WESTERN
ENVIRONMENTAL

QUBE Bulk Depot Lot 3 (P0 715823) Great Northern Highway

Biological Surveys 2025

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QUBE Bulk Depot Lot 3 (P0 715823) Great Northern Highway

Biological Surveys 2025

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This report is intended to be read in its entirety, and sections or parts of this report should therefore not be read and relied on out of context.

WEPL will not be liable to update or revise this report to take into account any events or circumstances or facts becoming apparent after the date of this report.

Executive Summary

Western Environmental Approvals Pty Ltd (WEPL) was commissioned to undertake biological surveys comprising a detailed level flora and vegetation, targeted threatened and priority flora, and basic fauna surveys for Qube Bulk. The Site is located at Qube Bulk Depot at Lot 3 (P0 715823) Great Northern Highway, Pippingarra. The Survey Area encompassed approximately 41.70 ha. The data collected will be used to support a Native Vegetation Clearing Permit (NVCP).

The biological surveys included a:

- A desktop assessment of relevant databases and previous surveys.
- A detailed level flora and vegetation survey.
- Targeted surveys for Threatened and Priority flora.
- Targeted surveys for Threatened Ecological Communities (TECs) and Priority Ecological Communities (PECs).
- A basic fauna survey and likelihood of occurrence for Threatened or Priority fauna.

Biological surveys were undertaken across six person days sampling flora, fauna and vegetation from 29 April 2025 to 30 April 2025.

Flora and Vegetation

Flora of Conservation Significance

The pre-survey likelihood of occurrence assessment identified that of the 30 conservation listed flora species:

- Three were considered to have a high likelihood of occurrence.
- None were considered to have a medium likelihood of occurrence.
- Twenty-seven were considered to have a low likelihood of occurrence.

Post survey, one priority-listed flora species was identified:

- *Euploca mutica* (P3).

One priority species (*Euploca mutica* P3) was located within the Survey area in three locations with seven individuals identified.

One Declared Pest (**Calotropis procera*) was identified in two locations in the southern side of the Survey Area with two individuals recorded.

Threatened and Priority Ecological communities

The desktop assessment identified that three Priority Ecological Communities (PECs) occur within 100 km of the Survey Area. The pre survey assessment identified that all three of the communities have a low likelihood of occurrence.

There were no TECs, or PECs identified during the Survey.

Basic Fauna Survey

Three fauna habitat types were described. The habitat comprises of a mixture of spinifex shrubland (*Triodia* and *Acacia spp*.), weedy grassland and comparatively small areas of seasonally inundated claypans. The survey area is bounded by the seasonally flowing Turner River to the east.

Five fauna species were identified in the likelihood of occurrence assessment to have a high to medium likelihood of occurrence.

No species of conservation significance were recorded within the Survey Area.

The two species that had a high likelihood of occurrence were:

- *Falco hypoleucos* (grey falcon) VU.
- *Dasyurus hallucatus* (northern quoll) EN.

The three species that had a medium likelihood of occurrence were:

- *Falco peregrinus* (peregrine falcon) OS.
- *Dasycercus blythi* (brush-tailed mulgara) P4.
- *Macrotis lagotis* (bilby, dalgyte, ninu) VU.

There was no core habitat for any Threatened of Priority species recorded in the Survey Area.

Peregrine falcon and grey falcon are typically recorded via direct observation, neither were recorded within the Survey Area during the site assessment. Brush-tailed mulgara, northern quoll and bilby are reliably recorded via observation of digging, foraging and denning evidence, the targeted transect searches for observations of evidence were sufficient in confirming that no evidence is present within the Survey Area.

Table of Contents

1. Introduction 1

1.1 Project Background 1

1.2 Location 1

1.3 Objectives and Scope of Work 1

1.4 Relevant Legislation and Guidance 3

1.5 Survey Limitations and Constraints 3

2. Existing Environment 7

2.1 Climate and Rainfall 7

2.2 Interim Biogeographic Regionalisation for Australia 8

2.3 Geology and Soils 8

2.3.1 Geology systems 8

2.3.2 Soil Landscape Mapping 9

2.4 Pre-European Vegetation 11

2.4.1 Vegetation Association Mapping 11

2.5 Environmentally Sensitive Areas 13

2.6 Wetlands and Hydrology 13

3. Methodology 16

3.1 Desktop Assessment 16

3.1.1 Database Searches 16

3.1.2 Likelihood of Occurrence 16

3.2 Flora and Vegetation Survey 18

3.2.1 Field Survey and Timing 18

3.2.2 Floristic Sampling 18
3.2.3 Flora Taxonomy and Lodgement of Specimens 20
3.2.4 Vegetation Description and Classification 20
3.2.5 Vegetation Condition Assessment 20
3.3 Identification and Assessment of Significant Vegetation 21
3.3.1 Identification of Threatened and Priority Ecological Communities 21
3.4 Basic Fauna Survey 21
3.4.1 Fauna Habitat Type Assessment 22
3.4.2 Fauna Taxonomy 22
3.4.3 Targeted Transect Searches 22
4. Results 23
4.1 Desktop Assessment 23
4.1.1 Flora Desktop Assessment 23
4.1.2 Threatened and Priority Ecological Communities 25
4.2 Flora Survey 27
4.2.1 Flora 27
4.2.2 Threatened or Priority Flora 27
4.2.3 Flora of Other Significance 28
4.2.4 Introduced Species 28
4.3 Vegetation Mapping 30
4.3.1 Vegetation Types 30
4.3.2 Vegetation Condition 34
4.3.3 Threatened and Priority Ecological Communities 36
4.3.4 Vegetation of Other Significance 37
4.4 Fauna Desktop Assessment 38
4.4.1 Fauna assemblage 38

4.4.2 Fauna likelihood of Occurrence 38
4.5 Fauna Field Survey 41
4.5.1 Fauna Habitat Types 41
4.5.2 Threatened and Priority Fauna 44
5. Discussion 48
5.1 Flora and Vegetation 48
5.1.1 Flora of Conservation Significance 48
5.1.2 Vegetation Significance 48
5.2 Fauna Habitat Significance 48
References 50

Tables

Table 1: Limitations and Constraints of the Flora, Vegetation and Fauna Survey 4
Table 2: Geology Systems Intersecting the Survey Area (DPIRD-027) 9
Table 3: Soil Systems Intersecting the Survey Area (DPIRD-017) 9
Table 4: Pre-European Vegetation Intersecting the Survey Area (DPIRD-006) 11
Table 5: Pre-European Vegetation Association Representation 11
Table 6: Distance of ESA's and Conservation Areas to the Survey Area 13
Table 7: Distance of ESA and Conservation Areas to each Survey Area 13
Table 8: Database Searches 16
Table 9: Likelihood of Occurrence Criteria 17
Table 10: Survey Team and Timing 18
Table 11: Threatened and Priority Flora Species with High or Medium Likelihood of Occurrence 24
Table 12: TECs and PECs within 100km Buffer of Survey Area 25
Table 13: Introduced Species 29
Table 14: Vegetation Types and Descriptions 31
Table 15: Vegetation Condition of the Survey Area (as per EPA, 2016 condition scale) 34
Table 16: Threatened and Priority Ecological Communities Presence or Absence within the Survey Area 36
Table 17: Fauna Habitat Type Description within the Survey Area 42
Table 18: Summary of Habitat Value 49

Figures

Figure 1: Survey Area....2
Figure 2: Survey Effort and Sampling Locations....6
Figure 3: Geology and Soils....10
Figure 4: Vegetation Complexes....12
Figure 5: Environmentally Sensitive Areas, Conservation Estate and Bush Forever....14
Figure 6: Surface Water Features and Geomorphic Wetlands....15
Figure 7: DBCA Database Seach Results Flora and Communities (100 km Buffer)....26
Figure 8: Vegetation Types with Conservation Significant Flora Records....33
Figure 9: Vegetation Condition and Significant Weeds Location....35
Figure 10: DBCA Database Fauna Search Results....40
Figure 11: Fauna Habitat Types and Conservation Significant Fauna Observations....47

Appendices

Appendix A Legislation
Appendix B Definitions and Criteria
Appendix C Desktop Assessment and Likelihood of Occurrence Flora
Appendix D Quadrat Data Sheet
Appendix E Site x Species Matrix
Appendix F Fauna Database Search Results and Likelihood of Occurrence

1. Introduction

1.1 Project Background

Western Environmental Approvals Pty Ltd (WEPL) was commissioned by Right Foot Forward (RFF) on behalf of Qube Bulk to undertake biological surveys to collect baseline data on environmental values at the Qube Bulk Depot at Lot 3 (P0 715823) Great Northern Highway, Pippingarra. This biological survey report will support a Native Vegetation Clearing Permit (NVCP).

1.2 Location

The Qube Bulk Transport Depot in Port Hedland at Lot 3 (P0 715823) Great Northern Highway, Pippingarra, the entire site comprises the Survey Area and covers approximately 41.70 ha and is located 16.7 km east of Port Hedland (Figure 1).

1.3 Objectives and Scope of Work

The objective of the survey was to delineate key flora, fauna and vegetation values within the Survey Area.

The scope of work included:

- Desktop assessment of State and Commonwealth databases and other sources.
- Detailed flora and vegetation survey consistent with the Environmental Protection Agency's (EPA) Flora and Vegetation Technical Guidance.
- A targeted search for potentially occurring Threatened and Priority flora species undertaken in accordance with the EPA's Technical Guidance.
- Basic fauna survey consistent with the EPA's Fauna Survey Technical Guidance.
- Technical report including the results of the desktop assessment.

This report presents the results of the field survey undertaken to support the above objectives.

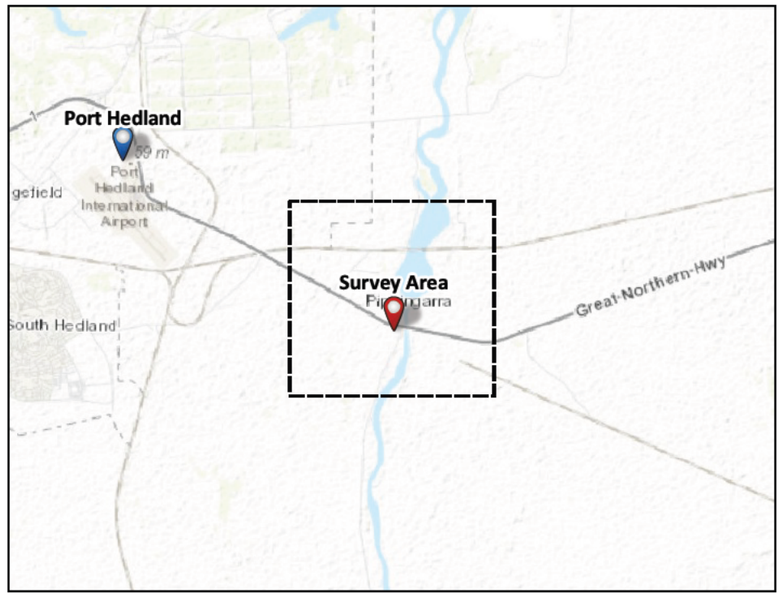

Figure 1: Survey Area Location

N

0 100 200 300 400 m

PROJECT/REPORT NAME	Detailed Flora and Fauna Survey Pippingarra WA 6722
SCALE	1:6,800
SHEET SIZE	A3 COLOUR
CLIENT	QUBE- Ports & Bulk
COORDINATE REFERENCE SYSTEM	GDA2020 / MGA zone 50
PROJECT NUMBER	A24.177
VERSION	0
DATA SOURCE	NEARMAPS
DRAWN BY / REVIEWED BY	JP/DR
DATE	20/5/2025

Legend

- Survey Area
- Cadastre (No Attributes) (LGATE-001)

No	Description	Drawn	Approved	Date
A	Original issue	JP	DR	20/5/2025

NOTES:

Cadastral boundary (LGATE-002). Base map ESRI Topo. Townsites (LGATE-248).

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1.4 Relevant Legislation and Guidance

This environmental assessment was conducted in accordance with Commonwealth and State legislation and guidelines:

- *Commonwealth Environment Protection and Biodiversity Conservation Act* 1999 (EPBC Act).
- *Western Australian Environmental Protection Act* 1986 (EP Act).
- *Western Australian Biodiversity Conservation Act* 2016 (BC Act).
- *Western Australian Biodiversity Conservation Regulations* 2018.
- Department of the Environment (DotE). (2013). *Matters of National Environmental Significance. Significant Impact Guidelines 1.1 - Environment Protection and Biodiversity Conservation Act* 1999.
- WA EPA. (2016). *Technical Guidance – Flora and Vegetation Surveys for Environmental Impact Assessment.* Known herein as the 'Flora and Vegetation Technical Guidance.'
- Department of Biodiversity Conservation and Attractions (DBCA) (2023) *Draft: Methods for survey and identification of Western Australian Threatened Ecological Communities.* Communities and Communities Program, DBCA.

A short description of key legislation is provided in Appendix A. Other definitions, including species and ecological community conservation categories, are provided in Appendix B.

1.5 Survey Limitations and Constraints

Limitations and constraints of the fauna, flora and vegetation survey as outlined in the *Flora and Vegetation and Fauna Survey Technical Guidance* (EPA, 2016) are detailed below in Table 1.

Table 1: Limitations and Constraints of the Flora, Vegetation and Fauna Survey

Possible Limitation	Degree of Limitation (Significant, Moderate or Negligible)	Potential Constraints on Survey Outcomes
Survey Level/ Scope	Negligible	The flora and vegetation survey, targeted flora survey and basic fauna survey is considered suitable based on species expected to be present and the extent and condition of vegetation/habitat present within the Survey Area. The level of information collected was suitable to provide information required to inform and support approvals and referrals.
Availability of contextual information at a regional and local scale	Negligible	All data required to complete the scope of works including regional and local contextual information was available. DBCA data was requested as part of the desktop assessment.
Site Access	Negligible	The Survey Area was readily accessed by vehicle and on foot.
Survey Intensity and Extent	Negligible	Suitable survey effort by experienced ecologists was applied. Survey effort included: Two (2) person days sampling for flora and vegetation assessment. Three quadrats and four relevès sampled. Two (2) person days of basic fauna survey. All planned Survey Areas were adequately sampled in line with the project scope of works. Due to some Cleared and Degraded areas across the Survey Area the targeted search effort was focused on Good or niche habitats. See Figure 2 for botanical and fauna survey effort, tracklogs and sampling locations.
Experience	Negligible	The ecologist leading the flora and vegetation field survey (Daniel Rubick) has been conducting flora and vegetation surveys in Western Australia for over 4 years, with over 4 years' experience in the Pilbara bioregion. The ecologist leading the fauna field survey (Jack Rogers) has been conducting fauna targeted assessments in Western Australia as well as Targeted Ornithological Surveys in the UK, with over 3 years' experience. Back-office support was provided by senior ecologists who have worked in the region for over 10 years.
Timing, weather, season	Negligible	The recommended primary survey period for flora and vegetation surveys for the region as per the EPA Technical Guidance occurs after the west season (March to June). The survey was completed at the end of April and beginning of May. Rainfall prior to the survey was above the long-term average (Graph 1. The temperatures and weather experienced during the field survey were not considered a limitation to the survey and did not affect the ability to record fauna or habitats.

Possible Limitation	Degree of Limitation (Significant, Moderate or Negligible)	Potential Constraints on Survey Outcomes
Proportion of the flora and fauna recorded and/or collected, and any identification issues	Negligible	A total of 92 flora species were recorded, including eight introduced species. The number of species collected and identified was considered good for this region and likely due to cyclone Zelia in February. There were no other factors considered a limitation to the survey. Species sampling was in line with the technical guidance for a detailed flora and vegetation and basic fauna.
Mapping Reliability	Negligible	The majority of the Survey Areas was traversed by foot and mapping reliability is considered high. Mapping accuracy and reliability was not considered a limitation.
Disturbances (fire, flood etc.)	Negligible	Areas of disturbance associated with historic clearing for transport facility and a recent cyclone in February was noted but were not a constraint on the results of the survey.

Figure 2: Survey Effort

N

0 75 150 225 300 m

SCALE	1:6,000
SHEET SIZE	A3 COLOUR
COORDINATE REFERENCE SYSTEM	GDA2020 / MGA zone 50
DATA SOURCE	NEARMAPS

PROJECT/REPORT NAME	Detailed Flora and Fauna Survey Pippingarra WA 6722
CLIENT	QUBE- Ports & Bulk
PROJECT NUMBER	A24.177
VERSION	0
DRAWN BY / REVIEWED BY	JP/DR
DATE	28/5/2025

Legend

- Survey Area
- Tracklog
- Quadrat
- Releve

No	Description	Drawn	Approved	Date
A	Original issue	JP	DR	28/5/2025

NOTES:

Cadastral boundary from LANDGATE 2022. Label corresponds to the vegetation association number.

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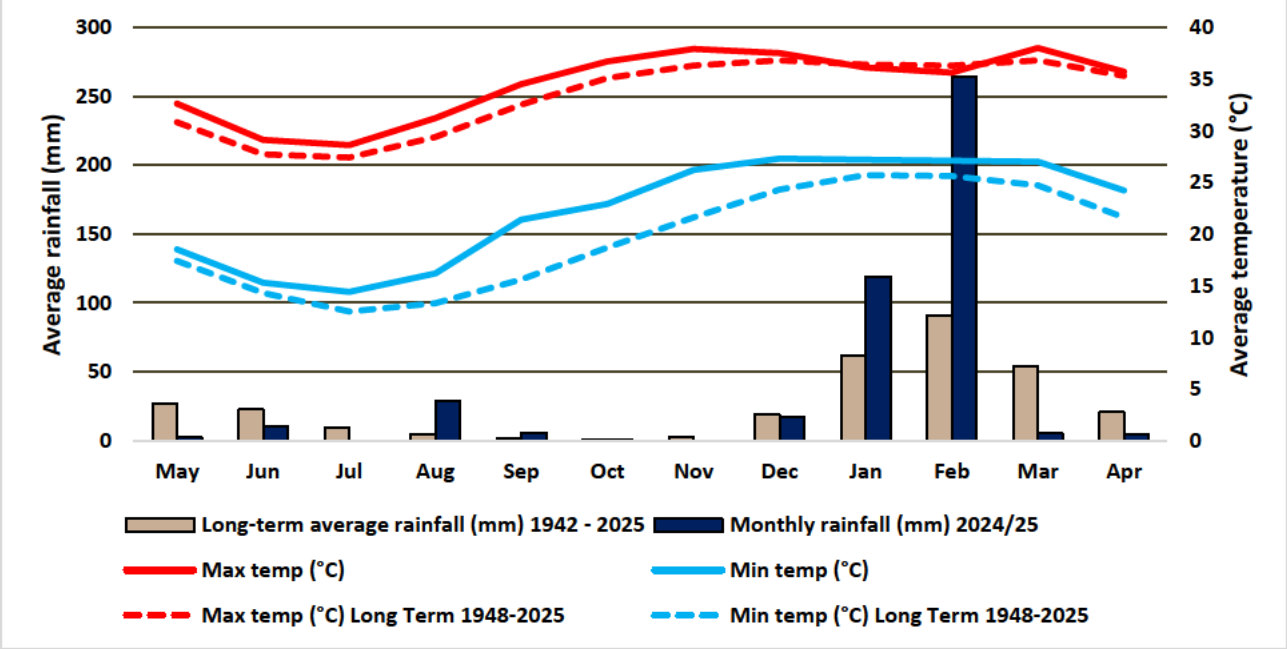
2. Existing Environment

2.1 Climate and Rainfall

Port Headland is characterized as an arid climate which experiences warm/dry winters and hot/humid summers with occasional tropical cyclones in the summer months. The majority of rainfall occurs in the summer months followed by an average of five to six cooler months of low rainfall. The Bureau of Meteorology (BoM) Port Hedland Airport recording station (ID004032) provides the closest long term weather data for the site. Mean daily maximum temperatures ranges from 27.4°C in July to 36.8°C in March and December (BoM, 2024). See summary of daily temperature statistics below in Graph 1.

