



Biologic
ENVIRONMENTAL
SURVEY

**Port Hedland
Transmission Line
Basic and Targeted
Vertebrate Fauna
Survey**

Report to Pilbara Energy

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Executive Summary

Pilbara Energy (APA, formerly Alinta Energy) commissioned Biologic to undertake a basic and targeted vertebrate fauna survey covering five potential infrastructure corridors along and adjacent to the Great Northern Highway, comprising of; Route 1 Horizon TXL Route 1b deviation from Horizon TXL, Route 2 SIA Infrastructure Corridor, Route 3 South of GNH and Route 4 North of GNH. Following the field assessment an additional route was added and assessed at a desktop level, Route 6. In total, these six potential alignments cover 9,160.79 hectares (ha).

The desktop assessment identified a total of 436 vertebrate fauna species as potentially occurring within the Study Area, comprising 51 mammals (including 39 native and 12 non-native), 246 birds, 127 reptiles and 12 amphibians. The field survey was undertaken by two experienced senior zoologists between 26 April and 5 May 2023. The primary objective of the survey was to identify the occurrence of terrestrial vertebrate fauna species and their supporting habitats within the Study Area, with a focus on significant species, particularly Matters of National Environmental Significance (MNES). Specific methods included targeted searches, active foraging, acoustic recordings for night parrot, ultrasonic sound recordings for bats and habitat assessments.

Five broad fauna habitat types were recorded and mapped within the Study Area, comprising, in decreasing order of extent, Sand Plain (85.88%; 7,867.53 ha), Drainage Area (5.28%; 483.89 ha), Major Drainage (3.96%; 362.57 ha), Hardpan Plain (2.05%; 187.59 ha), and Claypan (0.35%; 32.13 ha). The remaining 2.48% (227.07 ha) was mapped as Disturbed. All five fauna habitats mapped, excluding Claypan, are broadly distributed and well represented across the Pilbara bioregion, and therefore support fauna assemblages which are generally common and widespread. Major Drainage provides critical breeding, foraging and dispersal for grey falcon, and Sand Plain and Drainage Area habitats provide supporting habitat for several MNES species. A single water feature was recorded, often a greater level of importance to significant species.

A total of 88 vertebrate fauna species, comprising 11 mammals (two introduced and nine native), 58 bird species and 19 reptiles were recorded during the field survey. Of the 68 significant species identified in the desktop assessment, three species were Confirmed to occur within the Study Area. Bilby (*Macrotis lagotis* – Vulnerable) was recorded from a single track and nine associated diggings in the south-west of the Study Area (Route 1). An additional two diggings were recorded in the north just outside of the Study Area; however, as no other signs were recorded these cannot be confirmed. Pilbara leaf-nosed bat (*Rhinonictis aurantia* – Vulnerable) was recorded on three occasions during the current

survey from a total of 16 ultrasonic calls (within Route 1b and Route 3). Grey falcon (*Falco hypoleucos* – Vulnerable) was recorded from a single individual perched on a powerline in the north of the Study Area (Route 2).

Five species comprising brush-tailed mulgara (*Dasyercus blythi* – Priority 4), oriental pratincole (*Glareola maldivarum* – Migratory), common sandpiper (*Actitis hypoleucos* – Migratory), Caspian tern (*Hydroprogne caspia* – Migratory) and gull-billed tern (*Gelochelidon nilotica* – Migratory) were Confirmed in the Study Area from previous surveys. The peregrine falcon (*Falco peregrinus* – Specially Protected) was deemed Likely to occur and six species were deemed Possible to occur: northern quoll, Pilbara olive python, fork-tailed swift (*Apus pacificus* – Migratory), short-tailed mouse (*Leggadina lakedownensis* – Priority 4), letter-winged kite (*Elanus scriptus* – Priority 4) and spectacled hare-wallaby (*Lagorchestes conspicillatus leichardti* – Priority 4). The remaining 53 species were considered Unlikely or Highly Unlikely to occur within the Study Area, based on distance of previous records to the Study Area and/or the absence of suitable permanent or seasonal habitats within the Study Area.

1 Introduction

1.1 Background

Pilbara Energy (APA, formerly Alinta Energy) are seeking to progress development activities to build and operate a 220 kilovolt (kV) transmission line connecting its Port Hedland Power Station to a customer located approximately 65 kilometres (km) southwest of Port Hedland. APA have commissioned Biologic Environmental Survey (Biologic) to complete a single-season basic and targeted vertebrate fauna survey of the Study Area. Of particular interest is the potential for the Study Area to support significant species, which includes those listed as threatened and/or migratory under the *Environmental Protection and Biodiversity Conservation Act 1999* (EPBC Act) and/or *Biodiversity and Conservation Act 2016* (BC Act) or listed as Priority by the Department of Biodiversity, Conservation and Attractions (DBCA).

Five potential routes underwent zoological assessment in May 2023 and two were added following the survey. These two routes were assessed at the desktop level. One is set apart to the east (Route 5, Figure 1.1) and is presented in a separate report (Biologic, 2024). One, Route 6, occurs closer to Routes 1 through 4, and is included in this report, using extrapolated data for assessment. These Routes are shown in Figure 1.1 and are defined as follows:

- Basic and Targeted Vertebrate Fauna Survey:
 - Route 1: Horizon Transmission Line (TXL);
 - Route 1b: deviation from Horizon TXL;
 - Route 2: SIA Infrastructure Corridor;
 - Route 3: South of Great Northern Hwy (GNH); and
 - Route 4: North of GNH.
- Desktop Assessments:
 - Route 5 (Biologic, 2024), included in Figure 1.1 for context)
 - Route 6 (assessed with extrapolated data).

In total, the six potential alignments (Routes 1, 1b, 2, 3, 4 and 6) cover 9,160.79 hectares (ha) and henceforth are referred to collectively as the Study Area (Figure 1.1). The Study Area parallels a section of the GNH from South Hedland to just north of Indee Rd, with two alternative routes aligned north of the North-west Coastal Hwy and following an existing powerline corridor (Horizon) through Mundabullangana Station.

1.2 Scope and Objectives

The broader objective of this survey was to gather biological information through a desktop assessment and field survey to enhance and contextualise the knowledge of vertebrate fauna and fauna habitats within the Study Area. The objectives of the Scope of Works (SoW) were to:

- conduct a comprehensive desktop assessment (database searches and literature review) to identify vertebrate fauna species potentially occurring within the Study Area;
- undertake a basic and targeted vertebrate fauna survey to identify the occurrence of vertebrate fauna species and their supporting habitats within the Study Area, with a focus on significant species;
- define and delineate broad fauna habitats occurring within the Study Area, and describe their significance to vertebrate fauna, particularly significant species; and
- assess the likelihood and distribution of significant species occurring within the Study Area.

1.3 Legislation & Compliance

This assessment was carried out in acknowledgement of the following guidelines and recommendations developed by the relevant state and federal regulatory bodies, and relevant survey-specific license and ethics conditions:

- Bat Call (2021a) A review of ghost bat ecology, threats and survey requirements;
- Bat Call (2021b) A review of Pilbara leaf-nosed bat ecology, threats and survey requirements;
- Department of Biodiversity, Conservations and Attractions (DBCA, 2018) Guidelines for the survey and relocation of bilby in Western Australia
- Department of Environment, Water, Heritage and the Arts (DEWHA, 2010a) Survey guidelines for Australia's threatened bats;
- DEWHA (2010b) Survey guidelines for Australia's threatened birds;
- Department of Environment (DoE, 2013) Significant impact guidelines 1.1: Matters of national environmental significance;
- Department of Sustainability, Environment, Water, Population and Communities (DSEWPaC, 2011a) Survey guidelines for Australia's threatened mammals;
- DSEWPaC (2011b) Survey guidelines for Australia's threatened reptiles;
- Environmental Protection Agency (EPA, 2020b) Technical guidance: terrestrial vertebrate fauna surveys for environmental impact assessment;
- EPA (2020a) Statement of environmental principles, factors and objectives;
- EPA (2016) Environmental factor guidelines – terrestrial fauna; and

- Department of Parks and Wildlife (DPaW, 2017) Interim guidelines for the preliminary surveys of night parrot (*Pezoporus occidentalis*) in Western Australia.

1.4 Background to Protection of Fauna

Terrestrial fauna may be significant for a range of reasons, including:

- being identified as a threatened or priority species;
- being a species with restricted distribution;
- enduring a degree of historical impact from threatening processes; or
- providing an important function required to maintain the ecological integrity of a significant ecosystem (EPA, 2016).

All native fauna in Western Australia (WA) are protected at a state level under the BC Act and at a national level under the EPBC Act. Any action that has the potential to impact native fauna needs to be approved by relevant state and/or federal departments in accordance with the *WA Environmental Protection Act 1986* (EP Act) and the federal EPBC Act.

While all native fauna are protected under these Acts, some species are afforded extra protection. These include species that are considered Threatened under the EPBC Act and/or BC Act, or migratory bird species that are protected under international agreements and subsequently listed as Migratory under the EPBC Act and/or BC Act (Table 1.1; Appendix A). Furthermore, any species that may be threatened but for which there is insufficient information available to allocate a threatened status under the EPBC Act and/or BC Act, can also be listed as Priority species by the WA DBCA (Table 1.1). The primary focus of the current assessment is the seven MNES species listed in Section 4.2.4, with consideration also given to other significant species identified during the desktop assessment.

Table 1.1: Definitions and terms for significant species

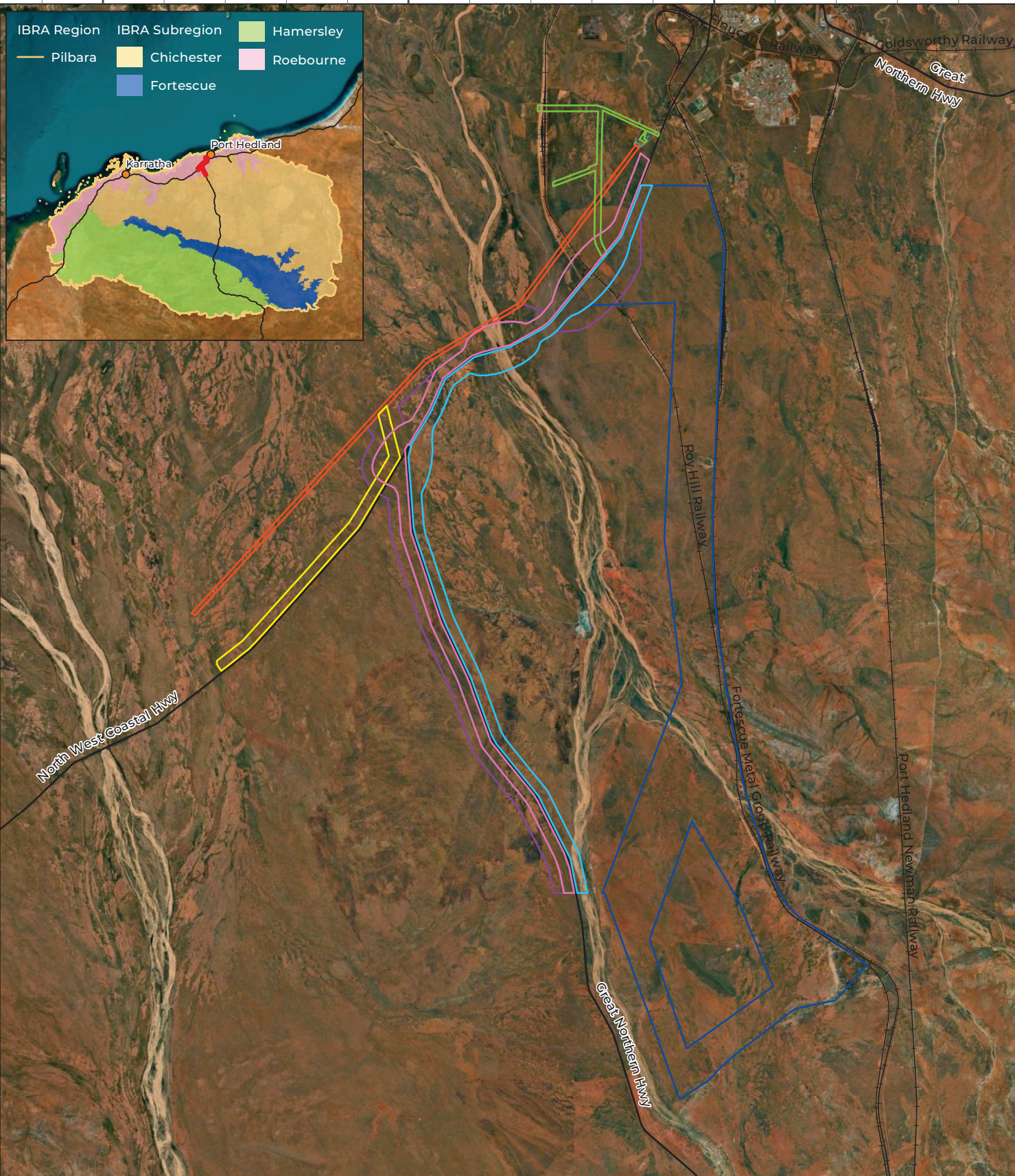
Act, Agreement or List	Status Codes ¹
Federal	
<p>EPBC Act</p> <p>In Australia, native fauna is protected under the EPBC Act. This Act makes provisions for an independent committee (the Threatened Species Scientific Committee [TSSC]), which is charged with maintaining a list of threatened species. Threatened species are listed under one of six categories, depending on their specific conservation status.</p> <p>Migratory bird species are those listed under international agreements and protected under the EPBC Act as a MNES. Relevant international agreements include the Convention on the Conservation of Migratory Species of Wild Animals (Bonn Convention), China-Australia Migratory Bird Agreement (CAMBA), Japan-Australia Migratory Bird Agreement (JAMBA), and Republic of Korea-Australia Migratory Bird Agreement (ROKAMBA).</p>	<p><i>Extinct:</i></p> <ul style="list-style-type: none"> • EX – Extinct • EW – Extinct in the Wild <p><i>Threatened:</i></p> <ul style="list-style-type: none"> • CR – Critically Endangered • EN – Endangered • VU – Vulnerable • CD – Conservation Dependent <p><i>Other:</i></p> <ul style="list-style-type: none"> • MI – Migratory
State	
<p>BC Act</p> <p>In WA, native fauna is protected under the BC Act. Species in special need of protection are listed as being Extinct, Threatened or Specially Protected. Within these groups, species are listed under one of eight categories, depending on their specific conservation status. Migratory bird species are those listed under the Bonn Convention and/or CAMBA, JAMBA and ROKAMBA agreements.</p>	<p><i>Extinct:</i></p> <ul style="list-style-type: none"> • EX – Extinct <p><i>Threatened:</i></p> <ul style="list-style-type: none"> • CR – Critically Endangered • EN – Endangered • VU – Vulnerable <p><i>Specially Protected:</i></p> <ul style="list-style-type: none"> • MI – Migratory • CD – Conservation Dependent • OS – Other specially protected fauna
<p>DBCA Priority List</p> <p>The DBCA maintains a list of Priority species that are considered to be possibly threatened but have not been assigned statutory protection under the BC Act, as not enough information is available for an accurate determination of conservation status. These species are generally in urgent need of survey to determine their distribution and abundance.</p>	<p><i>Poorly Known:</i></p> <ul style="list-style-type: none"> • P1 – Priority 1 • P2 – Priority 2 • P3 – Priority 3 <p><i>Rare, Near Threatened and other</i></p> <ul style="list-style-type: none"> • P4 – Priority

¹ See Appendix A for definitions of status codes

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LEGEND

Route 1	Route 5 (Biologic, 2024)	State Road
Route 1b	Route 6	Rail
Route 2		
Route 3		
Route 4		

Scale 1:180,000
 0 2 4 Km
 Coordinate System: GDA2020 MGA Zone 50
 Projection: Transverse Mercator
 Datum: GDA2020 Created 13/06/2024

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 Port Hedland Transmission
 Line Basic and Targeted
 Vertebrate Fauna Survey

**Figure 1.1: Study Area
 and regional context**

2 Existing Environment

2.1 Biogeography

The Study Area is located in the northern section of the Pilbara Craton (Kendrick & McKenzie, 2003; Kendrick & Stanley, 2003) in the Pilbara bioregion (Figure 1.1), as defined by the Interim Biogeographic Regionalisation of Australia (IBRA) (Thackway & Cresswell, 1995). The Pilbara bioregion is characterised by vast coastal plains and inland mountain ranges with cliffs and deep gorges (Thackway & Cresswell, 1995). Vegetation is predominantly mulga low woodlands or snappy gum over bunch and hummock grasses (Bastin & ACRIS, 2008).

The Pilbara bioregion is classified into four separate subregions, Chichester (PIL01), Fortescue (PIL02), Hamersley (PIL03) and Roebourne (PIL04), of which the Study Area is located within the Chichester and Roebourne subregions (Figure 1.1). The Chichester subregion has undulating Archaean granite and basalt plains with areas of basaltic ranges. These plains support a range of vegetation including shrub steppe and hummock grasslands (Kendrick & McKenzie, 2003). The Roebourne subregion is characterised by sub-coastal plains with hummock grasses and dwarf shrub steppe, and ranges of basalt with minor exposures of granite (Kendrick & Stanley, 2003).

2.2 Climate

The Pilbara bioregion has a semi-desert to tropical climate, with rainfall occurring sporadically throughout the year, but mostly during summer (Thackway & Cresswell, 1995). Summer rainfall is usually the result of tropical storms in the north or tropical cyclones that impact upon the coast and move inland. The winter rainfall is generally lighter and a result of cold fronts moving north easterly across the state (Leighton, 2004). The average annual rainfall ranges from 200–350 mm, although there are significant fluctuations between years, with some locations receiving up to 1,200 mm in some years (McKenzie *et al.*, 2009).

2.3 Geology

According to the Australian Geological Provinces database, the Study Area is located over one geological superprovince (Pilbara Craton) (Geoscience Australia, 2013). This database was compiled Australia-wide with spatial data captured at a wide scale of approximately 1:1 million. At a finer scale (1: 500,000), the regolith geology of the Study Area contains unconsolidated rock produced by weathering, erosion and/ or deposition that sits above solid bedrock (Eggleton, 2001) (Figure 2.1; Table 2.1) (GSWA, 2020). The entirety of the Study Area is the Alluvial/ fluvial unit of three unit codes: Ac-PIP, Af-PIP and Ai-PIP (Figure 2.1; Table 2.1).

Table 2.1: Geological units of the Study Area (1:500,000)




Unit Code Unit Name	Description	Route 1		Route 1B		Route 2		Route 3		Route 4		Route 6	
		Area (ha)	%	Area (ha)	%	Area (ha)	%	Area (ha)	%	Area (ha)	%	Area (ha)	%
_Ac-PIP: Alluvial/fluvial unit, PIP	Clay, silt, sand, and gravel in fluvial channels	19.95	3.12	-	-	-	-	203.71	7.94	115.90	4.19	4.06	0.19
_Af-PIP: Alluvial/fluvial unit, PIP	Clay, silt, and sand on floodplains	221.31	34.66	362.50	44.77	97.73	25.06	1,569.89	61.20	1,890.52	68.35	1,553.11	71.85
_Ai-PIP: Alluvial/fluvial unit, PIP	Unconsolidated, fine- grained deposits in alluvial drainage depressions, claypans, and ephemeral floodplain lakes; low-lying areas with internal drainage	397.28	62.22	447.19	55.23	292.26	74.94	791.71	30.86	759.47	27.46	604.32	27.96
Total		638.55	100	809.69	100	389.99	100	2,565.32	100	2,765.90	100	2,161.49	100

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Regolith Geology

-  A-PIP; Alluvial/fluvial unit, PIP
-  Ac-PIP; Alluvial/fluvial unit, PIP
-  Af-PIP; Alluvial/fluvial unit, PIP
-  Ai-PIP; Alluvial/fluvial unit, PIP
-  B-PIP; Coastal (wave-dominated) unit, PIP
-  C-f-PIP; Colluvial unit, PIP
-  Rr-k-PIP; Residual or relict unit, PIP
-  Tf-PIP; Coastal (tide-dominated) unit, PIP
-  W-PIP; Sheetwash unit, PIP
-  X-PIP; Exposed unit, PIP

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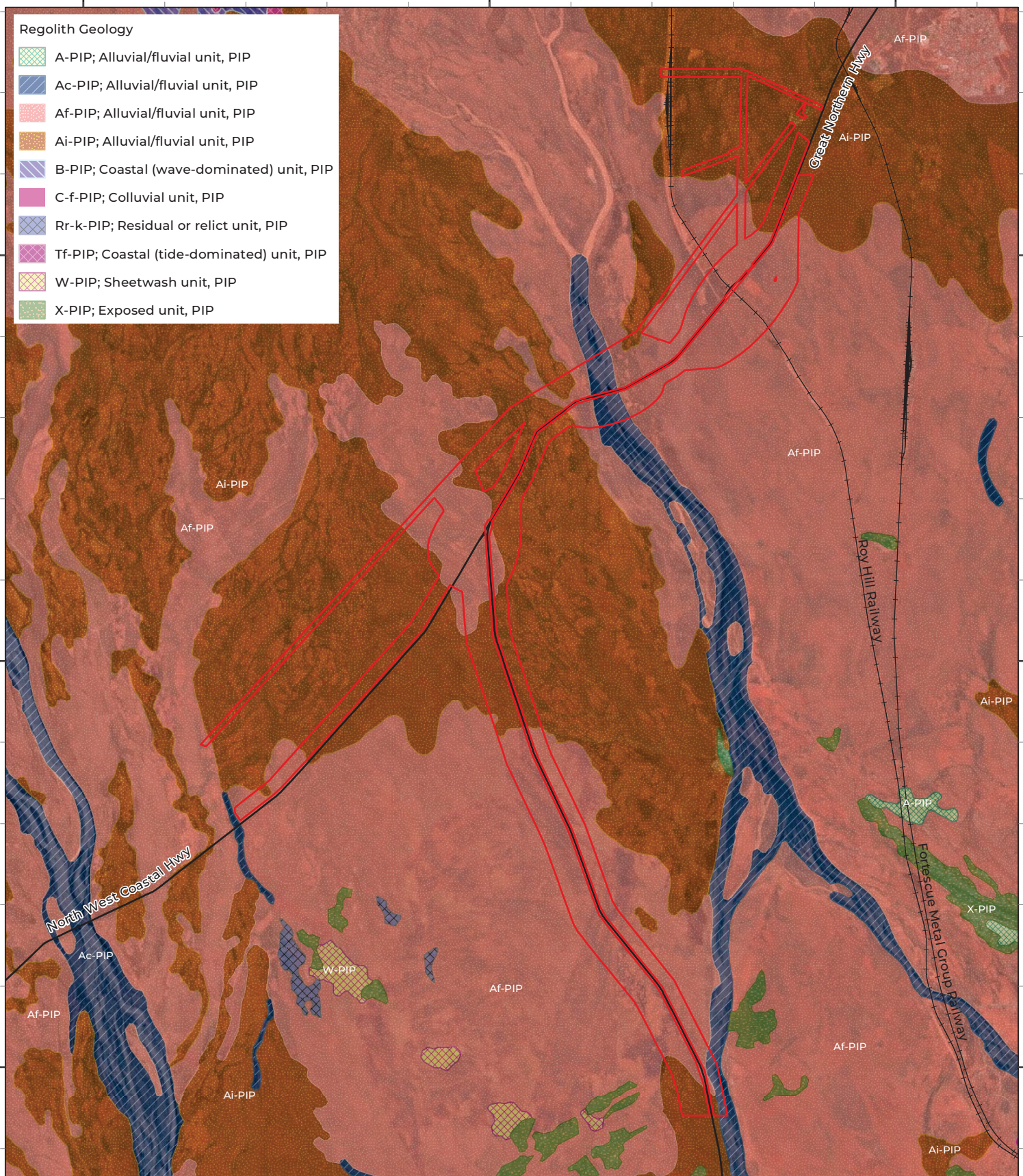
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
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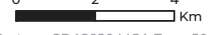


LEGEND

-  Study Area
-  State Road
-  Rail



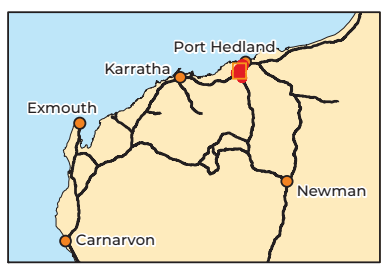
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Coordinate System: GDA2020 MGA Zone 50
 Projection: Transverse Mercator
 Datum: GDA2020 Created 10/06/2024



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Figure 2.1: Geology of the Study Area

2.4 Soils

The Atlas of Australian Soils was compiled by Commonwealth Scientific and Industrial Research Organisation in the 1960s to provide a consistent national description of Australia's soils (Northcote *et al.*, 1960-1968). It comprises a series of 10 maps and associated explanatory notes and is published at a scale of 1:2,000,000, but the original compilation was at scales from 1:250,000 to 1:500,000.

