Maitland to Karratha Terminal

Flora and Fauna Survey

Horizon Power

19 May 2022

→ **The Power of Commitment**

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Executive summary

Horizon Power is proposing the development of new transmission lines and a substation to supply electricity from the Maitland Strategic Industrial Area (MSIA) to the Burrup Strategic Industrial Area (BSIA), located in the Pilbara Region of Western Australia. Horizon Power commissioned GHD Pty Ltd to undertake a flora, vegetation and fauna survey of the Karratha to Maitland section of the proposed transmission line (survey area) which have not previously been surveyed. The purpose of the assessment is to delineate key flora, vegetation and fauna values and potential impacts to areas of sensitivity.

The outcomes of the assessment will inform the project design and provide information to support potential environmental approvals under the *Environmental Protection Act 1986* and *Environment Protection and Biodiversity Conservation Act 1999*.

This report is subject to and must be read in conjunction with, the limitations set out in section 1.6 and the assumptions and qualifications contained throughout this report.

Key findings

Flora and Vegetation

– Two broadscale vegetation associations mapped by Beard (1977) intersects the survey area. The current extent remaining for vegetation association 589 and vegetation association 157 is more than 96% of the pre-European extent at all scales (e.g. State, IBRA Bioregion, IBRA Sub-region and Local Government Area (LGA).
– Seven vegetation types were identified and described for the survey area, as well as already cleared areas. The vegetation within the eastern half of the survey area primarily consists of hummock grasslands of *Triodia epactia* and *T. wiseana* with scattered to open shrublands dominated by *Acacia, Hakea,* and *Senna* species on rocky sandy loam plains and low undulating rocky rises and slopes. The eastern half of the survey is dominated by tussock grasslands on weakly gilgaied red clay loams. Minor drainage lines which dissect the plain are lined by either *Corymbia hamersleyana* or *Eucalyptus victrix* and *Acacia coriacea*.
– The vegetation condition throughout the survey area varied from Completely Degraded to Excellent condition, with the majority of the survey area rated as Very Good condition (61%). The vegetation within the survey area has been impacted by past disturbances including land clearing for infrastructure and linear corridors (road, rail, powerlines and pipeline). There is also evidence of recreational vehicle use, camping and weed incursion within the survey area.
– No vegetation communities identified within the survey area are representative of a Threatened Ecological Community (TEC). The presence of one Priority Ecological Community (PEC) was identified within the survey area: Horseflat land system of the Roebourne Plains (Priority 3). Vegetation type 2 (VT02) is representative of this PEC. There is 75.13 ha of this PEC occurring within the survey area which ranged from Very Good to Good condition. As the Karratha area experienced a poor wet-season and lower than average rainfall leading up to the survey, the claypan areas were very dry, lacked annual and ephemeral germination and growth, and did not contain the species diversity that would be expected at this time of year.
– The survey recorded a total of 121 flora taxa (including subspecies and varieties) representing 34 families and 73 genera within the survey area. This total comprised 116 native taxa and five introduced taxa.
– No Weeds of National Significance (WONS) or Declared Pests listed under the *Biosecurity and Agriculture Management Act 2007* (BAM Act) were recorded within the survey area.
– No significant flora species were recorded within the survey area. The likelihood of occurrence assessment post-field survey concluded one significant flora, *Oldenlandia* sp. Hamersley Station (A.A. Mitchell PRP 1479) (Priority 3), is likely to be present within the survey area.

Fauna

– Four broad fauna habitat types (excluding cleared areas) have been identified within the survey area. The habitat types range from tussock grasslands on weak gilgai claypans, mixed *Acacia* shrublands over *Triodia*

hummock grasslands on sandy clay loam plains, Triodia hummock grasslands on low undulating rocky rises and slopes, and broad drainage lines.

– A total of 45 fauna species, including 30 birds, 11 reptiles and four mammals were recorded during the survey. Of these, 42 are native and three are introduced species.
– No significant fauna species or evidence of their presence was recorded in the survey area during the field assessment. The likelihood of occurrence assessment identified three species as likely to occur within the survey area: Oriental Plover (Migratory), Peregrine Falcon (Specially Protected) and Northern Short-tailed Mouse/Lakeland Downs Mouse (Priority 4). No species of conservation significance are likely to be solely dependent on the habitats present within the survey area.

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1. Introduction

1.1 Background

Horizon Power is proposing the development of new transmission lines and a substation to supply electricity from the Maitland Strategic Industrial Area (MSIA) to the Burrup Strategic Industrial Area (BSIA), located in the Pilbara Region of Western Australia. A flora, vegetation and fauna survey of the Karratha to Maitland section of the proposed transmission line (survey area) is required as this area has not previously been surveyed.

1.2 Purpose of this report

GHD Pty Ltd (GHD) was commissioned by Horizon Power to complete a detailed flora and vegetation survey and basic fauna survey of the new proposed transmission line route.

The purpose of the assessment is to delineate key flora, vegetation and fauna values within the survey area and potential impact to areas of sensitivity. The outcomes of the surveys will be used to inform the project design and provide information to support potential environmental approvals under the *Environmental Protection Act 1986* (EP Act) and *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act).

1.3 Project location

The transmission line route extends from the Karratha Horizon Power Plant and terminates in Maitland. The survey area is approximately 18 kilometres (km) long and up to 150 metres (m) wide, covering a total footprint of 189.41 hectares (ha). The location of the survey area is provided on Figure 1, Appendix A.

1.4 Scope of works

The scope of works was to undertake an assessment of the flora, vegetation and fauna values of the survey area. The following actions were completed to fulfil the scope:

- A desktop assessment of the study area prior to the field survey to identify biological features and constraints, which may be in, or near the survey area
- A single-season, detailed flora and vegetation survey to map vegetation units, condition and identify conservation significant flora and ecological communities within the survey area
- A basic fauna survey including fauna habitat mapping
- Provision of a concise report (this document) that documents the methods and results of the desktop assessment and field survey
- Provision of raw data and spatial files in IBSA format.

1.5 Relevant legislation and background information

In WA some ecological communities, flora and fauna are protected under both Federal and State Government legislation. In addition, regulatory authorities also provide a range of guidance and information on expected standards and protocols for environmental surveys.

An overview of key legislation and guidelines, conservation codes and background information relevant to this biological survey is provided in Appendix B.

1.6 Report limitations and assumptions

This report has been prepared by GHD for Horizon Power and may only be used and relied on by Horizon Power for the purpose agreed between GHD and Horizon Power as set out in section 1.2 of this report.

GHD otherwise disclaims responsibility to any person other than Horizon Power arising in connection with this report. GHD also excludes implied warranties and conditions, to the extent legally permissible.

The services undertaken by GHD in connection with preparing this report were limited to those specifically detailed in the report and are subject to the scope limitations set out in the report.

The opinions, conclusions and any recommendations in this report are based on conditions encountered and information reviewed at the date of preparation of the report. GHD has no responsibility or obligation to update this report to account for events or changes occurring subsequent to the date that the report was prepared.

The opinions, conclusions and any recommendations in this report are based on assumptions made by GHD described in this report. GHD disclaims liability arising from any of the assumptions being incorrect.

GHD has prepared this report on the basis of information provided by Horizon Power and others who provided information to GHD (including Government authorities), which GHD has not independently verified or checked beyond the agreed scope of work. GHD does not accept liability in connection with such unverified information, including errors and omissions in the report which were caused by errors or omissions in that information.

The opinions, conclusions and any recommendations in this report are based on information obtained from, and testing undertaken at or in connection with, specific sample points. Site conditions at other parts of the site may be different from the site conditions found at the specific sample points.

Site conditions may change after the date of this report. GHD does not accept responsibility arising from, or in connection with, any change to the site conditions. GHD is also not responsible for updating this report if the site conditions change.

This report has assessed the flora and fauna values within the survey area, as shown in Figure 1, Appendix A. Should the survey area change or be refined, further assessment may be required.

2. Methodology

2.1 Desktop assessment

A desktop assessment of the study area to identify environmental values and constraints was undertaken by viewing geographic information system (GIS) spatial files largely sourced from Government of Western Australia (GoWA) (2022) and reviewing publicly available, government managed databases. The information sources utilised in this assessment are presented in Table 1.

Table 1 Desktop information sources

Aspect	Information source
Climate	Bureau of Meteorology (BoM) Climate Data Online (2022)
Geology, landforms and soil	1:500 000 State linear structures layer (DMIRS-015) Soil Landscape Mapping – Systems (DPIRD-064)
Environmentally Sensitive Areas (ESAs)	Clearing Regulations - Environmentally Sensitive Areas (DWER-046)
Conservation reserves and areas	DBCA – Lands of Interest (DBCA-012)
Hydrology	Public Drinking Water Source Areas (DWER-033) *Rights in Water and Irrigation Act 1914* (RIWI Act), Surface Water Areas and Irrigation Districts (DWER-037) RIWI Act, Groundwater Areas (DWER-034) RIWI Act, Rivers (DWER-036) Waterways Conservation Act Management Areas (DWER-072) Ramsar Sites (DBCA-010) Directory of Important Wetlands in Australia - Western Australia (DBCA-045)
Vegetation	Pre-European Vegetation (DPIRD-006) Native Vegetation Extent (DPIRD-005) (GoWA 2021a) Statewide Vegetation Statistics (GoWA 2021b)
Threatened and Priority Ecological Communities (TECs and PECs)	DBCA Threatened Ecological Community (TEC) and Priority Ecological Community (PEC) spatial dataset Priority Ecological Communities for Western Australia Version 32 (DBCA 2021)
Matters of national Environmental Significance	EPBC Act Protected matters Search Tool (PMST) (DAWE 2022)

Where spatial data was available from the desktop assessment, this has been presented on Figure 2, Appendix A.

2.1.1 Flora and vegetation

Prior to the commencement of the field survey, a desktop assessment was undertaken to identify relevant environmental information pertaining to the survey area and within 20 km (desktop study area). The flora and vegetation desktop assessment included a review of:

- The Department of Agriculture, Water and the Environment (DAWE) Protected Matters Search Tool (PMST) to identify communities and species listed under the EPBC Act potentially occurring within the desktop study area (DAWE 2022a) (Appendix C)
- The DBCA Threatened and Priority Ecological Community (TEC and PEC) database (DBCA 2020a) to determine the potential for significant ecological communities to be present within the desktop study area
- The DBCA Threatened and Priority Flora and WA Herbarium databases for Threatened flora listed under the BC Act and listed Priority by the DBCA previously recorded in the desktop study area (DBCA 2020b)
- Due to the recent closure of the *NatureMap* database, the previous *Naturemap* searches undertaken for the Burrup Expansion Project (GHD 2020) was used to identify flora and fauna species previously recorded within the study area (Appendix C)

– A flora likelihood of occurrence assessment (Appendix D).

2.1.2 Fauna

The fauna desktop assessment included a review of:

– DAWE PMST database to identify fauna species listed under the EPBC Act potentially occurring within the desktop study area (DAWE 2022a) (Appendix C)
– The ALA database for fauna species previously recorded within the desktop study area (Appendix C)
– Aerial photography, geology/soils, land systems and hydrology information to provide background information on the variability of the environment and likely habitat-types present
– A fauna likelihood of occurrence assessment. For the purpose of this study, exclusively marine animals (marine birds, fish, whales, turtles etc.) were excluded from the likelihood of occurrence assessment as they are not expected to interact with the survey area (Appendix E).

2.2 Field survey

2.2.1 Survey timing and personnel

The detailed flora and vegetation survey and basic fauna survey was carried out over four days on 1-4 March by GHD senior botanist Pali Jayasekara and senior ecologist Erin Lynch. This is the preferred survey timing for the region from an ecological perspective (EPA 2016). Both GHD staff have extensive experience in undertaking biological surveys across Western Australia, and in particular the Pilbara region.

2.2.2 Guiding documents and data collection

The survey methodology and data collection that GHD employed was consistent with:

– EPA Technical Guidance – Flora and Vegetation Surveys for Environmental Impact Assessment (EPA 2016)
– EPA Technical Guidance – Terrestrial vertebrate fauna surveys for environmental impact assessment (EPA 2020).

Field data collection for the biological survey was undertaken using a GPS enabled Samsung tablet, using electronic forms in ArcGIS Collector and tailored to IBSA spatial data requirements. Data was synced to the cloud at the conclusion of the field day. A GPS device was used to capture survey effort (track logs). Field photographs were stored and where applicable have been provided as part of the Project deliverables.

2.2.3 Detailed and targeted flora and vegetation survey

The flora and vegetation field survey was undertaken to identify and describe the broad dominant vegetation types, assess vegetation condition, and complete high intensity sampling of vascular flora taxa present at the time of survey. Searches and assessment for significant ecological communities and flora species were also undertaken during the field survey.

Field survey methods involved a combination of quadrat sampling and traversing the survey area by foot. Nineteen non-permanent quadrats measuring (50 m x 50 m – area of 2,500 m^2) were conducted within the survey area to describe the broad-scale vegetation and physical features. A minimum of three quadrats were located, where possible, within each identified vegetation unit, with quadrats located in areas of Good or better quality vegetation. The location of the quadrat within the survey area are presented in Figure 3, Appendix A.

Field data at each quadrat site was recorded on a pro-forma data sheet and included the parameters detailed in Table 2. Survey and quadrat data are provided in Appendix D.

Table 2 Data collected during the field survey

Aspect	Measurement
Collection attributes	Site code, personnel/recorder, date, photograph of the site.
Physical features	Landform, slope, aspect, soil attributes, ground surface cover
Location	Coordinates recorded in GDA94 datum using a hand-held Global Positioning System (GPS) tool to accuracy approximately 2-5 m accuracy.
Vegetation condition	Broad-scale vegetation condition using the condition rating scale adapted by EPA (2016) for the Eremaean Botanical Province.
Disturbance	Level and nature of disturbances (e.g. weed presence, fire and time since last fire, impacts from grazing, infrastructure development activities).
Flora	List of dominant flora from each structural layer, list of all species at each quadrat including stratum, average height and cover using National Vegetation Information System (NVIS 2017).

Vegetation types

Vegetation types were identified and boundaries delineated using a combination of aerial photography, topographical features and field data/observations.

Vegetation types were described based on structure, dominant taxa and cover characteristics as defined by quadrat data and field observations. Vegetation unit descriptions follow the NVIS and are consistent with NVIS Level V (Association) and are grouped within NVIS Level III (Broad Floristic Formation). At Level V up to three taxa per stratum are used to describe the association (NVIS Technical Working Group 2017).

Vegetation types were assigned to native or non-native/planted categories based on presence of native or exotic species. Riparian vegetation was delineated based on the presence of surface water features and known phreatophytic or partial phreatophytic species.

Context area mapping

Context area mapping was undertaken by extrapolation of survey data, local knowledge and review of aerial imagery to broadly identify vegetation patterns and vegetation units.

Vegetation condition

The vegetation condition was assessed and mapped in accordance with the vegetation condition rating scale for the Northern and Eremaean Botanical Provinces devised by Trudgen (1988) and adapted by EPA (2016). The scale recognises the intactness of vegetation and consists of six rating levels. The vegetation condition rating scale is outlined in Appendix B. Areas devoid of vegetation were mapped as cleared (e.g. roads, infrastructure).

Flora inventory, identification and nomenclature

A flora inventory was compiled from taxa listed in described quadrats and from opportunistic floristic records throughout the survey area.

Species well known to the survey botanist were identified in the field; all other species were collected and assigned a unique collection number to facilitate tracking. All specimens collected during the field assessment were dried and processed in accordance with the requirements of the WA Herbarium. Species were identified using taxonomic literature, electronic keys and online electronic databases with reference to specimens at the WA Herbarium. Relevant taxonomic experts were also consulted where required.

The conservation status of all recorded flora was compared against the current lists available on *FloraBase* (WA Herbarium 1998–) and the EPBC Act Threatened species database provided by DAWE (2022a).

Nomenclature used in this report follows that used by the WA Herbarium as reported on *FloraBase* (WA Herbarium 1998–).

Targeted flora searches

The results of the desktop assessment were reviewed and a target list of significant flora taxa compiled (based on likelihood of occurrence assessment in Appendix D). Ecological information (e.g. habitat, associated flora taxa and phenology) was sourced from *FloraBase* (WA Herbarium 1998-) and other relevant publications where available.

The targeted flora survey was completed con-currently with the vegetation and flora assessment, with timing occurring in March 2022 to coincide with the flowering period of the majority of the target taxa for the bioregion. Suitable and preferred habitats for significant flora taxa in the survey area was traversed on foot. While traverses were meandering, they were spaced approximately 40 – 50 m apart, which is considered suitable for the target species and vegetation encountered in the survey area. Locations within the survey area with differing hydrology, fire or disturbance history to the surrounding areas were also searched where identified. Where significant flora taxa were identified the locations and number of plants present were recorded using handheld GPS units (± 2 m accuracy). A representative collection was also made for confirmation by the WA Herbarium.

2.2.4 Basic fauna survey

GHD staff undertook a basic fauna survey in conjunction with the flora and vegetation survey. The survey area was traversed by vehicle and on foot over the course of the survey to identify and describe the dominant fauna habitat types present and their condition, assess habitat connectivity, and identify and record fauna species within the survey area. An assessment of the likelihood of conservation significant fauna and their habitats occurring within the survey area was also undertaken. Track logs (survey effort) are presented on Figure 3, Appendix A.

Habitat assessment

A fauna habitat assessment was undertaken to document the type, value and extent of habitats within the survey area. A fauna habitat assessment was undertaken at each flora quadrat point. Specifically, the assessment included:

– Habitat structure (e.g. vegetation type, presence/absence of structural layers such as ground cover and mid storey)
– Presence/absence of refuge including: density of ground covers, fallen timber (coarse woody debris), hollow-bearing trees and stags and rocks/boulder piles, and the type and extent of each refuge
– Presence/absence of waterways
– Location of the habitat within the survey area in comparison to the habitat within the surrounding landscape
– Habitat connectivity and identification of wildlife corridors within and immediately adjacent to the survey area
– Current land use and disturbance history
– Evaluation of key habitat features and types identified during the desktop assessment relevant to fauna of conservation significance
– Evaluation of the likelihood of occurrence of significant fauna within the habitat (based on presence of suitable habitat)
– A representative photograph of each habitat type.

Opportunistic fauna searches

Opportunistic fauna searches were undertaken across the survey area. Opportunistic searches involved:

– Searching the survey area for tracks, scats, bones, diggings and feeding areas for both native and feral species
– Searching through microhabitats including turning over logs or rocks, turning over leaf litter and examining tree hollows and hollow logs
– Visual and aural surveys, which accounted for many bird species potentially utilising the survey area
– Recording GPS locations of any conservation significant fauna species observed.

Fauna species identification

Identification of fauna species was made in the field using available field guides and electronic guides. Nomenclature used in this report follows that used by the WA Museum and the DBCA *NatureMap* (DBCA 2007–) with the exception of birds, where Christidis and Boles (2008) was used.

2.3 Limitation

2.3.1 Desktop limitations

The EPBC Act PMST is based on bioclimatic modelling for the potential presence of species. As such, this does not represent actual records of the species within the survey area. The records from the DBCA searches of Threatened and Priority flora provide more accurate information for the general area and local occurrence. However, some collections, sighting or trapping records cannot be dated and often misrepresent the current range of Threatened and Priority species.

2.3.2 Survey limitations

The EPA (2016, 2020) states that flora and fauna survey reports for environmental impact assessment in WA should contain a section describing the limitations of the survey methods used. The limitations and constraints associated with this field survey are discussed in Table 3.

Table 3 Field survey limitations

Aspect	Constraint	Comment
Sources of information and availability of contextual information.	Nil	Adequate information is available for the survey area, this includes broadscale (1:1,000,000) mapping by Beard (1975) and digitised by Shepherd et al. (2002) and database searches (DBCA and ALA).
Scope (what life forms were sampled etc.)	Nil	Vascular flora and terrestrial vertebrate fauna were sampled during the survey. Non-vascular flora, invertebrate and aquatic fauna were not surveyed.
Proportion of flora and fauna collected and identified (based on sampling, timing and intensity)	Minor	The detailed and targeted vegetation and flora survey was undertaken on 1-4 March 2022, which is within the recommended timing for flora surveys in the Eremaean Botanical Province (6-8 weeks post wet season [March – June]) (EPA 2016). However, the amount of rainfall leading up to the survey was below average and the conditions were not considered optimal. The flora recorded from the field is detailed in section 4.1.5 and an inventory of flora recorded is provided in Appendix D. The portion of flora collected and identified was not considered fully representative for the survey area. It is highly likely the survey may have under-recorded some annuals and ephemerals due to the lack of rain. The basic fauna survey was undertaken concurrently with the flora and vegetation survey. The fauna assessment sampled those species that can be easily seen, heard or have distinctive signs, such as tracks, scats, diggings, etc. Many cryptic species would not have been identified during a basic survey and seasonal variation within species often requires targeted surveys at a particular time of the year. Of the fauna species recorded during the survey, all were identified to species level. The fauna assessment was aimed at identifying habitat types and terrestrial vertebrate fauna utilising the survey area. No sampling for invertebrates or aquatic species occurred. The information available on the identification, distribution and conservation status of invertebrates is generally less extensive than vertebrate species.
Flora determination	Nil	Flora determination was undertaken by the survey botanist in the field. Species that could not be identified in the field were collected and identified at the WA Herbarium by the experienced GHD taxonomic botanist Pali Jayasekara.

Aspect	Constraint	Comment
		Eight taxa were uncertain at a species level due to lack of flowering/fruiting material. These collections are not similar to known conservation significant flora (as identified in the desktop searches). The taxonomy and conservation status of the WA flora is dynamic. This report was prepared with reliance on taxonomy and conservation status current at the time report development, but it should be noted this may change in response to ongoing research and review of International Union for Conservation Nature criteria.
Completeness and further work which might be needed (e.g. was the relevant area fully surveyed)	Nil	The whole of the survey area was accessed by vehicle and on foot. The survey area was adequately surveyed during the field survey in line with the scope. Adequate number of floristic sampling was done for a detailed flora survey. A minimum of three quadrats were sampled per vegetation type, where possible. Where the extent of vegetation was too small a minimum on one quadrat was sampled (such as the drainage lines). The extent of Additional opportunistic sampling was undertaken through all the survey area to develop a comprehensive species inventory.
Mapping reliability	Nil	The vegetation and fauna habitats were mapped using high-resolution ESRI aerial imagery obtained from Landgate, topographical features, previous broad scale mapping (Beard 1975) and field data. Data was recorded in the field using hand-held GPS tools. Certain atmospheric factors and other sources of error can affect the accuracy of GPS receivers. The Garmin GPS units and GPS enabled tablets used for this survey are accurate to within 2-5 metres on average.
Timing/weather/ season/cycle	Moderate	The field survey was conducted during the wet-season (1-4 March 2021). In the four months prior to the survey (November-February), the Karratha Aero (station No. 004083) recorded a total of 21.8 mm of rainfall (Bureau of Meteorology 2022). This is well below the recorded long-term average for the same period (November-February; 140.1 mm) (Bureau of Meteorology 2022). The weather conditions recorded during the survey were generally hot and humid with light winds. A summary of the climatic conditions are provided: Daily maximum temperature 42 °C Daily minimum temperature 27°C Daily rainfall 0 mm. The conditions experienced in Karratha were very dry. The lack of summer rain has impacted on the presence of annual and ephemeral species. The recommended timing for flora survey in the Pilbara is 6-8 weeks post wet season (March – June) (EPA 2016). However, the amount of rainfall leading up to the survey was well below average and the conditions were not considered optimal.
Disturbances (e.g. fire, flood, accidental human intervention)	Nil	Some of the survey area has been subjected to historical disturbance events (e.g. clearing, weeds); however, these disturbances did not affect the survey.
Intensity (in retrospect, was the intensity adequate)	Nil	The vascular flora of the survey area was sampled in accordance with EPA (2016) and terrestrial fauna sampled in accordance with EPA (2020). The survey area was sufficiently covered by the field botanist and ecologist during the survey.
Resources	Nil	Adequate resources were employed during the field survey. Eight person days were spent undertaking the survey using one botanist and one ecologist.
Access restrictions	Nil	The survey area was accessed on foot and vehicle. There were no access restrictions.
Experience levels	Nil	The botanist and ecologist who executed the survey are practitioners suitably qualified and experienced in their respective fields. The field team lead, Pali Jayasekara (flora licence no. FB62000208-2) is a

Aspect	Constraint	Comment
		senior botanist with more than 17 years' experience leading and conducting vegetation and flora surveys (detailed, basic and targeted) in the Eremaean province. Senior Ecologist Erin Lynch (flora licence no. FB62000081-2) has over 13 years' experience undertaking flora and fauna surveys (detailed, basic and targeted) within the Eremaean province.

3. Desktop assessment

3.1 Climate

The survey area is located in the Pilbara region of Western Australia and experiences a semi-arid climate. Temperatures are warm to hot all year and rainfall is generally low, mostly falling in the late summer months due to the influence of tropical cyclones and monsoon. The closest meteorological recording station is located in Karratha (Karratha Aero station No. 004083). Climatic data from this station indicates the mean maximum temperature ranges from 36.2 °C in March, to 26.5 °C in June/July. The mean minimum temperature ranges from 26.9 °C in January to 13.9 °C in July. The mean annual rainfall is 297.5 mm, receiving highest rainfall in February (average of 77.5 mm) (Bureau of Meteorology 2022).

In the four months prior to the survey (November-February), the Karratha Aero station recorded a total of 21.8 mm of rainfall (Bureau of Meteorology 2022). This is well below the recorded long-term average for the same period (November-February; 140.1 mm) (Bureau of Meteorology 2022).

3.2 Geology, landforms and soils

The survey area is located within the Karratha Coast Zone of the Pilbara Province. The Pilbara Province lies over the Pilbara Craton, which consists of two different tectonic components. The two broad geologic sequences are the ancient Archaean granite-greenstone terrain and the younger volcano-sedimentary sequence of the Hamersley Basin (Tille 2006).

The Karratha Coast Zone is characterised by coastal mudflats with sandy coastal plains and some hills on marine deposits and some sedimentary and volcanic rocks of the Pilbara Craton. Soils include tidal soils with some calcareous loamy earths, salt lake soils and red/brown noncracking clays (Tille 2006).

3.3 Land systems

The Pilbara region has been surveyed for the purposes of land classification, mapping and resource evaluation. One hundred and two land systems which are grouped into 20 broad land types have been described for the region, which are distinguished on the basis of topography, geology, soils and vegetation (Van Vreeswyk et al. 2004). The survey area intersects two land systems; details of these land system are presented in Table 4.

Table 4 Land systems within the survey area

Land system	Description	Location
Ruth	Hills and ridges of volcanic and other rocks supporting hard spinifex (occasionally soft spinifex) grasslands. Geology: Archaean and Proterozoic intermediate and basic volcanic rocks; also quartz, minor chert, jaspilite, shale and siltstone. Geomorphology: Erosional surfaces; rounded hills and ridges with restricted lower slopes and stony interfluves, moderately to widely spaced drainage patterns.	Intersects the eastern end of the survey area.
Horseflat	Gilgaied clay plains supporting tussock grasslands and minor grassy snakewood shrublands. Geology: Quaternary alluvium. Geomorphology: Depositional surfaces; gilgaied and non-gilgaied clay plains, stony plains, narrow linear drainage depressions and dissected slopes marginal to the River land system; mostly internally drained, some through going trunk drainage channels.	Intersects the majority of the survey area.

3.4 Hydrology

The survey area is located within the proclaimed Pilbara Groundwater Area and the proclaimed Pilbara Surface Water Area (GoWA 2022). There are no Public Drinking Water Source Areas (PDWSA) within the survey area.

There are no watercourses (rivers) or wetlands within or immediately adjacent to the survey area. There are several broad, ephemeral drainage lines that traverse the survey area. Surface water in the area is largely reliant on weather, and surface water in waterways is generally only present or flowing for parts of the year, often in response to larger cyclonic, rainfall events.

3.5 Land use

3.5.1 Conservation estate and reserves

There are no DBCA managed conservation areas located within or immediately adjacent to the survey area. The closest reserves are an un-named reserve (arboretum) approximately 4 km east of the survey area and the Murujuga National Park, located on the Burrup Peninsula more than 10 km north of the survey area.

3.5.2 Environmentally sensitive areas

No Environmentally Sensitive Areas (ESAs) occur within the survey area. The closest ESA is located more than 10 km north of the survey area.

3.6 Vegetation and flora

3.6.1 Regional biogeography

The survey area is located in the Pilbara bioregion and Roebourne sub-region as described by IBRA. The Roebourne sub-region is characterised by Quaternary alluvial and older colluvial coastal and subcoastal plains with a grass savannah of mixed bunch and hummock grasses, and dwarf shrub steppe of *Acacia stellaticeps* or *A. pyrifolia* and *A. inaequilatera*. Uplands are dominated by *Triodia* hummock grasslands. Ephemeral drainage lines support *Eucalyptus victrix* or *Corymbia hamersleyana* woodlands. Samphire, *Sporobolus* and mangal occur on marine alluvial flats and river deltas. Resistant linear ranges of basalts occur across the coastal plains, with minor exposures of granite. Islands are either Quaternary sand accumulations, or composed of basalt or limestone, or combinations of any of these three (Kendrick and Stanley 2001).

3.6.2 Pre-European vegetation associations and extent

Broad scale (1:1,000,000) pre-European vegetation mapping of the Pilbara area was completed at an association level (Beard 1975). The mapping indicates that two vegetation associations occur within the survey area:

– Vegetation association 589: Mosaic: Short bunch-grassland - savanna / grass plain (Pilbara) / Hummock grasslands, grass steppe; soft spinifex
– Vegetation association 157: Hummock grasslands, grass steppe; hard spinifex, *Triodia wiseana*.

The pre-European mapping has been adapted and digitised by Shepherd et al. (2002). The extent of vegetation associations have been determined by the state-wide vegetation remaining extent calculations maintained by DBCA (latest update March 2019 – GoWA 2019). The current extents of vegetation associations remaining are greater than 96 per cent of the pre-European extent at all scales (e.g. State, IBRA Bioregion, IBRA Sub-region and Local Government Area (LGA) (Table 5).

Table 5 Extent of pre-European vegetation associations mapped within the survey area (Beard 1975, GoWA 2019)

Vegetation association	Scale	Pre-European extent (ha)	Current extent (ha)	Remaining (%)	% current extent in all DBCA managed land (proportion of current extent)
589	State: WA	807,698.58	802,713.40	99.38	1.91
	IBRA bioregion: Pilbara	728,768.20	724,695.82	99.44	2.11
	IBRA sub-region: Roebourne	675,391.80	671,327.48	99.40	2.14
	LGA: City of Karratha	312,813.64	310,512.32	99.26	0.78
157	State: WA	502,728.56	499,311.84	99.32	18.24
	IBRA bioregion: Pilbara	199,832.17	198,409.23	99.29	5.84
	IBRA sub-region: Roebourne	14,972.09	14,451.45	96.52	1.56
	LGA: City of Karratha	73,039.72	71,600.83	98.03	0.31

3.6.3 Significant ecological communities

The EPBC Act PMST did not identify any TECs within the survey area. Searches of the DBCA TEC/PEC database identified four PECs within 20 km of the survey area, two of which intersects the survey area boundary (Figure 2, Appendix A). The extent of the TEC/PECs provided by DBCA have a 500 m buffer radius, which means the extent portrayed in Figure 2 is not the actual occurrence boundary of the PEC. Survey/s are completed to verify the occurrence of TEC/PECs, where the buffer area intersects the survey area. Details of these communities are provided in Table 6.

Table 6 Significant ecological communities identified in the desktop searches (DBCA 2021)

Community Type	EPBC Act	State-listed (DBCA)	Description	Occurrence
Roebourne Plains coastal grasslands	-	Priority 1	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* along with other native species *including Astrebla pectinata, Eriachne benthamii, Chrysopogon fallax* and *Panicum decompositum*. 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).	Multiple occurrences in the study area, and intersecting the central/eastern section of the survey area.
Horseflat land system of the Roebourne Plains	-	Priority 3	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* 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 Balla surrounding the towns of Karratha and Roebourne. This community does not include priority ecological communities 'Roebourne Plains gilgai grasslands' and the 'Chenopod association of the Roebourne Plains area.	Multiple occurrences in the study area, and intersecting the eastern end of the survey area. Multiple occurrences occur less than 1 km from the western end of the survey area.
Coastal dune native tussock grassland dominated by *Whiteochloa airoides*	-	Priority 3	Tussock grassland of *Whiteochloa airoides* occurs on the landward side of foredunes, hind dunes or remnant dunes with white or pinkish white medium sands with marine fragments. There may be occasional *Spinifex longifolius* tussock or *Triodia epactia* hummock grasses and scattered low shrubs of *Olearia dampieri* subsp. *dampieri*, *Scaevola spinescens*, S*. cunninghamii*, *Trianthema turgidifolia* and *Corchorus* species (*C. walcottii, C. laniflorus*). Occurs on Barrow Island, Tent Island and possibly some unaffected littoral areas in West Pilbara. Closest known occurrence is approximately 5.5 km north east of the southern half of the survey area.	Occurrence approximately 12 km west of the survey area.
Burrup Peninsula rock pile communities	-	Priority 1	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 endemics land snails. Know occurrences located less than 1 km northwest of the survey area.	Occurrences on the Burrup Peninsula, from 14 km north of the survey area.

3.6.4 Flora diversity

The *NatureMap* database (GHD 2020) identified 656 taxa previously recorded within 20 km of the survey area (Appendix C). This total comprised 36 naturalised (introduced) taxa and 620 native taxa. The most commonly recorded families were Fabaceae, Poaceae, Malvaceae and Chenopodiaceae.

3.6.1 Significant flora

The EPBC Act PMST, *NatureMap* and DBCA (WA Herbarium and Threatened and Priority Flora) databases, identified the presence/potential presence of 7 significant flora species within the study area. The desktop search recorded:

– One Priority 2 taxon
– Five Priority 3 taxa
– One Priority 4 taxon.

The locations of significant flora registered on the DBCA databases are shown on Figure 2, Appendix A.

3.7 Fauna

3.7.1 Fauna diversity

A search of the *NatureMap* (GHD 2020) database identified 357 vertebrate fauna species previously recorded within the study area (Appendix C). This total comprised 207 birds, four amphibians, 104 reptiles and 42 mammals. Of the 357 fauna species previously recorded 12 are naturalised (introduced) species.

3.7.2 Significant fauna

The EPBC Act PMST (DAWE 2021) and *NatureMap* (DBCA 2007-2021) identified the presence/potential presence of 38 significant fauna within the study area (excluding exclusively marine species). The species list included:

– 13 species listed as Threatened under the EPBC Act and/or BC Act
– 21 bird species listed as Migratory only under the EPBC Act and/or BC Act
– One species listed as Other Specially Protected Fauna listed under the BC Act
– Three listed as Priority 4 by DBCA.

4. Field survey results

4.1 Flora and vegetation

4.1.1 Vegetation types

Seven vegetation types were identified and described for the survey area, as well as cleared areas. Where possible the vegetation description was aligned with those previously mapped in GHD 2020. A description of the vegetation types mapped across the survey area are provided in Table 7 and mapped in Figure 4, Appendix A.

The eastern half of the survey area followed along existing vehicle tracks and a pipeline whilst the western half of the alignment (west of the train line) had limited vehicle access.

The vegetation within the eastern half of the survey area primarily consists of hummock grasslands of *Triodia epactia* and *T. wiseana* with scattered to open shrublands dominated by *Acacia, Hakea,* and *Senna* species on rocky sandy loam plains and low undulating rocky rises and slopes. The eastern half of the survey area is dominated by tussock grasslands on weakly gilgaied red clay loams. Minor drainage lines which dissect the plain are lined by either *Corymbia hamersleyana* or *Eucalyptus victrix* and *Acacia coriacea*.

Vegetation types VT06 and VT07 which represent the broad drainage lines are considered to be representative of riparian vegetation.

Table 7 *Vegetation types recorded within the survey area*

Vegetation type code	Vegetation type description	Sample locations	Total extent (ha)	GHD (2020) vegetation type	Photograph
VT01	***Triodia Grassland*** *Acacia inaequilatera, Acacia bivenosa* and *Hakea lorea* subsp. *lorea* open shrubland to scattered shrubs over *Eremophila longifolia, Senna* spp. and *Solanum horridum* sparse shrubland over *Cymbopogon ambiguus, Themeda triandra* and *Cenchrus ciliaris op*en tussock grassland over *Triodia wiseana* and *Triodia epactia* hummock grassland on low undulating rocky rises and slopes.	HPK2 HPK16 HPK17	18.27	VT09	
VT02	***Eragrostis Tussock Grassland*** *Eragrostis xerophila, Aristida latifolia* and *Chrysopogon fallax* tussock grassland over *Neptunia dimorphantha, Indigofera trita subsp. trita* and *Sida fibulifera* scattered herbs on weak gilgai cracking clay plains. Other common species include *Salsola australis*, **Cenchrus ciliaris*, *Operculina aequisepala, Heliotropium cunninghamii* and *Stemodia kingii.* Representative of Priority 3 PEC Horseflat land system of the Roebourne Plains.	HPK1 HPK9 HPK15 HPK18	75.13	VT11	

Vegetation type code	Vegetation type description	Sample locations	Total extent (ha)	GHD (2020) vegetation type	Photograph
VT03	*Acacia xiphophylla* open shrubland over *Triodia epactia and T. wiseana* very open hummock grassland with *Eragrostis xerophila, Chrysopogon fallax* and *Themeda triandra* very open tussock grassland on sandy claypan with some patches of cracking clays.	HPK3 HPK6 HPK8	19.07	VT15	
VT04	*Acacia bivenosa* open shrubland over *Triodia wiseana open hummock grassland* on sandy clay loam plain with some rocky outcropping.	HPK11 HPK12 HPK13	45.04	VT09	

Vegetation type code	Vegetation type description	Sample locations	Total extent (ha)	GHD (2020) vegetation type	Photograph
VT05	*Acacia ancistrocarpa, A. bivenosa and A. inaequilatera* open shrubland over *Triodia wiseana* and *T. epactia* open hummock grassland on sandy clay loam plains.	HPK4 HPK14 HPK19	5.66	VT10	
VT06	*Eucalyptus victrix* low open forest over *Acacia coriacea* tall shrubland over *Carissa lanceolata* open shrubland over **Cenchrus ciliaris, Chrysopogon fallax* and *Themeda triandra* tussock grassland along alluvial broad drainage lines.	HPK5	0.23	VT17	

Vegetation type code	Vegetation type description	Sample locations	Total extent (ha)	GHD (2020) vegetation type	Photograph
VT07	*Corymbia hamersleyana* low open forest to scattered trees over *Acacia coriacea* tall shrubland to scattered shrubs over **Vachellia farnesiana and Carissa lanceolata* low shrubs over **Cenchrus ciliaris* and *Chrysopogon fallax* tussock grassland on brown sandy loam on minor/broad drainage lines.	HPK7 HPK10	9.36	VT14	
Cleared areas/road verge/salt pan	Cleared areas/road verge/salt pan	-	16.66	Cleared	Photo not available

4.1.2 Vegetation condition

The vegetation condition throughout the survey area varied from Completely Degraded to Excellent condition. The vegetation structure across the survey area in areas identified as Excellent to Very Good showed no to minimal signs of disturbance, and contained little to no weeds. The majority of the survey area contained vegetation of Very Good condition.

The vegetation immediately adjacent to cleared areas such as linear infrastructure (roads, vehicle tracks, and rail) were generally more disturbed and had a higher proportion of weed species (predominantly **Cenchrus ciliaris*). These areas were rated to be in Poor to Completely Degraded condition. Weed presence was also greater within the broad drainage areas, where **Cenchrus ciliaris* dominated the ground cover. Cattle grazing was also evident on the clay plains along the western half of the survey area (west of the rail).

Fire history did not have a significant impact on the structure and condition of vegetation in the survey area, as the majority of the vegetation was either long unburnt (6 years or longer) or of moderate age (3 to 5 years).

The extent of the vegetation condition mapped within the survey area is provided in Table 8 and mapped in Figure 5, Appendix A.

Table 8 Extent of vegetation condition mapped within the survey area

Vegetation Condition (EPA 2016)	Total extent (ha)
Excellent	16.22
Very Good	114.87
Good	21.30
Poor	12.00
Degraded	0.96
Completely Degraded	7.37
Cleared	16.66
Total	189.41

4.1.3 Significant ecological communities

There are no TECs present within the survey area. The field assessment did identify the likely presence of one Priority 3 PEC within the survey area; Horseflat land system of the Roebourne Plains.

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* and other *Eragrostis* spp., *Eriachne* spp. and *Dichanthium* spp. The community also supports a suite of annual grasses including Sorghum spp. and rare *Astrebla* spp. The community extends from Cape Preston to Balla Balla surrounding the towns of Karratha and Roebourne (DBCA 2021).

Within the survey area, the Horseflat Land System of the Roebourne Plains is represented by vegetation type 2 (VT02) which is dominated by an *Eragrostis xerophila* tussock grassland on weak gilgai cracking clay plains. This vegetation type is situated on the Horseflat land system, mapped by Van Vreeswyk et al. (2004). The condition of this vegetation type ranged from Good to Very Good, with signs of disturbance including the presence of the weed **Cenchrus ciliaris,* vehicle tracks and grazing by cattle. A total of 75.13 ha of the Horseflat Land System of the Roebourne Plains PEC has been mapped within the survey area.