The mean annual rainfall for Port Hedland Aero is 315 mm and in the 2024/2025 season presurvey was 459.4mm (144.4mm above average). Rainfall primarily falls during the months of Dec-July, with over 96.9% of annual mean rainfall occurring during these months (BoM, 2024). Mean monthly rainfall ranges between 0.9 mm in October to 90.5 mm in February (BoM, 2024). See summary of monthly rainfall statistics below in Graph 1.



Graph 1: Long-term and Monthly Total Rainfall, Maximum and Minimum Temperatures for Port Hedland Aero (Station 004032) (BOM, 2025)

2.2 Interim Biogeographic Regionalisation for Australia

The Interim Biogeographic Regionalisation of Australia (IBRA) divides Australia into 89 bioregions based on major biological, geographical and geological attributes. These bioregions are subdivided into 419 subregions as part of a refinement of the IBRA framework (Commonwealth of Australia, 2012). The Survey Area occurs within the Pilbara Biogeographic Region, subregion Roebourne (PIL04).

2.3 Geology and Soils

2.3.1 Geology systems

The soil landscape mapping units (DPIRD-027) intersecting the Survey Areas are listed below in Table 2 and shown in Figure 3.

Table 2: Geology Systems Intersecting the Survey Area (DPIRD-027)

Mapping Unit Symbol	Map Unit Name	Description
218Ua	Uaroo System	Broad sandy plains, pebbly plains and drainage tracts supporting hard and soft spinifex hummock grasslands with scattered acacia shrubs.
281Ri	River System	Broad sandy plains, pebbly plains and drainage tracts supporting hard and soft spinifex hummock grasslands with scattered acacia shrubs.

2.3.2 Soil Landscape Mapping

Soil Landscape Mapping Zones (DPIRD-017) by the Department of Primary Industries and Regional Development (DPIRD) indicates that the Site is mapped as being within the De Grey-Roebourne Lowlands Zone of the Pilbara soil-landscapes (Table 3).

Table 3: Soil Systems Intersecting the Survey Area (DPIRD-017)

Mapping Unit Zone	Map Unit Name	Description
281	De Grey-Roebourne Lowlands Zone	Alluvial plains and sandplains on alluvial and marine deposits over the northern Pilbara Craton with Red deep sandy duplexes, Red loamy earths, Red/brown non-cracking clays, Cracking clays, Red sandy earths and Red deep loamy duplexes.

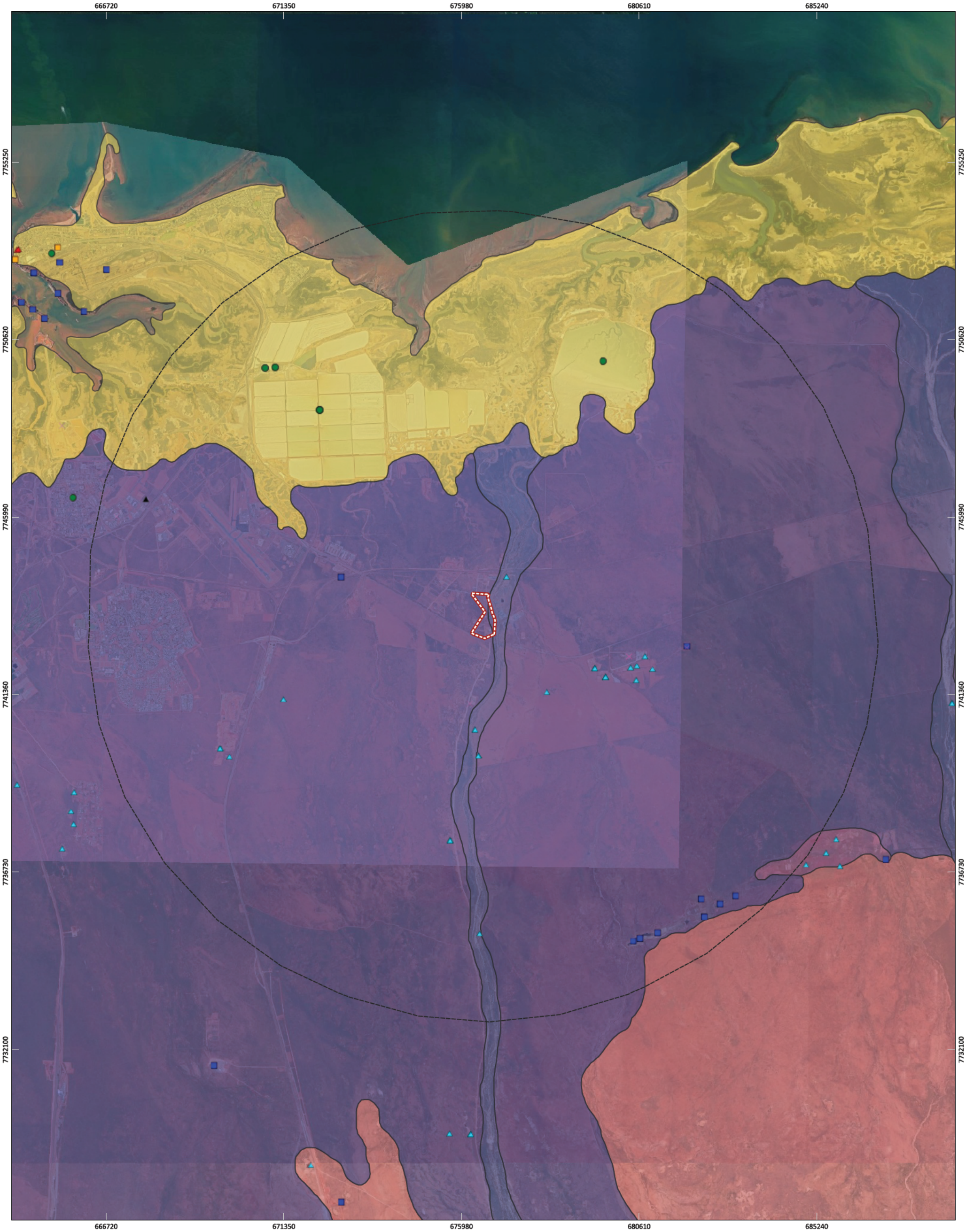


Figure 3: Geology and Soil (Topography)

0 1 2 km
N

SCALE: 1:92,600	SHEET SIZE: A3 COLOUR
COORDINATE REFERENCE SYSTEM: GDA2020 / MGA zone 50	PROJECT NUMBER: A24.177 / VERSION: 0
DATA SOURCE: LANDGATE AERIAL IMAGERY NOW	DRAWN BY / REVIEWED BY: JP/DR / DATE: 20/5/2025

PROJECT/REPORT NAME: Detailed Flora and Fauna Survey
Pippingarra WA 6722

CLIENT: QUBE- Ports & Bulk

Legend

Survey Area
10km Buffer

Soil Landscape Mapping
- Best Available (DPIRD-027)
- 281Bo
- 281Mc
- 281Ri
- 281Ro
- 281Ua
- 286Li

Minedex (DMIRS-001)
- BASE METAL
- CONSTRUCTION MATERIAL
- ENERGY
- INDUSTRIAL MINERAL
- IRON
- OTHER (MINEDEX NON-MINERALS)
- STEEL ALLOY METAL

No	Description	Drawn	Approved	Date
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NOTES:
Cadastral boundary (LGATE-002). Label corresponds to the vegetation association number.

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2.4 Pre-European Vegetation

2.4.1 Vegetation Association Mapping

During the 1970s, John Beard and associates conducted a systematic survey of native vegetation, describing the vegetation systems in Western Australia at a scale of 1:250 000 in the south-west and at a scale of 1:1,000,000 in less developed areas (Beard, 1976).

Beard's mapping attempted to depict the native vegetation as it was presumed to be at the time of settlement and is known as the pre-European vegetation type and extent. Beard's vegetation maps are maintained in digital form by DPIRD (2019). Extents are updated periodically by DBCA (GoWA, 2018). Pre-European vegetation associations are shown in Figure 4 and summarised in Table 4.

Table 4: Pre-European Vegetation Intersecting the Survey Area (DPIRD-006)

Vegetation Type	Description
ABYDOS PLAIN_589	Short bunch-grass savanna / Grass-steppe

The pre-European vegetation associations identified intersecting the Survey Areas and their pre-European and current extents are listed in Table 5 (GoWA, 2018).

Table 5: Pre-European Vegetation Association Representation

Vegetation Association	Original Extent (ha)	Current Extent (ha)	% Remaining	% Managed for Conservation
ABYDOS PLAIN_589	807,698.58	802,713.4	99.38	1.59

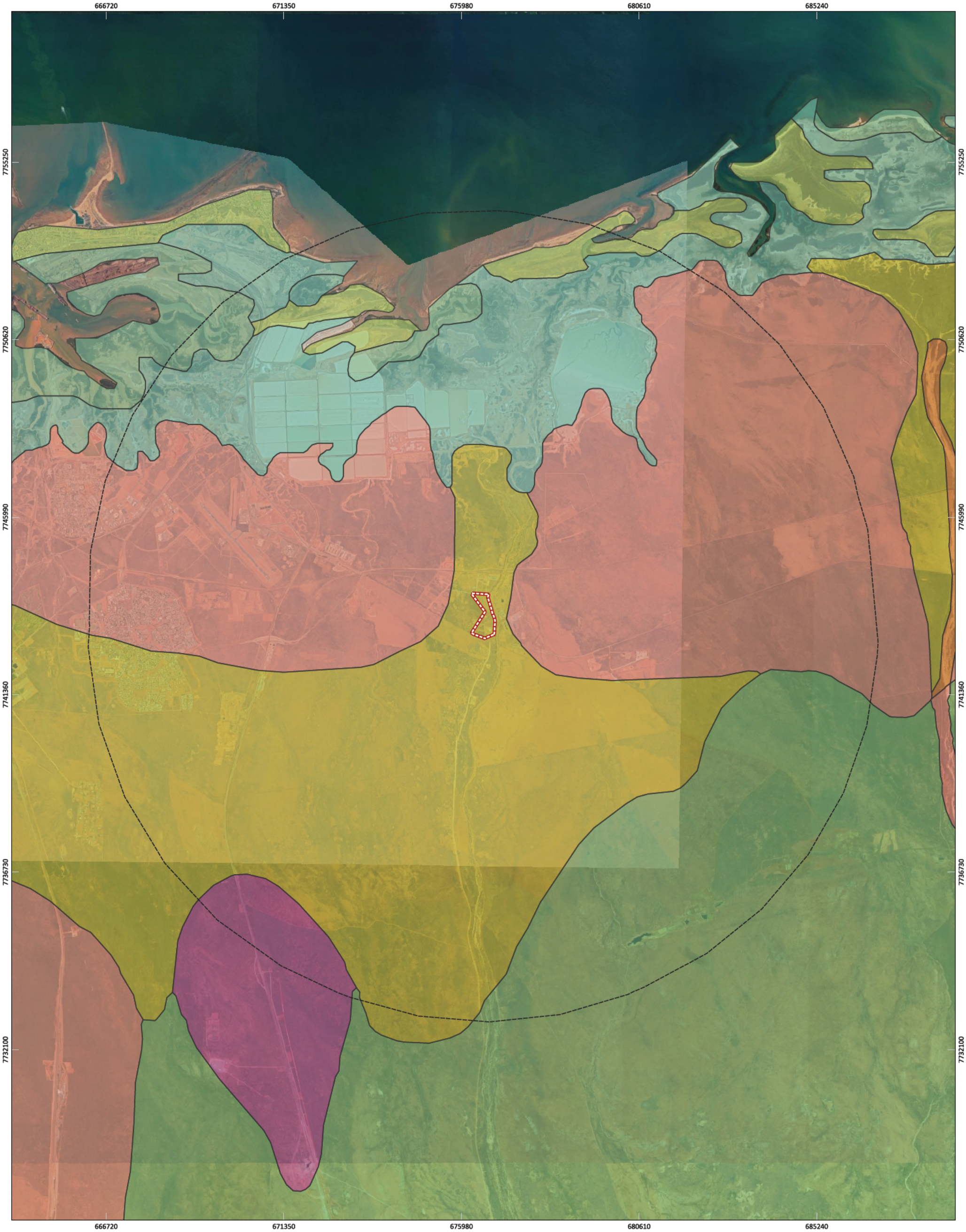

Figure 4: Pre-European Vegetation Type Mapping

N

0 1 2 km

PROJECT/REPORT NAME	Detailed Flora and Fauna Survey Pippingarra WA 6722
SCALE	1:92,600
SHEET SIZE	A3 COLOUR
CLIENT	QUBE- Ports & Bulk
COORDINATE REFERENCE SYSTEM	GDA2020 / MGA zone 50
PROJECT NUMBER	A24.177
VERSION	0
DATA SOURCE	LANDGATE AERIAL IMAGERY NOW
DRAWN BY / REVIEWED BY	JP/DR
DATE	20/5/2025

Legend

- Survey Area
- 10km Buffer

Pre-European Vegetation (DPIRD-006)

- ABYDOS PLAIN - CHICHESTER_619
- ABYDOS PLAIN - CHICHESTER_647
- ABYDOS PLAIN - CHICHESTER_93
- ABYDOS PLAIN_117
- ABYDOS PLAIN_127
- ABYDOS PLAIN_43
- ABYDOS PLAIN_589
- ABYDOS PLAIN_619
- ABYDOS PLAIN_647

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2.5 Environmentally Sensitive Areas

Environmentally Sensitive Areas (ESAs) are declared by the Department of Water and Environmental Regulation (DWER) to prevent the degradation of important environmental values such as Threatened Flora, Threatened Ecological Communities (TECs) or significant wetlands.

The Survey Area was not identified as intersecting an Environmentally Sensitive Area (DWER-046) or Conservation Area (DBCA-011). The nearest ESA's and Conservation Areas to the Survey Area are summarised below in Table 6 and shown in Figure 5.

Table 6: Distance of ESA's and Conservation Areas to the Survey Area

ESA (DWER-046)	Conservation Area (DBCA-011)
OID 3746: ESA, Leslie (Port Hedland) Salt fields System: 8.6 km northeast of the Survey area	OID 12879: Eighty Mile Beach Marine Park, 93.5 km northeast of Survey area
OID 7275 Spoil Bank Recreation Reserve: ESA, 14.3 km northwest of Survey area	-

2.6 Wetlands and Hydrology

The Survey Area does not intersect any wetlands listed under the Directory of Important Wetlands in Australia (DBCA-045). According to DWER Hydrography linear (DWER-031) the coastal waterline hydrology feature is 2.6km north of the Survey Area and connects with the Turner River that runs parallel to the Survey Area.

DWER Hydrology Catchment Tool (DWER-027) indicates that the Survey Area is within the Port Hedland Coast catchment (Basin No.709), and within the groundwater subareas (DWER-083) of Ashburton (ID182).

The nearest hydrological features to the Survey area are summarised below in Table 7 and shown in Figure 6.

Table 7: Distance of ESA and Conservation Areas to each Survey Area

Important Wetlands (DBCA-045)	Linear Hydrology (DWER-031)	Hydrology Catchments (DWER-027)
OID 66: ESA Leslie (Port Hedland) Salt fields System,: 8.6 km northeast of the Survey Area	OID 32886: Coastal Waterline from Turner River 2.6 km north of Survey Area	OID 34: Port Hedland Coast to the Indian Ocean.

Figure 5: Environmentally Sensitive Areas, Conservation Estate and Bush Forever

N

0 1 2 km

PROJECT/REPORT NAME: Detailed Flora and Fauna Survey Pippingarra WA 6722			
SCALE: 1:92,600	SHEET SIZE: A3 COLOUR	CLIENT: QUBE- Ports & Bulk	
COORDINATE REFERENCE SYSTEM: GDA2020 / MGA zone 50		PROJECT NUMBER: A24.177	VERSION: 0
DATA SOURCE: ESRI Topographic Map		DRAWN BY / REVIEWED BY: JP/DR	DATE: 20/5/2025

Legend

- Survey Area
- 10km Buffer
- Clearing Regulations - Environmentally Sensitive Areas (DWER-046)

No	Description	Drawn	Approved	Date
A	Original issue	JP	DR	20/5/2025

NOTES:

Cadastral boundary (LGATE-002). Label corresponds to the vegetation association number.