The broad soil landscape units that have been mapped across the Study Area comprise AB19, B27, BD1, Oc40 and Oc62 (Northcote *et al.*, 1960-1968) (Table 2.2; Figure 2.2). The majority of the Study Area is mapped as Oc40 and AB19, with smaller portions of B27, BD1 and Oc62.

2.5 Land Systems

Payne *et al.* (1988) and van Vreeswyk *et al.* (2004) classified and mapped the land systems of the Pilbara bioregion according to similarities in landform, soil, vegetation, geology and geomorphology. Three land systems intersect the Study Area (Table 2.3; Figure 2.3). The Uaroo System forms the dominant land system of the Survey Area, occurring over 6,272.56 ha (68.47%).

Table 2.2: Soil landscape units of the Study Area

Unit Code	Description	Route 1		Route 1B		Route 2		Route 3		Route 4		Route 6	
		Area (ha)	%	Area (ha)	%	Area (ha)	%	Area (ha)	%	Area (ha)	%	Area (ha)	%
AB19	Extensive sandy plains: chief soils are red earthy sands (Uc5.21) with extensive areas of red earths (Gn2.12) and with some hard red soils (Dr) along creek lines. Similar to unit AB21 but without sandstone residuals. Occurs on sheet(s): 6	208.40	32.64	-	-	389.99	100	724.17	28.23	729.27	26.37	576.88	26.69
B27	Low terrace associated with mainstream channels: chief soils are loose sands (Uc1.22) with some (Um5.11) soils on patches of calcrete (kunkar). Occurs on sheet(s): 6	27.06	4.24	-	-	-	-	353.00	13.76	253.44	9.16	20.13	0.93
BD1	Plains and levees	34.95	5.47	-	-	-	-	85.34	3.33	119.08	4.31	22.80	1.05
Oc40	Alluvial plains	368.13	57.65	793.90	98.05	-	-	1,402.79	54.68	1,664.09	60.16	1,541.68	71.32
Oc62	Very gently undulating pediplain with low granite outcrops and tors; occasional basic dykes occur as low elongate ridges: chief soils are hard alkaline red soils (Dr2.33) and (Dr2.43) having coarse-textured A horizons up to 18 in. thick.	208.40	32.64	15.79	1.95	-	-	-	-	-	-	-	-
Total		638.55	100	809.69	100	389.99	100	2,565.32	100	2,765.90	100	2,161.49	100

Table 2.3: Land Systems of the Study Area

Land System	Description	Route 1		Route 1B		Route 2		Route 3		Route 4		Route 6	
		Area (ha)	%	Area (ha)	%	Area (ha)	%	Area (ha)	%	Area (ha)	%	Area (ha)	%
Mallina System	Sandy surfaced alluvial plains supporting soft spinifex grasslands and minor hard spinifex and tussock grasslands.	355.40	55.66	71.86	8.88	-	-	885.44	34.52	539.92	19.52	436.48	20.19
River System	Narrow, seasonally active flood plains and major river channels supporting moderately close, tall shrublands or woodlands of acacias and fringing communities of eucalypts sometimes with tussock grasses or spinifex.	101.58	15.91	-	-	-	-	375.28	14.63	269.84	9.76	22.54	1.04
Uaroo System	Broad sandy plains, pebbly plains and drainage tracts supporting hard and soft spinifex hummock grasslands with scattered acacia shrubs.	181.57	28.43	737.83	91.12	389.99	100	1,304.59	50.85	1,956.12	70.72	1,702.46	78.76
Total		638.55	100	809.69	100	389.99	100	2,565.32	100	2,765.90	100	2,161.49	100

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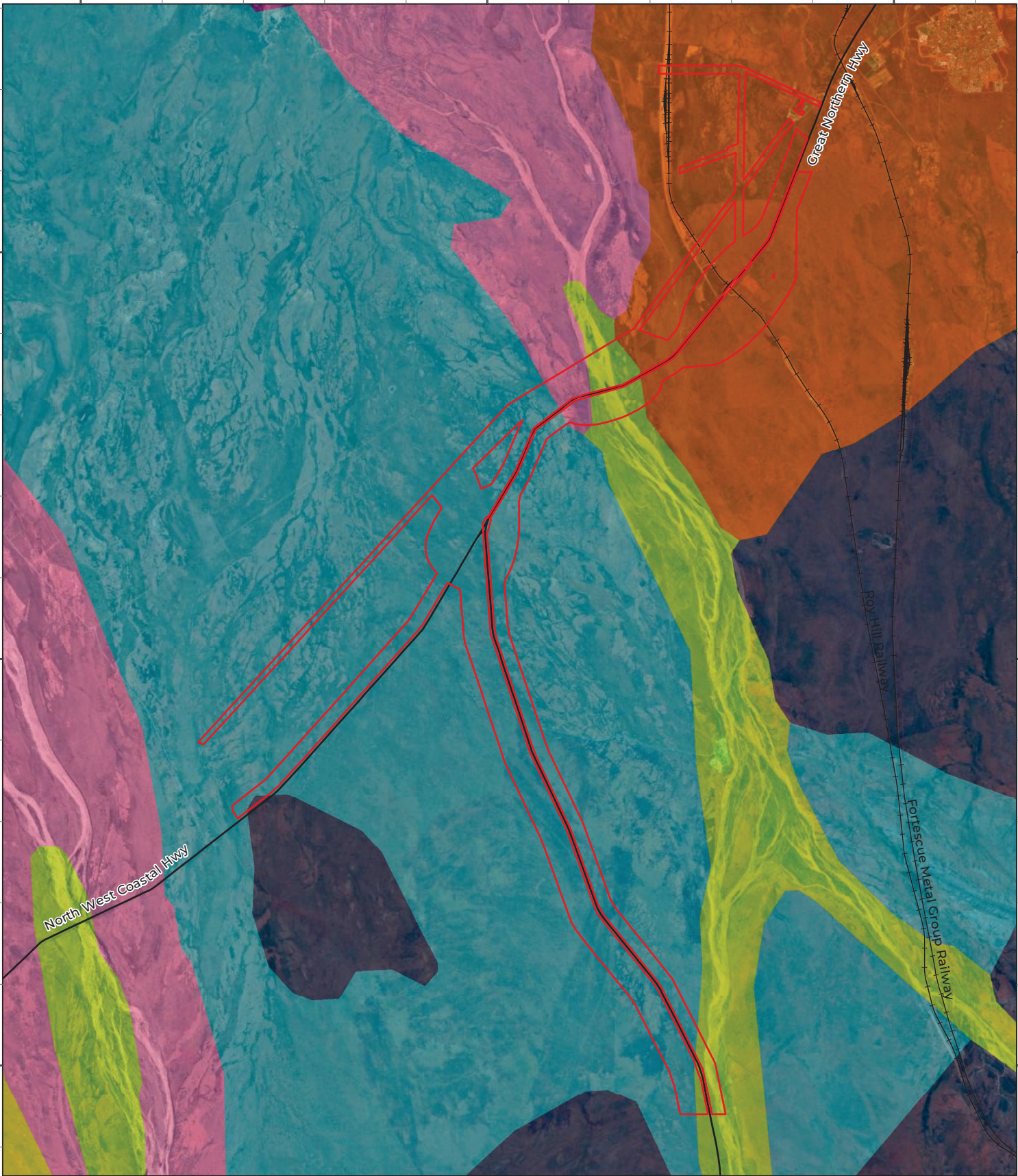
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LEGEND

Study Area	Soil Unit	BD1
State Road	AB19	Oc40
Rail	AB20	Oc62
	B27	SV8

Scale 1:135,000

Coordinate System: GDA2020 MGA Zone 50
 Projection: Transverse Mercator
 Datum: GDA2020 Created 10/06/2024

ALINTA ENERGY
 Port Hedland Transmission
 Line Basic and Targeted
 Vertebrate Fauna Survey

**Figure 2.2: Soils of the
 Study Area**

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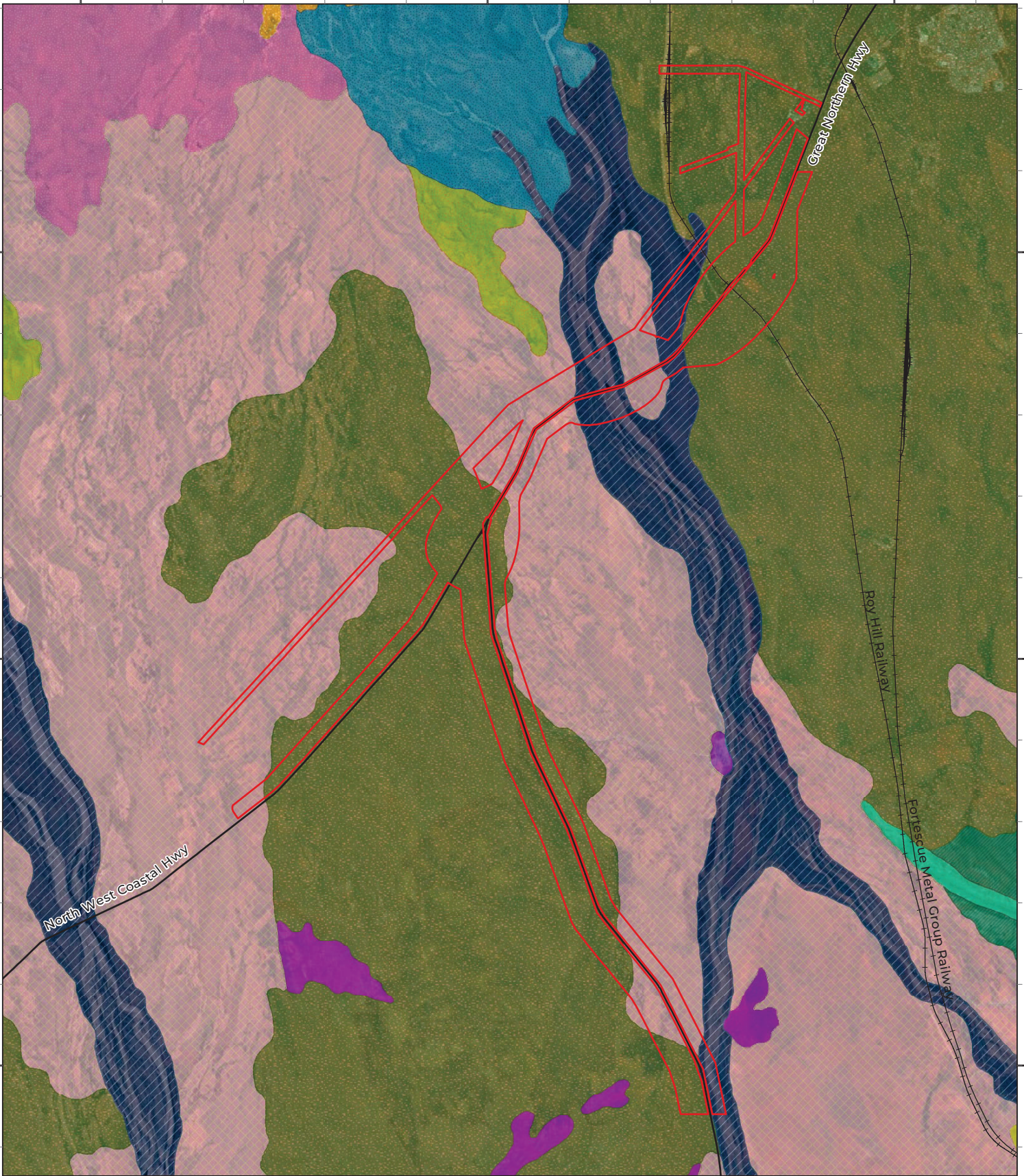
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Study Area	Land System	River System
State Road	Cheerawarra System	Robe System
Rail	Littoral System	Ruth System
	Macroy System	Talga System
	Mallina System	Uaroo System
	Paradise System	Yamerina System

Scale 1:135,000

0 2 4 Km

Coordinate System: GDA2020 MGA Zone 50
 Projection: Transverse Mercator
 Datum: GDA2020 Created 10/06/2024

ALINTA ENERGY
 Port Hedland Transmission
 Line Basic and Targeted
 Vertebrate Fauna Survey

**Figure 2.3: Land systems
 of the Study Area**

2.6 Hydrology & Hydrogeology

The Study Area is located within the Port Hedland Coast Basin, which extends from the Port Hedland Coastline, south to Chichester. At a finer scale, the Study Area is located in the South-West Creek and Turner River catchments (Figure 2.4; Table 2.4).

The Study Area runs parallel with, and bisects, the Turner River in the northern and southernmost sections of the Study Area. The Turner River originates at Black Range and Mungaroon Range then flows north to the Port Hedland coastline, draining into the Indian Ocean. The northern most point of the Study Area at Boodarie is located approximately 500 metres from South West Creek. (DWER, 2021).

Table 2.4: Hydrological catchments intersecting the Study Area

Study Area Route	Intersection with Study Area		
	South-West Catchment	Coastal Catchment	Turner River Catchment
Route 1	Y	Y	Y
Route 1B	-	-	Y
Route 2	Y	Y	-
Route 3	Y	-	Y
Route 4	Y	-	Y
Route 6	Y	-	Y

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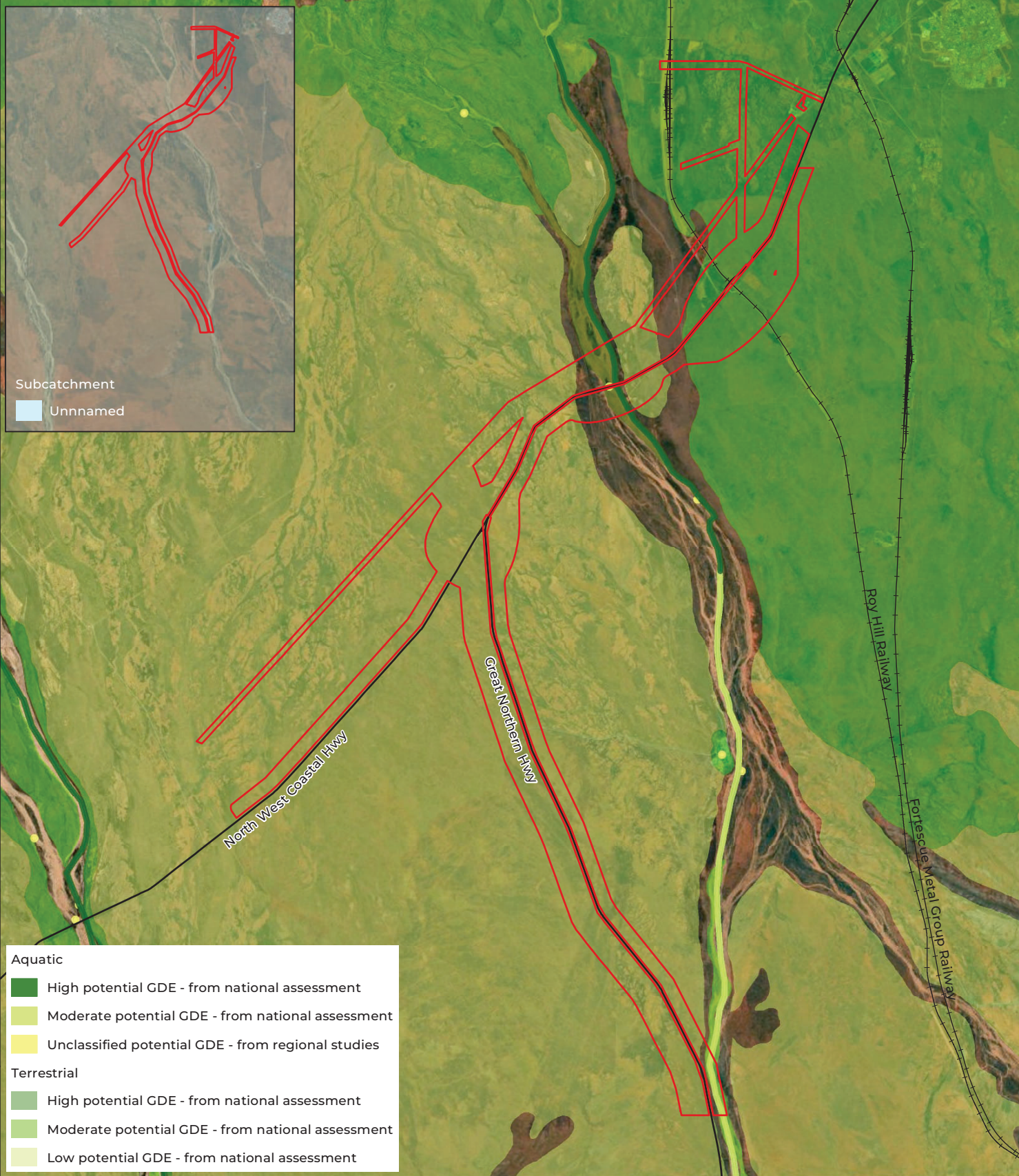
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Subcatchment
 Unnamed

- Aquatic**
- High potential GDE - from national assessment
 - Moderate potential GDE - from national assessment
 - Unclassified potential GDE - from regional studies
- Terrestrial**
- High potential GDE - from national assessment
 - Moderate potential GDE - from national assessment
 - Low potential GDE - from national assessment

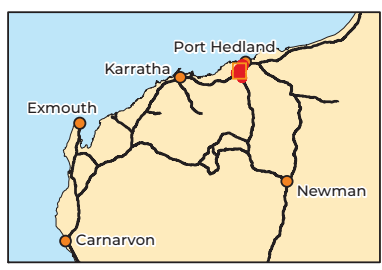
LEGEND

- Study Area
- State Road
- Rail



Scale 1:135,000
 0 2 4 Km

Coordinate System: GDA2020 MGA Zone 50
 Projection: Transverse Mercator
 Datum: GDA2020 Created 10/06/2024



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 Vertebrate Fauna Survey

Figure 2.4: Hydrology and potential GDEs of the Study Area

2.7 Pre-European Vegetation

Pre-European vegetation mapping was originally undertaken by Beard at various scales (predominantly 1:1,000,000) across the State (Beard, 1975) and has since been updated to be consistent with Native Vegetation Information System (NVIS) descriptions at a scale of 1:250,000. State-wide vegetation statistics are available for these associations which lists pre-European extent, current extent, area in DBCA managed lands and is a useful tool to determine if a vegetation association is rare or otherwise significant. The Beard vegetation mapping (Beard, 1990) provides a broad context of Western Australian native vegetation.

Four vegetation association occur within the Study Area (Table 2.5):

- Abydos Plain -Chichester 619;
- Abydos Plain 589;
- Abydos Plain 619; and
- Abydos Plain 647.

The largest vegetation association is the Abydos Plain 647, extending across 6,416.86 ha (70.05%) of the Study Area (Table 2.5; Figure 2.5).

2.8 Land Use and Tenure

The Study Area is located on three pastoral leases, comprising Boodarie Station, Mundabullangana Station and Indee Station in decreasing order of extent. Dominant land use within the Study Area is native pasture associated with the three pastoral leases.

2.9 Threatened and Priority Ecological Communities

No Threatened Ecological Communities (TECs) or Priority Ecological Communities (PECs) occur within the Study Area. However, several PECs occur within the vicinity of the Study Area. The nearest are the Priority 3 (P3) Gregory Land Systems (~16.6 km to the south-west of the Study Area) and the P3 Eighty Mile Land System (38.9 km to the north-east of the Study Area). Neither PECs occurring within the broader vicinity of the Study Area have conservation values related to terrestrial vertebrate fauna.

