sewage farms, irrigated croplands and grasslands. They are only rarely found over the ocean.	May occur	Potentially suitable habitat present, known records in vicinity.
Glareola maldivarum	Oriental Pratincole	Mi, Ma	MI	2013	3	9.5 km	The Oriental Pratincole inhabits open plains, floodplains or short grassland (including farmland), often occurring near terrestrial wetlands, and also occurring along the coast. The species does not breed in Australia.	May occur	Potentially suitable habitat present, some recent records in vicinity.
Hirundo rustica	Barn Swallow	Mi, Ma	MI	2016	4	8 km	The Barn Swallow is widespread in northern Australia during the summer months (Pizzey & Knight, 2007). Habitat includes open country, agricultural land, especially near water, railyards and towns (Pizzey & Knight, 2007).	May occur	Potentially suitable habitat present, some recent records in vicinity.
Hydroprogne caspia	Caspian Tern	Mi, Ma	MI	2017	30	0 km	The largest tern in Australia, the Caspian Tern is widespread in coastal regions, breeding on variable types of sites including low islands, cays, spits, banks, ridges, beaches of sand or shell, terrestrial wetlands and stony or rocky islets or banks.	Likely to occur	Suitable habitat present, numerous records in vicinity.
Limicola falcinellus	Broad-Billed Sandpiper	Mi, Ma	MI	2017	5	7 km	The Broad-billed Sandpiper occurs in sheltered parts of the coast, particularly estuarine mudflats, occasionally saltmarshes, shallow freshwater lagoons, saltworks and sewage farms and areas with large soft intertidal mudflats. They've also been observed on reefs or rocky platforms.	May occur	Suitable habitat present, some recent records in vicinity.
Limosa lapponica	Bar-tailed Godwit	Mi, Ma	MI	2017	26	1 km	The Bar-tailed Godwit is found in coastal habitats, particularly large intertidal sandflats, banks, mudflats, estuaries, inlets, harbours, coastal lagoons and bays.	Likely to occur	Suitable habitat present, numerous records in vicinity.
Numenius madagascariensis	Eastern Curlew	CR, Ma, Mi	CE	2017	15	5 km	Eastern Curlew is a non-breeding visitor to Australia where it is known from estuaries, mangrove swamps, saltmarshes and intertidal flats (BirdlLife, 2020).	May occur	Suitable habitat may be present, primarily old records from vicinity.
Numenius minutus	Little curlew, Little whimbrel	Mi, Ma	MI	2015	9	1 km	The Little Curlew congregates around pools, river beds and water-filled tidal channels, and shallow water at edges of billabongs. The species prefers pools with bare dry mud (including mudbanks in shallow water) and they do not use pools if they are totally dry, flooded or heavily vegetated (Higgins & Davies 1996). Birds utilise a variety of habitats while resting including grasslands, mudflats and swamps (Higgins & Davies, 1996).	May occur	Potentially suitable habitat present, primarily older records in vicinity.
Numenius phaeopus	Whimbrel	Mi, Ma	MI	2017	27	3 km	The Whimbrel occurs all along the Australian coast and inhabits estuaries, mangroves, tidal flats, flooded paddocks, and bare grasslands (Pizzey & Knight, 2007)	May occur	Potentially suitable habitat present, numerous records in vicinity.
Oceanites oceanicus	Wilson's Storm-petrel	Mi, Ma	MI	2008	2	7 km	Wilson's Storm Petrel spends most of its time at sea, migrating sometimes along the coasts of southern continents, feeding at ocean fronts.	Unlikely to occur	Vagrant visitor. Suitable habitat present, known records in vicinity.
Onychoprion anaethetus	Bridled Tern	Mi, Ma	MI	1994	8	7 km	The Bridled Tern is a non-breeding visitor to Australia. They are found on islands and rocky continental islands and rock stacks, rarely found in inshore continental waters or along mainland coastlines.	May occur	Numerous records in vicinity, potential vagrant visitor. Uncommon on mainland.
Plegadis falcinellus	Glossy Ibis	Mi, Ma	MI	2017	4	15 km	The Glossy Ibis occupies well vegetated wetlands, wet pastures, floodwaters, brackish wetlands and mudflats. This species is a non-breeding visitor to south-west Western Australia (Pizzey & Knight, 2007).	May occur	Marginal habitat present. Records from further inland

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Pluvialis fulva	Pacific Golden Plover	Mi, Ma	MI	2013	5	1 km	The Pacific Golden Plover usually forages on sandy or muddy shores (including mudflats and sandflats) or margins of sheltered areas such as estuaries and lagoons, though it also feeds on rocky shores, islands or reefs. In addition, Pacific Golden Plovers occasionally forage among vegetation, such as saltmarsh, mangroves or in pasture or crops.	Likely to occur	Suitable habitat present, several records in vicinity.
Pluvialis squatarola	Grey Plover	Mi, Ma	MI	2017	10	4.5 km	The Grey Plover is a non-breeding visitor to Australia and are almost entirely coastal inhabiting sheltered embankments, estuaries and lagoons with mudflats and sandflats.	May occur	Marginal habitat present, several records in vicinity.
Rostratula australis	Australian Painted Snipe	E, Ma	EN	-	-	-	The Australian Painted Snipe inhabits shallow terrestrial freshwater (occasionally brackish) wetlands, including temporary and permanent lakes, swamps and claypans. They also use inundated or waterlogged grassland or saltmarsh, dams, rice crops, sewage farms and bore drains.	Unlikely to occur	Marginal habitat (disturbed wetlands) present. No records in vicinity.
Sterna dougallii	Roseate Tern	Mi, Ma	MI	1981	5	9 km	The Roseate Tern occurs in coastal and marine areas in subtropical and tropical seas. The species inhabits rocky and sandy beaches, coral reefs, sand cays and offshore islands. Birds rarely occur in inshore waters or near the mainland, usually venturing into these areas only accidentally, when nesting islands are nearby (Higgins & Davies, 1996).	May occur	Vagrant visitor. Old records from vicinity. Suitable habitat may be present.
Sterna hirundo	Common Tern	Mi, Ma	MI	2000	2	12 km	The Common Tern is a marine, pelagic and coastal species. It has been recorded on ocean beaches, platforms and headlands and in sheltered waters.	May occur	Potentially suitable habitat present, old records in general vicinity.
Sternula albifrons	Little Tern	Mi, Ma	MI	2017	7	5 km	Little Terns inhabit sheltered coastal environments, including lagoons, estuaries, river mouths and deltas, lakes, bays, harbours and inlets, especially those with exposed sandbanks or sand-spits, and also on exposed ocean beaches	May occur	Potentially habitat present, several records in vicinity.
Sternula nereis nereis	Fairy Tern	VU	VU	1990	6	12 km	The Fairy Tern nests on sheltered sandy beaches, spits and banks above the high tide line and below vegetation. It has also been found in embankments.	May occur	Very old records from wider area.
Sula leucogaster	Brown Booby	Mi, Ma	MI	1983	3	6 km	The Brown Booby occurs in, but is not restricted to, tropical waters of all major oceans, often staying close to breeding islands. The species is known to approach mainland coastlines more than other boobies and has been recorded in coastal waters, harbours and estuaries and near offshore islands but seldom flying over land (Marchant & Higgins, 1993).	May occur	Very old records in vicinity. Suitable habitat may be present.
Thalasseus bergii	Great Crested Tern	Mi, Ma	MI	2017	24	1 km	This large tern is predominantly found offshore and coastal, on beaches, bays, inlets, tidal rivers, salt swamps, lakes and larger rivers (Pizzey & Knight, 2010).The Crested Tern is usually a strictly coastal species, though there are occasional records in the arid interior of Australia, where birds were possibly blown by passing tropical cyclones (Birdlife Australia, 2020).	Likely to occur	Suitable habitat present, numerous records in vicinity.
Tringa brevipes	Grey-tailed Tattler	Mi, Ma	P4	2017	33	1 km	The Grey-tailed Tattler is found on sheltered coasts with reefs and rock platforms or with intertidal mudflats. Also found on intertidal rocky, coral or stony reefs, platforms and islets that are exposed at low tide.	Likely to occur	Suitable habitat present, numerous records in vicinity.
Tringa glareola	Wood Sandpiper	Mi, Ma	MI	2017	7	7 km	The Wood Sandpiper uses well-vegetated, shallow, freshwater wetlands, such as swamps, billabongs, lakes, pools and waterholes. They are typically associated with emergent, aquatic plants or grass, and dominated by taller fringing vegetation, such as dense stands of rushes or reeds, shrubs, or dead or live trees, especially *Melaleuca* spp. and *Eucalyptus camaldulensis* and often with fallen timber. (Higgins & Davies, 1996).	May occur	May utilise disturbed artificial wetlands. Little to no intertidal mudflats present. Few records in vicinity.
Tringa nebularia	Common Greenshank, Greenshank	Mi, Ma	MI	2017	36	1 km	The Common Greenshank is known from a variety of inland wetlands and sheltered coastal habitats. It prefers large mudflats and saltmarsh, mangroves or seagrass.	May occur	Vagrant visitor, marginal habitat present, numerous records in vicinity.
Tringa stagnatilis	Marsh Sandpiper, Little Greenshank	Mi, Ma	MI	2017	19	7 km	The Marsh Sandpiper lives in permanent or ephemeral wetlands of varying salinity, including swamps, lagoons, billabongs, saltpans, saltmarshes, estuaries, pools on inundated floodplains, and intertidal mudflats and also regularly at sewage farms and saltworks. They are recorded less often at reservoirs, waterholes, soaks, bore-drain swamps and flooded inland lakes	May occur	May utilise disturbed artificial wetlands. Little to no intertidal mudflats present. Few records in vicinity.
Tringa totanus	Common Redshank, Redshank	Mi, Ma	MI	-	-	-	The Common Redshank is found at sheltered coastal wetlands such as bays, river estuaries, lagoons, inlets and saltmarsh (with bare open flats and banks of mud or sand).	May occur	Habitat present, no known records in vicinity.
Xenus cinereus	Terek sandpiper	Mi, Ma	MI	2017	4	8 km	The Terek Sandpiper is a coastal species, foraging on soft wet intertidal mudflats or sheltered estuaries, embankments, harbours or lagoons. Has been seen on sandy or shingle beaches or rock/coral reefs and platforms. It roosts among mangroves.	May occur	Suitable habitat present, several records in vicinity.

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		EPBC Act	DBCA / BC Act						
Mammals									
Dasyurus hallucatus	Northern quoll	EN	EN	2018	38	4 km	This species occupies a wide range of habitats including, rocky areas, deserts, eucalypt forests and woodlands, hummock grass (Plectrachne spp.), basalt hills, mesas, high and low plateaux, lower slopes, occasional tor fields and stony plains supporting either hard or soft spinifex grasslands (Braithwaite & Griffiths 1994; van Vreeswyk et al. 2004). Northern quolls on the Burrup Peninsula are likely to inhabit complex landforms of rocky outcrops, which can afford greater cover from predators than more open areas (Cardno, 2019). They will usually den in hollow trees or small caves and crevices in rocky outcrops.	Likely to occur	While only limited in extent, some small areas of suitable habitat (i.e. rocky outcrops) occur in the survey area. Anecdotal evidence of this species sighted along rocky wall near shoreline (J. Trainer *pers. comm.*) More extensive and undisturbed rocky outcrops occur to the east and south of the survey area.
Hydromys chrysogaster	Water-rat, Rakali		P4	1996	1	6 km	The Water Rat is one of the few Australian mammals adapted to the aquatic environment. The species occurs in the vicinity of permanent bodies of fresh or brackish water. Dens are made at the end of tunnels in banks and occasionally in logs (Van Dyck & Strahan, 2008).	Unlikely to occur	No permanent bodies of water, one record more than 20 years ago.
Leggadina lakedownensis	Northern Short-tailed Mouse		P4	2006	2	12 km	The Northern Short-tailed most occurs from Cape York to the Pilbara. Known to occur on sandy soils and cracking clays in Western Australia.	Unlikely to occur	No suitable habitat. Not recorded or determined as potential to occur in other recent surveys (Cardno, 2019; GHD, 2020).
Macroderma gigas	Ghost Bat	VU	VU	2006	3	11 km	The Ghost Bat occupy a range of habitats including arid Pilbara to tropical savanna woodlands and rainforests (TSSC, 2016). They roost in caves, rock crevices and old mines during the daytime (TSSC, 2016). Foraging occurs on average 1.9 km from active roosting areas (TSSC, 2016). The species has been recorded from a recent survey in the King Bay-Hearson Cove area of the Burrup Peninsula (Cardno, 2019).	May occur	Roosting habitat is not likely to occur in the survey area but may be present in the nearby ridges and hills. Species likely to be a resident and forage opportunistically in the survey area.
Mormopterus cobourgianus	North-western Free-tailed Bat		P1	2006	3	12 km	The North-western Free-tailed Bat are associated with mangrove habitat and roost in the hollows of those trees and are known to seek food there and in eucalypt or melaleuca woodland or other coastal habitat (ALA 2020). The species has been recorded from a recent survey in the King Bay-Hearson Cove area of the Burrup Peninsula (Cardno, 2019).	May occur	Opportunistic forager in the survey area. No suitable roosting habitat. While only very limited mangrove habitat (i.e. a few scattered trees on a rocky shoreline) occurs within survey area, this species may be an incidental visitor due to the proximity of more suitable mangrove habitat to the south of the East Intercourse Island (EII) causeway.
Pseudomys chapmani	Western Pebble-mound Mouse		P4	1993	1	6 km	The Western Pebble-mound Mouse prefers hummock grasslands, *Triodia basedowii, Acacia* spp. and *Ptilotus* spp. where it creates its own microhabitat by scattering a mound of pebbles around its burrows (Kitchener, 1983; Burbidge, 2016). Several disused mounds have been recorded on the Burrup recently (GHD, 2020).	May occur	Limited suitable habitat present, one record in vicinity.
Reptiles									
Liasis olivaceus barroni	Pilbara Olive Python	VU	VU	2019	20	1 km	The Olive Python (Pilbara subspecies) is known to occur at 17 locations in the Pilbara, mostly in the Hammersley Range and Dampier Archipelago and is terrestrial and rock-inhabiting (Wilson & Swan, 2010). It is often associated with rockpiles around permanent water pools and seasonal creek. On the Burrup Peninsula they prefer granophyre rock piles and occasionally are found in neighbouring spinifex grasslands (Cardno, 2019).	Likely to occur	Suitable habitat present, numerous records in vicinity.
Notoscincus butleri	Lined Soil-crevice Skink (Dampier)		P4	2005	12	6 km	Usually found in hummock grasslands on stony or sandy ground. A relatively poorly known species that has been collected in the Hearson Cove - King Bay area of the Burrup Peninsula.	Likely to occur	Suitable habitat present, numerous records in vicinity.

NatureMap
Mapping Western Australia's biodiversity

NatureMap Species Report

Created By Guest user on 19/04/2021

Method 'By Circle'
Centre 116° 42' 27" E,20° 40' 22" S
Buffer 40km
Group By Family

Family	Species	Records
Acanthaceae	3	75
Aizoaceae	9	65
Amaranthaceae	46	571
Anadyomenaceae	1	20
Apocynaceae	6	107
Araliaceae	4	76
Arecaceae	3	7
Areschougiaceae	1	3
Asteraceae	47	363
Bignoniaceae	1	1
Bonnemaisoniaceae	1	15
Boodleaceae	1	7
Boraginaceae	17	177
Brassicaceae	5	24
Bryopsidaceae	1	2
Cactaceae	1	70
Callithamniaceae	2	11
Campanulaceae	2	5
Capparaceae	2	43
Caryophyllaceae	4	26
Caulerpaceae	22	253
Celastraceae	4	8
Ceramiaceae	2	9
Champiaceae	2	23
Chenopodiaceae	47	523
Cladophoraceae	4	17
Cleomaceae	3	92
Codiaceae	5	13
Combretaceae	4	67
Commelinaceae	1	10
Convolvulaceae	31	240
Corallinaceae	3	7
Corynomorphaceae	1	1
Cucurbitaceae	5	56
Cymodoceaceae	2	38
Cyperaceae	26	137
Cystocloniaceae	3	4
Dasyaceae	3	26
Dasycladaceae	4	21
Delesseriaceae	1	1
Dichotomosiphonaceae	3	12
Ditrichaceae	1	1
Dumontiaceae	1	3
Elatinaceae	2	4
Euphorbiaceae	21	394
Fabaceae	132	1617
Frankeniaceae	3	15
Galaxauraceae	5	51
Gelidiaceae	1	1
Gelidiellaceae	1	10
Gentianaceae	3	5
Geraniaceae	1	1
Goodeniaceae	18	251
Gracilariaceae	3	14
Gyrostemonaceae	1	1
Halimedaceae	8	95
Haloragaceae	1	1
Halymeniaceae	4	22
Hydrocharitaceae	7	71
Hydrolithaceae	1	2
Hymenocladiaceae	1	4
Lamiaceae	4	35
Lauraceae	2	14
Liagoraceae	8	32
Lomentariaceae	2	17
Loranthaceae	3	5
Lythraceae	4	15
Malvaceae	56	538
Marsileaceae	2	2
Meliaceae	1	3
Menispermaceae	1	26
Molluginaceae	3	12
Montiaceae	3	9
Moraceae	8	135
Mychodeaceae	1	1
Myrtaceae	15	71
Nemastomataceae	1	1
Nyctaginaceae	9	101
Oleaceae	2	22
Orobanchaceae	1	10
Passifloraceae	1	14

Peyssonneliaceae	1	1
Phrymaceae	3	7
Phyllanthaceae	10	75
Pittosporaceae	2	40
Plantaginaceae	3	41
Plumbaginaceae	3	46
Poaceae	100	1159
Polygalaceae	3	11
Polygonaceae	1	1
Polyphysaceae	1	3
Portulacaceae	7	78
Primulaceae	1	6
Proteaceae	7	42
Pteridaceae	4	12
Rhamnaceae	2	6
Rhizophoraceae	3	68
Rhizophyllidaceae	1	17
Rhodomelaceae	13	86
Rhodymeniaceae	3	20
Ricciaceae	1	1
Rubiaceae	7	68
Santalaceae	2	18
Sapindaceae	5	61
Schizymeniaceae	1	11
Scinaiaceae	1	1
Scrophulariaceae	3	63
Sebdeniaceae	1	7
Siphonocladaceae	3	30
Solanaceae	21	194
Solieriaceae	2	15
Stylidiaceae	2	5
Surianaceae	1	22
Tamaricaceae	1	4
Thymelaeaceae	1	2
Udoteaceae	6	68
Valoniaceae	3	8
Violaceae	2	51
Wrangeliaceae	1	3
Zygophyllaceae	7	74
TOTAL	**914**	**9277**

	Name ID	Species Name	Naturalised	Conservation Code	[1]Endemic To Query Area
Acanthaceae					
1.	6828	*Avicennia marina (White Mangrove)*			
2.	14555	*Avicennia marina subsp. marina*			
3.	7166	*Dicliptera armata*			
Aizoaceae					
4.	2802	*Gunniopsis calcarea*			
5.	2818	*Sesuvium portulacastrum*			
6.	44305	*Trianthema pilosum*			
7.	2830	*Trianthema portulacastrum (Giant Pigweed)*	Y		
8.	33278	*Trianthema sp. Python Pool (G.R. Guerin & M.E. Trudgen GG 1023)*		P2	
9.	44362	*Trianthema triquetrum*			
10.	44360	*Trianthema turgidifolium*			
11.	2834	*Zaleya galericulata (Hogweed)*			
12.	29095	*Zaleya galericulata subsp. galericulata*			
Amaranthaceae					
13.	2645	*Achyranthes aspera (Chaff Flower)*			
14.	2646	*Aerva javanica (Kapok Bush)*	Y		
15.	2647	*Alternanthera angustifolia*			
16.	2651	*Alternanthera nana (Hairy Joyweed)*			
17.	2652	*Alternanthera nodiflora (Common Joyweed)*			
18.	31076	*Amaranthus cochleitepalus*			
19.	2660	*Amaranthus cuspidifolius*			
20.	2663	*Amaranthus interruptus (Native Amaranth)*			
21.	2666	*Amaranthus mitchellii (Boggabri Weed)*			
22.	20018	*Amaranthus undulatus*			
23.	2671	*Amaranthus viridis (Green Amaranth)*	Y		
24.	2674	*Gomphrena affinis*			
25.	18361	*Gomphrena affinis subsp. pilbarensis*			
26.	2676	*Gomphrena canescens (Batchelors Buttons)*			
27.	18363	*Gomphrena canescens subsp. canescens*			
28.	18360	*Gomphrena cucullata*		P3	
29.	2680	*Gomphrena cunninghamii*			
30.	2682	*Gomphrena flaccida (Gomphrena Weed)*			
31.	18367	*Gomphrena kanisii*			
32.	2683	*Gomphrena leptoclada*			
33.	18257	*Gomphrena leptoclada subsp. leptoclada*			
34.	17894	*Gomphrena leptophylla*		P3	
35.	11131	*Gomphrena sordida*			
36.	31074	*Gomphrena sp. Martins Well (K.F. Kenneally 6116)*			Y
37.	2687	*Gomphrena tenella*			
38.	2690	*Ptilotus aervoides*			
39.	2696	*Ptilotus astrolasius*			
40.	2698	*Ptilotus auriculifolius*			
41.	2699	*Ptilotus axillaris (Mat Mulla Mulla)*			
42.	2704	*Ptilotus calostachyus (Weeping Mulla Mulla)*			
43.	2706	*Ptilotus carinatus*			
44.	2711	*Ptilotus clementii (Tassel Top)*			
45.	2717	*Ptilotus divaricatus (Climbing Mulla Mulla)*			
46.	2721	*Ptilotus exaltatus (Tall Mulla Mulla)*			
47.	2725	*Ptilotus fusiformis*			
48.	2728	*Ptilotus gomphrenoides*			
49.	2729	*Ptilotus grandiflorus*			
50.	2731	*Ptilotus helipteroides (Hairy Mulla Mulla)*			
51.	2734	*Ptilotus incanus*			
52.	2745	*Ptilotus murrayi*			
53.	2746	*Ptilotus nobilis (Tall Mulla Mulla)*			
54.	2747	*Ptilotus obovatus (Cotton Bush)*			
55.	11396	*Ptilotus obovatus var. obovatus*			
56.	2751	*Ptilotus polystachyus (Prince of Wales Feather)*			
57.	2766	*Ptilotus villosiflorus*			
58.	43203	*Surreya diandra*			
Anadyomenaceae					
59.	35872	*Anadyomene plicata*			
Apocynaceae					
60.	6580	*Asclepias curassavica (Redhead Cottonbush)*	Y		