Mapping by DBCA (2020) shows the buffer area of the Roebourne Plains coastal grasslands with gilgai microrelief on cracking clays (Roebourne Plain gilgai grasslands) PEC intersecting the middle section of the survey area (Figure 2, Appendix A). These grasslands occur on microrelief on strongly gilgaied self-mulching cracking clays, and emergent depositional surfaces. The grasslands are 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* along with other native species including *Astrebla pectinata, Eriachne benthamii*, *Chrysopogon fallax* and *Panicum decompositum*. It is restricted to the Karratha area, where it has been

largely removed. 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). This community incorporates Unit 3 (gilgaied plains) of the Horseflat land system as described in van Vreeswyk, et al (2004).

Prior to the survey, the Karratha area had experienced a poor wet-season with lower than average rainfall. The claypan areas were very dry and lacked annual and ephemeral germination and growth. As a result, these areas did not contain the species diversity that would be expected at this time of year. Therefore, although *Eragrostis xerophila* was the dominant grass within VT02, defining which PEC is better represented in the survey area cannot solely rely on flora species presence/absence and cover. However, based on the soil descriptions and site observations, VT02 is not considered representative of the Roebourne Plains gilgai grassland PEC as the soils consisted of weak gilgai clay plains and not strongly gilgaied self-mulching cracking clays.

The PEC mapping is provided in Figure 6, Appendix A.

4.1.4 Flora diversity

The survey recorded 121 flora taxa (including subspecies and varieties) representing 34 families and 73 genera within the survey area. This total comprised 116 native taxa and five introduced taxa. Dominant families within the survey area include Fabaceae (25 taxa), Poaceae (19 taxa), Malvaceae (14 taxa) and Amaranthaceae (8 taxa).

As a result of the low rainfall preceding the field survey the survey area presented a low diversity of annual and ephemeral taxa.

The full inventory of flora recorded within the survey area is provided in Appendix D.

4.1.5 Introduced flora

Five introduced flora were recorded from the survey area:

– **Cenchrus ciliaris* (Buffel grass)
– **Malvastrum americanum* (Spiked Malvastrum)
– **Aerva javanica* (Kapok)
– **Vachellia farnesiana* (Mimosa bush)
– **Passiflora foetida* (Passionflower).

None of these species are listed Weeds of National Significance (WONS) or Declared Pests.

Buffel grass and Kapok have been rated as having ‘high’ potential ecological impact under the invasive plant prioritisation process. Very few scattered plants were recorded along the main vehicle access adjacent to the pipeline. Buffel grass significantly alters environmental conditions when invading new habitats as it reduces soil fertility, increases soil erosion (which increases surface run-off) and creates unstable watersheds with degraded water quality. It also exudes chemicals that are toxic to other plants (DEC 2013). Buffel grass is most common in disturbed areas such as vehicle tracks, roadsides, drainage areas and other previously cleared areas.

Mimosa bush, Spiked Malvastrum and Passionflower were generally restricted to the broad drainage lines.

4.1.6 Significant flora

No threatened flora species listed under the EPBC Act and/or BC Act were recorded within the survey area. Furthermore, no priority flora listed by DBCA was recorded.

Likelihood of occurrence

A likelihood of occurrence assessment was conducted post-field survey for all conservation significant flora taxa identified in the desktop assessment based on the desktop searches (provided in Appendix C). This assessment took into account previous records, habitat requirements, seasonal variation, efficacy of the survey, intensity of the survey, flowering times and the cryptic nature of the species (Appendix D).

The likelihood of occurrence assessment identified one priority species as likely to occur, *Oldenlandia* sp. Hamersley Station (A.A. Mitchell PRP 1479) (Priority 3). *Oldenlandia* sp. Hamersley Station (A.A. Mitchell PRP

1479) is a spreading annual, herb which grows to 0.1 m high and flowers in March (blue flowers). It is known to occur in cracking clay and basalt, on gently undulating plains with large surface rocks or flat crabholed plains (WA Herbarium 1998-).

This species has previously been recorded within 500 m of the survey area in open, flat grassland habitat over clay to cracking clay soils (GHD 2020). This habitat type is present within the current survey area and is representative of vegetation type 2 (VT02). The lack of recent rain is likely to have impacted the presence of this species.

4.2 Fauna

4.2.1 Fauna habitats

Four broad fauna habitat types (excluding cleared areas) have been identified within the survey area. These habitat types closely align with the vegetation types described in section 4.1.1. The topography of the survey area is generally flat, low-lying plains to low undulating rises with some rocky outcropping in the eastern section of the survey area. The habitat types range from tussock grasslands on weak gilgai claypans, mixed *Acacia* shrublands over *Triodia* hummock grasslands on sandy clay loam plains, *Triodia* hummock grasslands on low undulating rocky rises and slopes, and broad drainage lines.

Some of the habitats within the survey area have been impacted by past disturbances including land clearing for infrastructure and linear corridors (road, rail, powerline and pipeline). There is also evidence of recreational vehicle use, camping and weed incursion within the survey area.

The habitat types identified in the survey area are described in further detail in Table 9.

Table 9 Fauna habitat types within the survey area

Fauna habitat	Area (ha)	Representative photograph
Low undulating rocky rises and slopes. This habitat type is associated with stony/rocky plains and low undulating rises and consists of scattered shrubs of *Acacia*, *Hakea* and *Senna* species over a *Triodia* hummock grassland. The hummock grasslands provide refuge for reptiles (such as snakes, skinks, goannas and dragons), small mammals and ground dwelling birds. The open shrublands provide refuge and a food source for native birds. Rocky outcrops contain small crevices which provide refuge for reptile species and small mammals. This habitat type aligns with VT01.	18.27	
Broad drainage lines The minor drainage lines are dominated by open woodlands to scattered trees of *Corymbia hamersleyana, Acacia coriacea* and occasional *Eucalyptus victrix*. Mixed *Acacia* shrublands dominated the mid layer over an open hummock and tussock grassland of *Triodia epactia, T. wiseana* and **Cenchrus ciliaris*. Creeklines are considered to be important ecological corridors to other broader habitats within the local area and provide a source of water during periods of heavy rainfall. Trees and shrubs provide shelter and food resources to a number of native fauna species, in particular birds. This habitat type aligns with VT06 and VT07.	9.60	

Fauna habitat	Area (ha)	Representative photograph
Hummock grasslands on sandy clay loam plains This habitat type occurs on the plains. The vegetation is dominated by open shrublands of *Acacia* species (*Acacia bivenosa, A. ancistrocarpa, A. inaequilatera, A. pyrifolia*) over an open hummock and tussock grassland of *Triodia epactia, T. wiseana* and **Cenchrus ciliaris*. This habitat type is generally in very good condition with vehicle tracks and weed invasion impacting some areas. The hummock grasslands provide refuge for reptiles (such as snakes, skinks, goannas and dragons), small mammals and ground dwelling birds. The *Acacia* shrublands provide refuge and a food source for native birds. This habitat type aligns with VT04 and VT05.	50.7	
Grassland Claypans The grassland claypans habitat type consists of a low open tussock grassland of *Eragrostis xerophila* grassland with isolated patches of *Acacia xiphophylla* shrubs and *Triodia epactia* hummock grasses on weak gilgai clay plains. The area has been subject to varying degrees of degradation from historical clearing in adjacent areas, weed invasion and cattle grazing. The gilgai grassland provides suitable habitat for the Short-tailed mouse (Priority 4) who favours cracking clay and adjacent habitats. This habitat type aligns with VT02 and VT03.	94.20	

4.2.2 Habitat linkages

The habitat types within the survey area are well connected and form part of a largely contiguous landscape. The fauna habitats of the survey area are part of a much larger area of similar habitats within the local area and surrounding region. Apart from the existing main road (Madison Road) and railway, fauna movement is largely unrestricted. Madison Road and the railway provides the only barrier to fauna moving east-west through the landscape.

4.2.3 Fauna diversity

A total of 45 fauna species, including 30 birds, 11 reptiles and four mammals were recorded during the survey. Of these, three species are introduced: European cattle, dog/dingo, and feral cat. All fauna species recorded during the survey are generally common and are known to occur in the area.

A full list of fauna recorded during the survey is provided in Appendix E.

4.2.4 Significant fauna

No significant fauna species or evidence of their presence was recorded in the survey area during the field assessment.

Likelihood of occurrence

A likelihood of occurrence assessment was conducted post-field survey for conservation significant fauna identified in the desktop assessment. This assessment was based on species biology, habitat requirements, the quality and availability of suitable habitat, and local occurrence (Appendix E).

The likelihood of occurrence assessment identified three species as likely to occur and the remaining species are considered unlikely or highly unlikely to occur within the survey area. Species identified as likely to occur are listed in Table 10.

Table 10 Significant fauna likely to occur in the survey area

Species	EPBC Act	BC Act/ DBCA	Likelihood of occurrence
Oriental Plover (*Charadrius veredus*)	Mi	Mi	Likely The species is known from the region, however use would be opportunistic to the claypans and broad drainage areas/floodplain and utilised for foraging purposes only.
Peregrine Falcon (*Falco peregrinus*)		OS	Likely The habitats present within the survey area represents suitable foraging habitat, however lacks suitable breeding habitat. Therefore, likely to occur at least on an occasional basis.
Northern Short-tailed Mouse, Lakeland Downs Mouse (*Leggadina lakedownensis)*		P4	Likely There is one record within 5 km of the survey area. Suitable habitat (tussock grasslands, claypans and stony ranges) is present.

The likelihood of occurrence assessment identified other fauna species of conservation significance could occasionally occur within the habitats of the survey area (e.g. species deemed unlikely). However, it is considered unlikely the survey area provides important habitat (e.g. breeding habitat or key foraging habitat) for any of these species and that these other species may occasional use the habitats of the survey area for temporary refuge and dispersal between other areas of habitat.

No species of conservation significance are likely to be solely dependent on the habitats present within the survey area.

5. Discussion

Two vegetation associations mapped by Beard (1977) intersect the survey area. The current extent remaining for vegetation association 589 and vegetation association 157 is more than 99% of the pre-European extent at all scales (e.g. State, IBRA Bioregion, IBRA Sub-region and Local Government Area (LGA). Therefore, these vegetation types are not considered significant as a remnant of native vegetation.

Seven vegetation types were identified and described for the survey area, as well as already cleared areas. The vegetation within the eastern half of the survey area primarily consists of hummock grasslands of *Triodia epactia* and *T. wiseana* with scattered to open shrublands dominated by *Acacia, Hakea,* and *Senna* species on rocky sandy loam plains and low undulating rocky rises and slopes. The eastern half of the survey is dominated by tussock grasslands on weakly gilgaied red clay loams. Minor drainage lines which dissect the plain are lined by either *Corymbia hamersleyana* or *Eucalyptus victrix* and *Acacia coriacea*. Weed presence (particularly **Cenchrus ciliaris*) was greater in these minor drainage lines. The vegetation condition throughout the survey area varied from Completely Degraded to Excellent condition, with the majority of the survey area rated as Very Good condition (61%). The vegetation within the survey area has been impacted by past disturbances including land clearing for infrastructure and linear corridors (road, rail, powerlines and pipeline). There is also evidence of recreational vehicle use, camping and weed incursion within the survey area.

No vegetation communities identified within the survey area are representative of a Threatened Ecological Community (TEC). The presence of one Priority Ecological Community (PEC) was identified within the survey area: Horseflat land system of the Roebourne Plains (Priority 3). Vegetation type 2 (VT02) is representative of this PEC which is dominated by an *Eragrostis xerophila* tussock grassland on weak gilgai cracking clay plains. There is 75.13 ha of this PEC occurring within the survey area which ranged from Very Good to Good condition, with signs of disturbance including the presence of the weed **Cenchrus ciliaris,* vehicle tracks and grazing by cattle. Prior to the survey, the Karratha area experienced a poor wet-season and lower than average rainfall. As a result, the claypan areas were very dry, lacked annual and ephemeral germination and growth, and did not contain the species diversity that would be expected at this time of year.

No significant flora species were recorded within the survey area. The likelihood of occurrence assessment post-field survey concluded one significant flora, *Dolichocarpa* sp. Hamersley Station (A.A. Mitchell PRP 1479) (Priority 3), is likely to be present within the survey area. The vegetation type (VT02) identified as representing the PEC community (Horseflat land systems of the Roebourne Plains) is likely to support the Priority flora *Dolichocarpa* sp. Hamersley Station (A.A. Mitchell PRP 1479) based on preferred habitat type and previous surveys undertaken in the area. GHD (2020) recorded two individuals in flat grassland habitat over clay to cracking clay soils less than 500 m from the current survey area. Due to the poor wet-season and lower than average rainfall this species is unlikely to have been present during the survey.

Four broad fauna habitat types (excluding cleared areas) have been identified within the survey area. The habitat types range from tussock grasslands on weak gilgai claypans, mixed *Acacia* shrublands over *Triodia* hummock grasslands on sandy clay loam plains, Triodia hummock grasslands on low undulating rocky rises and slopes, and broad drainage lines. No significant fauna species or evidence of their presence was recorded in the survey area during the field assessment. The likelihood of occurrence assessment identified three species as likely to occur within the survey area: Oriental Plover (Migratory), Peregrine Falcon (Specially Protected) and Northern Short-tailed Mouse/Lakeland Downs Mouse (Priority 4). No species of conservation significance are likely to be solely dependent on the habitats present within the survey area.

The likelihood of occurrence assessment identified other fauna species of conservation significance could occasionally occur within the habitats of the survey area (e.g. species deemed unlikely). However, it is considered unlikely the survey area provides important habitat (e.g. breeding habitat or key foraging habitat) for any of these species and that these other species may occasional use the habitats of the survey area for temporary refuge and dispersal between other areas of habitat.

6. References

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Appendices

Appendix A

Figures

Figure 1 *Survey area*

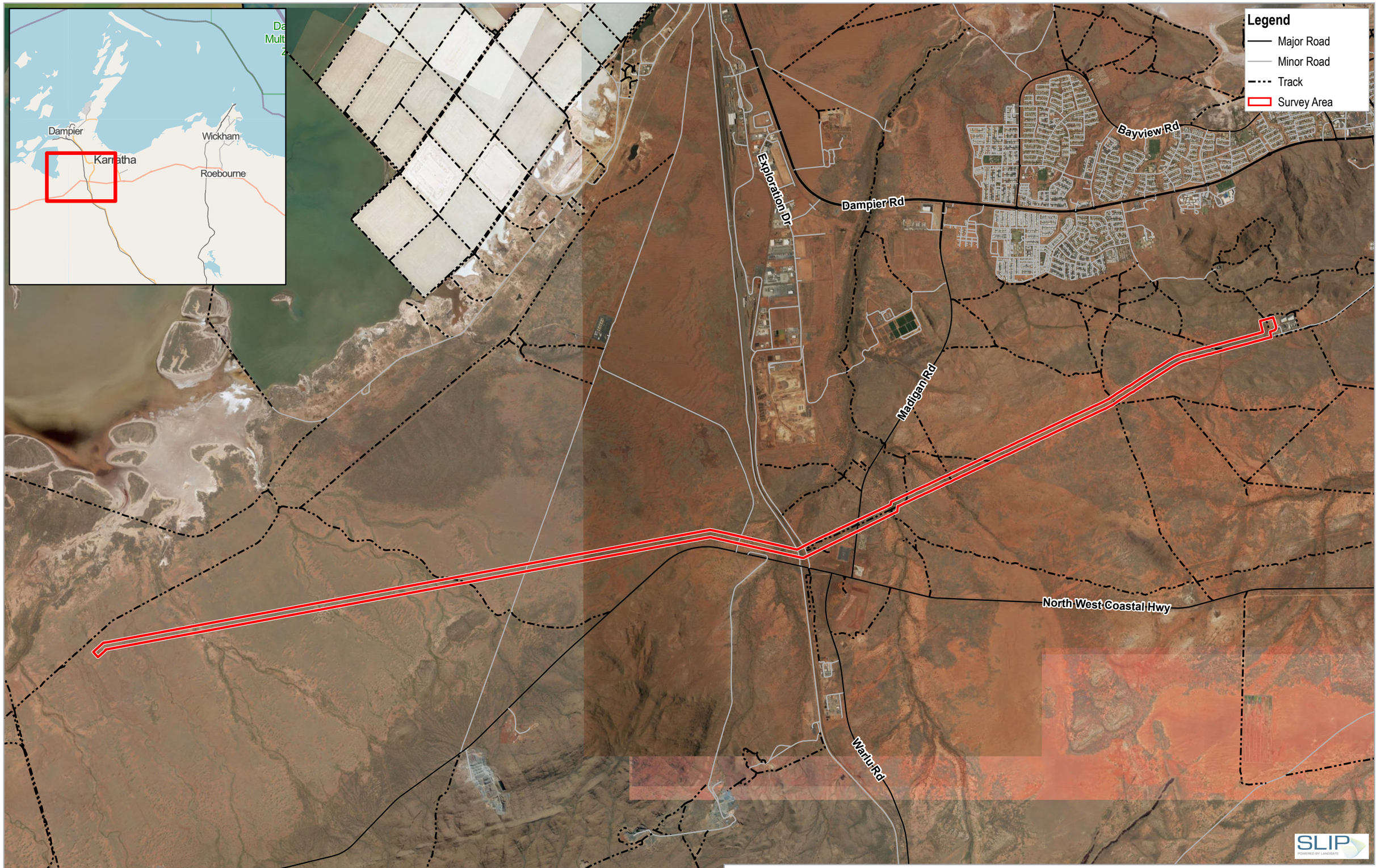
Figure 2 *Environmental constraints*

Figure 3 *Survey effort*

Figure 4 *Vegetation Types*

Figure 5 *Vegetation condition*

Figure 6 *Significant ecological communities*



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Metres

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Horizontal Datum: GDA 1994
Grid: GDA 1994 MGA Zone 50

N

GHD

Horizon Power
HP Maitland to Karratha Terminal

Survey Area

Project No. **12555576**
Revision No. **B**
Date **13/04/2022**

FIGURE 1

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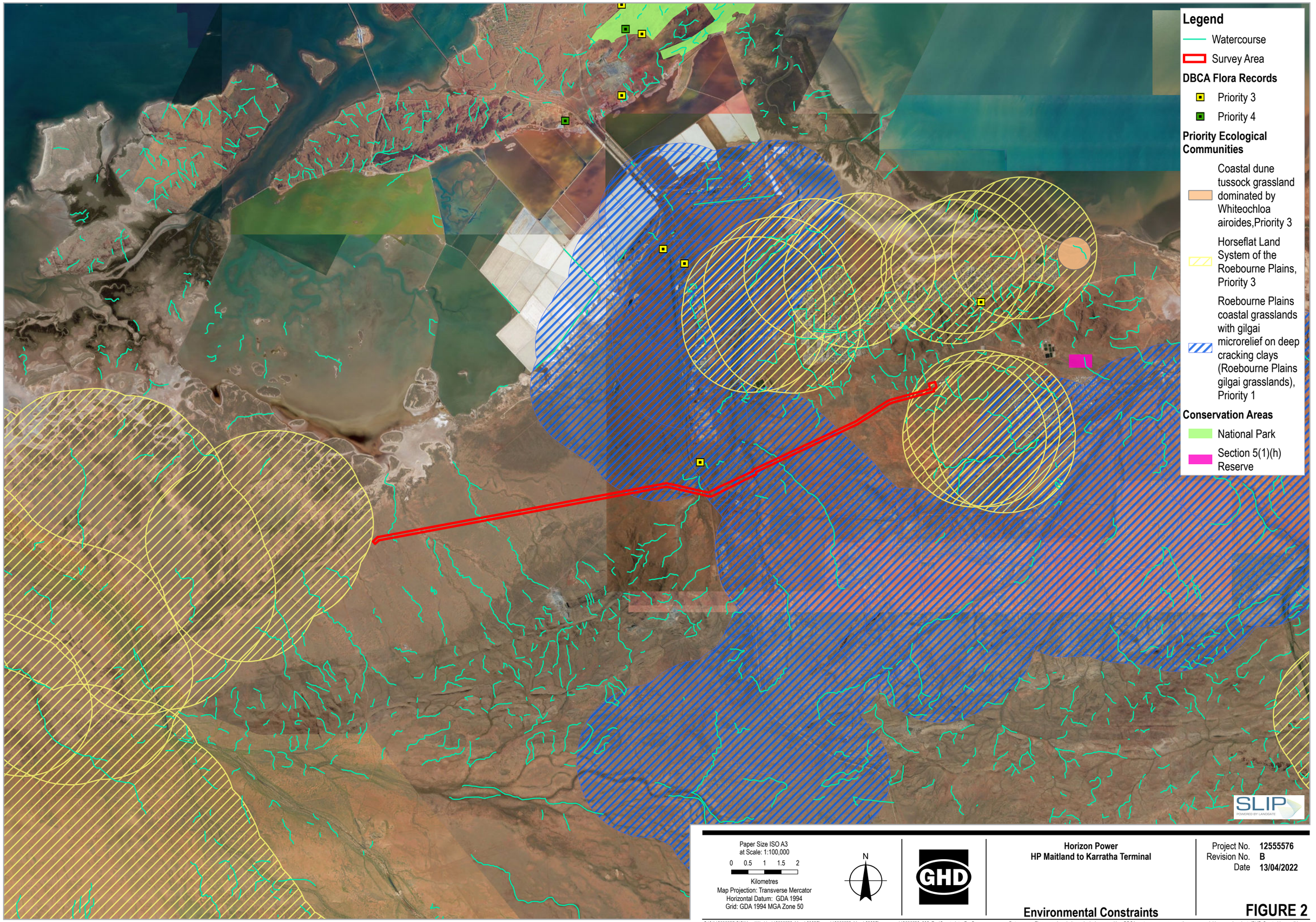

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Kilometres

Map Projection: Transverse Mercator
Horizontal Datum: GDA 1994
Grid: GDA 1994 MGA Zone 50

N

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Horizon Power
HP Maitland to Karratha Terminal

Environmental Constraints

Project No. **12555576**
Revision No. **B**
Date **13/04/2022**

FIGURE 2

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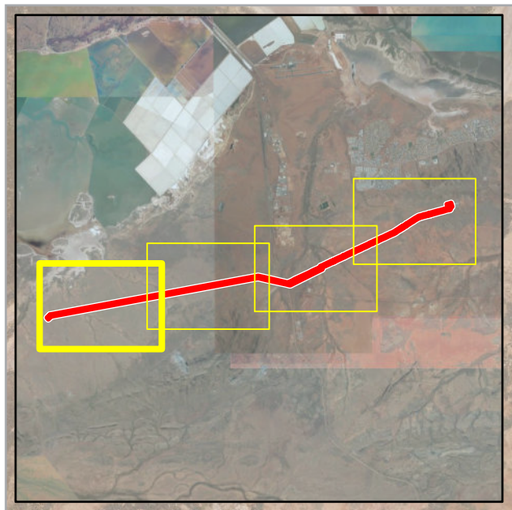

HPK10

HPK9

HPK1

SLIP
POWERED BY LANDGATE

Legend

- Quadrat
- Track Log
- Track
- Survey Area

Paper Size ISO A3
at Scale: 1:13,000

0 50 100 150 200

Metres

Map Projection: Transverse Mercator
Horizontal Datum: GDA 1994
Grid: GDA 1994 MGA Zone 50

N

GHD

Horizon Power
HP Maitland to Karratha Terminal

Survey Effort

Project No. **12555576**
Revision No. **B**
Date **13/04/2022**

Page 1 of 4

FIGURE 3

G:\61\12555576\GIS\Maps\Working\12555576_March2022Figures\12555576_March2022Figures.aprx\12555576_003_SurveyEffort_RevB
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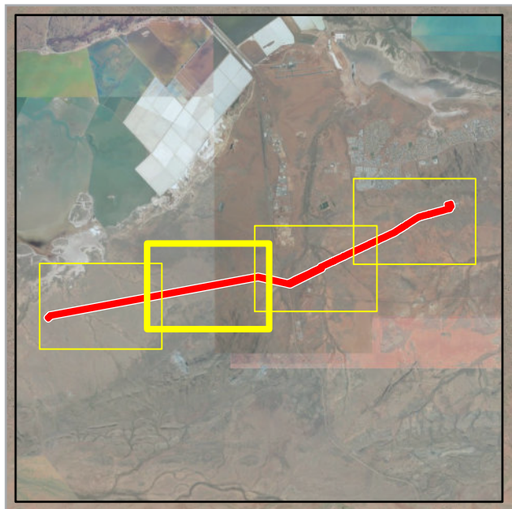

HPK11

HPK12

Legend

- Quadrat
- Track Log
- Major Road
- Minor Road
- Track
- Survey Area

SLIP
POWERED BY LANDGATE

Paper Size ISO A3
at Scale: 1:13,000

0 50 100 150 200

Metres

Map Projection: Transverse Mercator
Horizontal Datum: GDA 1994
Grid: GDA 1994 MGA Zone 50

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GHD

Horizon Power
HP Maitland to Karratha Terminal

Survey Effort

Project No. **12555576**
Revision No. **B**
Date **13/04/2022**

FIGURE 3

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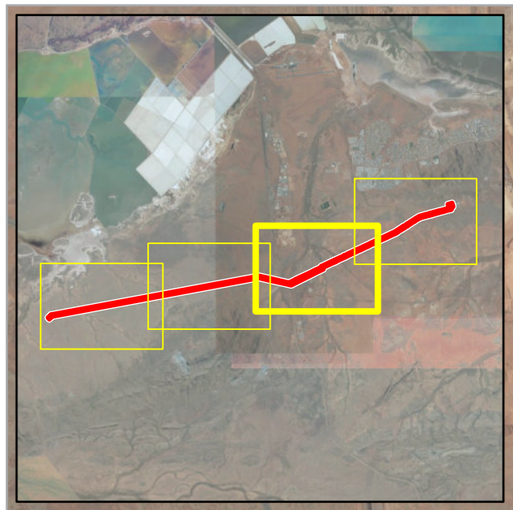

HPK4
HPK19
HPK14
HPK8
HPK5
HPK18
HPK13
HPK7
HPK6
HPK12

Legend

- Quadrat
- Track Log
- Major Road
- Minor Road
- Track
- Survey Area

Paper Size ISO A3
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Metres

Map Projection: Transverse Mercator
Horizontal Datum: GDA 1994
Grid: GDA 1994 MGA Zone 50

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Horizon Power
HP Maitland to Karratha Terminal

Survey Effort

Project No. **12555576**
Revision No. **B**
Date **13/04/2022**

FIGURE 3

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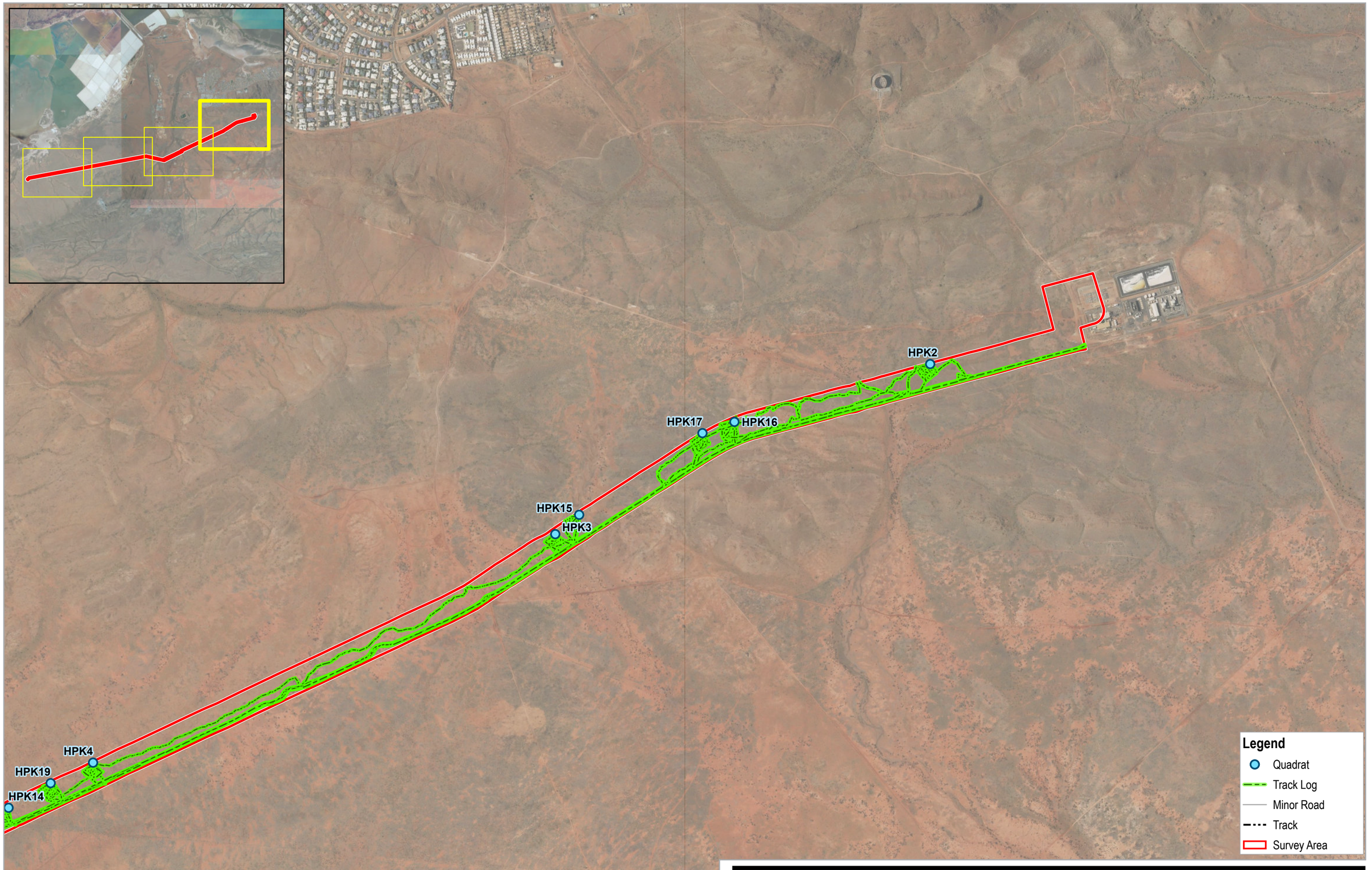

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Grid: GDA 1994 MGA Zone 50

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GHD

Horizon Power
HP Maitland to Karratha Terminal

Survey Effort

Project No. **12555576**
Revision No. **B**
Date **13/04/2022**

FIGURE 3

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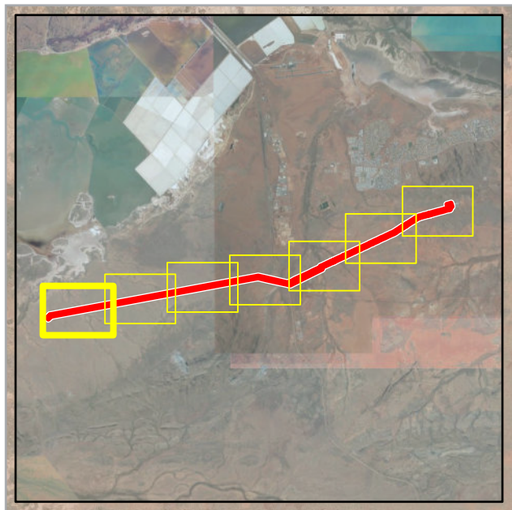

Legend

- Track
- Survey Area

Vegetation Type

- VT02
- VT07

Paper Size ISO A3
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Metres
Map Projection: Transverse Mercator
Horizontal Datum: GDA 1994
Grid: GDA 1994 MGA Zone 50

N

GHD

Horizon Power
HP Maitland to Karratha Terminal

Vegetation Type

Project No. **12555576**
Revision No. **B**
Date **13/04/2022**

FIGURE 4

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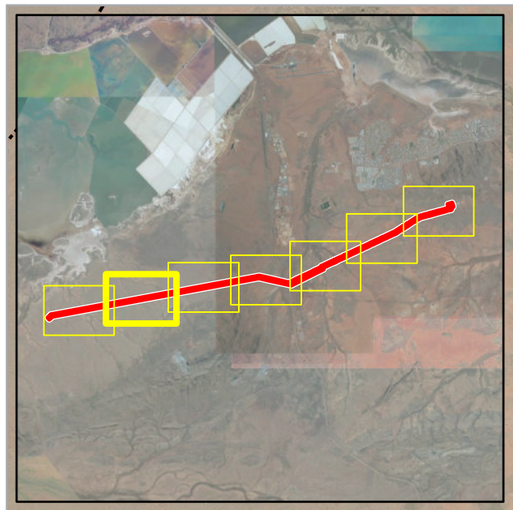

Legend

- Track
- Survey Area

Vegetation Type

- VT02
- VT07
- Cleared

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Metres

Map Projection: Transverse Mercator
Horizontal Datum: GDA 1994
Grid: GDA 1994 MGA Zone 50

N

GHD

Horizon Power
HP Maitland to Karratha Terminal

Vegetation Type

Project No. **12555576**
Revision No. **B**
Date **13/04/2022**

FIGURE 4

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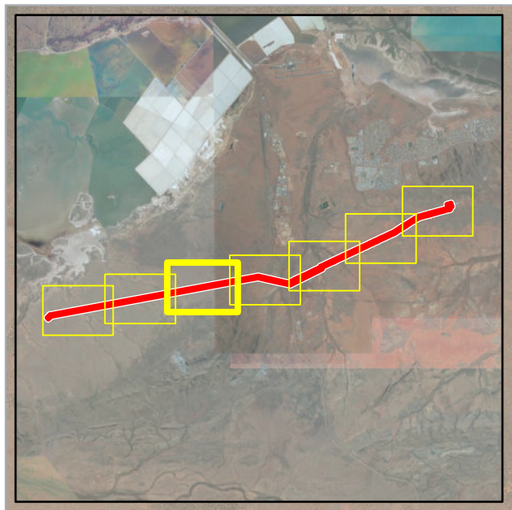

West Coastal Hwy

Legend

- Major Road
- Minor Road
- Track
- Survey Area

Vegetation Type

- VT02
- VT04
- VT07
- Cleared

Paper Size ISO A3
at Scale: 1:7,500

0 50 100 150 200

Metres

Map Projection: Transverse Mercator
Horizontal Datum: GDA 1994
Grid: GDA 1994 MGA Zone 50

N

GHD

Horizon Power
HP Maitland to Karratha Terminal

Vegetation Type

Project No. **12555576**
Revision No. **B**
Date **13/04/2022**

FIGURE 4

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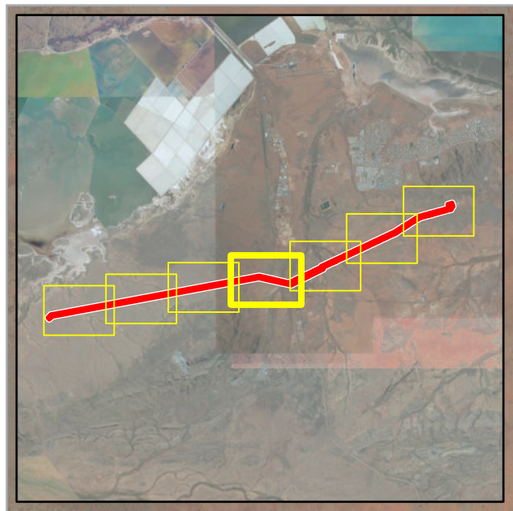

North West Coastal Hwy

North West Coastal Hwy

Legend

- Major Road
- Minor Road
- Track
- Survey Area

Vegetation Type

- VT02
- VT03
- VT04
- VT07
- Cleared

SLIP
POWERED BY LANDGATE

Paper Size ISO A3
at Scale: 1:7,500

0 50 100 150 200

Metres

Map Projection: Transverse Mercator
Horizontal Datum: GDA 1994
Grid: GDA 1994 MGA Zone 50

N

GHD

Horizon Power
HP Maitland to Karratha Terminal

Vegetation Type

Project No. **12555576**
Revision No. **B**
Date **13/04/2022**

FIGURE 4

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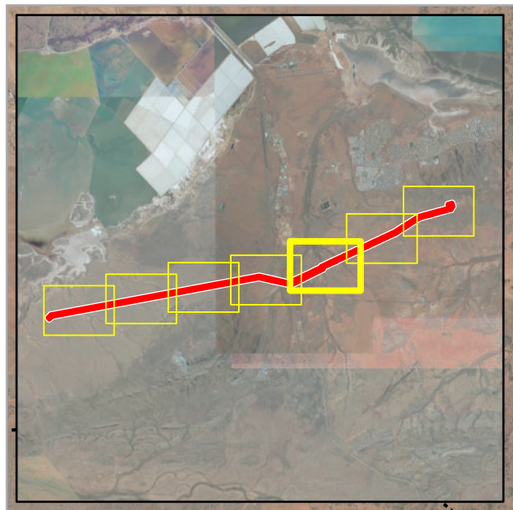

Madigan Rd

Madigan Rd

North West Coastal Hwy

SLIP
POWERED BY LANDGATE

Legend

- Major Road
- Minor Road
- Track
- Survey Area

Vegetation Type

- VT02
- VT03
- VT04
- VT05
- VT06
- VT07
- Cleared

Paper Size ISO A3
at Scale: 1:7,500

0 50 100 150 200

Metres

Map Projection: Transverse Mercator
Horizontal Datum: GDA 1994
Grid: GDA 1994 MGA Zone 50

N

GHD

Horizon Power
HP Maitland to Karratha Terminal

Vegetation Type

Project No. **12555576**
Revision No. **B**
Date **13/04/2022**

FIGURE 4

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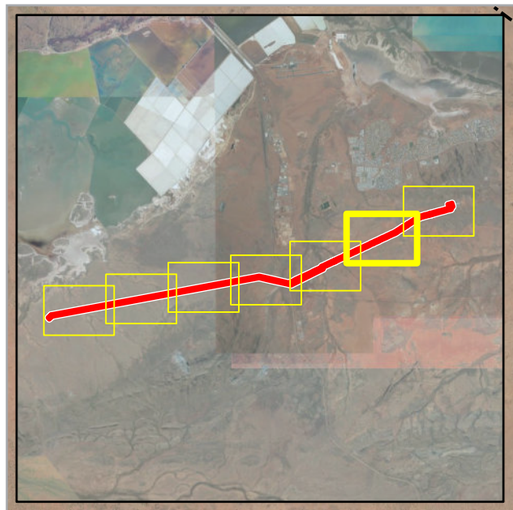

Legend

- Track
- Survey Area

Vegetation Type

- VT01
- VT02
- VT03
- VT04
- VT05
- Cleared

Paper Size ISO A3
at Scale: 1:7,500

0 50 100 150 200

Metres

Map Projection: Transverse Mercator
Horizontal Datum: GDA 1994
Grid: GDA 1994 MGA Zone 50

N

Horizon Power
HP Maitland to Karratha Terminal

Vegetation Type

Project No. **12555576**
Revision No. **B**
Date **13/04/2022**

FIGURE 4

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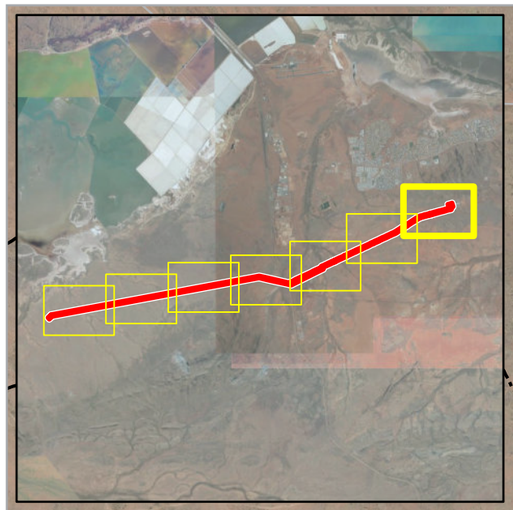

Stovehill Rd

Legend

- Minor Road
- Track
- Survey Area

Vegetation Type

- VT01
- VT02
- VT03
- Cleared

SLIP
POWERED BY LANDGATE

Paper Size ISO A3
at Scale: 1:7,500

0 50 100 150 200

Metres

Map Projection: Transverse Mercator
Horizontal Datum: GDA 1994
Grid: GDA 1994 MGA Zone 50