Table 2.5: Vegetation associations of the Study Area

Vegetation Association	Description	Route 1		Route 1B		Route 2		Route 3		Route 4		Route 6	
		Area (ha)	%	Area (ha)	%	Area (ha)	%	Area (ha)	%	Area (ha)	%	Area (ha)	%
Abydos Plain Chichester 619	Riverine; rivergum <i>E. camaldulensis</i> .	-	-	-	-	-	-	97.49	3.80	-	-	-	-
Abydos Plain 589	Mosaic: Short bunch grassland - savanna / grass plain (Pilbara) / Hummock grasslands, grass steppe; soft spinifex.	324.60	50.83	241.56	29.83	284.74	73.01	927.34	36.15	560.35	20.26	225.46	10.43
Abydos Plain 619	Riverine; rivergum <i>E. camaldulensis</i> .	22.28	3.49	-	-	-	-	113.16	4.41	115.09	4.16	1.96	0.09
Abydos Plain 647	Hummock grassland with scattered shrubs or mallee <i>Triodia</i> spp. <i>Acacia</i> spp., <i>Grevillea</i> spp. <i>Eucalyptus</i> spp.	291.67	45.68	568.12	70.17	105.25	26.99	1,427.31	55.64	2,090.45	75.58	1,934.06	89.48
Total		638.55	100	809.69	100	389.99	100	2,565.32	100	2,765.90	100	2,161.49	100

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Pre-European Vegetation

-  Abydos Plain - Chichester 93
-  Abydos Plain - Chichester 117
-  Abydos Plain - Chichester 589
-  Abydos Plain - Chichester 619
-  Abydos Plain - Chichester 647
-  Abydos Plain 93
-  Abydos Plain 127
-  Abydos Plain 589
-  Abydos Plain 619
-  Abydos Plain 647

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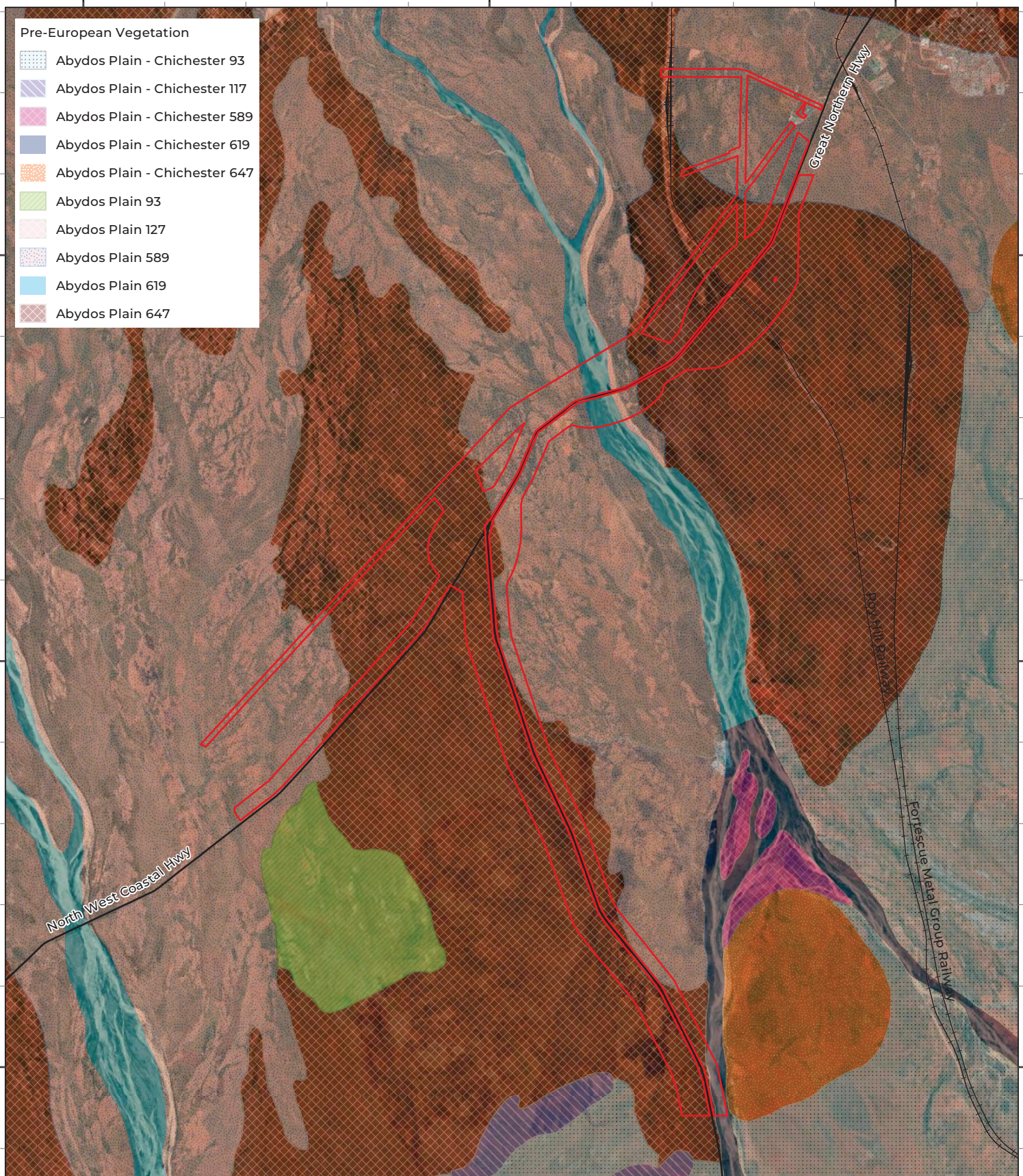
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
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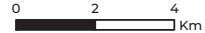


LEGEND

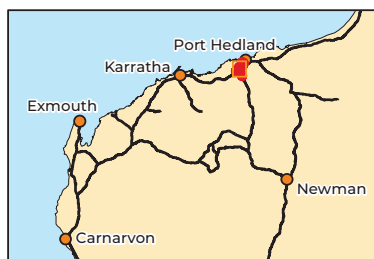
-  Study Area
-  State Road
-  Rail



Scale 1:135,000



Coordinate System: GDA2020 MGA Zone 50
 Projection: Transverse Mercator
 Datum: GDA2020 Created 10/06/2024



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 Line Basic and Targeted
 Vertebrate Fauna Survey

Figure 2.5: Pre-European
 vegetation associations of the
 Study Area

3 Methods

3.1 Desktop Assessment

A desktop assessment, comprising database searches and a literature review, was undertaken prior to the field survey. The purpose of the desktop assessment was to identify vertebrate fauna occurring, or potentially occurring, in the Study Area, with a focus on significant species.

3.1.1 Database searches

Database searches were undertaken to generate a list of vertebrate fauna previously recorded within, and near, the Study Area, including introduced and significant taxa. Five fauna databases were searched; three to obtain information on any species previously recorded (NatureMap, Birddata and Dandjoo); one to identify significant species previously recorded (DBCA Threatened and Priority Fauna Database); and one to identify significant species known or likely to occur within the region (Protected Matters Search Tool) (Table 3.1).

Table 3.1: Details of the database searches conducted.

Database Search	Search Area
DBCA (2023b) Threatened & Priority Fauna Databases	40 km buffer around Study Area
DBCA (2023a) Dandjoo	
DBCA (2022) NatureMap	
BirdLife Australia (2022) Birddata	
Atlas of Living Australia (ALA, 2023) Occurrence Search	
Department of Agriculture, Water and Environment (DAWE, 2022) Protected Matters Search Tool (PMST)	

3.1.2 Literature review

The literature review considered 21 sources of relevance to the Study Area including field surveys (basic, detailed and targeted) and desktop assessments (Table 3.2). All are located within a radius of 40 km from the Study Area.

Table 3.2: Literature sources used for the desktop review

Reference number	Survey	Type of Survey	Distance from Study Area (km)
1	Phoenix (2022) Detailed terrestrial fauna and targeted bilby survey for the Port Hedland Solar Farm Project	Targeted fauna survey	< 1 km
2	Biota (2004) Fauna habitats and fauna assemblage of the proposed FMG Stage A Rail Corridor	Basic fauna survey	Corridor 5 km E
3	ENV (2011) Port Hedland regional fauna assessment	Basic fauna survey	3 km NE
4	Biota (2006) Port Hedland Solar Saltfield Expansion fauna survey	Detailed fauna survey	10 km E
5	Biota (2002) Proposed Hope Downs Rail Corridor from Weeli Wolli Siding to Port Hedland - vertebrate fauna survey	Detailed fauna survey	Corridor 5 km E
6	Ecologia (2009a) RGP5 fauna survey Nelson Point to Bing Siding	Basic fauna survey	Corridor 5 km E
7	Biologic (2010) Mooka Siding level 1 & targeted survey	Basic and Targeted fauna survey	5 km E
8	Ecologia (2009b) RGP5 fauna survey northern quoll wider area survey	Targeted fauna survey	20 km SE
9	Ecologia (2008) RGP5 fauna survey: Quarry 1	Basic fauna survey	20 km SE
10	Phoenix (2013) Terrestrial fauna survey for the Balla Balla Magnetite Project barge loading facility	Detailed fauna survey	50 km SW
11	LTD (2022) Port Hedland Solar Project greater bilby management plan	Targeted fauna survey	Adjacent to Study Area E
12	Outback Ecology (2009) Wodgina DSO Project terrestrial vertebrate fauna assessment	Detailed and Targeted fauna survey	45 km S
13	360 Environmental (2018) Wodgina Gas Pipeline targeted fauna survey	Targeted fauna survey	< 10 km W
14	GHD (2010) Report for proposed Boodarie Industrial Area flora and fauna assessment	Basic fauna survey	4 km NE
15	Ecoscope (2020) Pippingarra and Wodgina roads: flora and fauna survey	Basic fauna survey	43 km S
16	Bamford Consulting (2008) Fauna assessment of the Wodgina Tailings Storage Facility 3	Basic fauna survey	47 km S
17	Western Wildlife (2022) Detailed vertebrate fauna survey 2021–2022	Detailed fauna survey	Within Study Area

3.2 Field Survey

3.2.1 Survey Timing & Personnel

The field survey was undertaken between April 26 and May 5, 2023, by senior zoologists Ashleigh Kimpton and Jari Cornelis, with 10 cumulative years of fauna survey experience, including work within the Pilbara region (Table 3.3).

Table 3.3: Project team

Biologic Personnel	Role	Qualification	Relevant Experience
Senior Zoologist			
Ashleigh Kimpton	<ul style="list-style-type: none"> Project Manager Field survey (lead) Reporting 	BSc Zoology; Pathology and Laboratory Medicine MSc Conservation Biology	6 years' Field survey 4 years' EIA (consulting) 6 years' Zoology
Jari Cornelis	<ul style="list-style-type: none"> Field survey 	MSc Philosophy BSc Zoology and Ecology	6 years' Field survey 5 years' EIA (consulting) 6 years' Zoology

3.2.2 Weather & Climate

Long-term climatic data is not available for the Study Area itself; however, long-term data is available from the Bureau of Meteorology (BoM) weather station at Port Hedland Airport (station 004032), located approximately 9 km northeast of the Study Area (BoM, 2023). The Port Hedland Airport weather station is expected to provide the most accurate long-term average (LTA) dataset for climatic conditions experienced within the Study Area.

In the 12 months prior to the survey, mean minimum and maximum temperatures were comparable to long-term averages (LTA). Rainfall in the 12 months prior to the surveys was below long-term averages for most months, with the exception of May and September 2022 and January 2023 which recorded above the long-term average for the month. Despite these wetter months the total rainfall for the 12 months prior to the survey was below average (182.2 mm compared to the LTA of 318.5 mm).

Observed temperatures during the survey were similar or slightly above long-term averages on most days, with minimum temperature averaging 21.8°C and maximum temperature averaging 33°C (BoM, 2023). No rainfall was recorded during the survey. Weather conditions during the trip were adequate to complete the survey; generally fine and slightly overcast. Weather conditions did not present any survey limitations. The seasonal timing of the survey appropriate for this level of survey.

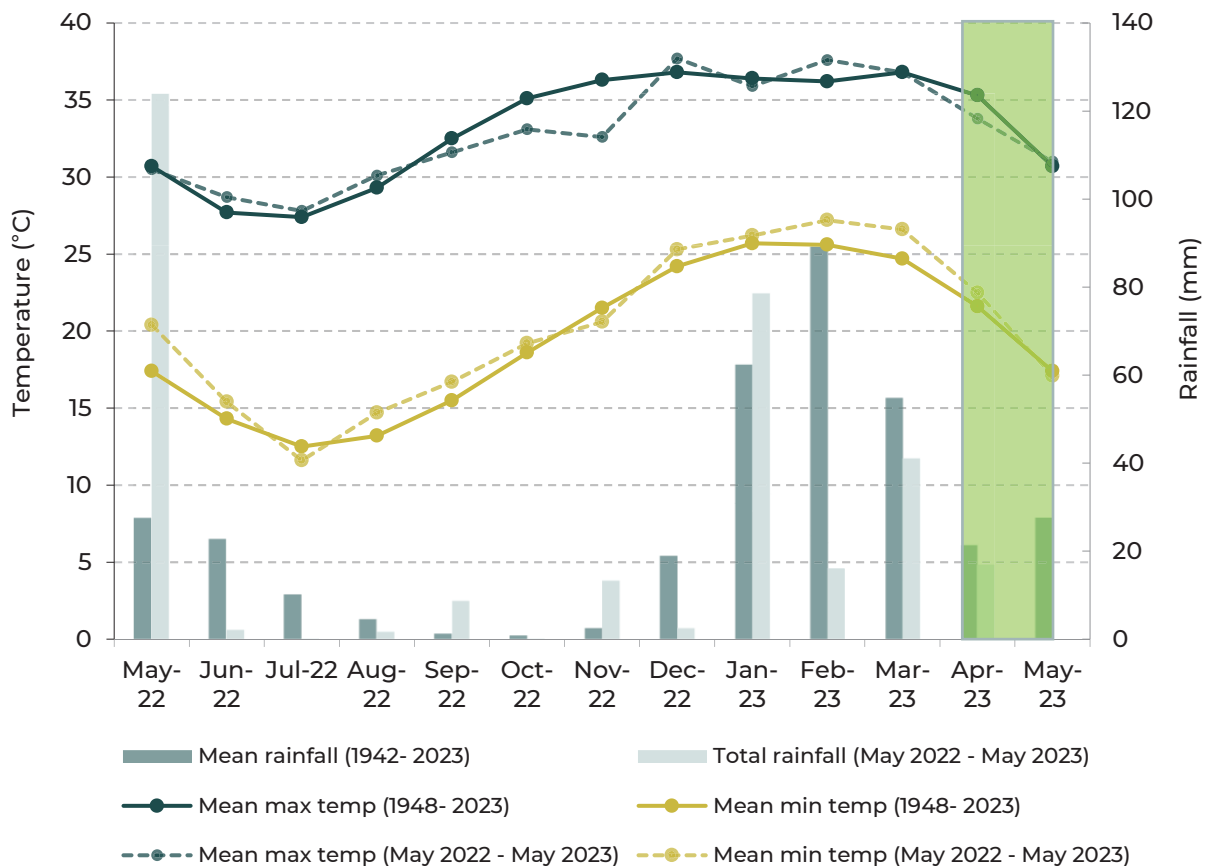


Figure 3.1: Long term and current climatic data for the Study Area

3.2.3 Sampling and Survey Methods

3.2.3.1 Habitat Assessments and Mapping

Habitat assessments were undertaken in the field to characterise and define habitats and their significance to vertebrate fauna. Habitat assessments were undertaken at 84 locations across the Study Area, including at all sampling sites (Figure 4.2)

Habitat assessments were conducted using methodology and terminology modified from the *Australian Soil and Land Survey Field Handbook* (National Committee on Soil and Terrain, 2009). The characteristics recorded during the habitat assessments were:

- site information, photo and location;
- landform: slope, relative inclination of slope, morphological type and landform type;
- vegetation: leaf litter, wood litter, hollow bearing trees, broad floristic formation, vegetation structure (tall, mid and low), and dominant species;
- land surface: micro relief, sheet erosion, rill erosion, gully erosion, gully depth, abundance and size of coarse fragments, rock outcropping, water bodies, comments on nests, burrows, roosts and diggings;

- soil: texture, colour;
- substrate: bare ground, rock size, rock type, rock outcropping; and
- disturbance: time since last fire, evidence of weeds, grazing, or human disturbances.

Fauna habitat mapping was completed for the Study Area using the vertebrate fauna habitat assessments completed during the field surveys, as well as high-resolution aerial imagery, vegetation, topographical, geology and soil mapping. Habitat mapping within Route 6 was undertaken after the field survey and was extrapolated from mapping of the other routes and using desktop mapping sources. Habitats were delineated and mapped across the Study Area at a scale of approximately 1:20,000.

3.2.3.1.1 Water Feature Assessments

Water feature assessments were conducted for any water features that were found within the Study Area ($n = 1$; Table 4.5). The assessments were aimed to define and characterise the features and identify the likelihood of target species utilising them. The characteristics recorded during the habitat assessments were:

- site information, photo and location;
- dimensions: length, width, depth;
- water presence: above the surface, in the intermediate zone; and
- vegetation: obligate phreatophytes, emergent macrophytes.

3.2.3.2 Active Searching

While undertaking targeted searches, time was spent undertaking active foraging. Active foraging occurred at 20 locations for a total of 15 person hours. Active foraging comprised searches of any observable microhabitats likely to support vertebrate fauna species. Searches aimed to record any species, from direct observation or secondary evidence. Techniques incorporated in active foraging included raking leaf litter and spoil heaps, overturning rocks and logs, investigating dead trees and logs, burrows, rock piles and identification of secondary evidence.

Table 3.4: Active searching sampling locations within Study Area

Site	Latitude	Longitude	Date	Sampling Effort
VALT-010	-20.7554	118.5133	27/04/2023	1 person hours
VALT-013	-20.7049	118.4876	1/05/2023	0.5 person hours
VALT-022	-20.4845	118.5053	2/05/2023	0.5 person hours
VALT-025	-20.7428	118.5127	1/05/2023	0.5 person hours
VALT-031	-20.5753	118.4342	1/05/2023	1.5 person hours
VALT-033	-20.5320	118.4750	2/05/2023	2 person hours
VALT-034	-20.4469	118.5134	30/04/2023	0.5 person hours
VALT-035	-20.6635	118.3532	28/04/2023	1 person hours
VALT-037	-20.6514	118.3706	28/04/2023	0.5 person hours
VALT-039	-20.6356	118.3831	28/04/2023	1 person hours
VALT-041	-20.6135	118.4040	28/04/2023	0.5 person hours
VALT-049	-20.6349	118.3437	29/04/2023	1 person hours
VALT-050	-20.5176	118.4642	29/04/2023	0.5 person hours
VALT-053	-20.4144	118.5057	30/04/2023	1 person hours
VALT-059	-20.4545	118.5486	30/04/2023	0.5 person hours
VALT-061	-20.4777	118.5397	30/04/2023	0.5 person hours
VALT-063	-20.6495	118.4574	1/05/2023	0.5 person hours
VALT-069	-20.5660	118.4415	30/04/2023	0.5 person hours
VALT-071	-20.6259	118.3934	3/05/2023	0.5 person hours
VALT-075	-20.4982	118.4956	2/05/2023	0.5 person hours
Total sampling effort				15 person hours

3.2.3.3 Ultrasonic Bat Recording

Overnight ultrasonic audio recordings of bat echolocation calls were undertaken with SongMeter (SM; Wildlife Acoustics Inc.) ultrasonic bat recorders at eight locations within the Study Area during the survey; totalling 24 recording nights (Table 3.5; Figure 3.2). At each location, recorders were placed in or in the vicinity of areas of prospective foraging habitats and features most likely to be utilised by bats for foraging and dispersal (such as water features, stands of trees or drainage lines).

Recorders were set to sample for all species known to occur within the region (McKenzie & Bullen, 2009). All recordings were analysed by Robert Bullen of Bat Call WA.

Table 3.5: Ultrasonic sampling locations within the Study Area

Site	Latitude	Longitude	Deployment	Retrieval	Sampling Nights
VALT-002	-20.4224	118.5452	27/04/2023	30/04/2023	3
VALT-014	-20.6738	118.4688	27/04/2023	30/04/2023	3
VALT-009	-20.7542	118.5193	27/04/2023	30/04/2023	3
VALT-020	-20.5222	118.4819	27/04/2023	30/04/2023	3
VALT-034	-20.4469	118.5136	30/04/2023	3/05/2023	3
VALT-035	-20.6642	118.3552	1/05/2023	4/05/2023	3
VALT-071	-20.6259	118.3934	30/04/2023	3/05/2023	3
VALT-069	-20.5659	118.4414	30/04/2023	3/05/2023	3
Total number of sampling nights					24

3.2.3.4 Targeted Searches

Targeted searches were undertaken within areas considered to provide suitable habitat for significant species identified in the desktop assessment. Searches primarily focused on recording species from direct observation, secondary evidence (i.e. tracks, scats, remains, nests, burrows and/or mounds) and/or habitat features of importance (i.e. den sites, roosting caves and/or water features) likely to be utilised by particular species. Targeted searches were conducted in 47 locations across the Study Area, for a total of 32.5 person hours, in conjunction with bilby searches (see Section 3.2.3.6).

3.2.3.5 Targeted Sampling – Night Parrot Acoustic Recording

SongMeter acoustic recorders were deployed at 10 locations for a total of 60 recording nights (Table 3.6; Figure 3.2). In an effort to target night parrot, acoustic recorders were deployed in potential habitat recommended within the *Interim Guideline for Preliminary Surveys of Night Parrot (Pezoporus occidentalis) in Western Australia* (DPaW, 2017) – “stands of large, old clumps of spinifex (*Triodia*)... especially so if the identified area is part of a paleo-drainage system or contains healthy stands of samphire.” Acoustic recordings were analysed for night parrot calls by Adaptive NRM. A list of non-target species recorded at each acoustic recorder site was also compiled and incorporated into the results for each site.

Table 3.6: Acoustic sampling locations within Study Area

Site	Latitude	Longitude	Deployment	Retrieval	Sampling Nights
VALT-010	-20.7550	118.5155	27/04/2023	5/05/2023	6
VALT-015	-20.6318	118.4484	27/04/2023	3/05/2023	6
VALT-019	-20.5968	118.4361	27/04/2023	3/05/2023	6
VALT-026	-20.4677	118.5413	27/04/2023	3/05/2023	6
VALT-034	-20.4469	118.5136	27/04/2023	3/05/2023	6
VALT-039	-20.6355	118.3831	28/04/2023	4/05/2023	6
VALT-040	-20.5399	118.4554	27/04/2023	3/05/2023	6
VALT-042	-20.6911	118.4761	28/04/2023	4/05/2023	6
VALT-046	-20.5089	118.5047	28/04/2023	4/05/2023	6
VALT-051	-20.4189	118.5285	28/04/2023	4/05/2023	6
Total number of sampling nights					60

3.2.3.6 Targeted Sampling – Bilby Plots

A standardised 2 hectare (ha) plot search (survey plot) was undertaken to search for evidence of bilby occurrence, as recommended by DBCA (2017). Each survey plot was subjected to targeted searches for a minimum of 30 minutes and comprised searches for any secondary evidence for the species i.e. burrows, diggings, tracks and scats, as described by Southgate *et al.* (2019). A total of 47 bilby plots and/ or transects were undertaken within the Study Area for a total of 32.5 person hours.

If evidence of bilby was recorded while undertaking searches within the survey plot, more thorough searches were undertaken over an expanded area to search for further evidence to define and map the approximate extent of the species' occurrence at the site. These searches primarily focused on diggings, which is often associated scat deposition. Searches followed the same approach to that implemented within survey plots, searching for evidence as described by Southgate *et al.* (2019).

Table 3.7: Bilby plot sampling locations within the Study Area

Site	Latitude	Longitude	Date	Sampling Effort
VALT-009	-20.7543	118.5193	27/04/2023	0.5 person hour
VALT-010	-20.7550	118.5154	27/04/2023	1.5 person hours
VALT-012	-20.7255	118.5031	1/05/2023	0.5 person hour
VALT-013	-20.7050	118.4879	1/05/2023	1 person hour
VALT-015	-20.6320	118.4479	27/04/2023	0.5 person hour
VALT-017	-20.6315	118.4551	27/04/2023	1 person hour

Site	Latitude	Longitude	Date	Sampling Effort
VALT-019	-20.5968	118.4361	3/05/2023	0.5 person hour
VALT-022	-20.4845	118.5053	2/05/2023	0.5 person hour
VALT-024	-20.5027	118.5125	30/04/2023	0.5 person hour
VALT-025	-20.7428	118.5127	1/05/2023	1 person hour
VALT-028	-20.4355	118.5440	5/05/2023	0.5 person hour
VALT-030	-20.4518	118.5281	30/04/2023	1 person hour
VALT-031	-20.5753	118.4342	1/05/2023	0.5 person hour
VALT-032	-20.4606	118.5210	27/04/2023	0.5 person hour
VALT-032	-20.4607	118.5210	27/04/2023	0.5 person hour
VALT-033	-20.5320	118.4750	2/05/2023	2 person hours
VALT-034	-20.4469	118.5134	30/04/2023	0.5 person hour
VALT-035	-20.6658	118.3533	28/04/2023	1 person hour
VALT-039	-20.6356	118.3831	28/04/2023	0.5 person hour
VALT-040	-20.5396	118.4555	27/04/2023	0.5 person hour
VALT-041	-20.6135	118.4040	28/04/2023	0.5 person hour
VALT-042	-20.5299	118.4645	28/04/2023	0.5 person hour
VALT-043	-20.5911	118.4244	4/05/2023	0.5 person hour
VALT-047	-20.5537	118.4215	29/04/2023	0.5 person hour
VALT-049	-20.6357	118.3438	29/04/2023	1 person hour
VALT-050	-20.5176	118.4642	29/04/2023	0.5 person hour
VALT-053	-20.4157	118.5048	30/04/2023	1 person hour
VALT-059	-20.4543	118.5460	30/04/2023	0.5 person hour
VALT-060	-20.5711	118.4048	29/04/2023	0.5 person hour
VALT-061	-20.4777	118.5397	30/04/2023	0.5 person hour
VALT-062	-20.5823	118.3942	29/04/2023	0.5 person hour
VALT-063	-20.6495	118.4574	1/05/2023	0.5 person hour
VALT-065	-20.6095	118.4422	1/05/2023	0.5 person hour
VALT-066	-20.6080	118.3694	29/04/2023	1.5 person hours
VALT-069	-20.5658	118.4407	30/04/2023	0.5 person hour
VALT-070	-20.6254	118.3532	29/04/2023	1.5 person hours
VALT-071	-20.6259	118.3934	3/05/2023	0.5 person hour
VALT-073	-20.4993	118.5211	1/05/2023	0.5 person hour
VALT-075	-20.4994	118.4929	2/05/2023	0.5 person hour
VALT-077	-20.4827	118.5251	2/05/2023	0.5 person hour
VALT-078	-20.5069	118.5109	2/05/2023	0.5 person hour

Site	Latitude	Longitude	Date	Sampling Effort
VALT-080	-20.6618	118.4676	2/05/2023	0.5 person hour
VALT-081	-20.6404	118.3767	3/05/2023	0.5 person hour
VALT-082	-20.4247	118.5262	4/05/2023	2 person hours
VALT-083	-20.5308	118.4616	4/05/2023	0.5 person hour
VALT-085	-20.4419	118.5471	2/05/2023	0.5 person hour
Total sampling effort				32.5 person hours

3.2.3.7 Opportunistic Records

At all times while surveying, all records pertaining to species not previously recorded during the survey, rare species, significant species or other fauna of interest were documented. These records include those from primary (i.e. direct observation of species) or secondary (e.g. burrows, scratchings, diggings, tracks and/or scats) evidence.