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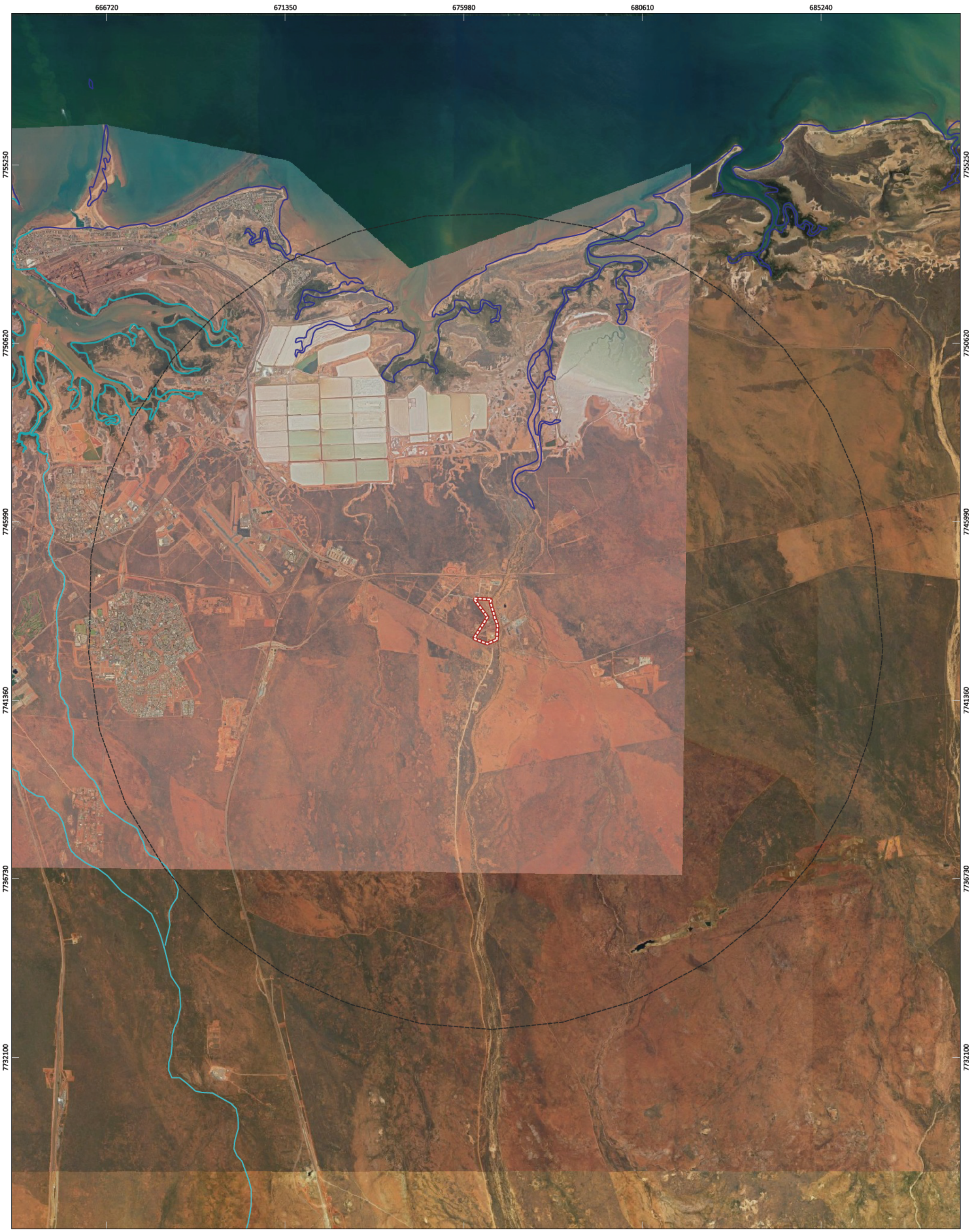

Figure 6: Surface Water Features and Geomorphic Wetlands

N

0 1 2 km

PROJECT/REPORT NAME	Detailed Flora and Fauna Survey Pippingarra WA 6722		
SCALE	1:92,600	SHEET SIZE	A3 COLOUR
CLIENT	QUBE- Ports & Bulk		
COORDINATE REFERENCE SYSTEM	GDA2020 / MGA zone 50	PROJECT NUMBER	A24.177
VERSION	0		
DATA SOURCE	LANDGATE AERIAL IMAGERY NOW	DRAWN BY / REVIEWED BY	JP/DR
DATE	20/5/2025		

Legend

- Survey Area
- 10km Buffer

Hydrography Linear (Hierarchy) (DWER-031)

- Coastal Waterline
- Estuarine
- Major Tributary
- Minor Tributary

No	Description	Drawn	Approved	Date
A	Original issue	JP	DR	20/5/2025

NOTES:

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3. Methodology

3.1 Desktop Assessment

3.1.1 Database Searches

Database searches of DBCA records were undertaken to compile a list of potential conservation significant flora, fauna and ecological communities previously recorded within or surrounding the Survey Areas (Table 8). In addition, an EPBC Protected Matters Search Tool (PMST) was undertaken to identify the potential for Matters of National Environmental Significance (MNES) to occur within or surrounding the Survey Area (DCCEEW, 2023).

Table 8: Database Searches

Database Name	Date Received and Reference Number	Search Type	Search Area
DBCA Threatened and Priority Fauna database search (Department of Biodiversity Conservation and Attractions, 2024a)	08/04/2025 46-0325FA	Threatened and Priority Fauna	50 km buffer around the Survey Areas
DBCA Threatened and Priority Flora database search (Department of Biodiversity Conservation and Attractions, 2024b)	08/04/2025 55-0325FL	Threatened and Priority Flora	100 km buffer around the Survey Areas
DBCA Threatened and Priority Ecological Communities database search (Department of Biodiversity Conservation and Attractions, 2024c)	19/04/2025, 15-0525EC	Threatened and Priority Ecological Communities	100 km buffer around the Survey Areas
Protected Matters Search Tool (Department of Agriculture Water and the Environment [DAWE], 2024)	14/04/2025	Commonwealth listed Threatened flora, fauna and Threatened Ecological Communities	50 km buffer around the Survey Areas

3.1.2 Likelihood of Occurrence

Conservation listed flora, fauna and ecological communities identified from the desktop assessment were assessed to determine the likelihood of their occurrence within the Survey Area, both prior to and post field survey. The assessment was completed based on the likelihood of occurrence criteria presented in Table 9.

Only species either recorded within the Survey Area or considered as having a high or medium likelihood of occurrence in post field survey assessment will be discussed in detail. Species classified as having a low likelihood of occurrence will not be discussed unless a justification for this classification is required.

The likelihood of occurrence assessment is contained within Appendix C for flora and Appendix F for fauna.

Table 9: Likelihood of Occurrence Criteria

Likelihood	Criteria
Recorded	Recorded in the Survey Area from database searches, previous survey by others or by current survey.
High	Records of flora species <5 km from the Survey Area. With record <30 years old. Records of fauna species <10 km from the Survey Area. With record <20 years old; or For species with well understood and specific habitat preference/ requirements, when specific habitat is present in the Survey Area, and records present <10 km from the Survey Area. Species with general habitat preference, which is present in the Survey Area, and records present <5 km from the Survey Area.
Medium	There are records <10 km from the Survey Area, however: The species is strongly linked to a specific habitat, which is marginally suitable or small in extent in the Survey Area; or Species has a general habitat preference, but small extent of suitable habitat is present. There is suitable habitat in the Survey Area, but records are >10 km from Survey Area.
Low	Records are historical only or are pre mapping procedures (e.g. records assigned to towns or place names). The species has a well understood and specific habitat preference/ requirements, which is absent from the Survey Area; or Suitable habitat is present, however there are no existing records of the species from the region despite reasonable previous search effort; or There is some suitable habitat in the Survey Area, however the species is very infrequently recorded in the locality (e.g. migratory bird species).

3.2 Flora and Vegetation Survey

3.2.1 Field Survey and Timing

The field survey was conducted over three days by the survey team listed in Table 10. The survey was conducted during the peak flowering period for the region Eremaean floristic region (EPA, 2016).

Table 10: Survey Team and Timing

Name	Position and years of Experience	DBCA Licence No.	Survey Dates
[redacted]	Senior Botanist, 4 years	FB62000688	29 April to 30 April

3.2.2 Floristic Sampling

A Detailed survey was undertaken to describe the values within the Survey Area. This included several sampling techniques as described below. All sampling methodologies were undertaken as per the guidance presented in EPA (2016).

Quadrat and Relevé Sampling

A total of three non-permanent flora quadrats were established within the Survey Area. Quadrats were only established in vegetation that was spatially large enough and where the vegetation was assessed as being in at least Good condition. All quadrats measured 50 m x 50 m (covering an area of 2,500 m2).

The following information was collected from within each quadrat:

- Observer.
- Date.
- Quadrat/site number.
- Global Position System (GPS) location (GDA2020; accuracy +/- 0.5 m) of the north-west corner.
- Digital photograph (spatially referenced with a reference number), taken from the north-west corner, looking diagonally across the quadrat.
- Broad soil type and colour.
- Topography.
- List of flora species recorded with height and total foliar cover within the quadrat for each species.
- National Vegetation Information System (NVIS) Vegetation description (NVIS Technical Working Group, 2017).
- Vegetation condition.

Four relevés were also recorded within the Survey Area to gather data on vegetation and condition. A relevé is an unmarked area within which the following data are generally collected: location, GPS coordinates and datum, list of species, vegetation structure, landform and soils, vegetation condition, period since the last fire, and description of disturbances.

The data collected in the quadrats and relevés is provided in Appendix D. Survey effort, including sampling locations and track logs, is presented in Figure 2.

Targeted Threatened and Priority Flora Survey

Searches were undertaken prioritising survey effort on areas of most suitable habitat for species identified as potentially present by the desktop assessment. Targeted searches were comprised of regularly spaced transects being walked at spacings of 50 metres through the most likely habitat. Any identified Threatened and Priority Flora was recorded by GPS, with population details and photographed.

Opportunistic Sampling

Species not captured in any quadrats or relevés were recorded and collected opportunistically to ensure all species within the Survey Area were captured. The full flora inventory is provided in Appendix E as a Site x Species matrix.

3.2.3 Flora Taxonomy and Lodgement of Specimens

Where field identification of plant taxa was not possible, specimens were collected for identification using resources of the Western Australian Herbarium (WAH). Identification of flora collections, including confirmations of Priority flora, was completed by Daniel Rubick. Non-typical specimens were submitted to the WAH and confirmed by WAH taxonomist (M. Hislop).

The finalised species list was checked against FloraBase (Western Australian Herbarium 2025) to determine the conservation status and known distribution of each taxon. Introduced species were compared against the current *Biosecurity and Agriculture Management Act 2007* (BAM Act) Declared Pest list (DPIRD, 2022) and the list of *Weeds of National Significance* (WoNS) (DAWE, 2022) to determine their control status.

Threatened and Priority Flora Report Forms (TPFRFs) were submitted to DBCA for new populations of conservation listed flora.

3.2.4 Vegetation Description and Classification

Vegetation was described from the quadrats and relevés, using the height and estimated cover of dominant and characteristic species of each stratum based on NVIS, recorded at Level V (NVIS Technical Working Group, 2017). Up to three species per stratum from each stratum (upper, mid and ground) were used to formulate vegetation descriptions for each relevé and each vegetation type. Vegetation types were defined by observation of species dominance and structural composition by the field survey team.

Statistical analysis was undertaken to assist in defining floristic groups and defining associations with Floristic Community Types, as per Gibson et al. (1994).

3.2.5 Vegetation Condition Assessment

Vegetation condition mapping was undertaken as per the requirements of EPA (2016). Delineation and mapping of vegetation condition within the Survey Area included critical review of sampling data (quadrats, relevés and mapping notes), vegetation mapping and aerial photography (i.e. delineation of tracks and cleared areas). Polygon boundaries for vegetation condition were digitised using the QGIS package.

3.3 Identification and Assessment of Significant Vegetation

3.3.1 Identification of Threatened and Priority Ecological Communities

Threatened and Priority communities' presence were assessed as per guidance in:

- Methods for survey and identification of Western Australian threatened ecological communities by DBCA, (2023a) and
- Listing in the Priority Ecological Communities for Western Australia version 35 by DBCA, (2023b).
- Where applicable Commonwealth Approved Conservation Advice including Listing Advice is also applied for EPBC Act listed communities.

3.4 Basic Fauna Survey

The basic fauna survey incorporated a number of survey techniques as per the *Terrestrial Fauna Technical Guidance* (EPA, 2020). A basic survey is a low-intensity survey, conducted at the local scale to gather broad fauna and habitat information. The primary objectives are to verify the overall adequacy of the desktop study, and to map and describe habitats, with a focus on habitat for conservation listed fauna.

Fauna species were identified by active searches, secondary evidence such as scats, tracks, calls, remains, diggings and other signs. A fauna inventory was not compiled as part of this survey (not required under basic level survey) however observations are used to inform the fauna habitat type assessment.

The fauna survey was undertaken by one ecologist on the 29 - 30 April 2025, totalling a two-person days of survey effort.

Potential habitats for conservation listed species were identified and evaluated and the likelihood of occurrence assessed.

3.4.1 Fauna Habitat Type Assessment

The fauna habitat types present within the Survey Area were defined considering landform, vegetation, structure such as rockpiles and logs and fauna assemblage occupying the area.

The following information was used to define and map all fauna habitat types within the Survey Area at specific fauna habitat assessment points and during traverses of the Survey Area:

- Land systems and landform.
- Vegetation type and condition mapping.
- Soil characteristics.
- Structure such as rockpiles and logs.
- Fauna assemblage information from desktop assessment and field observations.
- Aerial imagery and historic imagery.

Each fauna habitat type is described considering suitability for various fauna species groups or conservation listed species. In addition, the fauna habitat type's likelihood to harbour specialised fauna species which are not found in adjacent areas was taken into consideration. Habitat types were delineated in the field and digitised upon return from the field survey.

3.4.2 Fauna Taxonomy

Terrestrial vertebrate fauna taxa were identified in the field by an experienced ecologist.

Taxonomy and nomenclature follow the *WA Museum checklist 2024* (Western Australian Museum [WAM], 2024). Conservation status follows the DBCA Threatened and Priority fauna list (DBCA, 2024). Where required verification of identification of secondary evidence (tracks, scats, diggings) may be undertaken by a relevant species group expert.

3.4.3 Targeted Transect Searches

Targeted transect searches were undertaken to search for evidence of Threatened and Priority fauna species. Searches were undertaken prioritising survey effort on areas of most suitable habitat for species identified as potentially present by the desktop assessment. Threatened mammal species including bilby, northern quoll and brush tailed mulgara are reliably detected from their foraging and denning evidence (scats, digging evidence and burrow entrances). Absence of foraging and denning evidence of these species is a reliable metric for determining species absence within an area. Targeted searches were comprised of regularly spaced transects being walked at spacings of 20-30 metres through the most likely habitat. Any identified Threatened and Priority Flora was recorded by GPS, with population details and photographed. Survey Effort for fauna transects is shown in Figure 2.

4. Results

4.1 Desktop Assessment

4.1.1 Flora Desktop Assessment

DBCA database and PMST searches identified 30 conservation-listed flora species as occurring within 100 km. These species are either found within 100 km of the Survey Area or have the potential to occur in the region as identified by PMST searches (Figure 7).

No previous records are present within the Survey Area. See Appendix C for full database search results and likelihood of occurrence assessment. The likelihood of occurrence assessment identified that post survey all species had low likelihood of occurrence.

Likelihood of Occurrence

The pre-survey likelihood of occurrence assessment identified that of the 30 conservation listed flora species:

- Three were considered to have a high likelihood of occurrence.
- None were considered to have a medium likelihood of occurrence.
- Twenty-seven were considered to have a low likelihood of occurrence.

Post-survey two of the species with high likelihood of occurring were reclassified as low and one (*Euploca mutica*) was recorded.

Species with a pre-survey likelihood of occurrence of high are discussed below in Table 11.

Table 11: Threatened and Priority Flora Species with High or Medium Likelihood of Occurrence

Species	Conservation Status		Source		Flowering period	Preferred habitat	Habitat Occurs Within the Survey Area	Record distance	Record age	Pre-Survey Likelihood of Occurrence	Post-Survey Likelihood of Occurrence
	DBCA	EPBC	PMST	DBCA							
***Tephrosia rosea* var. *Port Hedland* (A.S. George 1114)**	P1			X	Jul-Sep	Sandy plain. Red Sand	Yes	4.6km	2011	High	Low
Euploca mutica	P3			X	Aug	Plains. Flat red silt sand on a low-lying floodplain.	Yes	4.4km	1997	High	Recorded
Rothia indica* subsp. *australis	P3			X	Mar-May	Sandy soils. Sandhills and sandy flats.	Yes	0.2km	2011	High	Low

4.1.2 Threatened and Priority Ecological Communities

The desktop assessment identified that three Priority Ecological Communities (PECs) occur within 100 km of the Survey Area (Figure 7). The pre survey assessment identified that of the three communities:

- None of the PECs have a buffered occurrence indicated by DBCA as being <5 km away and none were assessed as having a high likelihood of occurrence.
- None of the PECs have a buffered occurrence indicated by DBCA as being <10 km away and none were assessed as having a medium likelihood of occurrence.
- Three have a low likelihood of occurrence.

The TEC and PEC communities within 100 km Buffer of Survey Area are listed in Table 12.

Table 12: TECs and PECs within 100km Buffer of Survey Area

Community ID	Community Name	Status	DBCA Description of Habitat	Likelihood
Eighty Mile Land System	Eighty Mile Land System	P3	Beach foredunes, longitudinal coastal dunes and sandy plains with tussock grasslands and spinifex grasslands.	Low
Gregory LS	Gregory Land System	P3	Linear dunes and restricted sandplains supporting shrubby hard spinifex (and occasionally soft spinifex) grasslands.	Low
Horse flat Land System	Horse flat Land System of the Roebourne Plains	P3	The Horseflat Land System (Roebourne Plains) land units forming extensive clay plains dominated by tussock grasslands on mostly alluvial, red clay loams gilgaied and non-gilgaied for this community. The community is dominated by perennial tussock grasses include *Eragrostis xerophila* (Roebourne Plains grass), *Chrysopogon fallax* (ribbon grass) and other *Eragrostis* spp. and *Eriachne* spp. The community also supports a suite of annual grasses including *Dichanthium* spp. and *Sorghum* spp.. The community extends from Peedamulla to Balla Balla surrounding the towns of Karratha and Roebourne.	Low

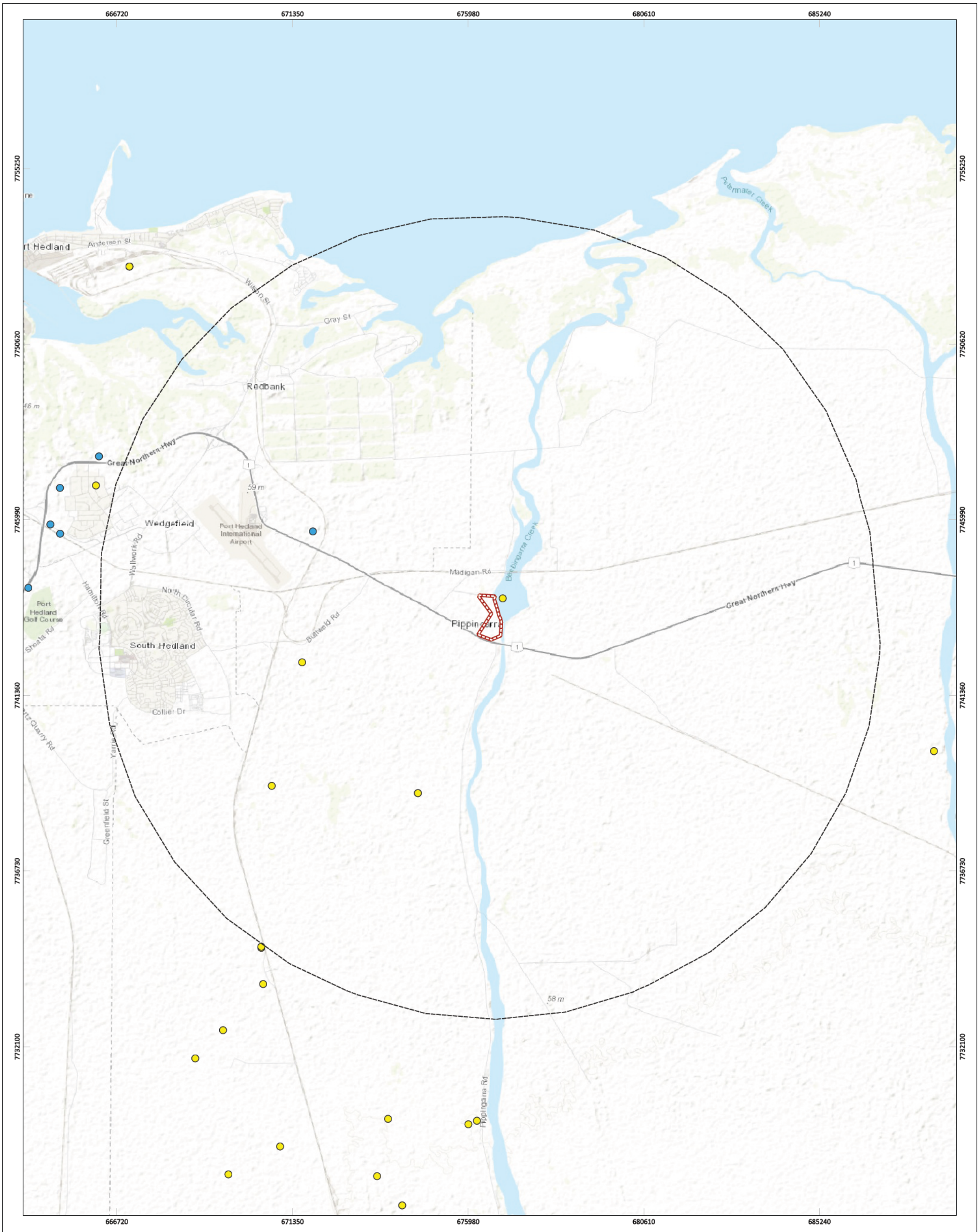

Figure 7: DBCA Database Search Results Flora and Communities

0 1 2 km

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PROJECT/REPORT NAME	Detailed Flora and Fauna Survey Pippingarra WA 6722
SCALE	1:92,600
SHEET SIZE	A3 COLOUR
CLIENT	QUBE- Ports & Bulk
COORDINATE REFERENCE SYSTEM	GDA2020 / MGA zone 50
PROJECT NUMBER	A24.177
VERSION	0
DATA SOURCE	ESRI Topographic Map
DRAWN BY / REVIEWED BY	JP/DR
DATE	21/5/2025

Legend

- Survey Area
- 10km Buffer

DBCA Threatened and Priority Flora

- Priority 1
- Priority 2
- Priority 3

No	Description	Drawn	Approved	Date
A	Original issue	JP	DR	21/5/2025

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4.2 Flora Survey

4.2.1 Flora

A total of 92 vascular flora species, including eight introduced species, were recorded from within the Survey Area from three quadrats, four relevés and opportunistic observations.