	Name ID	Species Name	Naturalised	Conservation Code	[1]Endemic To Query Area
61.	6567	*Carissa lanceolata (Conkerberry, Marnuwiji)*			
62.	6584	*Cynanchum floribundum (Dumara Bush, Tjipa)*			
63.	48280	*Cynanchum viminale subsp. australe*			
64.	12832	*Gymnanthera cunninghamii*		P3	
65.	6578	*Wrightia saligna*			
Araliaceae					
66.	6270	*Trachymene didiscoides*			
67.	6273	*Trachymene glaucifolia (Wild Carrot)*			
68.	6278	*Trachymene oleracea*			
69.	19043	*Trachymene oleracea subsp. oleracea*			
Arecaceae					
70.		*Cocos nucifera*			Y
71.	1042	*Phoenix dactylifera (Date Palm)*	Y		
72.	17910	*Washingtonia filifera*	Y		
Areschougiaceae					
73.	26823	*Erythroclonium sonderi*			
Asteraceae					
74.	7827	*Angianthus cunninghamii (Coast Angianthus)*			
75.	7832	*Angianthus milnei (Cone-spike Angianthus)*			
76.		*Baccharis sp*			Y
77.	7854	*Bidens bipinnata (Bipinnate Beggartick)*	Y		
78.	7866	*Blumea tenella*			
79.	14090	*Calocephalus beardii*			
80.	7905	*Calotis multicaulis (Many-stemmed Burr-daisy)*			
81.	7906	*Calotis plumulifera*			
82.	7919	*Centipeda minima (Spreading Sneezewood, Kanjirralaa, Inteng-inteng, Karengkal, Kata-palkalpa, Munyu-parnti-parnti)*			
83.	19762	*Centipeda minima subsp. macrocephala*			
84.	33516	*Chrysocephalum gilesii*			
85.	7939	*Conyza bonariensis (Flaxleaf Fleabane)*	Y		
86.	35558	*Flaveria trinervia (Speedy Weed)*	Y		
87.	8088	*Ixiochlamys cuneifolia*			
88.	8095	*Lactuca saligna (Wild Lettuce, Willow-leaf Lettuce)*	Y		
89.		*Launaea sarmenstosa*			
90.	8098	*Launaea sarmentosa*			
91.	8109	*Minuria integerrima (Smooth Minuria)*			
92.	8110	*Minuria leptophylla (Minnie Daisy)*			
93.		*Olearia Kennedy Range (G. Byrne 66)*			
94.	8127	*Olearia axillaris (Coastal Daisybush)*			
95.	42024	*Olearia sp. Kennedy Range (G. Byrne 66)*			
96.	13494	*Pentalepis trichodesmoides*			
97.	42160	*Pentalepis trichodesmoides subsp. trichodesmoides*			
98.	8167	*Pluchea dentex*			
99.	17816	*Pluchea ferdinandi-muelleri*			
100.	43944	*Pluchea longiseta*			
101.	8168	*Pluchea rubelliflora*			
102.	8170	*Pluchea tetranthera*			
103.	8189	*Pseudognaphalium luteoalbum (Jersey Cudweed)*			
104.	8191	*Pterocaulon serrulatum*			
105.		*Pterocaulon sp.*			
106.	8192	*Pterocaulon sphacelatum (Apple Bush, Fruit Salad Plant)*			
107.	8193	*Pterocaulon sphaeranthoides*			
108.	13301	*Rhodanthe floribunda*			
109.	13246	*Rhodanthe humboldtiana*			
110.	13310	*Rhodanthe margarethae*			
111.	45146	*Roebuckiella oncocarpa*			
112.	8231	*Sonchus oleraceus (Common Sowthistle)*	Y		
113.	8234	*Streptoglossa adscendens*			
114.	8235	*Streptoglossa bubakii*			
115.	8236	*Streptoglossa cylindriceps*			
116.	8237	*Streptoglossa decurrens*			
117.	8238	*Streptoglossa liatroides*			
118.	8240	*Streptoglossa odora*			
119.	8241	*Streptoglossa tenuiflora*			
120.	8252	*Tridax procumbens (Tridax, Tridax Daisy)*	Y		
Bignoniaceae					
121.	48390	*Dolichandrone occidentalis*			

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Bonnemaisoniaceae					
122.	26486	*Asparagopsis taxiformis*			
Boodleaceae					
123.	26508	*Boodlea composita*			
Boraginaceae					
124.	6682	*Ehretia saligna (False Cedar)*			
125.	14301	*Ehretia saligna var. saligna*			
126.	17301	*Heliotropium chrysocarpum*			
127.	6704	*Heliotropium conocarpum*			
128.	6705	*Heliotropium crispatum*			
129.	6706	*Heliotropium cunninghamii*			
130.	6707	*Heliotropium curassavicum (Smooth Heliotrope)*			
131.	17305	*Heliotropium glanduliferum*			
132.	6712	*Heliotropium heteranthum*			
133.	17307	*Heliotropium inexplicitum*			
134.	6713	*Heliotropium ovalifolium*			
135.	17309	*Heliotropium pachyphyllum*			
136.	6714	*Heliotropium paniculatum*			
137.	17315	*Heliotropium tanythrix*			
138.	6718	*Heliotropium tenuifolium (Mamukata)*			
139.	6727	*Trichodesma zeylanicum (Camel Bush, Kumbalin)*			
140.	11750	*Trichodesma zeylanicum var. zeylanicum*			
Brassicaceae					
141.	2995	*Brassica x napus*	Y		
142.	3029	*Lepidium linifolium*			
143.	3035	*Lepidium pedicellosum*			
144.	3038	*Lepidium pholidogynum*			
145.	3039	*Lepidium platypetalum (Slender Peppercress)*			
Bryopsidaceae					
146.	27191	*Pseudobryopsis hainanensis*			
Cactaceae					
147.	5227	*Opuntia stricta (Common Prickly Pear)*	Y		
Callithamniaceae					
148.	26450	*Aglaothamnion cordatum*			
149.	26706	*Crouania attenuata*			
Campanulaceae					
150.	37480	*Lobelia arnhemiaca*			
151.	7393	*Wahlenbergia tumidifructa*			
Capparaceae					
152.	2981	*Capparis spinosa*			
153.	48291	*Capparis spinosa subsp. nummularia*			
Caryophyllaceae					
154.	2898	*Polycarpaea corymbosa*			
155.	12075	*Polycarpaea corymbosa var. corymbosa*			
156.	2901	*Polycarpaea holtzei*			
157.	2903	*Polycarpaea longiflora*			
Caulerpaceae					
158.	26554	*Caulerpa brachypus*			
159.	42620	*Caulerpa chemnitzia*			
160.	26558	*Caulerpa constricta*			
161.	35158	*Caulerpa corynephora*			
162.	26559	*Caulerpa cupressoides*			
163.	47053	*Caulerpa cupressoides var. cupressoides*			
164.	47054	*Caulerpa cupressoides var. elegans*			
165.	27378	*Caulerpa cupressoides var. lycopodium*			
166.	36368	*Caulerpa cupressoides var. mamillosa*			Y
167.	44539	*Caulerpa cylindracea*			
168.	26562	*Caulerpa fergusonii*			
169.	44547	*Caulerpa lamourouxii*			
170.	26568	*Caulerpa lentillifera*			
171.	37643	*Caulerpa parvifolia*			
172.	26573	*Caulerpa racemosa*			
173.	35122	*Caulerpa racemosa var. racemosa*			
174.	26576	*Caulerpa serrulata*			
175.	26577	*Caulerpa sertularioides*			

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176.	26579	*Caulerpa taxifolia*			
177.	35124	*Caulerpa taxifolia var. taxifolia*			
178.	26582	*Caulerpa verticillata*			
179.	26584	*Caulerpa webbiana*			
Celastraceae					
180.	4729	*Stackhousia clementii*		P3	
181.	4731	*Stackhousia intermedia*			
182.	19555	*Stackhousia muricata subsp. annual (W.R. Barker 2172)*			
183.	4736	*Stackhousia umbellata*		P3	
Ceramiaceae					
184.	26587	*Centroceras clavulatum*			
185.	27310	*Spyridia filamentosa*			
Champiaceae					
186.	26619	*Champia stipitata*			
187.	26691	*Coelothrix irregularis*			
Chenopodiaceae					
188.	2450	*Atriplex amnicola (Swamp Saltbush)*			
189.	2451	*Atriplex bunburyana (Silver Saltbush)*			
190.	2453	*Atriplex codonocarpa (Flat-topped Saltbush)*			
191.	2463	*Atriplex isatidea (Coast Saltbush)*			
192.	2466	*Atriplex lindleyi*			
193.	17520	*Atriplex lindleyi subsp. conduplicata*		P3	
194.	2476	*Atriplex semilunaris (Annual Saltbush)*			
195.	33479	*Dysphania melanocarpa (Black Crumbweed)*			
196.	2504	*Dysphania plantaginella*			
197.	2506	*Dysphania rhadinostachya*			
198.	11653	*Dysphania rhadinostachya subsp. inflata*			
199.	11890	*Dysphania rhadinostachya subsp. rhadinostachya*			
200.	2511	*Enchylaena tomentosa (Barrier Saltbush)*			
201.	12064	*Enchylaena tomentosa var. tomentosa (Barrier Saltbush)*			
202.	2544	*Maireana georgei (Satiny Bluebush)*			
203.	2556	*Maireana planifolia (Low Bluebush)*			
204.	2564	*Maireana stipitata*			
205.	11662	*Maireana tomentosa subsp. tomentosa*			
206.	2573	*Neobassia astrocarpa*			
207.	2582	*Rhagodia eremaea (Thorny Saltbush)*			
208.	2584	*Rhagodia preissii*			
209.	11240	*Rhagodia preissii subsp. obovata*			
210.	11254	*Rhagodia preissii subsp. preissii*			
211.	30434	*Salsola australis*			
212.	2597	*Sclerolaena bicornis (Goathead Burr)*			
213.	11650	*Sclerolaena bicornis var. bicornis (Goathead Burr)*			
214.	2604	*Sclerolaena costata*			
215.	2607	*Sclerolaena densiflora*			
216.	2609	*Sclerolaena diacantha (Grey Copperburr)*			
217.	8877	*Sclerolaena gardneri*			
218.	2616	*Sclerolaena glabra*			
219.	2617	*Sclerolaena hostilis*			
220.	2633	*Sclerolaena uniflora (Two-spined Saltbush)*			
221.	2638	*Suaeda arbusculoides*			
222.	31616	*Tecticornia auriculata*			
223.	33236	*Tecticornia halocnemoides (Shrubby Samphire)*			
224.	33240	*Tecticornia halocnemoides subsp. longispicata*			
225.	33238	*Tecticornia halocnemoides subsp. tenuis*			
226.	33317	*Tecticornia indica*			
227.	33319	*Tecticornia indica subsp. bidens*			
228.	33356	*Tecticornia indica subsp. indica*			
229.	33357	*Tecticornia indica subsp. julacea*			
230.	33318	*Tecticornia indica subsp. leiostachya (Samphire)*			
231.	33299	*Tecticornia pergranulata subsp. elongata*			
232.	31618	*Tecticornia pruinosa*			
233.	33220	*Tecticornia pterygosperma subsp. denticulata*			
234.	2644	*Threlkeldia diffusa (Coast Bonefruit)*			
Cladophoraceae					
235.	44320	*Chaetomorpha basiretrorsa*			Y
236.	26612	*Chaetomorpha melagonium*			
237.	35865	*Cladophora catenata*			
238.	36316	*Cladophora herpestica*			

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Cleomaceae					
239.	2985	*Cleome oxalidea*			
240.	2987	*Cleome uncifera*			
241.	2988	*Cleome viscosa (Tickweed, Tjinduwadhu)*			
Codiaceae					
242.	35917	*Codium arabicum*			
243.	47113	*Codium arenicola*			Y
244.	35857	*Codium dwarkense*			
245.	26673	*Codium geppiorum*			
246.		*Codium platyclados*			Y
Combretaceae					
247.	5300	*Terminalia canescens (Joolal)*			
248.	45698	*Terminalia circumalata*			
249.	5310	*Terminalia platyphylla (Wild Plum, Durin)*			
250.	5313	*Terminalia supranitifolia*		P3	
Commelinaceae					
251.	1165	*Commelina ensifolia (Wandering Jew, Buargu)*			
Convolvulaceae					
252.	11167	*Bonamia erecta*			
253.	6605	*Bonamia linearis*			
254.	6606	*Bonamia media*			
255.	6608	*Bonamia pannosa*			
256.	44782	*Bonamia pilbarensis*			
257.	6609	*Bonamia rosea (Felty Bellflower)*			
258.	19880	*Convolvulus angustissimus*			
259.	6612	*Convolvulus clementii*			
260.	19565	*Cressa australis*			
261.	6662	*Cuscuta australis (Australian Dodder)*			
262.	13733	*Cuscuta victoriana*			
263.	48738	*Distimake dissectus var. dissectus*	Y		
264.	31274	*Duperreya commixta*			
265.	6617	*Evolvulus alsinoides (Tropical Speedwell)*			
266.	11200	*Evolvulus alsinoides var. villosicalyx*			
267.	6623	*Ipomoea coptica*			
268.	6624	*Ipomoea costata (Rock Morning Glory, Kanti)*			
269.	6631	*Ipomoea lonchophylla (Cowvine)*			
270.	6632	*Ipomoea macrantha*			
271.	6633	*Ipomoea muelleri (Poison Morning Glory, Yumbu)*			
272.	6635	*Ipomoea pes-caprae*			
273.	11312	*Ipomoea pes-caprae subsp. brasiliensis*			
274.	6636	*Ipomoea plebeia (Bellvine)*			
275.	6637	*Ipomoea polymorpha*			
276.		*Ipomoea sp.*			
277.	6651	*Operculina aequisepala*			
278.	6652	*Operculina brownii (Potato Vine, Bara)*			
279.	6653	*Polymeria ambigua (Morning Glory)*			
280.	6655	*Polymeria calycina*			
281.	17513	*Polymeria lanata*			
282.		*Polymeria sp.*			
Corallinaceae					
283.	26461	*Amphiroa foliacea*			
284.	26462	*Amphiroa fragilissima*			
285.	27037	*Lithophyllum kotschyanum*			
Corynomorphaceae					
286.	26698	*Corynomorpha prismatica*			
Cucurbitaceae					
287.	41720	*Cucumis argenteus*			
288.	7371	*Cucumis melo (Ulcardo Melon)*			
289.	41721	*Cucumis variabilis*			
290.	7381	*Trichosanthes cucumerina*			
291.	12032	*Trichosanthes cucumerina var. cucumerina*			
Cymodoceaceae					
292.	131	*Halodule uninervis*			
293.	132	*Syringodium isoetifolium*			
Cyperaceae					

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294.	750	*Bulbostylis barbata*			
295.	752	*Bulbostylis turbinata*			
296.	774	*Cyperus bifax (Downs Nutgrass)*			
297.	12801	*Cyperus blakeanus*			
298.	777	*Cyperus bulbosus (Bush Onion, Tjanmata)*			
299.	786	*Cyperus cunninghamii*			
300.	12811	*Cyperus cunninghamii subsp. cunninghamii*			
301.	789	*Cyperus difformis (Rice Sedge)*			
302.	798	*Cyperus iria*			
303.	804	*Cyperus nervulosus*			
304.	807	*Cyperus pulchellus*			
305.	814	*Cyperus squarrosus*			
306.	818	*Cyperus vaginatus (Stiffleaf Sedge)*			
307.	826	*Eleocharis dulcis (Chinese Water Chestnut)*			
308.	827	*Eleocharis geniculata*			
309.	851	*Fimbristylis dichotoma (Eight Day Grass)*			
310.	853	*Fimbristylis elegans*			
311.	855	*Fimbristylis ferruginea*			
312.	859	*Fimbristylis littoralis*			
313.	862	*Fimbristylis microcarya*			
314.	878	*Fimbristylis rara*			
315.	880	*Fimbristylis schultzii*			
316.	12159	*Fimbristylis simulans*			
317.	16257	*Schoenoplectus subulatus*			
318.	1006	*Schoenus odontocarpus*			
319.	1010	*Schoenus punctatus*		P3	
Cystocloniaceae					
320.	35922	*Hypnea cornuta*			
321.	26970	*Hypnea pannosa*			
322.	26972	*Hypnea spinella*			
Dasyaceae					
323.	26738	*Dasya elongata*			
324.	26740	*Dasya frutescens*			
325.	26930	*Heterosiphonia crassipes*			
Dasycladaceae					
326.	26509	*Bornetella oligospora*			
327.	26510	*Bornetella sphaerica*			
328.	44548	*Neomeris bilimbata*			
329.	27099	*Neomeris van-bosseae*			
Delesseriaceae					
330.	27056	*Martensia elegans*			
Dichotomosiphonaceae					
331.	48138	*Avrainvillea carteri*			
332.	36362	*Avrainvillea erecta*			
333.	26498	*Avrainvillea obscura*			
Ditrichaceae					
334.	32348	*Eccremidium arcuatum*			
Dumontiaceae					
335.	26851	*Gibsmithia hawaiiensis*			
Elatinaceae					
336.	5183	*Bergia ammannioides*			
337.	5186	*Bergia trimera*			
Euphorbiaceae					
338.	4583	*Adriana tomentosa*			
339.	17422	*Adriana tomentosa var. tomentosa*			
340.	4617	*Euphorbia australis (Namana)*			
341.	35307	*Euphorbia australis var. australis*			
342.	42843	*Euphorbia australis var. glabra*		P2	
343.	35303	*Euphorbia australis var. subtomentosa*			
344.	4619	*Euphorbia biconvexa*			
345.	4620	*Euphorbia boophthona (Gascoyne Spurge)*			
346.	9048	*Euphorbia careyi*			
347.	4623	*Euphorbia coghlanii (Namana)*			
348.	4626	*Euphorbia drummondii (Caustic Weed, Piwi)*			
349.	4629	*Euphorbia hirta (Asthma Plant)*	Y		
350.	4634	*Euphorbia mitchelliana*			

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351.	4635	*Euphorbia myrtoides*			
352.	4642	*Euphorbia schultzii*			
353.	4644	*Euphorbia sharkoensis*			
354.	4647	*Euphorbia tannensis*			
355.	12097	*Euphorbia tannensis subsp. eremophila (Desert Spurge)*			
356.	42879	*Euphorbia trigonosperma*			
357.	13281	*Euphorbia vaccaria*			
358.	42876	*Euphorbia vaccaria var. vaccaria*			
Fabaceae					
359.		*Acacia Airlie Island (V. Long VL163)*			
360.	3209	*Acacia ampliceps*			
361.	44580	*Acacia ampliceps x bivenosa*			
362.	44586	*Acacia ampliceps x sclerosperma subsp. sclerosperma*			
363.	3214	*Acacia ancistrocarpa (Fitzroy Wattle)*			
364.	3223	*Acacia arida*			
365.	3241	*Acacia bivenosa*			
366.	44588	*Acacia bivenosa x sclerosperma subsp. sclerosperma*			
367.	3260	*Acacia citrinoviridis*			
368.	13403	*Acacia colei*			
369.	17013	*Acacia colei var. colei*			
370.	3270	*Acacia coriacea (Wirewood)*			
371.	13500	*Acacia coriacea subsp. coriacea*			
372.	13502	*Acacia coriacea subsp. pendens*			
373.	16174	*Acacia elachantha*			
374.	12673	*Acacia glaucocaesia*			
375.	3356	*Acacia gregorii (Gregory's Wattle)*			
376.	3372	*Acacia holosericea (Candelbra Wattle, Liringgin)*			
377.	3377	*Acacia inaequilatera (Baderi)*			
378.	3419	*Acacia ligulata (Umbrella Bush, Watarka)*			
379.	3434	*Acacia maitlandii (Maitland's Wattle)*			
380.	3471	*Acacia orthocarpa (Needleleaf Wattle)*			
381.	3506	*Acacia pyrifolia (Ranji Bush, Kandji)*			
382.	29016	*Acacia pyrifolia var. morrisonii*			
383.	29015	*Acacia pyrifolia var. pyrifolia*			
384.	15203	*Acacia sabulosa*			
385.	13078	*Acacia sclerosperma subsp. sclerosperma*			
386.	29135	*Acacia sericophylla*			
387.	29102	*Acacia sp. Airlie Island (V. Long VL 163)*			
388.	3551	*Acacia sphaerostachya*			
389.	19456	*Acacia stellaticeps*			
390.	13070	*Acacia synchronicia*			
391.	3573	*Acacia tenuissima*			
392.	3579	*Acacia trachycarpa (Minni Ritchi, Balgali)*			
393.	3585	*Acacia tumida (Pindan Wattle, Walgali)*			
394.	20319	*Acacia tumida var. pilbarensis*			
395.	3606	*Acacia xiphophylla*			
396.	3680	*Aeschynomene indica (Budda Pea)*			
397.	3609	*Albizia lebbeck*			
398.	17147	*Alysicarpus muelleri*			
399.	11055	*Cajanus cinereus*			
400.	10972	*Cajanus marmoratus*			
401.	11150	*Cajanus pubescens*			
402.	3749	*Canavalia rosea (Wild Jack Bean)*			
403.	3769	*Clitoria ternatea*	Y		
404.	3774	*Crotalaria cunninghamii (Green Birdflower, Bilbun)*			
405.	20176	*Crotalaria cunninghamii subsp. cunninghamii*			
406.	19378	*Crotalaria dissitiflora subsp. benthamiana*			
407.	3783	*Crotalaria medicaginea*			
408.	20179	*Crotalaria medicaginea var. neglecta*			
409.	3785	*Crotalaria novae-hollandiae (New Holland Rattlepod)*			
410.	11231	*Crotalaria novae-hollandiae subsp. novae-hollandiae*			
411.	17433	*Cullen badocanum*			
412.	17117	*Cullen cinereum*			
413.	17436	*Cullen graveolens*			
414.	17439	*Cullen lachnostachys*			
415.	17118	*Cullen leucanthum*			
416.	17119	*Cullen leucochaites*			
417.	17120	*Cullen pogonocarpum*			
418.	15714	*Cullen stipulaceum*			
419.	3852	*Desmodium campylocaulon*			