3.2.4 Assessment of Significance

3.2.5 Habitats

For the purposes of this assessment, definition of ‘critical habitat’ followed that of DoE (2013), being areas necessary “for activities such as foraging, breeding, roosting, or dispersal”. For each species, suitable habitat was categorised as providing critical foraging, breeding, roosting, or dispersal habitat (as per the definition above), or supporting foraging, breeding, roosting or dispersal, for habitat types where the species may occur, but it is not necessary for such activities. Due to differing habitat preferences of significant species (including habitat features and/or microhabitats), habitat significance was assessed on a species-by-species basis. Unsuitable habitat was defined by habitat which is unlikely to support the species and impact upon its presence – note individuals may be recorded in these habitats intermittently, though are not expected to be reliant on them.

It should be noted that assessment of habitat significance applies only to habitat occurring within the Study Area, and therefore may not be representative of significance applied to the same habitat in other areas outside the Study Area. For example, a habitat within the Study Area may be deemed unsuitable due to the absence of certain habitat features which are required for the species persistence, despite the same habitat occurring outside the Study Area being considered of greater significance. The significance of a habitats within the Study Area may also be influenced by other habitats occurring within the Study Area and more broadly, including areas adjacent to the Study Area, particularly if representative of primary habitat.

3.2.6 Likelihood of Occurrence

Significant species identified by the desktop assessment were assessed for their likelihood of occurrence within the Study Area using a decision matrix which considers the suitability of habitat within the Study Area and the proximity of previous records. Based on this decision matrix, each species was assigned to one of six categories of likelihood: Confirmed, Highly Likely, Likely, Possible, Unlikely, or Highly Unlikely (Table 3.8).

The decision matrix is intended to be an indicative guide only, and the way in which it is interpreted may vary between species, depending on a given species' habitat preferences and ability to disperse, as well as the reliability and availability of contextual information. For example, considering species which have been previously recorded close to the Study Area, a species with a limited dispersal capability will have a reduced likelihood of occurring in the Study Area compared with a species with greater dispersal capability. It is also recognised that a lack of records in the vicinity of the Study Area may indicate limited sampling effort rather than species' absence, and that previous records may include historic or presumed erroneous information which may misrepresent a species' current distribution. Where the determination of a species' likelihood of occurrence within the Study Area deviates from the decision matrix, detailed justification for any variation is provided.

Table 3.8: Species likelihood of occurrence decision matrix

		Habitat suitability of Study Area			
		Breeding habitat present	Foraging and dispersal habitat present	Marginally suitable habitat ² present	No suitable habitat present
Species Records ¹	Recorded in Study Area	Confirmed	Confirmed	Confirmed	Confirmed
	Recorded within 10 km of Study Area	Highly Likely	Likely	Possible	Possible
	Recorded within 10–50km of Study Area	Likely	Possible	Possible	Unlikely
	Recorded within 50–100 km of Study Area	Possible	Possible	Unlikely	Unlikely
	Recorded >100 km of Study Area	Possible	Unlikely	Unlikely	Highly Unlikely
	Species considered locally/regionally extinct	Unlikely	Unlikely	Highly Unlikely	Highly Unlikely

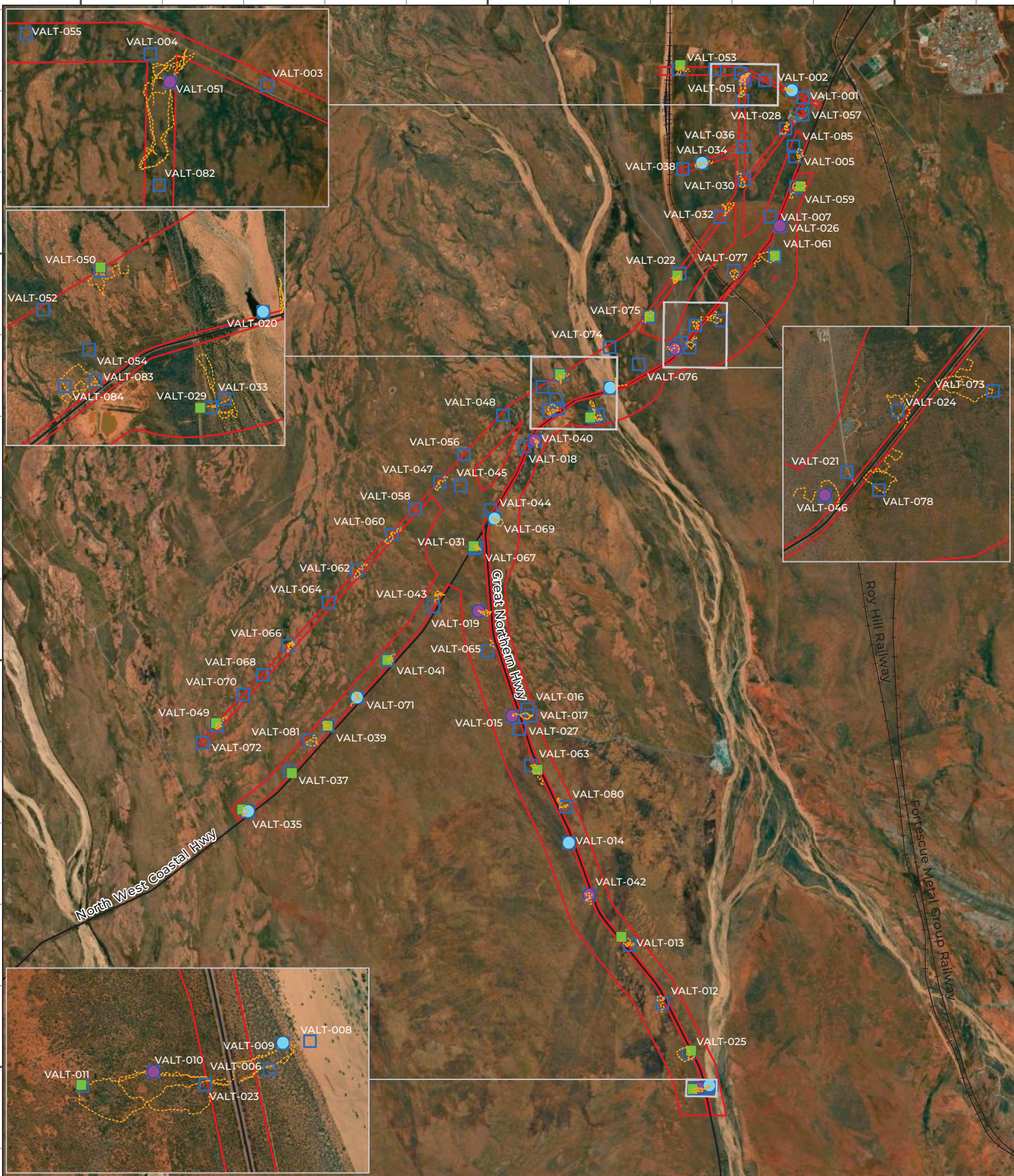
¹ Only records within the previous 50 years are considered.

² Marginally suitable habitat is habitat which is possibly used by a species but is unlikely to be depended upon; for example, it may be used only when in proximity to core breeding, foraging or dispersal habitat.

635000

650000

665000

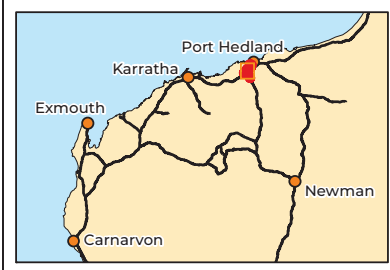


LEGEND

Study Area	Acoustic Recorder
State Road	Active Foraging
Rail	Habitat Assessment
	Ultrasonic Recorder
	Targeted Search

Scale 1:135,000

Coordinate System: GDA2020 MGA Zone 50
 Projection: Transverse Mercator
 Datum: GDA2020 Created 10/06/2024



ALINTA ENERGY
 Port Hedland Transmission
 Line Basic and Targeted
 Vertebrate Fauna Survey

Figure 3.2: Sample sites and traverses

4 Results & Discussion

4.1 Desktop Assessment

The literature review and database searches identified a total of 436 species of vertebrate fauna, which have previously been recorded and/or have the potential to occur within the Study Area. This comprised 51 mammals (including 39 native and 12 non-native), 246 birds, 127 reptiles and 12 amphibians (Table 4.1; Figure 4.1). Due to the size of the desktop assessment search area, and likelihood of encompassing habitats which may not occur within the Study Area, results of the desktop review are likely to include species which may not occur within the Study Area. Additionally, many species tend to be patchily distributed even where appropriate habitats are present, and many species of birds can occur as regular migrants, occasional visitors or vagrants.

Table 4.1: Summary of fauna species recorded within and in the vicinity of the Study Area in the desktop assessment

Reference Number/ Source	Citation	Mammals (non-native)	Mammals (native)	Birds	Reptiles	Amphibians	Total
Literature Sources							
1	Phoenix (2022)	4	11	25	36	6	82
2	Biota (2004)	6	16	81	56	6	165
3	ENV (2011)	2	5	80	18	2	107
4	Biota (2006)	3	8	31	38	3	83
5	Biota (2002)	6	26	65	66	6	169
6	Ecologia (2009a)	1	0	11	1	0	13
7	Biologic (2010)	4	10	31	12	0	57
8	Ecologia (2009b)	0	3	0	1	0	4
9	Ecologia (2008)	0	1	10	9	0	20
10	Phoenix (2013)	8	16	98	33	1	156
11	LTD (2022)	0	1	0	0	0	1
12	Outback Ecology (2009)	2	16	44	25	2	89
13	360 Environmental (2018)	1	5	0	0	0	6
14	GHD (2010)	3	2	34	7	0	46
15	Ecoscape (2020)	2	9	29	4	0	44
16	Bamford Consulting (2008)	3	10	49	10	2	74
17	Western Wildlife (2022)	6	21	82	54	6	169

Reference Number/ Source	Citation	Mammals (non-native)	Mammals (native)	Birds	Reptiles	Amphibians	Total
Database Searches (+0 km buffer)							
NatureMap	DBCA (2022)	10	35	213	104	12	374
Protected Matters Search Tool	DAWE (2022)	0	4	29	1	0	34
Atlas of Living Australia	ALA (2023)	0	9	45	2	0	56
DBCA Priority and Threatened Database	DBCA (2023b)	6	16	216	78	11	327
Birddata	BirdLife Australia (2022)	0	0	203	0	0	203
Dandjoo	DBCA (2023a)	0	2	13	1	1	17
Total species recorded		12	39	246	127	12	436
Significant species		0	10	55	3	0	68

Of the 436 species of vertebrate fauna identified by the desktop assessment, 68 are classified as significant species, including ten mammals, 55 birds and three reptiles (Table 4.2). Five significant species have previously been recorded within the Study Area (DBCA, 2023b):

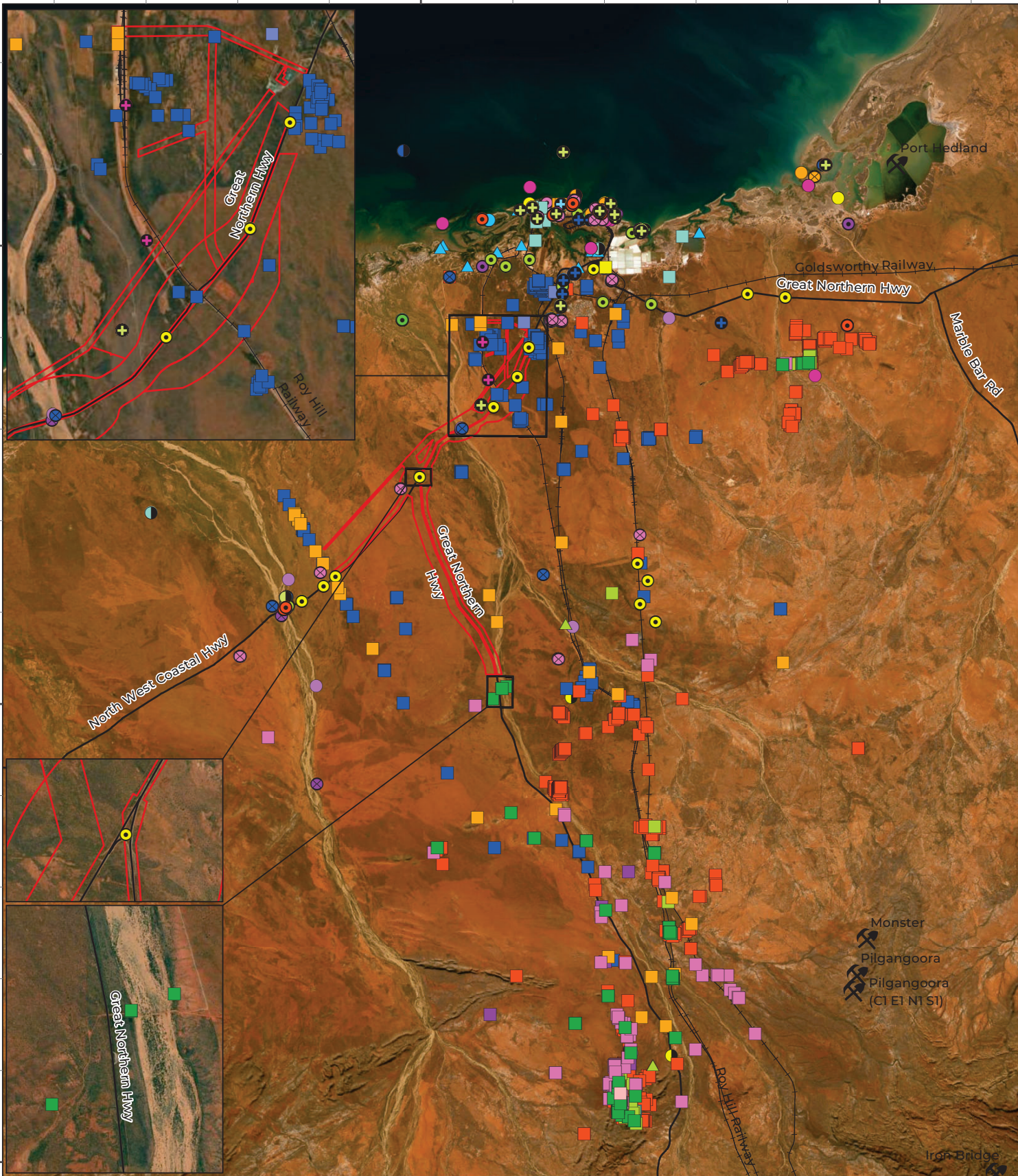
- brush-tailed mulgara (*Dasyercus blythi*) – Priority 4 (DBCA)
- oriental pratincole (*Glareola maldivarum*) – Migratory (EPBC Act and BC Act)
- gull-billed tern (*Gelochelidon nilotica*) – Migratory (EPBC Act and BC Act)
- Caspian tern (*Hydroprogne caspia*) – Migratory (EPBC Act and BC Act)
- common sandpiper (*Actitis hypoleucos*) – Migratory (EPBC Act and BC Act)

Table 4.2: Significant species identified and their conservation status

Scientific Name	Common Name	Conservation Status		
		EPBC Act	BC Act	DBCA
MAMMALS				
Dasyuridae				
<i>Antechinomys longicaudatus</i>	Long-tailed dunnart			P4
<i>Dasyercus blythi</i>	Brush-tailed mulgara			P4
<i>Dasyurus hallucatus</i>	Northern quoll	EN	EN	
Macropodidae				
<i>Lagorchestes conspicillatus leichardti</i>	Spectacled hare-wallaby			P4
Megadermatidae				
<i>Macroderma gigas</i>	Ghost bat	VU	VU	
Molossidae				
<i>Ozimops cobourgianus</i>	Northern coastal free-tailed bat			P1
Muridae				
<i>Leggadina lakedownensis</i>	Short-tailed mouse			P4
<i>Pseudomys chapmani</i>	Western pebble-mound mouse			P4
Rhinonycteridae				
<i>Rhinonycteris aurantia</i> 'Pilbara form'	Pilbara leaf-nosed bat	VU	VU	
Thylacomyidae				
<i>Macrotis lagotis</i>	Bilby	VU	VU	
BIRDS				
Accipitridae				
<i>Elanus scriptus</i>	Letter-winged kite			P4
<i>Erythrotriorchis radiatus</i>	Red goshawk	VU	VU	
<i>Pandion haliaetus cristatus</i>	Eastern osprey	MI	MI	

Scientific Name	Common Name	Conservation Status		
		EPBC Act	BC Act	DBCA
Anatidae				
<i>Spatula querquedula</i>	Garganey	MI	MI	
Apodidae				
<i>Apus pacificus</i>	Fork-tailed swift	MI	MI	
Charadriidae				
<i>Charadrius leschenaultii</i>	Greater sand plover	MI / VU	VU	
<i>Charadrius mongolus</i>	Lesser sand plover	MI / EN	EN	
<i>Charadrius veredus</i>	Oriental plover	MI	MI	
<i>Pluvialis fulva</i>	Pacific golden plover	MI	MI	
<i>Pluvialis squatarola</i>	Grey plover	MI	MI	
Falconidae				
<i>Falco hypoleucos</i>	Grey falcon	VU	VU	
<i>Falco peregrinus</i>	Peregrine falcon		OS	
Glareolidae				
<i>Glareola maldivarum</i>	Oriental pratincole	MI	MI	
Hirundinidae				
<i>Hirundo rustica</i>	Barn swallow	MI	MI	
Laridae				
<i>Chlidonias leucopterus</i>	White-winged black tern	MI	MI	
<i>Gelochelidon nilotica</i>	Gull-billed tern	MI	MI	
<i>Onychoprion anaethetus</i>	Bridled tern		MI	
<i>Thalasseus bergii</i>	Crested tern	MI	MI	
<i>Hydroprogne caspia</i>	Caspian tern	MI	MI	
<i>Sterna dougallii</i>	Roseate tern	MI	MI	
<i>Sterna hirundo</i>	Common tern	MI	MI	
<i>Sternula nereis</i>	Fairy tern	VU	VU	
<i>Sternula albifrons</i>	Little tern	MI	MI	
Motacillidae				
<i>Motacilla cinerea</i>	Grey wagtail	MI	MI	
<i>Motacilla flava</i>	Yellow wagtail	MI	MI	
Psittacidae				
<i>Pezoporus occidentalis</i>	Night parrot	EN	CR	
Rostratulidae				
<i>Rostratula australis</i>	Australian painted snipe	EN	EN	
Scolopacidae				
<i>Actitis hypoleucos</i>	Common sandpiper	MI	MI	

Scientific Name	Common Name	Conservation Status		
		EPBC Act	BC Act	DBCA
<i>Arenaria interpres</i>	Ruddy turnstone	MI	MI	
<i>Calidris acuminata</i>	Sharp-tailed sandpiper	MI	MI	
<i>Calidris alba</i>	Sanderling	MI	MI	
<i>Calidris canutus</i>	Red knot	MI / EN	EN	
<i>Calidris ferruginea</i>	Curlew sandpiper	MI / CR	CR	
<i>Calidris melanotos</i>	Pectoral sandpiper	MI	MI	
<i>Calidris ruficollis</i>	Red-necked stint	MI	MI	
<i>Calidris subminuta</i>	Long-toed stint	MI	MI	
<i>Calidris tenuirostris</i>	Great knot	MI / CR	CR	
<i>Gallinago megala</i>	Swinhoe's snipe	MI	MI	
<i>Gallinago stenura</i>	Pin-tailed snipe	MI	MI	
<i>Calidris falcinellus</i>	Broad-billed sandpiper	MI	MI	
<i>Limnodromus semipalmatus</i>	Asian dowitcher	MI	MI	
<i>Limosa lapponica menzbieri</i>	Bar-tailed godwit (northern Siberian)	CR	CR	
<i>Limosa limosa</i>	Black-tailed godwit	MI	MI	
<i>Numenius madagascariensis</i>	Eastern curlew	MI / CR	CR	
<i>Numenius minutus</i>	Little curlew	MI	MI	
<i>Numenius phaeopus</i>	Whimbrel	MI	MI	
<i>Phalaropus lobatus</i>	Red-necked phalarope	MI	MI	
<i>Calidris pugnax</i>	Ruff	MI	MI	
<i>Tringa brevipes</i>	Grey-tailed tattler	MI	MI	P4
<i>Tringa glareola</i>	Wood sandpiper	MI	MI	
<i>Tringa nebularia</i>	Common greenshank	MI	MI	
<i>Tringa stagnatilis</i>	Marsh sandpiper	MI	MI	
<i>Tringa totanus</i>	Common redshank	MI	MI	
<i>Xenus cinereus</i>	Terek sandpiper	MI	MI	
Threskiornithidae				
<i>Plegadis falcinellus</i>	Glossy ibis	MI	MI	
REPTILES				
Pythonidae				
<i>Liasis olivaceus barroni</i>	Pilbara olive python	VU	VU	
Scincidae				
<i>Ctenotus angusticeps</i>				P3
<i>Ctenotus uber johnstonei</i>				P2

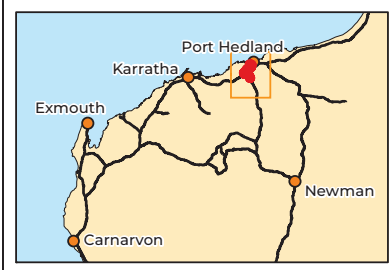


LEGEND

- Study Area
- Operating Mine
- State Road
- Rail

Scale 1:400,000

Coordinate System: GDA2020 MGA Zone 50
 Projection: Transverse Mercator
 Datum: GDA2020 Created 10/06/2024



ALINTA ENERGY
 Port Hedland Transmission
 Line Basic and Targeted
 Vertebrate Fauna Survey

Figure 4.1: Significant fauna records from the desktop assessment

Significant Fauna

Bird

- Bar-tailed godwit (Northern Siberian) - CR
- Curlew Sandpiper - CR
- Eastern curlew - CR
- Great knot - CR
- Lesser sand plover - EN
- Red knot - EN
- Fairy tern - VU
- Greater sand plover - VU
- Grey falcon - VU
- Grey-tailed tattler - MI and P4
- Asian dowitcher - MI
- Bar-tailed godwit - MI
- Barn swallow - MI
- Black-tailed godwit - MI
- Bridled tern - MI
- Broad-billed sandpiper - MI
- Brown booby - MI
- Caspian tern - MI
- Common sandpiper - MI
- Common greenshank - MI
- Common tern - MI
- Crested tern - MI
- Fork-tailed swift - MI
- Glossy ibis - MI
- Grey plover - MI
- Gull-billed tern - MI
- Lesser frigatebird - MI
- Little curlew - MI
- Little tern - MI
- Long-toed stint - MI
- Marsh sandpiper - MI
- Oriental plover - MI
- Oriental pratincole - MI
- Osprey - MI
- Pacific golden plover - MI
- Pectoral sandpiper - MI
- Pin-tailed snipe - MI

- Red-necked phalarope - MI
- Red-necked stint - MI
- Ruddy turnstone - MI
- Ruff - MI
- Sanderling - MI
- Sharp-tailed sandpiper - MI
- Terek sandpiper - MI
- Whimbrel - MI
- White-winged black tern - MI
- Wilson's storm-petrel - MI
- Wood sandpiper - MI
- Yellow wagtail - MI
- Peregrine falcon - OS

Mammal

- Northern quoll - EN
- Bilby - VU
- Banded hare-wallaby - VU
- Ghost bat - VU
- Pilbara leaf-nosed bat - VU
- North-western free-tailed bat - P1
- Northern leaf-nosed bat - P2
- Brush-tailed mulgara - P4
- Crest-tailed mulgara - P4
- Spectacled hare-wallaby (mainland) - P4
- Western pebble-mound mouse - P4
- Long-tailed dunnart - P4

Reptile

- ▲ Pilbara olive python - VU
- ▲ Airlie Island Ctenotus, Northwestern coastal Ctenotus - P3

4.2 Field Survey

4.2.1 Fauna Habitats

A total of five habitat types were recorded and mapped across the Study Area, excluding a small portion of the Study Area mapped as Disturbed. This included, in decreasing order of extent (Figure 4.2):

- Sand Plain (85.88%; 7,867.53 ha);
- Drainage Area (5.28%; 483.89 ha);
- Major Drainage (3.96%; 362.57 ha);
- Hardpan Plain (2.05%; 187.59 ha); and
- Claypan (0.35%; 32.13 ha).