N

GHD

Horizon Power
HP Maitland to Karratha Terminal

Vegetation Type

Project No. **12555576**
Revision No. **B**
Date **13/04/2022**

FIGURE 4

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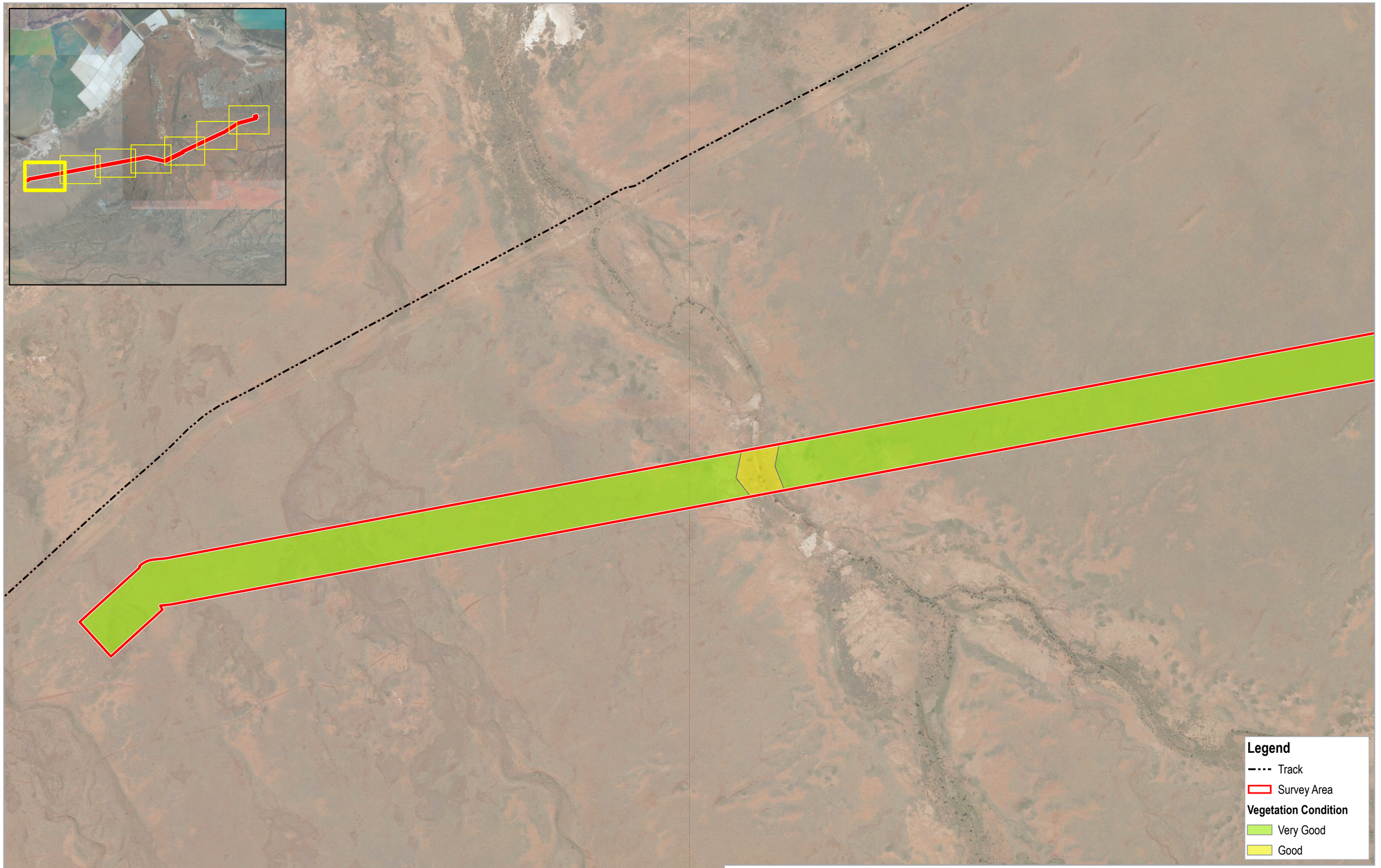

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Metres

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Horizontal Datum: GDA 1994
Grid: GDA 1994 MGA Zone 50

N

GHD

Horizon Power
HP Maitland to Karratha Terminal

Vegetation Condition

Project No. **12555576**
Revision No. **B**
Date **13/04/2022**

FIGURE 5

G:\61\12555576\GIS\Maps\Working\12555576_March2022Figures\12555576_March2022Figures.aprx\12555576_005_VegCondition_RevB
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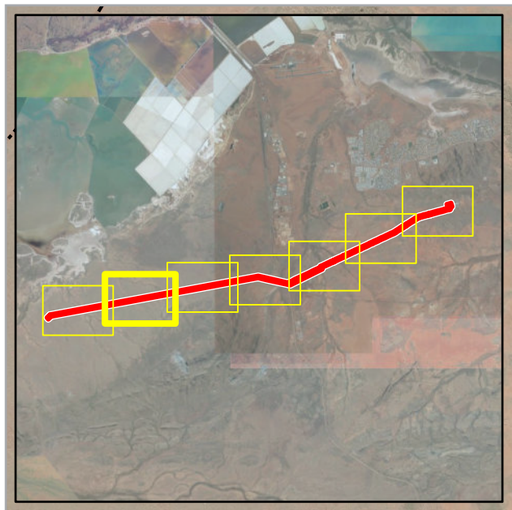

Legend

- Track
- Survey Area

Vegetation Condition

- Very Good
- Good
- Poor
- Cleared

Paper Size ISO A3
at Scale: 1:7,500

0 50 100 150 200
Metres

Map Projection: Transverse Mercator
Horizontal Datum: GDA 1994
Grid: GDA 1994 MGA Zone 50

N

GHD

Horizon Power
HP Maitland to Karratha Terminal

Vegetation Condition

Project No. **12555576**
Revision No. **B**
Date **13/04/2022**

FIGURE 5

G:\61\12555576\GIS\Maps\Working\12555576_March2022Figures\12555576_March2022Figures.aprx\12555576_005_VegCondition_RevB
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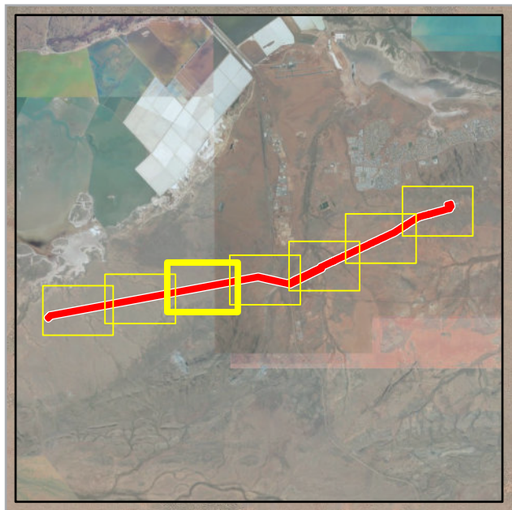

North West Coastal Hwy

Legend

- Major Road
- Minor Road
- Track
- Survey Area

Vegetation Condition

- Very Good
- Poor
- Cleared

Paper Size ISO A3
at Scale: 1:7,500

0 50 100 150 200

Metres

Map Projection: Transverse Mercator
Horizontal Datum: GDA 1994
Grid: GDA 1994 MGA Zone 50

N

GHD

Horizon Power
HP Maitland to Karratha Terminal

Vegetation Condition

Project No. **12555576**
Revision No. **B**
Date **13/04/2022**

FIGURE 5

G:\61\12555576\GIS\Maps\Working\12555576_March2022Figures\12555576_March2022Figures.aprx\12555576_005_VegCondition_RevB
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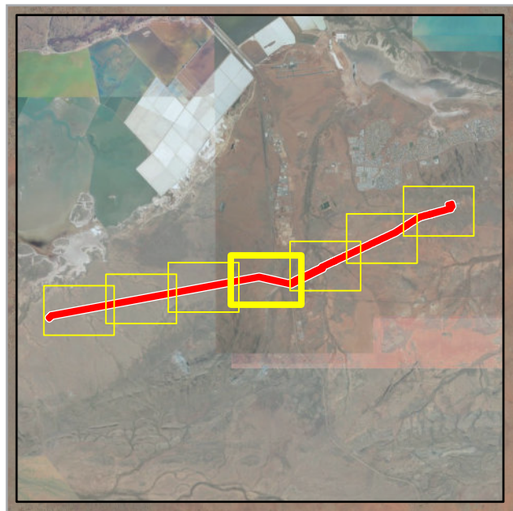
SLIP POWERED BY LANDGATE



North West Coastal Hwy

North West Coa

Legend

- Major Road
- Minor Road
- Track
- Survey Area

Vegetation Condition

- Very Good
- Good
- Poor
- Completely Degraded
- Cleared

SLIP
POWERED BY LANDGATE

Paper Size ISO A3
at Scale: 1:7,500

0 50 100 150 200

Metres

Map Projection: Transverse Mercator
Horizontal Datum: GDA 1994
Grid: GDA 1994 MGA Zone 50

N

GHD

Horizon Power
HP Maitland to Karratha Terminal

Vegetation Condition

Project No. **12555576**
Revision No. **B**
Date **13/04/2022**

FIGURE 5

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Print date: 13 Apr 2022 - 16:07

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Madigan Rd

Madigan Rd

North West Coastal Hwy

SLIP
POWERED BY LANDGATE

Legend

- Major Road
- Minor Road
- Track
- Survey Area

Vegetation Condition

- Very Good
- Good
- Poor
- Completely Degraded
- Cleared

Paper Size ISO A3
at Scale: 1:7,500

0 50 100 150 200

Metres

Map Projection: Transverse Mercator
Horizontal Datum: GDA 1994
Grid: GDA 1994 MGA Zone 50

N

GHD

Horizon Power
HP Maitland to Karratha Terminal

Vegetation Condition

Project No. **12555576**
Revision No. **B**
Date **13/04/2022**

FIGURE 5

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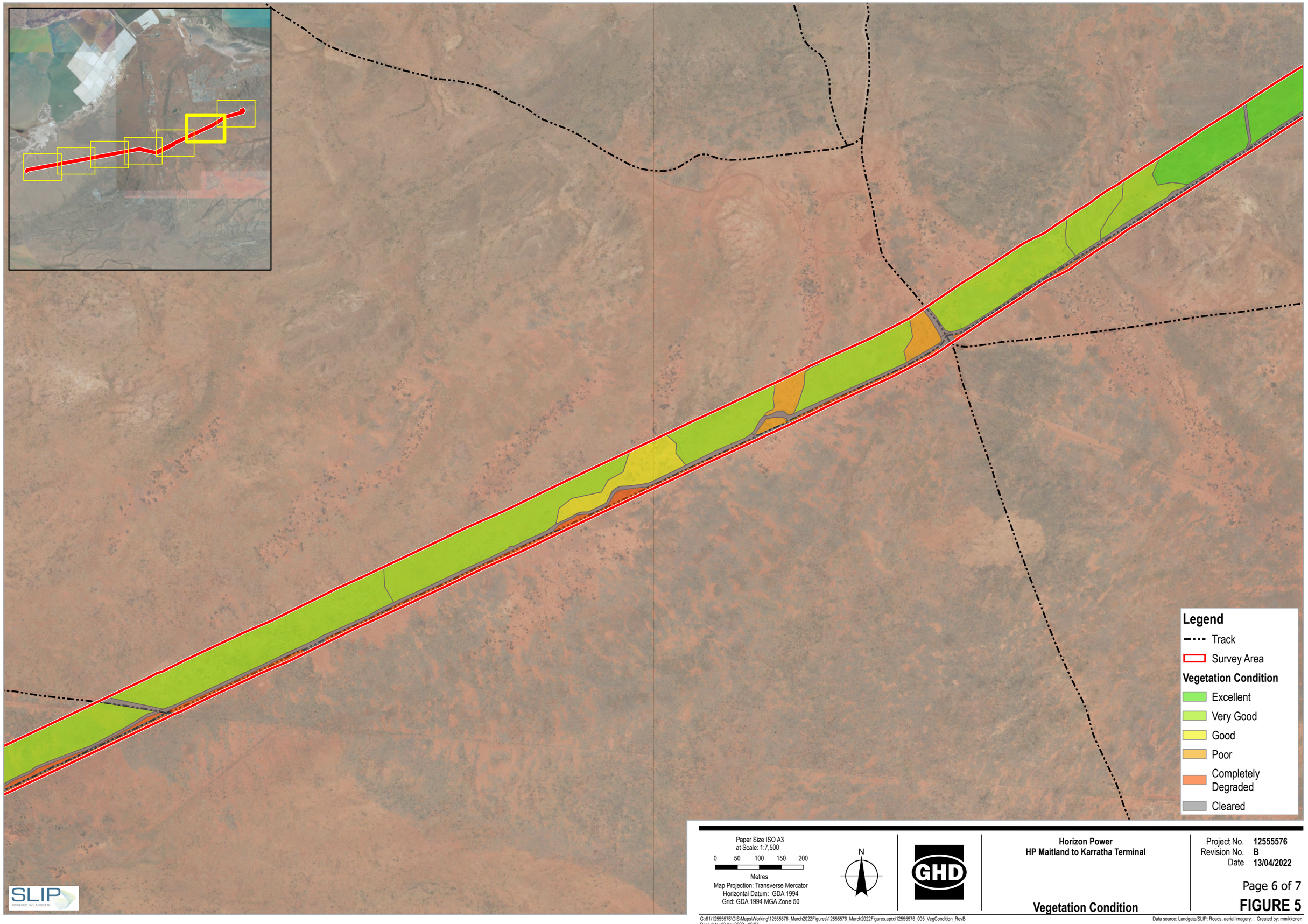

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FIGURE 5

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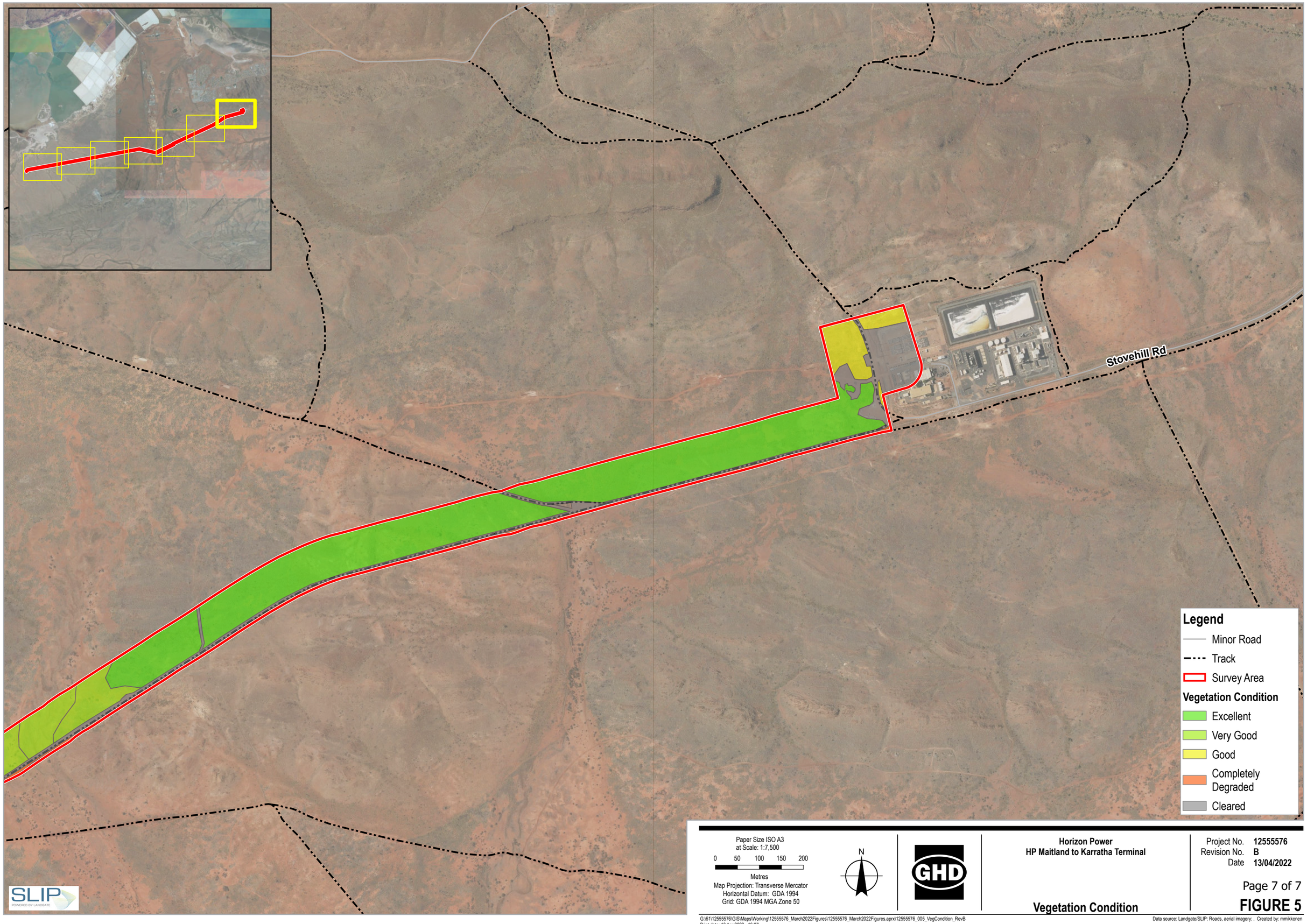

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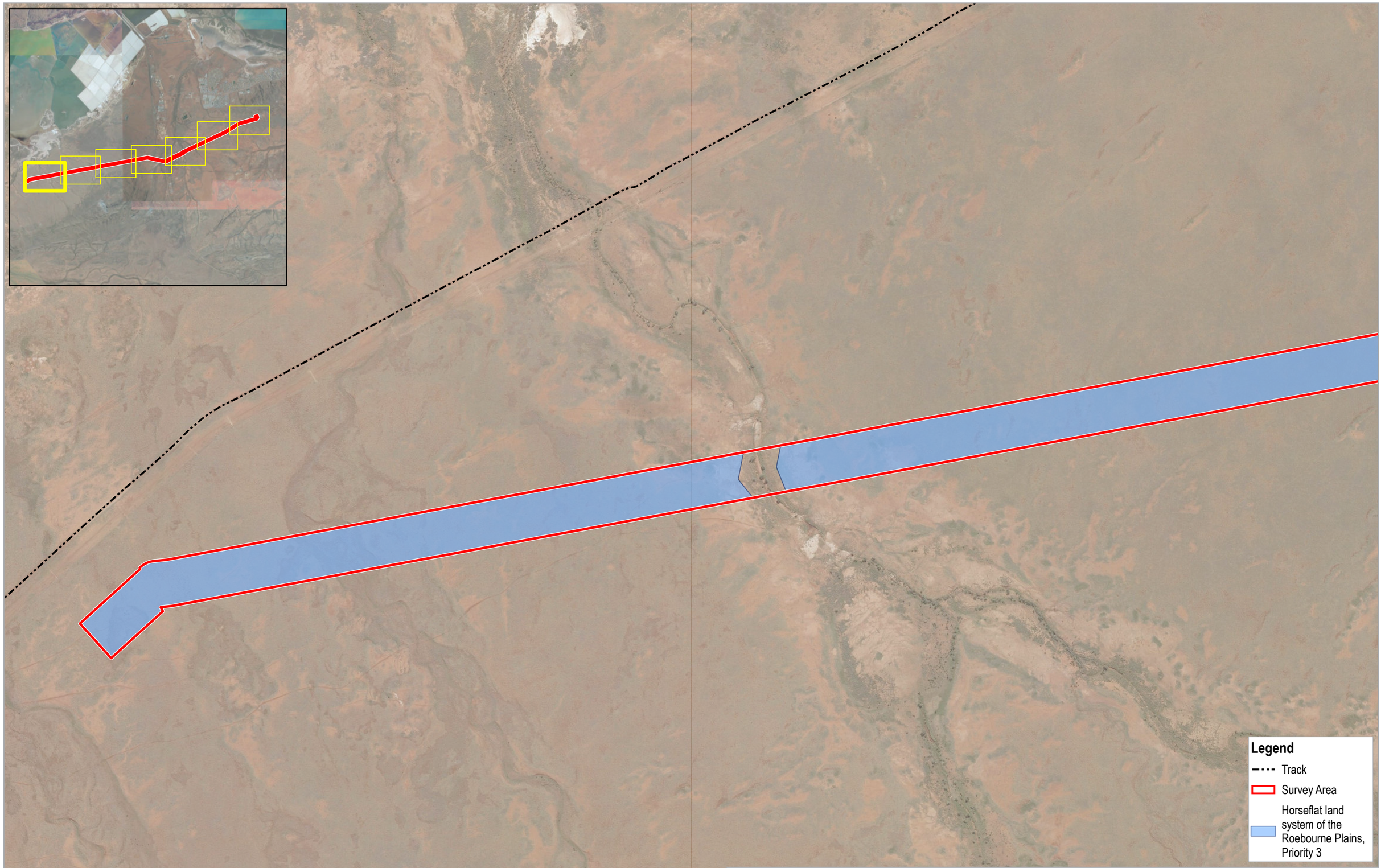

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Metres

Map Projection: Transverse Mercator
Horizontal Datum: GDA 1994
Grid: GDA 1994 MGA Zone 50

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Horizon Power
HP Maitland to Karratha Terminal

Significant Ecological Communities

Project No. **12555576**
Revision No. **B**
Date **13/04/2022**

FIGURE 6

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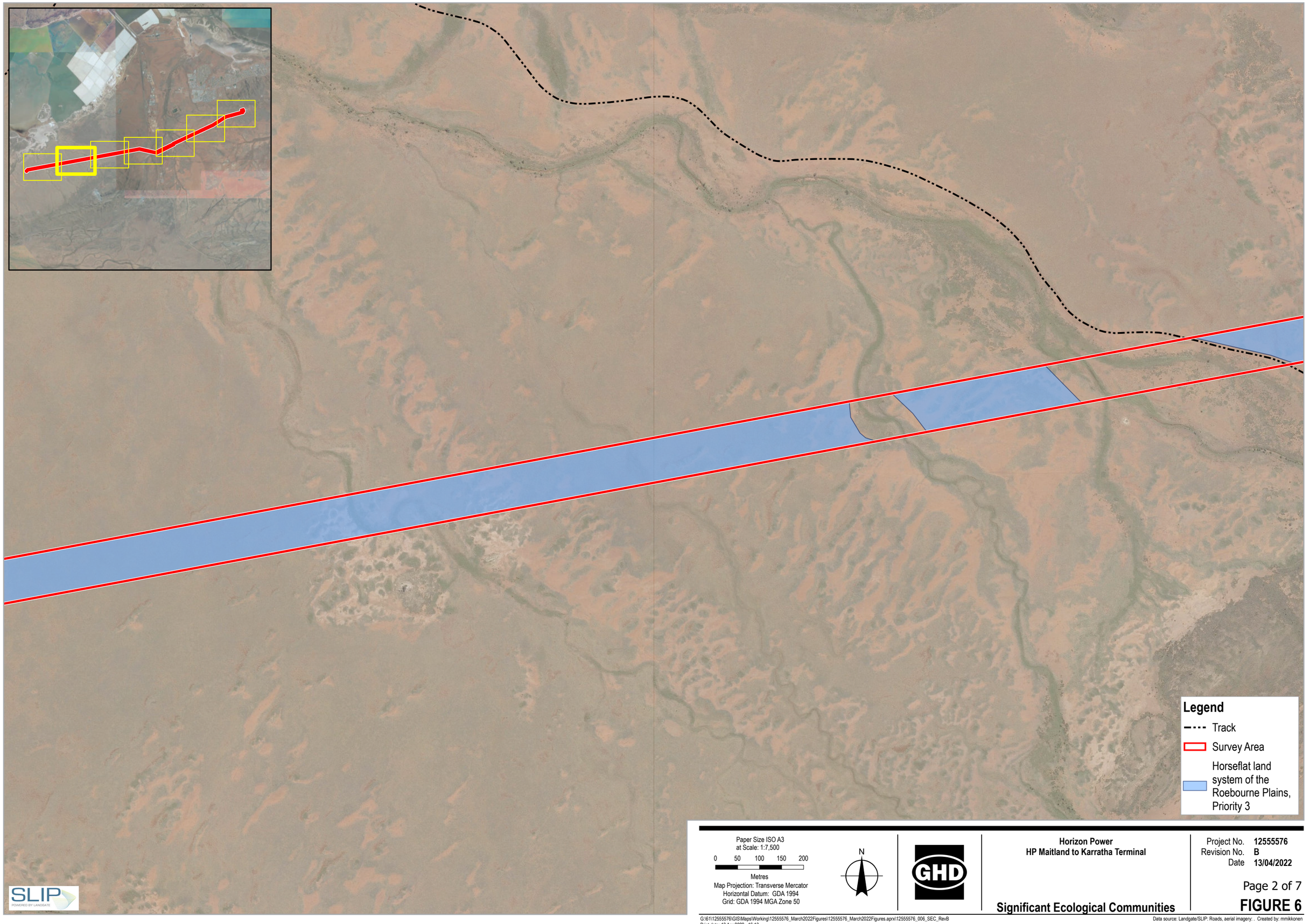

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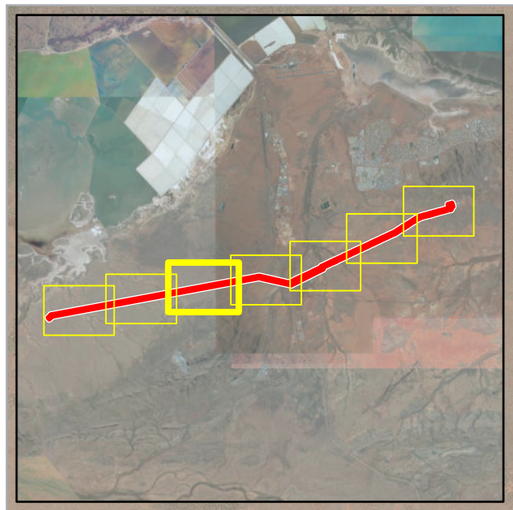

North West Coastal Hwy

Legend

- Major Road
- Minor Road
- Track
- Survey Area
- Horseflat land system of the Roebourne Plains, Priority 3

Paper Size ISO A3
at Scale: 1:7,500

0 50 100 150 200

Metres

Map Projection: Transverse Mercator
Horizontal Datum: GDA 1994
Grid: GDA 1994 MGA Zone 50

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Horizon Power
HP Maitland to Karratha Terminal

Significant Ecological Communities

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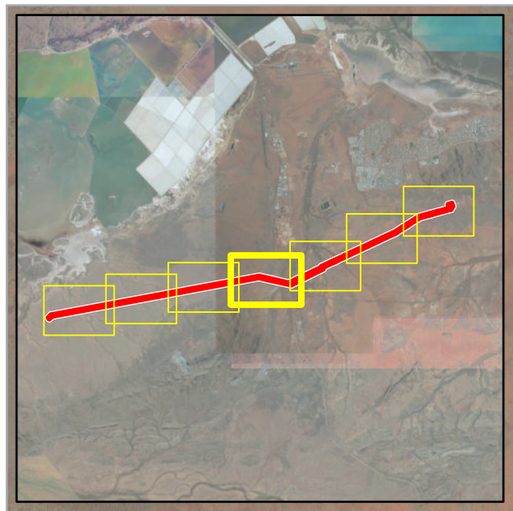

North West Coastal Hwy

North West Coastal Hwy

Legend

- Major Road
- Minor Road
- Track
- Survey Area
- Horseflat land system of the Roebourne Plains, Priority 3

SLIP POWERED BY LANDGATE

Paper Size ISO A3
at Scale: 1:7,500

0 50 100 150 200

Metres

Map Projection: Transverse Mercator
Horizontal Datum: GDA 1994
Grid: GDA 1994 MGA Zone 50

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Madigan Rd

Madigan Rd

North West Coastal Hwy

SLIP
POWERED BY LANDGATE

Legend

- Major Road
- Minor Road
- Track
- Survey Area
- Horseflat land system of the Roebourne Plains, Priority 3

Paper Size ISO A3
at Scale: 1:7,500

0 50 100 150 200

Metres

Map Projection: Transverse Mercator
Horizontal Datum: GDA 1994
Grid: GDA 1994 MGA Zone 50

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Horizon Power
HP Maitland to Karratha Terminal

Significant Ecological Communities

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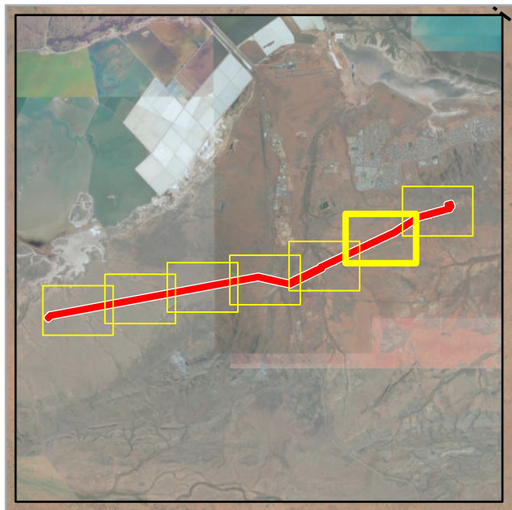

Legend

- Track
- Survey Area
- Horseflat land system of the Roebourne Plains, Priority 3

Paper Size ISO A3
at Scale: 1:7,500

0 50 100 150 200

Metres

Map Projection: Transverse Mercator
Horizontal Datum: GDA 1994
Grid: GDA 1994 MGA Zone 50

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Horizon Power
HP Maitland to Karratha Terminal

Significant Ecological Communities

Project No. **12555576**
Revision No. **B**
Date **13/04/2022**

FIGURE 6

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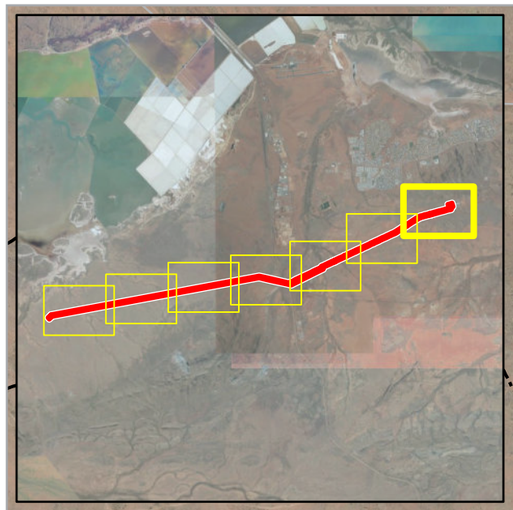

Stovehill Rd

Legend

- Minor Road
- Track
- Survey Area
- Horseflat land system of the Roebourne Plains, Priority 3

Paper Size ISO A3
at Scale: 1:7,500

0 50 100 150 200

Metres

Map Projection: Transverse Mercator
Horizontal Datum: GDA 1994
Grid: GDA 1994 MGA Zone 50

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Significant Ecological Communities

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Date **13/04/2022**

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Data source: Landgate/SLIP: Roads, aerial imagery: . Created by: mmikkonen

Appendix B

Relevant legislation and background information

Relevant legislation

Federal *Environment Protection and Biodiversity Conservation Act 1999*

The *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) is the Federal Government's central piece of environmental legislation. It provides a legal framework to protect and manage nationally and internationally important flora and ecological communities and heritage places, which are defined in the EPBC Act as Matters of National Environmental Significance (MNES).

The biological aspects listed as MNES include:

– Nationally threatened flora species and ecological communities
– Migratory species

A person must not undertake an action that has, will have, or is likely to have a significant impact (direct or indirect) on MNES, without approval from the Federal Minister for the Environment.

The EPBC Act is administered by the Department of Agriculture, Water and the Environment (DAWE).

State *Environmental Protection Act 1986*

The *Environmental Protection Act 1986* (EP Act) is the primary legislative Act dealing with the protection of the environment in Western Australia. The Act allows the Environmental Protection Authority (EPA), to prevent, control and abate pollution and environmental harm, for the conservation, preservation, protection, enhancement and management of the environment and for matters incidental to or connected with the foregoing. Part IV of the EP Act is administered by the EPA and makes provisions for the EPA to undertake environmental impact assessment of significant proposals, strategic proposals and land use planning schemes.

The Department of Water and Environment Regulation (DWER) is responsible for administering the clearing provisions of the EP Act (Part V). Clearing of native vegetation in Western Australia requires a permit from the DWER, unless exemptions apply. Applications for clearing permits are assessed by the Department and decisions are made to grant or refuse the application in accordance with the Act. When making a decision the assessment considers clearing against the ten clearing principles as specified in Schedule 5 of the EP Act:

1. Native vegetation should not be cleared if it comprises a high level of biodiversity.
2. Native vegetation should not be cleared if it comprises the whole or a part of, or is necessary for the maintenance of a significance habitat for fauna indigenous to Western Australia.
3. Native vegetation should not be cleared if it includes, or is necessary, for the continued existence of rare flora.
4. Native vegetation should not be cleared if it comprises the whole or part of native vegetation in an area that has been extensively cleared.
5. Native vegetation should not be cleared if it is significant as a remnant of native vegetation in an area that has been extensively cleared.
6. Native vegetation should not be cleared if it is growing in, or in association with, an environment associated with a watercourse or wetland.
7. Native vegetation should not be cleared if the clearing of the vegetation is likely to have an impact on the environmental values of any adjacent or nearby conservation area.
8. Native vegetation should not be cleared if the clearing of the vegetation is likely to cause appreciable land degradation.
9. Native vegetation should not be cleared if the clearing of the vegetation is likely to cause deterioration in the quality of surface or underground water.

10. Native vegetation should not be cleared if clearing the vegetation is likely to cause, or exacerbate, the incidence of flooding.

Exemptions for clearing include clearing that is a requirement of a written law or authorised under certain statutory processes (listed in Schedule 6 of the EP Act) and exemptions for prescribed low impact day-to-day activities (prescribed in the Environmental Protection (Clearing of Native Vegetation) Regulations 2004); these exemptions do not apply in environmentally sensitive areas (ESAs).

State *Biodiversity and Conservation Act 2016*

The *Biodiversity Conservation Act 2016* (BC Act) provides for the conservation and protection of biodiversity and biodiversity components, as well as the promotion of the ecologically sustainable use of biodiversity components in Western Australia. The BC Act replaces both the repealed *Wildlife Conservation Act 1950* (WC Act) and the *Sandalwood Act 1929* (Sandalwood Act), as well as their associated regulations. To attain the objectives of the BC Act, principles of ecological sustainable development have been established:

– Decision-making processes should effectively integrate both long-term and short-term economic, environmental, social and equitable considerations
– If there are threats of serious or irreversible environmental damage, lack of full scientific certainty should not be used as a reason for postponing measures to prevent environmental degradation
– The present generation should ensure that the health, diversity and productivity of the environment is maintained or enhanced for the benefit of future generations
– The conservation of biodiversity and ecological integrity should be a fundamental consideration indecision-making
– Improved valuation, pricing and incentive mechanisms should be promoted.

The BC Act is administered by the Department of Biodiversity Conservation and Attractions (DBCA).

State *Biosecurity and Agriculture Management Act 2007*

The *Biosecurity and Agriculture Management Act 2007* (BAM Act) and associated regulations are administered by the Department of Primary Industries and Regional Development (DPIRD) and replace the repealed *Agriculture and Related Resources Protection Act 1976.* The main purposes of the BAM Act and its regulations are to:

– Prevent new animal and plant pests (vermin and weeds) and diseases from entering WA
– Manage the impact and spread of those pests already present in the state
– Safely manage the use of agricultural and veterinary chemicals
– Increased control over the sale of agricultural products that contain violative chemical residues.

The Western Australian Organism List (WAOL) provides the status of organisms which have been categorised under the BAM Act. A Declared Pest is a prohibited organism or an organism for which a declaration under Section 22(2) of the Act is in force. Declared Pests may be assigned a control category including: C1 (exclusion), C2 (eradication) and C3 (management). The category may apply to the whole of the State, LGAs, districts, individual properties or even paddocks, and all landholders are obliged to comply with the specific category of control. Categories of control are defined below.

DPIRD Categories for Declared Pests under the BAM Act

Control class code	Description
C1 (Exclusion)	Pests will be assigned to this category if they are not established in Western Australia and control measures are to be taken, including border checks, in order to prevent them entering and establishing in the State.
C2 (Eradication)	Pests will be assigned to this category if they are present in Western Australia in low enough numbers or in sufficiently limited areas that their eradication is still a possibility.
C3 (Management)	Pests will be assigned to this category if they are established in Western Australia but it is feasible, or desirable, to manage them in order to limit their damage. Control measures can prevent a C3 pest from increasing in population size or density or moving from an area in which it is established into an area which currently is free of that pest.

Background information

Environmentally Sensitive Areas

Environmentally Sensitive Areas (ESAs) are declared by the Minister for Environment under Section 51B of the EP Act. The Table below outlines the aspects of areas declared as ESA in the Environmental Protection (Environmentally Sensitive Areas) Notice 2005.

Aspects of ESAs

Aspects of Environmentally Sensitive Areas
A declared World Heritage property as defined in Section 12 of the EPBC Act.
An area that is included on the Register of the National Estate (RNE), because of its natural values, under the *Australian Heritage Commission Act 1975* of the Commonwealth (the RNE was closed in 2007 and is no longer a statutory list – all references to the RNE were removed from the EPBC Act on 19 February 2012).
A defined wetland and the area within 50 m of the wetland. Defined wetlands include Ramsar wetlands, conservation category wetlands and nationally important wetlands.
The area covered by vegetation within 50 m of rare flora, to the extent to which the vegetation is continuous with the vegetation in which the rare flora is located.
The area covered by a Threatened Ecological Community.
A Bush Forever Site listed in “Bush Forever” Volumes 1 and 2 (2000), published by the Western Australia Planning Commission, except to the extent to which the site is approved to be developed by the Western Australia Planning Commission.
The areas covered by the Environmental Protection (Gnangara Mound Crown Land) Policy 1992.
The areas covered by the Environmental Protection (Western Swamp Tortoise Habitat) Policy 2002.
The areas covered by the lakes to which the *Environmental Protection (Swan Coastal Plain Lakes) Policy 1992* (EPP Lakes) applies.
Protected wetlands as defined in the Environmental Protection (South West Agricultural Zone Wetlands) Policy 1998.

Reserves and conservation areas

Department of Biodiversity, Conservation and Attractions managed lands and waters

DBCA manages lands and waters throughout Western Australia to conserve ecosystems and species, and to provide for recreation and appreciation of the natural environment. DBCA managed lands and waters include national parks, conservation parks and reserves, marine parks and reserves, regional parks, nature reserves, State forest and timber reserves. Access to, or through, some areas of DBCA managed lands may require a permit or could be restricted due to management activities. Proposed land use changes and development proposals that abut DBCA managed lands will generally be referred to DBCA throughout the assessment process.

Wetlands

Wetlands include not only lakes with open water, but areas of seasonally, intermittently or permanently waterlogged soil.

Ramsar Wetlands (Wetlands of International Importance)

The Convention of Wetlands of International Importance was signed in 1971 at the Iranian town of Ramsar. The Convention has since been referred to as the Ramsar Convention. Ramsar Listed wetlands are “sites containing

representative, rare or unique wetlands, or wetlands that are important for conserving biological diversity … because of their ecological, botanical, zoological, limnological or hydrological importance" (DAWE 2020b). Once a Ramsar Listed Wetland is designated, the country agrees to manage its conservation and ensure its wise use. Under the Convention, wise use is broadly defined as "maintaining the ecological character of a wetland" (DAWE 2020b).

Nationally important wetlands

Wetlands of national significance are listed under the Directory of Important Wetlands in Australia. Nationally important wetlands are wetlands which meet at least one of the following criteria (DAWE 2020a):

- It is a good example of a wetland type occurring within a biogeographic region in Australia
- It is a wetland which plays an important ecological or hydrological role in the natural functioning of a major wetland system/complex
- It is a wetland which is important as the habitat for animal taxa at a vulnerable stage in their life cycles, or provides a refuge when adverse conditions such as drought prevail
- The wetland supports one percent or more of the national populations of any native plant or animal taxa
- The wetland supports native plant or animal taxa or communities which are considered endangered or vulnerable at the national level
- The wetland is of outstanding historical or cultural significance.

Vegetation extent and status

The National Objectives and Targets for Biodiversity Conservation 2001–2005 (Commonwealth of Australia 2001) recognise that the retention of 30 percent or more of the pre-clearing extent of each ecological community is necessary if Australia's biological diversity is to be protected. This is the threshold level below which species loss appears to accelerate exponentially and loss below this level should not be permitted. This level of recognition is in keeping with the targets recommended in the review of the National Strategy for the Conservation of Australia's Biological Diversity (ANZECC 2000).

The extent of remnant native vegetation in WA has been assessed by Shepherd et al. (2002) and the GoWA (2019), based on broadscale vegetation association mapping by Beard (various publications). The GoWA produces Statewide Vegetation Statistics Reports that are used for a number of purposes including conservation planning, land use planning and when assessing development applications. The reports are updated every 2-3 years.

Vegetation condition

The vegetation condition can be assessed in accordance with the vegetation condition rating scale for the South West and Interzone Botanical Provinces (EPA 2016a). The scale recognises the intactness of vegetation and consists of six rating levels as outlined below.

Vegetation condition rating scale for the Eremaean and Northern Botanical Provinces

Condition	Eremaean and Northern Botanical Provinces description
Excellent	Pristine or nearly so, no obvious signs of damage caused by human activities since European settlement.
Very Good	Some relatively slight signs of damage caused by human activities since European settlement. For example, some signs of damage to tree trunks caused by repeated fire, the presence of some relatively non-aggressive weeds, or occasional vehicle tracks.
Good	More obvious signs of damage caused by human activity since European settlement, including some obvious impact on the vegetation structure such as at caused by low levels of grazing or slightly aggressive weed.
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.

Conservation codes

Species of significant flora and communities are protected under both Federal and State Acts. The Federal EPBC Act provides a legal framework to protect and manage nationally important flora and communities. The State BC Act is the primary wildlife conservation legislation in Western Australia. Information on the conservation codes is summarised in the following sections.

Ecological communities

Significant communities

Ecological communities are defined as naturally occurring biological assemblages that occur in a particular type of habitat (English and Blyth 1997). Federally listed Threatened Ecological Communities (TECs) are protected under the EPBC Act. The BC Act provides for the Minister to list an ecological community as a TEC (section 27), or as a collapsed ecological community (section 31) statutory listing of State TECs by the Minister. The legislation also describes statutory processes for preparing recovery plans for TECs, the registration of their critical habitat, and penalties for unauthorised modification of TECs.