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420.	3853	*Desmodium filiforme*			
421.	3856	*Desmodium muelleri*			
422.	3612	*Dichrostachys spicata (Pied Piper Bush)*			
423.	3871	*Erythrina vespertilio (Yulbah)*			
424.	3938	*Glycine canescens (Silky Glycine)*			
425.	3940	*Glycine falcata*		P3	
426.	14587	*Indigastrum parviflorum*			
427.	3973	*Indigofera colutea (Sticky Indigo)*			
428.	3980	*Indigofera linifolia*			
429.	3981	*Indigofera linnaei (Birdsville Indigo)*			
430.	3982	*Indigofera monophylla*			
431.	3987	*Indigofera trita*			
432.	31035	*Indigofera trita subsp. trita*			
433.	3989	*Isotropis atropurpurea (Poison Sage)*			
434.	3613	*Leucaena leucocephala (Leucaena)*	Y		
435.	4060	*Lotus australis (Austral Trefoil)*			
436.	4061	*Lotus cruentus (Redflower Lotus)*			
437.	3614	*Neptunia dimorphantha (Sensitive Plant)*			
438.	3617	*Neptunia monosperma*			
439.	3675	*Petalostylis labicheoides (Slender Petalostylis)*			
440.	4190	*Rhynchosia australis (Rhynchosia)*			
441.	20862	*Rhynchosia bungarensis*		P4	
442.	4191	*Rhynchosia minima (Rhynchosia)*			
443.	12279	*Senna artemisioides subsp. helmsii*			
444.	12280	*Senna artemisioides subsp. oligophylla*			
445.	18444	*Senna charlesiana*			
446.	12303	*Senna costata*			
447.	18443	*Senna ferraria*			
448.	18346	*Senna glutinosa*			
449.		*Senna glutinosa subsp. X luerssenii*			Y
450.	12305	*Senna glutinosa subsp. chatelainiana*			
451.	12307	*Senna glutinosa subsp. glutinosa*			
452.	12309	*Senna glutinosa subsp. pruinosa*			
453.	12308	*Senna glutinosa subsp. x luerssenii*			
454.	18451	*Senna hamersleyensis*			
455.	12312	*Senna notabilis*			
456.	18450	*Senna symonii*			
457.	12319	*Senna venusta*			
458.	4196	*Sesbania cannabina (Sesbania Pea)*			
459.	4198	*Sesbania formosa (White Dragon Tree)*			
460.	12353	*Stylosanthes hamata (Verano Stylo)*	Y		
461.	4220	*Swainsona canescens (Grey Swainsona)*			
462.	12356	*Swainsona formosa*			
463.	4231	*Swainsona kingii*			
464.	4233	*Swainsona leeana*			
465.	4234	*Swainsona maccullochiana (Ashburton Pea)*			
466.	4242	*Swainsona pterostylis*			
467.		*Tephrosia Fortescue (A.A. Mitchell 606)*			Y
468.	39500	*Tephrosia brachyodon var. longifolia*			
469.	4263	*Tephrosia clementii*			
470.	49016	*Tephrosia densa*			
471.	4269	*Tephrosia flammea*			
472.	4272	*Tephrosia leptoclada*			
473.	4280	*Tephrosia rosea (Flinders River Poison, Bungoo'dah)*			
474.	19531	*Tephrosia rosea var. clementii*			
475.		*Tephrosia rosea var. fortescue creeks (M.I.H. Brooker 2186)*			
476.	19529	*Tephrosia rosea var. rosea*			
477.	15947	*Tephrosia sp. B Kimberley Flora (C.A. Gardner 7300)*			
478.	17768	*Tephrosia sp. Bungaroo Creek (M.E. Trudgen 11601)*			
479.	15949	*Tephrosia sp. D Kimberley Flora (R.D. Royce 1848)*			
480.	42442	*Tephrosia sp. NW Eremaean (S. van Leeuwen et al. PBS 0356)*			
481.	40060	*Tephrosia sp. clay soils (S. van Leeuwen et al. PBS 0273)*			
482.	4285	*Tephrosia supina*			
483.	30716	*Vachellia farnesiana (Mimosa Bush)*	Y		
484.	4323	*Vigna lanceolata (Maloga Vigna, Wega)*			
485.		*Vigna lanceolata subsp. latifolia*			Y
486.	11576	*Vigna lanceolata var. lanceolata*			
487.	31391	*Vigna sp. Hamersley Clay (A.A. Mitchell PRP 113)*			
488.	46577	*Vigna triodiophila*		P3	
489.	4326	*Zornia albiflora*			

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490.	12679	*Zornia muelleriana subsp. congesta*			
Frankeniaceae					
491.	5188	*Frankenia ambita*			
492.	5209	*Frankenia pauciflora (Seaheath)*			
493.	14297	*Frankenia pauciflora var. pauciflora*			
Galaxauraceae					
494.	29616	*Dichotomaria marginata*			
495.	29615	*Dichotomaria obtusata*			
496.	26835	*Galaxaura rugosa*			
497.	27340	*Tricleocarpa cylindrica*			
498.	27341	*Tricleocarpa fragilis*			
Gelidiaceae					
499.	26848	*Gelidium crinale*			
Gelidiellaceae					
500.	26842	*Gelidiella acerosa*			
Gentianaceae					
501.	6539	*Centaurium erythraea (Common Centaury)*	Y		
502.	41660	*Schenkia australis*			
503.	41646	*Schenkia clementii*			
Geraniaceae					
504.	4335	*Erodium cygnorum (Blue Heronsbill)*			
Goodeniaceae					
505.	7495	*Goodenia berardiana*			
506.	7509	*Goodenia forrestii*			
507.	7515	*Goodenia heterochila*			
508.	7521	*Goodenia lamprosperma*			
509.	7526	*Goodenia microptera*			
510.	12552	*Goodenia muelleriana*			
511.	12570	*Goodenia pallida*		P1	
512.	10982	*Goodenia stobbsiana*			
513.	7556	*Goodenia tenuiloba*			
514.	7560	*Goodenia vilmoriniae*			
515.	12578	*Scaevola acacioides*			
516.	12723	*Scaevola amblyanthera*			
517.	7595	*Scaevola anchusifolia*			
518.	7606	*Scaevola crassifolia (Thick-leaved Fan-flower)*			
519.	7608	*Scaevola cunninghamii*			
520.	7614	*Scaevola globulifera*			
521.	7644	*Scaevola spinescens (Currant Bush, Maroon)*			
522.	7660	*Velleia glabrata (Pee the Bed)*			
Gracilariaceae					
523.	35899	*Gracilaria canaliculata*			
524.	26873	*Gracilaria salicornia*			
525.	35871	*Hydropuntia urvillei*			
Gyrostemonaceae					
526.	2778	*Codonocarpus cotinifolius (Native Poplar, Kundurangu)*			
Halimedaceae					
527.	47313	*Halimeda borneensis*			
528.	26891	*Halimeda cylindracea*			
529.	26892	*Halimeda discoidea*			
530.	26894	*Halimeda macroloba*			
531.	26896	*Halimeda simulans*			
532.	26897	*Halimeda tuna*			
533.	26898	*Halimeda velasquezii*			
534.	47213	*Halimeda versatilis*			
Haloragaceae					
535.	6151	*Gonocarpus ephemerus*			
Halymeniaceae					
536.	26708	*Cryptonemia kallymenioides*			
537.	37642	*Halymenia durvillei*			
538.	37640	*Halymenia floresii*			
539.	44523	*Spongophloea tissotii*			
Hydrocharitaceae					
540.	160	*Enhalus acoroides*			

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541.	162	*Halophila decipiens*			
542.	163	*Halophila minor*			
543.	164	*Halophila ovalis (Sea Wrack)*			
544.	165	*Halophila spinulosa*			
545.	139	*Najas tenuifolia (Water Nymph)*			
546.	169	*Thalassia hemprichii*			
Hydrolithaceae					
547.	26956	*Hydrolithon reinboldii*			
Hymenocladiaceae					
548.	36140	*Asteromenia exanimans*			
Lamiaceae					
549.	6729	*Clerodendrum floribundum (Lollybush)*			
550.	6732	*Clerodendrum tomentosum*			
551.	13689	*Clerodendrum tomentosum var. lanceolatum*			
552.	13690	*Clerodendrum tomentosum var. tomentosum*			
Lauraceae					
553.	2949	*Cassytha capillaris*			
554.	2950	*Cassytha filiformis (Love Vine, Jirawan)*			
Liagoraceae					
555.	26837	*Ganonema farinosum*			
556.	26839	*Ganonema pinnatum*			
557.	27021	*Liagora ceranoides*			
558.	44525	*Neoizziella divaricata*			
559.	35120	*Patenocarpus paraphysiferus*			Y
560.	29601	*Titanophycus validus*			
561.	27339	*Trichogloea requienii*			
562.	27370	*Yamadaella caenomyce*			
Lomentariaceae					
563.	26606	*Ceratodictyon spongiosum*			
564.	26845	*Gelidiopsis intricata*			
Loranthaceae					
565.	2381	*Amyema miraculosa*			
566.	2383	*Amyema preissii (Wireleaf Mistletoe)*			
567.	11874	*Amyema sanguinea var. sanguinea*			
Lythraceae					
568.	5276	*Ammannia auriculata*			
569.	5277	*Ammannia baccifera*			
570.	5278	*Ammannia multiflora*			
571.		*Lawsonia inermis*			
Malvaceae					
572.	4886	*Abutilon amplum*			
573.	9080	*Abutilon cunninghamii*			
574.	4891	*Abutilon fraseri (Lantern Bush)*			
575.	18120	*Abutilon fraseri subsp. fraseri*			
576.	4894	*Abutilon indicum (Indian Lantern Flower)*			
577.	11325	*Abutilon indicum var. australiense*			
578.	4895	*Abutilon lepidum*			
579.	4899	*Abutilon malvifolium (Bastard Marshmallow)*			
580.	4901	*Abutilon otocarpum (Desert Chinese Lantern)*			
581.	4902	*Abutilon oxycarpum (Flannel Weed)*			
582.	43020	*Abutilon oxycarpum subsp. Prostrate (A.A. Mitchell PRP 1266)*			
583.	12716	*Brachychiton acuminatus*			
584.		*Brachychiton australe*			Y
585.	18411	*Corchorus congener*		P3	
586.	4857	*Corchorus elachocarpus*			
587.	17339	*Corchorus incanus*			
588.	25847	*Corchorus incanus subsp. incanus*			
589.	13659	*Corchorus laniflorus*			
590.	18409	*Corchorus lasiocarpus subsp. lasiocarpus*			
591.	4862	*Corchorus parviflorus*			
592.		*Corchorus sp.*			
593.	17661	*Corchorus tectus*			
594.	4865	*Corchorus tridens*			
595.	13467	*Corchorus trilocularis*			
596.	4867	*Corchorus walcottii (Woolly Corchorus)*			
597.	4910	*Gossypium australe (Native Cotton)*			

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598.	4913	*Gossypium hirsutum (Upland Cotton)*	Y		
599.	4918	*Gossypium robinsonii (Wild Cotton)*			
600.	29316	*Hibiscus austrinus*			
601.	29317	*Hibiscus austrinus var. austrinus*			
602.	4923	*Hibiscus brachysiphonius*			
603.	4925	*Hibiscus coatesii*			
604.	4933	*Hibiscus leptocladus*			
605.	4942	*Hibiscus sturtii (Sturt's Hibiscus)*			
606.	11651	*Hibiscus sturtii var. campylochlamys*			
607.	11385	*Hibiscus sturtii var. grandiflorus*			
608.	11477	*Hibiscus sturtii var. platychlamys*			
609.	4960	*Lawrencia viridigrisea*			
610.	4962	*Malvastrum americanum (Spiked Malvastrum)*	Y		
611.	5051	*Melhania oblongifolia*			
612.		*Sida Excedentifolia (J.L. Egan 1925)*			Y
613.	31758	*Sida arsiniata*			
614.	4971	*Sida cardiophylla*			
615.	4972	*Sida clementii*			
616.	4976	*Sida echinocarpa*			
617.	4977	*Sida fibulifera (Silver Sida)*			
618.	4988	*Sida rohlenae*			
619.	33698	*Sida sp. Pilbara (A.A. Mitchell PRP 1543)*			
620.	16617	*Sida sp. spiciform panicles (E. Leyland s.n. 14/8/90)*			
621.	4989	*Sida spinosa (Spiny Sida)*			
622.	4873	*Triumfetta appendiculata*			
623.	4875	*Triumfetta chaetocarpa (Urchins)*			
624.	14694	*Triumfetta clementii*			
625.	4879	*Triumfetta leptacantha*			
626.	14942	*Triumfetta maconochieana*			
627.	5106	*Waltheria indica*			
Marsileaceae					
628.	75	*Marsilea exarata*			
629.	76	*Marsilea hirsuta (Nardoo)*			
Meliaceae					
630.	4518	*Owenia reticulata (Native Walnut, Bandal)*			
Menispermaceae					
631.	2942	*Tinospora smilacina (Snakevine, Oondala)*			
Molluginaceae					
632.	2836	*Glinus oppositifolius*			
633.	48203	*Hypertelis cerviana*			
634.	48201	*Trigastrotheca molluginea*			
Montiaceae					
635.	2864	*Calandrinia ptychosperma*			
636.	2866	*Calandrinia quadrivalvis*			
637.	2872	*Calandrinia tepperiana*			
Moraceae					
638.	25811	*Ficus aculeata*			
639.	31578	*Ficus aculeata var. indecora (Ranji)*			
640.	19648	*Ficus brachypoda*			
641.	1753	*Ficus platypoda (Native Fig, Makartu)*			
642.		*Ficus sp.*			
643.	1759	*Ficus virens (Albayi)*			
644.	11572	*Ficus virens var. sublanceolata*			
645.	12096	*Ficus virens var. virens*			
Mychodeaceae					
646.	27079	*Mychodea carnosa*			
Myrtaceae					
647.	19125	*Corymbia dichromophloia*			
648.	17089	*Corymbia greeniana*			
649.	17093	*Corymbia hamersleyana*			
650.	17092	*Corymbia opaca*			
651.	5580	*Eucalyptus camaldulensis (River Gum, Yabalinyba)*			
652.	35345	*Eucalyptus camaldulensis subsp. obtusa (Blunt-budded River Red Gum)*			
653.	35343	*Eucalyptus camaldulensis subsp. refulgens*			
654.	5714	*Eucalyptus microtheca (Coolibah)*			
655.	5752	*Eucalyptus prominens*			

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656.	14548	*Eucalyptus victrix*			
657.	15592	*Eucalyptus xerothermica*			
658.	5875	*Melaleuca argentea (Silver Cadjeput, Bandaran)*			
659.	5915	*Melaleuca glomerata*			
660.	5933	*Melaleuca linophylla*			
661.	6005	*Osbornia octodonta (Myrtle Mangrove)*			
Nemastomataceae					
662.	27189	*Predaea weldii*			
Nyctaginaceae					
663.	2769	*Boerhavia burbidgeana*			
664.	2770	*Boerhavia coccinea (Tar Vine, Wituka)*			
665.	8357	*Boerhavia diffusa*			
666.	2772	*Boerhavia gardneri*			
667.	2773	*Boerhavia paludosa*			
668.	2774	*Boerhavia repleta*			
669.	2775	*Boerhavia schomburgkiana*			
670.		*Boerhavia sp.*			
671.	2776	*Commicarpus australis (Perennial Tar Vine)*			
Oleaceae					
672.	6501	*Jasminum didymum*			
673.	12059	*Jasminum didymum subsp. lineare (Desert Jasmine)*			
Orobanchaceae					
674.	7103	*Striga curviflora*			
Passifloraceae					
675.	5226	*Passiflora foetida (Stinking Passion Flower)*	Y		
Peyssonneliaceae					
676.	44731	*Sonderophycus capensis*			
Phrymaceae					
677.	7082	*Mimulus gracilis*			
678.	7092	*Peplidium muelleri*			
679.	18462	*Peplidium sp. E Evol. Fl. Fauna Arid Aust. (A.S. Weston 12768)*			
Phyllanthaceae					
680.		*Breynia desorii*			
681.	4603	*Bridelia tomentosa*			
682.	4654	*Flueggea virosa*			
683.	12013	*Flueggea virosa subsp. melanthesoides (Dogwood, Guwal)*			
684.	38421	*Notoleptopus decaisnei*			
685.	38422	*Notoleptopus decaisnei var. decaisnei*			
686.	4673	*Phyllanthus amarus*	Y		
687.	9056	*Phyllanthus baccatus*			
688.	17626	*Phyllanthus erwinii*			
689.	4680	*Phyllanthus maderaspatensis*			
Pittosporaceae					
690.	19744	*Pittosporum angustifolium*			
691.	41300	*Pittosporum phillyreoides (Weeping Pittosporum, Yaliti)*			
Plantaginaceae					
692.	7098	*Stemodia grossa (Marsh Stemodia, Mindjaara)*			
693.	7099	*Stemodia kingii*			
694.	7102	*Stemodia viscosa (Pagurda)*			
Plumbaginaceae					
695.	6486	*Aegialitis annulata (Club Mangrove)*			
696.	6490	*Muellerolimon salicorniaceum*			
697.	6491	*Plumbago zeylanica (Native Plumbago)*			
Poaceae					
698.	172	*Acrachne racemosa*			
699.	204	*Aristida burbidgeae*			
700.	207	*Aristida contorta (Bunched Kerosene Grass)*			
701.	210	*Aristida holathera*			
702.	12063	*Aristida holathera var. holathera*			
703.	215	*Aristida latifolia (Feathertop Wiregrass)*			
704.	217	*Aristida nitidula (Flat-awned Threeawn)*			
705.	226	*Arundo donax (Giant Reed)*	Y		
706.	229	*Astrebla pectinata (Barley Mitchell Grass)*			
707.	258	*Cenchrus ciliaris (Buffel Grass)*	Y		

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708.	259	*Cenchrus echinatus (Burrgrass)*	Y		
709.	41568	*Cenchrus setaceus (Fountain Grass)*	Y		
710.	29721	*Cenchrus setiger (Birdwood Grass)*	Y		
711.	266	*Chloris barbata (Purpletop Chloris)*	Y		
712.	269	*Chloris pectinata (Comb Chloris)*			
713.	270	*Chloris pumilio*			
714.	273	*Chrysopogon fallax (Golden Beard Grass)*			
715.	275	*Chrysopogon pallidus (Ribbongrass)*			
716.	279	*Cymbopogon ambiguus (Scentgrass)*			
717.	280	*Cymbopogon bombycinus (Silky Oilgrass)*			
718.	281	*Cymbopogon obtectus (Silkyheads)*			
719.	282	*Cymbopogon procerus (Lemon Grass)*			
720.	46558	*Cynodon convergens*			
721.	46555	*Cynodon prostratus*			
722.	290	*Dactyloctenium radulans (Button Grass)*			
723.	303	*Dichanthium fecundum (Curly Bluegrass)*			
724.	13741	*Dichanthium sericeum subsp. humilius*			
725.	11964	*Dichanthium sericeum subsp. sericeum*			
726.	310	*Digitaria brownii (Cotton Panic Grass)*			
727.	313	*Digitaria ctenantha (Comb Finger Grass)*			
728.	328	*Echinochloa colona (Awnless Barnyard Grass)*	Y		
729.	343	*Ectrosia leporina (Hare's-foot Grass)*			
730.	357	*Enneapogon caerulescens (Limestone Grass)*			
731.	358	*Enneapogon cylindricus (Jointed Nineawn)*			
732.	360	*Enneapogon lindleyanus (Wiry Nineawn, Purple-head Nineawn)*			
733.	363	*Enneapogon pallidus (Conetop Nineawn)*			
734.	365	*Enneapogon polyphyllus (Leafy Nineawn)*			
735.	12749	*Enneapogon purpurascens (Purple Nineawn)*			
736.	368	*Enteropogon ramosus (Windmill Grass, Curly Windmill Grass)*			
737.	373	*Eragrostis brownii (Brown's Lovegrass)*			
738.	375	*Eragrostis cumingii (Cuming's Love Grass)*			
739.	378	*Eragrostis dielsii (Mallee Lovegrass)*			
740.	379	*Eragrostis elongata (Clustered Lovegrass)*			
741.	380	*Eragrostis eriopoda (Woollybutt Grass, Wangurnu)*			
742.	16731	*Eragrostis exigua*			
743.	381	*Eragrostis falcata (Sickle Lovegrass)*			
744.	388	*Eragrostis leptocarpa (Drooping Lovegrass)*			
745.	393	*Eragrostis setifolia (Neverfail Grass)*			
746.	38505	*Eragrostis surreyana*		P3	
747.	398	*Eragrostis tenellula (Delicate Lovegrass)*			
748.	399	*Eragrostis xerophila (Knotty-butt Neverfail)*			
749.	400	*Eriachne aristidea*			
750.	403	*Eriachne benthamii (Swamp Wanderrie)*			
751.	409	*Eriachne gardneri*			
752.	411	*Eriachne helmsii (Buck Wanderrie Grass)*			
753.	413	*Eriachne mucronata (Mountain Wanderrie Grass)*			
754.	414	*Eriachne obtusa (Northern Wandarrie Grass)*			
755.	417	*Eriachne pulchella (Pretty Wanderrie)*			
756.	16485	*Eriachne pulchella subsp. dominii*			
757.	16486	*Eriachne pulchella subsp. pulchella*			
758.	421	*Eriachne tenuiculmis*			
759.	425	*Eriochloa procera (Cupgrass)*			
760.	11011	*Eulalia aurea*			
761.	458	*Iseilema dolichotrichum*			
762.	459	*Iseilema eremaeum*			
763.	465	*Iseilema vaginiflorum (Red Flinders Grass)*			
764.	503	*Panicum decompositum (Native Millet, Kaltu-kaltu)*			
765.	504	*Panicum effusum (Hairy Panic Grass)*			
766.	505	*Panicum laevinode*			
767.	515	*Paraneurachne muelleri (Northern Mulga Grass)*			
768.	10975	*Paspalidium basicladum*			
769.	518	*Paspalidium clementii (Clements Paspalidium)*			
770.	523	*Paspalidium rarum (Rare Paspalidium)*			
771.	525	*Paspalidium tabulatum*			
772.	546	*Perotis rara (Comet Grass)*			
773.	599	*Schizachyrium fragile (Senale Redgrass)*			
774.	606	*Setaria dielsii (Diels' Pigeon Grass)*			
775.	613	*Setaria verticillata (Whorled Pigeon Grass)*	Y		
776.	619	*Sorghum plumosum (Plume Canegrass)*			
777.	12919	*Sorghum plumosum var. plumosum*			