The families with the highest number of taxa were *Fabaceae* (22 taxa), *Poaceae* (11 taxa) and *Amaranthaceae* (5 taxa). The most recorded genera were *Acacia* (7 taxa) and *Goodenia* (3 taxa). These families and genera are typical and common for the locality.

A site by species matrix and inventory of flora recorded is provided in Appendix E.

4.2.2 Threatened or Priority Flora

No Threatened flora were identified during the survey or have previously been recorded within the Survey Area. One priority species (*Euploca mutica* P3) was located within the Survey area in three locations with seven individuals identified (Figure 8).

The *Euploca mutica* (P3) is a low shrub that grows up to 0.6 m high. It has white flowers, and it located in the Port Hedland region with a priority 3 flora status (WAH 1998) (Plate 1 and Plate 2).

The post-survey likelihood of occurrence assessments found that all other threatened, or priority flora species had low likelihood of occurring.

Plate 1: *Euploca mutica* (P3) in flower (Left image)

Plate 2: *Euploca mutica* (P3) structure (Right image)

4.2.3 Flora of Other Significance

Flora may be considered of other conservation significance if it is a novel taxon or represents a range extension.

No species were identified as representing range extensions or flora of other significance.

4.2.4 Introduced Species

A total of eight introduced taxa were recorded within the Survey Area. These are listed in Table 13 along with their status under the BAM Act or WoNS listing.

One species recorded, *Calotrope* (**Calotropis procera*), is listed as a Declared Pest listed under the BAM Act. This species is discussed further below (Plate 3, Plate 4).

Calotrope (**Calotropis procera*) is a shrub or tree that grows to 1-4 m high and flowers cream, white and purple. The *Calotrope* flowers from January to December and is often identified on sandy or clayey soils (WAH 1998).

Plate 3: Calotrope (*_Calotropis procera_*) in flower (left image)

Plate 4: Calotrope (*_Calotropis procera_*) structure (Right image)

Table 13: Introduced Species

Taxon	Common Name	Status Under BAM Act/WoNS
Aerva javanica	Kapok Bush	
Calotropis procera	Calotrope	Declared Pest, WoNS
Indigofera sessiliflora	-	
Macroptilium atropurpureum	Purple Bean	
Stylosanthes hamata	Verano Stylo	
Vachellia farnesiana	Mimosa Bush	
Cenchrus setigerus	Birdwood Grass	
Portulaca oleracea	Purslane	

4.3 Vegetation Mapping

4.3.1 Vegetation Types

A total of three vegetation types were identified within the Survey Area. These are described in Table 14. A majority of the Survey Area is pindan plain (VT01) with almost half of the Survey Area cleared for a truck hardstand and transport facility. There were two small patches of quartzite depression (VT02) to the southwest of the Survey Area. There were also two patches of riparian vegetation (VT03) characterized by an upper storey of *Eucalyptus victrix* in the centre of the Survey Area on the edge of the Turner River (Table 14).

Table 14: Vegetation Types and Descriptions

Vegetation Unit Description	Vegetation Condition	Sampling Sites	Area and Proportion	Representative Photo
Veg Code: VT01 **Description: Pindan Plains.** **A closed mid hummock grassland characterized by a sparse canopy covering of Corymbia flavescens with a mid-level of *Acacia inaequilatera* and **Vachellia farnesiana* over a low closed tussock grassland stratum of *Triodia epactia, Arivela viscosa* and *Goodenia microptera*.** **In Good or Very Good condition to the South of the Survey Area and Degraded condition with cattle presence and grazing to the north of the Survey Area.**	Very Good to Completely Degraded	Q01, Q02, Q03, R03 and R04	16.68 ha 40.02 %	
Veg Code: VT02 **Description: Quartzite depression.** **A quartzite depression with a fringing low, open upper storey of *Melaleuca leucadendra, Acacia trachycarpa* and *Acacia colei* var. *colei* with a mid-stratum of *Acacia stellaticeps* and a low sedge and mixed herb stratum of *Schoenoplectus laevis, Alternanthera angustifolia* and *Dysphania plantaginella*.** **Degraded with signs of clearing of the edges and some mechanical equipment.** **Occurs in open depressions or lower slopes with a light covering of quartz in red soil.**	Degraded	R01	0.65 ha 1.55 %	

Vegetation Unit Description	Vegetation Condition	Sampling Sites	Area and Proportion	Representative Photo
Veg Code: VT03 **Description: Riparian vegetation** **A mid open forest of *Eucalyptus victrix* with a mid-stratum *Acacia colei* var. *colei, Corchorus incanus* subsp. *incanus* and *Tephrosia* sp. B Kimberley Flora (C.A. Gardner 7300) and a low, sparse herb stratum of **Cenchrus setigerus, Indigofera linifolia* and Amaranthus undulatus.** **In a Degraded condition with disturbance from clearing, cattle presence and grazing.**	Degraded	R02	1.26 ha 3.02 %	
Cleared areas	-	-	23.11 ha 55.41 %	
Total			41.70 ha 100%	

Figure 8: Vegetation Types and Conservation Significant Flora Records

N

0 50 100 150 m

SCALE: 1:4,300	SHEET SIZE: A3 COLOUR	CLIENT: QUBE- Ports & Bulk
COORDINATE REFERENCE SYSTEM: GDA2020 / MGA zone 50	PROJECT NUMBER: A24.177	VERSION: 0
DATA SOURCE: NEARMAPS	DRAWN BY / REVIEWED BY: JP/DR	DATE: 20/5/2025

PROJECT/REPORT NAME: Detailed Flora and Fauna Survey
Pippingarra WA 6722

Legend

- Survey Area

Flora Observation

- Priority 3: Poorly-known species - known from several locations (Euploca mutica)

Vegetation Type

- Cleared
- VT01 - Pindan sand plain
- VT02 - Quartzite depression
- VT03 - Riparian sumpland

No	Description	Drawn	Approved	Date
A	Original issue	JP	DR	20/5/2025

NOTES:

Cadastral boundary (LGATE-002). Label corresponds to the vegetation association number.

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4.3.2 Vegetation Condition

The vegetation within the Survey Area ranged from Very Good to Completely Degraded condition with the majority of the Survey Area being either cleared or on a spectrum from Very Good to Degraded. See Table 15 and Figure 9 for details. The Survey Area has been affected by degrading factors including clearing, cattle and weed invasion.

Table 15: Vegetation Condition of the Survey Area (as per EPA, 2016 condition scale)

Vegetation Condition	Extent (ha)	Extent (%)
Excellent	-	-
Very Good	5.88	14.15
Good	1.62	3.88
Poor	5.74	13.76
Degraded	3.93	9.42
Completely Degraded	1.41	3.38
Cleared	23.11	55.41
Total	41.70	100

Figure 9: Vegetation Condition and Significant Weeds within the Survey Area

N

0 50 100 150 m

SCALE: 1:4,300	SHEET SIZE: A3 COLOUR
PROJECT/REPORT NAME: Detailed Flora and Fauna Survey Pippingarra WA 6722	
CLIENT: QUBE- Ports & Bulk	
COORDINATE REFERENCE SYSTEM: GDA2020 / MGA zone 50	PROJECT NUMBER: A24.177 / VERSION: 0
DATA SOURCE: NEARMAPS	DRAWN BY / REVIEWED BY: JP/DR / DATE: 28/5/2025

Legend

- Survey Area

Vegetation Condition

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

Weed Observation

- Declared Pest
  - Cp - Calotropis procera

No	Description	Drawn	Approved	Date
A	Original issue	JP	DR	28/5/2025

NOTES:

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4.3.3 Threatened and Priority Ecological Communities

There were no TECs, or PECs identified by the survey and none were assessed as potentially or likely occurring by the likelihood of occurrence assessment (Table 16).

Threatened and Priority communities' presence were assessed as per guidance in Methods for survey and identification of Western Australian threatened ecological communities by DBCA, (2023a) and as per listing in the Priority Ecological Communities for Western Australia version 35 by DBCA, (2023b). Where applicable Commonwealth Approved Conservation Advice including Listing Advice is also applied for EPBC Act listed communities.

Table 16: Threatened and Priority Ecological Communities Presence or Absence within the Survey Area

Community Name	State Listed	EPBC Listed	Presence/Absence	Justification
Eighty Mile Land System	P3	-	Absent	Low, Located 25km northeast of the Survey Area along the coastal flats. The Survey Area does not contain coastal flats flora or geology.
Gregory Land System	P3	-	Absent	Low, Located 60km southwest of the Survey Area on higher topography and a specialised land system that is not present within the Survey Area.
Horse flat Land System of the Roebourne Plains	P3	-	Absent	Low, Located 90km west of the Survey Area on a specialised land system not located within the Survey Area.

4.3.4 Vegetation of Other Significance

As per the Flora and Vegetation Technical Guidance and EPA guidance, vegetation may be considered of significance for a range of reasons, other than a listing as a TEC or a PEC, including:

- Pre-European vegetation extent being below a threshold level.
- Scarcity.
- Unusual species.
- Novel combinations of species.
- A role as a refuge.
- A role as a key habitat for threatened species or large populations representing a significant proportion of the local to regional total population of a species.
- A restricted distribution.

No vegetation types of other significance were identified as occurring.

4.4 Fauna Desktop Assessment

4.4.1 Fauna assemblage

Desktop assessment for Conservation Significant Fauna species for which records exist within surrounding 50 km based on searches of DBCA databases and EPBC PMST.

As per the scope of a basic fauna survey under the Technical Guidance the primary objectives are to verify the overall adequacy of the desktop study, and to map and describe habitats, with a focus on habitat for conservation listed fauna.

A desktop assessment of expected conservation significant fauna assemblage was undertaken through searches of DBCA database records and the EPBC PMST, shown in Figure 10. Results are summarised in Appendix F.

Database searches identified 58 conservation listed fauna species that potentially occur, or habitat likely occurs within the Survey Area, comprising:

- Forty-seven bird species.
- Nine mammal species.
- Two reptile species.

Species listed as Marine only under the EPBC Act (e.g. sharks, whales, turtles) as well as pelagic seabirds (Albatrosses, petrels, prions, shearwaters and frigatebirds) have been excluded from the likelihood of occurrence list as there is no marine habitat present.

4.4.2 Fauna likelihood of Occurrence

The likelihood of occurrence for conservation listed fauna species found that:

- Two species had a high likelihood of occurrence.
- Three species had a medium likelihood of occurrence.
- Fifty-three species had a low likelihood of occurrence.

The species that had a high likelihood of occurrence were:

- *Falco hypoleucos* (grey falcon) VU
- *Dasyurus hallucatus* (northern quoll) EN

The species that had a medium likelihood of occurrence were:

- *Falco peregrinus* (peregrine Falcon) OS
- *Dasycercus blythi* (brush-tailed mulgara) P4
- *Macrotis lagotis* (bilby, dalgyte, ninu) VU

The species assessed as low likelihood of occurrence are species that are locally extinct, have no recent records or for which no suitable habitat is present (e.g. wading birds). Species recorded or assessed as having a high or medium likelihood of occurrence are discussed in detail in Section 4.5.2.

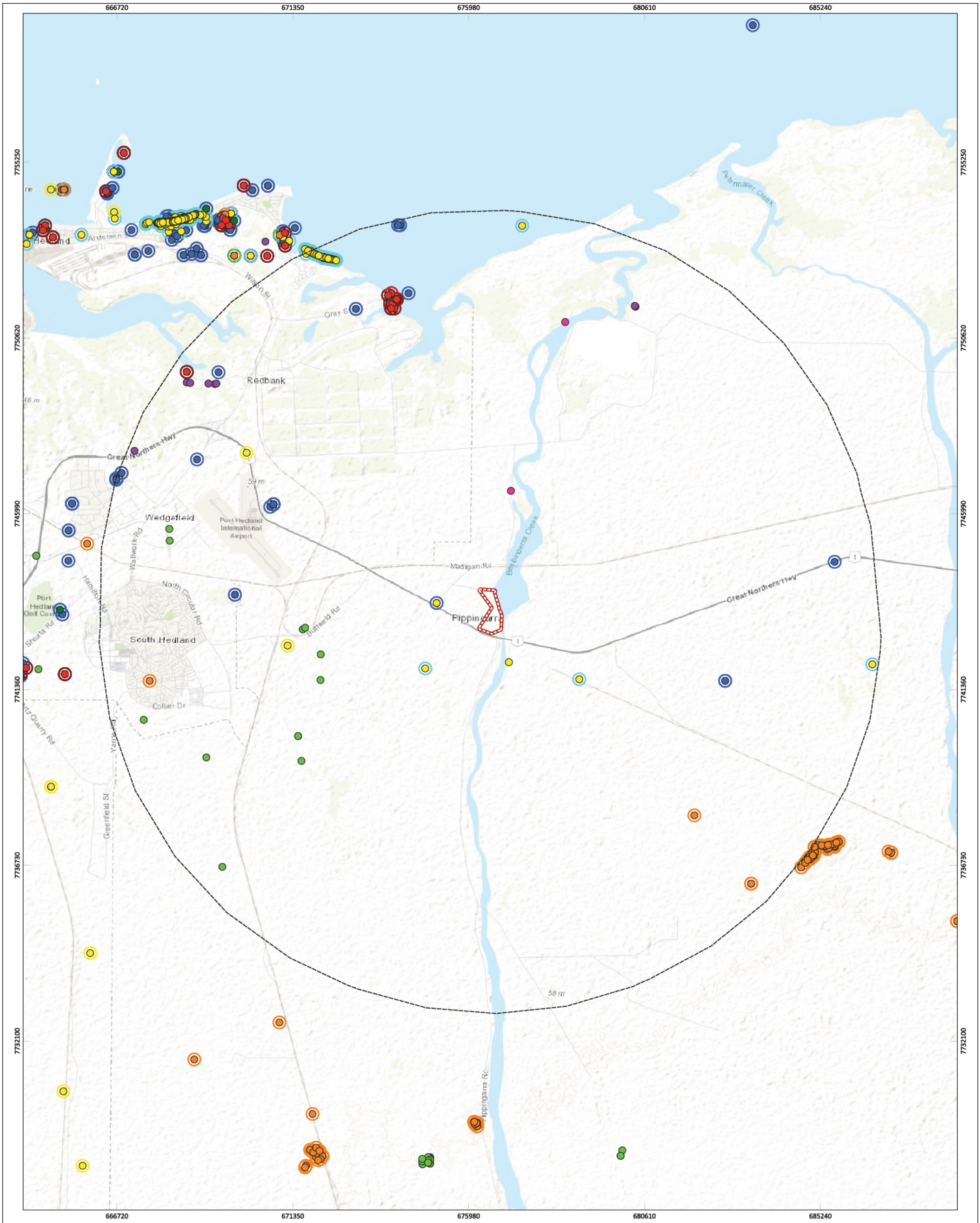

Figure 10: DBCA Database Search Results Fauna

0 1 2 km N		PROJECT/REPORT NAME: Detailed Flora and Fauna Survey Pippingarra WA 6722	
SCALE: 1:92,600	SHEET SIZE: A3 COLOUR	CLIENT: QUBE- Ports & Bulk	
COORDINATE REFERENCE SYSTEM: GDA2020 / MGA zone 50		PROJECT NUMBER: A24.177	VERSION: 0
DATA SOURCE: ESRI Topographic Map		DRAWN BY / REVIEWED BY: JP/DR	DATE: 28/5/2025

Legend

- Survey Area 10km Buffer

DBCA Threatened and Priority Fauna (EPBC Status)
- Critically endangered species
- Critically endangered and migratory species
- Endangered species
- Endangered and migratory species
- Vulnerable species
- Vulnerable and migratory species
- Migratory species

DBCA Threatened and Priority Fauna (WA Status)
- Critically endangered species
- Endangered species
- Vulnerable species
- Priority 1
- Priority 3
- Priority 4
- Priority 4 and migratory species
- Migratory species
- Other specially protected species

No	Description	Drawn	Approved	Date
A	Original issue	JP	DR	28/5/2025

NOTES:

Cadastral boundary (LGATE-002). Label corresponds to the vegetation association number.

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4.5 Fauna Field Survey

4.5.1 Fauna Habitat Types

Three fauna habitat types were described. These broadly align with the mapped vegetation type boundaries. The fauna habitat types are described below in Table 17and shown in Figure 11.

For possibly occurring conservation listed fauna species, habitat types are assessed as either core, supporting or non-significant habitat. As per *Commonwealth Matters of National Environmental Significance – Significant Impact Guidelines 1.1* "core" habitat is defined as that critical to the survival of the species and considered to contain denning/ breeding sites, primary foraging areas and refuge from drought, fire and other stresses (DotE, 2013). "Supporting" habitat is defined as that which is likely used for foraging and dispersing/ connective purposes but is not essential habitat for the continuation of a local population. "Non-significant" habitat is that which would be used only very infrequently for foraging or dispersing.

Table 17: Fauna Habitat Type Description within the Survey Area.