Possible TECs that do not meet survey criteria are added to the DBCA Priority Ecological Community (PEC) List under Priorities 1, 2 and 3. These are ecological communities that are adequately known; are rare but not threatened, or meet criteria for Near Threatened. PECs that have been recently removed from the threatened list are placed in Priority 4. These ecological communities require regular monitoring. Conservation dependent ecological communities are placed in Priority 5. PECs are not listed under any formal Federal or State legislation, however, may be listed as TECs under the EPBC Act.

Codes and definitions for TECs listed under the EPBC Act and/or BC Act

Categories	Definition
Federal Government Conservation Categories (EPBC Act)	
Critically Endangered (CR)	An ecological community if, at that time, is facing an extremely high risk of extinction in the wild in the immediate future, as determined in accordance with the prescribed criteria (as outlined in Environment Protection and Biodiversity Conservation Regulations 2000).
Endangered (EN)	An ecological community if, at that time: – is not critically endangered; and – is facing a very high risk of extinction in the wild in the near future, as determined in accordance with the prescribed criteria (as outlined in Environment Protection and Biodiversity Conservation Regulations 2000).
Vulnerable (VU)	An ecological community if, at that time: – is not critically endangered or endangered; and – is facing a high risk of extinction in the wild in the near future, as determined in accordance with the prescribed criteria (as outlined in Environment Protection and Biodiversity Conservation Regulations 2000).
Western Australia Conservation Categories (BC Act)	
Threatened Ecological Communities	
Critically Endangered (CR)	An ecological community that has been adequately surveyed and found to have been subject to a major contraction in area and/or that was originally of limited distribution and is facing severe modification or destruction throughout its range in the immediate future, or is already severely degraded throughout its range but capable of being substantially restored or rehabilitated.
Endangered (EN)	An ecological community that has been adequately surveyed and found to have been subject to a major contraction in area and/or was originally of limited distribution and is in danger of significant modification throughout its range or severe modification or destruction over most of its range in the near future.

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

Collapsed ecological communities

An ecological community is eligible for listing as a collapsed ecological community at a particular time if, at that time –

– there is no reasonable doubt that the last occurrence of the ecological community has collapsed); or

– the ecological community has been so extensively modified throughout its range that no occurrence of it is likely to recover –

- its species composition or structure; or
- its species composition and structure.

Section 33 of the BC Act provides for a collapsed ecological community to be regarded as a threatened ecological community if it is discovered in a state that no longer makes it eligible for listing as a collapsed ecological community.

Categories and definitions for PECs as listed by the DBCA

Category	Descriptions
Priority 1	Poorly known ecological communities. Ecological communities that are known from very few occurrences with a very restricted distribution (generally ≤5 occurrences or a total area of ≤100 ha). Occurrences are believed to be under threat either due to limited extent, or being on lands under immediate threat (e.g. within agricultural or pastoral lands, urban areas, active mineral leases) or for which current threats exist. May include communities with occurrences on protected lands. Communities may be included if they are comparatively well-known from one or more localities but do not meet adequacy of survey requirements, and/or are not well defined, and appear to be under immediate threat from known threatening processes across their range.
Priority 2	Poorly known ecological communities. Communities that are known from few occurrences with a restricted distribution (generally ≤10 occurrences or a total area of ≤200 ha). At least some occurrences are not believed to be under immediate threat of destruction or degradation. Communities may be included if they are comparatively well known from one or more localities but do not meet adequacy of survey requirements, and/or are not well defined, and appear to be under threat from known threatening processes.
Priority 3	Poorly known ecological communities. – Communities that are known from several to many occurrences, a significant number or area of which are not under threat of habitat destruction or degradation or: – Communities known from a few widespread occurrences, which are either large or with significant remaining areas of habitat in which other occurrences may occur, much of it not under imminent threat, or; – Communities made up of large, and/or widespread occurrences, that may or may not be represented in the reserve system, but are under threat of modification across much of their range from processes such as grazing by domestic and/or feral stock, and inappropriate fire regimes. Communities may be included if they are comparatively well known from several localities but do not meet adequacy of survey requirements and/or are not well defined, and known threatening processes exist that could affect them.
Priority 4	Ecological communities that are adequately known, rare but not threatened or meet criteria for Near Threatened, or that have been recently removed from the threatened list. These communities require regular monitoring. – Rare. Ecological communities known from few occurrences that are considered to have been adequately surveyed, or for which sufficient knowledge is available, and that are considered not currently threatened or in need of special protection, but could be if present circumstances change. These communities are usually represented on conservation lands. – Near Threatened. Ecological communities that are considered to have been adequately surveyed and that do not qualify for Conservation Dependent, but that are close to qualifying for Vulnerable.

Category	Descriptions
	– Ecological communities that have been removed from the list of threatened communities during the past five years.
Priority 5	Conservation Dependent ecological communities. Ecological communities that are not threatened but are subject to a specific conservation program, the cessation of which would result in the community becoming threatened within five years.

Other significant vegetation

Vegetation may be significant for a range of reasons other than a statutory listing. The EPA (2016a, b) states that significant vegetation may include vegetation that includes the following:

- Restricted distribution
- Degree of historical impact from threatening processes
- A role as a refuge
- Providing an important function required to maintain ecological integrity of a significant ecosystem
- Local endemism in restricted habitats
- Novel combinations of taxa
- A role as a key habitat for Threatened species or large population representing a significant proportion of the local to regional total population of a species
- Being representative of a vegetation unit in 'pristine' condition in a highly cleared landscape, recently discovered range extensions, or isolated outliers of the main range.

This may apply at a number of levels, so the unit may be significant when considered at the fine-scale (intra-locality), intermediate-scale (locality or inter-locality) or broad-scale (local to region).

Flora

Significant flora

Species of significant flora are protected under both Federal and State legislation. Any activities that are deemed to have a significant impact on species that are recognised by the EPBC Act, and/or the BC Act can warrant referral to DAWE and/or the EPA.

The Federal conservation level of flora species and their significance status is assessed under the EPBC Act. The significance levels for flora used in the EPBC Act align with the International Union for Conservation of Nature (IUCN) Red List criteria, which are internationally recognised as providing best practice for assigning the conservation status of species.

The State conservation level of flora species and their significance status also follows the IUCN Red List criteria. Under the BC Act flora can be listed as Threatened, Extinct and as Specially Protected species.

Threatened species are those are species which have been adequately searched for and are deemed to be, in the wild, either rare, under identifiable threat of extinction, or otherwise in need of special protection, and have been gazetted as such. The assessment of the conservation status of Threatened species is based on their national extent and ranked according to their level of threat using IUCN Red List categories and criteria. Specially protected species meet one or more of the following categories: species of special conservation interest; migratory species; cetaceans; species subject to international agreement; or species otherwise in need of special protection. Species that are listed as Threatened or Extinct species under the BC Act cannot also be listed as Specially Protected species.

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

Species that are adequately known, are rare but not threatened, or meet criteria for near threatened, or that have been recently removed from the threatened species, are placed in Priority 4. These species require regular monitoring.

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

For the purposes of this assessment, all species listed under the EPBC Act, BC Act and DBCA Priority species are considered significant.

Categories and definitions for EPBC Act and BC Act listed flora species

Conservation category	Definition
Threatened species	
Critically Endangered (CR)	Threatened species Threatened species considered to be "facing an extremely high risk of extinction in the wild in the immediate future, as determined in accordance with criteria set out in the ministerial guidelines". Listed as critically endangered under section 19(1)(a) of the BC Act in accordance with the criteria set out in section 20 and the ministerial guidelines.
Endangered (EN)	Threatened species considered to be "facing a very high risk of extinction in the wild in the near future, as determined in accordance with criteria set out in the ministerial guidelines". Listed as endangered under section 19(1)(b) of the BC Act in accordance with the criteria set out in section 21 and the ministerial guidelines.
Vulnerable (VU)	Threatened species considered to be "facing a high risk of extinction in the wild in the medium term future, as determined in accordance with criteria set out in the ministerial guidelines". Listed as vulnerable under section 19(1)(c) of the BC Act in accordance with the criteria set out in section 22 and the ministerial guidelines.
Extinct species	
Extinct (EX)	Species where "there is no reasonable doubt that the last member of the species has died", and listing is otherwise in accordance with the ministerial guidelines (section 24 of the BC Act).
Extinct in the Wild (EW)	Species that "is known only to survive in cultivation, in captivity or as a naturalised population well outside its past range; and it has not been recorded in its known habitat or expected habitat, at appropriate seasons, anywhere in its past range, despite surveys over a time frame appropriate to its life cycle and form", and listing is otherwise in accordance with the ministerial guidelines (section 25 of the BC Act).

Codes for DBCA listed Priority flora

Priority category	Definition
Priority 1	Poorly-known taxa Species that are known from one or a few locations (generally five or less) which are potentially at risk. All occurrences are either: very small; or on lands not managed for conservation, e.g. agricultural or pastoral lands, urban areas, road and rail reserves, gravel reserves and active mineral leases; or otherwise under threat of habitat destruction or degradation. Species may be included if they are comparatively well known from one or more locations but do not meet adequacy of survey requirements and appear to be under immediate threat from known threatening processes. Such species are in urgent need of further survey.
Priority 2	Poorly-known taxa Species that are known from one or a few locations (generally five or less), some of which are on lands managed primarily for nature conservation, e.g. national parks, conservation parks, nature reserves and other lands with secure tenure being managed for conservation. Species may be included if they are comparatively well known from one or more locations but do not meet adequacy of survey requirements and appear to be under threat from known threatening processes. Such species are in urgent need of further survey.
Priority 3	Poorly-known taxa Species that are known from several locations, and the species does not appear to be under imminent threat, or from few but widespread locations with either large population size or significant remaining areas of apparently suitable habitat, much of it not under imminent threat. Species may be included if they are comparatively well known from several locations but do not meet adequacy of survey requirements and known threatening processes exist that could affect them. Such species are in need of further survey.
Priority 4	Rare, Near Threatened and other taxa in need of monitoring

Priority category	Definition
	– Rare: Taxa that are considered to have been adequately surveyed, or for which sufficient knowledge is available, and that are considered not currently threatened or in need of special protection, but could be if present circumstances change. These taxa are usually represented on conservation lands. – Near Threatened. Taxa that are considered to have been adequately surveyed and that do not qualify for Conservation Dependent, but that are close to qualifying for Vulnerable. – Taxa that have been removed from the list of threatened taxa during the past five years for reasons other than taxonomy.

Other significant flora

Flora species, subspecies, varieties, hybrids and ecotypes may be significant for a range of reasons, other than a statutory listing. The EPA (2016a, b) states that significant flora may include taxa that have/are:

– A keystone role in a particular habitat for Threatened or Priority flora species, or large populations representing a considerable proportion of the local or regional total population of a species
– Relictual status, being representation of taxonomic or physiognomic groups that no longer occur widely in the broader landscape
– New species or anomalous features that indicate a potential new species
– Being representative of the range of a species (particularly, at the extremes of range, recently discovered range extensions, or isolated outliers of the main range)
– Unusual species, including restricted subspecies, varieties, or naturally occurring hybrids
– Local endemism (a restricted distribution) or association with a restricted habitat type (e.g. surface water or groundwater dependent ecosystems).

Introduced plants (weeds)

Declared Pests

Information on species considered to be Declared Pests is provided under *State Biosecurity and Agriculture Management Act 2007.*

Weeds of National Significance

The spread of weeds across a range of land uses or ecosystems is important in the context of socio-economic and environmental values. The assessment of Weeds of National Significance (WoNS) is based on four major criteria:

– Invasiveness
– Impacts
– Potential for spread
– Socio-economic and environmental values.

Australian state and territory governments have identified thirty-two Weeds of National Significance (WoNS); a list of 20 WoNS was endorsed in 1999 and a further 12 were added in 2012.

Fauna Conservation codes

Conservation significant fauna

The Federal conservation level of fauna species and their significance status is assessed under the EPBC Act. The significance levels for fauna used in the EPBC Act align with the International Union for Conservation of Nature (IUCN) Red List criteria, which are internationally recognised as providing best practice for assigning the conservation status of species. The EPBC Act also protects land and migratory species that are listed under International Agreements. The list of migratory species established under section 209 of the EPBC Act comprises:

– Migratory species which are native to Australia and are included in the appendices to the Bonn Convention (Convention on the Conservation of Migratory Species of Wild Animals Appendices I and II)
– Migratory species included in annexes established under the Japan-Australia Migratory Bird Agreement (JAMBA) and the China–Australia Migratory Bird Agreement (CAMBA)
– Native, migratory species identified in a list established under, or an instrument made under, an international agreement approved by the Minister, such as the republic of Korea–Australia Migratory Bird Agreement (ROKAMBA)

The State conservation level of fauna species and their significance status also follows the IUCN Red List criteria. Under the BC Act fauna can be listed as Threatened, Extinct and as Specially Protected species.

Threatened species are those are species which have been adequately searched for and are deemed to be, in the wild, either rare, under identifiable threat of extinction, or otherwise in need of special protection, and have been gazetted as such. The assessment of the conservation status of Threatened species is based on their national extent and ranked according to their level of threat using IUCN Red List categories and criteria. Specially protected species meet one or more of the following categories: species of special conservation interest; migratory species; cetaceans; species subject to international agreement; or species otherwise in need of special protection. Species that are listed as Threatened or Extinct species under the BC Act cannot also be listed as Specially Protected species.

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

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

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

For the purposes of this assessment, all species listed under the EPBC Act, BC Act and DBCA Priority species are considered conservation significant.

Conservation categories and definitions for EPBC Act and BC Act listed fauna species

Conservation category	Definition
Threatened species	
Critically Endangered (CR)	Threatened species considered to be “facing an extremely high risk of extinction in the wild in the immediate future, as determined in accordance with criteria set out in the ministerial guidelines”. Listed as critically endangered under section 19(1)(a) of the BC Act in accordance with criteria set out in section 20 and the ministerial guidelines.
Endangered (EN)	Threatened species considered to be “facing a very high risk of extinction in the wild in the near future, as determined in accordance with criteria set out in the ministerial guidelines”. Listed as endangered under section 19(1)(b) of the BC Act in accordance with the criteria set out in section 21 and the ministerial guidelines.
Vulnerable (VU)	Threatened species considered to be “facing a high risk of extinction in the wild in the medium term future as determined in accordance with criteria set out in the ministerial guidelines”. Listed as vulnerable under section 19(1)(c) of the BC Act in accordance with the criteria set out in section 22 and the ministerial guidelines.
Extinct species	
Extinct (EX)	Species where “there is no reasonable doubt that the last member of the species has died”, and listing is otherwise in accordance with the ministerial guidelines (section 24 of the BC Act).
Extinct in the Wild (EW)	Species that “is known only to survive in cultivation, in captivity or as a naturalized population well outside its past range, and it has not been recorded in its known habitat, at appropriate seasons, anywhere in its past range, despite surveys over a time frame appropriate to its lifecycle and form”, and listing is otherwise in accordance with the ministerial guidelines (section 25 of the BC Act).
Specially protected species	

Conservation category	Definition
Migratory (MI)	Fauna that periodically or occasionally visit Australia or an external Territory or the exclusive economic zone; or the species is subject of an international agreement that relates to the protection of migratory species and that binds the Commonwealth; and listing is otherwise in accordance with the ministerial guidelines (section 15 of the BC Act). Includes birds that are subject to an agreement between the government of Australia and the governments of Japan (JAMBA), China (CAMBA) and The Republic of Korea (ROKAMBA), and fauna subject to the Convention on the Conservation of Migratory Species of Wild Animals (Bonn Convention), an environmental treaty under the United Nations Environment Program. Migratory species listed under the BC Act are a subset of the migratory animals, that are known to visit Western Australia, protected under the international agreements or treaties, excluding species that are listed as Threatened species.
Species of special conservation interest (conservation dependent fauna) (CD)	Fauna of special conservation need being species dependent on ongoing conservation intervention to prevent it becoming eligible for listing as threatened.
Other specially protected fauna (OS)	Fauna otherwise in need of special protection to ensure their conservation, and listing is otherwise in accordance with the ministerial guidelines (section 18 of the BC Act).

Conservation codes for DBCA listed Priority fauna

Priority category	Definition
Priority 1	Poorly-known taxa Species that are known from one or a few locations (generally five or less) which are potentially at risk. All occurrences are either: very small; or on lands not managed for conservation, e.g. agricultural or pastoral lands, urban areas, road and rail reserves, gravel reserves and active mineral leases; or otherwise under threat of habitat destruction or degradation. Species may be included if they are comparatively well known from one or more locations but do not meet adequacy of survey requirements and appear to be under immediate threat from known threatening processes. Such species are in urgent need of further survey.
Priority 2	Poorly-known taxa Species that are known from one or a few locations (generally five or less), some of which are on lands managed primarily for nature conservation, e.g. national parks, conservation parks, nature reserves and other lands with secure tenure being managed for conservation. Species may be included if they are comparatively well known from one or more locations but do not meet adequacy of survey requirements and appear to be under threat from known threatening processes. Such species are in urgent need of further survey.
Priority 3	Poorly-known taxa Species that are known from several locations, and the species does not appear to be under imminent threat, or from few but widespread locations with either large population size or significant remaining areas of apparently suitable habitat, much of it not under imminent threat. Species may be included if they are comparatively well known from several locations but do not meet adequacy of survey requirements and known threatening processes exist that could affect them. Such species are in need of further survey.
Priority 4	Rare, Near Threatened and other taxa in need of monitoring – Rare: Taxa that are considered to have been adequately surveyed, or for which sufficient knowledge is available, and that are considered not currently threatened or in need of special protection, but could be if present circumstances change. These taxa are usually represented on conservation lands. – Near Threatened. Taxa that are considered to have been adequately surveyed and that do not qualify for Conservation Dependent, but that are close to qualifying for Vulnerable. – Taxa that have been removed from the list of threatened taxa during the past five years for reasons other than taxonomy.

Other significant fauna

Fauna species may be significant for a range of reasons other than those protected by international agreement or treaty, Specially Protected or Priority Fauna. Significant fauna may include short-range endemic species, species that have declining populations or declining distributions, species at the extremes of their range, or isolated outlying populations, or species which may be undescribed (EPA2020).

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Appendix C

Desktop searches

EPBC Act PMST

Naturemap flora and fauna searches

NatureMap
Mapping Western Australia's biodiversity

NatureMap Species Report

Created By Guest user on 22/04/2020

Current Names Only	Yes
Core Datasets Only	Yes
Method	'By Circle'
Centre	116° 45' 47" E,20° 40' 14" S
Buffer	20km
Group By	Kingdom

Kingdom	Species	Records
Animalia	713	8527
Chromista	26	68
Fungi	8	9
Plantae	656	3902
TOTAL	**1403**	**12506**

	Name ID	Species Name	Naturalised	Conservation Code	[1]Endemic To Query Area
Animalia					
1.		*? ?*			
2.		*Abudefduf bengalensis*			
3.		*Acanthopagrus latus*			
4.		*Acanthophis wellsei*			
5.	25332	*Acanthophis wellsi (Pilbara Death Adder)*			
6.	25535	*Accipiter cirrocephalus (Collared Sparrowhawk)*			
7.	25536	*Accipiter fasciatus (Brown Goshawk)*			
8.		*Acentrogobius gracilis*			
9.		*Acentrogobius sp.*			
10.	25755	*Acrocephalus australis (Australian Reed Warbler)*			
11.		*Actacarus pacificus*			
12.	41323	*Actitis hypoleucos (Common Sandpiper)*		IA	
13.	25544	*Aegotheles cristatus (Australian Owlet-nightjar)*			
14.		*Agauopsis arborea*			Y
15.		*Agauopsis dasyderma*			Y
16.		*Agauopsis moorea*			Y
17.		*Agauopsis obtusa*			Y
18.		*Agraptocorixa parvipunctata*			
19.		*Alepes apercna*			
20.		*Alepes mate*			Y
21.		*Allodessus bistrigatus*			
22.		*Alluaudomyia sp.*			
23.		*Alona cf. verrucosa*			
24.		*Alona rigidicaudis*			
25.		*Ambassis vachellii*			
26.		*Amblyeleotris gymnocephala*			
27.		*Amblygobius bynoensis*			
28.		*Amblyomma triguttatum*			
29.		*Amniataba caudavittata*			
30.	30833	*Amphibolurus longirostris (Long-nosed Dragon)*			
31.		*Aname mainae*			
32.		*Aname mellosa*			
33.	24312	*Anas gracilis (Grey Teal)*			
34.	24316	*Anas superciliosa (Pacific Black Duck)*			
35.		*Anax papuensis*			
36.	47414	*Anhinga novaehollandiae (Australasian Darter)*			
37.	44628	*Anilios ammodytes*			
38.	44635	*Anilios grypus*			
39.		*Anisops canaliculatus*			
40.		*Anisops hackeri*			
41.		*Anisops nasutus*			
42.		*Anisops sp.*			
43.		*Anomalohalacarus dampierensis*			Y

	Name ID	Species Name	Naturalised	Conservation Code	[1]Endemic To Query Area
44.		*Anopheles annulipes s.l.*			
45.	24505	*Anous stolidus subsp. pileatus (Common Noddy)*		IA	
46.	25317	*Antaresia childreni (Children's Python)*			
47.	25318	*Antaresia perthensis (Pygmy Python)*			
48.	25448	*Antaresia stimsoni (Stimson's Python)*			
49.	25241	*Antaresia stimsoni subsp. stimsoni (Stimson's Python)*			
50.	25670	*Anthus australis (Australian Pipit)*			
51.		*Apistus carinatus*			
52.		*Apogon brevicaudatus*			
53.		*Apogon cavitiensis*			
54.		*Apogon cookii*			
55.		*Apogon fasciatus*			
56.		*Apogon rueppellii*			
57.	25554	*Apus pacificus (Fork-tailed Swift, Pacific Swift)*		IA	
58.	24285	*Aquila audax (Wedge-tailed Eagle)*			
59.	25559	*Ardea intermedia (Intermediate Egret)*			
60.	41324	*Ardea modesta (great egret, white egret)*			
61.	24341	*Ardea pacifica (White-necked Heron)*			
62.	48573	*Ardenna pacifica (Wedge-tailed Shearwater)*		IA	
63.	24610	*Ardeotis australis (Australian Bustard)*			
64.	25736	*Arenaria interpres (Ruddy Turnstone)*		IA	
65.		*Arius leptaspis*			Y
66.	25566	*Artamus cinereus (Black-faced Woodswallow)*			
67.	25567	*Artamus leucorynchus (White-breasted Woodswallow)*			
68.	24354	*Artamus leucorynchus subsp. leucopygialis (White-breasted Woodswallow)*			
69.	24355	*Artamus minor (Little Woodswallow)*			
70.	24356	*Artamus personatus (Masked Woodswallow)*			
71.	24357	*Artamus superciliosus (White-browed Woodswallow)*			
72.		*Arthrorhabdus paucispinus*			
73.	25320	*Aspidites melanocephalus (Black-headed Python)*			
74.	25236	*Aspidites ramsayi (Woma)*			
75.		*Asterorhombus intermedius*			
76.		*Asterropteryx semipunctatus*			
77.		*Atule mate*			
78.		*Austrostrophus stictopygus*			
79.	24318	*Aythya australis (Hardhead)*			
80.		*Barnardius zonarius*			
81.		*Bathygobius fuscus*			
82.		*Bathygobius laddi*			
83.		*Batrachomoeus dahli*			
84.		*Bdelloidea sp. 2:2*			
85.		*Berosus pulchellus*			
86.		*Bostrychus sinensis*			Y
87.	25331	*Brachyurophis approximans (North-western Shovel-nosed Snake)*			
88.		*Bryaninops loki*			
89.	24359	*Burhinus grallarius (Bush Stone-curlew)*			
90.	47897	*Butorides striata (Striated Heron, Mangrove Heron)*			
91.	25715	*Cacatua roseicapilla (Galah)*			
92.	25716	*Cacatua sanguinea (Little Corella)*			
93.	24727	*Cacatua sanguinea subsp. westralensis (Little Corella)*			
94.	42307	*Cacomantis pallidus (Pallid Cuckoo)*			
95.	24779	*Calidris acuminata (Sharp-tailed Sandpiper)*		IA	
96.	24780	*Calidris alba (Sanderling)*		IA	
97.	25738	*Calidris canutus (Red Knot, knot)*		IA	
98.	24784	*Calidris ferruginea (Curlew Sandpiper)*		T	
99.	24788	*Calidris ruficollis (Red-necked Stint)*		IA	
100.	24789	*Calidris subminuta (Long-toed Stint)*		IA	
101.	24790	*Calidris tenuirostris (Great Knot)*		T	
102.		*Callionymus japonicus*			Y
103.		*Callionymus russelli*			
104.		*Callionymus sp.*			
105.	48920	*Canis familiaris (Dog, Dingo)*	Y		
106.	24253	*Capra hircus (Goat)*	Y		
107.		*Carangoides sp.*			
108.		*Caranx bucculentus*			
109.		*Carcharhinus brachyurus*			
110.		*Carenum pulchrum*			
111.		*Carenum subplanatum*			
112.		*Carenum venustum*			
113.	25015	*Carlia munda (Shaded-litter Rainbow Skink)*			

	Name ID	Species Name	Naturalised	Conservation Code	[1]Endemic To Query Area
114.	25017	*Carlia triacantha (Desert Rainbow Skink)*			
115.		*Catadromus lacordairei*			
116.		*Centrogenys vaigiensis*			
117.	25600	*Centropus phasianinus (Pheasant Coucal)*			
118.		*Cephalopholis boenak*			
119.		*Ceriodaphnia cornuta*			
120.		*Ceriodaphnia n. sp. a (Berner sp.#3) (SAP)*			
121.		*Ceriodaphnia n. sp. c (Berner sp.#1) (SAP)*			
122.	24181	*Chaerephon jobensis (Greater Northern Freetail-bat, Northern Mastiff Bat)*			
123.	25575	*Charadrius leschenaultii (Greater Sand Plover)*		T	
124.	25576	*Charadrius mongolus (Lesser Sand Plover)*		T	
125.	24377	*Charadrius ruficapillus (Red-capped Plover)*			
126.	24378	*Charadrius veredus (Oriental Plover)*		IA	
127.		*Cheilopogon arcticeps*			
128.		*Chelmon marginalis*			
129.		*Chelmon muelleri*			
130.	25336	*Chelonia mydas (Green Turtle)*		T	
131.	24321	*Chenonetta jubata (Australian Wood Duck, Wood Duck)*			
132.		*Cheumatopsyche wellsae*			
133.		*Chirocentrus dorab*			
134.		*Chironomus aff. alternans (V24) (CB)*			
135.		*Chlaenius australis*			
136.	41332	*Chlidonias leucopterus (White-winged Black Tern, white-winged tern)*		IA	
137.		*Choerodon cyanodus*			
138.		*Chroicocephalus novaehollandiae*			
139.		*Chromileptes altivelis*			
140.	24431	*Chrysococcyx basalis (Horsfield's Bronze Cuckoo)*			
141.	24288	*Circus approximans (Swamp Harrier)*			
142.	24289	*Circus assimilis (Spotted Harrier)*			
143.	24774	*Cladorhynchus leucocephalus (Banded Stilt)*			
144.		*Cloeon sp.*			
145.	24399	*Columba livia (Domestic Pigeon)*	Y		
146.		*Congrogadus subducens*			
147.		*Copidognathus lutarius*			Y
148.		*Copidognathus meridianus*			
149.		*Copidognathus piger*			Y
150.	25568	*Coracina novaehollandiae (Black-faced Cuckoo-shrike)*			
151.		*Coris sp.*			
152.	24416	*Corvus bennetti (Little Crow)*			
153.	25593	*Corvus orru (Torresian Crow)*			
154.	24419	*Corvus splendens (House Crow)*			
155.	25701	*Coturnix ypsilophora (Brown Quail)*			
156.	24673	*Coturnix ypsilophora subsp. australis (Brown Quail)*			
157.	24672	*Coturnix ypsilophora subsp. cervina (Brown Quail)*			
158.	24420	*Cracticus nigrogularis (Pied Butcherbird)*			
159.	25595	*Cracticus tibicen (Australian Magpie)*			
160.	25596	*Cracticus torquatus (Grey Butcherbird)*			
161.		*Craterocephalus pauciradiatus*			
162.	24919	*Crenadactylus ocellatus subsp. horni (Clawless Gecko)*			
163.	30893	*Cryptoblepharus buchananii*			
164.	25020	*Cryptoblepharus plagiocephalus*			
165.	30892	*Cryptoblepharus ustulatus*			
166.		*Cryptochironomus griseidorsum*			
167.		*Cryptoerithus halli*			
168.		*Cryptoerithus occultus*			
169.	25458	*Ctenophorus caudicinctus (Ring-tailed Dragon)*			
170.	24865	*Ctenophorus caudicinctus subsp. caudicinctus (Ring-tailed Dragon)*			
171.	25459	*Ctenophorus isolepis (Crested Dragon, Military Dragon)*			
172.	24876	*Ctenophorus isolepis subsp. isolepis (Crested Dragon, Military Dragon)*			
173.	24882	*Ctenophorus nuchalis (Central Netted Dragon)*			
174.	24886	*Ctenophorus reticulatus (Western Netted Dragon)*			
175.		*Ctenotrypauchen microcephalus*			
176.	25024	*Ctenotus angusticeps (Airlie Island Ctenotus, Northwestern coastal Ctenotus)*		P3	
177.	25027	*Ctenotus australis*			
178.	25036	*Ctenotus duricola*			
179.	25462	*Ctenotus grandis*			
180.	25043	*Ctenotus grandis subsp. titan*			
181.	25045	*Ctenotus helenae*			
182.	25052	*Ctenotus leonhardii*			
183.	25463	*Ctenotus pantherinus (Leopard Ctenotus)*			

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184.	25060	*Ctenotus pantherinus subsp. acripes (Leopard Ctenotus)*			
185.	25064	*Ctenotus pantherinus subsp. ocellifer (Leopard Ctenotus)*			
186.	25072	*Ctenotus rubicundus*			
187.	25073	*Ctenotus saxatilis (Rock Ctenotus)*			
188.	25074	*Ctenotus schomburgkii*			
189.	25077	*Ctenotus serventyi*			
190.		*Culex crinicauda*			
191.		*Culex palpalis*			
192.		*Cybister tripunctatus*			
193.	25466	*Cyclodomorphus melanops (Slender Blue-tongue)*			
194.	25090	*Cyclodomorphus melanops subsp. melanops (Slender Blue-tongue)*			
195.	25371	*Cyclorana australis (Giant Frog)*			
196.	25375	*Cyclorana maini (Sheep Frog)*			
197.	24322	*Cygnus atratus (Black Swan)*			
198.		*Cymbacephalus bosschei*			
199.		*Cynoglossus maculipinnis*			
200.		*Cynoglossus sp.*			
201.		*Cypretta sp PSW074*			
202.		*Cypricercus sp. 422 (CB)*			
203.		*Dasyheleinae sp. P2 (PSW)*			
204.	24091	*Dasykaluta rosamondae (Little Red Kaluta)*			
205.	24093	*Dasyurus hallucatus (Northern Quoll)*		T	
206.	24996	*Delma borea*			
207.	25001	*Delma nasuta*			
208.	25002	*Delma pax*			
209.	25004	*Delma tincta*			
210.	25468	*Demansia psammophis (Yellow-faced Whipsnake)*			
211.	25295	*Demansia psammophis subsp. cupreiceps (Yellow-faced Whipsnake)*			
212.	25297	*Demansia rufescens (Rufous Whipsnake)*			
213.	24325	*Dendrocygna eytoni (Plumed Whistling Duck)*			
214.		*Dexillus muelleri*			
215.	25607	*Dicaeum hirundinaceum (Mistletoebird)*			
216.		*Dicrotendipes P5 (=balciunasi?) (PSW)*			
217.		*Difflugia sp. P1*			
218.		*Dinematichthys sp.*			
219.		*Dineutus australis*			
220.		*Diplacodes bipunctata*			
221.		*Diplacodes haematodes*			
222.	24926	*Diplodactylus conspicillatus (Fat-tailed Gecko)*			
223.	41404	*Diplodactylus galaxias (Northern Pilbara Beak-faced Gecko)*			
224.	24937	*Diplodactylus mitchelli*			
225.	24944	*Diplodactylus savagei (Southern Pilbara Beak-faced Gecko)*			
226.		*Dischistodus darwiniensis*			
227.	24470	*Dromaius novaehollandiae (Emu)*			
228.		*Drombus sp.*			
229.	24084	*Dugong dugon (Dugong)*		S	
230.		*Ecnomus pilbarensis*			
231.	25092	*Egernia depressa (Southern Pygmy Spiny-tailed Skink)*			
232.	25101	*Egernia pilbarensis (Pilbara Skink)*			
233.		*Egretta garzetta*			
234.		*Egretta novaehollandiae*			
235.		*Elanus axillaris*			
236.	24290	*Elanus caeruleus subsp. axillaris (Australian Black-shouldered Kite)*			
237.		*Eleutheronema tetradactylum*			
238.		*Elops hawaiensis*			
239.	47937	*Elseyornis melanops (Black-fronted Dotterel)*			
240.	24631	*Emblema pictum (Painted Finch)*			
241.		*Encentridophorus sarasini*			
242.		*Enchytraeidae sp.*			
243.		*Engyprosopon sp.*			
244.		*Enneapterygius gracilis*			
245.		*Enneapterygius philippinus*			
246.		*Enneapterygius sp.*			
247.		*Enochrus deserticola*			
248.		*Eolophus roseicapillus*			
249.	24653	*Eopsaltria pulverulenta (Mangrove Robin)*			
250.	25362	*Ephalophis greyae*			
251.		*Ephemeroporus barroisi s.l.*			
252.	25578	*Ephippiorhynchus asiaticus (Black-necked Stork)*			
253.		*Ephydridae sp. 12 (PSW)*			

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254.		*Epinephelus bilobatus*			
255.		*Epinephelus coioides*			
256.		*Epinephelus malabaricus*			
257.		*Epinephelus quoyanus*			
258.		*Epinephelus sexfasciatus*			
259.	24568	*Epthianura aurifrons (Orange Chat)*			
260.	24570	*Epthianura tricolor (Crimson Chat)*			
261.	42404	*Eremiascincus isolepis*			
262.	41409	*Eremiascincus musivus (Mosaic Desert Skink)*			
263.	24837	*Eremiornis carteri (Spinifex-bird)*			
264.		*Eretes australis*			
265.	25473	*Eretmochelys imbricata (Hawksbill Turtle)*		T	
266.	25342	*Eretmochelys imbricata subsp. bissa (Hawksbill Turtle)*		T	
267.	24379	*Erythrogonys cinctus (Red-kneed Dotterel)*			
268.	47938	*Esacus magnirostris (Beach Stone-curlew, Beach Thick-knee)*			
269.		*Ethmostigmus curtipes*			
270.		*Euchlanis lyra*			
271.		*Euglypha sp.*			
272.		*Euristhmus microceps*			
273.		*Euristhmus sandrae*			Y
274.	24368	*Eurostopodus argus (Spotted Nightjar)*			
275.		*Eviota queenslandica*			
276.	25621	*Falco berigora (Brown Falcon)*			
277.	24471	*Falco berigora subsp. berigora (Brown Falcon)*			
278.	25622	*Falco cenchroides (Australian Kestrel, Nankeen Kestrel)*			
279.	25623	*Falco longipennis (Australian Hobby)*			
280.	25624	*Falco peregrinus (Peregrine Falcon)*		S	
281.	24475	*Falco peregrinus subsp. macropus (Australian Peregrine Falcon)*		S	
282.	24476	*Falco subniger (Black Falcon)*			
283.		*Favonigobius melanobranchus*			
284.		*Favonigobius sp.*			
285.	24041	*Felis catus (Cat)*	Y		
286.		*Festucalex sp.*			
287.	25327	*Fordonia leucobalia (White-bellied Mangrove Snake)*			
288.		*Fowleria aurita*			
289.	24478	*Fregata ariel (Lesser Frigatebird)*		IA	
290.	25727	*Fulica atra (Eurasian Coot)*			
291.	25301	*Furina ornata (Moon Snake)*			
292.	25730	*Gallirallus philippensis (Buff-banded Rail)*			
293.	24765	*Gallirallus philippensis subsp. mellori (Buff-banded Rail)*			
294.	42314	*Gavicalis virescens (Singing Honeyeater)*			
295.	24956	*Gehyra pilbara*			
296.	24958	*Gehyra punctata*			
297.	24959	*Gehyra variegata*			
298.	47954	*Gelochelidon nilotica (Gull-billed Tern)*		IA	
299.	24401	*Geopelia cuneata (Diamond Dove)*			
300.	24402	*Geopelia humeralis (Bar-shouldered Dove)*			
301.	25585	*Geopelia striata (Zebra Dove)*			
302.	24403	*Geopelia striata subsp. placida (Peaceful Dove)*			
303.	24404	*Geophaps plumifera (Spinifex Pigeon)*			
304.		*Geoscaptus laevissimus*			
305.		*Gerres filamentosus*			
306.		*Gerres subfasciatus*			
307.	25530	*Gerygone fusca (Western Gerygone)*			
308.		*Gerygone sp.*			
309.	24276	*Gerygone tenebrosa (Dusky Gerygone)*			
310.	24481	*Glareola maldivarum (Oriental Pratincole)*		IA	
311.		*Glyptophysa sp*			
312.		*Gnatholepis argus*			
313.		*Gobiodon rivulatus*			
314.		*Gobiodon sp.*			
315.	24443	*Grallina cyanoleuca (Magpie-lark)*			
316.	24484	*Grus rubicunda (Brolga)*			
317.		*Gymnothorax pseudothyrsoideus*			
318.	25627	*Haematopus fuliginosus (Sooty Oystercatcher)*			
319.	24487	*Haematopus longirostris (Pied Oystercatcher)*			
320.		*Haematopus ostralegus*			Y
321.		*Halacaridae sp.*			
322.	24293	*Haliaeetus leucogaster (White-bellied Sea-Eagle)*			
323.	25541	*Haliastur indus (Brahminy Kite)*			

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324.	24294	*Haliastur indus subsp. girrenera (Brahminy Kite)*			
325.	24295	*Haliastur sphenurus (Whistling Kite)*			
326.		*Halichoeres nigrescens*			
327.		*Halichoeres sp.*			
328.		*Halieutaea brevicaudata?*			
329.		*Haliichthys taeniophorus*			
330.		*Halophryne diemensis*			
331.	24297	*Hamirostra melanosternon (Black-breasted Buzzard)*			
332.		*Hellyethira sp.*			
333.		*Hemicordulia sp.*			
334.	25232	*Hemidactylus frenatus (Asian House Gecko)*	Y		
335.		*Herklotsichthys koningsbergeri*			
336.		*Heterocypris tatei*			
337.	24961	*Heteronotia binoei (Bynoe's Gecko)*			
338.	47965	*Hieraaetus morphnoides (Little Eagle)*			
339.	25734	*Himantopus himantopus (Black-winged Stilt)*			
340.		*Hippichthys penicillus*			
341.	24491	*Hirundo neoxena (Welcome Swallow)*			
342.	25630	*Hirundo rustica (Barn Swallow)*		IA	
343.		*Hogna crispipes*			
344.		*Hydraena sp.*			
345.	25363	*Hydrelaps darwiniensis*			
346.		*Hydrochus obscuroaeneus*			
347.		*Hydroglyphus grammopterus (=trilineatus)*			
348.		*Hydroglyphus leai*			
349.		*Hydroglyphus orthogrammus*			
350.	24215	*Hydromys chrysogaster (Water-rat, Rakali)*		P4	
351.	48587	*Hydroprogne caspia (Caspian Tern)*		IA	
352.		*Hyphydrus elegans*			
353.		*Hyphydrus lyratus*			
354.		*Hypopterus macropterus*			
355.		*Ilyocypris australiensis*			
356.		*Ilyodromus sp BOS25*			
357.		*Indolpium sp.*			
358.		*Inegocia japonica*			
359.		*Ischnura aurora aurora*			
360.		*Isidorella egraria*			
361.		*Isobactrus australiensis*			Y
362.		*Isobactrus obesus*			Y
363.		*Isopedella gibsandi*			
364.		*Isopedella tindalei*			
365.		*Istiblennius meleagris*			
366.		*Istigobius nigroocellatus*			
367.		*Istigobius ornatus*			
368.		*Keratella procurva*			
369.		*Laccophilus sharpi*			
370.	24367	*Lalage tricolor (White-winged Triller)*			
371.		*Lampona ampeinna*			
372.		*Lampona cylindrata*			
373.		*Lamponina scutata*			
374.		*Larsia albiceps*			
375.	25637	*Larus novaehollandiae (Silver Gull)*			
376.	25638	*Larus pacificus (Pacific Gull)*			
377.		*Latonopsis australis*			
378.		*Latrodectus geometricus*			
379.		*Leberis cf. diaphanus*			
380.		*Lecane bulla*			
381.		*Lecane luna*			
382.		*Lecane punctata*			
383.		*Lecane thalera*			
384.		*Lecane ungulata*			
385.	24217	*Leggadina lakedownensis (Northern Short-tailed Mouse, Lakeland Downs Mouse, Kerakenga)*		P4	
386.		*Leiognathus sp.*			
387.		*Lepadella patella*			
388.		*Lepidotrigla sp.*			
389.	25125	*Lerista bipes*			
390.	30928	*Lerista clara*			
391.	30929	*Lerista jacksoni*			
392.	25155	*Lerista muelleri*			