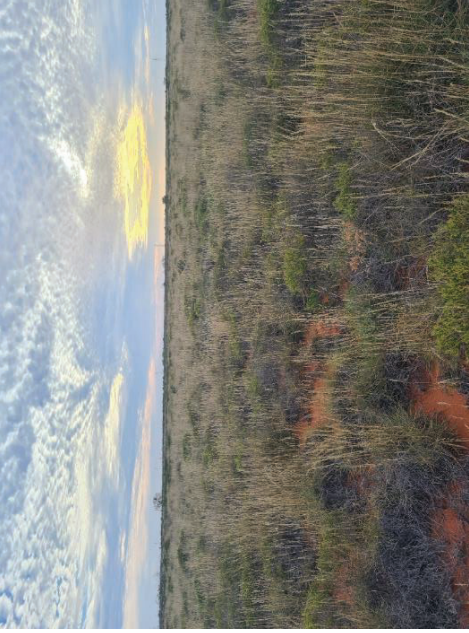

A total of 227.07 ha (2.48%) was considered Disturbed within the Study Area. The extent of the recorded habitats for each potential infrastructure route are presented in Table 4.3. Descriptions of the distinguishing characteristics and the occurrence within the Study Area for each of these habitat types are presented in Table 4.4, and the data from on-site habitat assessments are presented in Appendix C. The five habitats mapped are broadly distributed, except for Claypan, and well represented across the Pilbara bioregion and surrounding regions, and therefore support fauna assemblages which are generally common and widespread.



Of the five habitats occurring within the Study Area, Sand Plain and Major Drainage may provide critical or supporting habitat for MNES species, including Pilbara olive python, northern quoll, Pilbara leaf-nosed bat, grey falcon, and bilby (Table 4.4).



Table 4.3: Fauna habitats

Habitat	Route 1		Route 1B		Route 2		Route 3		Route 4		Route 6	
	Area (ha)	%	Area (ha)	%	Area (ha)	%	Area (ha)	%	Area (ha)	%	Area (ha)	%
Sand Plain	524.25	82.10	800.30	98.84	168.83	43.29	2,079.48	81.06	2,380.77	86.08	2,076.90	96.09
Drainage Area	51.72	8.10	-	-	24.57	6.30	168.45	6.57	179.78	6.50	62.06	2.87
Major Drainage	23.69	3.71	-	-	-	-	210.18	8.19	127.56	4.61	4.15	0.19
Hardpan Plain	22.90	3.59	-	-	164.92	42.29	-	-	-	-	-	-
Claypan	-	-	0.29	0.04	0.60	0.15	12.10	0.47	19.15	0.69	-	-
Disturbed	16.00	2.51	9.10	1.12	31.08	7.97	95.11	3.71	58.64	2.12	18.38	0.85
Total	638.56	100.00	800.30	100.00	390.00	100.00	2,565.32	100.00	2,765.90	100.00	2,161.49	100.00

Table 4-4: Broad fauna habitats occurring within the Study Area

Habitat	Distinguishing habitat characteristics	Extent of the habitat	Significant Species	Photo
<p>Sand Plain</p> <p>7,867.53 ha 85.88%</p>	<p>Low-lying or elevated sandy areas with accumulated loose sandy substrate, with small areas of sandy clay occurring. Often supporting an open vegetation cover, dominated by scattered <i>Acacia</i> shrubs over <i>Triodia</i> hummock grasses of various life stages.</p>	<p>Sandy Plain habitat is found throughout the Study Area. It is the dominant habitat occurring in the area, except for the northern upper corner of the Study Area. Sand plain is a common and widespread habitat throughout the Pilbara region.</p>	<p>Critical habitat for:</p> <ul style="list-style-type: none"> • brush-tailed mulgara — breeding, foraging and dispersal • spectacled hare-wallaby — breeding, foraging and dispersal <p>Supporting habitat for:</p> <ul style="list-style-type: none"> • bilby — breeding, foraging and dispersal • fork-tailed swift — foraging and dispersal 	
<p>Drainage Area</p> <p>483.89 ha 5.28%</p>	<p>Lower lying plain often subjected to sheet flow following large rainfall events. Vegetation and substrates of this habitat was variable, often comprising scattered <i>Eucalyptus</i> over <i>Acacia</i> and/or <i>Grevillea</i> shrubs with an understorey dominated by <i>Triodia</i> hummock grasses and/or mixed tussock grasses on alluvial substrates, often comprising heavy clays and gravel. Tussock grasses can be dominant within Drainage Area habitat as a result of high rainfall events.</p>	<p>Drainage Area habitat surrounds the Major Drainage areas in the central section of the Study Area, crossing Route 1, 3 and 4. This fauna habitat is common throughout the Pilbara bioregion. Across the region its structure and condition are variable as a result of rainfall events and disturbance (i.e. fire and cattle grazing).</p>	<p>Critical habitat for:</p> <ul style="list-style-type: none"> • brush-tailed mulgara — foraging and dispersal • short-tailed mouse — breeding, foraging and dispersal <p>Supporting habitat for:</p> <ul style="list-style-type: none"> • peregrine falcon — foraging • bilby — foraging and dispersal • fork-tailed swift — foraging and dispersal • spotted Ctenotus — foraging and dispersal • letter-winged kite — foraging • grey falcon — foraging 	

Habitat	Distinguishing habitat characteristics	Extent of the habitat	Significant Species	Photo
<p>Major Drainage 362.57 ha 3.96%</p>	<p>Major Drainage habitat is prone to flooding and is more likely to retain water when inundated. The structure and condition of vegetation often varies seasonally, particularly following rainfall events. This habitat supports an upper story of relatively tall <i>Eucalyptus</i>.</p>	<p>The Major Drainage habitat flows east to west through the central section of the Study Area (Route 1, 3 and 4) as well as through the south-west end of Route 3. This fauna habitat is widespread throughout the Pilbara bioregion, though its structure and condition are variable as a result of rainfall events and susceptible to degradation from cattle grazing.</p>	<p>Critical habitat for:</p> <ul style="list-style-type: none"> • grey falcon —breeding, foraging and dispersal • brush-tailed mulgara — breeding, foraging and dispersal • short-tailed mouse — breeding, foraging and dispersal <p>Supporting habitat for:</p> <ul style="list-style-type: none"> • northern quoll — foraging and dispersal • Pilbara leaf-nosed bat — foraging and dispersal • bilby — foraging and dispersal • Pilbara olive python — foraging and dispersal • peregrine falcon —breeding, foraging and dispersal • fork-tailed swift — foraging and dispersal • letter-winged kite — foraging and dispersal 	
<p>Hardpan Plain 187.59 ha 2.05%</p>	<p>Hardpan Plain habitat comprised flat low-lying clay based plain dominated by stands of mulga, with a high proportion of the substrate comprising bare soil. Often sparsely vegetated with large areas often void of vegetation.</p>	<p>This fauna habitat is common throughout parts of the Pilbara bioregion. Structure and condition are variable as a result of rainfall events and disturbance (i.e. fire and cattle grazing). This habitat is found in the northern section of Route 1b.</p>	<p>Supporting habitat for:</p> <ul style="list-style-type: none"> • fork-tailed swift — foraging and dispersal 	

Habitat	Distinguishing habitat characteristics	Extent of the habitat	Significant Species	Photo
<p>Claypan 32.13 ha 0.35%</p>	<p>Claypan habitat consists of heavy clay-based soils (both cracking and non-cracking surfaces). Low lying areas that have very slight to no gradient and are often drainage depressions. Typically have no vegetation cover.</p>	<p>Claypan habitat is limited in extent within the Study Area and is found in the north-west of Route 4. Claypan habitat is limited throughout the Pilbara.</p>	<p>Critical habitat for:</p> <ul style="list-style-type: none"> • short-tailed mouse — breeding, foraging and dispersal <p>Supporting habitat for:</p> <ul style="list-style-type: none"> • fork-tailed swift — foraging and dispersal 	
<p>Cleared/ Disturbed 227.07 ha 2.48%</p>	<p>Disturbed areas include where the natural vegetation and microhabitats have been disrupted, usually devoid of native vegetation. This includes tracks, laydown areas, camps, major roads/highways and historic, large-scale clearing.</p>	<p>The Disturbed areas occur throughout the Study Area, primarily associated with roads, access tracks and cattle tracks.</p>	<p>Nil</p>	

4.2.2 Habitat Features

4.2.2.1 Water Features

Water sources are a limiting factor for many ecosystems (James *et al.*, 1995), particularly within arid-zone ecosystems such as the Pilbara (Burbidge *et al.*, 2010; Doughty *et al.*, 2011) and often represent areas of comparatively high ecological productivity (Murray *et al.*, 2003). Water features have varying levels of significance to the target species of this assessment. For northern quolls, water features often represent areas of high productivity, and therefore may contain a relatively high abundance of feeding resources (Braithwaite & Griffiths, 1994; Oakwood, 2000), when in suitable habitat (e.g. rocky habitats, and to a lesser degree, drainage lines). For Pilbara leaf-nosed bats, water features can provide significant drinking and foraging sources, and are a key component to ‘gorges with pools’ being recognised as the priority foraging habitat for the species (TSSC, 2016b). Water features can often act as important foraging locations for Pilbara olive pythons; for that reason the species is often associated with water features, particularly within rocky habitats, but also, within drainage habitats (Pearson, 1993).

A single water feature was recorded within the Study Area in Major Drainage habitat (Table 4.5). The water feature was classified as permanent (lasting more than nine months).

Table 4.5: Water features recorded in the Study Area during the current survey

Water Feature ID	Coordinates		Habitat	Permanency
	Latitude	Longitude		
WALT-001	-20.5222	118.4819	Major Drainage	Permanent

4.2.3 Fauna Recorded

A total of 88 vertebrate fauna species, comprising 11 mammals (two introduced and nine native), 58 bird species and 19 reptiles were recorded during the field survey (Appendix B). This comprises approximately 20% of the total number of species identified in the desktop assessment ($n = 438$). In comparison with the results from previous surveys undertaken in the vicinity of the Study Area (see section 4.1) the total species diversity recorded during the survey was comparable to other basic surveys (Table 4.1). All species recorded during the survey were previously identified in the desktop assessment (Appendix B).

4.2.4 Significant Species

Three significant species were recorded within the Study Area during the current survey: Pilbara leaf-nosed bat, bilby and grey falcon. The Pilbara leaf-nosed bat was recorded via ultrasonic recorder on three occasions. Bilby was recorded from a single track and nine diggings. An additional two diggings were found in the north just outside of the Study Area; however, as no additional signs were recorded these are considered unconfirmed. A single grey falcon was recorded from direct observation of an active individual. Based on known species' distributions, previous records and the habitats present within the Study Area, a further four species were Confirmed, one species was considered Likely to occur, six were deemed Possible and the remaining 66 were considered Unlikely or Highly Unlikely to occur (Table 4.7).

The occurrence of those significant species which are MNES are discussed in further detail below (Section 4.2.4.1). The occurrence of other significant species which have either been Confirmed as occurring in the Study Area or are considered Highly Likely to occur, Likely to occur, or Possible to occur, is also discussed in more detail below (Section 4.2.4.2 to 4.2.4.5).

Consideration for some species as Unlikely or Highly Unlikely to occur within the Study Area is generally based on the absence of suitable permanent or seasonal habitats or micro habitats likely to support the species and/or the Study Area occurring outside the known distribution for the species (Table 4.7).

Table 4.6: Significant species recorded during the current survey

Common Name	Scientific Name	Site	Location		Record Type
			Latitude	Longitude	
Bilby	<i>Macrotis lagotis</i>	No site	-20.6083	118.3706	Track
		No site	-20.6083	118.3708	Digging
		No site	-20.6085	118.3709	Digging
		No site	-20.6085	118.3708	Digging
		No site	-20.6082	118.3708	Digging
		No site	-20.6087	118.3705	Digging
		No site	-20.6081	118.3703	Digging
		No site	-20.6076	118.3703	Digging
		No site	-20.6076	118.3704	Digging
		No site	-20.4178	118.5294	Digging
		No site	-20.4179	118.5294	Digging
		No site	-20.4175	118.5290	Digging
Grey Falcon	<i>Falco hypoleucos</i>	No site	-20.4368	118.5416	Direct observation
Pilbara Leaf-nosed Bat		VALT-035	-20.6642	118.3552	Ultrasonic recorder

Common Name	Scientific Name	Site	Location		Record Type
			Latitude	Longitude	
	<i>Rhinonictoris aurantia</i> Pilbara form	VALT-009	-20.7542	118.5193	Ultrasonic recorder
		VALT-009	-20.7542	118.5193	Ultrasonic recorder

Table 4-7: Significant species likelihood assessment

Common Name (Scientific Name)	Conservation Status			Preferred Broad Habitats	Within Current Known Distribution	Nearest Record/s to the Study Area	Potential Critical Habitat within the Study Area					Likelihood of Occurrence	Occurrence	Comments
	EPBC Act	BC Act	DBCA				Sandy Plain	Claypan	Drainage Area / Floodplain	Major Drainage	Hardpan Plain			
MAMMALS														
DASYURIDAE														
Long-tailed dunnart (<i>Antechinomys longicaudatus</i>)			P4	Typically occurs on plateaus near breakaways and scree slopes, and on rugged boulder-strewn scree slopes (Burbidge <i>et al.</i> , 2008). Once considered rare but now shown to be relatively common and widespread in rocky habitats (Burbidge <i>et al.</i> , 2008).	No	47.6 km SSE (2012) (DBCA, 2023b)	-	-	-	-	-	Highly Unlikely	N/A	Lack of suitable habitat within the Study Area.
Brush-tailed mulgara (<i>Dasyercus blythi</i>)		P4	P4	Can occur in a range of habitats across the Australian arid zone, often dominated by spinifex <i>Triodia</i> spp. grasslands on sandy or stony plains where suitable burrowing substrate is present (Payvey <i>et al.</i> , 2012; Woolley, 2006). Mature spinifex hummocks appear to be important for protection from introduced predators (Körtner <i>et al.</i> , 2007).	Yes	Recorded within Study Area (2012) (DBCA, 2023b)	C	-	C	C	-	Confirmed	Resident	Suitable habitat recorded within Study Area and species recorded in the area previously.
Northern quoll (<i>Dasyurus hallucatus</i>)	EN	EN	EN	The species tends to inhabit rocky habitats which offer protection from predators and are generally more productive in terms of availability of resources (Oakwood, 2000). Other microhabitat features important to the species include rock cover, proximity to permanent water and time-since last fire (Woinarski <i>et al.</i> , 2008).	Yes	5.4-km ENE (2014) (DBCA, 2023b) 5.7 km NW (2012) (DBCA, 2023b)	-	-	S	-	-	Possible	Irregular visitor (foraging or dispersal)	Species unlikely to occur as a resident; however, may occur occasionally during dispersal events. Despite the lack of suitable denning habitat within the Study Area, there are rocky areas in the broader vicinity, and the proximity of contemporary records suggest potential for dispersing and foraging individuals to occur near or within the Study Area occasionally.

Common Name (Scientific Name)	Conservation Status			Preferred Broad Habitats	Within Current Known Distribution	Nearest Record/s to the Study Area	Potential Critical Habitat within the Study Area					Likelihood of Occurrence	Occurrence	Comments	
	EPBC Act	BC Act	DBCA				Sandy Plain	Claypan	Drainage Area / Floodplain	Major Drainage	Hardpan Plain				
MACROPODIDAE Spectacled hare-wallaby (<i>Lagorchestes conspicillatus leichardti</i>)			P4	Inhabits spinifex hummock grasslands and Acacia shrublands (van Dyck & Strahan, 2008; Woinarski <i>et al.</i> , 2014).	Yes	25.6 km SE (2019) (DBCA, 2023b)	C	-	-	-	-	-	Possible	N/A	Has declined drastically in the Pilbara and Great Sandy Desert and is a rare species.
MEGADERMATIDAE Ghost bat (<i>Macroderma gigas</i>)	VU	VU		Ghost bats roost in deep, complex caves beneath bluffs of low, rounded hills, granite rock piles and abandoned mines (Armstrong & Anstee, 2000). These features often occur within habitats including gorge/gully, hill crest/hill slope and low hills (Armstrong & Anstee, 2000). Forages broadly across habitats, particularly woodland and open woodland habitats, including eucalypt and mulga woodlands (Biologic, 2020; Richards <i>et al.</i> , 2008; Tidemann <i>et al.</i> , 1985; TSSC, 2016a).	Yes	14.3 km ENE (2001) (DBCA, 2023b) 19.9 km S (2010) (DBCA, 2023b)	-	-	-	-	-	-	Highly Unlikely	N/A	Lack of suitable habitat within the Study Area or in close proximity (i.e. within <12 km, based on assessment of aerial imagery). Lack of contemporary records in the vicinity.
MOLOSSIDAE Northern coastal free-tailed bat (<i>Ozimops cobourgiensis</i>)			P1	Associated with mangrove habitat and roost in the hollows of those trees, and known to seek food there and in eucalypt or melaleuca woodland or other coastal habitat (van Dyck & Strahan, 2008).	Yes	9.2 km NNE (2001) (DBCA, 2023b) 12.9 km N (2009) (DBCA, 2023b)	-	-	-	-	-	-	Highly Unlikely	N/A	Lack of suitable habitat within the Study Area. Lack of contemporary records in the vicinity.
MURIDAE Short-tailed mouse (<i>Leggadina lakedownensis</i>)			P4	The species occupies a diverse range of habitats from the monsoon tropical coast to semiarid climates, including spinifex and tussock grasslands, samphire and sedgelands, <i>Acacia</i> shrublands, tropical eucalypt and Melaleuca woodlands and stony ranges; however, the species is usually found in seasonally inundated habitats on red or white sandy-clay soils (Moro & Kutt, 2008).	Yes	80.4 km ENE (2006) (ALA, 2023) 82.1 km WSW (2000) (ALA, 2023)	-	C	C	C	C	-	Possible	N/A	Occurrence and abundance likely to be influenced by seasonal conditions, particularly following large rainfall events when resources are most abundant. However, there is a lack of contemporary records in the vicinity.

Common Name (Scientific Name)	Conservation Status			Preferred Broad Habitats	Within Current Known Distribution	Nearest Record/s to the Study Area	Potential Critical Habitat within the Study Area					Likelihood of Occurrence	Occurrence	Comments
	EPBC Act	BC Act	DBCA				Sandy Plain	Claypan	Drainage Area / Floodplain	Major Drainage	Hardpan Plain			
Western pebble-mound mouse (<i>Pseudomys chapmani</i>)			P4	This species occurs on the gentler slopes of rocky ranges where the ground is covered with a stony mantle and vegetated by hard spinifex, often with a sparse overstorey of eucalypts and scattered shrubs (Anstee, 1996; Start <i>et al.</i> , 2000).	Yes	3.8 km SSW (2013) (DBCA, 2023b)	-	-	-	-	-	Highly Unlikely	N/A	Lack of rocky habitat within Study Area.
RHINONYCTERIDAE														
Pilbara leaf-nosed bat (<i>Rhinonycteris aurantia</i> 'Pilbara form')	VU	VU		The Pilbara leaf-nosed bat roosts within caves and abandoned mines with high humidity (95) and temperature (32°C) (Armstrong, 2001). The species forages in caves and along waterbodies with fringing vegetation (TSSC, 2016b).	Yes	1.4 km SSE (2016) (DBCA, 2023b)	S HR=1	-	S HR=1	S HR=1	S	Confirmed	Irregular visitor (foraging and/or dispersal)	The species was recorded on three occasions within the Study Area in Major Drainage and Sand Plain habitat. Given the proximity of the 2016 record (DBCA, 2023), it is possible for this species to utilise drainage lines within the Study Area for foraging activities. No critical roost habitat is present within the Study Area.
THYLACOMYIDAE														
Bilby (<i>Macrotis lagotis</i>)	VU	VU		Variety of habitats including spinifex hummock grassland and <i>Acacia</i> shrubland, on soft soils (Burrows <i>et al.</i> , 2012). In the Pilbara often associated with major drainage line sandy terraces (How <i>et al.</i> , 1991). Includes residual landforms (e.g. laterite rises), loamy or sandy soils associated with paleodrainage lines and perched drainage lines, sandplains and dune fields, habitat types where shrubs containing root dwelling larvae are common, and recently burnt habitat (within the last 1-3 years) (DBCA, 2017).	Yes	Recorded during the current survey	S	-	S	S	S	Confirmed	Regular visitor (foraging and/or dispersal)	Confirmed within the Study Area during the current survey. The species was recorded from a single track and nine associated diggings located in the south-west of the Study Area. An additional two diggings were recorded in the north; however, these are unconfirmed to be bilby.