	Name ID	Species Name	Naturalised	Conservation Code	[1]Endemic To Query Area
778.	622	*Sorghum timorense*			
779.	625	*Spinifex longifolius (Beach Spinifex)*			
780.	629	*Sporobolus australasicus (Fairy Grass)*			
781.	635	*Sporobolus virginicus (Marine Couch)*			
782.		*Themeda Mt Barricade (M.E. Trudgen 2471)*			Y
783.	672	*Themeda avenacea (Native Oatgrass)*			
784.	17820	*Themeda sp. Hamersley Station (M.E. Trudgen 11431)*		P3	
785.	17819	*Themeda sp. Mt Barricade (M.E. Trudgen 2471)*			
786.	673	*Themeda triandra*			
787.	678	*Tragus australianus (Small Burrgrass)*			
788.	679	*Triodia angusta*			
789.	13131	*Triodia epactia*			
790.	696	*Triodia pungens (Soft Spinifex)*			
791.	704	*Triodia wiseana (Limestone Spinifex)*			
792.	706	*Triraphis mollis (Needle Grass)*			
793.	725	*Whiteochloa airoides*			
794.	728	*Whiteochloa cymbiformis*			
795.	729	*Xerochloa barbata (Rice Grass)*			
796.	731	*Xerochloa laniflora (Rice Grass)*			
797.	732	*Yakirra australiensis*			
Polygalaceae					
798.	41363	*Polygala galeocephala*			
799.	41365	*Polygala glaucifolia*			
800.	4572	*Polygala isingii*			
Polygonaceae					
801.	2443	*Rumex vesicarius (Ruby Dock)*	Y		
Polyphysaceae					
802.	48409	*Acetabularia caliculus*			
Portulacaceae					
803.	2875	*Portulaca australis*			
804.	2878	*Portulaca conspicua*			
805.	2879	*Portulaca cyclophylla*			
806.	43981	*Portulaca decipiens*			
807.	2882	*Portulaca intraterranea*			
808.	2884	*Portulaca oleracea (Purslane, Wakati)*			
809.	2886	*Portulaca pilosa (Djanggara)*	Y		
Primulaceae					
810.	6478	*Aegiceras corniculatum (River Mangrove)*			
Proteaceae					
811.	2079	*Grevillea pyramidalis (Caustic Bush, Tjungu)*			
812.	19570	*Grevillea pyramidalis subsp. leucadendron*			
813.	15975	*Grevillea pyramidalis subsp. pyramidalis*			
814.	13440	*Grevillea wickhamii subsp. aprica*			
815.	2138	*Hakea chordophylla*			
816.	2177	*Hakea lorea (Witinti)*			
817.	19137	*Hakea lorea subsp. lorea*			
Pteridaceae					
818.	31	*Cheilanthes austrotenuifolia*			
819.	33	*Cheilanthes contigua*			
820.	12818	*Cheilanthes sieberi subsp. sieberi*			
821.	8462	*Cheilanthes tenuifolia (Rock Fern)*			
Rhamnaceae					
822.	4809	*Cryptandra pungens*			
823.	4846	*Ventilago viminalis (Supplejack, Barndaragu)*			
Rhizophoraceae					
824.	5291	*Bruguiera exaristata (Ribbed Mangrove)*			
825.	39680	*Ceriops australis*			
826.	5295	*Rhizophora stylosa (Spotted-leaved Red Mangrove)*			
Rhizophyllidaceae					
827.	27186	*Portieria hornemannii*			
Rhodomelaceae					
828.	26440	*Acanthophora dendroides*			
829.	26441	*Acanthophora spicifera*			
830.	26628	*Chondria armata*			
831.	26762	*Dictyomenia sonderi*			

	Name ID	Species Name	Naturalised	Conservation Code	[1]Endemic To Query Area
832.	26782	*Digenea simplex*			
833.	26800	*Echinophycus minutus*			Y
834.	48408	*Laurencia dendroidea*			
835.		*Laurencia similis*			
836.	27018	*Leveillea jungermannioides*			
837.	46834	*Osmundaria melvillii*			
838.	36400	*Palisada perforata*			
839.	27335	*Tolypiocladia calodictyon*			
840.	27336	*Tolypiocladia glomerulata*			
Rhodymeniaceae					
841.	26516	*Botryocladia leptopoda*			
842.	26685	*Coelarthrum cliftonii*			
843.	26686	*Coelarthrum opuntia*			
Ricciaceae					
844.		*Riccia albida*			
Rubiaceae					
845.	7317	*Dentella asperata*			
846.	7318	*Dentella minutissima*			
847.	7338	*Oldenlandia crouchiana*			
848.	19640	*Oldenlandia sp. Hamersley Station (A.A. Mitchell PRP 1479)*		P3	
849.		*Pomax Desert (A.S. George 11968)*			Y
850.	7363	*Synaptantha tillaeacea*			
851.	13339	*Synaptantha tillaeacea var. tillaeacea*			
Santalaceae					
852.	10977	*Exocarpos aphyllus (Leafless Ballart)*			
853.	2357	*Santalum lanceolatum (Northern Sandalwood, Yarnguli)*			
Sapindaceae					
854.	4739	*Alectryon oleifolius*			
855.	11487	*Alectryon oleifolius subsp. oleifolius*			
856.	4740	*Atalaya hemiglauca (Whitewood)*			
857.	4745	*Diplopeltis eriocarpa (Hairy Pepperflower)*			
858.	4759	*Dodonaea coriacea*			
Schizymeniaceae					
859.	35182	*Titanophora pikeana*			
Scinaiaceae					
860.	27270	*Scinaia tsinglanensis*			
Scrophulariaceae					
861.	7234	*Eremophila longifolia (Berrigan, Tulypurpa)*			
862.	16363	*Eremophila maculata subsp. brevifolia (Native Fuchsia)*			
863.	17158	*Myoporum montanum (Native Myrtle)*			
Sebdeniaceae					
864.	27274	*Sebdenia flabellata*			
Siphonocladaceae					
865.	26507	*Boergesenia forbesii*			
866.	26769	*Dictyosphaeria cavernosa*			
867.	27280	*Siphonocladus tropicus*			
Solanaceae					
868.	6962	*Datura leichhardtii (Native Thornapple)*	Y		
869.	6963	*Datura metel (Downy Thornapple)*	Y		
870.	6966	*Duboisia hopwoodii (Pituri, Kundugu)*			
871.	6971	*Nicotiana benthamiana (Tjuntiwari)*			
872.	6976	*Nicotiana occidentalis (Native Tobacco)*			
873.	11331	*Nicotiana occidentalis subsp. obliqua*			
874.	11856	*Nicotiana occidentalis subsp. occidentalis*			
875.	11734	*Nicotiana rosulata subsp. rosulata*			
876.	6980	*Nicotiana umbratica*		P3	
877.	20652	*Physalis angulata*	Y		
878.		*Solanum Boomerang Bay (K.F. Kenneally 10021)*			Y
879.	41820	*Solanum albostellatum*		P3	
880.	6998	*Solanum cleistogamum*			
881.	7002	*Solanum diversiflorum*			
882.	7007	*Solanum esuriale (Quena)*			
883.	7009	*Solanum gabrielae*			
884.	7014	*Solanum horridum*			
885.	7018	*Solanum lasiophyllum (Flannel Bush, Mindjulu)*			

	Name ID	Species Name	Naturalised	Conservation Code	[1]Endemic To Query Area
886.	7022	*Solanum nigrum (Black Berry Nightshade)*	Y		
887.	7029	*Solanum phlomoides*			
888.	7036	*Solanum sturtianum (Thargomindah Nightshade)*			
Solieriaceae					
889.	48503	*Betaphycus speciosus*			
890.	26827	*Eucheuma denticulatum*			
Stylidiaceae					
891.	7729	*Stylidium fluminense*			
892.	7799	*Stylidium spathulatum (Creamy Triggerplant)*			
Surianaceae					
893.	3182	*Stylobasium spathulatum (Pebble Bush)*			
Tamaricaceae					
894.	15741	*Tamarix aphylla (Athel Tree)*	Y		
Thymelaeaceae					
895.	5230	*Pimelea ammocharis*			
Udoteaceae					
896.	27121	*Penicillus nodulosus*			
897.	27213	*Rhipidosiphon javensis*			
898.	27348	*Udotea argentea*			
899.	27349	*Udotea flabellum*			
900.	35302	*Udotea glaucescens*			
901.	35121	*Udotea orientalis*			
Valoniaceae					
902.	36143	*Valonia fastigiata*			
903.	46438	*Valonia ventricosa*			
904.	27357	*Valoniopsis pachynema*			
Violaceae					
905.	5215	*Hybanthus aurantiacus*			
906.	5219	*Hybanthus enneaspermus*			
Wrangeliaceae					
907.	45078	*Grallatoria reptans*			
Zygophyllaceae					
908.	48900	*Roepera retivalvis*			
909.	4375	*Tribulus cistoides*			
910.	4377	*Tribulus hirsutus*			
911.	4379	*Tribulus macrocarpus*			
912.	4380	*Tribulus occidentalis (Perennial Caltrop)*			
913.	4381	*Tribulus platypterus (Cork Hopbush)*			
914.	4383	*Tribulus terrestris (Caltrop)*	Y		

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

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

Australian Government
Department of the Environment and Energy

EPBC Act Protected Matters Report

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

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

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

Report created: 04/03/20 16:36:04

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Coordinates
Buffer: 20.0Km

No Image Available

Summary

Matters of National Environmental Significance

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

World Heritage Properties:	None
National Heritage Places:	1
Wetlands of International Importance:	None
Great Barrier Reef Marine Park:	None
Commonwealth Marine Area:	None
Listed Threatened Ecological Communities:	None
Listed Threatened Species:	29
Listed Migratory Species:	59

Other Matters Protected by the EPBC Act

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

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

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

Commonwealth Land:	2
Commonwealth Heritage Places:	None
Listed Marine Species:	100
Whales and Other Cetaceans:	12
Critical Habitats:	None
Commonwealth Reserves Terrestrial:	None
Australian Marine Parks:	None

Extra Information

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

State and Territory Reserves:	5
Regional Forest Agreements:	None
Invasive Species:	17
Nationally Important Wetlands:	None
Key Ecological Features (Marine)	None

Details

Matters of National Environmental Significance

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

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

Name	Status	Type of Presence
Mammals		
Balaenoptera musculus Blue Whale [36]	Endangered	Species or species habitat likely to occur within area
Dasyurus hallucatus Northern Quoll, Digul [Gogo-Yimidir], Wijingadda [Dambimangari], Wiminji [Martu] [331]	Endangered	Species or species habitat known to occur within area
Macroderma gigas Ghost Bat [174]	Vulnerable	Species or species habitat likely to occur within area
Megaptera novaeangliae Humpback Whale [38]	Vulnerable	Species or species habitat known to occur within area
Rhinonicteris aurantia (Pilbara form) Pilbara Leaf-nosed Bat [82790]	Vulnerable	Species or species habitat may occur within area
Reptiles		
Aipysurus apraefrontalis Short-nosed Seasnake [1115]	Critically Endangered	Species or species habitat likely to occur within area
Caretta caretta Loggerhead Turtle [1763]	Endangered	Breeding known to occur within area
Chelonia mydas Green Turtle [1765]	Vulnerable	Breeding known to occur within area
Dermochelys coriacea Leatherback Turtle, Leathery Turtle, Luth [1768]	Endangered	Breeding likely to occur within area
Eretmochelys imbricata Hawksbill Turtle [1766]	Vulnerable	Breeding known to occur within area
Liasis olivaceus barroni Olive Python (Pilbara subspecies) [66699]	Vulnerable	Species or species habitat known to occur within area
Natator depressus Flatback Turtle [59257]	Vulnerable	Breeding known to occur within area
Sharks		
Carcharias taurus (west coast population) Grey Nurse Shark (west coast population) [68752]	Vulnerable	Species or species habitat likely to occur within area
Carcharodon carcharias White Shark, Great White Shark [64470]	Vulnerable	Species or species habitat may occur within area
Pristis clavata Dwarf Sawfish, Queensland Sawfish [68447]	Vulnerable	Species or species habitat known to occur within area
Pristis zijsron Green Sawfish, Dindagubba, Narrowsnout Sawfish [68442]	Vulnerable	Species or species habitat known to occur within area
Rhincodon typus Whale Shark [66680]	Vulnerable	Species or species habitat may occur within area

Listed Migratory Species		[Resource Information]
* Species is listed under a different scientific name on the EPBC Act - Threatened Species list.		
Name	Threatened	Type of Presence
Migratory Marine Birds		

Name	Threatened	Type of Presence
Anous stolidus Common Noddy [825]		Species or species habitat may occur within area
Apus pacificus Fork-tailed Swift [678]		Species or species habitat likely to occur within area
Ardenna pacifica Wedge-tailed Shearwater [84292]		Breeding known to occur within area
Calonectris leucomelas Streaked Shearwater [1077]		Species or species habitat may occur within area
Fregata ariel Lesser Frigatebird, Least Frigatebird [1012]		Species or species habitat known to occur within area
Hydroprogne caspia Caspian Tern [808]		Breeding known to occur within area
Macronectes giganteus Southern Giant-Petrel, Southern Giant Petrel [1060]	Endangered	Species or species habitat may occur within area
Onychoprion anaethetus Bridled Tern [82845]		Breeding known to occur within area
Sterna dougallii Roseate Tern [817]		Breeding likely to occur within area
Migratory Marine Species		
Anoxypristis cuspidata Narrow Sawfish, Knifetooth Sawfish [68448]		Species or species habitat likely to occur within area
Balaenoptera edeni Bryde's Whale [35]		Species or species habitat may occur within area
Balaenoptera musculus Blue Whale [36]	Endangered	Species or species habitat likely to occur within area
Carcharodon carcharias White Shark, Great White Shark [64470]	Vulnerable	Species or species habitat may occur within area
Caretta caretta Loggerhead Turtle [1763]	Endangered	Breeding known to occur within area
Chelonia mydas Green Turtle [1765]	Vulnerable	Breeding known to occur within area
Dermochelys coriacea Leatherback Turtle, Leathery Turtle, Luth [1768]	Endangered	Breeding likely to occur within area
Dugong dugon Dugong [28]		Species or species habitat known to occur within area
Eretmochelys imbricata Hawksbill Turtle [1766]	Vulnerable	Breeding known to occur within area
Manta alfredi Reef Manta Ray, Coastal Manta Ray, Inshore Manta Ray, Prince Alfred's Ray, Resident Manta Ray [84994]		Species or species habitat known to occur within area
Manta birostris Giant Manta Ray, Chevron Manta Ray, Pacific Manta Ray, Pelagic Manta Ray, Oceanic Manta Ray [84995]		Species or species habitat likely to occur within area

Name	Threatened	Type of Presence
Megaptera novaeangliae Humpback Whale [38]	Vulnerable	Species or species habitat known to occur within area
Natator depressus Flatback Turtle [59257]	Vulnerable	Breeding known to occur within area
Orcinus orca Killer Whale, Orca [46]		Species or species habitat may occur within area
Pristis clavata Dwarf Sawfish, Queensland Sawfish [68447]	Vulnerable	Species or species habitat known to occur within area
Pristis zijsron Green Sawfish, Dindagubba, Narrowsnout Sawfish [68442]	Vulnerable	Species or species habitat known to occur within area
Rhincodon typus Whale Shark [66680]	Vulnerable	Species or species habitat may occur within area
Sousa chinensis Indo-Pacific Humpback Dolphin [50]		Species or species habitat known to occur within area
Tursiops aduncus (Arafura/Timor Sea populations) Spotted Bottlenose Dolphin (Arafura/Timor Sea populations) [78900]		Species or species habitat known to occur within area
Migratory Terrestrial Species		
Hirundo rustica Barn Swallow [662]		Species or species habitat may occur within area
Motacilla cinerea Grey Wagtail [642]		Species or species habitat may occur within area
Motacilla flava Yellow Wagtail [644]		Species or species habitat may occur within area
Migratory Wetlands Species		
Actitis hypoleucos Common Sandpiper [59309]		Species or species habitat known to occur within area
Arenaria interpres Ruddy Turnstone [872]		Species or species habitat known to occur within area
Calidris acuminata Sharp-tailed Sandpiper [874]		Species or species habitat known to occur within area
Calidris alba Sanderling [875]		Species or species habitat known to occur within area
Calidris canutus Red Knot, Knot [855]	Endangered	Species or species habitat known to occur within area
Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	Species or species habitat known to occur within area
Calidris melanotos Pectoral Sandpiper [858]		Species or species habitat may occur within area

Name	Threatened	Type of Presence
Calidris ruficollis Red-necked Stint [860]		Species or species habitat known to occur within area
Calidris subminuta Long-toed Stint [861]		Species or species habitat known to occur within area
Calidris tenuirostris Great Knot [862]	Critically Endangered	Species or species habitat known to occur within area
Charadrius leschenaultii Greater Sand Plover, Large Sand Plover [877]	Vulnerable	Species or species habitat known to occur within area
Charadrius mongolus Lesser Sand Plover, Mongolian Plover [879]	Endangered	Species or species habitat known to occur within area
Charadrius veredus Oriental Plover, Oriental Dotterel [882]		Species or species habitat known to occur within area
Glareola maldivarum Oriental Pratincole [840]		Species or species habitat known to occur within area
Limicola falcinellus Broad-billed Sandpiper [842]		Species or species habitat known to occur within area
Limosa lapponica Bar-tailed Godwit [844]		Species or species habitat known to occur within area
Limosa limosa Black-tailed Godwit [845]		Species or species habitat known to occur within area
Numenius madagascariensis Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat known to occur within area
Numenius phaeopus Whimbrel [849]		Species or species habitat known to occur within area
Pandion haliaetus Osprey [952]		Breeding known to occur within area
Phalaropus lobatus Red-necked Phalarope [838]		Species or species habitat known to occur within area
Pluvialis fulva Pacific Golden Plover [25545]		Species or species habitat known to occur within area
Pluvialis squatarola Grey Plover [865]		Species or species habitat known to occur within area
Tringa brevipes Grey-tailed Tattler [851]		Species or species habitat known to occur within area
Tringa nebularia Common Greenshank, Greenshank [832]		Species or species habitat known to occur within area
Tringa stagnatilis Marsh Sandpiper, Little Greenshank [833]		Species or species

Name	Threatened	Type of Presence
		habitat known to occur within area
Tringa totanus Common Redshank, Redshank [835]		Species or species habitat known to occur within area
Xenus cinereus Terek Sandpiper [59300]		Species or species habitat known to occur within area

Other Matters Protected by the EPBC Act

Commonwealth Land [Resource Information]

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

Name
Commonwealth Land -
Defence - KARRATHA TRAINING DEPOT

Listed Marine Species [Resource Information]

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

Name	Threatened	Type of Presence
Birds		
Actitis hypoleucos Common Sandpiper [59309]		Species or species habitat known to occur within area
Anous stolidus Common Noddy [825]		Species or species habitat may occur within area
Apus pacificus Fork-tailed Swift [678]		Species or species habitat likely to occur within area
Ardea alba Great Egret, White Egret [59541]		Species or species habitat known to occur within area
Ardea ibis Cattle Egret [59542]		Species or species habitat may occur within area
Arenaria interpres Ruddy Turnstone [872]		Species or species habitat known to occur within area
Calidris acuminata Sharp-tailed Sandpiper [874]		Species or species habitat known to occur within area
Calidris alba Sanderling [875]		Species or species habitat known to occur within area
Calidris canutus Red Knot, Knot [855]	Endangered	Species or species