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393.	30925	*Lerista verhmens*			
394.	25005	*Lialis burtonis*			
395.	25238	*Liasis olivaceus subsp. barroni (Pilbara Olive Python)*		T	
396.	25239	*Liasis olivaceus subsp. olivaceus (Olive Python)*			
397.	25661	*Lichmera indistincta (Brown Honeyeater)*			
398.	24582	*Lichmera indistincta subsp. indistincta (Brown Honeyeater)*			
399.		*Limbodessus compactus*			
400.	25739	*Limicola falcinellus (Broad-billed Sandpiper)*		IA	
401.		*Limnadopsis "pilbarensis" (ex P2)(PSW)*			Y
402.		*Limnocythere dorsosicula*			
403.	30932	*Limosa lapponica (Bar-tailed Godwit)*		IA	
404.	25741	*Limosa limosa (Black-tailed Godwit)*		IA	
405.		*Liocranium praepositum*			
406.		*Litarachna bartschae*			Y
407.	25392	*Litoria rubella (Little Red Tree Frog)*			
408.		*Liza alata*			
409.		*Liza subviridis*			
410.		*Liza vaigiensis*			
411.		*Lophiocharon trisignatus*			
412.	30933	*Lucasium stenodactylum*			
413.		*Lutjanus argentimaculatus*			
414.		*Lutjanus carponotatus*			
415.		*Lutjanus malabaricus*			
416.		*Lutjanus russellii*			
417.		*Lychas sp. 2*			
418.		*Macrochaetus sp.*			
419.	24180	*Macroderma gigas (Ghost Bat)*		T	
420.	25489	*Macropus robustus (Euro, Biggada)*			
421.	24135	*Macropus robustus subsp. erubescens (Euro, Biggada)*			
422.	24136	*Macropus rufus (Red Kangaroo, Marlu)*			
423.	24326	*Malacorhynchus membranaceus (Pink-eared Duck)*			
424.	25651	*Malurus lamberti (Variegated Fairy-wren)*			
425.	25652	*Malurus leucopterus (White-winged Fairy-wren)*			
426.	24583	*Manorina flavigula (Yellow-throated Miner)*			
427.		*Megacephala greyana*			
428.	24051	*Megaptera novaeangliae (Humpback Whale)*		S	
429.	24736	*Melopsittacus undulatus (Budgerigar)*			
430.	25184	*Menetia greyii*			
431.	25491	*Menetia surda*			
432.	25187	*Menetia surda subsp. surda*			
433.	24598	*Merops ornatus (Rainbow Bee-eater)*			
434.		*Mesocyclops brooksi*			
435.		*Mesovelia hungerfordi*			
436.		*Metacyclops sp. P2 (PSW)*			
437.		*Metavelifer multiradiatus*			
438.		*Micrognathus micronotopterus*			
439.		*Micronecta n. sp. P3 (PSW)*			
440.		*Microvelia (Austromicrovelia) peramoena*			
441.	25542	*Milvus migrans (Black Kite)*			
442.	25545	*Mirafra javanica (Horsfield's Bushlark, Singing Bushlark)*			
443.		*Monacanthus chinensis*			
444.		*Monodactylus argenteus*			
445.		*Monommata sp.*			
446.	25495	*Morethia ruficauda*			
447.	25193	*Morethia ruficauda subsp. exquisita*			
448.		*Mormopterus (Ozimops) cobourgianus*			
449.	24183	*Mormopterus loriae (Little Northern Freetail-bat)*			
450.		*Mugil cephalus*			
451.		*Muraenichthys sp.*			
452.	24223	*Mus musculus (House Mouse)*	Y		
453.		*Muscidae sp. P1*			
454.		*Naididae (ex Tubificidae)*			
455.	25344	*Natator depressus (Flatback Turtle)*		T	
456.		*Nebrius ferrugineus*			Y
457.		*Nematoda sp. P2/P4 (PSW)*			
458.		*Nemipterus celebicus*			
459.	25685	*Neochmia ruficauda (Star Finch)*			
460.		*Neopsephotus bourkii*			
461.		*Nephila edulis*			
462.		*Netuma proxima*			

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463.	24095	*Ningaui timealeyi (Pilbara Ningaui)*			
464.	48016	*Ninox boobook (Boobook Owl)*			
465.	25430	*Notaden nichollsi (Desert Spadefoot)*			
466.	24224	*Notomys alexis (Spinifex Hopping-mouse)*			
467.	25196	*Notoscincus butleri (lined soil-crevice skink (Dampier))*		P4	
468.	25197	*Notoscincus ornatus subsp. ornatus*			
469.	24798	*Numenius madagascariensis (Eastern Curlew)*		T	
470.	24799	*Numenius minutus (Little Curlew, Little Whimbrel)*		IA	
471.	25742	*Numenius phaeopus (Whimbrel)*		IA	
472.	25564	*Nycticorax caledonicus (Rufous Night Heron)*			
473.	24192	*Nyctophilus arnhemensis (Arnhem Land Long-eared Bat)*			
474.	24194	*Nyctophilus geoffroyi (Lesser Long-eared Bat)*			
475.		*Nyctophilus geoffroyi subsp. pallescens*			
476.	24742	*Nymphicus hollandicus (Cockatiel)*			
477.	24497	*Oceanites oceanicus (Wilson's Storm-petrel)*		IA	
478.	24407	*Ocyphaps lophotes (Crested Pigeon)*			
479.	24976	*Oedura marmorata (Marbled Velvet Gecko)*			
480.		*Omobranchus punctatus*			
481.		*Omobranchus rotundiceps*			
482.		*Omobranchus sp.*			
483.		*Omoedus orbiculatus*			
484.		*Onigocia pedimacula*			
485.		*Onigocia pedimacula?*			
486.	41347	*Onychoprion anaethetus (Bridled Tern)*		IA	
487.		*Ophichthus celebicus?*			
488.		*Opisthopora sp.*			
489.		*Opistognathus darwiniensis*			
490.		*Orthetrum caledonicum*			
491.		*Orthomorpha coarctata*			
492.	24085	*Oryctolagus cuniculus (Rabbit)*	Y		
493.	48034	*Osphranter robustus (Euro, Biggada)*			
494.		*Ostracoda (unident.)*			
495.	34016	*Ovis aries (Sheep)*			
496.		*Oxyopes variabilis*			
497.		*Oxyurichthys sp.*			
498.	24620	*Pachycephala lanioides (White-breasted Whistler)*			
499.	25678	*Pachycephala melanura (Mangrove Golden Whistler)*			
500.	24621	*Pachycephala melanura subsp. melanura (Mangrove Golden Whistler)*			
501.	25680	*Pachycephala rufiventris (Rufous Whistler)*			
502.		*Pandaka lidwilli*			
503.	48591	*Pandion cristatus (Osprey, Eastern Osprey)*		IA	
504.		*Pantala flavescens*			
505.		*Parachaeturichthys sp.*			Y
506.		*Paracymus pygmaeus*			
507.		*Paracymus spenceri*			
508.		*Paraexocoetus brachypterus*			Y
509.		*Paramonacanthus choirocephalus*			
510.		*Parapercis diplospilus*			
511.		*Parascorpaena picta*			
512.		*Paratanytarsus sp. P2 (PSW)*			
513.	24627	*Pardalotus rubricatus (Red-browed Pardalote)*			
514.	48053	*Pardalotus rubricatus subsp. rubricatus (Red-browed Pardalote)*			Y
515.	25682	*Pardalotus striatus (Striated Pardalote)*			
516.	25687	*Passer domesticus (House Sparrow)*	Y		
517.	24642	*Passer montanus (Eurasian Tree Sparrow)*	Y		
518.		*Pediana horni*			
519.		*Pediana tenuis*			
520.		*Pegasus volitans*			
521.	24648	*Pelecanus conspicillatus (Australian Pelican)*			
522.		*Peneoenanthe pulverulenta*			
523.		*Pentapodus porosus*			
524.		*Pentapodus sp.*			
525.		*Periophthalmus argentilineatus*			
526.	48060	*Petrochelidon ariel (Fairy Martin)*			
527.	48061	*Petrochelidon nigricans (Tree Martin)*			
528.	24144	*Petrogale rothschildi (Rothschild's Rock-wallaby)*			
529.		*Petroscirtes mitratus*			
530.	25697	*Phalacrocorax carbo (Great Cormorant)*			
531.	25698	*Phalacrocorax melanoleucos (Little Pied Cormorant)*			
532.	24667	*Phalacrocorax sulcirostris (Little Black Cormorant)*			

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533.	25699	*Phalacrocorax varius (Pied Cormorant)*			
534.	24411	*Phaps histrionica (Flock Bronzewing, Flock Pigeon)*			
535.		*Phreodrilid with dissimilar ventral chaetae*			
536.		*Phreodrilid with similar ventral chaetae*			
537.		*Pilbarascutigera incola*			
538.		*Pilbarophreatoicus platyarthricus*			
539.		*Pisodonophis cancrivorus*			
540.	24677	*Pitta moluccensis (Blue-winged Pitta)*			
541.		*Planigale sp. nov.*			
542.	24842	*Platalea regia (Royal Spoonbill)*			
543.		*Platycephalus endrachtensis*			
544.		*Platycephalus sp.*			
545.	24843	*Plegadis falcinellus (Glossy Ibis)*		IA	
546.		*Pleurosicya sp.*			
547.		*Plotosus lineatus*			
548.	24382	*Pluvialis fulva (Pacific Golden Plover)*		IA	
549.	24383	*Pluvialis squatarola (Grey Plover)*		IA	
550.	25703	*Podargus strigoides (Tawny Frogmouth)*			
551.	24679	*Podargus strigoides subsp. brachypterus (Tawny Frogmouth)*			
552.	25510	*Pogona minor (Dwarf Bearded Dragon)*			
553.	24907	*Pogona minor subsp. minor (Dwarf Bearded Dragon)*			
554.	24681	*Poliocephalus poliocephalus (Hoary-headed Grebe)*			
555.		*Polydactylus multiradiatus*			
556.		*Polypedilum nubifer*			
557.		*Pomadasys kaakan*			
558.		*Pomadasys maculatus*			
559.		*Pontarachne australis*			Y
560.		*Priacanthus hamrur*			
561.		*Priolepis nuchifasciata*			
562.		*Pristotis obtusirostris*			
563.		*Procladius paludicola*			
564.		*Protonibea diacanthus*			
565.		*Psettodes erumei*			
566.	24105	*Pseudantechinus roryi (Rory's Pseudantechinus)*			
567.	24106	*Pseudantechinus woolleyae (Woolley's Pseudantechinus)*			
568.	25261	*Pseudechis australis (Mulga Snake)*			
569.	24233	*Pseudomys chapmani (Western Pebble-mound Mouse, Ngadji)*		P4	
570.	24234	*Pseudomys delicatulus (Delicate Mouse)*			
571.	24235	*Pseudomys desertor (Desert Mouse)*			
572.	24237	*Pseudomys hermannsburgensis (Sandy Inland Mouse)*			
573.	42416	*Pseudonaja mengdeni (Western Brown Snake)*			
574.	25263	*Pseudonaja modesta (Ringed Brown Snake)*			
575.	25264	*Pseudonaja nuchalis (Gwardar, Northern Brown Snake)*			
576.		*Pseudorhombus arsius*			
577.		*Pseudorhombus sp.*			
578.		*Pterapogon mirifica*			
579.		*Pterois volitans*			
580.	24172	*Pteropus alecto (Black Flying-fox)*			
581.	24173	*Pteropus scapulatus (Little Red Flying-fox)*			
582.		*Ptilonorhynchus guttatus*			
583.	24716	*Puffinus pacificus (Wedge-tailed Shearwater)*		IA	
584.	42344	*Purnella albifrons (White-fronted Honeyeater)*			
585.		*Quistrachia legendrei*			
586.		*Rastrelliger kanagurta*			
587.	24245	*Rattus rattus (Black Rat)*	Y		
588.	24246	*Rattus tunneyi (Pale Field-rat)*			
589.	24776	*Recurvirostra novaehollandiae (Red-necked Avocet)*			
590.		*Regimbartia attenuata*			
591.		*Repomucenus calcaratus*			
592.		*Rhagada angulata*			
593.		*Rhagada convicta*			
594.		*Rhagada dampierana*			
595.		*Rhagada minima*			
596.		*Rhagada perprima*			
597.		*Rheotanytarsus trivittatus*			
598.	48096	*Rhipidura albiscapa (Grey Fantail)*			
599.	25614	*Rhipidura leucophrys (Willie Wagtail)*			
600.	24457	*Rhipidura phasiana (Mangrove Grey Fantail)*			
601.		*Rhombognathus dispar*			Y
602.		*Rhombognathus ocularis*			Y

	Name ID	Species Name	Naturalised	Conservation Code	[1]Endemic To Query Area
603.		*Rhombognathus scutulatus*			
604.		*Salarias sexfilum*			
605.		*Scaptognathides hawaiiensis*			Y
606.		*Scaptognathides ornatus*			Y
607.		*Scatophagus argus*			
608.		*Scirtidae sp.*			
609.		*Scolecenchelys macroptera*			
610.		*Scolopendra laeta*			
611.		*Scolopendra morsitans*			
612.		*Scolopsis taenioptera*			
613.		*Secutor insidiator*			
614.		*Selaroides leptolepis*			
615.		*Sillago burrus*			
616.		*Sillago lutea*			
617.		*Simaetha tenuior*			
618.		*Simognathus platyaspis*			Y
619.		*Simognathus salebrosus*			Y
620.		*Simognathus tener*			Y
621.		*Simulium ornatipes*			
622.	30948	*Smicrornis brevirostris (Weebill)*			
623.	24116	*Sminthopsis macroura (Stripe-faced Dunnart)*			
624.		*Soleichthys heterorhinos*			
625.		*Sorsogona tuberculata*			
626.		*Sphyraena barracuda*			
627.		*Sphyraena sp.*			
628.		*Spratelloides delicatulus*			
629.	48114	*Stenella longirostris (Spinner Dolphin)*		P4	
630.	24521	*Sterna bengalensis (Lesser Crested Tern)*			
631.	25640	*Sterna dougallii (Roseate Tern)*		IA	
632.	25642	*Sterna hirundo (Common Tern)*		IA	
633.		*Sternolophus australis*			
634.	48593	*Sternula albifrons (Little Tern)*		IA	
635.	48594	*Sternula nereis (Fairy Tern)*			
636.		*Stethojulis interrupta*			
637.	24329	*Stictonetta naevosa (Freckled Duck)*			
638.	24482	*Stiltia isabella (Australian Pratincole)*			
639.		*Stratiomyidae sp.*			
640.	25589	*Streptopelia chinensis (Spotted Turtle-Dove)*	Y		
641.	24924	*Strophurus ciliaris subsp. aberrans*			
642.	24927	*Strophurus elderi*			
643.	24932	*Strophurus jeanae*			
644.	24949	*Strophurus wellingtonae*			
645.		*Suggrundus macracanthus*			
646.	25754	*Sula leucogaster (Brown Booby)*		IA	
647.		*Supunna picta*			
648.	25269	*Suta fasciata (Rosen's Snake)*			
649.	25307	*Suta punctata (Spotted Snake)*			
650.		*Synanceia horrida*			
651.		*Tabanidae sp.*			
652.	25705	*Tachybaptus novaehollandiae (Australasian Grebe, Black-throated Grebe)*			
653.	24207	*Tachyglossus aculeatus (Short-beaked Echidna)*			
654.	30870	*Taeniopygia guttata (Zebra Finch)*			
655.		*Tanytarsus sp. D (SAP)*			
656.	24175	*Taphozous georgianus (Common Sheath-tailed Bat)*			
657.		*Tasmanocoenis arcuata*			
658.		*Terapon jarbua*			
659.		*Testudinella patina*			
660.		*Thalasseus bengalensis*			
661.	48597	*Thalasseus bergii (Crested Tern)*		IA	
662.	24845	*Threskiornis spinicollis (Straw-necked Ibis)*			
663.	25202	*Tiliqua multifasciata (Central Blue-tongue)*			
664.	25548	*Todiramphus chloris (Collared Kingfisher)*			
665.	24306	*Todiramphus chloris subsp. pilbara (Pilbara Collared Kingfisher)*			
666.	42351	*Todiramphus pyrrhopygius (Red-backed Kingfisher)*			
667.	25549	*Todiramphus sanctus (Sacred Kingfisher)*			
668.	24309	*Todiramphus sanctus subsp. sanctus (Sacred Kingfisher)*			
669.		*Tramea stenoloba*			
670.		*Triacanthus sp.*			
671.	48141	*Tribonyx ventralis (Black-tailed Native-hen)*			
672.		*Trichocyclus nigropunctatus*			

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673.		*Trichonotus setiger*			
674.	24803	*Tringa brevipes (Grey-tailed Tattler)*		P4	
675.	24806	*Tringa glareola (Wood Sandpiper)*		IA	
676.	24808	*Tringa nebularia (Common Greenshank, greenshank)*		IA	
677.	24809	*Tringa stagnatilis (Marsh Sandpiper, little greenshank)*		IA	
678.	24851	*Turnix velox (Little Button-quail)*			
679.	30954	*Tursiops aduncus (Indo-Pacific Bottlenose Dolphin)*			
680.		*Tylosurus crocodilus*			
681.	30814	*Tympanocryptis cephalus (Pebble Dragon)*			
682.		*Tyto delicatula*			
683.		*Upeneus sulphureus*			
684.		*Urodacus armatus*			
685.		*Valamugil buchanani*			
686.		*Valamugil seheli*			
687.		*Valenciennea muralis*			
688.	25577	*Vanellus miles (Masked Lapwing)*			
689.	24386	*Vanellus tricolor (Banded Lapwing)*			
690.	25209	*Varanus acanthurus (Spiny-tailed Monitor)*			
691.	25210	*Varanus brevicauda (Short-tailed Pygmy Monitor)*			
692.	25212	*Varanus eremius (Pygmy Desert Monitor)*			
693.	25216	*Varanus giganteus (Perentie)*			
694.	25218	*Varanus gouldii (Bungarra or Sand Monitor)*			
695.	25524	*Varanus panoptes (Yellow-spotted Monitor)*			
696.	25223	*Varanus panoptes subsp. rubidus*			
697.	25224	*Varanus pilbarensis (Pilbara Rock Monitor, Northern Pilbara Rock Goanna)*			
698.	25526	*Varanus tristis (Racehorse Monitor)*			
699.	25227	*Varanus tristis subsp. tristis (Racehorse Monitor)*			
700.		*Venatrix arenaris*			
701.	24205	*Vespadelus finlaysoni (Finlayson's Cave Bat)*			
702.	24040	*Vulpes vulpes (Red Fox)*	Y		
703.		*Wesmaldra nixaut*			
704.		*Wydundra kennedy*			
705.		*Wydundra nixaut*			Y
706.	41351	*Xenus cinereus (Terek Sandpiper)*		IA	
707.		*Yirrkala sp.*			
708.		*Yongeichthys nebulosus*			
709.		*Zebrias quagga*			
710.		*Zenodorus orbiculatus*			
711.		*Zonocypretta kalimna*			
712.	24857	*Zosterops luteus (Yellow White-eye)*			
713.	24248	*Zyzomys argurus (Common Rock-rat)*			

Chromista

714.	35220	*Canistrocarpus cervicornis*			
715.	35910	*Canistrocarpus crispatus*			
716.	26694	*Colpomenia sinuosa*			
717.	26764	*Dictyopteris australis*			
718.	29954	*Dictyopteris woodwardia*			
719.	26775	*Dictyota ciliolata*			
720.	26778	*Dictyota furcellata*			
721.	26946	*Hormophysa cuneiformis*			
722.	26949	*Hydroclathrus clathratus*			
723.	27043	*Lobophora variegata*			
724.	27113	*Padina australis*			
725.	27115	*Padina boryana*			
726.	27116	*Padina elegans*			
727.	48304	*Padina tetrastromatica*			Y
728.	27245	*Sargassum ilicifolium*			
729.	27248	*Sargassum ligulatum*			
730.	27253	*Sargassum peronii*			
731.		*Sargassum siliquosum*			Y
732.	42785	*Sirophysalis trinodis*			
733.	27282	*Spatoglossum macrodontum*			
734.	27293	*Sphacelaria rigidula*			
735.	27321	*Stypopodium flabelliforme*			
736.	27345	*Turbinaria gracilis*			
737.		*Turbinaria mesenterina*			
738.	27346	*Turbinaria ornata*			
739.		*Turbinaria reniformis*			

Fungi

	Name ID	Species Name	Naturalised	Conservation Code	[1]Endemic To Query Area
740.	27576	*Acarospora nodulosa*			
741.	44918	*Caloplaca michelagoensis*			
742.		*Caloplaca sp.*			
743.	27715	*Diploschistes actinostomus*			
744.	27932	*Peltula bolanderi*			
745.		*Phellinus rimosus*			
746.	46616	*Triodiomyces altilis*			
747.	28194	*Xanthoria parietina*			
Plantae					
748.	4886	*Abutilon amplum*			
749.	9080	*Abutilon cunninghamii*			
750.	4891	*Abutilon fraseri (Lantern Bush)*			
751.	18120	*Abutilon fraseri subsp. fraseri*			
752.	4895	*Abutilon lepidum*			
753.	4899	*Abutilon malvifolium (Bastard Marshmallow)*			
754.	4902	*Abutilon oxycarpum (Flannel Weed)*			
755.	43020	*Abutilon oxycarpum subsp. Prostrate (A.A. Mitchell PRP 1266)*			
756.	3209	*Acacia ampliceps*			
757.	44580	*Acacia ampliceps x bivenosa*			
758.	44586	*Acacia ampliceps x sclerosperma subsp. sclerosperma*			
759.	3214	*Acacia ancistrocarpa (Fitzroy Wattle)*			
760.	3223	*Acacia arida*			
761.	3241	*Acacia bivenosa*			
762.	44588	*Acacia bivenosa x sclerosperma subsp. sclerosperma*			
763.	17013	*Acacia colei var. colei*			
764.	3270	*Acacia coriacea (Wirewood)*			
765.	13500	*Acacia coriacea subsp. coriacea*			
766.	13502	*Acacia coriacea subsp. pendens*			
767.	16174	*Acacia elachantha*			
768.	12673	*Acacia glaucocaesia*			
769.	3356	*Acacia gregorii (Gregory's Wattle)*			
770.	3372	*Acacia holosericea (Candelbra Wattle, Liringgin)*			
771.	3377	*Acacia inaequilatera (Baderi)*			
772.	3434	*Acacia maitlandii (Maitland's Wattle)*			
773.	3471	*Acacia orthocarpa (Needleleaf Wattle)*			
774.	3506	*Acacia pyrifolia (Ranji Bush, Kandji)*			
775.	29016	*Acacia pyrifolia var. morrisonii*			
776.	29015	*Acacia pyrifolia var. pyrifolia*			
777.	13078	*Acacia sclerosperma subsp. sclerosperma*			
778.	29135	*Acacia sericophylla*			
779.	3551	*Acacia sphaerostachya*			
780.	19456	*Acacia stellaticeps*			
781.	13070	*Acacia synchronicia*			
782.	3573	*Acacia tenuissima*			
783.	3579	*Acacia trachycarpa (Minni Ritchi, Balgali)*			
784.	3606	*Acacia xiphophylla*			
785.	26441	*Acanthophora spicifera*			
786.	48409	*Acetabularia caliculus*			
787.	2645	*Achyranthes aspera (Chaff Flower)*			
788.	172	*Acrachne racemosa*			
789.	4583	*Adriana tomentosa*			
790.	17422	*Adriana tomentosa var. tomentosa*			
791.	6486	*Aegialitis annulata (Club Mangrove)*			
792.	6478	*Aegiceras corniculatum (River Mangrove)*			
793.	2646	*Aerva javanica (Kapok Bush)*	Y		
794.	3680	*Aeschynomene indica (Budda Pea)*			
795.	3609	*Albizia lebbeck*			
796.	4739	*Alectryon oleifolius*			
797.	11487	*Alectryon oleifolius subsp. oleifolius*			
798.	2651	*Alternanthera nana (Hairy Joyweed)*			
799.	2652	*Alternanthera nodiflora (Common Joyweed)*			
800.	17147	*Alysicarpus muelleri*			
801.	20018	*Amaranthus undulatus*			
802.	5277	*Ammannia baccifera*			
803.	5278	*Ammannia multiflora*			
804.	26461	*Amphiroa foliacea*			
805.	26462	*Amphiroa fragilissima*			
806.	35872	*Anadyomene plicata*			
807.	7832	*Angianthus milnei (Cone-spike Angianthus)*			
808.	207	*Aristida contorta (Bunched Kerosene Grass)*			

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809.	215	*Aristida latifolia (Feathertop Wiregrass)*			
810.	217	*Aristida nitidula (Flat-awned Threeawn)*			
811.	226	*Arundo donax (Giant Reed)*	Y		
812.	6580	*Asclepias curassavica (Redhead Cottonbush)*	Y		
813.	26486	*Asparagopsis taxiformis*			
814.	36140	*Asteromenia exanimans*			
815.	229	*Astrebla pectinata (Barley Mitchell Grass)*			
816.	2450	*Atriplex amnicola (Swamp Saltbush)*			
817.	2451	*Atriplex bunburyana (Silver Saltbush)*			
818.	2453	*Atriplex codonocarpa (Flat-topped Saltbush)*			
819.	2463	*Atriplex isatidea (Coast Saltbush)*			
820.	2466	*Atriplex lindleyi*			
821.	2476	*Atriplex semilunaris (Annual Saltbush)*			
822.	6828	*Avicennia marina (White Mangrove)*			
823.	14555	*Avicennia marina subsp. marina*			
824.	26498	*Avrainvillea obscura*			
825.	7854	*Bidens bipinnata (Bipinnate Beggartick)*	Y		
826.	2769	*Boerhavia burbidgeana*			
827.	2770	*Boerhavia coccinea (Tar Vine, Wituka)*			
828.	8357	*Boerhavia diffusa*			
829.	2772	*Boerhavia gardneri*			
830.	2773	*Boerhavia paludosa*			
831.	2774	*Boerhavia repleta*			
832.	2775	*Boerhavia schomburgkiana*			
833.		*Boerhavia sp.*			
834.	11167	*Bonamia erecta*			
835.	6606	*Bonamia media*			
836.	6608	*Bonamia pannosa*			
837.	44782	*Bonamia pilbarensis*			
838.	6609	*Bonamia rosea (Felty Bellflower)*			
839.	26508	*Boodlea composita*			
840.	26509	*Bornetella oligospora*			
841.	26510	*Bornetella sphaerica*			
842.	26516	*Botryocladia leptopoda*			
843.	12716	*Brachychiton acuminatus*			
844.	2995	*Brassica x napus*	Y		
845.	4603	*Bridelia tomentosa*			
846.	5291	*Bruguiera exaristata (Ribbed Mangrove)*			
847.	750	*Bulbostylis barbata*			
848.	752	*Bulbostylis turbinata*			
849.	11055	*Cajanus cinereus*			
850.	10972	*Cajanus marmoratus*			
851.	11150	*Cajanus pubescens*			
852.	2864	*Calandrinia ptychosperma*			
853.	7905	*Calotis multicaulis (Many-stemmed Burr-daisy)*			
854.	3749	*Canavalia rosea (Wild Jack Bean)*			
855.	2981	*Capparis spinosa*			
856.	48291	*Capparis spinosa subsp. nummularia*			
857.	6567	*Carissa lanceolata (Conkerberry, Marnuwiji)*			
858.	2949	*Cassytha capillaris*			
859.	2950	*Cassytha filiformis (Love Vine, Jirawan)*			
860.	26554	*Caulerpa brachypus*			
861.	42620	*Caulerpa chemnitzia*			
862.	35158	*Caulerpa corynephora*			
863.	26559	*Caulerpa cupressoides*			
864.	47053	*Caulerpa cupressoides var. cupressoides*			
865.	47054	*Caulerpa cupressoides var. elegans*			
866.	27378	*Caulerpa cupressoides var. lycopodium*			
867.	36368	*Caulerpa cupressoides var. mamillosa*			
868.	44539	*Caulerpa cylindracea*			
869.	44547	*Caulerpa lamourouxii*			
870.	26568	*Caulerpa lentillifera*			
871.	26573	*Caulerpa racemosa*			
872.	35122	*Caulerpa racemosa var. racemosa*			
873.	26576	*Caulerpa serrulata*			
874.	26577	*Caulerpa sertularioides*			
875.	26579	*Caulerpa taxifolia*			
876.	26582	*Caulerpa verticillata*			
877.	258	*Cenchrus ciliaris (Buffel Grass)*	Y		
878.	259	*Cenchrus echinatus (Burrgrass)*	Y		

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879.	41568	*Cenchrus setaceus (Fountain Grass)*	Y		
880.	29721	*Cenchrus setiger (Birdwood Grass)*	Y		
881.	6539	*Centaurium erythraea (Common Centaury)*	Y		
882.	19762	*Centipeda minima subsp. macrocephala*			
883.	26606	*Ceratodictyon spongiosum*			
884.	39680	*Ceriops australis*			
885.	26612	*Chaetomorpha melagonium*			
886.	26619	*Champia stipitata*			
887.	33	*Cheilanthes contigua*			
888.	266	*Chloris barbata (Purpletop Chloris)*	Y		
889.	269	*Chloris pectinata (Comb Chloris)*			
890.	270	*Chloris pumilio*			
891.	33516	*Chrysocephalum gilesii*			
892.	273	*Chrysopogon fallax (Golden Beard Grass)*			
893.	2985	*Cleome oxalidea*			
894.	2988	*Cleome viscosa (Tickweed, Tjinduwadhu)*			
895.	6729	*Clerodendrum floribundum (Lollybush)*			
896.	6732	*Clerodendrum tomentosum*			
897.	13689	*Clerodendrum tomentosum var. lanceolatum*			
898.	3769	*Clitoria ternatea*	Y		
899.	35917	*Codium arabicum*			
900.	26673	*Codium geppiorum*			
901.		*Codium platyclados*			Y
902.	2778	*Codonocarpus cotinifolius (Native Poplar, Kundurangu)*			
903.	26686	*Coelarthrum opuntia*			
904.	1165	*Commelina ensifolia (Wandering Jew, Buargu)*			
905.	2776	*Commicarpus australis (Perennial Tar Vine)*			
906.	19880	*Convolvulus angustissimus*			
907.	6612	*Convolvulus clementii*			
908.	7939	*Conyza bonariensis (Flaxleaf Fleabane)*	Y		
909.	18411	*Corchorus congener*		P3	
910.	4857	*Corchorus elachocarpus*			
911.	17339	*Corchorus incanus*			
912.	25847	*Corchorus incanus subsp. incanus*			
913.	13659	*Corchorus laniflorus*			
914.	4862	*Corchorus parviflorus*			
915.	4865	*Corchorus tridens*			
916.	13467	*Corchorus trilocularis*			
917.	4867	*Corchorus walcottii (Woolly Corchorus)*			
918.	17093	*Corymbia hamersleyana*			
919.	17092	*Corymbia opaca*			
920.	19565	*Cressa australis*			
921.	3774	*Crotalaria cunninghamii (Green Birdflower, Bilbun)*			
922.	19378	*Crotalaria dissitiflora subsp. benthamiana*			
923.	20179	*Crotalaria medicaginea var. neglecta*			
924.	3785	*Crotalaria novae-hollandiae (New Holland Rattlepod)*			
925.	11231	*Crotalaria novae-hollandiae subsp. novae-hollandiae*			
926.	4809	*Cryptandra pungens*			
927.	41720	*Cucumis argenteus*			
928.	7371	*Cucumis melo (Ulcardo Melon)*			
929.	41721	*Cucumis variabilis*			
930.	17439	*Cullen lachnostachys*			
931.	17118	*Cullen leucanthum*			
932.	17119	*Cullen leucochaites*			
933.	17120	*Cullen pogonocarpum*			
934.	13733	*Cuscuta victoriana*			
935.	279	*Cymbopogon ambiguus (Scentgrass)*			
936.	280	*Cymbopogon bombycinus (Silky Oilgrass)*			
937.	6584	*Cynanchum floribundum (Dumara Bush, Tjipa)*			
938.	48280	*Cynanchum viminale subsp. australe*			
939.	46558	*Cynodon convergens*			
940.	46555	*Cynodon prostratus*			
941.	774	*Cyperus bifax (Downs Nutgrass)*			
942.	12801	*Cyperus blakeanus*			
943.	777	*Cyperus bulbosus (Bush Onion, Tjanmata)*			
944.	786	*Cyperus cunninghamii*			
945.	12811	*Cyperus cunninghamii subsp. cunninghamii*			
946.	798	*Cyperus iria*			
947.	804	*Cyperus nervulosus*			
948.	814	*Cyperus squarrosus*			

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949.	818	*Cyperus vaginatus (Stiffleaf Sedge)*			
950.	290	*Dactyloctenium radulans (Button Grass)*			
951.	26740	*Dasya frutescens*			
952.	6963	*Datura metel (Downy Thornapple)*	Y		
953.	7317	*Dentella asperata*			
954.	7318	*Dentella minutissima*			
955.	3852	*Desmodium campylocaulon*			
956.	3853	*Desmodium filiforme*			
957.	3856	*Desmodium muelleri*			
958.	303	*Dichanthium fecundum (Curly Bluegrass)*			
959.	13741	*Dichanthium sericeum subsp. humilius*			
960.	3612	*Dichrostachys spicata (Pied Piper Bush)*			
961.	7166	*Dicliptera armata*			
962.	26769	*Dictyosphaeria cavernosa*			
963.	26782	*Digenea simplex*			
964.	310	*Digitaria brownii (Cotton Panic Grass)*			
965.	313	*Digitaria ctenantha (Comb Finger Grass)*			
966.	4745	*Diplopeltis eriocarpa (Hairy Pepperflower)*			
967.	48738	*Distimake dissectus var. dissectus*	Y		
968.	4759	*Dodonaea coriacea*			
969.	48390	*Dolichandrone occidentalis*			
970.	2504	*Dysphania plantaginella*			
971.	2506	*Dysphania rhadinostachya*			
972.	11653	*Dysphania rhadinostachya subsp. inflata*			
973.	11890	*Dysphania rhadinostachya subsp. rhadinostachya*			
974.	32348	*Eccremidium arcuatum*			
975.	328	*Echinochloa colona (Awnless Barnyard Grass)*	Y		
976.	343	*Ectrosia leporina (Hare's-foot Grass)*			
977.	6682	*Ehretia saligna (False Cedar)*			
978.	14301	*Ehretia saligna var. saligna*			
979.	827	*Eleocharis geniculata*			
980.	2511	*Enchylaena tomentosa (Barrier Saltbush)*			
981.	12064	*Enchylaena tomentosa var. tomentosa (Barrier Saltbush)*			
982.	357	*Enneapogon caerulescens (Limestone Grass)*			
983.	360	*Enneapogon lindleyanus (Wiry Nineawn, Purple-head Nineawn)*			
984.	363	*Enneapogon pallidus (Conetop Nineawn)*			
985.	365	*Enneapogon polyphyllus (Leafy Nineawn)*			
986.	368	*Enteropogon ramosus (Windmill Grass, Curly Windmill Grass)*			
987.	378	*Eragrostis dielsii (Mallee Lovegrass)*			
988.	380	*Eragrostis eriopoda (Woollybutt Grass, Wangurnu)*			
989.	16731	*Eragrostis exigua*			
990.	381	*Eragrostis falcata (Sickle Lovegrass)*			
991.	38505	*Eragrostis surreyana*		P3	
992.	399	*Eragrostis xerophila (Knotty-butt Neverfail)*			
993.	7234	*Eremophila longifolia (Berrigan, Tulypurpa)*			
994.	16363	*Eremophila maculata subsp. brevifolia (Native Fuchsia)*			
995.	400	*Eriachne aristidea*			
996.	403	*Eriachne benthamii (Swamp Wanderrie)*			
997.	413	*Eriachne mucronata (Mountain Wanderrie Grass)*			
998.	414	*Eriachne obtusa (Northern Wandarrie Grass)*			
999.	417	*Eriachne pulchella (Pretty Wanderrie)*			
1000.	16485	*Eriachne pulchella subsp. dominii*			
1001.	16486	*Eriachne pulchella subsp. pulchella*			
1002.	421	*Eriachne tenuiculmis*			
1003.	425	*Eriochloa procera (Cupgrass)*			
1004.	4335	*Erodium cygnorum (Blue Heronsbill)*			
1005.	3871	*Erythrina vespertilio (Yulbah)*			
1006.	5714	*Eucalyptus microtheca (Coolibah)*			
1007.	5752	*Eucalyptus prominens*			
1008.	14548	*Eucalyptus victrix*			
1009.	11011	*Eulalia aurea*			
1010.	4617	*Euphorbia australis (Namana)*			
1011.	35307	*Euphorbia australis var. australis*			
1012.	35303	*Euphorbia australis var. subtomentosa*			
1013.	4619	*Euphorbia biconvexa*			
1014.	4620	*Euphorbia boophthona (Gascoyne Spurge)*			
1015.	9048	*Euphorbia careyi*			
1016.	4623	*Euphorbia coghlanii (Namana)*			
1017.	4626	*Euphorbia drummondii (Caustic Weed, Piwi)*			
1018.	4629	*Euphorbia hirta (Asthma Plant)*	Y		

	Name ID	Species Name	Naturalised	Conservation Code	[1]Endemic To Query Area
1019.	4635	*Euphorbia myrtoides*			
1020.	4647	*Euphorbia tannensis*			
1021.	12097	*Euphorbia tannensis subsp. eremophila (Desert Spurge)*			
1022.	42879	*Euphorbia trigonosperma*			
1023.	13281	*Euphorbia vaccaria*			
1024.	42876	*Euphorbia vaccaria var. vaccaria*			
1025.	6617	*Evolvulus alsinoides (Tropical Speedwell)*			
1026.	11200	*Evolvulus alsinoides var. villosicalyx*			
1027.	25811	*Ficus aculeata*			
1028.	31578	*Ficus aculeata var. indecora (Ranji)*			
1029.	19648	*Ficus brachypoda*			
1030.	1753	*Ficus platypoda (Native Fig, Makartu)*			
1031.	1759	*Ficus virens (Albayi)*			
1032.	12096	*Ficus virens var. virens*			
1033.	851	*Fimbristylis dichotoma (Eight Day Grass)*			
1034.	878	*Fimbristylis rara*			
1035.	35558	*Flaveria trinervia (Speedy Weed)*	Y		
1036.	4654	*Flueggea virosa*			
1037.	12013	*Flueggea virosa subsp. melanthesoides (Dogwood, Guwal)*			
1038.	5188	*Frankenia ambita*			
1039.	5209	*Frankenia pauciflora (Seaheath)*			
1040.	26835	*Galaxaura rugosa*			
1041.	26848	*Gelidium crinale*			
1042.	3938	*Glycine canescens (Silky Glycine)*			
1043.	2674	*Gomphrena affinis*			
1044.	18361	*Gomphrena affinis subsp. pilbarensis*			
1045.	2676	*Gomphrena canescens (Batchelors Buttons)*			
1046.	18363	*Gomphrena canescens subsp. canescens*			
1047.	2680	*Gomphrena cunninghamii*			
1048.	2682	*Gomphrena flaccida (Gomphrena Weed)*			
1049.	18367	*Gomphrena kanisii*			
1050.	11131	*Gomphrena sordida*			
1051.	31074	*Gomphrena sp. Martins Well (K.F. Kenneally 6116)*			Y
1052.	7509	*Goodenia forrestii*			
1053.	7515	*Goodenia heterochila*			
1054.	7521	*Goodenia lamprosperma*			
1055.	7526	*Goodenia microptera*			
1056.	12552	*Goodenia muelleriana*			
1057.	10982	*Goodenia stobbsiana*			
1058.	7556	*Goodenia tenuiloba*			
1059.	4910	*Gossypium australe (Native Cotton)*			
1060.	4913	*Gossypium hirsutum (Upland Cotton)*	Y		
1061.	26873	*Gracilaria salicornia*			
1062.	2079	*Grevillea pyramidalis (Caustic Bush, Tjungu)*			
1063.	19570	*Grevillea pyramidalis subsp. leucadendron*			
1064.	15975	*Grevillea pyramidalis subsp. pyramidalis*			
1065.	13440	*Grevillea wickhamii subsp. aprica*			
1066.	12832	*Gymnanthera cunninghamii*		P3	
1067.	2177	*Hakea lorea (Witinti)*			
1068.	19137	*Hakea lorea subsp. lorea*			
1069.	47313	*Halimeda borneensis*			
1070.	26891	*Halimeda cylindracea*			
1071.	26892	*Halimeda discoidea*			
1072.	26894	*Halimeda macroloba*			
1073.	47213	*Halimeda versatilis*			
1074.	131	*Halodule uninervis*			
1075.	162	*Halophila decipiens*			
1076.	163	*Halophila minor*			
1077.	164	*Halophila ovalis (Sea Wrack)*			
1078.	165	*Halophila spinulosa*			
1079.	37642	*Halymenia durvillei*			
1080.	37640	*Halymenia floresii*			
1081.	17301	*Heliotropium chrysocarpum*			
1082.	6704	*Heliotropium conocarpum*			
1083.	6706	*Heliotropium cunninghamii*			
1084.	6707	*Heliotropium curassavicum (Smooth Heliotrope)*			
1085.	6712	*Heliotropium heteranthum*			
1086.	17307	*Heliotropium inexplicitum*			
1087.	17315	*Heliotropium tanythrix*			
1088.	6718	*Heliotropium tenuifolium (Mamukata)*			