Common Name (Scientific Name)	Conservation Status			Preferred Broad Habitats	Within Current Known Distribution	Nearest Record/s to the Study Area	Potential Critical Habitat within the Study Area					Likelihood of Occurrence	Occurrence	Comments
	EPBC Act	BC Act	DBCA				Sandy Plain	Claypan	Drainage Area / Floodplain	Major Drainage	Hardpan Plain			
BIRDS														
ACCIPITRIDAE														
Letter-winged kite (<i>Elanus scriptus</i>)			P4	Habitats for this species include grasslands with trees and tree-lined watercourses (Pizzey & Knight, 2007). Infrequently recorded in the Pilbara and Kimberley regions. Irruptive species, often expanding and contracting in distribution in response to seasonal rainfall and resource availability (Pizzey & Knight, 2007).	Yes	0.5 km NW (undated) (ALA, 2023)	-	-	S	S	-	Possible	Irregular visitor (foraging or dispersal)	Lack of suitable nesting habitat within the Study Area, however it may utilise drainage lines and other habitats for foraging and dispersal.
Red goshawk (<i>Erythrotriorchis radiatus</i>)	VU	VU		Inhabits tall open forests and woodlands, often in association with drainage lines and fertile soils (Garnett et al., 2011; Menkhorst et al., 2017). Nests in trees taller than 20 m within 1 km of watercourse or wetland habitats (Garnett et al., 2011). Forages in a broad range of habitats within a home range of up to 200 km ² (Garnett et al., 2011).	No	547.3 km NE (undated) (ALA, 2023)	-	-	-	-	-	Highly Unlikely	N/A	Lack of suitable habitat within the Study Area, which is not within the species current distribution. They are considered a rare and infrequent visitor to the Pilbara region.
Osprey (<i>Pandion haliaetus</i>)	MI	MI		Often occurs along coasts and inshore waters and tidal zones (Menkhorst et al., 2017). Occasionally occurs further inland, particularly following cyclonic activity along the coast, where it's regularly associated with large permanent or long-standing waterbodies, often occurring along rivers and lakes. Found mainly in sheltered seas around islands, tidal creeks, estuaries and saltwork ponds, also large river pools (Johnstone & Storr, 1998).	Yes	0.5 km ESE (1979) (DBCA, 2023b) 5.8 km N (2012) (DBCA, 2023b)	-	-	-	-	-	Highly Unlikely	N/A	Lack of suitable habitat within the Study Area. Lack of contemporary records in the vicinity.
ANATIDAE														
Garganey (<i>Spatula querquedula</i>)	MI	MI		Rare visitor to Australia, recorded from lakes and inland waterbodies (Johnstone & Storr, 1998).	No	5.4 km NW (2019) (ALA, 2023)	-	-	-	-	-	Unlikely	N/A	Lack of suitable habitat within the Study Area, which is not within the species current distribution.

Common Name (Scientific Name)	Conservation Status			Preferred Broad Habitats	Within Current Known Distribution	Nearest Record/s to the Study Area	Potential Critical Habitat within the Study Area					Likelihood of Occurrence	Occurrence	Comments
	EPBC Act	BC Act	DBCA				Sandy Plain	Claypan	Drainage Area / Floodplain	Major Drainage	Hardpan Plain			
APODIDAE														
Fork-tailed swift (<i>Apus pacificus</i>)	MI	MI		Inhabits dry/open habitats, inclusive of riparian woodlands and tea-tree swamps, low scrub, heathland or saltmarsh, as well as treeless grassland and sandplains covered with spinifex, open farmland and inland and coastal sand-dunes (Johnstone & Storr, 1998). Aerial species, which forages high above the tree canopy and rarely lower (Johnstone & Storr, 1998).	Yes	8.0 KM ESE (2006) (DBCA, 2023b)	S	S	S	S	S	Possible	Infrequent visitor (foraging or dispersal)	May infrequently occur within the airspace above all habitats of the Study Area during foraging and/or migratory activities; however, unlikely to land or nest.
CHARADRIIDAE														
Greater sand plover (<i>Charadrius leschenaultia</i>)	VU/ MI	VU / MI		Wide, sandy or shelly beaches, sandspits, sand clays, tidal mudflats, reefs, mangroves, saltmarsh, dunes and bare paddocks (Pizzey & Knight, 2007).	Yes	0.5 km ESE (1979) (DBCA, 2023b) 11.6 km N (2014) (DBCA, 2023b)	-	-	-	-	-	Highly Unlikely	N/A	Lack of suitable habitat within the Study Area. Lack of contemporary records in the vicinity
Lesser sand plover (<i>Charadrius mongolus</i>)	EN/ MI	EN		Tidal mudflats and sandflats, gently sloping sandy and shelly beaches, estuaries, reefs, saltmarsh, atolls, mangroves and airfields. On occasion inland on freshwater lakes, bore drains and swamps (Pizzey & Knight, 2007).	No	0.5 km ESE (1979) (DBCA, 2023b) 12.6 km N (2007) (DBCA, 2023b)	-	-	-	-	-	Highly Unlikely	N/A	Lack of suitable habitat within the Study Area, which is not within the species current distribution
Oriental plover (<i>Charadrius veredus</i>)	MI	MI		Variety of habitats, including coastal habitats, such as estuarine mudflats and sandbanks, on sandy or rocky ocean beaches as well as open inland environments such as, semi-arid or arid grasslands, where the grass is short and sparse (Johnstone & Storr, 2004).	Yes	12.6 km N (2008) (DBCA, 2023b)	-	-	-	-	-	Unlikely	N/A	Lack of suitable habitat within the Study Area. Lack of contemporary records in the vicinity
Pacific golden plover (<i>Pluvialis fulva</i>)	MI	MI		Estuaries, mudflats, saltmarshes, mangroves, rocky reefs and seaweed washed up on ocean shores as well as margins of shallow open inland swamps, sewerage ponds, paddocks with short grass, sports-grounds, airfields and ploughed land (Pizzey & Knight, 2007).	No	6.4 km ENE (1979) (DBCA, 2023b) 13.8 km NNE (2013) (DBCA, 2023b)	-	-	-	-	-	Highly Unlikely	N/A	Lack of suitable habitat within the Study Area, which is not within the species current distribution

Common Name (Scientific Name)	Conservation Status			Preferred Broad Habitats	Within Current Known Distribution	Nearest Record/s to the Study Area	Potential Critical Habitat within the Study Area					Likelihood of Occurrence	Occurrence	Comments	
	EPBC Act	BC Act	DBCA				Sandy Plain	Claypan	Drainage Area / Floodplain	Major Drainage	Hardpan Plain				
Grey plover (<i>Pluvialis squatarola</i>)	MI	MI	MI	Inhabits intertidal mudflats, saltmarshes, sandflats and beaches, tidal reefs, estuaries and is rarely found inland (Pizzey & Knight, 2007).	No	0.5 km ESE (1979) (DBCA, 2023b) 15.3 km NNE (2013) (DBCA, 2023b)	-	-	-	-	-	-	N/A	Lack of suitable habitat within the Study Area, which is not within the species current distribution	
FALCONIDAE															
Grey falcon (<i>Falco hypoleucos</i>)	VU	VU	VU	Timbered lowlands, particularly <i>Acacia</i> shrubland and along inland drainage systems. Also frequents spinifex and tussock grassland habitats to forage (Burbidge <i>et al.</i> , 2010; Olsen & Olsen, 1986). The species commonly nests in timbered areas, particularly tall trees along watercourses, or tall infrastructure (e.g. powerline towers) and forages in open or more sparsely vegetated habitats (Garnett <i>et al.</i> , 2011).	Yes	Recorded during the current survey	-	-	S	C	-	-	Confirmed	Infrequent visitor (foraging or dispersal)	Confirmed during the current survey from a single individual recorded in the north of the Study Area. The frequency of occurrence is likely to be dependent on the location of nesting sites within or in the vicinity of the Study Area.
Peregrine falcon (<i>Falco peregrinus</i>)	OS	OS	OS	The species occurs along coastal cliffs, rivers and ranges as well as wooded watercourses and lakes nesting on cliffs, granite outcrops, quarries and in the wheatbelt, old corvid and Whistling Kite nests (Johnstone & Storr, 1998).	Yes	0.3 km WNW (2012) (DBCA, 2023b)	-	-	S	C	-	-	Likely	Infrequent visitor (foraging or dispersal)	Lack of suitable nesting habitat within the Study Area; however, it is likely to utilise drainage lines and other habitats for foraging and dispersal. Occurrence within the Study Area is likely to be dependent on proximity of nesting.

Common Name (Scientific Name)	Conservation Status			Preferred Broad Habitats	Within Current Known Distribution	Nearest Record/s to the Study Area	Potential Critical Habitat within the Study Area					Likelihood of Occurrence	Occurrence	Comments
	EPBC Act	BC Act	DBCA				Sandy Plain	Claypan	Drainage Area / Floodplain	Major Drainage	Hardpan Plain			
GLAREOLIDAE Oriental pratincole (<i>Glareola maldivarum</i>)	MI	MI		Semi-arid open plains and spends winter on the coast in northern Australia (Simpson <i>et al.</i> , 2010).	Yes	Recorded within Study Area (2007) (DBCA, 2023b)	-	-	-	-	-	Confirmed/Unlikely	N/A	Lack of suitable habitat within the Study Area. Previous record was likely an individual flying over from suitable habitat outside the Study Area and is generally considered unlikely to rely on habitats in the Study Area.
HIRUNDINIDAE Barn swallow (<i>Hirundo rustica</i>)	MI	MI		Non-breeding summer visitor to the Pilbara and Kimberley. It favours areas near water (Johnstone <i>et al.</i> , 2013) (Menkhorst <i>et al.</i> , 2017).	Yes	2.2 km NE (2005) (DBCA, 2023b)	-	-	-	-	-	Unlikely	N/A	Lack of suitable habitat within the Study Area. Lack of contemporary records in the vicinity.
LARIDAE White-winged black tern (<i>Chlidonias leucopterus</i>)	MI	MI		Large wetlands, coastal and inland; saltfields, sewage ponds, estuaries, coastal waters (Pizzey & Knight, 2007).	Yes	2.2 km NE (2004) (DBCA, 2023b)	-	-	-	-	-	Highly Unlikely	N/A	Lack of suitable habitat within the Study Area. Lack of contemporary records in the vicinity.
Gull-billed tern (<i>Gelochelidon nilotica</i>)	MI	MI		Found in freshwater swamps, brackish and salt lakes, beaches and estuarine mudflats, floodwaters, sewage farms, irrigated croplands and grasslands (Johnstone & Storr, 1998). In the interior, they are often associated with inundated saltlakes and claypans and watercourses (Johnstone & Storr, 1998). Colonially breeds and nests on islets in partially filled saltlakes or saltmarshes in mid-western interior (Johnstone & Storr, 1998).	Yes	Recorded within Study Area (2004) (DBCA, 2023b)	-	-	-	-	-	Confirmed/Unlikely	N/A	Lack of suitable habitat within the Study Area. Previous record was likely an individual flying over from suitable habitat outside the Study Area and is generally considered unlikely to rely on habitats in the Study Area.

Common Name (Scientific Name)	Conservation Status			Preferred Broad Habitats	Within Current Known Distribution	Nearest Record/s to the Study Area	Potential Critical Habitat within the Study Area					Likelihood of Occurrence	Occurrence	Comments
	EPBC Act	BC Act	DBCA				Sandy Plain	Claypan	Drainage Area / Floodplain	Major Drainage	Hardpan Plain			
Caspian tern (<i>Hydroprogne caspia</i>)	MI	MI	MI	Mainly sheltered seas, estuaries and tidal creeks; occasionally near-coastal salt lakes (including saltwork ponds) and brackish pools in lower courses of rivers; rarely fresh water (Johnstone & Storr, 1998).	No	Recorded within Study Area (2011) (DBCA, 2023b)	-	-	-	-	-	-	N/A	Lack of suitable habitat within the Study Area. Previous record was likely an individual flying over from suitable habitat outside the Study Area and is generally considered unlikely to rely on habitats in the Study Area.
Bridled tern (<i>Onychoprion anaethetus</i>)	MI	MI	MI	Occupy tropical and sub-tropical seas. Breeds on islands including vegetated coral cays, rock stacks and rocky continental islands (DAWE, 2020).	No	10.9 km N (1995) (DBCA, 2023b)	-	-	-	-	-	-	N/A	Lack of suitable habitat within Study Area, which is not within the species current distribution.
Roseate tern (<i>Sterna dougallii</i>)	MI	MI	MI	Breeds on sandy or pebbly beaches or short grass on islands. Feeds offshore, disperses well out to sea (Fleggi, 2002).	No	24.0 km NNE (2006) (ALA, 2023)	-	-	-	-	-	-	N/A	Lack of suitable habitat within Study Area, which is not within the species current distribution.
Common tern (<i>Sterna hirundo</i>)	MI	MI	MI	Migrant from north Asian breeding grounds. Coastal, foraging in near-shore waters from sheltered bays beyond surf zone (Menkhorst et al., 2017).	No	12.5 km NNE (2014) (DBCA, 2023b)	-	-	-	-	-	-	N/A	Lack of suitable habitat within Study Area.
Little tern (<i>Sterna albibrons</i>)	MI	MI	MI	Widespread on coast of north and east Australia, forages over sheltered waters and roost on exposed sandbars, splits or beaches. From Oct – Mar most Little Terns seen in Australia are non-breeding migrants from Asian breeding grounds. Nests in colonies in open sandy settings, close to tideline; beach-nesting populations of at least south east Australia (Menkhorst et al., 2017).	No	12.1 km N (2014) (DBCA, 2023b)	-	-	-	-	-	-	N/A	Lack of suitable habitat within Study Area.
Fairy tern (<i>Sterna nereis</i>)	VU	VU	VU	Coastlines, estuaries, and wetlands, nesting on sheltered sandy beaches and banks (DAWE, 2020).	No	10.9 km N (1995) (DBCA, 2023b) 12.6 km N (2008) (DBCA, 2023b)	-	-	-	-	-	-	N/A	Lack of suitable habitat within Study Area.

Common Name (Scientific Name)	Conservation Status			Preferred Broad Habitats	Within Current Known Distribution	Nearest Record/s to the Study Area	Potential Critical Habitat within the Study Area					Likelihood of Occurrence	Occurrence	Comments	
	EPBC Act	BC Act	DBCA				Sandy Plain	Claypan	Drainage Area / Floodplain	Major Drainage	Hardpan Plain				
Crested tern (<i>Thalasseus bergii</i>)	MI	MI	MI	Favours sheltered seas, also estuaries and saltwork ponds. Rarely crosses the coastline and inland records generally involve birds driven by a storm or cyclone (Johnstone & Storr, 1998).	No	0.5 km ESE (1979) (DBCA, 2023b) 12.5 km NNE (2014) (DBCA, 2023b)	-	-	-	-	-	-	Highly Unlikely	N/A	Lack of suitable habitat within Study Area, which is not within the species current distribution.
MOTACILLIDAE															
Grey wagtail (<i>Motacilla cinerea</i>)	MI	MI	MI	Higher altitudes near fast-running water (Simpson et al., 2010).	Yes	482.0 km NE (2015) (ALA, 2023)	-	-	-	-	-	-	Highly Unlikely	N/A	Lack of suitable habitat within Study Area. Lack of contemporary records in the vicinity.
Yellow wagtail (<i>Motacilla flava</i>)	MI	MI	MI	An uncommon but regular visitor to the Pilbara region (Johnstone et al., 2013). Occupies a range of damp or wet habitats with low vegetation although favors edges of fresh water, especially sewage ponds (Johnstone & Storr, 2004).	Yes	14.0 km NNE (1982) (DBCA, 2023b)	-	-	-	-	-	-	Highly Unlikely	N/A	Lack of suitable habitat within Study Area.
PSITTACIDAE															
Night parrot (<i>Pezoporus occidentalis</i>)	EN	CR	EN	The night parrot prefers sandy/stony plain habitat with old-growth spinifex for roosting and nesting in conjunction with native grasses and herbs for foraging (DPaW, 2017).	Yes	202.5 km ESE (undated) (ALA, 2023)	-	-	-	-	-	-	Highly Unlikely	N/A	Size of spinifex within Study Area not suitable for roosting or nesting. There is a lack of contemporary records within close proximity of the Study Area.
ROSTRATULIDAE															
Australian painted snipe (<i>Rostratula australis</i>)	EN	EN	EN	Favours recently flooded areas in shallow lowland freshwater temporary or permanent wetlands. This includes swamps, marshes, reedbeds, overgrown rice fields, inundated grassland and saltmarsh, margins of pools, freshwater lakes, sewage pools, reservoirs and mudflats (BirdLife International, 2016).	Yes	69.4 km E (undated) (ALA, 2023)	-	-	-	-	-	-	Highly Unlikely	N/A	Lack of suitable habitat within Study Area. Lack of contemporary records in the vicinity.

Common Name (Scientific Name)	Conservation Status			Preferred Broad Habitats	Within Current Known Distribution	Nearest Record/s to the Study Area	Potential Critical Habitat within the Study Area					Likelihood of Occurrence	Occurrence	Comments
	EPBC Act	BC Act	DBCA				Sandy Plain	Claypan	Drainage Area / Floodplain	Major Drainage	Hardpan Plain			
SCOLOPACIDAE														
Common sandpiper (<i>Actitis hypoleucos</i>)	MI	MI		Estuaries and deltas of streams, as well as banks farther upstream; around lakes, pools, billabongs, reservoirs, dams and claypans (Geering <i>et al.</i> , 2007; Johnstone & Storr, 1998).	Yes	Recorded within Study Area (2004) (DBCA, 2023b)	-	-	-	-	-	-	N/A	Lack of suitable habitat within the Study Area. Previous record was likely an individual flying over from suitable habitat outside the Study Area and is generally considered unlikely to rely on habitats in the Study Area.
Ruddy turnstone (<i>Arenaria interpres</i>)	MI	MI		Species habitat includes tidal reefs and pools, pebbly, shelly and sandy shores with stranded seaweed, weed-covered rocks, mudflats and on occasion inland shallow waters, sewage ponds, open or ploughed grounds and commercial salt fields (Pizzey & Knight, 2007).	No	0.5 km ESE (1979) (DBCA, 2023b) 2.3 km NE (2007) (DBCA, 2023b)	-	-	-	-	-	-	N/A	Lack of suitable habitat within the Study Area.
Sharp-tailed sandpiper (<i>Calidris acuminata</i>)	MI	MI		Coastal and inland areas saline and freshwater but prefers non-tidal fresh or brackish wetlands (Geering <i>et al.</i> , 2007). Favours flooded samphire flats and grasslands, mangrove creeks mudflats, beaches, river pools, saltwork ponds, sewage ponds and freshwater soaks (Johnstone <i>et al.</i> , 2013).	Yes	0.5 km WNW (1981) (DBCA, 2023b) 2.2 km NE (2004) (DBCA, 2023b)	-	-	-	-	-	-	N/A	Lack of suitable habitat within the Study Area.
Sanderling (<i>Calidris alba</i>)	MI	MI		Broad ocean beaches of firm sand, depositing strands and mounds of seaweed. Often near river mouths, tidal mudflats, inlets and coastal lagoons (Pizzey & Knight, 2007)	No	0.5 km ESE (1979) (DBCA, 2023b) 12.7 km NNE (2006) (DBCA, 2023b)	-	-	-	-	-	-	N/A	Lack of suitable habitat within the Study Area. Lack of contemporary records in the vicinity.
Red knot (<i>Calidris canutus</i>)	EN/ MI	EN/ MI		Found in mudflats and sandflats in estuaries, on sheltered coasts, near coastal saltlakes and saltworks ponds (Johnstone & Storr, 1998).	Yes	0.5 km ESE (1979) (DBCA, 2023b) 12.6 km N (2008) (DBCA, 2023b)	-	-	-	-	-	-	N/A	Lack of suitable habitat within the Study Area. Lack of contemporary records in the vicinity.

Common Name (Scientific Name)	Conservation Status			Preferred Broad Habitats	Within Current Known Distribution	Nearest Record/s to the Study Area	Potential Critical Habitat within the Study Area					Likelihood of Occurrence	Occurrence	Comments
	EPBC Act	BC Act	DBCA				Sandy Plain	Claypan	Drainage Area / Floodplain	Major Drainage	Hardpan Plain			
Broad-billed sandpiper (<i>Calidris falcinellus</i>)	MI	MI	DBCA	Migrant from Siberian bogs, staging on shores of Yellow Sea. Gregarious and mainly coastal in Australia (Menkhurst et al., 2017). Tidal mudflats, reefs, saltmarsh, freshwater wetlands, sewerage ponds (Pizzey & Knight, 2007).	No	14.9 km NNE (2013) (DBCA, 2023b)	-	-	-	-	-	-	N/A	Lack of suitable habitat within the Study Area, which is not within the species current distribution.
Curlew sandpiper (<i>Calidris ferruginea</i>)	CR / MI	CR / MI		Inhabits intertidal mudflats in sheltered coastal areas (i.e. estuaries, bays, inlets and lagoons) (Geering et al., 2007). This rare species generally roosts on bare dry shingle, shell or sand beaches, sandspits and islets in or around coastal or near-coastal lagoons and other wetlands (Geering et al., 2007).	Yes	2.3 km NE (2007) (DBCA, 2023b)	-	-	-	-	-	-	N/A	Lack of suitable habitat within the Study Area.
Pectoral sandpiper (<i>Calidris melanotos</i>)	MI	MI		Coastal lagoons, estuaries, bays, swamps, lakes, inundated grasslands, saltmarshes, river pools, creeks, floodplains and artificial wetlands (Johnstone et al., 2013). It prefers wetlands with open fringing mudflats and low, emergent or fringing vegetation (Geering et al., 2007).	Yes	10.3 km NE (2014) (DBCA, 2023b)	-	-	-	-	-	-	N/A	Lack of suitable habitat within the Study Area.
Ruff (<i>Calidris pugnax</i>)	MI	MI		Mainly fresh, brackish and saline wetlands with exposed mudflats. Found near lakes, swamps, pools, lagoons, tidal rivers and floodplains. Sometimes observed in sheltered coastal areas, including harbours and estuaries (DoEE, 2019).	No	0.5 km ESE (1979) (DBCA, 2023b)	-	-	-	-	-	-	N/A	Lack of suitable habitat within the Study Area, which is not within the species current distribution.
Red-necked stint (<i>Calidris ruficollis</i>)	MI	MI		Lives in permanent or ephemeral wetlands of varying salinity and also regularly at sewage farms and saltworks. They are recorded less often at reservoirs, waterholes, soaks, bore-drain swamps and flooded inland lakes. In Western Australia, they prefer freshwater to marine environments. The species usually forages in shallow water at the edge of wetlands and roost or loaf on tidal mudflats, near low saltmarsh and around inland swamps (Johnstone & Storr, 1998).	No	0.5 km ESE (1979) (DBCA, 2023b) 2.2 km NE (2004) (DBCA, 2023b)	-	-	-	-	-	-	N/A	Lack of suitable habitat within the Study Area, which is not within the species current distribution.