Fauna Habitat Type	Habitat Description	Total Area, Proportion of the Survey Area (ha)	Representative Photo
FHT-01 ***Triodia* and *Acacia* Scrubland**	Closed mid hummock grassland characterized by a mid-level of *Acacia inaequilatera* over a closed lower stratum of *Triodia epactia* . Surface geology of typical pindan soil type; loamy red soil. Large termite mounds and anthills occasionally present. No core habitat for all species. Supporting habitat for: grey falcon peregrine falcon bilby brush-tailed mulgara northern quoll	6.2 14.86 %	
FHT-02 **Weedy Grassland**	Closed grassland of invasive buffel grass (*Cenchrus ciliaris*) interspersed with species found in FHT-01 and FHT-03. Surface geology of typical pindan soil type; loamy red soil. Large termite mounds and anthills occasionally present No core habitat for all species. Supporting habitat for: grey falcon peregrine falcon bilby brush-tailed mulgara northern quoll	8.3 19.91 %	

Fauna Habitat Type	Habitat Description	Total Area, Proportion of the Survey Area (ha)	Representative Photo
FHT -03 **Claypans**	A seasonally inundated are of claypans with sparse cover of smooth-barked coolibah (*Eucalyptus victrix*) with a mid-stratum acacia. Surface geology consisted of cracked clay at the time of the Survey. No core habitat for all species. Supporting habitat for: grey Falcon peregrine falcon bilby brush-tailed mulgara northern quoll	1.16 2.77 %	
BG-01 **Built Structure and Bare Ground**	Built elements of the Depot Site and bare sand and road surfaces within the Survey Area Non-significant habitat for: all listed species	26.04 62.46 %	
Total		41.7 ha	

4.5.2 Threatened and Priority Fauna

There were no observations of, or secondary evidence recorded for threatened and priority fauna within the Survey Area. Discussion of habitat type suitability for species identified as having a high or medium likelihood of occurrence is provided below:

Falco hypoleucos (grey falcon) VU

Grey falcons generally utilise acacia scrubland and tree lined water courses. Grey falcon primarily forage on other species of bird, hunting them in open habitat such as spinifex grassland and acacia scrubland, where they will alight to the ground to consume their prey.

No direct of secondary observations of grey falcon were made during the field survey. There are three records of this species within 10 km of the Survey Area within 20 years. The nearest record is of a confirmed grey falcon recorded near the turner river 850 m south of the Survey Area.

Within the Survey Area, fauna habitat FHT-01, FHT-02 and FHT-03 are considered suitable supporting habitat due to presence of occasional trees that may offer roosting opportunities as well as large open areas that could support foraging activities. This species is an infrequent visitor to the area, with its presence likely limited to foraging rather than sustained use or breeding.

Falco peregrinus (peregrine falcon) OS

This species is an uncommon but wide-ranging raptor, occurring across most regions of Australia. It occupies an extremely diverse range of dryland habitats of Australia. The species typically nests on cliff ledges, shallow hollows in tall trees, or artificial structures such as building ledges and communication towers.

There are no records of this species within 10 km of the Survey Area within 20 years. There are two records of the species within 50km of the survey area within 20 years. The species is assigned a medium likelihood of occurrence due to the fact that it is an extremely widespread and metropolitan species and there is a high abundance of potential foraging species present within the area.

Within the Survey Area, fauna habitat FHT-01, FHT-02 and FHT-03 are considered potentially suitable supporting habitat due to presence of occasional large trees that may offer roosting opportunities as well as large open areas that could support foraging activities. This species is an infrequent visitor to the area, with its presence likely limited to foraging rather than sustained use or breeding.

Dasycercus blythi (brush-tailed mulgara) P4

Brush tailed mulgara are small nocturnal carnivores which prey on a wide variety of invertebrates and small reptiles. Brush-tailed mulgara are primarily found in mature spinifex grassland which is present within the Survey Area in FHT-01.

Brush-tailed mulgara are considered to have a medium likelihood of occurrence within the Survey Area. Brush-tailed mulgara are reliably surveyed for by searching for digging and foraging evidence and survey effort was considered sufficient to show that digging and foraging evidence as absent within the Survey area.

There are 12 records of this species within 10 km of the Survey Area within 20 years, the nearest record is a confirmed moderately certain observation from a fauna survey, 4 km west in the Pippingarra area. Brush-tailed mulgara foraging habitat is contiguous from where the recent sightings are to the Survey Area.

Although the species is likely present on occasion within the Survey Area, the Survey Area is unlikely to comprise the entire home range of an individual. The species typically occupies a large home range with males home ranges averaging over 25.5 Ha and females home ranges averaging 10.8 Ha (Körtner, Pavey, Geiser 2007)

The targeted transect survey effort is considered sufficient to determine that there was no foraging or denning evidence within the Survey Area.

Dasyurus hallucatus (northern quoll) EN

Northern quoll is a small nocturnal carnivore that require hollow logs or rock crevices for females to den in. North quoll forage on a wide variety of invertebrates, small reptiles and small mammals, which may all be - present within FHT-01, FHT-02 and FHT-03. No direct of secondary observations of northern quoll were made during the field survey, however prey items (grasshoppers, and small lizards) were abundant.

There are five records of this species within 10 km of the Survey Area within 20 years, the nearest record is a confirmed sighting from a targeted survey 5 km southeast if the survey are in the Pippingara area. The habitat where the species records occur is relatively contiguous with the habitat within the Survey Area. northern quoll are unlikely to breed and den within the survey area as their required hollow log and rock crevice habitat features are not present, however quoll may forage within FHT-01 FHT-02 and FHT-03.

Although the species is likely present on occasion within the Survey Area, the Survey Area is unlikely to comprise the entire home range of an individual. The species typically occupies a large home range with males home ranges averaging over 233 ± 106.2 ha and females home ranges averaging 22 ± 6.4 ha (Cowan, Dunlop, Moore 2020)

The targeted transect survey effort is considered sufficient to determine that there was no foraging or denning evidence within the Survey Area.

Macrotis lagotis (bilby, dalgyte, ninu) VU

Bilby are medium sized nocturnal omnivores which dig for their food items. Bilby are known to utilise hummock grassland habitat (i.e. spinifex grassland) in alluvial plains which are present within the Survey Area as FHT-01

Bilby are considered to have a medium likelihood of occurrence within the Survey Area. Bilby are reliably surveyed for by searching for digging and foraging evidence and survey effort was considered sufficient to show that digging and foraging evidence as absent within the Survey area.

There was a single record of bilby within 10 km of the Survey Area, this record was of an unconfirmed burrow identified at the BHP Billiton Flashbutt Yard 5 km east of the Survey Area in 2013. The next nearest record was of a confirmed instance of foraging and digging evidence 12 km east along the mainline rail line in 2019.

FHT-01 represents supporting habitat for bilby, they feed rest and breed within *Triodia* and *Acacia* scrubland and may utilise anthills and termite mounds to forage.

Although the species is likely present on occasion within the Survey Area, the Survey Area is unlikely to comprise the entire home range of an individual. The species typically occupies a large home range with males home ranges averaging over 316 Ha and females home ranges averaging 18 ha (DCCEEW 2016).

The targeted transect survey effort is considered sufficient to determine that there was no foraging or denning evidence within the Survey Area.

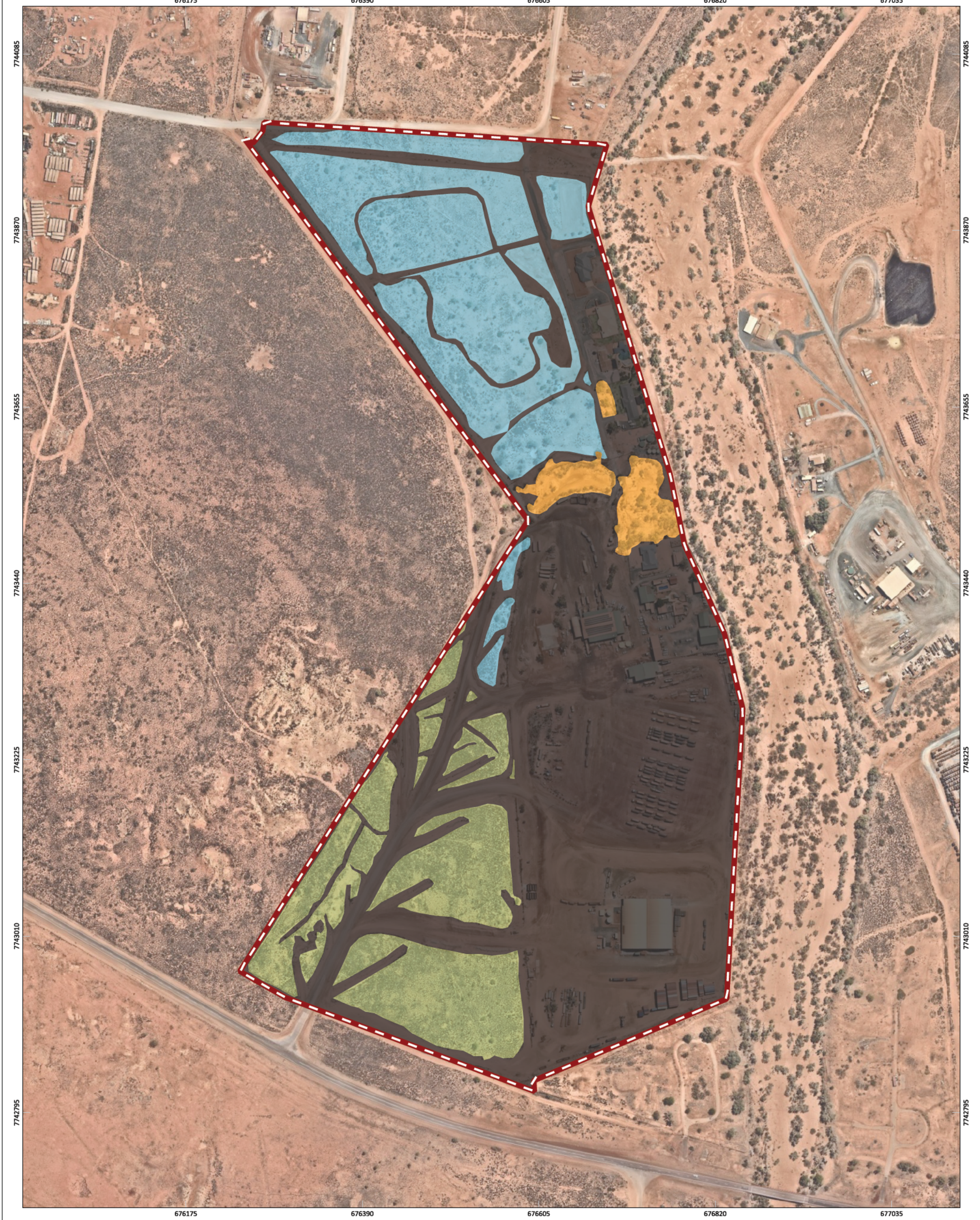

Figure 11: Fauna Habitat Types And Conservation Significant Fauna Observations

0 25 50 75 100 m
N

PROJECT/REPORT NAME	Detailed Flora and Fauna Survey Pippingarra WA 6722
SCALE	1:4,300
SHEET SIZE	A3 COLOUR
CLIENT	QUBE- Ports & Bulk
COORDINATE REFERENCE SYSTEM	GDA2020 / MGA zone 50
PROJECT NUMBER	A24.177
VERSION	0
DATA SOURCE	NEARMAPS
DRAWN BY / REVIEWED BY	JP/DR
DATE	28/5/2025

Legend

- Survey Area

Fauna Habitat

- BG-01 - Bare Ground and Built Structure
- FHT_1 - Triodia and Acacia Scrubland
- FHT_2 - Weedy Grassland
- FHT_3 - Claypan

No	Description	Drawn	Approved	Date
A	Original issue	JP	DR	28/5/2025

NOTES:

Cadastral boundary (LGATE-002). Label corresponds to the vegetation association number.

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5. Discussion

5.1 Flora and Vegetation

5.1.1 Flora of Conservation Significance

No Threatened flora were recorded during the targeted flora survey. One priority species (*Euploca mutica* P3) was located within the Survey area in three locations with seven individuals identified to the west of the Survey Area. Pre Survey, the *Euploca mutica* P3 had a high likelihood of occurrence with a previous DBCA point location 4.4 km east identified in 1997.

The likelihood of occurrence assessment identified that all other conservation significant flora species were assessed as having a low likelihood of occurrence post-survey.

5.1.2 Vegetation Significance

Three vegetation types were identified within the Survey Area with condition ranging from Very Good to Completely Degraded. There was not any vegetation of regional, state or national significance identified.

Of the three PECs identified by the desktop assessment as being located within 100 km buffer of the Survey Area, none were identified as being of a high or medium chance of occurring.

5.2 Fauna Habitat Significance

Three fauna habitat types were described. The habitat comprises of a mixture of spinifex shrubland (*Triodia* and *Acacia* spp.), weedy grassland and comparatively small areas of seasonally inundated claypans. The survey area is bounded by the seasonally flowing Turner River to the east.

Five fauna species were identified in the likelihood of occurrence assessment to have a high to medium likelihood of occurrence.

No species of conservation significance were recorded within the Survey Area.

The two species that had a high likelihood of occurrence were:

- *Falco hypoleucos* (grey falcon) VU
- *Dasyurus hallucatus* (northern quoll) EN

The species that had a medium likelihood of occurrence were:

- *Falco peregrinus* (peregrine falcon) OS
- *Dasycercus blythi* (brush-tailed mulgara) P4

- *Macrotis lagotis* (bilby, dalgyte, ninu) VU

Extant of core and supporting habitat present within the Survey Area by species is summarised in Table 18

Table 18: Summary of Habitat Value

Species	Extent Core Habitat (ha)	Extent Supporting Habitat (ha)
Falco hypoleucos **(grey falcon)**		15.7
Falco peregrinus **(peregrine falcon)**		15.7
Dasycercus blythi **(brush-tailed mulgara)**		15.7
Dasyurus hallucatus **(northern quoll)**		15.7
Macrotis lagotis **(bilby)**		15.7

Peregrine falcon and grey falcon on typically recorded via direct observation, neither were recorded within the Survey Area. Brush-tailed mulgara, northern quoll and bilby are reliably recorded via observation of digging, foraging and denning evidence, the targeted transect searches for this evidence were sufficient in confirming that no evidence is present within the Survey Area.

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Appendix A
Legislation

Environment Protection and Biodiversity Conservation Act 1999

The EPBC Act aims to protect matters of national environmental significance (MNES). Under the EPBC Act, the Commonwealth Department of Climate Change, Energy and the Environment lists Threatened species and communities in categories determined by criteria set out in the EPBC Act.

Projects likely to cause a significant impact on MNES should be referred to the DCCEEW for assessment under the EPBC Act.

Biodiversity Conservation Act 2016

The Biodiversity Conservation Act 2016 aims to conserve and protect biodiversity and biodiversity components within the State and to promote ecologically sustainable use of biodiversity components in the State.

Environmental Protection Act 1986

Declared Rare Flora (DRF) and Threatened Ecological Communities (TECs) are given special consideration in environmental impact assessments and have special status as Environmentally Sensitive Areas (ESAs) under the EP Act and the Environmental Protection (Clearing of Native Vegetation) Regulations 2004. Exemptions for a clearing permit do not apply in an ESA. In addition, habitat necessary for the maintenance of indigenous fauna is considered in the clearing principles and assessed during consideration of applications for a clearing permit.

Biosecurity and Agricultural Management Act 2007

Plants may be 'Declared' by the Minister for Agriculture and Food under the BAM Act. The Western Australian Organism List contains information on the area(s) in which a plant is declared and the control and keeping categories to which it has been assigned in Western Australia. A declaration may apply to the whole State, to districts, individual properties or even to single paddocks. If a plant is 'Declared', landholders are obliged to control that plant on their properties.

Weeds of National Significance

The Australian Government along with the State and Territory governments has endorsed 32 WoNS. Four major criteria were used in determining WoNS:

- The invasiveness of a weed species.
- A weed's impacts.
- The potential for spread of a weed.
- Socio-economic and environmental values.

Each WoNS has a national strategy and a national coordinator, responsible for implementing the strategy. WoNS are regarded as the worst weeds in Australia because of their invasiveness, potential for spread, and economic and environmental impacts.

Department of Biodiversity, Conservation and Attractions Priority Lists

DBCA lists 'Priority' flora and fauna that have not been assigned statutory protection as "Threatened" under the BC Act and are under consideration for declaration as Threatened. Flora and fauna assessed as Priority 1-3 are considered to be in urgent need of further survey. Priority 4 flora requires monitoring every 5 -10 years.

DBCA maintains a list of Priority Ecological Communities (PECs) which identifies plant communities that require further investigation before possible nomination for TEC status. Once listed, a community becomes a PEC and, when endorsed by the WA Minister for Environment, becomes a TEC and protected as an ESA under Environmental Protection (Clearing of Native Vegetation) Regulations 2004.

Informal Recognition of Flora and Fauna

Certain populations or communities of flora and/or fauna may be of local significance or interest because of their patterns of distribution and abundance. For example, specific locations of flora and may be locally significant because they are range extensions to the previously known distribution, or are newly discovered taxa (and have the potential to be of more than local significance). In addition, many species are in decline as a result of threatening processes (land clearing, grazing, and changed fire regimes) and relict populations of such species assume local importance for DBCA. It is not uncommon for DBCA to make comment on these species of interest.

Appendix B
Definitions and Criteria

EPBC Act Categories for Flora, Fauna and Ecological Communities

Category	Threatened Species	Threatened Ecological Communities
Extinct	A native species is eligible to be included in the extinct category at a particular time if, at that time, there is no reasonable doubt that the last member of the species has died.	N/A.
Extinct in the wild	A native species is eligible to be included in the extinct in the wild category at a particular time if, at that time: (a) it is known only to survive in cultivation, in captivity or as a naturalised population well outside its past range; or (b) it has not been recorded in its known and/or expected habitat, at appropriate seasons, anywhere in its past range, despite exhaustive surveys over a time frame appropriate to its life cycle and form.	N/A.
Critically Endangered (CE)	A native species is eligible to be included in the critically endangered category at a particular time if, at that time, it is facing an extremely high risk of extinction in the wild in the immediate future, as determined in accordance with the prescribed criteria.	An ecological community is eligible to be included in the critically endangered category at a particular time if, at that time, it is facing an extremely high risk of extinction in the wild in the immediate future, as determined in accordance with the prescribed criteria.
Endangered (EN)	A native species is eligible to be included in the endangered category at a particular time if, at that time: (a) it is not critically endangered; and (b) it is facing a very high risk of extinction in the wild in the near future, as determined in accordance with the prescribed criteria.	An ecological community is eligible to be included in the endangered category at a particular time if, at that time: (a) it is not critically endangered; and (b) it is facing a very high risk of extinction in the wild in the near future, as determined in accordance with the prescribed criteria.
Vulnerable (VU)	A native species is eligible to be included in the vulnerable category at a particular time if, at that time: (a) it is not critically endangered or endangered; and (b) it is facing a high risk of extinction in the wild in the medium term future, as determined in accordance with the prescribed criteria.	An ecological community is eligible to be included in the vulnerable category at a particular time if, at that time: (a) it is not critically endangered or endangered; and (b) it is facing a high risk of extinction in the wild in the medium term future, as determined in accordance with the prescribed criteria.
Conservation Dependent	A native species is eligible to be included in the conservation dependent category at a particular time if, at that time: (a) the species is the focus of a specific conservation program the cessation of which would result in the species becoming vulnerable, endangered or critically endangered; or (b) the following subparagraphs are satisfied: (i) the species is a species of fish. (ii) the species is the focus of a plan of management that provides for	N/A.