Name	Threatened	Type of Presence
		habitat known to occur within area
Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	Species or species habitat known to occur within area
Calidris melanotos Pectoral Sandpiper [858]		Species or species habitat may occur within area
Calidris ruficollis Red-necked Stint [860]		Species or species habitat known to occur within area
Calidris subminuta Long-toed Stint [861]		Species or species habitat known to occur within area
Calidris tenuirostris Great Knot [862]	Critically Endangered	Species or species habitat known to occur within area
Calonectris leucomelas Streaked Shearwater [1077]		Species or species habitat may occur within area
Charadrius leschenaultii Greater Sand Plover, Large Sand Plover [877]	Vulnerable	Species or species habitat known to occur within area
Charadrius mongolus Lesser Sand Plover, Mongolian Plover [879]	Endangered	Species or species habitat known to occur within area
Charadrius ruficapillus Red-capped Plover [881]		Species or species habitat known to occur within area
Charadrius veredus Oriental Plover, Oriental Dotterel [882]		Species or species habitat known to occur within area
Chrysococcyx osculans Black-eared Cuckoo [705]		Species or species habitat known to occur within area
Fregata ariel Lesser Frigatebird, Least Frigatebird [1012]		Species or species habitat known to occur within area
Glareola maldivarum Oriental Pratincole [840]		Species or species habitat known to occur within area
Haliaeetus leucogaster White-bellied Sea-Eagle [943]		Breeding known to occur within area
Heteroscelus brevipes Grey-tailed Tattler [59311]		Species or species habitat known to occur within area
Himantopus himantopus Pied Stilt, Black-winged Stilt [870]		Species or species habitat known to occur within area
Hirundo rustica Barn Swallow [662]		Species or species habitat may occur within area
Larus novaehollandiae Silver Gull [810]		Breeding known to occur within area

Name	Threatened	Type of Presence
Limicola falcinellus Broad-billed Sandpiper [842]		Species or species habitat known to occur within area
Limosa lapponica Bar-tailed Godwit [844]		Species or species habitat known to occur within area
Limosa limosa Black-tailed Godwit [845]		Species or species habitat known to occur within area
Macronectes giganteus Southern Giant-Petrel, Southern Giant Petrel [1060]	Endangered	Species or species habitat may occur within area
Merops ornatus Rainbow Bee-eater [670]		Species or species habitat may occur within area
Motacilla cinerea Grey Wagtail [642]		Species or species habitat may occur within area
Motacilla flava Yellow Wagtail [644]		Species or species habitat may occur within area
Numenius madagascariensis Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat known to occur within area
Numenius phaeopus Whimbrel [849]		Species or species habitat known to occur within area
Pandion haliaetus Osprey [952]		Breeding known to occur within area
Phalaropus lobatus Red-necked Phalarope [838]		Species or species habitat known to occur within area
Pluvialis fulva Pacific Golden Plover [25545]		Species or species habitat known to occur within area
Pluvialis squatarola Grey Plover [865]		Species or species habitat known to occur within area
Puffinus pacificus Wedge-tailed Shearwater [1027]		Breeding known to occur within area
Recurvirostra novaehollandiae Red-necked Avocet [871]		Species or species habitat known to occur within area
Rostratula benghalensis (sensu lato) Painted Snipe [889]	Endangered*	Species or species habitat may occur within area
Sterna anaethetus Bridled Tern [814]		Breeding known to occur within area
Sterna caspia Caspian Tern [59467]		Breeding known to occur within area
Sterna dougallii Roseate Tern [817]		Breeding likely to occur within area
Stiltia isabella Australian Pratincole [818]		Species or species

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

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

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

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

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

Extra Information

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

Invasive Species	[Resource Information]

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

Name	Status	Type of Presence
Birds		
Columba livia Rock Pigeon, Rock Dove, Domestic Pigeon [803]		Species or species

Name	Status	Type of Presence
		habitat likely to occur within area
Passer domesticus House Sparrow [405]		Species or species habitat likely to occur within area
Passer montanus Eurasian Tree Sparrow [406]		Species or species habitat likely to occur within area
Mammals		
Canis lupus familiaris Domestic Dog [82654]		Species or species habitat likely to occur within area
Equus caballus Horse [5]		Species or species habitat likely to occur within area
Felis catus Cat, House Cat, Domestic Cat [19]		Species or species habitat likely to occur within area
Mus musculus House Mouse [120]		Species or species habitat likely to occur within area
Oryctolagus cuniculus Rabbit, European Rabbit [128]		Species or species habitat likely to occur within area
Rattus rattus Black Rat, Ship Rat [84]		Species or species habitat likely to occur within area
Vulpes vulpes Red Fox, Fox [18]		Species or species habitat likely to occur within area
Plants		
Cenchrus ciliaris Buffel-grass, Black Buffel-grass [20213]		Species or species habitat likely to occur within area
Jatropha gossypifolia Cotton-leaved Physic-Nut, Bellyache Bush, Cotton-leaf Physic Nut, Cotton-leaf Jatropha, Black Physic Nut [7507]		Species or species habitat likely to occur within area
Opuntia spp. Prickly Pears [82753]		Species or species habitat likely to occur within area
Parkinsonia aculeata Parkinsonia, Jerusalem Thorn, Jelly Bean Tree, Horse Bean [12301]		Species or species habitat likely to occur within area
Prosopis spp. Mesquite, Algaroba [68407]		Species or species habitat likely to occur within area
Reptiles		
Hemidactylus frenatus Asian House Gecko [1708]		Species or species habitat likely to occur within area
Ramphotyphlops braminus Flowerpot Blind Snake, Brahminy Blind Snake, Cacing Besi [1258]		Species or species habitat known to occur within area

Caveat

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

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

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

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

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

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

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

- migratory and
- marine

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

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

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

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

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

Coordinates

-20.67278 116.7075

Acknowledgements

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

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

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

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

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

Appendix B

Relevé Data

Appendix B Relevé Data

Appendix B - Relevé Data

Site No: 3	**Date**: 6/8/2020	**Longitude**: 116.72161	**Latitude**: -20.65720

Type: Releve

Soil Types:

Topography: Rocky Outcrop

Surface: rocks with clay loam

Outcrops: rocks 70%

Litter:

Condition: Good

Condition Notes: historically cleared, earth moved

Vegetation Type: ToAlTe Hummock Grassland

Vegetation Description: *Trachymene oleracea* subsp. *oleracea, Trichodesma zeylanicum* var. *zeylanicum* and *Swainsona formosa* mid to tall herbland with *Abutilon lepidum*, *Crotalaria novae-hollandiae* and *Senna notabilis* low shrubland over *Triodia epactia* tall hummock grassland.

Taxon		Ht (cm)	Foliage (%)
	Abutilon lepidum	60	4
	Acacia bivenosa	100	1
	Acacia pyrifolia	50	1
	Alysicarpus muelleri	5	0
	Boerhavia coccinea	0	3
*	*Cenchrus ciliaris*	30	20
	Cynanchum floribundum		Opportunistic
	Euphorbia ?tannensis subsp. *eremophila*	30	0.5
	Euphorbia biconvexa	40	1
	Evolvulus alsinoides	15	0.5

Taxon		Ht (cm)	Foliage (%)
	Indigofera colutea	5	0
	Indigofera linifolia	15	0
	Indigofera monophylla	40	0
	Portulaca oleracea	0	0
	Ptilotus exaltatus	20	0
	Rhynchosia minima	40	2
	Rhynchosia minima	0	0.5
	Salsola australis	30	0
	Solanum diversiflorum	20	0.5
	Swainsona formosa	30	5
	Terminalia canescens	200	0
	Trichodesma zeylanicum var. *zeylanicum*	60	5
	Triodia epactia	40	26
	Triumfetta ?appendiculata	10	1

Site No: 4	**Date**: 6/8/2020	**Longitude**: 116.71818	**Latitude**: -20.66829

Type: Releve

Soil Types: clay

Topography: Lower Slope

Surface:

Outcrops: small rocks

Litter:

Condition: Good

Condition Notes: cleared, weeds, regularly disturbed

Vegetation Type: AaEgPr Artificial wetland

Vegetation Description: *Acacia ampliceps* and *Sesbania cannabina* medium open shrubland over *Eleocharis geniculata, Schoenus falcatus* and *Cyperus vaginatus* low open sedgeland over *Pluchea rubelliflora, Samolus repens* and *Stemodia grossa* low open herbland.

	Taxon	Ht (cm)	Foliage (%)
	Acacia ampliceps	150	7
	Adriana tomentosa var. *tomentosa*	60	0
	Ammannia baccifera	20	0
	Ammannia baccifera	40	4
*	*Cenchrus ciliaris*	30	15
*	*Chloris barbata*	30	4
	Eleocharis geniculata	5	2
	Eragrostis pergracilis	20	1
	Euphorbia australis		Opportunistic
	Ficus aculeata	250	0.5
	Grevillea pyramidalis	200	0
	Indigofera monophylla	30	0
*	*Passiflora foetida*	0	1

Taxon		Ht (cm)	Foliage (%)
	Pluchea rubelliflora	20	1
	Portulaca oleracea	0	1
	Ptilotus exaltatus	20	2
	Samolus repens	20	0.5
	Schoenus falcatus	100	4
	Sesbania cannabina	180	1
	Stemodia grossa	30	0.5
	Trichodesma zeylanicum var. *zeylanicum*	50	0.5
	Triodia ?angusta	40	5

Site No: OBS	**Date**: 6/8/2020	**Longitude**: 116.71751	**Latitude**: -20.66903

Type: Observation

Soil Types:

Topography: Wetland

Surface:

Outcrops:

Litter:

Condition: Degraded

Condition Notes: cleared

Vegetation Type: AaEgPr Artificial wetland

Vegetation Description: *Acacia ampliceps* and *Sesbania cannabina* medium open shrubland over *Eleocharis geniculata, Schoenus falcatus* and *Cyperus vaginatus* low open sedgeland over *Pluchea rubelliflora, Samolus repens* and *Stemodia grossa* low open herbland.

Taxon		Ht (cm)	Foliage (%)
	Acacia ampliceps	200	2
	Adriana tomentosa var. *tomentosa*	150	0
	Ammannia baccifera	40	0.5
	Brachychiton acuminatus	350	0
	Cyperus vaginatus	60	2
	Eleocharis geniculata	10	5
	Eragrostis pergracilis	20	1
	Pluchea rubelliflora	20	1
	Ptilotus exaltatus	30	0
	Salsola australis	40	0.5
	Samolus repens	30	3
	Schoenus falcatus	60	2
	Sesbania cannabina	200	1

Taxon		Ht (cm)	Foliage (%)
	Stemodia grossa	30	2
	Trianthema turgidifolium	30	0.5
	Triodia ?angusta	10	1
	Typha domingensis	150	2

Site No: 5	**Date**: 6/8/2020	**Longitude**: 116.71422	**Latitude**: -20.67281

Type: Releve

Soil Types: clay

Topography: Wetland

Surface: water and saturated clay

Outcrops: none

Litter:

Condition: Degraded

Condition Notes: cleared, weeds, tracks

Vegetation Type: AaEgPr Artificial wetland

Vegetation Description: *Acacia ampliceps* and *Sesbania cannabina* medium open shrubland over *Eleocharis geniculata, Schoenus falcatus* and *Cyperus vaginatus* low open sedgeland over *Pluchea rubelliflora, Samolus repens* and *Stemodia grossa* low open herbland.

Taxon		Ht (cm)	Foliage (%)
	Acacia ampliceps	200	2
	Adriana tomentosa var. tomentosa	150	0.1
	Ammannia baccifera	40	0.5
	Brachychiton acuminatus	350	0.1
	Cyperus vaginatus	60	2
	Eleocharis geniculata	10	5
	Eragrostis pergracilis	20	1
	Pluchea rubelliflora	20	1
	Ptilotus exaltatus	30	0.1
	Salsola australis	40	0.5
	Samolus repens	30	3
	Schoenus falcatus	60	2
	Sesbania cannabina	200	1
	Stemodia grossa	30	2
	Trianthema turgidifolium	30	0.5
	Triodia ?angusta	30	1
	Typha domingensis	150	2

Site No: 6	**Date**: 6/8/2020	**Longitude**: 116.72298	**Latitude**: -20.64594

Type: Releve

Soil Types: silt sand clay

Topography: Shoreline

Surface:

Outcrops: rocks and sand

Litter:

Condition: Degraded

Condition Notes: weeds, cleared

Vegetation Type: FvTdLc Tidal / Shoreline

Vegetation Description: *Flueggea virosa* subsp. *melanthesoides, Rhizophora stylosa* and *Avicennia marina* scattered mangrove patches with *Typha domingensis, Cyperus vaginatus* and *Spinifex longifolius* low scattered sedges with *Ipomoea costata* and **Passiflora foetida* scattered climbers.

Taxon		Ht (cm)	Foliage (%)
	Acacia ampliceps	350	0.1
	Acacia colei	300	2
*	*Aerva javanica*	70	0.1
	Arivela viscosa	50	0.1
	Avicennia marina	250	0.1
	Boerhavia coccinea	0	0.1
*	*Cenchrus ciliaris*	40	0.1
	Cyperus vaginatus	80	0.1
	Flueggea virosa subsp. *melanthesoides*	300	2
	Ipomoea costata	10	5
	Ipomoea pes-caprae	10	0.1
	Melaleuca argentea	400	0.1
*	*Passiflora foetida*	cl	0.1

Taxon		Ht (cm)	Foliage (%)
	Phyllanthus maderaspatensis	20	1
	Rhynchosia minima	0	0.5
	Spinifex longifolius	40	0.1
	Stemodia grossa	15	0.1
	Swainsona formosa	40	0.1
	Trianthema turgidifolium	5	0.1
	Trichodesma zeylanicum var. *zeylanicum*	100	0.1
	Triodia epactia	30	25
	Typha domingensis	200	0.1

Site No: 7	**Date**: 7/8/2020	**Longitude**: 116.71273	**Latitude**: -20.67546

Type: Observation

Soil Types:

Topography: Flat

Surface: rocks and clay

Outcrops:

Litter:

Condition: Degraded

Condition Notes: between rail and road

Vegetation Type: SdSfTe Hummock Grassland

Vegetation Description: *Solanum diversifolium, Indigofera monophylla* and *Acacia synchronicia* mid to low open shrubland with *Swainsona formosa, Boerhavia coccinea* and *Euphorbia australis* mid to low open herbland over *Triodia epactia* Hummock Grassland.

Taxon		Ht (cm)	Foliage (%)
	Abutilon lepidum		0.1
	Acacia bivenosa	150	0.1
*	*Aerva javanica*	30	0.5
	Atriplex semilunaris	30	0.1
	Brachychiton acuminatus	250	1
*	*Cenchrus ciliaris*	40	40
	Corchorus walcottii	30	0.1
	Euphorbia ?tannensis subsp. *eremophila*	20	0.1
	Indigofera colutea	20	0.1
	Indigofera monophylla	30	0.1
	Phyllanthus maderaspatensis	10	0.1
	Rhynchosia minima	0	0.1
	Salsola australis	40	2
	Solanum diversiflorum	10	1

Taxon		Ht (cm)	Foliage (%)
	Stemodia grossa	50	1
	Swainsona formosa	20	0.1
	Trianthema turgidifolium	40	1
	Trichodesma zeylanicum var. *zeylanicum*	200	2
	Triodia epactia	20	2
	Triumfetta ?clementii	20	0.1

Site No: 8	**Date**: 7/8/2020	**Longitude**: 116.71080	**Latitude**: -20.67651

Type: Releve

Soil Types: rocks with clay

Topography: Slope

Surface: rocky

Outcrops: numerous

Litter: less than 5%

Condition: Very Good

Condition Notes: disturbance at edge, slope represents native veg

Vegetation Type: SdSfTe Hummock Grassland

Vegetation Description: *Solanum diversifolium, Indigofera monophylla* and *Acacia synchronicia* mid to low open shrubland with *Swainsona formosa, Boerhavia coccinea* and *Euphorbia australis* mid to low open herbland over *Triodia epactia* Hummock Grassland.

	Taxon	Ht (cm)	Foliage (%)
	Abutilon lepidum	40	0.5
	Acacia coriacea	100	0.5
	Acacia synchronicia	80	0.5
	Arivela viscosa	30	0.1
	Boerhavia coccinea	0	2
*	*Cenchrus ciliaris*	20	1
	Corchorus parviflorus	20	0.1
	Crotalaria novae-hollandiae	20	0.1
	Cymbopogon ambiguus	100	1
	Eriachne obtusa	20	0.1
	Euphorbia ?tannensis subsp. *eremophila*	20	0.1
	Euphorbia australis	0	0.1

Taxon		Ht (cm)	Foliage (%)
	Goodenia microptera	15	0.1
	Hibiscus sturtii var. *campylochlamys*	30	0.5
	Indigofera monophylla	30	1
	Phyllanthus maderaspatensis	20	0.1
	Rhynchosia minima	0	0.5
	Solanum diversiflorum	10	1
	Stemodia grossa	10	0.1
	Swainsona formosa	30	3
	Trichodesma zeylanicum var. *zeylanicum*	140	2
	Triodia epactia	20	20
	Triumfetta ?clementii	15	0.1

Site No: 9	**Date**: 7/8/2020	**Longitude**: 116.71080	**Latitude**: -20.67704

Type: Releve

Soil Types: clay

Topography: Wetland

Surface:

Outcrops: moderate to high

Litter:

Condition: Degraded

Condition Notes:

Vegetation Type: AaEgPr Artificial wetland

Vegetation Description: *Acacia ampliceps* and *Sesbania cannabina* medium open shrubland over *Eleocharis geniculata, Schoenus falcatus* and *Cyperus vaginatus* low open sedgeland over *Pluchea rubelliflora, Samolus repens* and *Stemodia grossa* low open herbland.

	Taxon	Ht (cm)	Foliage (%)
	Acacia ampliceps	100	0.5
	Ammannia baccifera	30	0.1
*	*Cenchrus ciliaris*	20	4
	Cyperus vaginatus	80	0.1
	Eleocharis geniculata	5	1
	Eriachne obtusa	30	0.5
	Heliotropium curassavicum	0	0.1
	Phyllanthus maderaspatensis	20	0.1
	Pluchea rubelliflora	20	4
	Samolus repens	10	0.1
	Samolus repens	30	1
	Sesbania cannabina	180	0.5
	Stemodia grossa	30	2

Taxon		Ht (cm)	Foliage (%)
	Streptoglossa decurrens	20	0.5
	Tecticornia indica	30	5
	Trianthema turgidifolium	30	1

Site No: 10	**Date**: 7/8/2020	**Longitude**: 116.70942	**Latitude**: -20.68022

Type: Releve

Soil Types:

Topography: Rocky Outcrop

Surface:

Outcrops: numerous

Litter: less than 5%

Condition: Very Good

Condition Notes: near powerline

Vegetation Type: ToAlTe Hummock Grassland

Vegetation Description: *Trachymene oleracea* subsp. *oleracea, Trichodesma zeylanicum* var. *zeylanicum* and *Swainsona formosa* mid to tall herbland with *Abutilon lepidum*, *Crotalaria novae-hollandiae* and *Senna notabilis* low shrubland over *Triodia epactia* tall hummock grassland.

Taxon		Ht (cm)	Foliage (%)
	Abutilon lepidum	50	4
	Acacia synchronicia	120	0.1
	Arivela viscosa	30	0.1
	Boerhavia coccinea	0	1
*	*Cenchrus ciliaris*	10	0.5
	Crotalaria novae-hollandiae	10	0.5
	Cucumis variabilis	0	0.1
	Dysphania rhadinostachya subsp. *Rhadinostachya*	10	0.1
	Euphorbia ?tannensis subsp. *eremophila*	20	0.5
	Grevillea pyramidalis	100	0.1
	Hybanthus aurantiacus	10	0.1
	Ipomoea costata	0	0.1
	Phyllanthus maderaspatensis	20	0.1
	Portulaca oleracea	0	0.5

Taxon		Ht (cm)	Foliage (%)
	Ptilotus auriculifolius	40	0.1
	Rhynchosia minima	0	1
	Scaevola acacioides	100	0.1
	Solanum diversiflorum	10	0.5
	Streptoglossa decurrens	20	0.1
	Tephrosia densa	10	0.1
	Trachymene oleracea subsp. *oleracea*	50	7
	Trichodesma zeylanicum var. *zeylanicum*	100	2
	Triodia epactia	30	30

Site No: 11	**Date**: 7/8/2020	**Longitude**: 116.70842	**Latitude**: -20.68158

Type: Releve **Soil Types**: gravel and clay

Topography: Flat To Slope **Surface**:

Outcrops: small **Litter**:

Condition: Good **Condition Notes**: cleared, natural regrowth

Vegetation Type: SdSfTe Hummock Grassland

Vegetation Description: *Solanum diversifolium, Indigofera monophylla* and *Acacia synchronicia* mid to low open shrubland with *Swainsona formosa, Boerhavia coccinea* and *Euphorbia australis* mid to low open herbland over *Triodia epactia* Hummock Grassland.

Taxon		Ht (cm)	Foliage (%)
	Abutilon lepidum		Opportunistic
	Acacia synchronicia	150	0.5
*	*Aerva javanica*		Opportunistic
	Boerhavia coccinea	0	4
*	*Cenchrus ciliaris*	20	15
	Corchorus parviflorus		Opportunistic
	Cullen pogonocarpum		Opportunistic
	Eucalyptus camaldulensis	300	0.1
	Euphorbia australis	0	2
	Solanum diversiflorum	20	0.5
	Solanum horridum	10	0.5
	Swainsona formosa	20	3
	Triodia epactia	30	0.1

Site No: 12	**Date**: 8/7/2020	**Longitude**: 116.70846	**Latitude**: -20.68283

Type: Releve

Soil Types:

Topography: Creek

Surface: rocky creekbed

Outcrops:

Litter:

Condition: Good

Condition Notes: weeds, altered drainage, pipeline

Vegetation Type: EcScCc Minor Flowline

Vegetation Description: *Eucalyptus camaldulensis* and *Melaleuca lasiandra* low woodland over *Sesbania cannabina, Acacia coriacea* and *Solanum horridum* mid open shrubland over **Cenchrus ciliaris* low open tussock grassland.