Common Name (Scientific Name)	Conservation Status			Preferred Broad Habitats	Within Current Known Distribution	Nearest Record/s to the Study Area	Potential Critical Habitat within the Study Area					Likelihood of Occurrence	Occurrence	Comments
	EPBC Act	BC Act	DBCA				Sandy Plain	Claypan	Drainage Area / Floodplain	Major Drainage	Hardpan Plain			
Long-toed stint (<i>Calidris subminuta</i>)	MI	MI	MI	They prefer shallow freshwater or brackish wetlands but are also found of muddy shorelines, growths of short grasses, weeds, sedges, low or floating aquatic vegetation, reeds, rushes and occasionally stunted samphire. The Long-toed Stint also frequents permanent wetlands and forages on wet mud or in shallow water, often among short grass, weeds and other vegetation on islets or around the edges of wetlands. They roost or loaf in sparse vegetation at the edges of wetlands and on damp mud near shallow water. It also roosts in small depressions in the mud (Johnstone & Storr, 1998).	No	0.5 km ESE (1979) (DBCA, 2023b) 2.3 km NE (2007) (DBCA, 2023b)	-	-	-	-	-	Unlikely	N/A	Lack of suitable habitat within the Study Area, which is not within the species current distribution.
Great knot (<i>Calidris tenuirostris</i>)	CR/ MI	CR /MI	CR	Breeds in the subarctic on montane tundra. Non-breeding birds migrate to harbours, bays, inlets, estuaries and lagoons with large intertidal sand and mud flats (Garnett <i>et al.</i> , 2011).	No	0.5 km ESE (1979) (DBCA, 2023b) 12.1 km N (2014) (DBCA, 2023b)	-	-	-	-	-	Highly Unlikely	N/A	Lack of suitable habitat within the Study Area, which is not within the species current distribution.
Swinhoe's snipe (<i>Callinago megalala</i>)	MI	MI	MI	Migrant to grassy margins of freshwater wetlands, also uses constructed wetlands. Has been recorded on sandy flats of rivers and creeks under rainforest canopy (Menkhorst <i>et al.</i> , 2017).	No	0.4 km SE (1976) (ALA, 2023)	-	-	-	-	-	Highly Unlikely	N/A	Lack of suitable habitat within the Study Area, which is not within the species current distribution.
Pin-tailed snipe (<i>Callinago stenura</i>)	MI	MI	MI	Boggy edges of vegetated wetlands, sewage and other ponds, stubbles, grasslands with shrubs and pastures (Pizzey & Knight, 2007). Migrant to wetlands on coastal plains, however status poorly understood (Menkhorst <i>et al.</i> , 2017).	No	7.7 km NNE (2014) (DBCA, 2023b)	-	-	-	-	-	Highly Unlikely	N/A	Lack of suitable habitat within the Study Area, which is not within the species current distribution.
Asian dowitcher (<i>Limnodromus semipalmatus</i>)	MI	MI	MI	Breeds in isolated colonies in central and east Siberia, migrates to non-breeding grounds in south-east Asia, with stronghold in the north Sumatra coast in WA, especially Roebuck Bay (Menkhorst <i>et al.</i> , 2017).	Yes	13.2 km NNE (1994) (DBCA, 2023b)	-	-	-	-	-	Highly Unlikely	N/A	Lack of suitable habitat within the Study Area. Lack of contemporary records in the vicinity.

Common Name (Scientific Name)	Conservation Status			Preferred Broad Habitats	Within Current Known Distribution	Nearest Record/s to the Study Area	Potential Critical Habitat within the Study Area					Likelihood of Occurrence	Occurrence	Comments
	EPBC Act	BC Act	DBCA				Sandy Plain	Claypan	Drainage Area / Floodplain	Major Drainage	Hardpan Plain			
Bar-tailed godwit (<i>Limosa lapponica</i>)	MI	MI	MI	Muddy/ sandy estuaries, sheltered coastal bays, inland on shallow lakes, sewage farms. Widespread; locally common on coast (Flegg, 2002).	Yes	0.5 km ESE (1977) (DBCA, 2023b) 12.1 km N (2014) (DBCA, 2023b)	-	-	-	-	-	-	N/A	Lack of suitable habitat within the Study Area. Lack of contemporary records in the vicinity.
Black-tailed godwit (<i>Limosa limosa</i>)	MI	MI	MI	Found mainly in coastal habitats like estuaries, tidal mudflats, shallow river margins, sewage ponds, brackish or saline inland lakes, airfields and flooded pastures (Pizzey & Knight, 2007).	No	16.2 km NE (2005) (DBCA, 2023b)	-	-	-	-	-	-	N/A	Lack of suitable habitat within the Study Area, which is not within the species current distribution.
Bar-tailed godwit (northern Siberian) (<i>Limosa lapponica menzibieri</i>)	CR	CR	CR	Found on muddy coastlines, estuaries, inlets, mangrove-fringed lagoons and sheltered bays (Garnett et al., 2011).	Yes	16.2 km NE (2011) (DBCA, 2023b)	-	-	-	-	-	-	N/A	Lack of suitable habitat within the Study Area. Lack of contemporary records in the vicinity.
Eastern curlew (<i>Numenius madagascariensis</i>)	CR / MI	MI	MI	Mainly tidal mudflats, also reef flats, sandy beaches and rarely near-coastal lakes including saltwork ponds (Johnstone & Storr, 1998).	Yes	0.5 km ESE (1977) (DBCA, 2023b) 12.1 km N (2014) (DBCA, 2023b)	-	-	-	-	-	-	N/A	Lack of suitable habitat within the Study Area. Lack of contemporary records in the vicinity.
Little curlew (<i>Numenius minutus</i>)	MI	MI	MI	Nests in east Siberian taiga clearings, late May to mid-July, on Migration, many stages on Coastal plains on west side of Yellow Sea. Occurs on north Australia and south New Guinea non breeding grounds from about mid-September to mid-April (Menkhorst et al., 2017).	No	0.5 km ESE (1979) (DBCA, 2023b) 2.3 km NE (2010) (DBCA, 2023b)	-	-	-	-	-	-	N/A	Lack of suitable habitat within the Study Area, which is not within the species current distribution.
Whimbrel (<i>Numenius phaeopus</i>)	MI	MI	MI	Often found on the intertidal mudflats of sheltered coasts. Can also be found in lagoons, harbours, estuaries and river deltas, frequently those with mangroves, but also in open, unvegetated mudflats (DAWE, 2020).	No	0.5 km ESE (1979) (DBCA, 2023b) 11.6 km N (2014) (DBCA, 2023b)	-	-	-	-	-	-	N/A	Lack of suitable habitat within the Study Area, which is not within the species current distribution.

Common Name (Scientific Name)	Conservation Status			Preferred Broad Habitats	Within Current Known Distribution	Nearest Record/s to the Study Area	Potential Critical Habitat within the Study Area					Likelihood of Occurrence	Occurrence	Comments
	EPBC Act	BC Act	DBCA				Sandy Plain	Claypan	Drainage Area / Floodplain	Major Drainage	Hardpan Plain			
Red-necked phalarope (<i>Phalaropus lobatus</i>)	MI	MI	MI	Infrequently comes to land, recordings mainly coastal, inland wetlands, brackish, saline or fresh pools and lagoons (Morcombe, 2004).	No	34.2 km E (1981) (DBCA, 2023b)	-	-	-	-	-	Highly Unlikely	N/A	Lack of suitable habitat within the Study Area, which is not within the species current distribution.
Grey-tailed tattler (<i>Tringa brevipes</i>)	MI	MI	P4	Found mainly in tidal mudflats, estuaries, shores and reefs of islands and coastal swamps and commercial salt fields (Pizzey & Knight, 2007).	No	0.5 km ESE (1979) (DBCA, 2023b) 11.6 km N (2014) (DBCA, 2023b)	-	-	-	-	-	Highly Unlikely	N/A	Lack of suitable habitat within the Study Area, which is not within the species current distribution.
Wood sandpiper (<i>Tringa glareola</i>)	MI	MI	MI	Species occurs as a non-breeding summer migrant which occurs throughout the region. Occurs mainly in river pools, sewage ponds, flooded claypans, freshwater lagoons and bore overflows (Johnstone et al., 2013). Freshwater wetlands and occasional brackish intertidal mudflats (Ceering et al., 2007).	No	0.5 km ESE (1979) (DBCA, 2023b) 2.4 km NE (2014) (DBCA, 2023b)	-	-	-	-	-	Unlikely	N/A	Lack of suitable habitat within the Study Area, which is not within the species current distribution.
Common greenshank (<i>Tringa nebularia</i>)	MI	MI	MI	Species occurs as a non-breeding summer migrant which occurs throughout the region. Occurs mainly in tidal mudflats, mangrove creeks, flooded samphire flats, beaches, river pools and saltwork and sewage ponds (Johnstone et al., 2013).	Yes	0.5 km WNW (1977) (DBCA, 2023b) 2.3 km NE (2010) (DBCA, 2023b)	-	-	-	-	-	Unlikely	N/A	Lack of suitable habitat within the Study Area. Lack of contemporary records in the vicinity.
Marsh sandpiper (<i>Tringa stagnatilis</i>)	MI	MI	MI	Lives in permanent or ephemeral wetlands of varying salinity and frequents sewage farms and saltworks. They are recorded less often at reservoirs, waterholes, soaks, bore-drain swamps and flooded inland lakes. In Western Australia they prefer freshwater to marine environments. The species usually forages in shallow water at the edge of wetlands and roost or loaf on tidal mudflats, near low saltmarsh, and around inland swamps (Johnstone & Storr, 1998).	No	6.6 km SW (2007) (DBCA, 2023b) 12.5 km NNE (2014) (DBCA, 2023b)	-	-	-	-	-	Highly Unlikely	N/A	Lack of suitable habitat within the Study Area, which is not within the species current distribution.

Common Name (Scientific Name)	Conservation Status			Preferred Broad Habitats	Within Current Known Distribution	Nearest Record/s to the Study Area	Potential Critical Habitat within the Study Area					Likelihood of Occurrence	Occurrence	Comments
	EPBC Act	BC Act	DBCA				Sandy Plain	Claypan	Drainage Area / Floodplain	Major Drainage	Hardpan Plain			
Common redshank (<i>Tringa totanus</i>)	MI	MI	MI	It is found at sheltered coastal wetlands with bare open flats and banks of mud or sand. They are also found around salt lakes, freshwater lagoons, artificial wetlands and saltworks and sewage farms. The species has been observed feeding in shallow water, on wet bare mud or sand, or on algal deposits and roosting on small elevated areas such as estuarine sandbars and muddy islets surrounded by water (Johnstone & Storr, 1998).	No	14.8 km NW (1995) (DBCA, 2023b)	-	-	-	-	-	Highly Unlikely	N/A	Lack of suitable habitat within the Study Area, which is not within the species current distribution.
Terek sandpiper (<i>Xenus cinereus</i>)	MI	MI	MI	Tidal mudflats, estuaries; shores and reefs of islands; coastal swamps, commercial saltfields (Pizzev & Knight, 2007).	No	0.5 km ESE (1979) (DBCA, 2023b) 11.6 km N (2014) (DBCA, 2023b)	-	-	-	-	-	Highly Unlikely	N/A	Lack of suitable habitat within the Study Area, which is not within the species current distribution.
THRESKIORNITHIDAE														
Glossy ibis (<i>Plegadis falcinellus</i>)	MI	MI	MI	Freshwater wetlands, irrigated areas, margins of dams, floodplains, brackish and saline wetlands, tidal mudflats, pastures, lawns and public gardens (Johnstone <i>et al.</i> , 2013).	Yes	6.1 km SW (2004) (DBCA, 2023b)	-	-	-	-	-	Unlikely	N/A	Lack of suitable habitat within the Study Area. Lack of contemporary records in the vicinity.
REPTILES														
PYTHONIDAE														
Pilbara olive python (<i>Liasis olivaceus barroni</i>)	VU	VU	VU	Associated with drainage systems, including areas with localised drainage and watercourses (Pearson, 1993). In inland Pilbara, the species is most often encountered near permanent waterholes in rocky ranges or among riverine vegetation (Pearson, 1993).	Yes	8.2 km ENE (2015) (DBCA, 2023b)	-	-	S	-	-	Possible	N/A	Lack of rocky habitat within the Study Area; however, may occur along drainage lines and river systems. Particularly where providing connectivity to other areas of critical habitat.

Common Name (Scientific Name)	Conservation Status			Preferred Broad Habitats	Within Current Known Distribution	Nearest Record/s to the Study Area	Potential Critical Habitat within the Study Area					Likelihood of Occurrence	Occurrence	Comments
	EPBC Act	BC Act	DBCA				Sandy Plain	Claypan	Drainage Area / Floodplain	Major Drainage	Hardpan Plain			
SCINCIDAE Airlie beach ctenotus (<i>Ctenotus angusticeps</i>)			P3	Observed on coastal mudflats vegetated with samphire, sometimes sheltering in crab holes on the intertidal zone (Wilson & Swan, 2021).	Yes	6.1 km NNW (2012) (DBCA, 2023b)	-	-	-	-	-	-	N/A	Lack of suitable habitat within the Study Area
Western spotted ctenotus (<i>Ctenotus uber johnstonei</i>)			P2	Within the Pilbara and Kimberly, the taxon is known from <i>Triodia</i> on hillslopes, <i>Acacia xiphophylla</i> over chenopods, and <i>Acacia xiphophylla</i> scattered tall shrubs to high open shrubland (Cogger, 2014).	No	959.1 km E (1980) (ALA, 2023)	-	-	-	-	-	-	Highly Unlikely	Lack of suitable habitat within the Study Area, which is not within the species current distribution. Taxonomic status of the Pilbara population unknown, may represent an undescribed taxon (P. Doughty, Western Australian Museum, pers. comm.).

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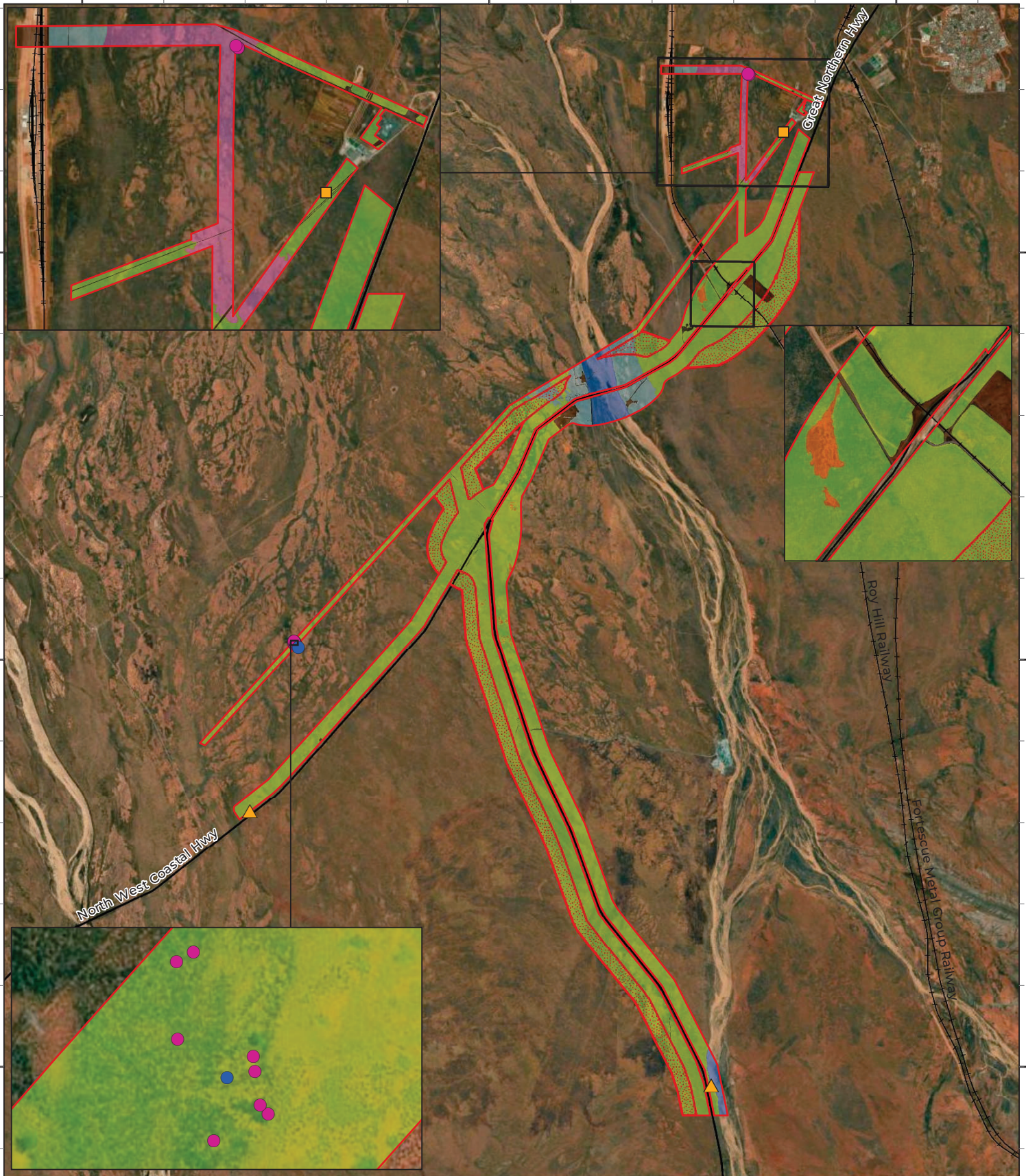
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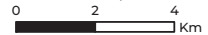


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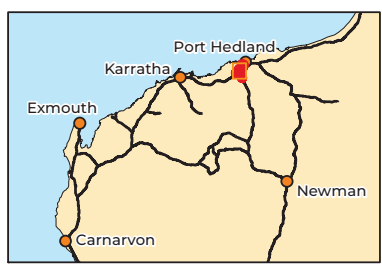
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|------------------------------|----------------------|------------------------------------|
| Study Area | Fauna Habitat | Significant Fauna |
| Extrapolated Desktop Mapping | Claypan | Bilby - VU |
| State Road | Disturbed | Digging |
| Rail | Drainage Area | Track |
| | Hardpan Plain | Grey falcon - VU |
| | Major Drainage | Individual (alive) |
| | Sand Plain | Pilbara leaf-nosed bat - VU |
| | | Individual (alive) |



Scale 1:135,000



Coordinate System: GDA2020 MGA Zone 50
Projection: Transverse Mercator
Datum: GDA2020
Created 13/06/2024



ALINTA ENERGY
Port Hedland Transmission Line Basic and Targeted Vertebrate Fauna Survey
Figure 4.2: Fauna habitat and species of significance recorded in the Study Area

4.2.4.1 EPBC Matters of National Environmental Significance

The sections below provide summaries on the following MNES species: northern quoll, bilby, ghost bat, Pilbara leaf-nosed bat, night parrot, grey falcon and Pilbara olive python.

4.2.4.1.1 Northern Quoll (*Dasyurus hallucatus*) – Endangered (EPBC Act and BC Act)

The northern quoll tends to inhabit rocky habitats which offer protection from predators and are generally more productive in terms of availability of resources (Braithwaite & Griffiths, 1994; DoE, 2016; Oakwood, 2000). Other microhabitat features important to the species include: rock cover; proximity to permanent water and time-since last fire (Woinarski *et al.*, 2008).

Although the Study Area falls within the current distribution of the northern quoll, whereby the species or species habitat may occur (DoE, 2016), the species was not recorded during the current survey. The species is considered to Possible to occur based on the presence of suitable supporting habitat and the occurrence of previous records in the vicinity of the Study Area. The nearest record of the species is located approximately 5.4 km east-north-east of the Study Area (DBCA, 2023b).

Within the Study Area, no critical habitat for the species occurs; however, supporting habitat (i.e. dispersal or foraging habitat, as defined by DoE (2016), occurs in Major Drainage habitat (3.96%; 362.57 ha). The extent of this habitat within the Study Area is limited; however, it forms part of larger continuations of the habitat beyond the extent of the Study Area, therefore, may potentially act as foraging and/or dispersal corridors where connectivity to other areas of critical habitat is provided.

Northern quoll records are high in the vicinity of the Study Area; however, the lack of critical denning habitat, limited extent of suitable supporting habitat, and the lack of records within the Study Area suggest that while the species is Possible to occur, it is likely limited to infrequent visitation by dispersing individuals.

4.2.4.1.2 Greater Bilby (*Macrotis lagotis*) – Vulnerable (EPBC Act and BC Act)

Extant populations of the greater bilby occur in a variety of habitats, usually on landforms with level to low slope topography and light to medium soils (Southgate, 1990). Throughout its distribution, it occupies three major vegetation types: open tussock grassland on uplands and hills, hummock grassland in plains and alluvial areas and occasionally mulga woodland/shrubland growing on ridges and rises (Southgate, 1990). Within the Pilbara region the species is sparsely distributed, and often associated with spinifex sandplain habitat (Dziminski & Carpenter, 2016).

From extensive targeted searches the species was recorded from a single track and nine diggings in the south-west (Route 1). of the Study Area. An additional two diggings were recorded in the north just outside of the Study Area (Route 2), however, as no other signs were recorded these cannot be confirmed. The species has previously been recorded inside the Study Area on one occasion, and is known from 48 records in the vicinity (40 km) of the Study Area (DBCA, 2023b).

Sand Plain (82.58%, 5,780.26 ha) habitat is considered supporting breeding (in the absence of active burrows) and foraging/ dispersal habitat for the species; and is extensive within with the Study Area. Although the species is known to utilise broad habitats occurring within the Study Area in other parts of its distribution (i.e. Major Drainage (3.96%; 362.57 ha) and Drainage Area (5.28%, 438.89 ha), these habitats are less often utilised by the species within the Pilbara region, likely due to the high amount of alluvial material making substrates less suitable for burrowing activity compared to sand-plain habitats (Cramer *et al.*, 2017). The likelihood of these habitats being utilised by the species may also increase when larger areas of suitable habitat (e.g. Sand Plain) are present adjacent to or in the vicinity. The species is confirmed within the Study Area; however, the minimal number of records recorded during the current survey suggest that the species occurs at a low abundance in the local area.

4.2.4.1.3 Ghost Bat (*Macroderma gigas*) – Vulnerable (EPBC Act and BC Act)

In the Pilbara region, the species roosts in deep, complex caves beneath bluffs of low rounded hills, often composed of Marra Mamba Iron Formation or banded iron formation, granite rock piles and abandoned mines (Armstrong & Anstee, 2000). They roost either individually or in colonies (Churchill, 2008) and move between a number of caves, both seasonally and as dictated by weather changes (van Dyck & Strahan, 2008). The species will often forage more broadly across habitats, often utilising drainage lines and other habitats where prey species are likely to be most abundant (Richards *et al.*, 2008; Tidemann *et al.*, 1985). Recent studies of ghost bat home range and foraging behaviour in the Pilbara region have identified Drainage Area, Gorge/ Gully, Major Drainage and Mulga Woodland as high suitability foraging habitats for the species, followed by Stony Plain as moderate suitability (Biologic, 2020). This suitability however, is variable depending on particular habitat characteristics, including the abundance of foraging structures (tree perches) and density of understorey vegetation present (Biologic, 2020).

No records or evidence of occurrence of ghost bat was recorded within the Study Area during the current survey; however, detectability, particularly of foraging individuals is difficult due to their foraging behaviour (i.e. infrequent and highly variable calling during foraging) and capabilities of ultrasonic recording devices (i.e. limited detection zones). The species is known from 132 records within 40 km of the Study Area, with the nearest previous record occurring 14.3 km east-north-east (DBCA, 2023b). No suitable roosting habitat was recorded within 12km of the Study Area (from aerial imagery), and it is therefore not known if the Study Area may provide supporting foraging habitat. As such, the species is considered Highly Unlikely to occur within the Study Area.

4.2.4.1.4 Pilbara Leaf-nosed Bat (*Rhinonictoris aurantia*) – Vulnerable (EPBC Act and BC Act)

This species' limited ability to conserve heat and water means it requires warm (28–32 °C) and very humid (85–100) roost sites in caves (Armstrong, 2001; Churchill, 1991) and/or mine shafts as these enable the individuals to persist in arid climates by limiting water loss and energy expenditure (van Dyck & Strahan, 2008). Such caves are relatively uncommon in the Pilbara (Armstrong, 2001), which limits the availability of diurnal roosts for this species. Pilbara leaf-nosed bats roost in undisturbed caves, deep fissures or abandoned mine shafts. The species forages within and in the vicinity of roost caves and more broadly along waterbodies with suitable fringing vegetation supporting prey species (TSSC, 2016b). Pilbara Leaf-nosed bats are predicted to travel up to 20 km from roost caves during nightly foraging (Cramer *et al.*, 2016); however, seasonal variation is known to occur, with foraging occurring up to 20 km in the dry season and up to 50 km during the wet season (Bat Call, 2021b). Long-distance movements by the species have also been recorded, with a single monitored individual recorded from two roost caves located 170 km distant approximately 12 months apart (Bullen & Reiffer, 2019), suggesting the species may forage and/or disperse over greater distances than previously thought.