Category	Threatened Species	Threatened Ecological Communities
	management actions necessary to stop the decline of, and support the recovery of, the species so that its chances of long-term survival in nature are maximised. (iii) the plan of management is in force under a law of the Commonwealth or of a State or Territory. (iv) cessation of the plan of management would adversely affect the conservation status of the species.	

Conservation Codes for Western Australian Flora and Fauna (DBCA)

Conservation Codes for Western Australian Flora and Fauna	
Threatened, Extinct and Specially Protected fauna or flora1 are species2 which have been adequately searched for and are deemed to be, in the wild, Threatened, extinct or in need of special protection, and have been gazetted as such. **The Wildlife Conservation (Specially Protected Fauna) Notice 2018 and the Wildlife Conservation (Rare Flora) Notice 2018 have been transitioned under regulations 170, 171 and 172 of the Biodiversity Conservation Regulations 2018 to be the lists of Threatened, Extinct and Specially Protected species under Part 2 of the Biodiversity Conservation Act 2016.** **Categories of Threatened, Extinct and Specially Protected fauna and flora are:**	
T	Threatened species Listed by order of the Minister as Threatened in the category of critically endangered, endangered or vulnerable under section 19(1), or is a rediscovered species to be regarded as Threatened species under section 26(2) of the Biodiversity Conservation Act 2016 (BC Act). Threatened fauna is that subset of 'Specially Protected Fauna' listed under schedules 1 to 3 of the Wildlife Conservation (Specially Protected Fauna) Notice 2018 for Threatened Fauna. Threatened flora is that subset of 'Rare Flora' listed under schedules 1 to 3 of the Wildlife Conservation (Rare Flora) Notice 2018 for Threatened Flora. The assessment of the conservation status of these species is based on their national extent and ranked according to their level of threat using International Union for Conservation of Nature (IUCN) Red List categories and criteria as detailed below.
CR	Critically endangered species Threatened species considered to be "facing an extremely high risk of extinction in the wild in the immediate future, as determined in accordance with criteria set out in the ministerial guidelines". Listed as critically endangered undersection 19(1)(a) of the BC Act in accordance with the criteria set out in section 20 and the ministerial guidelines. Published under schedule 1 of the Wildlife Conservation (Specially Protected Fauna) Notice 2018 for critically endangered fauna or the Wildlife Conservation (Rare Flora) Notice 2018 for critically endangered flora.
EN	Endangered species Threatened species considered to be "facing a very high risk of extinction in the wild in the near future, as determined in accordance with criteria set out in the ministerial guidelines". Listed as endangered under section 19(1)(b) of the BC Act in accordance with the criteria set out in section 21 and the ministerial guidelines. Published under schedule 2 of the Wildlife Conservation (Specially Protected Fauna) Notice 2018 for endangered fauna or the Wildlife Conservation (Rare Flora) Notice 2018 for endangered flora.
VU	Vulnerable species

Conservation Codes for Western Australian Flora and Fauna	
	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 undersection 19(1)(c) of the BC Act in accordance with the criteria set out in section 22 and the ministerial guidelines. Published under schedule 3 of the Wildlife Conservation (Specially Protected Fauna) Notice 2018 for vulnerable fauna or the Wildlife Conservation (Rare Flora) Notice 2018 for vulnerable flora.
Extinct species **Listed by order of the Minister as extinct under section 23(1) of the BC Act as extinct or extinct in the wild.**	
EX	Extinct species Species where "there is no reasonable doubt that the last member of the species has died", and listing is otherwise in accordance with the ministerial guidelines (section 24 of the BC Act). Published as presumed extinct under schedule 4 of the Wildlife Conservation (Specially Protected Fauna) Notice 2018 for extinct fauna or the Wildlife Conservation (Rare Flora) Notice 2018 for extinct flora.
EW	Extinct in the wild species Species that "is known only to survive in cultivation, in captivity or as a naturalised population well outside its past range; and it has not been recorded in its known habitat or expected habitat, at appropriate seasons, anywhere in its past range, despite surveys over a time frame appropriate to its life cycle and form", and listing is otherwise in accordance with the ministerial guidelines (section 25 of the BC Act). Currently there are no Threatened fauna or Threatened flora species listed as extinct in the wild. If listing of a species as extinct in the wild occurs, then a schedule will be added to the applicable notice.
Specially protected species **Listed by order of the Minister as specially protected under section 13(1) of the BC Act. Meeting one or more of the following categories: species of special conservation interest; migratory species; cetaceans; species subject to international agreement; or species otherwise in need of special protection.** **Species that are listed as Threatened species (critically endangered, endangered or vulnerable) or extinct species under the BC Act cannot also be listed as Specially Protected species.**	
MI	Migratory species Fauna that periodically or occasionally visit Australia or an external Territory or the exclusive economic zone; or the species is subject of an international agreement that relates to the protection of migratory species and that binds the Commonwealth; and listing is otherwise in accordance with the ministerial guidelines (section 15 of the BC Act). Includes birds that are subject to an agreement between the government of Australia and the governments of Japan (JAMBA), China (CAMBA) and The Republic of Korea (ROKAMBA), and fauna subject to the Convention on the Conservation of Migratory Species of Wild Animals (Bonn Convention), an environmental treaty under the United Nations Environment Program. Migratory species listed under the BC Act are a subset of the migratory animals that are known to visit Western Australia, protected under the international agreements or treaties, excluding species that are listed as Threatened species. Published as migratory birds protected under an international agreement under schedule 5 of the Wildlife Conservation (Specially Protected Fauna) Notice 2018.
CD	Species of special conservation interest (conservation dependent fauna) Fauna of special conservation need being species dependent on ongoing conservation intervention to prevent it becoming eligible for listing as Threatened, and listing is otherwise in accordance with the ministerial guidelines (section 14 of the BC Act). Published as conservation dependent fauna under schedule 6 of the Wildlife Conservation (Specially Protected Fauna) Notice 2018.

Conservation Codes for Western Australian Flora and Fauna	
OS	Other specially protected species Fauna otherwise in need of special protection to ensure their conservation, and listing is otherwise in accordance with the ministerial guidelines (section 18 of the BC Act). Published as other specially protected fauna under schedule 7 of the Wildlife Conservation (Specially Protected Fauna) Notice 2018.
P	Priority species Possibly Threatened species that do not meet survey criteria, or are otherwise data deficient, are added to the Priority Fauna or Priority Flora Lists under Priorities 1, 2 or 3. These three categories are ranked in order of Priority for survey and evaluation of conservation status so that consideration can be given to their declaration as Threatened fauna or flora. Species that are adequately known, are rare but not Threatened, or meet criteria for near Threatened, or that have been recently removed from the Threatened species or other specially protected fauna lists for other than taxonomic reasons, are placed in Priority 4. These species require regular monitoring. Assessment of Priority codes is based on the Western Australian distribution of the species, unless the distribution in WA is part of a contiguous population extending into adjacent States, as defined by the known spread of locations.
1	Priority 1: Poorly-known species Species that are known from one or a few locations (generally five or less) which are potentially at risk. All occurrences are either: very small; or on lands not managed for conservation, e.g. agricultural or pastoral lands, urban areas, road and rail reserves, gravel reserves and active mineral leases; or otherwise under threat of habitat destruction or degradation. Species may be included if they are comparatively well known from one or more locations but do not meet adequacy of survey requirements and appear to be under immediate threat from known threatening processes. Such species are in urgent need of further survey.
2	Priority 2: Poorly-known species Species that are known from one or a few locations (generally five or less), some of which are on lands managed primarily for nature conservation, e.g. national parks, conservation parks, nature reserves and other lands with secure tenure being managed for conservation. Species may be included if they are comparatively well known from one or more locations but do not meet adequacy of survey requirements and appear to be under threat from known threatening processes. Such species are in urgent need of further survey.
3	Priority 3: Poorly-known species Species that are known from several locations, and the species does not appear to be under imminent threat, or from few but widespread locations with either large population size or significant remaining areas of apparently suitable habitat, much of it not under imminent threat. Species may be included if they are comparatively well known from several locations but do not meet adequacy of survey requirements and known threatening processes exist that could affect them. Such species are in need of further survey.
4	Priority 4: Rare, Near Threatened and other species in need of monitoring (a) Rare. Species that are considered to have been adequately surveyed, or for which sufficient knowledge is available, and that are considered not currently Threatened or in need of special protection but could be if present circumstances change. These species are usually represented on conservation lands. (b) Near Threatened. Species that are considered to have been adequately surveyed and that are close to qualifying for vulnerable but are not listed as Conservation Dependent. (c) Species that have been removed from the list of Threatened species during the past five years for reasons other than taxonomy.

1 The definition of flora includes algae, fungi and lichens.

DBCA Definitions and Criteria for TECs and PECs

Criteria	Definition
Threatened Ecological Communities	
Presumed Totally Destroyed (PD)	An ecological community that has been adequately searched for but for which no representative occurrences have been located. The community has been found to be totally destroyed or so extensively modified throughout its range that no occurrence of it is likely to recover its species composition and/or structure in the foreseeable future. An ecological community will be listed as presumed totally destroyed if there are no recent records of the community being extant and either of the following applies (A or B): A. Records within the last 50 years have not been confirmed despite thorough searches of known or likely habitats or B. All occurrences recorded within the last 50 years have since been destroyed.
Critically Endangered (CR)	An ecological community that has been adequately surveyed and found to have been subject to a major contraction in area and/or that was originally of limited distribution and is facing severe modification or destruction throughout its range in the immediate future, or is already severely degraded throughout its range but capable of being substantially restored or rehabilitated. An ecological community will be listed as Critically Endangered when it has been adequately surveyed and is found to be facing an extremely high risk of total destruction in the immediate future. This will be determined on the basis of the best available information, by it meeting any one or more of the following criteria (A, B or C): A. The estimated geographic range, and/or total area occupied, and/or number of discrete occurrences since European settlement have been reduced by at least 90% and either or both of the following apply (i or ii): i. geographic range, and/or total area occupied and/or number of discrete occurrences are continuing to decline such that total destruction of the community is imminent (within approximately 10 years). ii. modification throughout its range is continuing such that in the immediate future (within approximately 10 years) the community is unlikely to be capable of being substantially rehabilitated. B. Current distribution is limited, and one or more of the following apply (i, ii or iii): i. geographic range and/or number of discrete occurrences, and/or area occupied is highly restricted and the community is currently subject to known threatening processes which are likely to result in total destruction throughout its range in the immediate future (within approximately 10 years). ii. there are very few occurrences, each of which is small and/or isolated and extremely vulnerable to known threatening processes. iii. there may be many occurrences but total area is very small and each occurrence is small and/or isolated and extremely vulnerable to known threatening processes. C. The ecological community exists only as highly modified occurrences that may be capable of being rehabilitated if such work begins in the immediate future (within approximately 10 years).
Endangered (EN)	An ecological community that has been adequately surveyed and found to have been subject to a major contraction in area and/or was originally of limited distribution and is in danger of significant modification throughout its range or severe modification or destruction over most of its range in the near future.

Criteria	Definition
	An ecological community will be listed as Endangered when it has been adequately surveyed and is not Critically Endangered but is facing a very high risk of total destruction in the near future. This will be determined on the basis of the best available information by it meeting any one or more of the following criteria (A, B, or C): A. The geographic range, and/or total area occupied, and/or number of discrete occurrences have been reduced by at least 70% since European settlement and either or both of the following apply (i or ii): i. the estimated geographic range, and/or total area occupied and/or number of discrete occurrences are continuing to decline such that total destruction of the community is likely in the short term future (within approximately 20 years). ii. modification throughout its range is continuing such that in the short term future (within approximately 20 years) the community is unlikely to be capable of being substantially restored or rehabilitated. B. Current distribution is limited, and one or more of the following apply (i, ii or iii): i. geographic range and/or number of discrete occurrences, and/or area occupied is highly restricted and the community is currently subject to known threatening processes which are likely to result in total destruction throughout its range in the short term future (within approximately 20 years). ii. there are few occurrences, each of which is small and/or isolated and all or most occurrences are very vulnerable to known threatening processes. iii. there may be many occurrences but total area is small and all or most occurrences are small and/or isolated and very vulnerable to known threatening processes. The ecological community exists only as very modified occurrences that may be capable of being substantially restored or rehabilitated if such work begins in the short-term future (within approximately 20 years).
Vulnerable (VU)	An ecological community that has been adequately surveyed and is found to be declining and/or has declined in distribution and/or condition and whose ultimate security has not yet been assured and/or a community that is still widespread but is believed likely to move into a category of higher threat in the near future if threatening processes continue or begin operating throughout its range. An ecological community will be listed as Vulnerable when it has been adequately surveyed and is not Critically Endangered or Endangered but is facing a high risk of total destruction or significant modification in the medium to long-term future. This will be determined on the basis of the best available information by it meeting any one or more of the following criteria (A, B or C): A. The ecological community exists largely as modified occurrences that are likely to be capable of being substantially restored or rehabilitated. B. The ecological community may already be modified and would be vulnerable to threatening processes, is restricted in area and/or range and/or is only found at a few locations. C. The ecological community may be still widespread but is believed likely to move into a category of higher threat in the medium to long term future because of existing or impending threatening processes.
Priority Ecological Communities	
Priority One	Poorly known ecological communities Ecological communities with apparently few, small occurrences, all or most not actively managed for conservation (e.g. within agricultural or pastoral lands, urban areas, active mineral leases) and for which current threats exist. Communities may be included if they are comparatively well-known from one or more localities but do not meet adequacy of

Criteria	Definition
	survey requirements, and/or are not well defined, and appear to be under immediate threat from known threatening processes across their range.
Priority Two	Poorly known ecological communities Communities that are known from few small occurrences, all or most of which are actively managed for conservation (e.g. within national parks, conservation parks, nature reserves, state forest, unallocated Crown land, water reserves, etc.) and not under imminent threat of destruction or degradation. Communities may be included if they are comparatively well known from one or more localities, but do not meet adequacy of survey requirements, and/or are not well defined, and appear to be under threat from known threatening processes.
Priority Three	Poorly known ecological communities i. Communities that are known from several to many occurrences, a significant number or area of which are not under threat of habitat destruction or degradation or. ii. Communities known from a few widespread occurrences, which are either large or within significant remaining areas of habitat in which other occurrences may occur, much of it not under imminent threat, or. iii. Communities made up of large, and/or widespread occurrences, that may or 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 Four	Ecological communities that are adequately known, rare but not Threatened or meet criteria for Near Threatened, or that have been recently removed from the Threatened list. These communities require regular monitoring. i. 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. ii. 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. iii. Ecological communities that have been removed from the list of Threatened communities during the past five years.
Priority Five	Conservation Dependent Ecological Communities Ecological Communities that are not Threatened but are subject to a specific conservation program, the cessation of which would result in the community becoming Threatened within five years.

Appendix C
Desktop Assessment and Likelihood of Occurrence Flora

Flora Database Search Result and Likelihood of Occurrence (100 km Buffer)

Species	Conservation Status		Source		Flowering period	Preferred habitat	Habitat Occurs Within the Survey Area	Record distance	Record age	Pre-Survey Likelihood of Occurrence	Post-Survey Likelihood of Occurrence
	DBCA	EPBC	PMST	DBCA							
Quoya zonalis	T	EN		X	Aug	Steep, rocky, sandstone conglomerate and granite slopes in skeletal, brown, sandy loam soils of the Capricorn Land System.	No	92km	2024	Low	Low
Acacia cyperophylla* var. *omearana	P1			X	May	Stony & gritty alluvium. Along drainage lines.	No	99km	1997	Low	Low
Acacia leeuweniana	P1			X	Apr,May,Oct	Gritty, skeletal red-grey sandy loam, light orange-brown gravelly sand, granite. In rock fissures in outcrops, among boulders.	No	97km	2010	Low	Low
Atriplex eremitis	P1			X	Aug	N/A	No	39km	2023	Low	Low
***Corchorus sp. Yarrie* (J. Bull & D. Roberts CAL 01.05)**	P1			X		Sandy clay loam with exposed ironstone bedrock	No	97km	2019	Low	Low
Euploca parviantrum	P1			X	Feb-Mar	N/A	N/A	51km	2011	Low	Low
***Tephrosia rosea* var. *Port Hedland* (A.S. George 1114)**	P1			X	Jul-Sep	Sandy plain. Red Sand	Yes	4.6km	2011	High	Low

Species	Conservation Status		Source		Flowering period	Preferred habitat	Habitat Occurs Within the Survey Area	Record distance	Record age	Pre-Survey Likelihood of Occurrence	Post-Survey Likelihood of Occurrence
	DBCA	EPBC	PMST	DBCA							
***Themeda* sp. *Panorama* (J. Nelson et al. NS 102)**	P1			X		Creek, red brown sand.	Yes	89km	2024	Low	Low
Triodia degreyensis	P1			X	Feb to March	Lower stony slopes of ironstones hills.	No	45km	2014	Low	Low
Gomphrena pusilla	P2			X	Mar-Apr,Jun	Fine beach sand. Behind foredune, on limestone.	No	18km	2011	Low	Low
***Abutilon sp. Pritzelianum* (S. van Leeuwen 5095)**	P3			X		Sandplain.	Yes	20km	2015	Low	Low
***Dolichocarpa sp. Hamersley Station* (A.A. Mitchell PRP 1479)**	P3			X		Claypan, red brown sandy clay.	Yes	90km	2019	Low	Low
Euphorbia clementii	P3			X	Jun	Gravelly hillsides, stony grounds.	No	44km	2011	Low	Low
Euphorbia inappendiculata* var. *inappendiculata	P3			X	May, Aug	Red loamy depressions.	Yes	90km	2019	Low	Low
Euploca mutica	P3			X	Aug	Plains. Flat red silt sand on a low-lying floodplain.	Yes	4.4km	1997	High	Recorded
Gomphrena cucullata	P3			X	Feb-Apr	Red sandy loam, clayey sand. Open floodplains.	Yes	65km	1962	Low	Low

Species	Conservation Status		Source		Flowering period	Preferred habitat	Habitat Occurs Within the Survey Area	Record distance	Record age	Pre-Survey Likelihood of Occurrence	Post-Survey Likelihood of Occurrence
	DBCA	EPBC	PMST	DBCA							
Gomphrena leptophylla	P3			X	Mar to Sep	Sand, sand to clayey loam, granite, quartzite. Open flats, sandy creek beds, edges salt pans & marshes, stony hillsides.	Yes	20km	2015	Low	Low
Goodenia obscurata	P3			X	April to Oct	N/A	No	82km	2011	Low	Low
Gymnanthera cunninghamii	P3			X	Apr,Dec	Sandy soils.	Yes	10.4km	1985	Low	Low
Heliotropium murinum	P3			X	May or Sep	Red sand. Plains.	Yes	92km	2016	Low	Low
Nicotiana umbratica	P3			X	Apr, Jun, Sept	Shallow soils. Rocky outcrops.	No	79km	1995	Low	Low
Phyllanthus hebecarpus	P3			X	0	Growing in between granite boulders.	No	92km	2015	Low	Low
Rothia indica subsp. ***australis***	P3			X	0	Sandy soils. Sandhills and sandy flats.	Yes	0.2km	2011	High	Low
Stylidium weeliwolli	P3			X	Aug-Sep	Gritty sand soil, sandy clay. Edge of watercourses.	No	60km	2011	Low	Low
Terminalia supranitifolia	P3			X	Nov-Dec	Sand. Among basalt rocks.	No	80km	2010	Low	Low
Triodia basitricha	P3			X	0	Crest of range. Skeletal clay loam over ironstone.	No	99km	2019	Low	Low
Triodia chichesterensis	P3			X	Feb-Apr, Aug	Brown clay-loam soil with quartzite.	Yes	31km	2010	Low	Low

Species	Conservation Status		Source		Flowering period	Preferred habitat	Habitat Occurs Within the Survey Area	Record distance	Record age	Pre-Survey Likelihood of Occurrence	Post-Survey Likelihood of Occurrence
	DBCA	EPBC	PMST	DBCA							
Vigna triodiophila	P3			X	May	Among dolerite boulders on very steep upper slope. Stony red-brown clay loam.	No	73km	2006	Low	Low
Bulbostylis burbidgeae	P4			X	Mar or Jun to Aug	Granitic soils. Granite outcrops, cliff bases.	No	12.5km	2007	Low	Low
Ptilotus mollis	P4			X	May or Sep	Stony hills, screes, steep rocky sites, often in full sun on massive ironstone formations	No	29km	2010	Low	Low

Appendix D
Quadrat Data Sheet

Quadrat Number: Q01			
Date: 29/04/2025	Project Number: A24.177		
Collector: Daniel Rubick			
Coordinates GDA2020	Easting: [redacted]	Northing: [redacted]	
Slope	Flat		
Aspect	-		
Position	Open plain		
Soil Texture	Clay		
Soil Colour	Orange		
Rock Type	-		
Rock Cover	-		
Bare Ground	10-25%		
Litter	1-5%		
Surface Water	-		
Vegetation Condition	Very Good		
Weed Cover	5%		
Disturbance	Grazing		
Fire Age Years	-		

VT01-A closed mid hummock grassland characterized by a sparse canopy covering of *Corymbia flavescens* with a mid-level of *Acacia inaequilatera* and **Vachellia farnesiana* var. *farnesiana* over a closed lower stratum of *Triodia wiseana, Arivela viscosa* and *Goodenia microptera*.