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1089.	26930	*Heterosiphonia crassipes*			
1090.	29316	*Hibiscus austrinus*			
1091.	29317	*Hibiscus austrinus var. austrinus*			
1092.	4923	*Hibiscus brachysiphonius*			
1093.	4925	*Hibiscus coatesii*			
1094.	4933	*Hibiscus leptocladus*			
1095.	4942	*Hibiscus sturtii (Sturt's Hibiscus)*			
1096.	5215	*Hybanthus aurantiacus*			
1097.	5219	*Hybanthus enneaspermus*			
1098.	14587	*Indigastrum parviflorum*			
1099.	3973	*Indigofera colutea (Sticky Indigo)*			
1100.	3980	*Indigofera linifolia*			
1101.	3981	*Indigofera linnaei (Birdsville Indigo)*			
1102.	3982	*Indigofera monophylla*			
1103.	3987	*Indigofera trita*			
1104.	6623	*Ipomoea coptica*			
1105.	6624	*Ipomoea costata (Rock Morning Glory, Kanti)*			
1106.	6631	*Ipomoea lonchophylla (Cowvine)*			
1107.	6633	*Ipomoea muelleri (Poison Morning Glory, Yumbu)*			
1108.	6635	*Ipomoea pes-caprae*			
1109.	11312	*Ipomoea pes-caprae subsp. brasiliensis*			
1110.	6637	*Ipomoea polymorpha*			
1111.	458	*Iseilema dolichotrichum*			
1112.	459	*Iseilema eremaeum*			
1113.	465	*Iseilema vaginiflorum (Red Flinders Grass)*			
1114.	8088	*Ixiochlamys cuneifolia*			
1115.	6501	*Jasminum didymum*			
1116.	12059	*Jasminum didymum subsp. lineare (Desert Jasmine)*			
1117.	8095	*Lactuca saligna (Wild Lettuce, Willow-leaf Lettuce)*	Y		
1118.	4960	*Lawrencia viridigrisea*			
1119.		*Lawsonia inermis*			
1120.	3035	*Lepidium pedicellosum*			
1121.	3038	*Lepidium pholidogynum*			
1122.	3613	*Leucaena leucocephala (Leucaena)*	Y		
1123.	27037	*Lithophyllum kotschyanum*			
1124.	4060	*Lotus australis (Austral Trefoil)*			
1125.	4061	*Lotus cruentus (Redflower Lotus)*			
1126.	2544	*Maireana georgei (Satiny Bluebush)*			
1127.	2556	*Maireana planifolia (Low Bluebush)*			
1128.	2564	*Maireana stipitata*			
1129.	11662	*Maireana tomentosa subsp. tomentosa*			
1130.	4962	*Malvastrum americanum (Spiked Malvastrum)*	Y		
1131.	27056	*Martensia elegans*			
1132.	5051	*Melhania oblongifolia*			
1133.	7082	*Mimulus gracilis*			
1134.	8109	*Minuria integerrima (Smooth Minuria)*			
1135.	8110	*Minuria leptophylla (Minnie Daisy)*			
1136.	6490	*Muellerolimon salicorniaceum*			
1137.	27079	*Mychodea carnosa*			
1138.	17158	*Myoporum montanum (Native Myrtle)*			
1139.	139	*Najas tenuifolia (Water Nymph)*			
1140.	2573	*Neobassia astrocarpa*			
1141.	44548	*Neomeris bilimbata*			
1142.	3614	*Neptunia dimorphantha (Sensitive Plant)*			
1143.	6971	*Nicotiana benthamiana (Tjuntiwari)*			
1144.	6976	*Nicotiana occidentalis (Native Tobacco)*			
1145.	11331	*Nicotiana occidentalis subsp. obliqua*			
1146.	11856	*Nicotiana occidentalis subsp. occidentalis*			
1147.	38421	*Notoleptopus decaisnei*			
1148.	38422	*Notoleptopus decaisnei var. decaisnei*			
1149.	7338	*Oldenlandia crouchiana*			
1150.	19640	*Oldenlandia sp. Hamersley Station (A.A. Mitchell PRP 1479)*		P3	
1151.	6651	*Operculina aequisepala*			
1152.	6652	*Operculina brownii (Potato Vine, Bara)*			
1153.	5227	*Opuntia stricta (Common Prickly Pear)*	Y		
1154.	36400	*Palisada perforata*			
1155.	503	*Panicum decompositum (Native Millet, Kaltu-kaltu)*			
1156.	504	*Panicum effusum (Hairy Panic Grass)*			
1157.	505	*Panicum laevinode*			
1158.	515	*Paraneurachne muelleri (Northern Mulga Grass)*			

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1159.	10975	*Paspalidium basicladum*			
1160.	518	*Paspalidium clementii (Clements Paspalidium)*			
1161.	523	*Paspalidium rarum (Rare Paspalidium)*			
1162.	525	*Paspalidium tabulatum*			
1163.	5226	*Passiflora foetida (Stinking Passion Flower)*	Y		
1164.	27121	*Penicillus nodulosus*			
1165.	13494	*Pentalepis trichodesmoides*			
1166.	42160	*Pentalepis trichodesmoides subsp. trichodesmoides*			
1167.	18462	*Peplidium sp. E Evol. Fl. Fauna Arid Aust. (A.S. Weston 12768)*			
1168.	3675	*Petalostylis labicheoides (Slender Petalostylis)*			
1169.	4673	*Phyllanthus amarus*	Y		
1170.	9056	*Phyllanthus baccatus*			
1171.	17626	*Phyllanthus erwinii*			
1172.	4680	*Phyllanthus maderaspatensis*			
1173.	20652	*Physalis angulata*	Y		
1174.	5230	*Pimelea ammocharis*			
1175.	41300	*Pittosporum phillyreoides (Weeping Pittosporum, Yaliti)*			
1176.	8167	*Pluchea dentex*			
1177.	17816	*Pluchea ferdinandi-muelleri*			
1178.	43944	*Pluchea longiseta*			
1179.	8168	*Pluchea rubelliflora*			
1180.	8170	*Pluchea tetranthera*			
1181.	6491	*Plumbago zeylanica (Native Plumbago)*			
1182.	2901	*Polycarpaea holtzei*			
1183.	2903	*Polycarpaea longiflora*			
1184.	41365	*Polygala glaucifolia*			
1185.	4572	*Polygala isingii*			
1186.	6653	*Polymeria ambigua (Morning Glory)*			
1187.	6655	*Polymeria calycina*			
1188.	17513	*Polymeria lanata*			
1189.		*Polymeria sp.*			
1190.		*Pomax Desert (A.S. George 11968)*			Y
1191.	2878	*Portulaca conspicua*			
1192.	2879	*Portulaca cyclophylla*			
1193.	43981	*Portulaca decipiens*			
1194.	2882	*Portulaca intraterranea*			
1195.	2884	*Portulaca oleracea (Purslane, Wakati)*			
1196.	8189	*Pseudognaphalium luteoalbum (Jersey Cudweed)*			
1197.		*Pterocaulon sp.*			
1198.	8192	*Pterocaulon sphacelatum (Apple Bush, Fruit Salad Plant)*			
1199.	8193	*Pterocaulon sphaeranthoides*			
1200.	2690	*Ptilotus aervoides*			
1201.	2696	*Ptilotus astrolasius*			
1202.	2698	*Ptilotus auriculifolius*			
1203.	2699	*Ptilotus axillaris (Mat Mulla Mulla)*			
1204.	2704	*Ptilotus calostachyus (Weeping Mulla Mulla)*			
1205.	2706	*Ptilotus carinatus*			
1206.	2711	*Ptilotus clementii (Tassel Top)*			
1207.	2717	*Ptilotus divaricatus (Climbing Mulla Mulla)*			
1208.	2721	*Ptilotus exaltatus (Tall Mulla Mulla)*			
1209.	2725	*Ptilotus fusiformis*			
1210.	2728	*Ptilotus gomphrenoides*			
1211.	2731	*Ptilotus helipteroides (Hairy Mulla Mulla)*			
1212.	2745	*Ptilotus murrayi*			
1213.	2746	*Ptilotus nobilis (Tall Mulla Mulla)*			
1214.	2747	*Ptilotus obovatus (Cotton Bush)*			
1215.	2751	*Ptilotus polystachyus (Prince of Wales Feather)*			
1216.	2766	*Ptilotus villosiflorus*			
1217.	2582	*Rhagodia eremaea (Thorny Saltbush)*			
1218.	2584	*Rhagodia preissii*			
1219.	11240	*Rhagodia preissii subsp. obovata*			
1220.	5295	*Rhizophora stylosa (Spotted-leaved Red Mangrove)*			
1221.	13301	*Rhodanthe floribunda*			
1222.	13246	*Rhodanthe humboldtiana*			
1223.	13310	*Rhodanthe margarethae*			
1224.	4190	*Rhynchosia australis (Rhynchosia)*			
1225.	20862	*Rhynchosia bungarensis*		P4	
1226.	4191	*Rhynchosia minima (Rhynchosia)*			
1227.		*Riccia albida*			
1228.	48900	*Roepera retivalvis*			

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1229.	2443	*Rumex vesicarius (Ruby Dock)*	Y		
1230.	30434	*Salsola australis*			
1231.	2357	*Santalum lanceolatum (Northern Sandalwood, Yarnguli)*			
1232.	12578	*Scaevola acacioides*			
1233.	12723	*Scaevola amblyanthera*			
1234.	7606	*Scaevola crassifolia (Thick-leaved Fan-flower)*			
1235.	7608	*Scaevola cunninghamii*			
1236.	7614	*Scaevola globulifera*			
1237.	7644	*Scaevola spinescens (Currant Bush, Maroon)*			
1238.	41660	*Schenkia australis*			
1239.	41646	*Schenkia clementii*			
1240.	16257	*Schoenoplectus subulatus*			
1241.	1010	*Schoenus punctatus*		P3	
1242.	2604	*Sclerolaena costata*			
1243.	2607	*Sclerolaena densiflora*			
1244.	2609	*Sclerolaena diacantha (Grey Copperburr)*			
1245.	8877	*Sclerolaena gardneri*			
1246.	2633	*Sclerolaena uniflora (Two-spined Saltbush)*			
1247.	27274	*Sebdenia flabellata*			
1248.	12279	*Senna artemisioides subsp. helmsii*			
1249.	12280	*Senna artemisioides subsp. oligophylla*			
1250.	18444	*Senna charlesiana*			
1251.	12303	*Senna costata*			
1252.	18443	*Senna ferraria*			
1253.	18346	*Senna glutinosa*			
1254.	12305	*Senna glutinosa subsp. chatelainiana*			
1255.	12307	*Senna glutinosa subsp. glutinosa*			
1256.	12309	*Senna glutinosa subsp. pruinosa*			
1257.	12308	*Senna glutinosa subsp. x luerssenii*			
1258.	18451	*Senna hamersleyensis*			
1259.	12312	*Senna notabilis*			
1260.	18450	*Senna symonii*			
1261.	12319	*Senna venusta*			
1262.	4196	*Sesbania cannabina (Sesbania Pea)*			
1263.	2818	*Sesuvium portulacastrum*			
1264.	606	*Setaria dielsii (Diels' Pigeon Grass)*			
1265.	613	*Setaria verticillata (Whorled Pigeon Grass)*	Y		
1266.		*Sida Excedentifolia (J.L. Egan 1925)*			
1267.	31758	*Sida arsiniata*			
1268.	4971	*Sida cardiophylla*			
1269.	4976	*Sida echinocarpa*			
1270.	4977	*Sida fibulifera (Silver Sida)*			
1271.	4988	*Sida rohlenae*			
1272.	33698	*Sida sp. Pilbara (A.A. Mitchell PRP 1543)*			
1273.	16617	*Sida sp. spiciform panicles (E. Leyland s.n. 14/8/90)*			
1274.	4989	*Sida spinosa (Spiny Sida)*			
1275.	6998	*Solanum cleistogamum*			
1276.	7002	*Solanum diversiflorum*			
1277.	7007	*Solanum esuriale (Quena)*			
1278.	7009	*Solanum gabrielae*			
1279.	7014	*Solanum horridum*			
1280.	7018	*Solanum lasiophyllum (Flannel Bush, Mindjulu)*			
1281.	7022	*Solanum nigrum (Black Berry Nightshade)*	Y		
1282.	7029	*Solanum phlomoides*			
1283.	7036	*Solanum sturtianum (Thargomindah Nightshade)*			
1284.	8231	*Sonchus oleraceus (Common Sowthistle)*	Y		
1285.	619	*Sorghum plumosum (Plume Canegrass)*			
1286.	12919	*Sorghum plumosum var. plumosum*			
1287.	622	*Sorghum timorense*			
1288.	625	*Spinifex longifolius (Beach Spinifex)*			
1289.	44523	*Spongophloea tissotii*			
1290.	629	*Sporobolus australasicus (Fairy Grass)*			
1291.	635	*Sporobolus virginicus (Marine Couch)*			
1292.	27310	*Spyridia filamentosa*			
1293.	4729	*Stackhousia clementii*		P3	
1294.	4731	*Stackhousia intermedia*			
1295.	19555	*Stackhousia muricata subsp. annual (W.R. Barker 2172)*			
1296.	7098	*Stemodia grossa (Marsh Stemodia, Mindjaara)*			
1297.	7099	*Stemodia kingii*			
1298.	8234	*Streptoglossa adscendens*			

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1299.	8235	*Streptoglossa bubakii*			
1300.	8236	*Streptoglossa cylindriceps*			
1301.	8237	*Streptoglossa decurrens*			
1302.	8238	*Streptoglossa liatroides*			
1303.	8240	*Streptoglossa odora*			
1304.	8241	*Streptoglossa tenuiflora*			
1305.	7729	*Stylidium fluminense*			
1306.	3182	*Stylobasium spathulatum (Pebble Bush)*			
1307.	12353	*Stylosanthes hamata (Verano Stylo)*	Y		
1308.	2638	*Suaeda arbusculoides*			
1309.	43203	*Surreya diandra*			
1310.	12356	*Swainsona formosa*			
1311.	4231	*Swainsona kingii*			
1312.	4233	*Swainsona leeana*			
1313.	4234	*Swainsona maccullochiana (Ashburton Pea)*			
1314.	4242	*Swainsona pterostylis*			
1315.	7363	*Synaptantha tillaeacea*			
1316.	13339	*Synaptantha tillaeacea var. tillaeacea*			
1317.	132	*Syringodium isoetifolium*			
1318.	31616	*Tecticornia auriculata*			
1319.	33236	*Tecticornia halocnemoides (Shrubby Samphire)*			
1320.	33240	*Tecticornia halocnemoides subsp. longispicata*			
1321.	33238	*Tecticornia halocnemoides subsp. tenuis*			
1322.	33317	*Tecticornia indica*			
1323.	33319	*Tecticornia indica subsp. bidens*			
1324.	33356	*Tecticornia indica subsp. indica*			
1325.	33357	*Tecticornia indica subsp. julacea*			
1326.	33318	*Tecticornia indica subsp. leiostachya (Samphire)*			
1327.	33299	*Tecticornia pergranulata subsp. elongata*			
1328.	31618	*Tecticornia pruinosa*			
1329.	33220	*Tecticornia pterygosperma subsp. denticulata*			
1330.		*Tephrosia Fortescue (A.A. Mitchell 606)*			Y
1331.	4263	*Tephrosia clementii*			
1332.	49016	*Tephrosia densa*			
1333.	4272	*Tephrosia leptoclada*			
1334.	4280	*Tephrosia rosea (Flinders River Poison, Bungoo'dah)*			
1335.	19531	*Tephrosia rosea var. clementii*			
1336.	15947	*Tephrosia sp. B Kimberley Flora (C.A. Gardner 7300)*			
1337.	17768	*Tephrosia sp. Bungaroo Creek (M.E. Trudgen 11601)*			
1338.	15949	*Tephrosia sp. D Kimberley Flora (R.D. Royce 1848)*			
1339.	42442	*Tephrosia sp. NW Eremaean (S. van Leeuwen et al. PBS 0356)*			
1340.	40060	*Tephrosia sp. clay soils (S. van Leeuwen et al. PBS 0273)*			
1341.	4285	*Tephrosia supina*			
1342.	5300	*Terminalia canescens (Joolal)*			
1343.	45698	*Terminalia circumalata*			
1344.	5310	*Terminalia platyphylla (Wild Plum, Durin)*			
1345.	5313	*Terminalia supranitifolia*		P3	
1346.	169	*Thalassia hemprichii*			
1347.	672	*Themeda avenacea (Native Oatgrass)*			
1348.	17820	*Themeda sp. Hamersley Station (M.E. Trudgen 11431)*		P3	
1349.	17819	*Themeda sp. Mt Barricade (M.E. Trudgen 2471)*			
1350.	673	*Themeda triandra*			
1351.	2644	*Threlkeldia diffusa (Coast Bonefruit)*			
1352.	2942	*Tinospora smilacina (Snakevine, Oondala)*			
1353.	27335	*Tolypiocladia calodictyon*			
1354.	27336	*Tolypiocladia glomerulata*			
1355.	6270	*Trachymene didiscoides*			
1356.	6273	*Trachymene glaucifolia (Wild Carrot)*			
1357.	6278	*Trachymene oleracea*			
1358.	19043	*Trachymene oleracea subsp. oleracea*			
1359.	2830	*Trianthema portulacastrum (Giant Pigweed)*	Y		
1360.	44362	*Trianthema triquetrum*			
1361.	44360	*Trianthema turgidifolium*			
1362.	4375	*Tribulus cistoides*			
1363.	4377	*Tribulus hirsutus*			
1364.	4379	*Tribulus macrocarpus*			
1365.	4380	*Tribulus occidentalis (Perennial Caltrop)*			
1366.	4381	*Tribulus platypterus (Cork Hopbush)*			
1367.	4383	*Tribulus terrestris (Caltrop)*	Y		
1368.	6727	*Trichodesma zeylanicum (Camel Bush, Kumbalin)*			

	Name ID	Species Name	Naturalised	Conservation Code	[1]Endemic To Query Area
1369.	11750	*Trichodesma zeylanicum var. zeylanicum*			
1370.	7381	*Trichosanthes cucumerina*			
1371.	12032	*Trichosanthes cucumerina var. cucumerina*			
1372.	8252	*Tridax procumbens (Tridax, Tridax Daisy)*	Y		
1373.	48201	*Trigastrotheca molluginea*			
1374.	679	*Triodia angusta*			
1375.	13131	*Triodia epactia*			
1376.	696	*Triodia pungens (Soft Spinifex)*			
1377.	704	*Triodia wiseana (Limestone Spinifex)*			
1378.	706	*Triraphis mollis (Needle Grass)*			
1379.	4873	*Triumfetta appendiculata*			
1380.	14694	*Triumfetta clementii*			
1381.	14942	*Triumfetta maconochieana*			
1382.	27348	*Udotea argentea*			
1383.	27349	*Udotea flabellum*			
1384.	35302	*Udotea glaucescens*			
1385.	30716	*Vachellia farnesiana (Mimosa Bush)*	Y		
1386.	27357	*Valoniopsis pachynema*			
1387.	7660	*Velleia glabrata (Pee the Bed)*			
1388.	4846	*Ventilago viminalis (Supplejack, Barndaragu)*			
1389.	4323	*Vigna lanceolata (Maloga Vigna, Wega)*			
1390.	31391	*Vigna sp. Hamersley Clay (A.A. Mitchell PRP 113)*			
1391.	46577	*Vigna triodiophila*		P3	
1392.	5106	*Waltheria indica*			
1393.	17910	*Washingtonia filifera*	Y		
1394.	725	*Whiteochloa airoides*			
1395.	728	*Whiteochloa cymbiformis*			
1396.	6578	*Wrightia saligna*			
1397.	729	*Xerochloa barbata (Rice Grass)*			
1398.	731	*Xerochloa laniflora (Rice Grass)*			
1399.	732	*Yakirra australiensis*			
1400.	2834	*Zaleya galericulata (Hogweed)*			
1401.	29095	*Zaleya galericulata subsp. galericulata*			
1402.	4326	*Zornia albiflora*			
1403.	12679	*Zornia muelleriana subsp. congesta*			

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 Agriculture, Water and the Environment

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. Please see the caveat for interpretation of information provided here.

Report created: 11-Nov-2021

Summary
Details
- Matters of NES
- Other Matters Protected by the EPBC Act
- Extra Information

Caveat
Acknowledgements

Summary

Matters of National Environment 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:	None
Wetlands of International Importance (Ramsar	None
Great Barrier Reef Marine Park:	None
Commonwealth Marine Area:	None
Listed Threatened Ecological Communities:	None
Listed Threatened Species:	13
Listed Migratory Species:	16

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

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 Lands:	1
Commonwealth Heritage Places:	None
Listed Marine Species:	21
Whales and Other Cetaceans:	None
Critical Habitats:	None
Commonwealth Reserves Terrestrial:	None
Australian Marine Parks:	None
Habitat Critical to the Survival of Marine Turtles:	None

Extra Information

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

State and Territory Reserves:	None
Regional Forest Agreements:	None
Nationally Important Wetlands:	None
EPBC Act Referrals:	2
Key Ecological Features (Marine):	None
Biologically Important Areas:	2
Bioregional Assessments:	None
Geological and Bioregional Assessments:	None

Details

Matters of National Environmental Significance

Listed Threatened Species			[Resource Information]
Status of Conservation Dependent and Extinct are not MNES under the EPBC Act. Number is the current name ID.			
Scientific Name	Threatened Category	Presence Text	Buffer Status
BIRD			
Calidris canutus Red Knot, Knot [855]	Endangered	Species or species habitat known to occur within area	In feature area
Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	Species or species habitat known to occur within area	In feature area
Charadrius leschenaultii Greater Sand Plover, Large Sand Plover [877]	Vulnerable	Species or species habitat likely to occur within area	In feature area
Falco hypoleucos Grey Falcon [929]	Vulnerable	Species or species habitat likely to occur within area	In feature area
Limosa lapponica menzbieri Northern Siberian Bar-tailed Godwit, Russkoye Bar-tailed Godwit [86432]	Critically Endangered	Species or species habitat known to occur within area	In feature area
Numenius madagascariensis Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat likely to occur within area	In feature area
Pezoporus occidentalis Night Parrot [59350]	Endangered	Species or species habitat may occur within area	In feature area
Rostratula australis Australian Painted Snipe [77037]	Endangered	Species or species habitat may occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Sternula nereis nereis			
Australian Fairy Tern [82950]	Vulnerable	Species or species habitat may occur within area	In feature area
MAMMAL			
Dasyurus hallucatus			
Northern Quoll, Digul [Gogo-Yimidir], Wijingadda [Dambimangari], Wiminji [Martu] [331]	Endangered	Species or species habitat known to occur within area	In feature area
Macroderma gigas			
Ghost Bat [174]	Vulnerable	Species or species habitat likely to occur within area	In feature area
Rhinonicteris aurantia (Pilbara form)			
Pilbara Leaf-nosed Bat [82790]	Vulnerable	Species or species habitat may occur within area	In feature area
REPTILE			
Liasis olivaceus barroni			
Olive Python (Pilbara subspecies) [66699]	Vulnerable	Species or species habitat likely to occur within area	In feature area

Listed Migratory Species			[Resource Information]
Scientific Name	Threatened Category	Presence Text	Buffer Status
Migratory Marine Birds			
Apus pacificus			
Fork-tailed Swift [678]		Species or species habitat likely to occur within area	In feature area
Sterna dougallii			
Roseate Tern [817]		Foraging, feeding or related behaviour likely to occur within area	In feature area
Migratory Terrestrial Species			
Hirundo rustica			
Barn Swallow [662]		Species or species habitat may occur within area	In feature area
Motacilla cinerea			
Grey Wagtail [642]		Species or species habitat may occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
[Motacilla flava](#) Yellow Wagtail [644]		Species or species habitat may occur within area	In feature area
Migratory Wetlands Species			
[Actitis hypoleucos](#) Common Sandpiper [59309]		Species or species habitat known to occur within area	In feature area
[Calidris acuminata](#) Sharp-tailed Sandpiper [874]		Species or species habitat likely to occur within area	In feature area
[Calidris canutus](#) Red Knot, Knot [855]	Endangered	Species or species habitat known to occur within area	In feature area
[Calidris ferruginea](#) Curlew Sandpiper [856]	Critically Endangered	Species or species habitat known to occur within area	In feature area
[Calidris melanotos](#) Pectoral Sandpiper [858]		Species or species habitat may occur within area	In feature area
[Charadrius leschenaultii](#) Greater Sand Plover, Large Sand Plover [877]	Vulnerable	Species or species habitat likely to occur within area	In feature area
[Charadrius veredus](#) Oriental Plover, Oriental Dotterel [882]		Species or species habitat may occur within area	In feature area
[Glareola maldivarum](#) Oriental Pratincole [840]		Species or species habitat may occur within area	In feature area
[Limosa lapponica](#) Bar-tailed Godwit [844]		Species or species habitat known to occur within area	In feature area
[Numenius madagascariensis](#) Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat likely to occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Tringa nebularia			
Common Greenshank, Greenshank [832]		Species or species habitat likely to occur within area	In feature area

Other Matters Protected by the EPBC Act

Commonwealth Lands [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.

Commonwealth Land Name	State	Buffer Status
Unknown		
Commonwealth Land - [51566]	WA	In buffer area only

Listed Marine Species [Resource Information]

Scientific Name	Threatened Category	Presence Text	Buffer Status
Bird			
Actitis hypoleucos			
Common Sandpiper [59309]		Species or species habitat known to occur within area	In feature area
Apus pacificus			
Fork-tailed Swift [678]		Species or species habitat likely to occur within area overfly marine area	In feature area
Bubulcus ibis as Ardea ibis			
Cattle Egret [66521]		Species or species habitat may occur within area overfly marine area	In feature area
Calidris acuminata			
Sharp-tailed Sandpiper [874]		Species or species habitat likely to occur within area	In feature area
Calidris canutus			
Red Knot, Knot [855]	Endangered	Species or species habitat known to occur within area overfly marine area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
[Calidris ferruginea](#) Curlew Sandpiper [856]	Critically Endangered	Species or species habitat known to occur within area overfly marine area	In feature area
[Calidris melanotos](#) Pectoral Sandpiper [858]		Species or species habitat may occur within area overfly marine area	In feature area
[Chalcites osculans as Chrysococcyx osculans](#) Black-eared Cuckoo [83425]		Species or species habitat likely to occur within area overfly marine area	In feature area
[Charadrius leschenaultii](#) Greater Sand Plover, Large Sand Plover [877]	Vulnerable	Species or species habitat likely to occur within area	In feature area
[Charadrius veredus](#) Oriental Plover, Oriental Dotterel [882]		Species or species habitat may occur within area overfly marine area	In feature area
[Glareola maldivarum](#) Oriental Pratincole [840]		Species or species habitat may occur within area overfly marine area	In feature area
[Haliaeetus leucogaster](#) White-bellied Sea-Eagle [943]		Species or species habitat known to occur within area	In feature area
[Hirundo rustica](#) Barn Swallow [662]		Species or species habitat may occur within area overfly marine area	In feature area
[Limosa lapponica](#) Bar-tailed Godwit [844]		Species or species habitat known to occur within area	In feature area
[Merops ornatus](#) Rainbow Bee-eater [670]		Species or species habitat may occur within area overfly marine area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Motacilla cinerea Grey Wagtail [642]		Species or species habitat may occur within area overfly marine area	In feature area
Motacilla flava Yellow Wagtail [644]		Species or species habitat may occur within area overfly marine area	In feature area
Numenius madagascariensis Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat likely to occur within area	In feature area
Rostratula australis as Rostratula benghalensis (sensu lato) Australian Painted Snipe [77037]	Endangered	Species or species habitat may occur within area overfly marine area	In feature area
Sterna dougallii Roseate Tern [817]		Foraging, feeding or related behaviour likely to occur within area	In feature area
Tringa nebularia Common Greenshank, Greenshank [832]		Species or species habitat likely to occur within area overfly marine area	In feature area

Extra Information

EPBC Act Referrals [Resource Information]

Title of referral	Reference	Referral Outcome	Assessment Status	Buffer Status
Not controlled action				
Improving rabbit biocontrol: releasing another strain of RHDV, sthrn two thirds of Australia	2015/7522	Not Controlled Action	Completed	In feature area
Not controlled action (particular manner)				
Algae Farm and Processing Facilities	2012/6596	Not Controlled Action (Particular Manner)	Post-Approval	In feature area

Biologically Important Areas

Scientific Name	Behaviour	Presence	Buffer Status
Seabirds			
Ardenna pacifica Wedge-tailed Shearwater [84292]	Breeding	Known to occur	In feature area
Sterna dougallii Roseate Tern [817]	Breeding	Known to occur	In feature area

Caveat

1 PURPOSE

This report is designed to assist in identifying the location of matters of national environmental significance (MNES) and other matters protected by the Environment Protection and Biodiversity Conservation Act 1999 (Cth) (EPBC Act) which may be relevant in determining obligations and requirements under the EPBC Act.

The report contains the mapped locations of:

- World and National Heritage properties;
- Wetlands of International and National Importance;
- Commonwealth and State/Territory reserves;
- distribution of listed threatened, migratory and marine species;
- listed threatened ecological communities; and
- other information that may be useful as an indicator of potential habitat value.

2 DISCLAIMER

This report is not intended to be exhaustive and should only be relied upon as a general guide as mapped data is not available for all species or ecological communities listed under the EPBC Act (see below). Persons seeking to use the information contained in this report to inform the referral of a proposed action under the EPBC Act should consider the limitations noted below and whether additional information is required to determine the existence and location of MNES and other protected matters.

Where data are available to inform the mapping of protected species, the presence type (e.g. known, likely or may occur) that can be determined from the data is indicated in general terms. It is the responsibility of any person using or relying on the information in this report to ensure that it is suitable for the circumstances of any proposed use. The Commonwealth cannot accept responsibility for the consequences of any use of the report or any part thereof. To the maximum extent allowed under governing law, the Commonwealth will not be liable for any loss or damage that may be occasioned directly or indirectly through the use of, or reliance

3 DATA SOURCES

Threatened ecological communities

For threatened ecological communities where the distribution is well known, maps are generated based on information contained in recovery plans, State vegetation maps and 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

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

Where little information is available for a 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 detailed distribution mapping methods are used to update these distributions

4 LIMITATIONS

The following species and ecological communities have not been mapped and do not appear in this report:

- threatened species listed as extinct or considered vagrants;
- some recently listed species and ecological communities;
- some listed migratory and listed marine species, which are not listed as threatened species; and
- migratory species that are very widespread, vagrant, or only occur in Australia in small numbers.

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

- listed migratory and/or listed marine seabirds, which are not listed as threatened, have only been mapped for recorded
- seals which have only been mapped for breeding sites near the Australian continent

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

Refer to the metadata for the feature group (using the Resource Information link) for the currency of the information.

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.

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Appendix D

Flora results

Flora species list

Flora species matrix

Quadrat data and photographs

Significant flora likelihood of occurrence assessment

Inventory of flora recorded in the survey area

Family	Taxon	Status
Aizoaceae	*Zaleya galericulata subsp. galericulata*	
Amaranthaceae	*Achyranthes aspera*	
Amaranthaceae	*Aerva javanica*	*
Amaranthaceae	*Alternanthera angustifolia*	
Amaranthaceae	*Alternanthera nodiflora*	
Amaranthaceae	*Ptilotus astrolasius*	
Amaranthaceae	*Ptilotus calostachyus*	
Amaranthaceae	*Ptilotus exaltatus*	
Amaranthaceae	*Ptilotus xerophilus*	
Apocynaceae	*Carissa lanceolata*	
Apocynaceae	*Cynanchum floribundum*	
Apocynaceae	*Cynanchum viminale*	
Asteraceae	*Pterocaulon sphaeranthoides*	
Asteraceae	*Streptoglossa sp.*	
Bignoniaceae	*Dolichandrone occidentalis*	
Boraginaceae	*Ehretia saligna*	
Boraginaceae	*Heliotropium chrysocarpum*	
Boraginaceae	*Heliotropium cunninghamii*	
Boraginaceae	*Trichodesma zeylanicum* var. *zeylanicum*	
Brassicaceae	*Lepidium oxytrichum*	
Capparaceae	*Capparis umbonata*	
Capparaceae	*Capparis spinosa* subsp. *nummularia*	
Chenopodiaceae	*Enchylaena tomentosa* var. *tomentosa*	
Chenopodiaceae	*Rhagodia preissii*	
Chenopodiaceae	*Salsola australis*	
Chenopodiaceae	*Sclerolaena bicornis* var. *bicornis*	
Chenopodiaceae	*Sclerolaena costata*	
Cleomaceae	*Arivela viscosa*	
Convolvulaceae	*Bonamia pilbarensis*	
Convolvulaceae	*Bonamia rosea*	
Convolvulaceae	*Evolvulus alsinoides* var. *villosicalyx*	
Convolvulaceae	*Ipomoea costata*	
Convolvulaceae	*Ipomoea muelleri*	
Convolvulaceae	*Operculina aequisepala*	
Cucurbitaceae	*Cucumis aff variabilis*	
Cucurbitaceae	*Cucumis variabilis*	
Euphorbiaceae	*Euphorbia biconvexa*	
Euphorbiaceae	*Euphorbia tannensis* subsp. *eremophila*	

Family	Taxon	Status
Fabaceae	*Acacia ancistrocarpa*	
Fabaceae	*Acacia bivenosa*	
Fabaceae	*Acacia colei*	
Fabaceae	*Acacia coriacea*	
Fabaceae	*Acacia elachantha*	
Fabaceae	*Acacia inaequilatera*	
Fabaceae	*Acacia maitlandii*	
Fabaceae	*Acacia pyrifolia* var. *pyrifolia*	
Fabaceae	*Acacia synchronicia*	
Fabaceae	*Acacia xiphophylla*	
Fabaceae	*Indigofera monophylla*	
Fabaceae	*Indigofera trita subsp. trita*	
Fabaceae	*Neptunia dimorphantha*	
Fabaceae	*Rhynchosia minima*	
Fabaceae	*Senna artemisioides* subsp. *helmsii*	
Fabaceae	*Senna artemisioides* subsp. *oligophylla*	
Fabaceae	*Senna glutinosa* subsp. *glutinosa*	
Fabaceae	*Senna glutinosa* subsp. ×*luerssenii*	
Fabaceae	*Senna glutinosa* subsp. *pruinosa*	
Fabaceae	*Senna hamersleyensis*	
Fabaceae	*Senna notabilis*	
Fabaceae	*Sesbania cannabina*	
Fabaceae	*Tephrosia* sp. NW Eremaean (S. van Leeuwen et al. PBS 0356)	
Fabaceae	*Vachellia farnesiana*	*
Fabaceae	*Vigna triodiophila*	
Goodeniaceae	*Goodenia microptera*	
Goodeniaceae	*Goodenia prostrata*	
Goodeniaceae	*Scaevola spinescens*	
Lamiaceae	*Clerodendrum floribundum*	
Lauraceae	*Cassytha filiformis*	
Malvaceae	*Abutilon aff lepidum*	
Malvaceae	*Abutilon amplum*	
Malvaceae	*Abutilon lepidum*	
Malvaceae	*Abutilon* sp.	
Malvaceae	*Corchorus trilocularis*	
Malvaceae	*Corchorus walcottii*	
Malvaceae	*Gossypium australe*	
Malvaceae	*Hibiscus coatesii*	
Malvaceae	*Hibiscus sturtii* var. *platychlamys*	

Family	Taxon	Status
Malvaceae	*Malvastrum americanum*	*
Malvaceae	*Sida* sp.	
Malvaceae	*Sida echinocarpa*	
Malvaceae	*Sida fibulifera*	
Malvaceae	*Triumfetta clementii*	
Molluginaceae	*Trigastrotheca molluginea*	
Myrtaceae	*Corymbia hamersleyana*	
Myrtaceae	*Eucalyptus victrix*	
Nyctaginaceae	*Boerhavia sp.*	
Nyctaginaceae	*Commicarpus australis*	
Oleaceae	*Jasminum didymum* subsp. *lineare*	
Passifloraceae	*Passiflora foetida*	*
Phyllanthaceae	*Phyllanthus maderaspatensis*	
Plantaginaceae	*Stemodia kingii*	
Plantaginaceae	*Stemodia viscosa*	
Poaceae	*Aristida sp.*	
Poaceae	*Aristida contorta*	
Poaceae	*Aristida holathera* Domin var. *holathera*	
Poaceae	*Aristida latifolia*	
Poaceae	*Cenchrus ciliaris*	*
Poaceae	*Chrysopogon fallax*	
Poaceae	*Cymbopogon ambiguus*	
Poaceae	*Cymbopogon obtectus*	
Poaceae	*Eragrostis sp.*	
Poaceae	*Eragrostis xerophila*	
Poaceae	*Eriachne benthamii*	
Poaceae	*Eriachne mucronata*	
Poaceae	*Eulalia aurea*	
Poaceae	*Panicum decompositum*	
Poaceae	*Panicum laevinode*	
Poaceae	Poaceae sp.	
Poaceae	*Themeda triandra*	
Poaceae	*Triodia epactia*	
Poaceae	*Triodia wiseana*	
Portulacaceae	*Portulaca sp.*	
Proteaceae	*Hakea chordophylla*	
Rubiaceae	*Dolichocarpa* sp. Hamersley Station	
Santalaceae	*Santalum lanceolatum*	
Sapindaceae	*Diplopeltis eriocarpa*	

Family	Taxon	Status
Scrophulariaceae	*Eremophila longifolia*	
Solanaceae	*Solanum diversiflorum*	
Solanaceae	*Solanum horridum*	
Solanaceae	*Solanum lasiophyllum*	
Violaceae	*Afrohybanthus aurantiacus*	

* denotes introduced (weed) species

Quadrat Number:	HPK01	**Type:**	50x50m Quadrat
Date:	**0**2/03/2022	**Described by:**	PJ/EL
MGA Zone: 50	**Easting:** 465968	**Northing: 7699478**	
Habitat:	Cracking Clay Grassland		
Soil Type:	Clay loam		
Soil Color:	Brown		
Rock Type:	Quartz		
Rock Abundancy:	0-10%		
Fire Age:	Over 5 Years		
Leaf Litter:	<2%		
Dead Logs/ Branches:	<2%		
Disturbance:	Cattle tracks		
Weeds:	<2		
Vegetation condition:	Very Good		
Vegetation description:	*Eragrostis xerophila*, *Aristida latifolia* with **Cenchrus ciliaris* tussock grassland		

Name	Cover %	Height (m)
Eragrostis xerophila	35	0.4
*Cenchrus ciliaris**	2	0.3
*Vachellia farnesiana**	.1	0.6
Sida fibulifera	.1	0.1
Aristida latifolia	.1	1
Ptilotus exaltatus	.1	0.6
Neptunia dimorphantha	.1	P
Heliotropium cunninghamii	.1	0.1
Commicarpus australis	.1	0.1
Stemodia kingii	.1	0.3
Senna artemisioides subsp. oligophylla	.1	0.1
Salsola australis	.1	0.5
Rhynchosia minima	.1	L
Operculina aequisepala	.1	L
Chrysopogon fallax	.1	0.8
Sclerolaena bicornis var. bicornis	.1	0.1

*Denotes weed species, L Denotes Liana P Denotes prostrate species

Quadrat Number: HPK02 **Type:** 50x50m Quadrat

Date: 3/03/2022 **Described by:** PJ/EL

MGA Zone: 50 **Easting:** 482180 **Northing:** 7703897

Habitat: Undulating rocky hills

Soil Type: Sandy Clay

Soil Color: Red Brown

Rock Type: Iron stones and Quartz

Rock Abundancy: 0-10%

Fire Age: Over 5 Years

Leaf Litter: 5-10%

Dead Logs/ Branches: 5-10%

Disturbance: Weeds

Weeds: <01

Vegetation condition: Excellent

Vegetation description: *Acacia inaequilatera* open shrubland over *Triodia epactia, Triodia wiseana* hummock grassland with *Chrysopogon fallax* scattered tussock grassland

Name	Cover %	Height (m)
Triodia epactia	30	0.7
Triodia wiseana	26	0.3
Acacia inaequilatera	5	2
Chrysopogon fallax	1	1
Ptilotus exaltatus	.1	0.4
Boerhavia sp	.1	0.1
*Cenchrus ciliaris**	.1	0.4
Salsola australis	.1	0.5
Rhynchosia minima	.1	L
Corchorus walcottii	.1	0.4
Salsola australis	.1	0.5
Eriachne mucronata	.1	0.3
Themeda triandra	.1	0.9
Solanum lasiophyllum	.1	0.5
Indigofera trita subsp. *trita*	.1	0.4
Trichodesma zeylanicum var. zeylanicum	.1	1
Acacia synchronicia	.1	1.5
Solanum horridum	.1	0.3
Heliotropium chrysocarpum	.1	0.2
Pterocaulon sphaeranthoides	.1	0.5
Streptoglossa sp	.1	0.3