Taxon		Ht (cm)	Foliage (%)
	Acacia ampliceps		0.1
	Acacia coriacea	300	1
	Adriana tomentosa var. *tomentosa*		0.1
	Arivela viscosa		0.1
	Brachychiton acuminatus	100	0.1
	Capparis spinosa subsp. *nummularia*		0.1
*	*Cenchrus ciliaris*	30	10
	Cucumis variabilis	0	1
	Cyperus vaginatus	50	1
	Eucalyptus camaldulensis	500	30
	Flueggea virosa subsp. *melanthesoides*	180	0.1
	Heliotropium curassavicum		0.1
	Melaleuca lasiandra	350	15
	Phyllanthus maderaspatensis	20	0.1
	Pluchea rubelliflora	20	2

Taxon		Ht (cm)	Foliage (%)
	Pterocaulon sphaeranthoides	20	0.1
	Sesbania cannabina	200	4
	Solanum horridum	20	0.1
	Stemodia grossa	50	1
	Streptoglossa decurrens	30	0.5
	Swainsona formosa		0.1
	Tecticornia indica	30	0.1
	Trichodesma zeylanicum var. *zeylanicum*	120	1
	Triumfetta ?clementii	40	0.5

Site No: 13	**Date**: 8/7/2020	**Longitude**: 116.70506	**Latitude**: -20.68237

Type: Releve

Soil Types:

Topography: Undulating

Surface: rocky with clay

Outcrops: moderate

Litter:

Condition: Good To Very Good

Condition Notes: clearing, pipeline, tracks

Vegetation Type: AbEtTa Hummock Grassland

Vegetation Description: *Acacia bivenosa, Salsola australis* and *Corchorus walcottii* mid to low open shrubland over *Euphorbia tannensis* subsp. *eremophila, Euphorbia australis* and *Tribulus hirsutus* low open herbland over *Triodia angusta* and *Triodia epactia* tall Hummock Grassland

Taxon		Ht (cm)	Foliage (%)
	Abutilon lepidum	50	0.5
	Acacia bivenosa	200	7
	Corchorus walcottii	20	0.5
	Diplopeltis eriocarpa	30	0.1
	Dysphania rhadinostachya subsp. *Rhadinostachya*	10	0.1
	Eriachne obtusa	30	0.1
	Euphorbia ?tannensis subsp. *eremophila*	20	2
	Euphorbia australis	0	0.1
	Evolvulus alsinoides	5	0.1
	Goodenia microptera	10	0.1
	Hybanthus aurantiacus	10	0.1
	Indigofera monophylla	30	0.1
	Ptilotus exaltatus	50	1
	Senna glutinosa subsp. *glutinosa*	130	0.1

Taxon		Ht (cm)	Foliage (%)
	Senna notabilis	10	0.1
	Solanum diversiflorum	10	0.1
	Solanum horridum	20	0.5
	Streptoglossa decurrens	30	0.1
	Stylobasium spathulatum	100	1
	Swainsona formosa	30	1
	Trachymene oleracea subsp. *oleracea*	10	0.1
	Tribulus hirsutus	0	1
	Trichodesma zeylanicum var. *zeylanicum*	100	0.5
	Triodia ?angusta	30	35
	Triumfetta ?clementii	30	0.1

Site No: 14	**Date**: 8/7/2020	**Longitude**: 116.70349	**Latitude**: -20.68216

Type: Releve

Soil Types:

Topography: Wetland

Surface:

Outcrops: moderate

Litter:

Condition: Good

Condition Notes: dead shrubs, tracks, earth moving

Vegetation Type: PaTiEo Tidal Flats

Vegetation Description: *Pittosporum phillyreoides* and *Acacia coriacea* scattered tall trees over *Tecticornia indica, Enchylaena tomentosa* and *Acacia ampliceps* low open shrubland over *Eriachne obtusa* and **Cenchrus ciliaris* low open tussock grassland. AbEtT

Taxon		Ht (cm)	Foliage (%)
	Acacia ampliceps	200	4
	Acacia coriacea		Opportunistic
*	*Cenchrus ciliaris*	20	1
	Enchylaena tomentosa	30	1
	Eriachne obtusa	20	1
	Neobassia astrocarpa	10	1
	Pittosporum phillyreoides	100	0.1
	Solanum horridum	20	0.5
	Tecticornia indica	30	8
	Trianthema turgidifolium	30	4

Site No: 15	**Date**: 8/7/2020	**Longitude**: 116.70106	**Latitude**: -20.68155

Type: Releve

Soil Types:

Topography: Slope Rocky Outcrop

Surface:

Outcrops: numerous

Litter:

Condition: Very Good

Condition Notes: disturbance on all sides, pipeline, clearing

Vegetation Type: ToAlTe Hummock Grassland

Vegetation Description: *Trachymene oleracea* subsp. *oleracea, Trichodesma zeylanicum* var. *zeylanicum* and *Swainsona formosa* mid to tall herbland with *Abutilon lepidum*, *Crotalaria novae-hollandiae* and *Senna notabilis* low shrubland over *Triodia epactia* tall hummock grassland.

Taxon		Ht (cm)	Foliage (%)
	Abutilon lepidum	40	1
	Arivela viscosa	5	0.1
	Boerhavia coccinea	0	3
*	*Cenchrus ciliaris*	10	0.5
	Cucumis variabilis	0	0.1
	Evolvulus alsinoides	5	0.1
	Gomphrena cunninghamii	5	0.1
	Hibiscus sturtii var. *campylochlamys*	0	0.1
	Phyllanthus maderaspatensis	10	0.1
	Portulaca oleracea	0	2
	Rhynchosia minima	0	0.1
	Senna notabilis	20	0.5
	Streptoglossa decurrens	20	0.1

Taxon		Ht (cm)	Foliage (%)
	Swainsona formosa	30	1
	Tephrosia densa	10	0.1
	Trachymene oleracea subsp. *oleracea*	40	8
	Trianthema turgidifolium	20	0.1
	Trichodesma zeylanicum var. *zeylanicum*	100	5
	Triodia epactia	30	12
	Triumfetta ?clementii	30	1

Site No: 16	**Date**: 8/10/2020	**Longitude**: 116.71090	**Latitude**: -20.67354

Type: Releve **Soil Types**: rocks

Topography: Rocky Hill **Surface**: hill slope

Outcrops: **Litter**:

Condition: Very Good **Condition Notes**:

Vegetation Type: ToAlTe Hummock Grassland

Vegetation Description: *Trachymene oleracea* subsp. *oleracea, Trichodesma zeylanicum* var. *zeylanicum* and *Swainsona formosa* mid to tall herbland with *Abutilon lepidum*, *Crotalaria novae-hollandiae* and *Senna notabilis* low shrubland over *Triodia epactia* tall hummock grassland.

Taxon		Ht (cm)	Foliage (%)
*	*Cenchrus ciliaris*	10	1
	Crotalaria medicaginea var. *neglecta*	10	0.1
	Dysphania rhadinostachya subsp. *Rhadinostachya*		Opportunistic
	Eriachne obtusa		Opportunistic
	Euphorbia ?tannensis subsp. *eremophila*	20	0.5
	Euphorbia australis		Opportunistic
	Ficus brachypoda		Opportunistic
	Gomphrena cunninghamii	5	0.1
	Hibiscus sturtii var. *campylochlamys*	10	0.1
	Panicum decompositum	10	0.1
	Phyllanthus maderaspatensis	15	0.5
	Pittosporum angustifolium		Opportunistic
	Polycarpaea longiflora		Opportunistic

Taxon		Ht (cm)	Foliage (%)
	Portulaca oleracea	0	0.5
	Ptilotus auriculifolius	10	0.1
	Ptilotus exaltatus	5	0.1
	Solanum diversiflorum	10	0.1
	Streptoglossa decurrens	20	0.5
	Streptoglossa liatroides		Opportunistic
	Swainsona formosa	20	0.1
	Trachymene oleracea subsp. *oleracea*	40	15
	Trichodesma zeylanicum var. *zeylanicum*	130	4
	Triodia epactia	30	15
	Triumfetta ?clementii	15	0.1
	*Vigna ?*sp. Hamersley Clay (A.A. Mitchell PRP 113)	0	0.5

Site No: 17	**Date**: 8/10/2020	**Longitude**: 116.70885	**Latitude**: -20.67380

Type: Releve

Soil Types: rocks with clay

Topography: Undulating Flat

Surface: rocky

Outcrops: numerous

Litter:

Condition: Very Good

Condition Notes: old laydown area?

Vegetation Type: AbEtTa Hummock Grassland

Vegetation Description: *Acacia bivenosa, Salsola australis* and *Corchorus walcottii* mid to low open shrubland over *Euphorbia tannensis* subsp. *eremophila, Euphorbia australis* and *Tribulus hirsutus* low open herbland over *Triodia angusta* and *Triodia epactia* tall Hummock Grassland

Taxon		Ht (cm)	Foliage (%)
	Abutilon lepidum	30	1
	Acacia bivenosa	120	3
	Aristida contorta	10	0.1
	Arivela viscosa	30	0.1
	Boerhavia coccinea	0	0.5
	Bonamia pilbarensis	0	0.1
*	*Cenchrus ciliaris*	5	0.5
	Corchorus walcottii	10	1
	Eriachne obtusa	20	0.1
	Euphorbia ?tannensis subsp. *eremophila*	20	2
	Euphorbia australis	0	4
	Goodenia microptera	15	0.1
	Grevillea pyramidalis	100	0.5
	Indigofera colutea		
	Indigofera monophylla	30	0.1

Taxon		Ht (cm)	Foliage (%)
	Ptilotus auriculifolius	30	1
	Ptilotus exaltatus	30	0.5
	Rhynchosia minima	0	0.1
	Salsola australis	20	2
	Sida fibulifera	5	0.1
	Solanum diversiflorum	20	0.1
	Solanum horridum	20	0.1
	Swainsona formosa	30	0.1
	Tephrosia supina	20	0.1
	Trachymene oleracea subsp. *oleracea*	30	0.1
	Tribulus hirsutus	0	2
	Triodia epactia	20	8
	Triumfetta ?clementii	20	0.1

Site No: 18	**Date**: 11/8/2020	**Longitude**: 116.70550	**Latitude**: -20.67507

Type: Releve

Soil Types: sand and rocks

Topography: Drainage

Surface: channel

Outcrops:

Litter:

Condition: Good

Condition Notes: altered drainage, tracks

Vegetation Type: GpTzTa Minor Flowline

Vegetation Description: *Grevillea pyramidalis* and *Terminalia canescens* low isolated trees over *Trichodesma zeylanicum* var. *zeylanicum, Pluchea rubelliflora* and *Streptoglossa decurrens* tall herbland over *Triodia angusta* and **Cenchrus ciliaris* tall mixed Hummock and Tussock grassland.

Taxon		Ht (cm)	Foliage (%)
	Acacia pyrifolia	40	0.1
	Boerhavia coccinea	0	1
*	*Cenchrus ciliaris*	20	0.5
	Cullen stipulaceum		Opportunistic
	Cyperus vaginatus	40	0.5
	Gomphrena cunninghamii	10	0.1
	Grevillea pyramidalis	200	0.5
	Indigofera colutea	10	0.1
	Indigofera colutea	20	0.5
	Indigofera monophylla	30	0.5
	Phyllanthus maderaspatensis	20	0.1
	Pluchea rubelliflora	20	6
	Portulaca oleracea	0	0.1
	Pterocaulon sphaeranthoides	30	0.1

Taxon		Ht (cm)	Foliage (%)
	Solanum phlomoides	20	0.1
	Stemodia grossa	30	0.1
	Streptoglossa decurrens	20	1
	Swainsona formosa	30	2
	Terminalia canescens	200	0.1
	Trachymene oleracea subsp. *oleracea*	60	0.5
	Trianthema turgidifolium	10	0.1
	Trichodesma zeylanicum var. *zeylanicum*	120	8
	Triodia ?angusta	30	15
	Triumfetta appendiculata	20	0.1

Site No: 19	**Date**: 11/8/2020	**Longitude**: 116.69813	**Latitude**: -20.67547

Type: Observation

Soil Types:

Topography: Drainage

Surface: channel

Outcrops: numerous

Litter:

Condition: Good

Condition Notes: man made, weeds

Vegetation Type: Drain outside Minor channel

Vegetation Description: *Eucalyptus camaldulensis* and *Melaleuca lasiandra* low woodland over *Sesbania cannabina, Acacia coriacea* and *Solanum horridum* mid open shrubland over **Cenchrus ciliaris* low open tussock grassland.

Taxon		Ht (cm)	Foliage (%)
	Acacia coriacea	300	4
	Acacia synchronicia	60	0.1
	Arivela viscosa		Opportunistic
*	*Cenchrus ciliaris*	20	20
	Chrysopogon fallax	50	4
	Corymbia hamersleyana	600	10
	Ficus aculeata	250	1
	Indigofera monophylla	30	0.5
	Pittosporum phillyreoides	60	0.5
	Rhynchosia minima	0	0.5
	Sida fibulifera	20	0.5
	Solanum phlomoides	20	0.1
	Stemodia grossa	30	2
	Streptoglossa decurrens	30	1

Taxon		Ht (cm)	Foliage (%)
	Swainsona formosa		Opportunistic
	Terminalia canescens		Opportunistic
	Trachymene oleracea subsp. *oleracea*	30	1
	Trichodesma zeylanicum var. *zeylanicum*	100	3
	Triodia epactia	20	2
	Triumfetta ?clementii	20	10

Site No: 20	**Date**: 11/8/2020	**Longitude**: 116.69545	**Latitude**: -20.67301

Type: Releve

Soil Types:

Topography: Rocky Shoreline

Surface:

Outcrops: numerous

Litter:

Condition: Very Good

Condition Notes:

Vegetation Type: FvTdLc Tidal / Shoreline

Vegetation Description: *Flueggea virosa* subsp. *melanthesoides, Rhizophora stylosa* and *Avicennia marina* scattered mangrove patches with *Typha domingensis, Cyperus vaginatus* and *Spinifex longifolius* low scattered sedges with *Ipomoea costata* and **Passiflora foetida* scattered climbers.

Taxon		Ht (cm)	Foliage (%)
	Aegialitis annulata	40	Opportunistic
	Avicennia marina	200	5
	Bruguiera exaristata	80	Opportunistic
	Ceriops australis	200	Opportunistic
	Rhizophora stylosa	180	30

Site No: 21	**Date**: 13/4/2021	**Longitude**: 116.71596	**Latitude**: -20.67090

Type: Releve

Soil Types: rocky sand clay

Topography: artificial wetland

Surface:

Outcrops: Some rocks

Litter:

Condition: Degraded

Condition Notes:

Vegetation Type: AaEgPr

Vegetation Description: *Acacia ampliceps* and *Sesbania cannabina* medium open shrubland over *Eleocharis geniculata, Schoenus falcatus* and *Cyperus vaginatus* low open sedgeland over *Pluchea rubelliflora, Samolus repens* and *Stemodia grossa* low open herbland

Taxon		Ht (cm)	Foliage (%)
	Acacia ampliceps	200	4
	Acacia coriacea	200	1
	Adriana tomentosa var. *tomentosa*	150	0.5
	Ammannia baccifera	50	0.1
	Boerhavia coccinea	0	1
*	*Cenchrus ciliaris*	30	15
*	*Chloris barbata*	10	2
	Cucumis variabilis	0	0.01
	Cyperus vaginatus	80	1
	Eleocharis geniculata	5	1
	Enchylaena tomentosa	30	15
*	*Flaveria trinervia*	50	0.5

Taxon		Ht (cm)	Foliage (%)
	Heliotropium curassavicum	3	0.5
	Ipomoea costata	0	1
	Melaleuca argentea		opp
	Neptunia dimorphantha	0	0.1
	Phyllanthus maderaspatensis	20	0.1
	Rhynchosia minima	Opportunistic	Opportunistic
	Salsola australis	Opportunistic	Opportunistic
	Samolus repens	20	20
	Sesbania cannabina	150	5
	Stemodia grossa	50	5
*	*Stylosanthes hamata*	20	0.1
	Trianthema turgidifolium	20	0.1
	Triodia epactia	30	3

Site No: 22	**Date**: 13/4/2021	**Longitude**: 116.71136	**Latitude**: -20.67673

Type: Releve

Soil Types: sand rock

Topography: artificial wetland

Surface:

Outcrops: None

Litter: <1%

Condition: Degraded

Condition Notes:

Vegetation Type: AaEgPr

Vegetation Description: *Acacia ampliceps* and *Sesbania cannabina* medium open shrubland over *Eleocharis geniculata, Schoenus falcatus* and *Cyperus vaginatus* low open sedgeland over *Pluchea rubelliflora, Samolus repens* and *Stemodia grossa* low open herbland

	Taxon	Ht (cm)	Foliage (%)
	Acacia ampliceps	40	0.1
	Boerhavia coccinea	0	0.1
*	*Cenchrus ciliaris*	10	0.1
*	*Chloris barbata*	10	0.1
	Cyperus vaginatus	50	0.1
	Enchylaena tomentosa	40	1
	Eragrostis surreyana (P3)	0	0.01
	Heliotropium curassavicum	5	0.1
	Ipomoea costata	0	0.1
	Phyllanthus maderaspatensis	20	0.1
	Salsola australis	50	0.1
	Samolus repens	20	4
	Sesbania cannabina	120	0.5

Taxon		Ht (cm)	Foliage (%)
	Stemodia grossa	30	0.5
	Tecticornia indica	20	6
	Trianthema turgidifolium	20	2

Site No: 23	**Date**: 13/4/2021	**Longitude**: 116.70989	**Latitude**: -20.68239

Type: Releve

Soil Types: Clay

Topography: Shallow ephemeral drainage

Surface:

Outcrops: None

Litter: 20%

Condition: Good

Condition Notes: Man made, altered drainage, rubbish, pipeline, partial clearing.

Vegetation Type: EcScCc

Vegetation Description: *Eucalyptus camaldulensis* and *Melaleuca lasiandra* low woodland over *Sesbania cannabina, Acacia coriacea* and *Solanum horridum* mid open shrubland over **Cenchrus ciliaris* low open tussock grassland.

Taxon		Ht (cm)	Foliage (%)
	Abutilon lepidum	30	0.01
	Acacia coriacea	150	1
	Arivela viscosa	20	0.5
	Cassytha capillaris	0	0.01
*	*Cenchrus ciliaris*	20	25
	Crotalaria novae-hollandiae	40	0.01
	Cucumis variabilis	0	0.1
	Enchylaena tomentosa	20	0.1
	Eucalyptus camaldulensis	600	20
	Evolvulus alsinoides	10	0.1
	Flueggea virosa subsp. *melanthesoides*	60	0.01
	Neptunia dimorphantha	0	0.01

Taxon		Ht (cm)	Foliage (%)
	Phyllanthus maderaspatensis	30	0.01
	Rhynchosia minima	20	3
	Salsola australis	40	0.1
	Sesbania cannabina	20	0.1
	Solanum diversiflorum	20	0.1
	Solanum horridum	30	0.01
	Tecticornia indica	20	0.1
	Trichodesma zeylanicum var. *zeylanicum*	80	0.01
	Triodia epactia	30	15
	Triumfetta ?clementii	20	0.1

Site No: 24	**Date**: 13/4/2021	**Longitude**: 116.70946	**Latitude**: -20.68070

Type: Releve

Soil Types: clay

Topography: hill

Surface: rocky

Outcrops: 80%

Litter: 5%

Condition: Very Good

Condition Notes: Powerline

Vegetation Type: ToAlTe

Vegetation Description: *Trachymene oleracea* subsp. *oleracea, Trichodesma zeylanicum* var. *zeylanicum* and *Swainsona formosa* mid to tall herbland with *Abutilon lepidum*, *Crotalaria novae-hollandiae* and *Senna notabilis* low shrubland over *Triodia epactia* tall hummock grassland.

Taxon		Ht (cm)	Foliage (%)
	Abutilon lepidum	50	8
	Acacia pyrifolia	150	0.1
	Arivela viscosa	40	0.5
	Boerhavia coccinea	5	0.5
	Bonamia media	5	2
*	*Cenchrus ciliaris*	10	2
	Crotalaria novae-hollandiae	30	0.01
	Euphorbia ?tannensis subsp. *eremophila*	30	0.1
	Grevillea pyramidalis	80	0.01
	Hibiscus sturtii var. *campylochlamys*	20	0.01
	Indigofera linifolia	10	0.01
	Indigofera trita	10	0.01

Taxon		Ht (cm)	Foliage (%)
	Ipomoea costata	0	0.1
	Rhynchosia minima	10	0.5
	Solanum horridum	10	0.5
	Tephrosia densa	50	0.1
	Triodia epactia	50	15

Site No: 25	**Date**: 13/4/2021	**Longitude**: 116.70195	**Latitude**: -20.68194

Type: Releve

Soil Types: silt

Topography: wetland / inlet

Surface: bare

Outcrops: 5% rocks

Litter: 0%

Condition: Good

Condition Notes: condition difficult to determine, manmade rock wall, altered drainage

Vegetation Type: PaTiEo

Vegetation Description: *Pittosporum phillyreoides* and *Acacia coriacea* scattered tall trees over *Tecticornia indica, Enchylaena tomentosa* and *Acacia ampliceps* low open shrubland over *Eriachne obtusa* and **Cenchrus ciliaris* low open tussock grassland.