Species	Naturalised	Conservation code	Height	% Cover
Acacia inaequilatera			3	10
Corymbia flavescens			5	2
Vachellia farnesiana var. *farnesiana*	*		3	6
Triodia epactia			0.5	80
Triodia lanigera			0.5	8
Arivela viscosa			0.5	1
Goodenia microptera			0.3	0.1
Calandrinia pentavalvis			0.3	0.1
Tribulus hirsutus			0.2	0.1
Goodenia muelleriana			0.3	0.1

Quadrat Number: Q01				
Waltheria indica			0.5	1
Afrohybanthus aurantiacus			0.5	0.5
Euphorbia australis var. *subtomentosa*			0.1	0.1
Euphorbia biconvexa			0.2	0.1
Cucumis argenteus			0.2	0.2
Senna notabilis			0.3	0.1
Portulaca oleracea	M		0.1	0.1
Indigofera colutea			0.1	0.1
Bulbostylis barbata			0.1	0.1
Indigofera linifolia			0.1	0.1
Bonamia linearis			0.1	0.1
Evolvulus alsinoides var. *decumbens*			0.1	0.1
Trianthema pilosum			0.3	0.5
Ptilotus exaltatus var. *exaltatus*			0.1	0.1
Corchorus sp. A Kimberley Flora (K.F. Kenneally & B.P.M. Hyland 10421)			1	1
Ptilotus fusiformis			0.3	0.3
Indigofera monophylla			1	0.3
Ipomoea muelleri			0.1	0.1
Trigastrotheca molluginea			0.4	0.2
Paspalidium rarum			0.1	0.1
Triodia lanigera			1	3
Enchylaena tomentosa			0.1	0.1
Polymeria lanata			0.3	0.3
Alysicarpus muelleri			1	5
Hakea lorea subsp. *lorea*			3	1
Acacia stellaticeps			0.5	1
Stylosanthes hamata	*		0.2	0.2
Tephrosia sp. Northern (K.F. Kenneally 11950)			0.3	0.2
Sida clementii			0.4	0.1
Solanum diversiflorum			0.1	0.1
Tinospora smilacina			0.5	0.1

Quadrat Number: Q01				
Triumfetta chaetocarpa			0.5	0.5

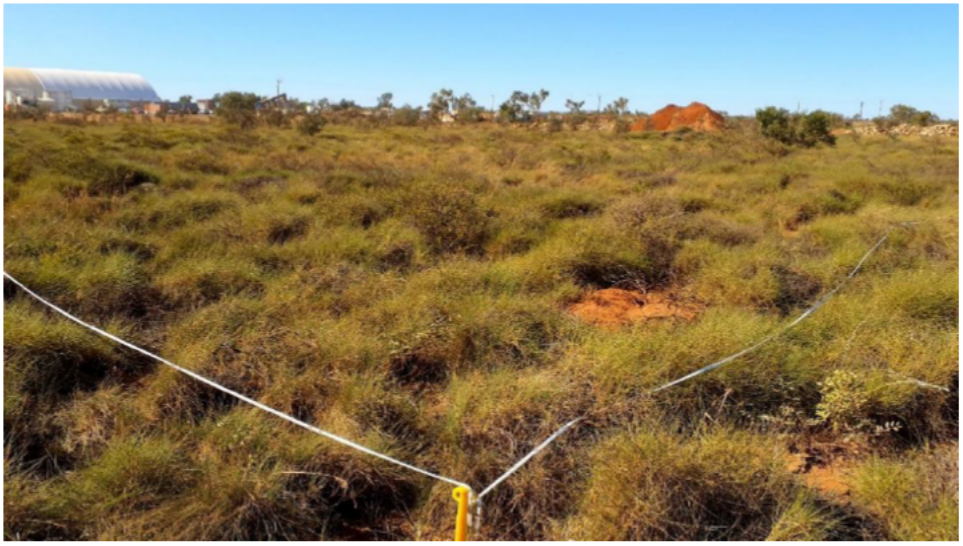
Quadrat Number: Q02			
Date: 30/04/2025	Project Number: A24.177		
Collector: Daniel Rubick			
Coordinates GDA2020	Easting: [redacted]	Northing: [redacted]	
Slope	Flat		
Aspect	-		
Position	Plain		
Soil Texture	Loam		
Soil Colour	Orange		
Rock Type	Quartzite		
Rock Cover	1-5%		
Bare Ground	10-25%		
Litter	5-10%		
Surface Water	-		
Vegetation Condition	Good		
Weed Cover	15%		
Disturbance	Grazing		
Fire Age Years	-		

VT01- A closed mid hummock grassland characterized by a sparse, mid-level stratum of *Acacia inaequilatera* and **Calotropis procera* over a closed lower stratum of *Triodia wiseana, Arivela viscosa* and *Senna notabilis*.

Species	Naturalised	Conservation code	Height	% Cover
Acacia inaequilatera			2	15
Calotropis procera	*DP		1.8	5
Acacia stellaticeps			0.5	8
Triodia epactia			1	70
Arivela viscosa			0.5	6
Enchylaena tomentosa			0.1	2
Senna notabilis			0.5	1
Ptilotus fusiformis			0.3	0.5
Cenchrus setigerus	*		0.5	4
Crotalaria medicaginea var. *neglecta*			0.2	0.5
Paspalidium rarum			0.1	0.1
Evolvulus alsinoides var. *decumbens*			0.1	0.1

Quadrat Number: Q02				
Calandrinia pentavalvis			0.1	0.3
Euphorbia biconvexa			0.2	0.1
Trigastrotheca molluginea			0.2	0.3
Bonamia linearis			0.1	0.1
Bulbostylis barbata			0.1	0.1
Stemodia grossa			0.2	0.1
Dactyloctenium radulans			0.1	0.1
Portulaca oleracea	M		0.1	0.2
Indigofera colutea			0.1	0.1
Stylosanthes hamata	*		0.3	0.1
Euphorbia australis var. *subtomentosa*			0.1	0.1
Goodenia microptera			0.3	0.1
Aristida holathera var. *holathera*			0.5	3
Chrysopogon fallax			1	5
Trigastrotheca molluginea			0.1	0.1
Tinospora smilacina			1	0.2
Rhynchosia minima			0.3	0.2
Corymbia flavescens			0.5	0.2
Sesbania cannabina			0.6	0.1
Goodenia muelleriana			0.1	0.1
Afrohybanthus aurantiacus			0.1	0.1

Quadrat Number: Q03			
Date: 30/04/2025	Project Number: A24.177		
Collector: Daniel Rubick			
Coordinates GDA2020	Easting: [redacted]	Northing: [redacted]	
Slope	Flat		
Aspect	S		
Position	Plain		
Soil Texture	Loam		
Soil Colour	Pale Orange		
Rock Type	Quartzite		
Rock Cover	1-5%		
Bare Ground	10-25%		
Litter	5-10%		
Surface Water	-		
Vegetation Condition	Very Good		
Weed Cover	10%		
Disturbance	Grazing		
Fire Age Years	-		



VT01-A closed mid hummock grassland characterized by a sparse, mid-level stratum of *Acacia inaequilatera* and *Acacia stellaticeps* over a closed lower stratum of *Triodia wiseana, Arivela viscosa* and *Bonamia erecta*.

Species	Naturalised	Conservation code	Height	% Cover
Acacia inaequilatera			2	8
Acacia stellaticeps			1	12
Acacia ancistrocarpa			1.5	3
Carissa lanceolata			2	1.5
Triodia epactia			0.5	80
Triodia lanigera			0.5	12
Arivela viscosa			0.5	2
Bonamia erecta			0.5	3
Indigofera monophylla			0.5	1
Ptilotus fusiformis			0.5	0.2
Paspalidium rarum			0.2	0.1

Quadrat Number: Q03				
Calandrinia pentavalvis			0.3	0.1
Afrohybanthus aurantiacus			0.5	0.1
Trianthema pilosum			0.2	0.2
Goodenia microptera			0.3	0.1
Tribulus hirsutus			0.2	0.1
Bulbostylis barbata			0.1	0.1
Portulaca oleracea	M		0.1	0.1
Senna notabilis			0.3	0.5
Trigastrotheca molluginea			0.1	0.1
Stemodia grossa			0.1	0.1
Cucumis argenteus			0.1	0.1
Crotalaria ramosissima			0.1	0.1
Dampiera candicans			0.8	0.5
Triumfetta chaetocarpa			0.5	0.3
Eriachne aristidea	*DP		0.1	0.1
Triumfetta chaetocarpa			0.5	1
Calotropis procera	*		0.3	0.1
Indigofera linifolia			0.1	0.1
Dactyloctenium radulans			0.2	0.1

Relevé Number: R01			
Date: 30/04/2025	Project Number: A24.177		
Collector: Daniel Rubick			
Coordinates GDA2020	Easting: [redacted]	Northing: [redacted]	
Slope	Gentle		
Aspect	-		
Position	Open Depression		
Soil Texture	Loam		
Soil Colour	Pale Orange		
Rock Type	Quartzite		
Rock Cover	5-10%		
Bare Ground	25-50%		
Litter	1-5%		
Surface Water	-		
Vegetation Condition	Degraded		
Weed Cover	15%		
Disturbance	Grazing and clearing		
Fire Age Years	-		

VT02- An open quartzite depression with a fringing upper storey of *Melaleuca leucadendra, Acacia trachycarpa* and *Acacia colei* var. *colei* with a mid-stratum of *Acacia stellaticeps* and a lower stratum of *Schoenoplectus laevis, Alternanthera angustifolia* and *Dysphania plantaginella*.

Species	Naturalised	Conservation code	Height	% Cover
Melaleuca leucadendra			<10	4
Acacia trachycarpa			<10	4
Acacia stellaticeps				8
Triodia epactia			0.5	20
Schoenoplectus laevis			0.5	8
Alternanthera angustifolia			0.5	1
Calandrinia tepperiana			0.1	0.1

Relevé Number: R01				
Dentella asperata			0.1	0.1
Bonamia alatisemina			0.1	0.1
Bergia perennis subsp. *perennis*			0.1	0.1
Dentella asperata			0.1	0.1
Acacia trachycarpa			1.5	5
Dysphania plantaginella			0.2	0.3
Marsilea angustifolia			0.1	0.2
Acacia colei var. *colei*			2	0.1
Acacia sericophylla			3	3
Bergia ammannioides			0.1	0.1
Triraphis mollis			0.3	0.5
Eriachne benthamii			0.4	0.5
Afrohybanthus aurantiacus			0.5	0.3
Goodenia lamprosperma			0.5	0.2
Bonamia erecta			0.3	0.2
Stemodia grossa			0.4	0.5
Goodenia microptera			0.4	0.1
Cyperus iria			0.3	0.3
Euphorbia biconvexa			0.3	0.1
Eriachne aristidea			0.5	0.5
Dactyloctenium radulans			0.3	0.1
Senna notabilis			0.5	0.1
Arivela viscosa			0.5	0.5

Relevé Number: R02			
Date: 30/04/2025	Project Number: A24.177		
Collector: Daniel Rubick			
Coordinates GDA2020	Easting: [redacted]	Northing: [redacted]	
Slope	Flat		
Aspect	North		
Position	River		
Soil Texture	Loamy Sand		
Soil Colour	Pale Orange		
Rock Type	Quartzite		
Rock Cover	5-10%		
Bare Ground	50-75%		
Litter	10-25%		
Surface Water	-		
Vegetation Condition	Degraded		
Weed Cover	50%		
Disturbance	Grazing, tracks and landscaping		
Fire Age Years	-		

VT03- A mid open forest of *Eucalyptus victrix* with a mid-stratum *Acacia colei* var. *colei*, *Corchorus incanus* subsp. *incanus* and *Tephrosia* sp. B *Kimberley Flora* (C.A. Gardner 7300) and a low, sparse lower stratum of **Cenchrus setigerus*, *Indigofera linifolia* and *Amaranthus undulatus*.

Species	Naturalised	Conservation code	Height	% Cover
Eucalyptus victrix				50
Acacia trachycarpa			>2	20
Cenchrus setigerus	*			60
Aerva javanica	*			10
Arivela viscosa				1
Tephrosia sp. *B Kimberley Flora* (C.A. Gardner 7300)			1	2

Relevé Number: R02				
Corchorus incanus subsp. *incanus*			1	2
Indigofera linifolia			0.3	0.1
Euphorbia boophthona			0.2	0.1
Amaranthus undulatus			0.5	0.3
Sesbania cannabina			0.5	0.1
Macroptilium atropurpureum	*		0.1	3
Indigofera sessiliflora	*		0.1	0.1
Euphorbia biconvexa			0.3	0.1
Boerhavia burbidgeana			0.1	0.2
Bonamia alatisemina			0.1	0.2
Waltheria indica			0.5	0.2
Triodia epactia			0.5	2
Tribulus hirsutus			0.1	0.1
Enchylaena tomentosa			0.1	0.1
Senna notabilis			1	0.1
Acacia sericophylla			3	2
Calandrinia tepperiana			0.1	0.1
Acacia colei var. *colei*			2	5
Bonamia erecta			0.5	0.5
Melaleuca leucadendra			7	2
Aerva javanica	*		0.5	1

DP 'Declared Pest'

Relevé Number: R03			
Date: 30/04/2025	Project Number: A24.177		
Collector: Daniel Rubick			
Coordinates GDA2020	Easting: [redacted]	Northing: [redacted]	
Slope	Flat		
Aspect	-		
Position	Plain		
Soil Texture	Clay		
Soil Colour	Pale Orange		
Rock Type	-		
Rock Cover	-		
Bare Ground	10-25%		
Litter	5-10%		
Surface Water	-		
Vegetation Condition	Poor		
Weed Cover	5%		
Disturbance	Grazing and tracks		
Fire Age Years	-		

VT01- A low, sparse upper story of *Eucalyptus victrix* and *Corymbia flavescens* with a mid, sparse mid storey of *Acacia inaequilatera, Carissa lanceolata* and *Acacia sericophylla* with a low, closed understorey of **Cenchrus setigerus, Cucumis argenteus* and *Arivela viscosa*.