*Denotes weed species, L Denotes Liana

Quadrat Number: HPK03 **Type:** 50x50m Quadrat

Date: 3/01/2022 **Described by:** PJ/EL

MGA Zone: 50 **Easting:** 480771 **Northing:** 7703258

Habitat: Claypan

Soil Type: 50% Sandy Clay and 50% heavy Clay

Soil Color: Red Brown

Rock Type: Quartz

Rock Abundancy: 40-50%

Fire Age: Over 5 Years

Leaf Litter: 0-10%

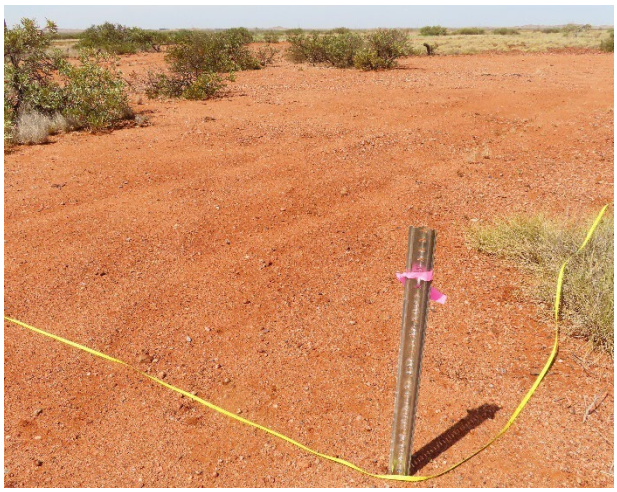
Dead Logs/ Branches: <2%

Disturbance: Weeds

Weeds: <01

Vegetation condition: Very Good

Vegetation description *Acacia xiphophylla*, open shrubland over *Triodia wiseana* very open hummock grassland with *Eragrostis xerophila open tussock* grassland



Name	Cover %	Height (m)
Acacia xiphophylla	4	1.8
Triodia wiseana	2	0.5
Eragrostis xerophila	12	0.2
*Cenchrus ciliaris**	5	0.3
Rhynchosia minima	1	L
Chrysopogon fallax	.1	0.8
Triodia epactia	.1	0.5
Indigofera trita subsp. trita	.1	0.3
Solanum horridum	.1	0.2
Streptoglossa sp	.1	0.3
Aristida contorta	.1	0.3
Enchylaena tomentosa var. tomentosa	.1	0.4
Ptilotus exaltatus	.1	0.3
Heliotropium cunninghamii	.1	0.2
Senna hamersleyensis	.1	0.2
Sclerolaena costata	.1	0.3
Sida fibulifera	.1	0.2
Aristida latifolia	.1	0.8
Rhagodia preissii	.1	1.5
Pterocaulon sphaeranthoides	.1	0.3
Salsola australis	.1	0.3

*Denotes weed species, L Denotes Liana

Quadrat Number: HPK04 **Size:** 50x50m

Date: 3/03/2022 **Described by:** PJ/EL

MGA Zone: 50 **Easting:** 479033 **Northing:** 7702399

Habitat: Plain

Soil Type: Sandy Clay

Soil Color: Orange Brown

Rock Type: Iron and Quartz

Rock Abundancy: 25%

Fire Age: Over 5 Years

Leaf Litter: 10%

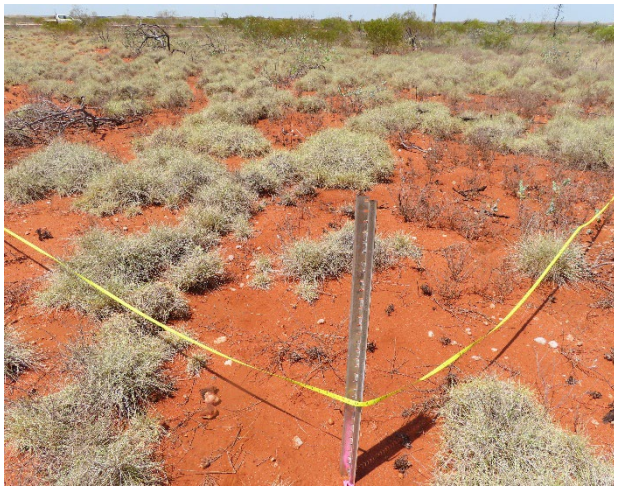
Dead Logs/ Branches: 5%

Disturbance: Power line, and tracks

Weeds: <01

Vegetation condition: Very Good

Vegetation description: *Acacia ancistrocarpa*, shrubland with mix species of *Acacia bivenosa* and *Acacia inaequilatera* open shrubland *over Triodia wiseana* and *Triodia ep*actia open Hummock grassland



Name	Cover %	Height (m)
Acacia ancistrocarpa	15	1.8.
Triodia wiseana	15	0.5
Triodia epactia	5	0.5
Acacia bivenosa	3	1.7
Acacia inaequilatera	2	2
Diplopeltis eriocarpa	.1	0.4
Indigofera monophylla	.1	0.3
Ptilotus astrolasius	.1	0.3
Corchorus walcottii	.1	0.2
Senna glutinosa subsp. glutinosa	.1	1
Ptilotus astrolasius	.1	0.1
Hakea chordophylla	.1	0.2
Hibiscus sturtii var. platychlamys	.1	0.3
Afrohybanthus aurantiacus	.1	0.3
Senna artemisioides subsp. oligophylla	.1	0.4
Aristida contorta	.1	0.2
Tephrosia sp. NW Eremaean (S. van Leeuwen et al. PBS 0356)	.1	0.2
Cassytha filiformis	.1	L
Bonamia rosea	.1	1.5
*Cenchrus ciliaris**	.1	0.3
Gossypium australe	.1	0.3
Eremophila longifolia	.1	0.9
Evolvulus alsinoides var. villosicalyx	.1	0.1

*Denotes weed species, L Denotes Liana

Quadrat Number: HPK05 **Type:** 100x25m Quadrat

Date: 3/01/2022 **Described by:** PJ/EL

MGA Zone: 50 **Easting:** 478050 **Northing:** 7701946

Habitat: Creek line

Soil Type: Sandy Clay

Soil Color: Orange Brown

Rock Type: Iron and Quartz

Rock Abundancy: 10%

Fire Age: Over 5 Years

Leaf Litter: 90%

Dead Logs/ Branches: 10%

Disturbance: Weeds, Tracks

Weeds: 40%

Vegetation condition: Good

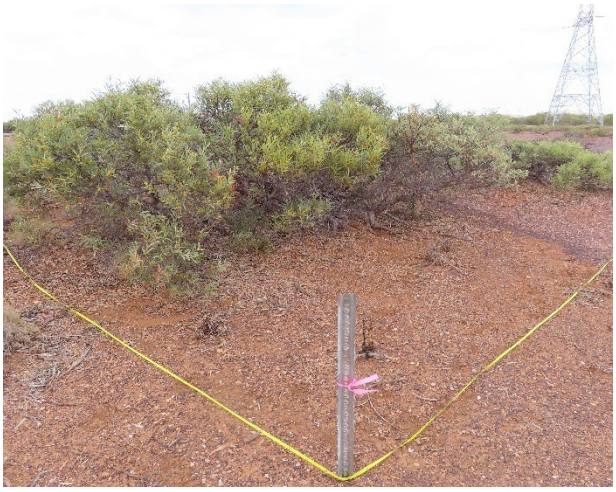
Vegetation description *Eucalyptus victrix* low open forest over *Acacia coriacea* tall shrubland over *Carissa lanceolata* open shrubland over *Cenchrus ciliaris* tussock grassland

Name	Cover %	Height (m)
Eucalyptus victrix	40	7
*Cenchrus ciliaris**	40	0.6
Acacia coriacea	15	2.5
Carissa lanceolata	5	2.2
Chrysopogon fallax	3	1
Themeda triandra	3	0.9
Jasminum didymum subsp. *lineare*	.1	1
*Malvastrum Americanum**	.1	0.4
Triodia epactia	.1	0.6
Senna glutinosa subsp. glutinosa	.1	.06
Hakea chordophylla	.1	1.9
Senna glutinosa subsp. *glutinosa*	.1	1
Acacia pyrifolia var. *pyrifolia*	.1	1.1
Acacia ancistrocarpa	.1	1
*Passiflora foetida**	.1	L
Senna notabilis	.1	0.3
Vachellia farnesiana	.1	1.4
Acacia bivenosa	.1	1.2
Cynanchum floribundum	.1	L
Hibiscus sturtii var. *platychlamys*	.1	0.1
Eriachne benthamii	.1	0.4
Neptunia dimorphantha	.1	P
Phyllanthus maderaspatensis	.1	0.3
Sesbania cannabina	.1	1.6
Achyranthes aspera	.1	1.6
Alternanthera angustifolia	.1	0.2
Panicum decompositum	.1	0.6
Scaevola spinescens	.1	0.8
Bonamia rosea	.1	0.1

Gossypium australe	.1	0.1
Acacia inaequilatera	.1	1.6
Ptilotus exaltatus	.1	0.6
Eremophila longifolia	.1	0.8
Sida echinocarpa	.1	0.5
Solanum horridum	.1	0.5
Solanum diversiflorum	.1	0.3
Trichodesma zeylanicum var. *zeylanicum*	.1	0.7
Corymbia hamersleyana	.1	2
Evolvulus alsinoides var. *villosicalyx*	.1	0.1
Eragrostis xerophila	.1	0.2

*Denotes weed species, L Denotes Liana P Denotes prostrate species

Quadrat Number:	HPK06	**Type:**	50x50m Quadrat
Date:	3/01/2022	**Described by:**	PJ/EL
MGA Zone: 50	**Easting:** 477159	**Northing:**	7701398
Habitat:	Plain		
Soil Type:	Cracking Clay, Sandy Clay		
Soil Color:	Orange Brown		
Rock Type:	Iron and Quartz		
Rock Abundancy:	95%		
Fire Age:	Over 5 Years		
Leaf Litter:	5%		
Dead Logs/ Branches:	5%		
Disturbance:	Camp fire. Weeds, Tracks		
Weeds:	<01		
Vegetation condition:	Very Good		
Vegetation description:	*Acacia xiphophylla* shrubland over *Eragrostis xerophila* very open tussock grassland		



Name	Cover %	Height (m)
Acacia xiphophylla	30	1.8
Eragrostis xerophila	5	0.4
Chrysopogon fallax	1	1
*Cenchrus ciliaris**	.1	0.4
Chrysopogon fallax	.1	0.4
Ptilotus exaltatus	.1	0.3
Salsola australis	.1	0.6
Enchylaena tomentosa var. *tomentosa*	.1	0.2
Sida fibulifera	.1	0.7
Triodia wiseana	.1	0.1
Lepidium oxytrichum	.1	0.2

*Denotes weed species

Quadrat Number: HPK07 **Type:** 100x25m Quadrat

Date: 3/01/2022 **Described by:** PJ/EL

MGA Zone: 50 **Easting:** 477296 **Northing:** 7701464

Habitat: Creek line

Soil Type: Sandy Clay

Soil Color: Orange Brown

Rock Type: Iron and Quartz

Rock Abundancy: 1%

Fire Age: Over 5 Years

Leaf Litter: 70%

Dead Logs/ Branches: 10%

Disturbance: Camp fire. Weeds, Tracks

Weeds: <01

Vegetation condition: Very Good

Vegetation description *Corymbia hamersleyana low open forest tall trees over Acacia coriacea* tall shrubland over *Carissa lanceolata shrubland over Cenchrus ciliaris and Chrysopogon fallax* tussock grassland

Name	Cover %	Height (m)
Corymbia hamersleyana	50	5
*Cenchrus ciliaris**	35	0.6
Acacia coriacea	20	3
Carissa lanceolata	20	2
Chrysopogon fallax	20	1
Themeda triandra	3	0.9
Acacia pyrifolia var. *pyrifolia*	1	1.5
Corchorus walcottii	1	0.7
Senna artemisioides subsp. *oligophylla*	.1	0.6
Capparis umbonata	.1	2.2
Acacia bivenosa	.1	0.3
Cucumis variabilis	.1	L
Eremophila longifolia	.1	1
Trichodesma zeylanicum var. *zeylanicum*	.1	1.5
Bonamia rosea	.1	0.1
Gossypium australe	.1	0.2
*Vachellia farnesiana**	.1	1.8
*Malvastrum Americanum**	.1	0.9
Rhynchosia minima	.1	L
Capparis spinosa subsp. *nummularia*	.1	0.4
Themeda triandra	.1	1.3
Abutilon amplum	.1	1
Acacia colei	.1	1.6
Sesbania cannabina	.1	0.2
Enchylaena tomentosa . var. *tomentosa*	.1	0.8
Santalum lanceolatum	.1	2

*Denotes weed species, , L Denotes Liana

Quadrat Number: HPK08 **Type:** 50x50m Quadrat

Date: 2/03/2022 **Described by:** PJ/EL

MGA Zone: 50 **Easting:** 478266 **Northing:** 7702025

Habitat: Plain with cracking clay patches

Soil Type: Sandy Clay , Cracking clay

Soil Color: Orange Brown

Rock Type: Iron and Quartz

Rock Abundancy: 10%

Fire Age: Over 5 Years

Leaf Litter: 25%

Dead Logs/ Branches: 5%

Disturbance: Camp fire. Weeds, Tracks

Weeds: <01

Vegetation condition: Very Good

Vegetation description *Acacia xiphophylla shrubland over Triodia epactia open hummock grassland with Themeda triandra very open tussock grassland*

Name	Cover %	Height (m)
Acacia xiphophylla	30	2.3
Triodia epactia	20	0.9
Themeda triandra	5	1
Eragrostis xerophila	.1	0.3
Chrysopogon fallax	.1	0.3
Scaevola spinescens	.1	0.9
Ptilotus exaltatus	.1	0.3
Aristida latifolia	.1	0.7
Enchylaena tomentosa R.Br. var. *tomentosa*	.1	0.8
Rhagodia preissii	.1	1.2
Eremophila longifolia	.1	2
Aristida contorta	.1	0.7
Sclerolaena costata	.1	0.2
Corchorus walcottii	.1	0.2
Senna artemisioides subsp. *helmsii*	.1	1
Solanum horridum	.1	0.2
Ptilotus astrolasius	.1	0.2
*Cenchrus ciliaris**	.1	0.8
Evolvulus alsinoides var. *villosicalyx*	.1	0.2
Acacia bivenosa	.1	1.1.
Corchorus walcottii	.1	0.2
Acacia inaequilatera	.1	1.5
Acacia ancistrocarpa	.1	1.8
Trichodesma zeylanicum var. *zeylanicum*	.1	1
Pterocaulon sphaeranthoides	.1	0.6
Corchorus walcottii	.1	0.8
Sida fibulifera	.1	0.1
Abutilon aff lepidum	.1	0.4

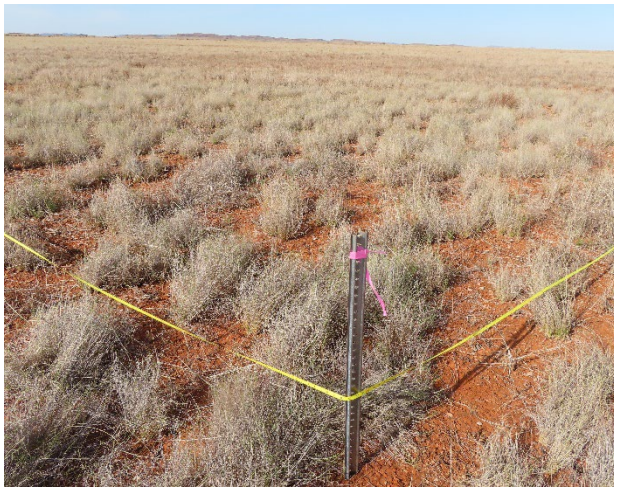
*Denotes weed species

Quadrat Number: HPK09 **Type:** 50x50m Quadrat

Date: 3/01/2022 **Described by:** PJ/EL

MGA Zone: 50 **Easting:** 466908 **Northing:** 7699700

Habitat:	Cracking clay grassland
Soil Type:	Clay Loam , Cracking clay
Soil Color:	Orange Brown
Rock Type:	Iron and Quartz
Rock Abundancy:	10%
Fire Age:	Over 5 Years
Leaf Litter:	30%
Dead Logs/ Branches:	1%
Disturbance:	Weeds, Tracks
Weeds:	<01
Vegetation condition:	Very Good
Vegetation description	*Eragrostis xerophila tussock grassland*



Name	Cover %	Height (m)
Eragrostis xerophila	35	0.4
*Cenchrus ciliaris**	.1	0.4
Stemodia kingii	.1	0.3
Neptunia dimorphantha	.1	P
Sida fibulifera	.1	0.2
Salsola australis	.1	0.3
Indigofera trita subsp. *trita*	.1	0.2
Ptilotus exaltatus	.1	0.6
Aristida latifolia	.1	0.6
Boerhavia sp	.1	0.1
Heliotropium cunninghamii	.1	0.1

*Denotes weed species

Quadrat Number: HPK10 **Type:** 100x25m Quadrat

Date: 3/01/2022 **Described by:** PJ/EL

MGA Zone: 50 **Easting:** 467306 **Northing:** 7699805

Habitat: Creek line

Soil Type: Sandy Clay Loam**,**

Soil Color: Orange Brown

Rock Type: Iron and Quartz, sandstone outcrops and small boulders

Rock Abundancy: 20%

Fire Age: Over 5 Years

Leaf Litter: 2%

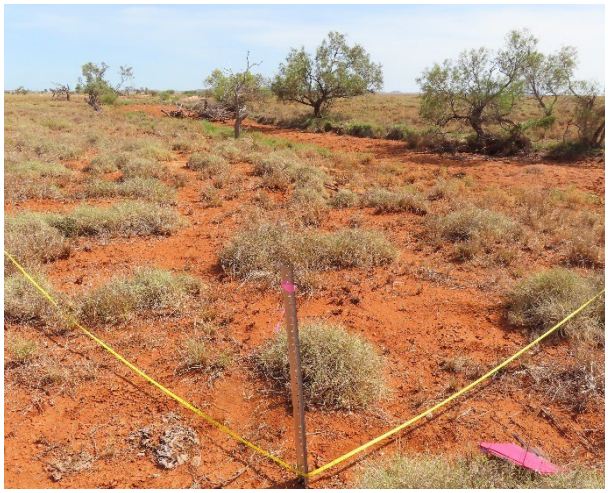
Dead Logs/ Branches: 3%

Disturbance: Camp fire. Weeds, Tracks

Weeds: 20%

Vegetation condition: Good

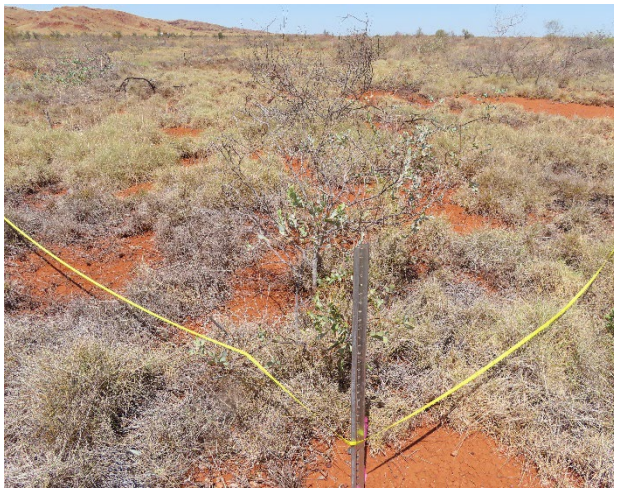
Vegetation description: *Acacia coriacea tall shrubs over Vachellia farnesiana low shrubs over Cenchrus ciliaris tussock grassland*

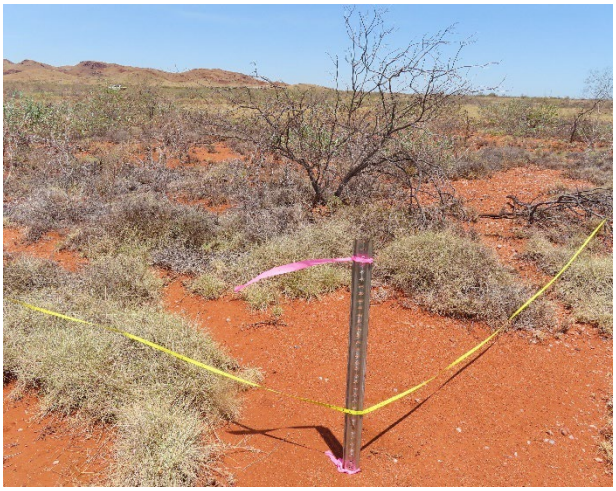


Name	Cover %	Height (m)
Acacia coriacea	10	5
*Cenchrus ciliaris**	20	9
*Vachellia farnesiana**	1	1.9
Stemodia kingii	.1	0.4
Ipomoea muelleri	.1	L
Solanum diversiflorum	.1	0.2
Bonamia pilbarensis	.1	0.2
Cucumis variabilis	.1	L
Rhynchosia minima	.1	L
Pterocaulon sphaeranthoides	.1	0.7
Eragrostis sp	.1	0.4
Salsola australis	.1	0.4
Chrysopogon fallax	.1	1
Clerodendrum floribundum	.1	0.3
Malvastrum americanum	.1	0.6
Evolvulus alsinoides var. *villosicalyx*	.1	0.1
Sesbania cannabina	.1	0.1
oerhavia	.1	0.1
Alternanthera nodiflora	.1	0.1
Triodia wiseana	.1	0.6
Euphorbia biconvexa	.1	0.1
Operculina aequisepala	.1	L
Portulaca sp	.1	P

*Denotes weed species, L Denotes Liana P Denotes prostrate species

Quadrat Number:	HPK11	**Type:**	50x50m Quadrat
Date:	3/03/2022	**Described by:**	PJ/EL
MGA Zone: 50	**Easting:** 474078	**Northing:**	7701055
Habitat:	Plain		
Soil Type:	Clay Loam		
Soil Color:	Orange Brown		
Rock Type:	Iron and Quartz, sandstone outcrops and small boulders		
Rock Abundancy:	10%		
Fire Age:	Over 5 Years		
Leaf Litter:	5%		
Dead Logs/ Branches:	2%		
Disturbance:	Camp fire. Weeds, Tracks		
Weeds:	<01		
Vegetation condition:	Very Good		
Vegetation description:	*Acacia bivenosa* open shrubland over *Triodia wiseana* open hummock grassland		





Name	Cover %	Height (m)
Triodia wiseana	30	0.6
Acacia bivenosa	7	1.6
Acacia pyrifolia . var. *pyrifolia*	.1	1.7
*Cenchrus ciliaris**	.1	0.1
Afrohybanthus aurantiacus	.1	0.3
Acacia coriacea	.1	0.4
Cassytha filiformis	.1	L
Indigofera monophylla	.1	0.3
Ptilotus exaltatus	.1	0.3
Senna glutinosa subsp. *pruinosa*	.1	1.8
Bonamia pilbarensis	.1	L
Solanum diversiflorum	.1	0.4
Evolvulus alsinoides var. *villosicalyx1*	.1	0.1
Indigofera trita L.f. subsp. *trita*	.1	0.3
Trichodesma zeylanicum var. *zeylanicum*	.1	1.6
Heliotropium chrysocarpum	.1	0.2
Pterocaulon sphaeranthoides	.1	0.8
Aristida holathera Domin var. *holathera*	.1	0.4
Solanum horridum	.1	0.5
Cucumis variabilis	.1	L
Salsola australis	.1	0.6
Triumfetta clementii	.1	0.6
Abutilon sp.	.1	0.3
Aristida contorta	.1	0.2
Sclerolaena costata	.1	0.3
Senna glutinosa subsp. *glutinosa*	.1	1.6
Corchorus walcottii	.1	0.6

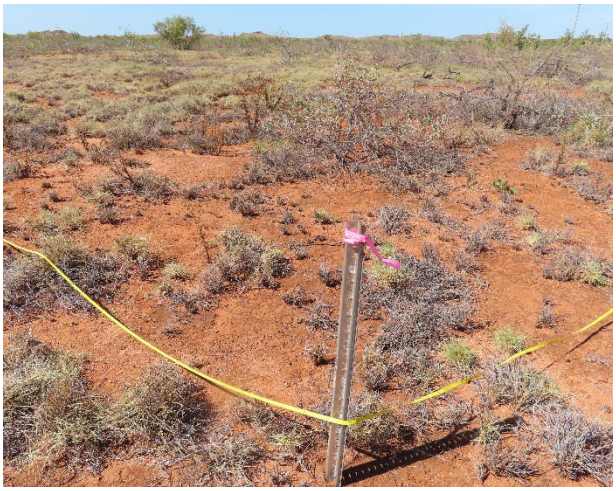
*Denotes weed species, L Denotes Liana

Quadrat Number:	HPK12	**Type:**	50x50m Quadrat
Date:	3/03/2022	**Described by:**	PJ/EL
MGA Zone: 50	**Easting:** 474788	**Northing:**	7701145
Habitat:	Plain		
Soil Type:	Clay Loam		
Soil Color:	Orange Brown		
Rock Type:	Iron and Quartz, sandstone outcrops and small boulders		
Rock Abundancy:	10%		
Fire Age:	Over 5 Years		
Leaf Litter:	5%		
Dead Logs/ Branches:	2%		
Disturbance:	Camp fire. Weeds, Tracks		
Weeds:	<01		
Vegetation condition:	Excellent		
Vegetation description:	*Acacia bivenosa* Open shrubland over *Triodia wiseana* tussock grassland		

Name	Cover %	Height (m)
Triodia wiseana	30	.4
Acacia bivenosa	10	1.6
Corchorus walcottii	.1	0.4
Cassytha filiformis	.1	L
Trichodesma zeylanicum var. *zeylanicum*	.1	1.4
Ptilotus exaltatus	.1	0.6
Senna glutinosa subsp. ×*luerssenii*	.1	1.3
Solanum horridum	.1	0.3
Afrohybanthus aurantiacus	.1	0.5
Senna glutinosa subsp. *glutinosa*	.1	1
Heliotropium chrysocarpum	.1	0.2
Corchorus walcottii	.1	0.4
Abutilon sp	.1	0.3
Senna notabilis	.1	0.5
Cymbopogon obtectus	.1	0.8
Goodenia microptera	.1	0.1
Triumfetta clementii	.1	0.3
Ptilotus astrolasius	.1	0.4
Pterocaulon sphaeranthoides	.1	0.7
Indigofera monophylla	.1	0.5
Hibiscus sturtii var. *platychlamys*	.1	0.3
Salsola australis	.1	0.4
Cucumis aff variabilis	.1	L

L Denotes Liana

Quadrat Number:	HPK13	**Type:**	50x50m Quadrat
Date:	3/03/2022	**Described by:**	PJ/EL
MGA Zone: 50	**Easting:** 477659	**Northing:**	7701727
Habitat:	Plain		
Soil Type:	Sandy Clay Loam		
Soil Color:	Orange Brown		
Rock Type:	Iron and Quartz,		
Rock Abundancy:	10%		
Fire Age:	Over 5 Years		
Leaf Litter:	5%		
Dead Logs/ Branches:	10%		
Disturbance:	Camp fire. Weeds, Tracks		
Weeds:	<01		
Vegetation condition:	Very Good		
Vegetation description; *grassland*	*Acacia bivenosa low shrubland over Triodia wiseana hummock*		



Name	Cover %	Height (m)
Triodia wiseana	35	0.4
Acacia bivenosa	12	1.6
Ptilotus exaltatus	.1	0.5
Trichodesma zeylanicum var. *zeylanicum*	.1	1.3
Evolvulus alsinoides var. *villosicalyx*	.1	0.1
Cassytha filiformis	.1	L
*Abutilon*aff *lepidum*	.1	0.8
Indigofera monophylla	.1	0.4
Chrysopogon fallax	.1	0.6
Aristida contorta	.1	0.7
Bonamia pilbarensis	.1	L
Senna glutinosa subsp. *glutinosa*	.1	0.6
Dolichandrone occidentalis	.1	0.5
Corchorus walcottii	.1	0.2
Scaevola spinescens	.1	1.2
Rhynchosia minima	.1	L
*Cenchrus ciliaris**	.1	0.3
Solanum horridum	.1	0.4
Senna notabilis	.1	0.3
Triumfetta clementii	.1	0.3
Ptilotus xerophilus	.1	0.5
Cymbopogon ambiguus	.1	1
Cucumis variabilis	.1	L

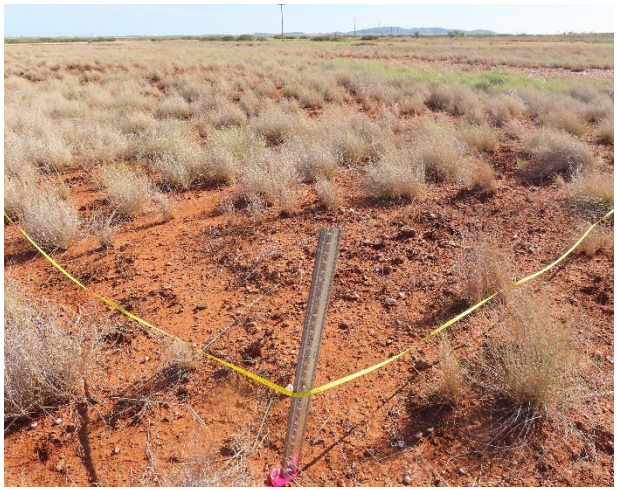
*Denotes weed species, L Denotes Liana

Quadrat Number:	HPK14	**Type:**	50x50m Quadrat
Date:	3/03/2022	**Described by:**	PJ/EL
MGA Zone: 50	**Easting:** 478716	**Northing:**	7702229
Habitat:	Plain		
Soil Type:	Sandy Clay		
Soil Color:	Orange Brown		
Rock Type:	Quartzes/ granite pebbles		
Rock Abundancy:	**10**%		
Fire Age:	Over 5 Years		
Leaf Litter:	5%		
Dead Logs/ Branches:	5%		
Disturbance:	Camp fire. Weeds, Tracks weeds		
Weeds:	<01		
Vegetation condition:	Very Good		
Vegetation description:	*Acacia ancistrocarpa* shrubland over *Triodia wiseana hummock grassland*		

Name	Cover %	Height (m)
Triodia wiseana	30	0.4
Acacia ancistrocarpa	12	1.6
Acacia bivenosa	.1	1.6
Acacia pyrifolia . var. *pyrifolia*	.1	1.2
Indigofera monophylla	.1	0.4
Rhagodia preissii	.1	0.8
Scaevola spinescens	.1	1
Senna artemisioides subsp. *oligophylla*	.1	0.6
Hibiscus sturtii var. *platychlamys*	.1	0.3
Aristida contorta	.1	0.4
Ptilotus exaltatus	.1	0.4
Goodenia microptera	.1	0.2
Senna glutinosa subsp. *glutinosa*	.1	0.8
Cymbopogon ambiguus	.1	0.2
Cassytha filiformis	.1	L
Senna glutinosa subsp. ×*luerssenii*	.1	1.1
*Cenchrus ciliaris**	.1	0.8
Ptilotus astrolasius	.1	0.5
Alternanthera angustifolia	.1	0.5
Heliotropium chrysocarpum	.1	0.4
Bonamia rosea	.1	0.2

*Denotes weed species

Quadrat Number:	HPK15	**Type:**	50x50m Quadrat
Date:	4/03/2022	**Described by:**	PJ/EL
MGA Zone: 50	**Easting:** 480860	**Northing:**	7703330
Habitat:	Cracking clay grassland		
Soil Type:	Cracking Clay		
Soil Color:	Orange Brown		
Rock Type:	Quartzes		
Rock Abundancy:	15%		
Fire Age:	Over 5 Years		
Leaf Litter:	5%		
Dead Logs/ Branches:	0%		
Disturbance:	No		
Weeds:	<01		
Vegetation condition:	Excellent		
Vegetation description:	*Eragrostis xerophila and Chrysopogon fallax tussock grassland*		



Name	Cover %	Height (m)
Eragrostis xerophila	30	0.3
Chrysopogon fallax	3	1
Aristida latifolia	.1	0.8
Salsola australis	.1	0.4
Indigofera trita subsp. *trita*	.1	0.2
Sida fibulifera	.1	0.2
Ptilotus exaltatus	.1	0.3
Heliotropium cunninghamii	.1	0.2
Operculina aequisepala	.1	L
Panicum laevinode	.1	0.6
Triodia wiseana	.1	0.5
Neptunia dimorphantha	.1	0.1
Solanum horridum	.1	0.2

Quadrat Number: HPK16 **Type:** 50x50m Quadrat

Date: 4/01/2022 **Described by:** PJ/EL

MGA Zone: 50 **Easting:** 481444 **Northing:** 7703679

Habitat: Undulating rocky hills

Soil Type: Sandy loam

Soil Color: Orange Brown

Rock Type: Quartz with iron pebbles

Rock Abundancy: 10

Fire Age: Over 5 Years

Leaf Litter: 5%

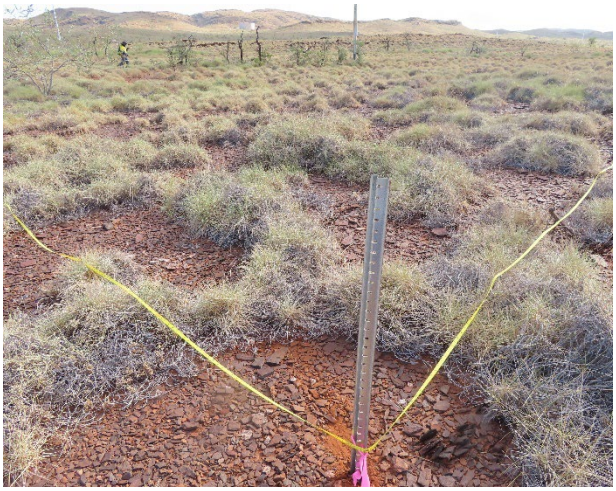
Dead Logs/ Branches: 0

Disturbance: Weeds,

Weeds: <01

Vegetation condition: Very Good

Vegetation description: *Acacia inaequilatera* and *Acacia bivenosa open shrubland over Triodia wiseana and Triodia epactia open hummock grassland.*



Name	Cover %	Height (m)
Acacia inaequilatera	3	2
Acacia bivenosa	1	1.4
Triodia wiseana	28	0.4
Triodia epactia	5	0.5
Senna artemisioides subsp. *oligophylla*	.1	0.6
Corchorus walcottii	.1	0.3
Indigofera monophylla	.1	0.4
Diplopeltis eriocarpa	.1	0.3
Ptilotus exaltatus	.1	0.7
*Cenchrus ciliaris**	.1	0.6
Senna glutinosa (DC.) Randell subsp. *glutinosa*	.1	0.5
Heliotropium chrysocarpum	.1	0.2
Eulalia aurea	.1	0.9
Trichodesma zeylanicum var. *zeylanicum*	.1	0.9
Cymbopogon ambiguus	.1	0.9
Rhynchosia minima	.1	L
Salsola australis	.1	0.4
Solanum horridum	.1	0.2
Acacia colei	.1	0.6
Eremophila longifolia	.1	1
Ptilotus calostachyus	.1	1
Goodenia prostrata	.1	P
Eriachne mucronata	.1	0.4
Chrysopogon fallax	.1	0.2
Afrohybanthus aurantiacus	.1	0.6
Indigofera trita	.1	0.3
Aristida holathera Domin var. *holathera*	.1	0.2

*Denotes weed species, L Denotes Liana P Denotes prostrate species

Quadrat Number: HPK17 **Type:** 50x50m Quadrat

Date: 4/03/2022 **Described by:** PJ/EL

MGA Zone: 50 **Easting:** 481324 **Northing:** 7703637

Habitat: Undulating rocky hills

Soil Type: Sandy loam

Soil Color: Orange Brown

Rock Type: Quartz/ granite, shale and sandstones

Rock Abundancy: 60%

Fire Age: Over 5 Years

Leaf Litter: 10%

Dead Logs/ Branches: 5%

Disturbance: Weeds

Weeds: <01

Vegetation condition: Excellent

Vegetation description; *Acacia inaequilatera* and *Acacia bivenosa* open shrubland over *Triodia wiseana* Hummock grassland

Name	Cover %	Height (m)
Acacia inaequilatera	3	2.4
Acacia bivenosa	1	2.3
Triodia wiseana	40	0.6
Trichodesma zeylanicum var. *zeylanicum*	.1	0.7
Indigofera monophylla	.1	0.3
Ptilotus exaltatus	.1	0.7
Solanum horridum	.1	0.3
Acacia coriacea	.1	1.5
Diplopeltis eriocarpa	.1	0.4
Pterocaulon sphaeranthoides	.1	0.5
Heliotropium chrysocarpum	.1	0.2
Corchorus walcottii	.1	0.2
*Cenchrus ciliaris**	.1	0.3
Gossypium australe	.1	0.2
Abutilon aff lepidum	.1	0.6
Afrohybanthus aurantiacus	.1	0.3
Salsola australis	.1	0.4
Cassytha filiformis	.1	L
Eremophila longifolia	.1	1.4
Hakea chordophylla	.1	1.6

*Denotes weed species,

Quadrat Number:	HPK18	**Type:**	50x50m Quadrat
Date:	3/03/2022	**Described by:**	PJ/EL
MGA Zone: 50	**Easting:** 477821	**Northing:**	7701830
Habitat:	Cracking clay		
Soil Type:	Sandy loam		
Soil Color:	Orange Brown		
Rock Type:	Quartzes/ granite pebbles.		
Rock Abundancy:	60%		
Fire Age:	Over 5 Years		
Leaf Litter:	1%		
Dead Logs/ Branches:	0		
Disturbance:	Power line, tracks		
Weeds:	0		
Vegetation condition:	Very good		
Vegetation description:	*Eragrostis xerophila* tussock grassland		

Name	Cover %	Height (m)
Eragrostis xerophila	30	0.4
Ptilotus exaltatus	.1	0.5
Sida fibulifera	.1	0.3
Eremophila longifolia	.1	0.2
Diplopeltis eriocarpa	.1	0.2
Indigofera trita	.1	0.4
Cenchrus ciliaris	.1	0.4
Salsola australis	.1	0.8
Aristida latifolia	.1	0.6
Stemodia kingii	.1	0.2
Triodia epactia	.1	0.4
Sclerolaena costata	.1	0.2
Cenchrus ciliaris	.1	0.1
Corchorus trilocularis	.1	0.2
Pterocaulon sphaeranthoides	.1	0.1
Aristida contorta	.1	0.2
Corchorus walcottii	.1	0.1
Neptunia dimorphantha	.1	0.1

Quadrat Number: HPK19 **Type:** 50x50m Quadrat

Date: 4/01/2022 **Described by:** PJ/EL

MGA Zone: 50 **Easting:** 478874 **Northing:** 7702322

Habitat: Plain

Soil Type: Sandy Clay Loam

Soil Color: Orange Brown

Rock Type: Quartz/ Iron.