Taxon		Ht (cm)	Foliage (%)
	Enchylaena tomentosa	30	0.1
	Tecticornia indica	30	5
	Trianthema turgidifolium	30	0.1

Site No: 26	**Date**: 13/4/2021	**Longitude**: 116.70416	**Latitude**: -20.68208

Type: Releve

Soil Types: gravel clay

Topography: slopes

Surface: rocky

Outcrops: 1% rocks

Litter: 5%

Condition: Very Good

Condition Notes:

Vegetation Type: AbEtTa

Vegetation Description: *Acacia bivenosa, Salsola australis* and *Corchorus walcottii* mid to low open shrubland over *Euphorbia tannensis* subsp. *eremophila, Euphorbia australis* and *Tribulus hirsutus* low open herbland over *Triodia angusta* and *Triodia epactia* tall Hummock Grassland

	Taxon	Ht (cm)	Foliage (%)
	Abutilon lepidum	40	1
	Acacia ampliceps	100	0.5
	Acacia bivenosa	220	0.5
	Acacia coriacea	150	0.1
	Acacia pyrifolia	50	0.1
	Cassytha capillaris	0	0.5
*	*Cenchrus ciliaris*	20	10
	Crotalaria novae-hollandiae	30	0.1
	Cucumis variabilis		0.01
	Cullen pogonocarpum	20	0.01
	Euphorbia biconvexa	30	0.1
	Grevillea pyramidalis	200	0.1
	Indigofera monophylla	20	0.5
	Phyllanthus maderaspatensis	30	0.5

Taxon		Ht (cm)	Foliage (%)
	Pterocaulon sphaeranthoides	40	0.1
	Rhynchosia minima	20	0.5
	Salsola australis	30	0.1
	Senna artemisioides subsp. *oligophylla*	20	0.1
	Solanum diversiflorum	20	0.5
	Solanum horridum	20	2
	Trianthema turgidifolium	30	0.1
	Trichodesma zeylanicum var. *zeylanicum*	50	0.1
	Triodia epactia	60	10

Site No: 27	**Date**: 13/4/2021	**Longitude**: 116.72546	**Latitude**: -20.65806

Type: Releve

Soil Types: clay between rocks

Topography: rock piles and slopes

Surface: rocky

Outcrops: 75%

Litter: 1%

Condition: Good to Very Good

Condition Notes: condition better 5m from pipeline

Vegetation Type: ToAlTe

Vegetation Description: *Trachymene oleracea* subsp. *oleracea, Trichodesma zeylanicum* var. *zeylanicum* and *Swainsona formosa* mid to tall herbland with *Abutilon lepidum*, *Crotalaria novae-hollandiae* and *Senna notabilis* low shrubland over *Triodia epactia* tall hummock grassland.

	Taxon	Ht (cm)	Foliage (%)
	Abutilon lepidum	50	0.5
	Boerhavia coccinea	0	0.01
	Brachychiton acuminatus	300	0.1
	Cajanus pubescens	70	0.5
*	*Cenchrus ciliaris*	20	1
	Commelina ensifolia	10	0.01
	Cucumis variabilis		
	Cullen ?leucochaites	200	0.01
	Cymbopogon ambiguus	130	0.1
	Euphorbia australis	10	0.01
	Evolvulus alsinoides	10	0.1
	Gomphrena cunninghamii	5	0.01

Taxon		Ht (cm)	Foliage (%)
	Grevillea pyramidalis	100	0.5
	Ipomoea costata	0	1
	Paspalidium tabulatum	20	0.01
	Rhynchosia minima	20	5
	Trichodesma zeylanicum var. *zeylanicum*	80	0.1
	Triodia epactia	50	10
	Triumfetta ?appendiculata	40	0.1
	Triumfetta ?clementii	5	0.01
	Triumfetta maconochieana	20	0.01

Site No: 28	**Date**: 13/4/2021	**Longitude**: 116.72200	**Latitude**: -20.66312

Type: Quick observation

Soil Types:

Topography: drainage shallow

Surface:

Outcrops:

Litter:

Condition: degraded

Condition Notes:

Vegetation Type: EcScCc

Vegetation Description: *Eucalyptus camaldulensis* and *Melaleuca lasiandra* low woodland over *Sesbania cannabina, Acacia coriacea* and *Solanum horridum* mid open shrubland over **Cenchrus ciliaris* low open tussock grassland.

Taxon		Ht (cm)	Foliage (%)
	Acacia coriacea	250	
	Arivela viscosa	40	
	Cyperus vaginatus	40	
	Eucalyptus camaldulensis	400	
	Goodenia microptera	30	

Site No: 29	**Date**: 13/4/2021	**Longitude**: 116.72164	**Latitude**: -20.66348

Type: Releve

Soil Types: clay and rocks

Topography: flat undulating

Surface: small rocks

Outcrops: 5%

Litter: 1%

Condition: Very Good

Condition Notes: pipeline

Vegetation Type: ToAlTe

Vegetation Description: *Trachymene oleracea* subsp. *oleracea, Trichodesma zeylanicum* var. *zeylanicum* and *Swainsona formosa* mid to tall herbland with *Abutilon lepidum*, *Crotalaria novae-hollandiae* and *Senna notabilis* low shrubland over *Triodia epactia* tall hummock grassland.

	Taxon	Ht (cm)	Foliage (%)
	Abutilon lepidum	50	0.5
	Acacia bivenosa	Opportunistic	Opportunistic
	Acacia pyrifolia	60	0.1
	Arivela viscosa	20	0.1
	Bonamia media	20	2
	Cajanus pubescens	30	0.1
*	*Cenchrus ciliaris*	20	0.5
	Eucalyptus camaldulensis	350	0.1
	Evolvulus alsinoides	10	0.5
	Hakea lorea	150	0.1
	Heliotropium inexplicitum	Opportunistic	Opportunistic
	Hybanthus aurantiacus	20	0.1
	Indigofera linifolia	20	0.1

Taxon		Ht (cm)	Foliage (%)
	Phyllanthus maderaspatensis	30	0.1
	Rhynchosia minima	20	0.5
	Senna glutinosa subsp. *pruinosa*	Opportunistic	Opportunistic
	Solanum diversiflorum	20	0.1
*	*Stylosanthes hamata*	20	0.1
	Tephrosia densa	10	0.1
	Tribulus hirsutus	10	0.1
	Trichodesma zeylanicum var. *zeylanicum*	8	0.1
	Triodia epactia	50	15
	Triumfetta ?appendiculata	30	0.1

Site No: 30	**Date**: 13/4/2021	**Longitude**: 116.72609	**Latitude**: -20.65227

Type: Releve

Soil Types: clay

Topography: rock piles

Surface: rocky

Outcrops: 30%

Litter:

Condition: Good

Condition Notes: pipeline, powerline, weeds

Vegetation Type: ToAlTe

Vegetation Description: *Trachymene oleracea* subsp. *oleracea, Trichodesma zeylanicum* var. *zeylanicum* and *Swainsona formosa* mid to tall herbland with *Abutilon lepidum*, *Crotalaria novae-hollandiae* and *Senna notabilis* low shrubland over *Triodia epactia* tall hummock grassland.

	Taxon	Ht (cm)	Foliage (%)
	Abutilon lepidum	20	0.01
	Acacia bivenosa	150	0.1
	Acacia pyrifolia	150	0.1
	Bonamia media	Opportunistic	Opportunistic
	Cajanus pubescens	30	0.1
*	*Cenchrus ciliaris*	20	5
	Cucumis variabilis	0	0.01
	Evolvulus alsinoides	20	0.01
	Grevillea pyramidalis	150	0.1
	Hakea lorea	200	0.1
	Hybanthus aurantiacus	20	0.1
	Paspalidium tabulatum	30	0.01
	Pittosporum phillyreoides	80	0.1

Taxon		Ht (cm)	Foliage (%)
	Rhynchosia minima	20	1
	Solanum horridum	10	0.01
	Themeda triandra sens. Lat	30	0.1
	Trichodesma zeylanicum var. *zeylanicum*	80	0.5
	Triodia epactia	30	12
	Triumfetta ?appendiculata	40	0.5
	Triumfetta ?clementii	20	0.1
	Triumfetta maconochieana	30	0.1

Site No: 31	**Date**: 13/4/2021	**Longitude**: 116.70798	**Latitude**: -20.67446

Type: Releve

Soil Types: clay

Topography: rockpiles, slopes

Surface: rocky

Outcrops: 75%

Litter: <1%

Condition: Very Good to Good

Condition Notes: Weeds

Vegetation Type: ToAlTe

Vegetation Description: *Trachymene oleracea* subsp. *oleracea, Trichodesma zeylanicum* var. *zeylanicum* and *Swainsona formosa* mid to tall herbland with *Abutilon lepidum*, *Crotalaria novae-hollandiae* and *Senna notabilis* low shrubland over *Triodia epactia* tall hummock grassland.

Taxon		Ht (cm)	Foliage (%)
	Abutilon lepidum	50	5
	Acacia coriacea	250	0.1
	Arivela viscosa	20	0.1
	Boerhavia coccinea	0	0.5
	Cajanus pubescens	Opportunistic	Opportunistic
	Cassytha capillaris	0	0.01
*	*Cenchrus ciliaris*	20	1
	Commelina ensifolia	10	0.1
	Cucumis variabilis	Opportunistic	Opportunistic
	Cynanchum floribundum	Opportunistic	Opportunistic
	Evolvulus alsinoides	20	0.5
	Evolvulus alsinoides var. *villosicalyx*	30	1
	Ficus brachypoda	250	0.1

Taxon		Ht (cm)	Foliage (%)
	Gomphrena cunninghamii	10	0.1
	Grevillea pyramidalis	100	0.01
	Hibiscus sturtii var. *campylochlamys*	10	0.01
	Indigofera trita	20	0.01
	Ipomoea costata	0	0.1
	Phyllanthus maderaspatensis	20	0.1
	Portulaca oleracea	10	0.01
	Portulaca pilosa	10	0.01
	Ptilotus auriculifolius	30	0.01
	Rhynchosia minima	20	2
	Scaevola acacioides	Opportunistic	Opportunistic
	Solanum horridum	20	0.5
	Tephrosia densa	20	0.1
	Themeda triandra sens. Lat	30	0.1
	Trichodesma zeylanicum var. *zeylanicum*	80	0.1
	Triodia epactia	50	20
	Triumfetta ?appendiculata	20	0.01
	Triumfetta ?clementii	20	0.01
	Triumfetta maconochieana	30	0.01

Appendix C

Statistical Analysis of Floristic Data

Appendix C Statistical Analysis of Floristic Data

Appendix C Statistical Analysis of Floristic Data

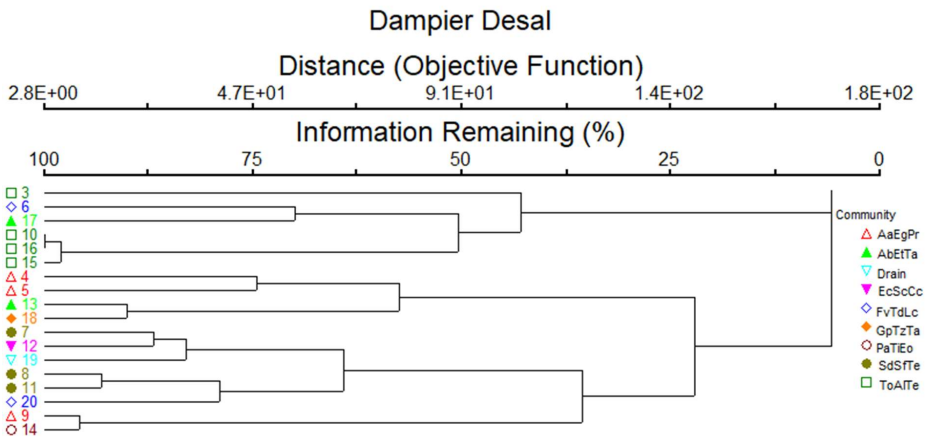

Figure 1 Similarity dendrogram using PC Ord following 2020 survey symbolised by vegetation community

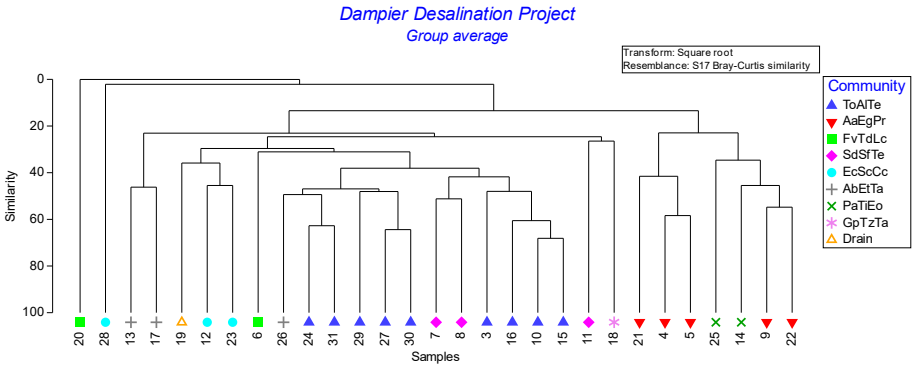

Figure 2 Similarity dendrogram using Primer following 2021 survey symbolised by vegetation community

Field Code Changed

Appendix D

Flora Species by Community Matrix

Appendix D Flora Species by Community Matrix

Appendix D
Flora Species by Community Matrix
60657149 - Flora, Vegetation and Fauna Assessmet - Dampier Desalination Project
Rio Tinto Iron Ore

Family	Taxon	Hummock Grassland			Artificial Wetland	Minor Flow		Tidal		Survey	
		AbEtTa	SdSfTe	ToAlTe	AaEgPr	EcScCc	GpTzTa	FvTdLc	PaTiEo	Phase I	Phase II
Acanthaceae											
	Avicennia marina							x		x	x
	Aizoaceae		x	x	x		x	x	x	x	
Aizoaceae											
	Trianthema turgidifolium	x	x	x	x		x	x	x	x	x
Amaranthaceae											
	**Aerva javanica*		x	x				x		x	
	Gomphrena cunninghamii			x			x			x	x
	Ptilotus auriculifolius	x		x						x	x
	Ptilotus exaltatus	x		x	x					x	
Apiaceae											
	Trachymene oleracea subsp. *oleracea*	x		x			x			x	
Apocynaceae											
	Cynanchum floribundum			x						x	x
Asteraceae											
	**Flaveria trinervia*				x						x
	Pluchea rubelliflora				x	x	x			x	
	Pterocaulon sphaeranthoides	x				x	x			x	x
	Streptoglossa decurrens	x		x	x	x	x			x	
	Streptoglossa liatroides			x						x	
Boraginaceae											
	Heliotropium curassavicum				x	x				x	x
	Heliotropium inexplicitum			x							x
	Trichodesma zeylanicum var. *zeylanicum*	x	x	x	x	x	x	x		x	x
Capparaceae											
	Capparis spinosa subsp. *nummularia*					x				x	
Caryophyllaceae											
	Polycarpaea longiflora			x						x	
Chenopodiaceae											
	Atriplex semilunaris		x							x	
	Dysphania rhadinostachya subsp. *rhadinostachya*	x		x						x	
	Enchylaena tomentosa				x	x			x		x
	Neobassia astrocarpa								x		
	Salsola australis	x	x	x	x					x	x
	Tecticornia indica				x	x			x	x	x

Appendix D
Flora Species by Community Matrix
60657149 - Flora, Vegetation and Fauna Assessmet - Dampier Desalination Project
Rio Tinto Iron Ore

Family	Taxon	Hummock Grassland			Artificial Wetland	Minor Flow		Tidal		Survey	
		AbEtTa	SdSfTe	ToAlTe	AaEgPr	EcScCc	GpTzTa	FvTdLc	PaTiEo	Phase I	Phase II
Cleomaceae											
	Arivela viscosa	x	x	x		x		x		x	x
Combretaceae											
	Terminalia canescens			x			x			x	
Commelinaceae											
	Commelina ensifolia			x							x
Convolvulaceae											
	Bonamia media			x						x	x
	Bonamia pilbarensis	x								x	
	Evolvulus alsinoides	x		x		x				x	x
	Evolvulus alsinoides var. *villosicalyx*										x
	Ipomoea costata			x	x			x		x	x
	Ipomoea pes-caprae							x		x	
	Cucurbitaceae			x		x				x	
	Cucumis variabilis			x		x				x	
Cucurbitaceae											
	**Cucumis variabilis*	x		x	x	x				x	x
Cyperaceae											
	Cyperus vaginatus				x	x	x	x		x	x
	Eleocharis geniculata				x					x	x
	Schoenus falcatus				x					x	
	Typha domingensis				x					x	
Euphorbiaceae											
	Adriana tomentosa var. *tomentosa*				x	x				x	x
	Euphorbia ?tannensis subsp. *eremophila*	x	x	x						x	x
	Euphorbia australis	x	x	x	x					x	x
	Euphorbia biconvexa	x		x						x	x
Fabaceae											
	Acacia ampliceps	x			x	x		x	x	x	x
	Acacia bivenosa	x	x	x						x	x
	Acacia colei							x		x	
	Acacia coriacea	x	x	x	x	x			x	x	x
	Acacia pyrifolia	x		x			x			x	x
	Acacia synchronicia		x	x						x	

Appendix D
Flora Species by Community Matrix
60657149 - Flora, Vegetation and Fauna Assessmet - Dampier Desalination Project
Rio Tinto Iron Ore

Family	Taxon	Hummock Grassland			Artificial Wetland	Minor Flow		Tidal		Survey	
		AbEtTa	SdSfTe	ToAlTe	AaEgPr	EcScCc	GpTzTa	FvTdLc	PaTiEo	Phase I	Phase II
	Alysicarpus muelleri			x						x	
	Cajanus pubescens			x							x
	Crotalaria medicaginea var. *neglecta*	x		x		x				x	x
	Crotalaria novae-hollandiae		x	x						x	
	Cullen ?leucochaites			x							x
	Cullen pogonocarpum	x	x							x	x
	Cullen stipulaceum						x			x	
	Indigofera colutea	x	x	x			x			x	
	Indigofera linifolia			x						x	x
	Indigofera monophylla	x	x	x	x		x			x	x
	Indigofera trita			x							x
	Neptunia dimorphantha				x	x					x
	Rhynchosia minima	x	x	x	x	x		x		x	x
	Senna artemisioides subsp. *oligophylla*	x									x
	Senna glutinosa subsp. *glutinosa*	x								x	
	Senna glutinosa subsp. *pruinosa*			x							x
	Senna notabilis	x		x						x	
	Sesbania cannabina				x	x				x	x
	Stylobasium spathulatum	x								x	
	**Stylosanthes hamata*			x	x						x
	Swainsona formosa	x	x	x		x	x	x		x	
	Swainsona sturtii			x						x	
	Tephrosia supina	x								x	
	Tephrosia densa			x						x	x
	Vigna ?sp. Hamersley Clay (A.A. Mitchell PRP 113)			x						x	
Goodeniaceae											
	Goodenia microptera	x	x			x				x	x
	Scaevola acacioides			x						x	x
Lauraceae											
	Cassytha capillaris	x		x		x					x
Lythraceae											
	Ammannia baccifera				x					x	x
Malvaceae											
	Abutilon lepidum	x	x	x		x				x	x
	Brachychiton acuminatus		x	x	x	x				x	x

Appendix D
Flora Species by Community Matrix
60657149 - Flora, Vegetation and Fauna Assessmet - Dampier Desalination Project
Rio Tinto Iron Ore

Family	Taxon	Hummock Grassland			Artificial Wetland	Minor Flow		Tidal		Survey	
		AbEtTa	SdSfTe	ToAlTe	AaEgPr	EcScCc	GpTzTa	FvTdLc	PaTiEo	Phase I	Phase II
Malv cont.	*Corchorus parviflorus*		x							x	
	Corchorus walcottii	x	x							x	
	Hibiscus sturtii var. *campylochlamys*		x	x						x	x
	Sida fibulifera	x								x	
	Triumfetta ?appendiculata			x						x	x
	Triumfetta ?clementii	x	x	x		x				x	x
	Triumfetta appendiculata						x			x	
	Triumfetta maconochieana			x							x
Moraceae											
	Ficus aculeata				x					x	
	Ficus brachypoda			x						x	x
Myrtaceae											
	Corymbia hamersleyana					x				x	
	Eucalyptus camaldulensis		x	x		x				x	x
	Melaleuca argentea				x			x		x	x
	Melaleuca lasiandra					x				x	
Nyctaginaceae											
	Boerhavia coccinea	x	x	x	x		x	x		x	x
	Passifloraceae				x			x		x	
	Passiflora foetida				x			x		x	
Pittosporaceae											
	Pittosporum angustifolium			x						x	
	Pittosporum phillyreoides								x	x	
Phyllanthaceae											
	Flueggea virosa subsp. *melanthesoides*					x		x		x	x
	Phyllanthus maderaspatensis	x	x	x	x	x	x	x		x	x
Pittosporaceae											
	Pittosporum phillyreoides			x							x
Plantaginaceae											
	Stemodia grossa		x		x	x	x	x		x	x
Plumbaginaceae											
	Aegialitis annulata							x		x	
Poaceae											
	Aristida contorta	x								x	
	**Cenchrus ciliaris*	x	x	x	x	x	x	x	x	x	x

Appendix D
Flora Species by Community Matrix
60657149 - Flora, Vegetation and Fauna Assessmet - Dampier Desalination Project
Rio Tinto Iron Ore

Family	Taxon	Hummock Grassland			Artificial Wetland	Minor Flow		Tidal		Survey	
		AbEtTa	SdSfTe	ToAlTe	AaEgPr	EcScCc	GpTzTa	FvTdLc	PaTiEo	Phase I	Phase II
Poa cont.	**Chloris barbata*				x					x	x
	Chrysopogon fallax					x				x	
	Cymbopogon ambiguus		x	x						x	x
	Eragrostis pergracilis				x					x	
	Eragrostis surreyana										x
	Eriachne obtusa	x	x	x	x				x	x	
	Panicum decompositum			x						x	
	Paspalidium tabulatum										x
	Spinifex longifolius							x		x	
	Themeda triandra sens. Lat			x							x
	Triodia ?angusta	x			x		x			x	
	Triodia epactia	x	x	x	x	x		x		x	x
Portulacaceae											
	Portulaca oleracea			x	x		x			x	x
	Portulaca pilosa			x							x
Primulaceae											
	Samolus repens				x					x	x
Proteaceae											
	Grevillea pyramidalis	x		x	x		x			x	x
	Hakea lorea			x							x
Rhizophoraceae											
	Bruguiera exaristata							x		x	
	Ceriops australis							x		x	
	Rhizophora stylosa							x		x	
Sapindaceae											
	Diplopeltis eriocarpa	x								x	
Solanaceae											
	Solanum diversiflorum	x	x	x		x				x	x
	Solanum horridum	x	x	x		x			x	x	x
	Solanum phlomoides						x			x	
Typhaceae											
	Typha domingensis							x		x	
Violaceae											
	Hybanthus aurantiacus	x		x						x	x
Zygophyllaceae											
	Tribulus hirsutus	x		x						x	