Species	Naturalised	Conservation code	Height	% Cover
Acacia inaequilatera			<10	8
Eucalyptus victrix				5
Corymbia hamersleyana				3
Carissa lanceolata				10
Triodia epactia				80
Salicornia australis				3
Chrysopogon fallax				3
Acacia sericophylla			2	1
Evolvulus alsinoides* var. *decumbens			0.1	0.1
Cucumis argenteus			0.3	0.3
Portulaca oleracea	M		0.1	0.1
Sporobolus australasicus				

Relevé Number: R03				
Dactyloctenium radulans			0.1	0.1
Arivela viscosa			1	1
Enchylaena tomentosa			0.1	0.1
Marsilea angustifolia			0.1	0.1
Goodenia muelleriana			0.3	0.3
Cenchrus setigerus	*		0.5	10
Alysicarpus muelleri			0.1	1
Boerhavia burbidgeana			0.1	0.2
Euphorbia australis var. *subtomentosa*			0.1	0.1

DP 'Declared Pest'

Relevé Number: R04			
Date: 30/04/2025	Project Number: A24.177		
Collector: Daniel Rubick			
Coordinates GDA2020	Easting: [redacted]	Northing: [redacted]	
Slope	Flat		
Aspect	-		
Position	Plain		
Soil Texture	Loam		
Soil Colour	Pale Orange		
Rock Type			
Rock Cover			
Bare Ground	25-50%		
Litter	5-10%		
Surface Water	-		
Vegetation Condition	Degraded		
Weed Cover	80%		
Disturbance	Grazing and tracks		
Fire Age Years	-		

VT01-A low, sparse upper story of *Eucalyptus victrix* and *Corymbia flavescens* with a mid, sparse mid storey of *Acacia inaequilatera* and *Carissa lanceolata* with a low, closed understorey of **Cenchrus setigerus, Alysicarpus muelleri* and *Arivela viscosa.*

Species	Naturalised	Conservation code	Height	% Cover
Eucalyptus victrix			<10	7
Acacia inaequilatera				5
Corymbia flavescens				3
Carissa lanceolata			>2	5
Vachellia farnesiana	*		>2	1
Cenchrus setigerus	*			70
Salicornia australis				20
Boerhavia burbidgeana				1
Enchylaena tomentosa			0.1	0.1
Portulaca oleracea	M		0.1	0.1

Relevé Number: R04				
Triodia epactia			0.5	0.5
Dactyloctenium radulans			0.1	0.1
Goodenia muelleriana			0.3	0.1
Arivela viscosa			0.5	0.2
Alysicarpus muelleri			0.5	0.2

Appendix E
Site x Species Matrix

Family	Full Taxon	Naturalised	Conservation code	OPPO	Q01	Q02	Q03	Q04	Q05	Q06
Aizoaceae	*Carpobrotus edulis*	*			X			X		
Araliaceae	*Trachymene pilosa*				X	X	X			
Asparagaceae	*Asparagus asparagoides*	* DP							X	X
Asparagaceae	*Lomandra caespitosa*					X	X			
Asparagaceae	*Lomandra hermaphrodita*							X		
Asparagaceae	*Lomandra maritima*					X	X			
Asparagaceae	*Lomandra micrantha subsp. micrantha*			X						
Asparagaceae	*Thysanotus patersonii*			X						
Asparagaceae	*Thysanotus sp.*						X			
Asparagaceae	*Thysanotus thyrsoideus*			X						
Asteraceae	*Arctotheca calendula*	*					X			X
Asteraceae	*Hypochaeris glabra*	*			X	X	X	X	X	
Asteraceae	*Podotheca gnaphalioides*							X		
Asteraceae	*Sonchus oleraceus*	*				X	X			
Asteraceae	*Ursinia anthemoides*	*			X	X	X	X		
Campanulaceae	*Lobelia tenuior*			X						
Campanulaceae	*Wahlenbergia capensis*	*								
Casuarinaceae	*Allocasuarina fraseriana*			X						
Centrolepidaceae	*Centrolepis drummondiana*			X						
Colchicaceae	*Burchardia congesta*				X					
Crassulaceae	*Crassula glomerata*	*		X						
Cyperaceae	*Ficinia marginata*									X

Family	Full Taxon	Naturalised	Conservation code	OPPO	Q01	Q02	Q03	Q04	Q05	Q06
Cyperaceae	*Lepidosperma calcicola*						X	X		
Cyperaceae	*Lepidosperma sp.*				X					
Dasypogonaceae	*Dasypogon bromeliifolius*						X			
Dilleniaceae	*Hibbertia hypericoides*			X						
Dilleniaceae	*Hibbertia subvaginata*						X			
Ericaceae	*Styphelia propinqua*			X						
Fabaceae	*Acacia huegelii*			X						
Fabaceae	*Acacia iteaphylla*	*						X		
Fabaceae	*Acacia longifolia*	*					X			
Fabaceae	*Acacia pulchella*						X			
Fabaceae	*Bossiaea eriocarpa*			X						
Fabaceae	*Daviesia physodes*			X						
Fabaceae	*Gastrolobium capitatum*						X			
Fabaceae	*Gompholobium tomentosum*					X	X	X		
Fabaceae	*Jacksonia furcellata*			X						
Fabaceae	*Jacksonia sternbergiana*			X						
Fabaceae	*Lotus angustissimus*	*			X	X	X	X	X	X
Fabaceae	*Vicia sativa*	*				X	X			
Geraniaceae	*Geranium molle*	*					X			
Geraniaceae	*Pelargonium capitatum*	*		X						
Goodeniaceae	*Dampiera linearis*			X						
Haemodoraceae	*Conostylis aculeata*					X				

Family	Full Taxon	Naturalised	Conservation code	OPPO	Q01	Q02	Q03	Q04	Q05	Q06
Haemodoraceae	*Conostylis aculeata subsp. aculeata*			X						
Haemodoraceae	*Conostylis juncea*			X						
Haemodoraceae	*Conostylis sp.*					X				
Haemodoraceae	*Haemodorum spicatum*					X	X	X		
Haemodoraceae	*Phlebocarya ciliata*						X			
Hemerocallidaceae	*Dianella revoluta*			X						
Hemerocallidaceae	*Tricoryne elatior*							X		
Iridaceae	*Gladiolus caryophyllaceus*	*			X	X	X			
Iridaceae	*Patersonia occidentalis*				X					
Iridaceae	*Romulea rosea var. australis*	*						X	X	X
Lauraceae	*Cassytha racemosa forma racemosa*				X					
Loranthaceae	*Nuytsia floribunda*			X						
Macarthuriaceae	*Macarthuria australis*			X						
Myrtaceae	*Astartea scoparia*				X	X				X
Myrtaceae	*Eremaea pauciflora*			X						
Myrtaceae	*Corymbia calophylla*			X						
Myrtaceae	*Eremaea purpurea*			X						
Myrtaceae	*Eucalyptus camaldulensis*	*		X						
Myrtaceae	*Eucalyptus rudis*				X					X
Myrtaceae	*Eucalyptus todtiana*			X						
Myrtaceae	*Hypocalymma angustifolium*				X	X	X			
Myrtaceae	*Hypocalymma robustum*			X						

Family	Full Taxon	Naturalised	Conservation code	OPPO	Q01	Q02	Q03	Q04	Q05	Q06
Myrtaceae	*Kunzea glabrescens*			X						
Myrtaceae	*Melaleuca preissiana*					X	X	X		
Myrtaceae	*Melaleuca rhaphiophylla*				X				X	
Myrtaceae	*Melaleuca teretifolia*									X
Myrtaceae	*Regelia ciliata*					X	X			
Myrtaceae	*Scholtzia involucrata*			X						
Orchidaceae	*Caladenia sp.*						X			
Orchidaceae	*Drakaea sp.*					X	X			
Orchidaceae	*Microtis media subsp. media*						X			
Phyllanthaceae	*Poranthera microphylla*			X						
Pinaceae	*Pinus pinaster*	*		X						
Pittosporaceae	*Billardiera fraseri*					X				
Poaceae	*Avena barbata*	*							X	
Poaceae	*Briza maxima*	*			X	X	X			
Poaceae	*Bromus diandrus*	*								X
Poaceae	*Bromus rubens*	*							X	X
Poaceae	*Ehrharta calycina*	*			X	X	X	X		X
Poaceae	*Lolium perenne*	*						X	X	X
Poaceae	*Pentameris airoides*	*			X			X		
Poaceae	*Vulpia myuros*	*				X		X	X	
Polygalaceae	*Comesperma calymega*					X	X			
Proteaceae	*Adenanthos cygnorum*					X				

Family	Full Taxon	Naturalised	Conservation code	OPPO	Q01	Q02	Q03	Q04	Q05	Q06
Proteaceae	*Banksia attenuata*					X	X			
Proteaceae	*Banksia ilicifolia*					X	X	X		
Proteaceae	*Banksia littoralis*			X						
Proteaceae	*Banksia menziesii*							X		
Proteaceae	*Hakea varia*			X						
Restionaceae	*Alexgeorgea nitens*			X						
Restionaceae	*Dielsia stenostachya*			X						
Restionaceae	*Hypolaena exsulca*					X				
Rubiaceae	*Opercularia vaginata*			X						
Stylidiaceae	*Stylidium piliferum*						X			
Stylidiaceae	*Stylidium repens*					X				
Xanthorrhoeaceae	*Xanthorrhoea gracilis*						X			
Xanthorrhoeaceae	*Xanthorrhoea preissii*						X			

Appendix F
Fauna Database Search Results and Likelihood of Occurrence

Fauna Database Search Results (DBCA Database Search using 20 Km Buffer, PMST 20 km buffer), Likelihood and Fauna Survey Records

Scientific Name	Common Name	Conservation Status		Database Source		Likelihood of Occurrence	Justification
		WA	EPBC	DBCA	PMST		
Aves							
Actitis hypoleucos	common sandpiper	MI	MI	X		Low	Migratory shorebird, no permanent wetland habitat within Survey Area, unlikely to occur within Survey Area
Apus pacificus	fork-tailed swift	MI	MI	X		Low	Migratory species, no breeding or roosting habitat within Survey Area
Arenaria interpres	ruddy turnstone	MI	MI	X	X	Low	Migratory shorebird, no permanent wetland habitat within Survey Area, unlikely to occur within Survey Area
Calidris acuminata	sharp-tailed sandpiper	MI	MI	X	X	Low	Migratory shorebird, no permanent wetland habitat within Survey Area, unlikely to occur within Survey Area
Calidris alba	sanderling	MI	MI	X		Low	Migratory shorebird, no permanent wetland habitat within Survey Area, unlikely to occur within Survey Area
Calidris canutus	red knot	EN	EN & MI	X	X	Low	Migratory shorebird, no permanent wetland habitat within Survey Area, unlikely to occur within Survey Area
Calidris falcinellus	broad-billed sandpiper	MI	MI	X		Low	Migratory shorebird, no permanent wetland habitat within Survey Area, unlikely to occur within Survey Area
Calidris ferruginea	curlew sandpiper	CR	CR & MI	X	X	Low	Migratory shorebird, no permanent wetland habitat within Survey Area, unlikely to occur within Survey Area
Calidris melanotos	pectoral sandpiper	MI	MI	X		Low	Migratory shorebird, no permanent wetland habitat within Survey Area, unlikely to occur within Survey Area

Scientific Name	Common Name	Conservation Status		Database Source		Likelihood of Occurrence	Justification
		WA	EPBC	DBCA	PMST		
Calidris pugnax	ruff	MI	MI	X		Low	Migratory shorebird, no permanent wetland habitat within Survey Area, unlikely to occur within Survey Area
Calidris ruficollis	red-necked stint	MI	MI	X		Low	Migratory shorebird, no permanent wetland habitat within Survey Area, unlikely to occur within Survey Area
Calidris subminuta	long-toed stint	MI	MI	X		Low	Migratory shorebird, no permanent wetland habitat within Survey Area, unlikely to occur within Survey Area
Calidris tenuirostris	great knot	CR	CR & MI	X		Low	Migratory shorebird, no permanent wetland habitat within Survey Area, unlikely to occur within Survey Area
Charadrius leschenaultii	greater sand plover,	VU	VU & MI	X	X	Low	Migratory shorebird, no permanent wetland habitat within Survey Area, unlikely to occur within Survey Area
Charadrius mongolus	lesser sand plover	EN	EN & MI	X	X	Low	Migratory shorebird, no permanent wetland habitat within Survey Area, unlikely to occur within Survey Area
Charadrius veredus	oriental plover	MI	MI	X		Low	Migratory shorebird, no permanent wetland habitat within Survey Area, unlikely to occur within Survey Area
Chlidonias leucopterus	white-winged black tern	MI	MI	X		Low	Coastal bird species, no permanent wetland habitat within Survey Area, unlikely to occur within Survey Area
Erythrotriorchis radiatus	Red Goshawk	VU	EN		X	Low	Outside of the expected likely range for this species (DCCEEW 2023)
Falco hypoleucos	grey falcon	VU		X	X	High	Species that feeds on the ground and is known to perch on human built

Scientific Name	Common Name	Conservation Status		Database Source		Likelihood of Occurrence	Justification
		WA	EPBC	DBCA	PMST		
							structures, 7 records (DBCA) within 50km within 20 years. Nearest record is 850m south of survey area.
Falco peregrinus	peregrine falcon	OS		X		Medium	Flyover species, may alight in trees or on built structure to consume prey, no breeding habitat within Survey Area.
Gallinago stenura	pin-tailed snipe	MI	MI	X		Low	Migratory shorebird, no permanent wetland habitat within Survey Area, unlikely to occur within Survey Area
Gelochelidon nilotica	gull-billed tern	MI	MI	X		Low	Coastal bird species, no permanent wetland habitat within Survey Area, unlikely to occur within Survey Area
Glareola maldivarum	oriental pratincole	MI	MI	X		Low	Coastal bird species, no permanent wetland habitat within Survey Area, unlikely to occur within Survey Area
Hirundo rustica	barn swallow	MI	MI	X		Low	Rare migratory species, unlikely to alight within Survey Area, and all recent records are of flyover events. 18 records (DBCA) within 50km within 20 years)
Hydroprogne caspia	Caspian tern	MI	MI	X		Low	Coastal bird species, no permanent wetland habitat within Survey Area, unlikely to occur within Survey Area
Limnodromus semipalmatus	Asian dowitcher	MI	MI	X	X	Low	Migratory shorebird, no permanent wetland habitat within Survey Area, unlikely to occur within Survey Area
Limosa lapponica	bar-tailed godwit	MI	MI	X	X	Low	Migratory shorebird, no permanent wetland habitat within Survey Area, unlikely to occur within Survey Area

Scientific Name	Common Name	Conservation Status		Database Source		Likelihood of Occurrence	Justification
		WA	EPBC	DBCA	PMST		
Limosa limosa	black-tailed godwit	MI	MI	X	X	Low	Migratory shorebird, no permanent wetland habitat within Survey Area, unlikely to occur within Survey Area
Numenius madagascariensis	eastern curlew	CR	CR & MI	X	X	Low	Migratory shorebird, no permanent wetland habitat within Survey Area, unlikely to occur within Survey Area
Numenius minutus	little curlew	MI	MI	X		Low	Migratory shorebird, no permanent wetland habitat within Survey Area, unlikely to occur within Survey Area
Numenius phaeopus	whimbrel	MI	MI	X		Low	Migratory shorebird, no permanent wetland habitat within Survey Area, unlikely to occur within Survey Area
Pandion haliaetus	osprey	MI	MI	X		Low	Coastal bird species, no permanent wetland habitat within Survey Area, Is known to perch on tall built structures which are not present within the Survey Area. unlikely to occur within Survey Area
Pezoporus occidentalis	Night Parrot	CR	EN		X	Low	Extremely rare species with only a handful of records within the last 20 years, none within 50km of Survey Area, unlikely to occur within Survey Area.
Phalaropus lobatus	red-necked phalarope	MI	MI	X		Low	Migratory shorebird, no permanent wetland habitat within Survey Area, unlikely to occur within Survey Area
Plegadis falcinellus	glossy ibis	MI	MI	X		Low	Coastal bird species, no permanent wetland habitat within Survey Area, unlikely to occur within Survey Area

Scientific Name	Common Name	Conservation Status		Database Source		Likelihood of Occurrence	Justification
		WA	EPBC	DBCA	PMST		
Pluvialis fulva	Pacific golden plover	MI	MI	X		Low	Migratory shorebird, no permanent wetland habitat within Survey Area, unlikely to occur within Survey Area
Pluvialis squatarola	grey plover	MI	MI	X	X	Low	Migratory shorebird, no permanent wetland habitat within Survey Area, unlikely to occur within Survey Area
Rostratula australis	Australian Painted Snipe	EN	EN		X	Low	Migratory shorebird, no permanent wetland habitat within Survey Area, unlikely to occur within Survey Area
Sterna hirundo	common tern	MI	MI	X		Low	Coastal bird species, no permanent wetland habitat within Survey Area, unlikely to occur within Survey Area
Sternula albifrons	little tern	MI	MI	X	X	Low	Coastal bird species, no permanent wetland habitat within Survey Area, unlikely to occur within Survey Area
Sternula nereis	fairy tern	VU	VU	X		Low	Coastal bird species, no permanent wetland habitat within Survey Area, unlikely to occur within Survey Area
Thalasseus bergii	crested tern	MI	MI	X		Low	Coastal bird species, no permanent wetland habitat within Survey Area, unlikely to occur within Survey Area
Tringa brevipes	grey-tailed tattler	P4 & MI	MI	X		Low	Migratory shorebird, no permanent wetland habitat within Survey Area, unlikely to occur within Survey Area
Tringa glareola	wood sandpiper	MI	MI	X		Low	Migratory shorebird, no permanent wetland habitat within Survey Area, unlikely to occur within Survey Area

Scientific Name	Common Name	Conservation Status		Database Source		Likelihood of Occurrence	Justification
		WA	EPBC	DBCA	PMST		
Tringa nebularia	common greenshank	MI	MI	X	X	Low	Migratory shorebird, no permanent wetland habitat within Survey Area, unlikely to occur within Survey Area
Tringa stagnatilis	marsh sandpiper	MI	MI	X		Low	Migratory shorebird, no permanent wetland habitat within Survey Area, unlikely to occur within Survey Area
Xenus cinereus	Terek sandpiper	MI	MI	X	X	Low	Migratory shorebird, no permanent wetland habitat within Survey Area, unlikely to occur within Survey Area
Mammals							
Dasycercus blythi	brush-tailed mulgara	P4		X		Medium	Species is widespread and utilises spinifex (*Triodia*) habitat types which a present within the Survey Area. 262 records (DBCA) within 50km within 20 years, nearest record within 4 km of Survey Area. Potential to occur within Survey Area.
Dasycercus cristicauda	crest-tailed mulgara, minyiminyi	P4		X		Low	Previously synonymous with *D.blythi,* not present withing Pilbara and now misnomer record.
Dasyurus hallucatus	northern quoll	EN	EN	X	X	High	species requires rock crags or large termite mounds to rest, habitat types not present within Survey Area.870 records (DBCA) within 50km within 20 years. Nearest record is 7 km south of Survey Area. Species may forage within Survey Area

Scientific Name	Common Name	Conservation Status		Database Source		Likelihood of Occurrence	Justification
		WA	EPBC	DBCA	PMST		
Leggadina lakedownensis	northern short-tailed mouse, Lakeland Downs mouse, kerakenga	P4		X		Low	Species is known from Sandy soils and cracking clays in WA (DBCA). Due to nocturnal habit and small size, difficult to detect. Two records (DBCA) within 50 km in 20 years. Species unlikely to occur within Survey Area
Macroderma gigas	ghost bat	VU	VU	X	X	Low	This species requires natural caves and manmade mineshafts to roost and breed which are not present within or near the Survey Area. Species Unlikely to Occur within Survey Area
Macrotis lagotis	bilby, dalgyte, ninu	VU	VU	X	X	Medium	Species utilises Spinifex (*Triodia*) habitat which is present within the Survey Area. 40 records (DBCA) within 50km within 20 years. Nearest record is 5 km west of the Survey Area
Ozimops cobourgianus	northern coastal free-tailed bat	P1		X		Low	Species generally found in mangrove and associated floodplain forest, nor present within the Survey Area. Species unlikely to occur within Survey Area.
Pseudomys chapmani	western pebble-mound mouse, ngadji	P4		X		Low	This species requires pebbly ground to build its characteristic nests; this habitat type not present within the Survey Area. Species Unlikely to occur within Survey Area.
Rhinonicteris aurantia	Pilbara leaf-nosed bat	VU	VU	X	X	Low	This species requires natural caves and manmade mineshafts to roost and breed which are not present within or

Scientific Name	Common Name	Conservation Status		Database Source		Likelihood of Occurrence	Justification
		WA	EPBC	DBCA	PMST		
							near the Survey Area. Species Unlikely to Occur within Survey Area
Reptiles and Amphibians							
Ctenotus angusticeps	Airlie Island ctenotus, northwestern coastal ctenotus	P3		X		Low	This species inhabits coastal shrubland habitat, 16 records (DBCA) within 50km within 20 years, all records are within primary coastal vegetation. Species Unlikely to occur within Survey Area
Liasis olivaceus barroni	Pilbara olive python	VU	VU	X	X	Low	Species primarily relies on rocky habitat with access to standing fresh water, not present within Survey Area. Four records (DBCA) within 50km within 20 years, all within expected appropriate habitat. .