Rock Abundancy: 10%

Fire Age: Over 5 Years

Leaf Litter: 1%

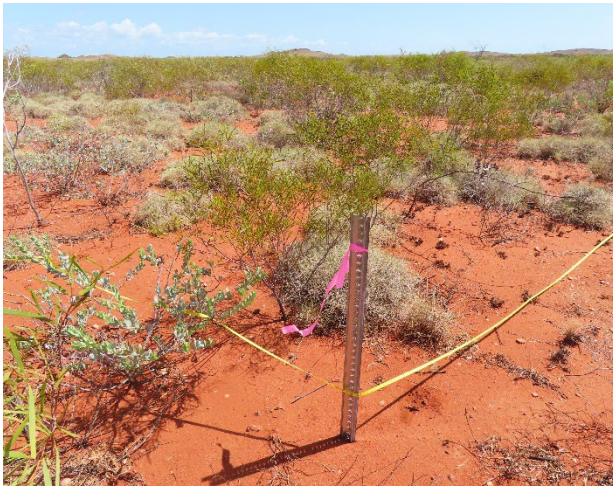
Dead Logs/ Branches: 0

Disturbance: Camp fire. Weeds, Tracks weeds

Weeds: <01

Vegetation condition: Excellent

Vegetation description: *Acacia ancistrocarpa and Acacia bivenosa shrubland over Triodia wiseana hummock grassland*



Name	Cover %	Height (m)
Acacia ancistrocarpa	20	1.7
Acacia bivenosa	2	1.7
Triodia wiseana	15	0.5
Eremophila longifolia	.1	1
Solanum horridum	.1	0.2
Ptilotus exaltatus	.1	0.4
Senna glutinosa subsp. *glutinosa*	.1	0.4
Acacia pyrifolia var. *pyrifolia*	.1	0.5
Aristida contorta	.1	0.2
Ptilotus astrolasius	.1	0.3
Senna artemisioides subsp. *oligophylla*	.1	0.9
Corchorus walcottii	.1	0.4
Evolvulus alsinoides var. *villosicalyx*	.1	0.1
Trichodesma zeylanicum var. *zeylanicum*	.1	1
Cymbopogon ambiguus	.1	0.8
Heliotropium chrysocarpum	.1	0.2
Goodenia microptera	.1	0.1
Triumfetta clementii	.1	0.1
Bonamia pilbarensis	.1	L
Hibiscus sturtii var. *platychlamys*	.1	0.2
Afrohybanthus aurantiacus	.1	.4

Flora species matrix

Species	HK01	HK02	HK03	HK04	HK05	HK06	HK07	HK08	HK09	HK10	HK11	HK12	HK13	HK14	HK15	HK16	HK17	HK18	HK19	OPP
Abutilon aff lepidum								X					X							
Abutilon amplum							X													
Abutilon lepidum																	X			
Abutilon sp.		X									X	X				X				
Acacia maitlandii																				X
Acacia ancistrocarpa				X	X			X						X			X			
Acacia bivenosa		X		X	X		X	X			X	X	X	X		X			X	
Acacia colei							X									X	X			
Acacia coriacea					X		X			X	X									
Acacia elachantha																				X
Acacia inaequilatera		X		X	X			X								X	X			
Acacia pyrifolia var. *pyrifolia*					X		X				X			X					X	
Acacia synchronicia		X																		
Acacia xiphophylla			X			X		X												
Achyranthes aspera					X															
Aerva javanica																				X
Afrohybanthus aurantiacus				X							X	X				X	X		X	
Alternanthera angustifolia					X									X						
Alternanthera nodiflora										X										
Aristida sp.											X									
Aristida contorta			X	X				X			X		X	X				X	X	
Aristida holathera Domin var. *holathera*											X					X				
Aristida latifolia	X		X					X	X									X		
Boerhavia sp.		X							X	X							X			

Species	HK01	HK02	HK03	HK04	HK05	HK06	HK07	HK08	HK09	HK10	HK11	HK12	HK13	HK14	HK15	HK16	HK17	HK18	HK19	OPP
Bonamia pilbarensis										X	X		X						X	
Bonamia rosea				X	X		X							X						
Capparis umbonata							X													
Capparis spinosa subsp. *nummularia*							X													
Carissa lanceolata					X		X													
Cassytha filiformis				X							X	X	X	X			X		X	
Cenchrus ciliaris	X	X	X	X	X	X	X	X	X	X	X		X	X		X	X	X		
Chrysopogon fallax	X	X	X		X	X	X	X		X			X			X				
Clerodendrum floribundum										X										
Commicarpus australis	X																			
Corchorus trilocularis																				X
Corchorus walcottii		X		X	X		X				X	X	X			X	X	X	X	
Corymbia hamersleyana					X		X													
Cucumis aff variabilis												X								
Cucumis variabilis							X			X	X		X							
Cymbopogon ambiguus														X		X	X		X	
Cymbopogon obtectus													X							
Cynanchum floribundum					X							X								
Cynanchum viminale																				X
Diplopeltis eriocarpa				X												X	X	X		
Dolichandrone occidentalis																				X
Dolichocarpa sp. Hamersley Station													X							
Enchylaena tomentosa var. *tomentosa*			X			X	X	X												
Eragrostis sp.										X										
Eragrostis xerophila	X		X		X	X		X	X						X			X		

Species	HK01	HK02	HK03	HK04	HK05	HK06	HK07	HK08	HK09	HK10	HK11	HK12	HK13	HK14	HK15	HK16	HK17	HK18	HK19	OPP
Eremophila longifolia				X	X		X	X									X		X	
Eriachne benthamii					X															
Eriachne mucronata		X														X				
Eucalyptus victrix					X															
Eulalia aurea					X											X				
Euphorbia biconvexa										X										
Euphorbia tannensis subsp. *eremophila*																				X
Evolvulus alsinoides var. *villosicalyx*				X	X			X		X	X		X				X		X	
Goodenia microptera														X					X	
Goodenia prostrata																X				
Gossypium australe				X	X		X										X			
Hakea chordophylla				X	X												X			
Heliotropium chrysocarpum		X									X			X		X	X		X	
Heliotropium cunninghamii	X		X						X			X			X					
Hibiscus coatesii																				X
Hibiscus sturtii var. *platychlamys*				X	X							X		X					X	
Indigofera monophylla				X							X	X	X	X		X	X			
Indigofera trita subsp. trita		X	X						X		X				X	X	X	X		
Ipomoea costata																				X
Ipomoea muelleri										X										
Jasminum didymum subsp. *lineare*					X															
Lepidium oxytrichum						X														
Malvastrum americanum					X		X			X										
Neptunia dimorphantha	X				X				X						X			X		

Species	HK01	HK02	HK03	HK04	HK05	HK06	HK07	HK08	HK09	HK10	HK11	HK12	HK13	HK14	HK15	HK16	HK17	HK18	HK19	OPP
Operculina aequisepala	X									X					X					
Panicum decompositum																				X
Panicum laevinode															X					
Passiflora foetida																				X
Phyllanthus maderaspatensis					X															
Poaceae sp.																		X		
Portulaca sp.										X								X		
Pterocaulon sphaeranthoides		X	X					X		X	X	X					X			
Ptilotus astrolasius				X				X				X		X					X	
Ptilotus calostachyus																X	X			
Ptilotus exaltatus	X	X	X		X	X		X	X		X	X	X	X	X	X		X	X	
Ptilotus xerophilus													X				X			
Rhagodia preissii			X					X						X						
Rhynchosia minima	X	X	X				X			X			X			X				
Salsola australis	X	X	X			X			X	X	X	X			X	X	X	X		
Santalum lanceolatum							X													
Scaevola spinescens					X			X					X	X						
Sclerolaena bicornis var. *bicornis*	X																			
Sclerolaena costata			X					X			X							X		
Senna artemisioides subsp. *helmsii*								X												
Senna artemisioides subsp. *oligophylla*	X			X			X							X		X			X	
Senna glutinosa subsp. *glutinosa*				X	X						X	X	X	X		X			X	

Species	HK01	HK02	HK03	HK04	HK05	HK06	HK07	HK08	HK09	HK10	HK11	HK12	HK13	HK14	HK15	HK16	HK17	HK18	HK19	OPP
Senna glutinosa subsp. *×luerssenii*						X						X		X						
Senna glutinosa subsp. *prui nosa*											X									
Senna hamersleyensis			X																	
Senna notabilis					X							X	X							
Sesbania cannabina					X		X			X										
Sida sp.				X																
Sida echinocarpa					X															
Sida fibulifera	X		X			X		X	X						X			X		
Solanum diversiflorum					X					X	X						X			
Solanum horridum		X	X		X			X			X	X	X		X	X	X		X	
Solanum lasiophyllum		X																		
Stemodia kingii	X								X	X								X		
Streptoglossa sp.		X	X																	
Tephrosia sp. NW Eremaean (S. van Leeuwen et al. PBS 0356)				X																
Themeda triandra		X			X		X	X								X				
Trichodesma zeylanicum var. *zeylanicum*		X					X	X			X	X	X						X	
Trigastrotheca molluginea																				X
Triodia epactia		X	X	X	X		X	X								X	X	X		
Triodia wiseana		X	X	X		X				X	X	X	X	X	X	X	X			
Triumfetta clementii											X	X	X						X	
Vachellia farnesiana	X				X		X			X										
Vigna triodiophila																				X
Zaleya galericulata subsp. *galericulata*																		X		

Flora likelihood of occurrence assessment guidelines

Likelihood of occurrence	Guideline
Known	Species recorded within survey area from field survey results.
Likely	Species previously recorded within 20 km and large areas of suitable habitat occur in the survey area.
Possible	Species previously recorded within 20 km and areas of suitable habitat occur/may occur in the survey area.
Unlikely	Species previously recorded within 20 km, but suitable habitat does not occur in the survey area.
Highly unlikely	Species not previously recorded within 20 km, suitable habitat does not occur in the survey area and/or the survey area is outside the natural distribution of the species.
Other considerations	Intensity of survey, availability of access, growth form type, recorded flowering times

Significant flora likelihood of occurrence assessment

Family	Taxon	Status		Description (if available) (WA Herbarium 1998–)	Likelihood of occurrence	Source
		EPBC Act	BC Act / DBCA			
Aizoaceae	*Trianthema* sp. Python Pool (G.R. Guerin & M.E. Trudgen GG 1023)		P2	Prostrate to near prostrate annual herb. Flowers pink. Clayey-sand, clayey-loam. Plains, low undulating hills.	**Unlikely –** the closest known record is located approximately 20 km south of the survey area. It has not been previously recorded in the survey area (GHD 2019).	WAHerb
Celastraceae	*Stackhousia clementii*		P3	Dense broom-like perennial, herb, to 0.45 m high. Flowers green/yellow/brown. Skeletal soils. Sandstone hills.	**Unlikely –** limited suitable habitat present.	TPFL, WAHerb
Combretaceae	*Terminalia supranitifolia*		P3	Spreading, tangled shrub or tree, 1.5-3 m high. Flowers green-yellow, May or July or December. Sand. Among basalt rocks.	**Unlikely** – no suitable habitat within the survey area	NatureMap, TPFL, WAHerb
Fabaceae	*Rhynchosia bungarensis*		P4	Compact, prostrate shrub, to 0.5 m high. Flowers yellow. Pebbly, shingly coarse sand amongst boulders. Banks of flow line in the mouth of a gully in a valley wall.	**Unlikely**– no suitable habitat within the survey area.	NatureMap, WAHerb
Fabaceae	*Vigna triodiophila*		P3	Fine-stemmed prostrate or scrambling vine, small, ovate to elliptic leaves. Known to flower and fruit between	**Unlikely –** no suitable habitat within the survey area.	WAHerb

Family	Taxon	Status		Description (if available) (WA Herbarium 1998–)	Likelihood of occurrence	Source
		EPBC Act	BC Act / DBCA			
				May and September. Endemic to basalt rockpile habitats in shallow, red-brown or brown, clayey sand or loam.		
Poaceae	*Themeda* sp. Hamersley Station (M.E. Trudgen 11431)		P3	Tussocky perennial, grass-like or herb, 0.9-1.8 m high. Flowers August. Red clay. Clay pan, grass plain.	**Unlikely** – although suitable habitat is present, based on known occurrences and number of surveys undertaken in the area, this species is considered unlikely to occur.	WAHerb
Rubiaceae	*Oldenlandia* sp. Hamersley Station (A.A. Mitchell PRP 1479)		P3	Spreading annual, herb, 0.05-0.1 m high. Flowers blue, March. Cracking clay, basalt. Gently undulating plain with large surface rocks, flat crabholed plain.	**Likely** – the species has been recorded within 1 km of the survey area. Suitable habitat present.	NatureMap

Appendix E

Fauna results

Fauna species recorded

Significant fauna likelihood of occurrence assessment

Fauna species recorded during the survey

Family	Species	Common Name	Status
BIRDS			
Accipitridae	*Aquila audax*	Wedge-tailed Eagle	
Accipitridae	*Haliastur sphenurus*	Whistling Kite	
Artamidae	*Artamus cinereus*	Black-faced Woodswallow	
Artamidae	*Artamus nigrogularis*	Pied Butcherbird	
Cacatuidae	*Eolophus roseicapilla*	Galah	
Campephagidae	*Coracina novaehollandiae*	Black-faced Cuckoo-shrike	
Columbidae	*Geopelia cuneata*	Diamond Dove	
Columbidae	*Geopelia humeralis*	Bar-shouldered Dove	
Columbidae	*Geophaps plumifera*	Spinifex Pigeon	
Columbidae	*Ocyphaps lophotes*	Crested Pigeon	
Columbidae	*Phaps chalcoptera*	Common Bronzewing	
Corvidae	*Corvus orru*	Torresian Crow	
Estrildidae	*Emblema pictum*	Painted Finch	
Estrildidae	*Taeniopygia guttata*	Zebra Finch	
Falconidae	*Falco berigora*	Brown Falcon	
Falconidae	*Falco cenchroides*	Nankeen Kestrel	
Halcyonidae	*Todiramphus sanctus*	Sacred Kingfisher	
Maluridae	*Malurus lamberti*	Variegated Fairy-wren	
Megaluridae	*Cincloramphus mathewsi*	Rufous Songlark	
Meliphagidae	*Epthianura tricolor*	Crimson Chat	
Meliphagidae	*Lichenostomus keartlandi*	Grey-headed Honeyeater	
Meliphagidae	*Lichenostomus virescens*	Singing Honeyeater	
Meliphagidae	*Manorina flavigula*	Yellow-throated Miners	
Monarchidae	*Grallina cyanoleuca*	Magpie-lark	
Motacillidae	*Anthus novaeseelandiae*	Australasian Pipit	
Otididae	*Ardeotis australis*	Australian Bustard	
Phasianidae	*Coturnix ypsilophora*	Brown Quail	
Psittacidae	*Melopsittacus undulatus*	Budgerigar	
Rhipiduridae	*Motacilla alba*	Willie Wagtail	
Turnicidae	*Turnix velox*	Little Button Quail	
REPTILES			
Agamidae	*Ctenophorus caudicinctus*	Ring-tailed Dragon	
Agamidae	*Ctenophorus isolepis*	Military Dragon	
Agamidae	*Ctenophorus nuchalis*	Central Netted Dragon	
Agamidae	*Lophognathus gilberti*	Gilbert's Dragon	
Agamidae	*Pogona mitchelli*	Pilbara Bearded Dragon	
Scincidae	*Carlia munda*		
Scincidae	*Ctenotus grandis*		
Scincidae	*Ctenotus saxatilis*	Rock Skink	

Family	Species	Common Name	Status
Scincidae	*Lerista clara*	Sharp-blazed Three-toed Slider	
Scincidae	*Menetia greyii*	Common Dwarf Skink	
Varanidae	*Varanus acanthurus*	Ridge-tailed Monitor	
MAMMALS			
Bovidae	*Bos taurus*	European Cattle	Introduced
Canidae	*Canis lupus*	Dog	Introduced
Felidae	*Felis catus*	Cat	introduced
Macropodidae	*Macropus robustus*	Euro	

Parameters of fauna likelihood of occurrence assessment

Assessment outcome	Description
Known	The species was recorded or has been recorded recently by reputable observers
Likely	Species are **likely** to occur in the survey area where there is suitable habitat within the survey area and there are recent records of occurrence of the species in close proximity to the survey area. OR Species known distribution overlaps with the survey area and there is suitable habitat within the survey area.
Unlikely	Species assessed as **unlikely** include those species previously recorded within 5 km of the survey area however: There is limited (i.e. the type, quality and quantity of the habitat is generally poor or restricted) habitat in the survey area. The suitable habitat within the survey area is isolated from other areas of suitable habitat and the species has no capacity to migrate into the survey area. OR Those species that have a known distribution overlapping with the survey area however: There is limited habitat in the survey area (i.e. the type, quality and quantity of the habitat is generally poor or restricted). The suitable habitat within the survey area is isolated from other areas of suitable habitat and the species has no capacity to migrate into the survey area.
Highly unlikely	Species that are considered **highly unlikely** to occur in the survey area include: Those species that have no suitable habitat within the survey area. Those species that have become locally extinct, or are not known to have ever been present in the region of the survey area.

Source information - desktop searches
PMST – DAWE PMST to identify fauna listed under the EPBC Act potentially occurring within the survey area
DBCA – DBCA 2020. WA Government, DBCA Threatened and Priority fauna rankings
NM – DBCA NatureMap (accessed 2020)

Significant fauna likelihood of occurrence assessment

Taxa	Common Name	Status		Description and habitat requirements	Likelihood of occurrence within the survey area	Source
		BC Act	EPBC Act			
Birds						
Actitis hypoleucos	Common Sandpiper	Mi	Mi	The species utilises a wide range of coastal wetlands and some inland wetlands, with varying levels of salinity, and is mostly found around 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. The muddy margins utilised by the species are often narrow, and may be steep. The species is often associated with mangroves, and sometimes found in areas of mud littered with rocks or snags (Geering et al. 2007; Higgins & Davies 1996). Generally the species forages in shallow water and on bare soft mud at the edges of wetlands; often where obstacles project from substrate, e.g. rocks or mangrove roots. Birds sometimes venture into grassy areas adjoining wetlands (Higgins & Davies 1996).	Unlikely No suitable habitat present.	NM PMST
Arenaria interpres	Ruddy Turnstone	Mi	Mi	In Australasia, the Ruddy Turnstone is mainly found on coastal regions with exposed rock coast lines or coral reefs. It also lives near platforms and shelves, often with shallow tidal pools and rocky, shingle or gravel beaches. It can, however, be found on sand, coral or shell beaches, shoals, cays and dry ridges of sand or coral. It has occasionally been sighted in estuaries, harbours, bays and coastal lagoons, among low saltmarsh or on exposed beds of seagrass, around sewage ponds and on mudflats (Higgins & Davies 1996).	Unlikely No suitable habitat present.	NM PMST
Calidris canutus	Red Knot	Mi, En	Mi, En	In Australasia the Red Knot mainly inhabit intertidal mudflats, sandflats and sandy beaches of sheltered coasts, in estuaries, bays, inlets, lagoons and harbours; sometimes on sandy ocean beaches or shallow pools on exposed wave-cut rock platforms or coral reefs. They are occasionally seen on terrestrial saline wetlands near the coast, such as lakes, lagoons, pools and pans, and recorded on sewage ponds and saltworks, but rarely use freshwater swamps. They rarely use inland lakes or swamps (Higgins & Davies 1996).	Unlikely No suitable habitat present.	PMST
Calidris acuminata	Sharp-tailed Sandpiper	Mi	Mi	In Australasia, the Sharp-tailed Sandpiper prefers muddy edges of shallow fresh or brackish wetlands, with inundated or emergent sedges, grass, saltmarsh or other low vegetation. This includes lagoons, swamps, lakes and pools near the coast, and dams, waterholes, soaks, bore drains and bore swamps, saltpans and hypersaline saltlakes inland. They also occur in saltworks and sewage farms. They use flooded paddocks, sedgelands and other ephemeral wetlands, but leave when they dry. They use intertidal mudflats in sheltered bays, inlets, estuaries or seashores, and also swamps and creeks lined with mangroves. They	Unlikely No suitable habitat present.	PMST

Taxa	Common Name	Status		Description and habitat requirements	Likelihood of occurrence within the survey area	Source
		BC Act	EPBC Act			
				tend to occupy coastal mudflats mainly after ephemeral terrestrial wetlands have dried out, moving back during the wet season. They may be attracted to mats of algae and water weed either floating or washed up around terrestrial wetlands, and coastal areas with much beachcast seaweed. Sometimes they occur on rocky shores and rarely on exposed reefs (Higgins & Davies 1996).		
Calidris melanotos	Pectoral Sandpiper	Mi	Mi	In Australasia, the Pectoral Sandpiper prefers shallow fresh to saline wetlands. The species is found at coastal lagoons, estuaries, bays, swamps, lakes, inundated grasslands, saltmarshes, river pools, creeks, floodplains and artificial wetlands. The species is usually found in coastal or near coastal habitat but occasionally found further inland. It prefers wetlands that have open fringing mudflats and low, emergent or fringing vegetation, such as grass or samphire. The species has also been recorded in swamp overgrown with lignum. They forage in shallow water or soft mud at the edge of wetlands (Higgins & Davies 1996).	Unlikely No suitable habitat present.	PMST
Tringa stagnatilis	Marsh Sandpiper	Mi	Mi	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. In north Australia they prefer intertidal mudflats (Higgins & Davies 1996), although surveys in Kakadu National Park recorded more birds around shallow freshwater lakes than in areas influenced by tide (Bamford 1988). At the Top End they often use ephemeral pools on inundated freshwater and tidal floodplains (Higgins & Davies 1996).	Unlikely No suitable habitat present.	PMST
Calidris ferruginea	Curlew Sandpiper	Cr, Mi	Cr, Mi	Curlew Sandpipers mainly occur on intertidal mudflats in sheltered coastal areas, such as estuaries, bays, inlets and lagoons, and also around non-tidal swamps, lakes and lagoons near the coast, and ponds in saltworks and sewage farms. They are also recorded inland, though less often, including around ephemeral and permanent lakes, dams, waterholes and bore drains, usually with bare edges of mud or sand. They occur in both fresh and brackish waters. Occasionally they are recorded around floodwaters (Higgins & Davies 1996)	Unlikely No suitable habitat present.	NM PMST
Calidris ruficollis	Red-necked Stint		Mi	In Australasia, the Red-necked Stint is mostly found in coastal areas, including in sheltered inlets, bays, lagoons and estuaries with intertidal mudflats, often near spits, islets and banks and, sometimes, on protected sandy or coralline shores. Occasionally they have been recorded on exposed or ocean beaches, and sometimes on stony or rocky shores, reefs or shoals. They also occur in saltworks and sewage farms; saltmarsh; ephemeral or permanent shallow wetlands near the	Unlikely No suitable habitat present.	NM PMST

Taxa	Common Name	Status		Description and habitat requirements	Likelihood of occurrence within the survey area	Source
		BC Act	EPBC Act			
				coast or inland, including lagoons, lakes, swamps, riverbanks, waterholes, bore drains, dams, soaks and pools in saltflats. They sometimes use flooded paddocks or damp grasslands. They have occasionally been recorded on dry gibber plains, with little or no perennial vegetation (Higgins & Davies 1996).		
Calidris subminuta	Long-toed Stint	Mi	Mi	In Australia, the Long-toed Stint occurs in a variety of terrestrial wetlands. They prefer shallow freshwater or brackish wetlands including lakes, swamps, river floodplains, streams, lagoons and sewage ponds. The species is also fond of areas of muddy shoreline, growths of short grass, weeds, sedges, low or floating aquatic vegetation, reeds, rushes and occasionally stunted samphire. It has also been observed at open, less vegetated shores of larger lakes and ponds and is common on muddy fringes of drying ephemeral lakes and swamps. The Long-toed Stint also frequents permanent wetlands such as reservoirs and artificial lakes. They are uncommon, but not unknown, at tidal estuaries, saline lakes, saltponds and bore swamps (Higgins & Davies 1996). The Long-toed Stint forages on wet mud or in shallow water, often among short grass, weeds and other vegetation on islets or around the edges of wetlands. They occasionally feed on open water, well away from the shore; this is more common in drying ephemeral wetlands. They roost or loaf in sparse vegetation at the edges of wetlands and on damp mud near shallow water. It also roosts in small depressions in the mud (Higgins & Davies 1996).	Unlikely No suitable habitat present.	PMST
Calidris tenuirostris	Great Knot	Cr	Cr, Mi	In Australasia, the species typically prefers sheltered coastal habitats, with large intertidal mudflats or sandflats. This includes inlets, bays, harbours, estuaries and lagoons. They are occasionally found on exposed reefs or rock platforms, shorelines with mangrove vegetation, ponds in saltworks, at swamps near the coast, saltlakes and non-tidal lagoons. The Great Knot rarely occurs on inland lakes and swamps (Higgins & Davies 1996). Typically, the Great Knot roosts in large groups in open areas, often at the waters edge or in shallow water close to feeding grounds (Higgins & Davies 1996; Rogers 2001). It is known that in hot conditions, waders prefer to roost where a damp substrate lowers the local temperature (Rogers 1999). A group of approximately 8610 birds have been recorded roosting at an inland claypan near Roebuck Bay in north-west Western Australia (Collins et al. 2001).	Unlikely No suitable habitat present.	NM
Charadrius leschenaultii	Greater Sand Plover	Vu, Mi	Vu, Mi	In the non-breeding grounds in Australasia, the species is almost entirely coastal, inhabiting littoral and estuarine habitats. They mainly occur on sheltered sandy, shelly or muddy beaches with large intertidal mudflats or sandbanks, as well as sandy estuarine lagoons and inshore reefs,	Unlikely No suitable habitat present.	NM PMST

Taxa	Common Name	Status		Description and habitat requirements	Likelihood of occurrence within the survey area	Source
		BC Act	EPBC Act			
				rock platforms, small rocky islands or sand cays on coral reefs. They are occasionally recorded on near-coastal saltworks and saltlakes, including marginal saltmarsh, and on brackish swamps (Stewart et al. 2007).		
Charadrius veredus	Oriental Plover	Mi	Mi	Immediately after arriving in non-breeding grounds in northern Australia, Oriental Plovers spend a few weeks in coastal habitats such as estuarine mudflats and sandbanks, on sandy or rocky ocean beaches or nearby reefs, or in near-coastal grasslands, before dispersing further inland. Thereafter they usually inhabit flat, open, semi-arid or arid grasslands, where the grass is short and sparse, and interspersed with hard, bare ground, such as claypans, dry paddocks, playing fields, lawns and cattle camps or open areas that have been recently burnt (Storr 1980).	Likely The species is known from the region, however use would be opportunistic to the claypans and broad drainage areas/floodplain and utilised for foraging purposes only.	PMST
Glareola maldivarum	Oriental Pratincole		Mi	In non-breeding grounds in Australia, the Oriental Pratincole usually inhabits open plains, floodplains or short grassland (including farmland or airstrips), often with extensive bare areas. They often occur near terrestrial wetlands, such as billabongs, lakes or creeks, and artificial wetlands such as reservoirs, saltworks and sewage farms, especially around the margins. The species also occurs along the coast, inhabiting beaches, mudflats and islands, or around coastal lagoons (Lloyd and Lloyd 1991).	Unlikely No suitable habitat present.	PMST
Falco peregrinus	Peregrine Falcon	OS		The Peregrine Falcon is uncommon but wide ranging across Australia. Habitat is extremely diverse, from rainforest to arid scrub, from coastal heath to alpine. The Peregrine Falcon nests primarily on ledges of cliffs, shallow tree hollows, and ledges of building in cities (Morcombe 2004).	Likely The habitats present within the survey area represents suitable foraging habitat, however lacks suitable breeding habitat. Therefore likely to occur at least on an occasional basis.	NM
Gelochelidon nilotica	Gull-billed Tern		Mi	The Gull-billed Tern is nomadic or migratory species in Australia. Gull-billed Terns are found in freshwater swamps, brackish and salt lakes, beaches and estuarine mudflats, floodwaters, sewage farms, irrigated croplands and grasslands, where resources are favorable. They are only rarely found over the ocean. The Gull-billed Tern. Although essentially an inland species, outside breeding season it shows a distinct preference for saltmarshes and lagoons near the coast. Movements are not fully understood but it is common and widespread in Australia (Morcombe 2004).	Unlikely No suitable habitat present.	NM

Taxa	Common Name	Status		Description and habitat requirements	Likelihood of occurrence within the survey area	Source
		BC Act	EPBC Act			
Hydroprogne caspia	Caspian Tern	Mi	Mi	The Caspian Tern is mostly found in sheltered coastal embayments (harbours, lagoons, inlets, bays, estuaries and river deltas) and those with sandy or muddy margins are preferred. They also occur on near-coastal or inland terrestrial wetlands that are either fresh or saline, especially lakes (including ephemeral lakes), waterholes, reservoirs, rivers and creeks. They also use artificial wetlands, including reservoirs, sewage ponds and saltworks. In offshore areas the species prefers sheltered situations, particularly near islands, and is rarely seen beyond reefs (DAWE 2020).	Unlikely No suitable habitat present.	NM PMST
Sterna dougallii	Roseate Tern	Mi	Mi	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. In WA, the subspecies is regularly recorded north from Mandurah to around Eighty Mile Beach. Around the Kimberley coastline, the subspecies occurs at scattered sites, north to the Bonaparte Archipelago and possibly further. The subspecies used to be a sporadic visitor to the southwest, but occurs regularly at present. In addition, breeding colonies have been established on Lancelin Island and Second Rock (DAWE 2020).	Unlikely, Typically marine exclusive.	PMST
Limosa lapponica (all sub-species)	Bar-tailed Godwit	Vu or Cr, Mi	Vu or Cr, Mi	The Bar-tailed Godwit is found mainly in coastal habitats such as large intertidal sandflats, banks, mudflats, estuaries, inlets, harbours, coastal lagoons and bays. It is found often around beds of seagrass and, sometimes, in nearby saltmarsh. It has been sighted in coastal sewage farms and saltworks, saltlakes and brackish wetlands near coasts, sandy ocean beaches, rock platforms, and coral reef-flats. It is rarely found on inland wetlands or in areas of short grass, such as farmland, paddocks and airstrips, although it is commonly recorded in paddocks at some locations overseas (Marchant & Higgins 1993).	Unlikely No suitable habitat present.	NM PMST
Numenius madagascariensis	Eastern Curlew	Cr, Mi	Cr, Mi	The Eastern Curlew is a large non-breeding migratory shorebird, found commonly along the north coast of Western Australia, but rarely south of Shark Bay. The species is found along the coastline from Barrow Island and Dampier Archipelago, through the Kimberley in WA to the NT. It is found in estuaries, bays, harbours, inlets and coastal lagoons, saltworks and sewerage farms, areas (e.g. intertidal mudflats or sandflats fringed by mangroves) often with beds of seagrass and occasionally on ocean beaches, coral reefs, rock platforms and rocky islets. The Eastern Curlew forages on soft, sheltered, intertidal sand- or mudflats, often near mangroves, on saltflats, saltmarshes, rock pools, coastal reefs and ocean beaches near the tideline. The species roosts in large flocks, separate from other waders on sandy spits and islets, dry beach sand	Unlikely No suitable habitat present.	NM PMST

Taxa	Common Name	Status		Description and habitat requirements	Likelihood of occurrence within the survey area	Source
		BC Act	EPBC Act			
				near the high-water mark, among coastal vegetation (including low saltmarsh and mangroves) and occasionally on reef-flats, in the shallow water of lagoons, near-coastal wetlands, in trees and posts (Morcombe 2004).		
Numenius minutus	Little Curlew, Little Whimbrel	Mi	Mi	When resting during the heat of day, 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 may also rest in grassy, open woodlands and on bare blacksoil plains, or on dry or recently burnt grasslands on floodplains, which may be without vegetation for hundreds of metres, and occasionally on mudflats when nearby grasslands are unburnt, or around swamps. Resting has also been recorded under partly submerged vegetation. After freshwater pools dry up, roosting may occur in the shallows of reservoirs and the sea (Higgins & Davies 1996).	Unlikely No suitable habitat present.	NM
Numenius phaeopus	Whimbrel	Mi	Mi	The Whimbrel is often found on the intertidal mudflats of sheltered coasts. It is also found in harbours, lagoons, estuaries and river deltas, often those with mangroves, but also open, unvegetated mudflats. It is occasionally found on sandy or rocky beaches, on coral or rocky islets, or on intertidal reefs and platforms. It has been infrequently recorded using saline or brackish lakes near coastal areas. It also used saltflats with saltmarsh, or saline grasslands with standing water left after high spring-tides, and in similar habitats in sewage farms and salt fields (Higgins & Davies 1996). There are a small number of inland records from saline lakes and canegrass swamps (Jarman 1978). It has also been recorded in coastal dunes and on a football field (Smith & Chafer 1987).	Unlikely No suitable habitat present.	NM PMST
Pandion cristatus	Osprey, Eastern Osprey	Mi	Mi	Eastern Ospreys occur in littoral and coastal habitats and terrestrial wetlands of tropical and temperate Australia and offshore islands. They are mostly found in coastal areas but occasionally travel inland along major rivers, particularly in northern Australia. They require extensive areas of open fresh, brackish or saline water for foraging (Marchant & Higgins 1993). They frequent a variety of wetland habitats including inshore waters, reefs, bays, coastal cliffs, beaches, estuaries, mangrove swamps, broad rivers, reservoirs and large lakes and waterholes. They exhibit a preference for coastal cliffs and elevated islands in some parts of their range, but may also occur on low sandy, muddy or rocky shores and over coral cays.	Unlikely No suitable habitat present however may occur as an occasional visitor (flyover).	NM PMST

Taxa	Common Name	Status		Description and habitat requirements	Likelihood of occurrence within the survey area	Source
		BC Act	EPBC Act			
Pezoporus occidentalis	Night Parrot	En	En	The Night Parrot inhabits arid and semi-arid areas that are characterised by having dense, low vegetation. Based on accepted records, the habitat of the Night Parrot consists of Triodia grasslands in stony or sandy environments and of samphire and chenopod shrublands, including genera such as Atriplex, Bassia and Maireana, on floodplains and claypans, and on the margins of saltlakes, creeks or other sources of water (Parker 1980). It has also been observed to enter dense Muehlenbecki growth when flushed from a more typical habitat (Boles et al. 1994).	Unlikely No suitable habitat present.	PMST
Pluvialis fulva	Pacific Golden Plover	Mi	Mi	In non-breeding grounds in Australia this species usually inhabits coastal habitats, though it occasionally occurs around inland wetlands. Pacific Golden Plovers usually occur on beaches, mudflats and sandflats (sometimes in vegetation such as mangroves, low saltmarsh such as Sarcocornia, or beds of seagrass) in sheltered areas including harbours, estuaries and lagoons, and also in evaporation ponds in saltworks. The species is also sometimes recorded on islands, sand and coral cays and exposed reefs and rocks. They are less often recorded in terrestrial habitats, usually wetlands such as fresh, brackish or saline lakes, billabongs, pools, swamps and wet claypans, especially those with muddy margins and often with submerged vegetation or short emergent grass. Other terrestrial habitats inhabited include short (or, occasionally, long) grass in paddocks, crops or airstrips, or ploughed or recently burnt areas, and they are very occasionally recorded well away from water (Marchant & Higgins 1993).	Unlikely No suitable habitat present.	NM PMST
Rostratula australis	Australian Painted Snipe	En	En	The Australian Painted Snipe is rarely seen as it is extremely secretive, keeping to dense vegetation of swamps, emerging only in subdued light of dawn and dusk. The preferred habitat of this species includes surrounds and shallows of wetlands that are well vegetated with dense low cover (Morcombe 2004).	Unlikely No suitable habitat present.	PMST
Sternula nereis nereis	Australian Fairy Tern	Vu	Vu	The habitat of the fairy tern is essentially marine, including sheltered coasts, bays, inlets, estuaries, coastal lagoons, ocean beaches but rarely out to sea or out of sight of land. They also inhabit wetlands near the coast including salt ponds and lakes. This species favours sites with sand spits and small sand islets in river mouth channels (Morcombe 2004).	Unlikely No suitable habitat present.	PMST
Thalasseus bergii	Crested Tern	Mi	Mi	Crested Terns occur singularly or in flocks in coastal areas, estuaries, inlets, islands and occasionally on large inland lakes or rivers. They are often seen perching with gulls on beaches, sand spits or jetties. Crested Terns are widespread from the south coast of Africa north to Asia, south	Unlikely No suitable habitat present.	NM

Taxa	Common Name	Status		Description and habitat requirements	Likelihood of occurrence within the survey area	Source
		BC Act	EPBC Act			
				to Australia and east to Polynesia. They also occur on many islands in the Indian and Pacific Oceans (DAWE 2020).		
Tringa brevipes	Grey-tailed Tattler	P4, Mi	Mi	The Grey-tailed Tattler is often found on sheltered coasts with reefs and rock platforms or with intertidal mudflats. It can also be found at intertidal rocky, coral or stony reefs as well as platforms and islets that are exposed at low tide. It has been found around shores of rock, shingle, gravel or shells and also on intertidal mudflats in embayments, estuaries and coastal lagoons, especially fringed with mangroves. In Moreton Bay, Queensland, it is most abundant in areas with dense beds of seagrass. In Tasmania it is also abundant in areas with seagrass beds. It is less often on open flat sandy beaches or sandbanks, especially around accumulated seaweed or isolated clumps of dead coral. It is occasionally found around near-coastal wetlands, such as lagoons and lakes and ponds in sewage farms and saltworks. Inland records for the species are rare with sightings on river banks and the edges of rock pools (Higgins & Davies 1996).	Unlikely No suitable habitat present.	NM
Tringa glareola	Wood Sandpiper	Mi	Mi	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 and River Red Gums (*Eucalyptus camaldulensis*) and often with fallen timber. They also frequent inundated grasslands, short herbage or wooded floodplains, where floodwaters are temporary or receding, and irrigated crops. They are also found at some small wetlands only when they are drying (DAWE 2022).	Unlikely No suitable habitat present.	NM
Tringa nebularia	Common Greenshank	Mi	Mi	The Common Greenshank is found in a wide variety of inland wetlands and sheltered coastal habitats of varying salinity. It occurs in sheltered coastal habitats, typically with large mudflats and saltmarsh, mangroves or seagrass. Habitats include embayments, harbours, river estuaries, deltas and lagoons and are recorded less often in round tidal pools, rock-flats and rock platforms. The species uses both permanent and ephemeral terrestrial wetlands, including swamps, lakes, dams, rivers, creeks, billabongs, waterholes and inundated floodplains, claypans and saltflats. It will also use artificial wetlands, including sewage farms and saltworks dams, inundated rice crops and bores (DAWE 2022).	Unlikely No suitable habitat present.	NM PMST
Hirundo rustica	Barn Swallow	Mi	Mi	In Australia, the Barn Swallow is recorded in open country in coastal lowlands, often near water, towns and cities. Birds are often sighted perched on overhead wires, and also in or over freshwater wetlands,	Unlikely This species is a rare vagrant to Australia and	PMST

Taxa	Common Name	Status		Description and habitat requirements	Likelihood of occurrence within the survey area	Source
		BC Act	EPBC Act			
				paperbark Melaleuca woodland, mesophyll shrub thickets and tussock grassland (DAWE 2020).	any use is irregular and opportunistic	
Apus pacificus	Fork-tailed Swift	Mi	Mi	In WA there are sparsely scattered records along the south coast, ranging from the Eyre Bird Observatory and west to Denmark. They are widespread in coastal and sub-coastal areas between Augusta and Carnarvon, including some on nearshore and offshore islands. This species is almost exclusively aerial, flying less than 1 m to at least 300 m above ground. This species is considered rare in the south-west region (DAWE 2020).	Unlikely This species is strictly areal very rarely utilising a terrestrial habitat	PMST
Mammals						
Dasyurus hallucatus	Northern Quoll	En	En	The Northern Quoll once occurred across the majority of northern Australia but its range has significantly contracted. It occurs in the Pilbara region but in disjunct populations. The Northern Quoll inhabits a range of vegetation associations but is especially abundant on dissected rocky escarpment and eucalypt woodland within 200 km of the coast. It is known to den in rock crevices and rock piles and favours rocky areas. They are predominantly nocturnal but are occasionally active during the day, particularly during the mating season and are known to have a large home range (Van Dyck and Strahan 2008).	Unlikely This species is known to occur in the local region. Rocky areas are prime habitat for this species which has limited presence within the survey area. There are no records within 5 km of the survey area. This species may occur in the area as an occasional visitor (foraging and dispersal).	PMST
Leggadina lakedownensis	Northern Short-tailed Mouse, Lakeland Downs Mouse	P4		The Lakeland Downs Mouse occupies a diverse range of habitats from the monsoon tropical coast to semiarid climates, including spinifex and tussock grasslands, samphire and sedgelands, Acacia shrublands, tropical Eucalyptus and Melaleuca woodlands and stony ranges. Most habitats, however, are seasonally inundated on red or white sandy-clay soils. They are nocturnal, largely solitary, and individuals spend the day in simple, single-chambered burrows (Van Dyck and Strahan 2008).	Likely There is one record within 5 km of the survey area. Suitable habitat is present.	NM
Macroderma gigas	Ghost bat	Vu	Vu	The Ghost Bat occurs in a wide range of habitats, and requires an undisturbed cave, deep fissure or disused mine shaft in which to roost. It is patchily distributed across Australia, and is sensitive to disturbance (Van Dyck and Strahan 2008).	Unlikely No caves are present in or around the survey area. The species is known north and east of Karratha due to caves and mine adits present.	PMST

Taxa	Common Name	Status		Description and habitat requirements	Likelihood of occurrence within the survey area	Source
		BC Act	EPBC Act			
Rhinonicteris aurantia (Pilbara form)	Pilbara leaf nosed bat	Vu	Vu	The Pilbara Leaf-nosed Bat roosts in deep caves or mines in the wet season and forages nearby. This species occurs in the Pilbara region where its populations are scattered and localised. There are a few known populations of this species in the western Pilbara, roosting in caves formed in gorges that dissect massive siliceous sedimentary geology. It is most often observed in flight over waterholes in gorges (Van Dyck and Strahan 2008). Optimal roosts are thought to occur in caves that form between ascending rock layers, where humidity is maintained from seeping groundwater (Van Dyck and Strahan 2008)	Unlikely No caves are present in or around the survey area. The species is known north and east of Karratha due to caves present.	PMST
Reptiles						
Liasis olivaceus subsp. barroni	Pilbara Olive Python	Vu	Vu	The Olive Python (Pilbara subspecies) is a dull olive-brown to pale fawn or rich-brown python with a white underside and pale finely dotted lips. This species reaches an average size of 2.5 m but can grow up to 4 m long. The Olive Python's range is restricted to the Pilbara region, north Western Australia, and the Dampier Archipelago. Habitat consists of rocky escarpments, gorges and waterholes within the Pilbara region. The preferred microhabitats for this species are under rock piles, on top of rocks, and under spinifex as well as in man-made features such as overburden heaps, railway embankments and sewerage treatment ponds. The species' breeding season occurs from June to August, with males moving long distances in search of breeding females (Wilson and Swan 2017).	Unlikely This species is known to occur locally and rocky habitat is considered suitable habitat however there are no permanent pools within the survey area. May occur opportunistically.	PMST
Notoscincus butleri	Lined soil-crevice skink (Dampier)	P4		*Notoscincus butleri* is a pale coppery-brown skink with bold black vertebral and dorsal stripes, broad black upper lateral stripes, white midlateral stripes and a narrow dark ventrolateral stripe. *Notoscincus butleri* range is restricted to arid, rocky areas of near-coastal Pilbara region. Habitat is found in spinifex dominated areas near creek and river margins (Wilson and Swan 2010).	Unlikely The low undulating rocky hills may be considered suitable habitat however there are no major creeks or rivers within the survey area.	NM

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