Appendix E

Priority Flora Locations

Appendix E Priority Flora Locations

Easting	Northing	Population Count	Species
469937	7713603	Not counted	Eragrostis surreyana
470255	7714043	200	Eragrostis surreyana
470240	7714006	100	Eragrostis surreyana
470208	7714016	10	Eragrostis surreyana
470049	7713794	10	Eragrostis surreyana
469983	7713696	4	Eragrostis surreyana
469947	7713678	100	Eragrostis surreyana
469919	7713522	2	Eragrostis surreyana
469933	7713607	100	Eragrostis surreyana
469938	7713629	10	Eragrostis surreyana
470035	7713747	20	Eragrostis surreyana
470024	7713731	1	Eragrostis surreyana
469989	7713676	3	Eragrostis surreyana
469971	7713656	50	Eragrostis surreyana
469934	7713576	5	Eragrostis surreyana
469966	7713648	200	Eragrostis surreyana
469978	7713659	50	Eragrostis surreyana
469993	7713687	20	Eragrostis surreyana

Appendix F

Fauna Species List

Appendix F Fauna Species List

Family	Taxon	Common Name	Habitat Type				Survey	
			Grasslands on rocky slopes	Minor creeks/drainage lines	Artificial/ephemeral wetlands	Rocky shoreline	Phase I	Phase II
Mammals								
Canidae	*Canis familiaris*	Wild Dog			X			X
Felidae	*Felis catus*	Cat	X	X			X	X
Macropodidae	*Osphranter robustus*	Euro/Common Wallaroo	X	X	X	X	X	X
Tachyglossidae	*Tachyglossus aculeatus*	Short-Beaked Echidna	X	X			X	X
Unidentified bat species	Unidentified species		X	X	X		X	
Unidentified small rodent species	Unidentified species					X		X
Reptiles								
Agamidae (Dragons)	*Ctenophorus caudicinctus caudicinctus*	Ring-tailed Dragon	X					X
	Unidentified species					X		X
Gekkonidae (Geckoes)	*Heteronotia binoei*	Bynoe's Gecko	X					X
Scincidae (Skinks)	*Ctenotus duricola*	Eastern Pilbara Lined Ctenotus	X					X
	Ctenotus schomburgkii	Barred Wedgesnout Ctenotus	X					X
	Morethia ruficauda	Lined Firetail Skink	X					X
Birds								
Accipitridae (Osprey, Hawks, Eagles)	*Circus assimilis*	Spotted Harrier	X	X	X		X	
	Haliaeetus leucogaster	White-bellied Sea-Eagle	X	X	X		X	X
	Haliastur indus	Brahminy Kite				X	X	
	Haliastur sphenurus	Whistling Kite	X	X	X		X	X
	Pandion cristatus	Osprey			X			X
Alcedinidae (Kingfishers)	*Todiramphus chloris*	Collared Kingfisher				X	X	
	Todiramphus pyrrhopygius	Red-backed Kingfisher	X	X			X	X
	Todiramphus sanctus	Sacred Kingfisher		X				X
Anatidae (Ducks)	*Anas superciliosa*	Pacific Black Duck			X			X
Ardeidae (Herons, Egrets, Bitterns)	*Ardea novaehollandiae*	White-faced Heron			X	X	X	
	Ardea sacra	Eastern Reef Heron				X	X	
	Ixobrychus flavicollis	Black Bittern				X		X
Artamidae (Woodswallows)	*Artamus cinereus*	Black-faced Woodswallow	X	X	X		X	X
	Artamus personatus	Masked Woodswallow	X				X	X
	Artamus leucorynchus	White-breasted Woodswallow			X	X	X	X
	Cracticus torquatus	Grey Butcherbird	X					X
Cacatuidae (Cockatoos)	*Cacatua roseicapilla*	Galah	X				X	X
	Cacatua sanguinea	Little Corella	X	X			X	X

Family	Taxon	Common Name	Habitat Type				Survey	
			Grasslands on rocky slopes	Minor creeks/drainage lines	Artificial/ephemeral wetlands	Rocky shoreline	Phase I	Phase II
Campephagidae (Cuckoo-shrikes, Trillers)	*Coracina novaehollandiae*	Black-faced Cuckoo-shrike	X				X	X
	Lalage tricolor	White-winged Triller	X	X			X	
Charadriidae (Lapwings, Plovers, Dotterels)	*Elseyornis melanops*	Black-fronted Dotterel			X		X	X
Columbidae (Pigeons, Doves)	*Geopelia striata*	Peaceful Dove	X				X	
	Geophaps plumifera	Spinifex Pigeon	X		X		X	X
	Ocyphaps lophotes	Crested Pigeon	X	X	X		X	X
Corvidae (Ravens, Crows)	*Corvus coronoides*	Australian Raven	X					X
Cracticidae (Butcherbirds, Magpies, Currawongs)	*Cracticus nigrogularis*	Pied Butcherbird	X	X	X	X	X	X
Cuculidae (Cuckoos)	*Cacomantis pallidus*	Pallid Cuckoo	X	X			X	
	Chrysococcyx basalis	Horsfield's Bronze Cuckoo						
Estrildidae (Finches)	*Emblema pictum*	Painted Finch	X	X	X		X	
	Taeniopygia guttata	Zebra Finch	X	X	X		X	
Falconidae (Falcons)	*Falco cenchroides*	Nankeen Kestrel	X	X	X		X	X
Hirundinidae (Swallows, Martins)	*Hirundo neoxena*	Welcome Swallow		X	X		X	X
	Petrochelidon ariel	Fairy Martin			X			X
Laridae (Gulls, Noddies, Terns)	*Larus novaehollandiae*	Silver Gull			X	X	X	X
	Hydroprogne caspia	Caspian Tern			X	X	X	X
Locustellidae (Songlarks, Cisticolas, Spinifex-bird)	*Cincloramphus mathewsi*	Rufous Songlark	X				X	
Meliphagidae (Honeyeaters)	*Gavicalis virescens*	Singing Honeyeater	X	X	X		X	X
	Lichmera indistincta	Brown Honeyeater	X	X	X		X	X
	Manorina flavigula	Yellow-throated Miner	X	X	X		X	X
	Ptilotula penicillata	White-plumed Honeyeater	X				X	
Meropidae (Bee-eaters)	*Merops ornatus*	Rainbow Bee-eater	X	X			X	X
Monarchidae (Monarchs, Flycatchers)	*Grallina cyanoleuca*	Magpie-lark	X		X	X	X	X
Motacillidae (Pipits)	*Anthus australis*	Australian Pipit	X		X		X	
Podicipedidae (Grebes)	*Tachybaptus novaehollandiae*	Australasian Grebe			X			X
	Poliocephalus poliocephalus	Hoary-headed Grebe			X		X	
Recurvirostridae	*Himantopus himantopus*	Black-winged Stilt			X			X
Rhipiduridae (Fantails)	*Rhipidura leucophrys*	Willie Wagtail	X	X			X	X
Scolopacidae (Curlews, Sandpipers, Snipes, Godwits)	*Actitis hypoleucos*	Common Sandpiper			X	X	X	X
Threskiornithidae (Ibises & Spoonbills)	*Threskiornis spinicollis*	Straw-necked Ibis			X		X	

Appendix G

Fauna Habitat Assessments

Appendix G Fauna Habitat Assessments

Fauna Habitat Assessment

Site Information

Site number	2021-1									
Observer	J. Leigh									
Photo's taken	2									

General Habitat Description

Triodia on rocky slopes and flats.
Grasslands with moderate cover.
Includes some tall shrubs over diverse low herbs, shrubs and grasses.

Habitat Characteristics

Characteristics	Abundance	Notes
Hollows small	Rare	
Hollows large	Absent	
Logs (<10cm diam)	Occasional	
Logs (10-30cm diam)	Rare	
Logs (>30cm diam)	Absent	
Decorticating bark	Rare to occasional	
Course litter (>2cm diam)	Occasional	
Fine litter (<2cm diam)	Rare to occasional	
Bare ground	Common	
Grass	Common	
Soil cracks	Rare	Soil Description: Clayey brown soils
Stones (<20cm)	Common to abundant	
Stones (20-60cm)	Common to abundant	
Boulders (60cm-2m)	Occasional	
Large boulders (>2m)	Rare	
Rock crevices	Occasional	
Exfoliating rock	Rare to occasional	
Cryptogramic crust	Absent	
Water body/wetland	Absent	
Large mature trees	Absent	
Vines	Absent	
Mistletoe	Absent	
Dense understorey	Absent	

Disturbance (e.g. type, severity)

Some edge effects			

Animal Signs/Observations

Euro scat common, yellow throated miners, several skink species observed in rockpiles, crested pigeons, zebra finches.			

Conservation Signifcant Fauna Signs and / or Potential Habitat

Does not provide significant habitat for SREs or quolls.		

Other

Habitat Quality	
Moderate to High	
Connectivity	Common in landscape
Other significant features	

Fauna Habitat Assessment

Site Information

Site number	2021-2									
Observer	J. Leigh									
Photo's taken	2									

General Habitat Description

Minor creeks and drainage - ephemeral creeks and drainage.
Includes mature trees in varying densities (no large hollows observed), moderate density groundcover of tussock grasses, herbs and shrubs.

Habitat Characteristics

Characteristics	Abundance	Notes
Hollows small	Rare	
Hollows large	Absent	
Logs (<10cm diam)	Occasional	
Logs (10-30cm diam)	Rare to occasional	
Logs (>30cm diam)	Absent	
Decorticating bark	Rare	
Course litter (>2cm diam)	Rare to occasional	
Fine litter (<2cm diam)	Rare	
Bare ground	Abundant	
Grass	Occasional	
Soil cracks	Rare to occasional	Soil Description: Clayey brown soils
Stones (<20cm)	Abundant	
Stones (20-60cm)	Abundant	
Boulders (60cm-2m)	Rare to occasional	
Large boulders (>2m)	Rare	
Rock crevices	Rare to occasional	
Exfoliating rock	Rare	
Cryptogramic crust	Rare	
Water body/wetland	Abundant	
Large mature trees	Absent	
Vines	Rare	
Mistletoe	Absent	
Dense understorey	Absent	

Disturbance (e.g. type, severity)

Some drainage areas may be modified.

Animal Signs/Observations

Euros, zebra finches.

Conservation Signifcant Fauna Signs and / or Potential Habitat

Does not provide significant habitat for SREs or quolls.

Other

Habitat Quality	
Moderate to High	

Connectivity Creeklines are used by fauna as linkages through the landscape.

Other significant features

Fauna Habitat Assessment

Site Information

Site number	2021-3									
Observer	J. Leigh									
Photo's taken	0									

General Habitat Description

Minor creeks and drainage - ephemeral creeks and drainage.
Includes mature trees in varying densities (no large hollows observed), moderate density groundcover of tussock grasses, herbs and shrubs.

Habitat Characteristics

Characteristics	Abundance	Notes
Hollows small	Rare	
Hollows large	Absent	
Logs (<10cm diam)	Occasional	
Logs (10-30cm diam)	Rare to occasional	
Logs (>30cm diam)	Absent	
Decorticating bark	Rare	
Course litter (>2cm diam)	Rare to occasional	
Fine litter (<2cm diam)	Rare	
Bare ground	Abundant	
Grass	Occasional	
Soil cracks	Rare to occasional	Soil Description: Clayey brown soils
Stones (<20cm)	Abundant	
Stones (20-60cm)	Abundant	
Boulders (60cm-2m)	Rare to occasional	
Large boulders (>2m)	Rare	
Rock crevices	Rare to occasional	
Exfoliating rock	Rare	
Cryptogramic crust	Rare	
Water body/wetland	Abundant	
Large mature trees	Absent	
Vines	Rare	
Mistletoe	Absent	
Dense understorey	Absent	

Disturbance (e.g. type, severity)

Some drainage areas may be modified.			

Animal Signs/Observations

Conservation Signifcant Fauna Signs and / or Potential Habitat

Does not provide significant habitat for SREs or quolls.		

Other

Habitat Quality	
Moderate to High	
Connectivity	Creeklines are used by fauna as linkages through the landscape.
Other significant features	

Fauna Habitat Assessment

Site Information

Site number	2021-4									
Observer	J. Leigh									
Photo's taken	3									

General Habitat Description

Isolated rockpiles - large rockpiles with minimal vegetation.

Habitat Characteristics

Characteristics	Abundance	Notes
Hollows small	Absent	
Hollows large	Absent	
Logs (<10cm diam)	Absent	
Logs (10-30cm diam)	Absent	
Logs (>30cm diam)	Absent	
Decorticating bark	Absent	
Course litter (>2cm diam)	Absent	
Fine litter (<2cm diam)	Absent	
Bare ground	Absent	
Grass	Absent	
Soil cracks	Absent	Soil Description: Clayey brown soils
Stones (<20cm)	Occasional to common	
Stones (20-60cm)	Occasional to common	
Boulders (60cm-2m)	Abundant	
Large boulders (>2m)	Abundant	
Rock crevices	Common to abundant	
Exfoliating rock	Occasional	
Cryptogramic crust	Absent	
Water body/wetland	Absent	
Large mature trees	Absent	
Vines	Absent	
Mistletoe	Absent	
Dense understorey	Absent	

Disturbance (e.g. type, severity)

Animal Signs/Observations

Euro and bird scat, likely to be used by reptiles and possibly quolls.			

Conservation Signifcant Fauna Signs and / or Potential Habitat

May provide habitat for quolls.		

Other

Habitat Quality	
Moderate	
Connectivity	Most have limited connectivity - isolated piles.
Other significant features	

Fauna Habitat Assessment

Site Information

Site number	2021-5									
Observer	J. Leigh									
Photo's taken	1									

General Habitat Description

Triodia on rocky slopes and flats.
Grasslands with moderate cover.
Includes some tall shrubs over diverse low herbs, shrubs and grasses.

Habitat Characteristics

Characteristics	Abundance	Notes
Hollows small	Rare	
Hollows large	Absent	
Logs (<10cm diam)	Occasional	
Logs (10-30cm diam)	Absent	
Logs (>30cm diam)	Absent	
Decorticating bark	Rare	
Course litter (>2cm diam)	Occasional	
Fine litter (<2cm diam)	Occasional	
Bare ground	Common	
Grass	Abundant	
Soil cracks	Rare	Soil Description: Clayey brown soils
Stones (<20cm)	Common to abundant	
Stones (20-60cm)	Common to abundant	
Boulders (60cm-2m)	Common	
Large boulders (>2m)	Rare	
Rock crevices	Rare to occasional	
Exfoliating rock	Occasional	
Cryptogramic crust	Absent	
Water body/wetland	Absent	
Large mature trees	Absent	
Vines	Rare	
Mistletoe	Absent	
Dense understorey	Absent	

Disturbance (e.g. type, severity)

Moderate levels from pipeline construction, landform modification and weeds (buffel).

Animal Signs/Observations

Euro scat common, yellow throated miners, reptiles likely, crested pigeons.

Conservation Signifcant Fauna Signs and / or Potential Habitat

Isolated rockpiles scattered throughout, potential to be used by foraging quolls

Other

Habitat Quality	
Moderate to High	
Connectivity	Common in landscape
Other significant features	

Fauna Habitat Assessment

Site Information

Site number	2021-6									
Observer	J. Leigh									
Photo's taken	2									

General Habitat Description

Minor creeks and drainage - ephemeral creeks and drainage.
Includes mature trees in varying densities (no large hollows observed), moderate density groundcover of tussock grasses, herbs and shrubs.

Habitat Characteristics

Characteristics	Abundance	Notes
Hollows small	Rare	
Hollows large	Absent	
Logs (<10cm diam)	Occasional	
Logs (10-30cm diam)	Rare to occasional	
Logs (>30cm diam)	Absent	
Decorticating bark	Rare to occasional	
Course litter (>2cm diam)	Rare to occasional	
Fine litter (<2cm diam)	Rare to occasional	
Bare ground	Common to abundant	
Grass	Common to abundant	
Soil cracks	Absent	Soil Description: Clayey brown soils
Stones (<20cm)	Common	
Stones (20-60cm)	Common	
Boulders (60cm-2m)	Rare to occasional	
Large boulders (>2m)	Absent	
Rock crevices	Rare	
Exfoliating rock	Rare	
Cryptogramic crust	Occasional	
Water body/wetland	Abundant	
Large mature trees	Absent	
Vines	Absent	
Mistletoe	Absent	
Dense understorey	Absent	

Disturbance (e.g. type, severity)

Appears to be a modified drainage area.

Animal Signs/Observations

2 x magpie larks, euro scat common.

Conservation Signifcant Fauna Signs and / or Potential Habitat

Smaller area, may be utilised by migratory waders but very marginal habitat.

Other

Habitat Quality	
Moderate to High	

Connectivity Creeklines are used by fauna as linkages through the landscape. See aerial.

Other significant features

Fauna Habitat Assessment

Site Information

Site number	2021-6									
Observer	J. Leigh									
Photo's taken	2									

General Habitat Description

Minor creeks and drainage - ephemeral creeks and drainage.
Includes mature trees in varying densities (no large hollows observed), moderate density groundcover of tussock grasses, herbs and shrubs.

Habitat Characteristics

Characteristics	Abundance	Notes
Hollows small	Rare	
Hollows large	Absent	
Logs (<10cm diam)	Occasional	
Logs (10-30cm diam)	Rare to occasional	
Logs (>30cm diam)	Absent	
Decorticating bark	Occasional	
Course litter (>2cm diam)	Common	
Fine litter (<2cm diam)	Common	
Bare ground	Common	
Grass	Common to abundant	
Soil cracks	Rare	Soil Description: Clayey brown soils
Stones (<20cm)	Common to abundant	
Stones (20-60cm)	Common to abundant	
Boulders (60cm-2m)	Occasional	
Large boulders (>2m)	Absent	
Rock crevices	Absent	
Exfoliating rock	Absent	
Cryptogramic crust	Rare to occasional	
Water body/wetland	Abundant	
Large mature trees	Absent	
Vines	Absent	
Mistletoe	Absent	
Dense understorey	Absent	

Disturbance (e.g. type, severity)

Potential landform modification and pipeine construction, weeds abundant.

Animal Signs/Observations

Ctenotus schomburgkii , echidna, magpie larks, Euro scat common.

Conservation Signifcant Fauna Signs and / or Potential Habitat

Other

Habitat Quality	
Moderate	

Connectivity Creeklines are used by fauna as linkages through the landscape. See aerial.

Other significant features

Fauna Habitat Assessment

Site Information

Site number	2021-8									
Observer	J. Leigh									
Photo's taken	2									

General Habitat Description

Triodia on rocky slopes and flats.
Grasslands with moderate cover.
Includes some tall shrubs over diverse low herbs, shrubs and grasses.

Habitat Characteristics

Characteristics	Abundance	Notes
Hollows small	Rare	
Hollows large	Absent	
Logs (<10cm diam)	Occasional	
Logs (10-30cm diam)	Rare	
Logs (>30cm diam)	Absent	
Decorticating bark	Rare	
Course litter (>2cm diam)	Rare	
Fine litter (<2cm diam)	Rare	
Bare ground	Common to abundant	
Grass	Abundant	
Soil cracks	Rare	Soil Description: Clayey red brown soils
Stones (<20cm)	Abundant	
Stones (20-60cm)	Abundant	
Boulders (60cm-2m)	Occasional	
Large boulders (>2m)	Absent	
Rock crevices	Rare to occasional	
Exfoliating rock	Rare	
Cryptogramic crust	Occasional	
Water body/wetland	Absent	
Large mature trees	Absent	
Vines	Absent	
Mistletoe	Absent	
Dense understorey	Absent	

Disturbance (e.g. type, severity)

Some landform modification and weed (buffel) presence - pipeline installation.

Animal Signs/Observations

Whistling Kite flying over, Yellow-throated Miners, Euro scat comon, Rainbow Bee Eaters heard.

Conservation Signifcant Fauna Signs and / or Potential Habitat

Does not provide significant habitat for SREs, contains potential foraging areas for quolls.

Other

Habitat Quality
Moderate

Connectivity Common throughout landscape.

Other significant features Adjacent drainage area.

Fauna Habitat Assessment

Site Information

Site number	2021-9									
Observer	J. Leigh									
Photo's taken	2									

General Habitat Description

Triodia on rocky slopes and flats.
Grasslands with moderate cover.
Includes some tall shrubs over diverse low herbs, shrubs and grasses.

Habitat Characteristics

Characteristics	Abundance	Notes
Hollows small	Rare	
Hollows large	Absent	
Logs (<10cm diam)	Rare to occasional	
Logs (10-30cm diam)	Rare	
Logs (>30cm diam)	Absent	
Decorticating bark	Rare	
Course litter (>2cm diam)	Rare to occasional	
Fine litter (<2cm diam)	Rare to occasional	
Bare ground	Occasional to common	
Grass	Abundant	
Soil cracks	Rare	Soil Description: Clayey brown to red soils
Stones (<20cm)	Abundant	
Stones (20-60cm)	Abundant	
Boulders (60cm-2m)	Common to abundant	
Large boulders (>2m)	Rare to occasional	
Rock crevices	Common	
Exfoliating rock	Rare to occasional	
Cryptogramic crust	Absent	
Water body/wetland	Absent	
Large mature trees	Absent	
Vines	Absent	
Mistletoe	Absent	
Dense understorey	Absent	

Disturbance (e.g. type, severity)

Minor landform disturbance from pipeline construction. Presence of buffel.

Animal Signs/Observations

Euro scat common, Echidna scat, Yellow-throated Miners, Raven.

Conservation Signifcant Fauna Signs and / or Potential Habitat

Landscape likely to provide foraging habitat for quolls, possibly rare denning opportunity. No SRE habitat likely.

Other

Habitat Quality

Moderate to High

Connectivity Common across landscape.

Other significant features