Pilbara leaf-nosed bat was recorded on three occasions during the current survey, from a total of 16 ultrasonic calls within Sand Plain (Route 1b – southern end of Study Area) and Major Drainage habitat (Route 3 – southern end of the Study Area) (Table 4.6; Figure 4.2). Call times for the species were consistent with foraging, with the earliest call recorded at 2045 hours and the latest call at 0156 hours (Table 4.6). Based on the timing of the calls and lack of roosting habitat, the individual is likely originating from outside the Study Area (i.e. where it may be roosting). The species is known from 95 previous records in the vicinity (40 km) of the Study Area (DBCA, 2023b).

Although no roosting habitat occurs within the Study Area, Major Drainage (3.96%; 362.57 ha), Sand Plain (85.88%, 7,867.53 ha) and Drainage Area (5.28%, 438.89 ha) habitat provide supporting foraging and dispersal habitat for the species and contained one water feature within the Major Drainage Line, likely to also provide supporting foraging habitat for the Pilbara leaf-nosed bat (Table 4.5). The proximity to the nearest known roost is not known, but it is likely to be 20-30 km from the Study Area based on previous records (e.g. Poondano) in the area (DBCA, 2023b).

While the species is confirmed within the Study Area, due to the lack of critical roosting habitat, it is likely to be used for foraging and dispersal supporting habitat.

4.2.4.1.5 Pilbara Olive Python (*Liasis olivaceus barroni*) – Vulnerable (EPBC Act and BC Act)

The Pilbara olive python is moderately common throughout the rocky ranges of the Pilbara region and the Mt Augustus area in the Gascoyne region. The species is regularly encountered in the vicinity of rocky habitats (i.e. Gorge/ Gully and Breakaway/ Cliff habitats) and drainage systems (i.e. Major Drainage), particularly areas with permanent and/or semi-permanent water features (DSEWPaC, 2011b; Pearson, 1993). In the inland Pilbara, the species is most often encountered near permanent waterholes in rocky ranges or among riverine vegetation (Pearson, 1993). Pilbara olive python are primarily nocturnal and tend to shelter in small caves or under vegetation during the day, although it is occasionally active during the day during warmer summer months (Pearson, 1993).

No Pilbara olive python or evidence of occurrence of the species was recorded within the Study Area during the current survey. The species has only been recorded on two occasions previously in the vicinity (within 40 km) of the Study Area, with the closest record 8.2 km north-east of the Study Area (DBCA, 2023b). Within the Study Area, Major Drainage (3.96%; 362.57 ha) provides supporting habitat for dispersal and foraging for the species. Major Drainage habitat may facilitate connectivity between critical habitats outside the Study Area.

A single water features is known to occur within the Study Area, located in Major Drainage habitat (Table 4.5; Appendix D). For Pilbara olive pythons in particular, water features can often act as critical foraging locations and for that reason the species is often associated with such features, particularly within rocky habitats, but also, to a lesser degree, within Major Drainage habitat where suitable vegetation cover is present. As little to no evidence of the Pilbara olive python was found within the Study Area during the current or previous surveys, the species is considered Possible to occur.

4.2.4.1.6 Grey Falcon (*Falco hypoleucos*) – Vulnerable (EPBC Act and BC Act)

The Pilbara is thought to potentially be a stronghold of the grey falcon (Sutton, 2010). Grey falcons do not appear to be associated with particular vegetation types (Schoenjahn *et al.*, 2019); they often sit motionless in the canopies of trees or dead branches of eucalypts (Falkenberg, 2010). The grey falcon tends to prefer sparsely-treed, open plains and creek lines for hunting (Olsen & Olsen, 1986). Breeding habitat for this species has been observed to be riparian habitat as well as other productive ‘oases’ within an arid environment, though not necessarily immediately adjacent to waterholes (Sutton, 2010). Nesting often occurs in the abandoned nest of a raptor or corvid in trees or tall infrastructure such as power line towers or communications towers (Olsen & Olsen, 1986; Schoenjahn *et al.*, 2019).

The species was recorded from a single individual perched on a powerline in the north of the Study Area (Route 2) during the current survey. Furthermore, the desktop assessment returned 11 records of grey falcon both within the Study Area (DBCA, 2023b). The frequency of occurrence of the species within the Study Area is likely to be dependent on the proximity of nesting within or in the vicinity of the Study Area. Nesting may occur within the Study Area where suitable tall infrastructure (i.e. powerline or transmission towers) occurs or along Major Drainage Line habitat where suitable tall trees are present.

The Study Area provides critical breeding and foraging habitat for the species, in the form of the Major Drainage (3.96%; 362.57 ha) and supporting habitat in the form of Drainage Area (5.28%, 438.89 ha) habitat. The species is known to utilise powerlines, such as those found in the west of the Study Area for nesting or perching. The species is confirmed within the Study Area, and is likely to be if not permanent, a frequent visitor.

4.2.4.1.7 Night Parrot (*Pezoporus occidentalis*) – Endangered (EPBC Act and BC Act)

The ecology and habitat preferences of the night parrot within the Pilbara region are poorly known. Based on accepted records, the habitat of the species comprises long-unburnt mature *Triodia* grasslands in stony or sandy environments (McGilp, 1931; North, 1898; Whitlock, 1924; Wilson, 1937), and of samphire and chenopod shrublands, including genera such as *Atriplex*, *Bassia* and *Maireana*, on floodplains and claypans, and on the margins of salt lakes, creeks or other sources of water (McGilp, 1931; Wilson, 1937). The current interim guidelines for preliminary surveys of night parrot in Western Australia (DPaW, 2017) suggest this species requires old-growth (often more than 50 years unburnt) spinifex (*Triodia*) for roosting and nesting. Although little is known about foraging sites, habitats that comprise various grasses and herbs are thought to be suitable.

Records of the night parrot within the Pilbara region are scarce, with the nearest contemporary record of the species located approximately 203 km east-south-east of the Study Area (ALA, 2023). No evidence of occurrence of night parrot was recorded within the Study Area during the current survey, including from targeted acoustic recorders deployed in areas of habitat considered possibly suitable for the species. Habitat within the Study Area was considered suboptimal for the species, particularly due to most areas of *Triodia* grasslands lacking large, long-unburnt hummocks and the absence of any chenopod shrubland habitat within the Study Area. Although little is known about the species' habitat preferences and occurrence, particularly within the Pilbara region, the extent of which these habitats may still provide habitat for the species is unknown. However, based on the absence of any habitat considered to be of significance to the species, it is considered Unlikely to occur within the Study Area either as a resident or infrequent visitor during foraging and/ or dispersal.

4.2.4.2 Species Confirmed within the Study Area

Other than the bilby, Pilbara leaf-nosed bat and grey falcon (as discussed above in section 4.2.4.1), five significant species have been confirmed within the Study Area during previous surveys.

4.2.4.2.1 Brush-tailed Mulgara (*Dasymercus blythi*) – Priority 4 (DBCA)

The brush-tailed mulgara is often recorded from a range of sandy and stony plain habitats (Pavey *et al.*, 2012). The species was previously recorded in 2012 within the Study Area (DBCA, 2023b). No evidence of the species was recorded during the current survey; however, the species is considered confirmed to occur as a resident in Sand Plain (85.88%, 7,867.53 ha), Major Drainage (3.96%; 362.57 ha) and Drainage Area (5.28%, 438.89 ha) habitats where suitable vegetation cover and sandy or loamy substrates permitting burrowing are present.

4.2.4.2.2 Oriental Pratincole (*Glareola maldivarum*) – Migratory (EPBC Act and BC Act)

The gull-billed tern inhabits semi-arid open plains and spends winter on the coast in northern Australia (Simpson *et al.*, 2010). The species was previously recorded within Study Area in 2007 (DBCA, 2023b); however, no evidence of the species was recorded during the current survey. The previous record was likely an individual flying over from suitable habitat outside the Study Area and is generally considered unlikely to rely on habitats in the Study Area.

4.2.4.2.3 Gull-billed Tern (*Gelochelidon nilotica*) – Migratory (EPBC Act and BC Act)

The gull-billed tern inhabits freshwater swamps, brackish and salt lakes, beaches and estuarine mudflats, floodwaters, sewage farms, irrigated croplands and grasslands (Johnstone & Storr, 1998). In the interior, they are often associated with inundated salt lakes and claypans and watercourses (Johnstone & Storr, 1998). Colonially breeds and nests on islets in partially filled saltlakes or saltmarshes in mid-western interior (Johnstone & Storr, 1998). The species was previously recorded within the Study Area in 2004 (DBCA, 2023b); however, no evidence of the species was recorded during the current survey. The previous record was likely an individual flying over from suitable habitat outside the Study Area and is generally considered unlikely to rely on habitats in the Study Area.

4.2.4.2.4 Caspian Tern (*Hydroprogne caspia*) – Migratory (EPBC Act and BC Act)

The Caspian tern inhabits mainly sheltered seas, estuaries and tidal creeks; occasionally near-coastal salt lakes (including saltwork ponds) and brackish pools in lower courses of rivers; rarely fresh water (Johnstone & Storr, 1998). The species was previously recorded within the Study Area in 2011 (DBCA, 2023b); however, no evidence of the species was recorded during the current survey. The previous record was likely an individual flying over from suitable habitat outside the Study Area and is generally considered unlikely to rely on habitats in the Study Area.

4.2.4.2.5 Common Sandpiper (*Actitis hypoleucos*) – Migratory (EPBC Act and BC Act)

The common sandpiper inhabits estuaries and deltas of streams, as well as banks farther upstream; around lakes, pools, billabongs, reservoirs, dams and claypans (Geering *et al.*, 2007; Johnstone & Storr, 1998). The species was previously recorded within the Study Area in 2004 (DBCA, 2023b); however, no evidence of the species was recorded during the current survey. The previous record was likely an individual flying over from suitable habitat outside the Study Area and is generally considered unlikely to rely on habitats in the Study Area.

4.2.4.3 Species Highly Likely to Occur

Within the Study Area, no species were considered Highly Likely to occur.

4.2.4.4 Species Likely to Occur

Within the Study Area, one species (peregrine falcon) was considered Likely to occur.

4.2.4.4.1 Peregrine Falcon (*Falco peregrinus*) – Specially Protected (BC Act)

In arid areas of its distribution, the peregrine falcon is often recorded along cliffs above rivers, ranges and wooded watercourses where it hunts birds (Johnstone & Storr, 1998). It typically nests on rocky ledges occurring on tall, vertical cliff faces between 25 m and 50 m high (Olsen & Olsen, 1989). It also appears to prefer nesting on large ledges a reasonable distance (average of 13 m) from the top of the cliff (Olsen & Olsen, 1989), possibly to avoid ground dwelling predators. Nesting may also occasionally occur in tall trees along drainage lines, including use of abandoned nests of other large bird species (Olsen & Olsen, 1989).

No peregrine falcon or evidence of the species' occurrence (i.e. nests sites) were recorded within the Study Area during the current survey. The species has previously been recorded approximately 0.3 km west-north-west of the Study Area in 2012 (DBCA, 2023b), and is considered Likely to occur within the Study Area to forage within all fauna habitats. Due to the species broad foraging range and the widespread occurrence of these habitats in the broader vicinity of the Study Area, foraging is likely to occur over a much broader area and not confined to the Study Area. The frequency of occurrence of the species within the Study Area is likely to be dependent on the proximity of nesting within or in the vicinity of the Study Area. Suitable nesting habitat may occur within Major Drainage (3.96%; 362.57 ha) with supporting habitat occurring within Drainage Area (5.28%, 438.89 ha) habitat.

4.2.4.5 Species Possible to Occur

Other than the northern quoll and Pilbara olive python (as discussed above in section 4.2.4.1), four significant species were deemed Possible to occur within the Study Area.

4.2.4.5.1 Fork-tailed Swift (*Apus pacificus*) – Migratory (EPBC Act and BC Act)

The fork-tailed swift is a wide ranging but sparsely distributed species that occurs in a wide range of dry and/or open habitats (Johnstone & Storr, 1998). The species does not breed in Australia, migrating from breeding grounds in the northern Hemisphere. During its occurrence in Australia, the species is almost exclusively aerial, feeding and possibly also roosting aurally (DoE, 2018).

The nearest recent record (2006) is located approximately 8 km east-south-east of the Study Area (DBCA, 2023b). The fork-tailed swift was not recorded during the current survey. However, the species is considered Possible to occur as an infrequent visitor. The fork-tailed swift may forage in the airspace above all habitats occurring within the Study Area; however, landing or nesting within the Study Area unlikely.

4.2.4.5.2 Short-tailed Mouse (*Leggadina lakedownensis*) – Priority 4 (DBCA)

The short-tailed mouse occurs across northern Australia, from Cape York to the Pilbara, with one population on Thevenard Island (Western Australia). It is a nocturnal species found in areas of open tussock and hummock grassland, acacia shrubland, and savanna woodland, on alluvial clay or sandy soils (Lee, 1995; Moro & Kutt, 2008).

No evidence of the short-tailed mouse was recorded during the current survey; and is known from a historical record located approximately 80 km east-northeast of the Study Area (Figure 4.1; Table 4.7). Like many rodent species, short-tailed mouse populations can be subject to boom-bust or eruptive population dynamics, particularly following fire and rainfall events when resources are less or more abundant (Bennison *et al.*, 2018; van Dyck & Strahan, 2008). Suitable habitat likely to support the species occurs within Major Drainage (3.96%; 362.57 ha), Drainage Area (5.28%, 438.89 ha) and Claypan (0.35%; 32.13 ha) habitats of the Study Area. The species is considered Possible to occur as a resident, with abundance likely to fluctuate, particularly following rainfall events when resources are most abundant.

4.2.4.5.3 Letter-winged kite (*Elanus scriptus*) – Priority 4 (DBCA)

The letter-winged kite inhabits grasslands with trees and tree-lined watercourses (Pizzey & Knight, 2007). Infrequently recorded in the Pilbara and Kimberley regions. Irruptive species, often expanding and contracting in distribution in response to seasonal rainfall and resource availability (Pizzey & Knight, 2007).

No evidence of the letter-winged kite was recorded during the current survey and is known from an undated record 0.5 km north-west (ALA, 2023). The species is considered Possible to occur as an irregular visitor for foraging or dispersal within the Study Area, utilising Major Drainage (3.96%; 362.57 ha) and Drainage Area habitats (5.28%, 438.89 ha).

4.2.4.5.4 Spectacled hare-wallaby (*Lagorchestes conspicillatus leichardti*) – Priority 4 (DBCA)

The spectacled hare-wallaby is found across northern Australia. The species inhabits spinifex hummock grasslands and Acacia shrublands (van Dyck & Strahan, 2008; Woinarski *et al.*, 2014).

No evidence of the spectacled hare-wallaby was recorded during the current survey. The species is known in the area from a recent (2019) record, located 25.6 km south-east of the Study Area. The species has declined drastically in the Pilbara and Great Sandy Desert and is considered a rare species; however, due to the presence of potential critical Sand Plain habitat (85.88%, 7,867.53 ha) in the Study Area, the species is considered Possible to occur.

4.3 Constraints and Limitations

The EPA (2020b) outlines several potential limitations to fauna surveys. These aspects are assessed and discussed in Table 4.8 below.

Table 4.8 Survey limitations and constraints

Potential limitation or constraint	Constraint	Applicability to this survey
Availability of data and information	No	A significant amount of survey work has been undertaken in the wider local area and the surrounding region, and most of these previous survey results were available for review at the time of reporting.
Competency/experience of the survey team, including experience in the bioregion surveyed	No	The field personnel involved in the survey are experienced in undertaking fauna surveys of similar nature, including with the significant species targeted during the survey. Technical personnel with relevant expertise assisted with analysis of ultrasonic recordings (Bob Bullen) and acoustic recordings (Nick Leseberg).
Scope of the survey, e.g. where faunal groups were excluded from the survey	No	The scope was a basic and targeted level vertebrate fauna survey which was conducted within the EPA (2020b) framework.
Timing, weather, and season	No	Below average rainfall was recorded in the 11 months prior to the survey, potentially reducing the abundance and activity levels of some vertebrate groups during sampling. However, prior to the survey (in January 2023), rainfall was above the long-term average. Temperatures recorded were similar or slightly higher than the long-term averages. However, these temperatures are unlikely to have impacted upon the detectability of fauna.
Disturbance that may have affected results, e.g. fire, flood	No	No temporary disturbance impinged on the results of this assessment.
Proportion of fauna identified, recorded or collected	No	All vertebrate fauna observed during the field surveys were identified to species level. Species identification of fauna recorded via camera traps and ultrasonic recordings were able to be accurately identified with the assistance of technical personnel with relevant expertise.
Adequacy of the survey intensity and proportion of the survey achieved, e.g. the extent to which the area was surveyed	No	A basic survey was undertaken across the Study Area to assist with decisions on future environmental approvals. The sampling methods and survey intensity was appropriate to achieve the scope of the survey. The intent of the basic level survey was to collect preliminary and baseline information on site. Part of the Study Area was assessed only from desktop assessment (Route 6) based on extrapolation of habitat mapping. Despite no on-ground verification of habitat mapping being undertaken, it is unlikely to have influenced the results of the assessment of significant species occurrence within the Study Area.

Potential limitation or constraint	Constraint	Applicability to this survey
Access problems	Partial	<p>The Study Area was largely accessible either by vehicle or on foot, thus the sampling techniques used during this survey were unconstrained by accessibility or remoteness.</p> <p>There were difficulties accessing sections of the Mundabullangana Station during the later portion of the survey (to deploy and retrieve equipment in the area); however, this is unlikely to affect sampling or overall assessment of significant species likelihood of occurrence.</p>
Problems with data and analysis, including sampling bias	No	No limitations with data collection and/or analysis were encountered during the field survey or during subsequent analysis.

5 Conclusion

Five broad fauna habitat types were recorded and mapped within the Study Area, comprising, in decreasing order of extent, Sand Plain (85.88%; 7,867.53 ha), Drainage Area (5.28%; 483.89 ha), Major Drainage (3.96%; 362.57 ha), Hardpan Plain (2.05%; 187.59 ha), and Claypan (0.35%; 32.13 ha). The remaining 2.48% (227.07 ha) of the Study Area was mapped as Disturbed. All five fauna habitats mapped are broadly distributed and well represented across Pilbara bioregions, and therefore support fauna assemblages which are generally common and widespread. A single water feature, which are often of greater importance to some significant species, was recorded within the Study Area.

Of the five fauna habitats mapped within the Study Area, Major Drainage Line habitat is likely to provides critical breeding, foraging and dispersal for grey falcon, as well as supporting foraging and dispersal habitat for bilby, northern quoll, Pilbara leaf-nosed bat and Pilbara olive python. Sand Plain provides supporting breeding, foraging and dispersal for bilby in the absence of active burrows, as well as supporting foraging and dispersal habitat for Pilbara leaf-nosed bat. Drainage Area also provides supporting foraging and dispersal habitat for bilby, Pilbara leaf-nosed bat and grey falcon. All five habitats recorded within the Study Area are also considered important habitats for other significant species identified in the desktop assessment, including peregrine falcon, brush-tailed mulgara, spectacled hare-wallaby, short-tailed mouse, letter-winged kite, and fork-tailed swift.

The desktop assessment identified a total of 436 vertebrate fauna species as potentially occurring within the Study Area, comprising 51 mammals (including 39 native and 12 non-native), 246 birds, 127 reptiles and 12 amphibians. A total of 88 vertebrate fauna species, comprising 11 mammals (two introduced and nine native), 58 bird species and 19 reptiles were recorded during the field survey.

Of the 68 significant species identified in the desktop assessment, three were Confirmed to occur within the Study Area during the current survey, comprising:

- Bilby – from a single track and nine associated diggings in the south-west of the Study Area (Route 1 Horizon TXL) in Sand Plain habitat. An additional two diggings were recorded in the north just outside of the Study Area; however, as no other signs were recorded these cannot be confirmed.
- Pilbara leaf-nosed bat –recorded on three occasions from a total of 16 ultrasonic calls in Sand Plain habitat (Route 1b Deviation from Horizon TXL – southern end of Study Area and Route 3 South of GNH – southern end of the Study Area).
- Grey falcon – was recorded from a single individuals perched on a powerline in Sand Plain habitat in the north of the Study Area (Route 2 SIA Infrastructure Corridor).

An additional five species comprising of brush-tailed mulgara, oriental pratincole, common sandpiper, Caspian tern and gull-billed tern were Confirmed in the Study Area from previous records. The peregrine falcon was deemed Likely to occur and a further six species, northern quoll, Pilbara olive python, fork-tailed swift, short-tailed mouse, letter-winged kite and spectacled hare-wallaby, were deemed Possible to occur. The remaining 53 species were considered Unlikely or Highly Unlikely to occur within the Study Area, based on distance of previous records to the Study Area, the absence of suitable permanent or seasonal habitats and/or specific micro-habitats occurring within the Study Area.

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Appendix A: Conservation Listings

Environment Protection and Biodiversity Conservation Act 1999

Category	Definition
Threatened	
Extinct (EX)	Presumed extinct i.e. there is no reasonable doubt that the last member of the species has died.
Extinct in the Wild (EW)	Presumed extinct in the wild, only surviving in cultivation, captivity or as a naturalised population well outside its past range.
Critically Endangered (CE)	Taxa facing an extremely high risk of extinction in the wild in the immediate future (i.e. 50% chance of extinction in the immediate future).
Endangered (EN)	Taxa facing a very high risk of extinction in the wild in the near future i.e. 20% chance of extinction in the near future.
Vulnerable (VU)	Taxa facing a high risk of extinction in the wild in the medium-term future i.e. 10% chance of extinction in the medium-term future.
Conservation Dependent (CD)	Taxa which will become Vulnerable, Endangered or Critically Endangered if specific conservation efforts cease.
Other	
Migratory (MI)	Birds listed under international agreements relating to the protection of migratory birds i.e. Convention on the Conservation of Migratory Species of Wild Animals (Bonn Convention), China-Australia Migratory Bird Agreement (CAMBA), Japan-Australia Migratory Bird Agreement (JAMBA) or Republic of Korea-Australia Migratory Bird Agreement (ROKAMBA).

Biodiversity Conservation Act 2016

Category	Definition
Extinct	
Extinct (EX)	Presumed extinct i.e. there is no reasonable doubt that the last member of the species has died.
Extinct in the Wild (EW)	Presumed extinct in the wild i.e. species which have been adequately searched for and there is no reasonable doubt that the last wild individual has died.
Threatened	
Critically Endangered (CE)	Taxa facing an extremely high risk of extinction in the wild.
Endangered (EN)	Taxa facing a very high risk of extinction in the wild.
Vulnerable (VU)	Taxa facing a high risk of extinction in the wild.
Specially Protected	
Migratory (MI)	Birds listed under international agreements relating to the protection of migratory birds i.e. Convention on the Conservation of Migratory Species of Wild Animals (Bonn Convention), China-Australia Migratory Bird Agreement (CAMBA), Japan-Australia Migratory Bird Agreement (JAMBA) or Republic of Korea-Australia Migratory Bird Agreement (ROKAMBA).
Conservation Dependent (CD)	Species dependent on ongoing conservation intervention to prevent them becoming eligible for listing as threatened.
Other specially protected fauna (OS)	Species otherwise in need of special protection to ensure their conservation.

Department of Biodiversity, Conservation and Attractions Priority codes

Category	Definition
Poorly known	
Priority 1 (P1)	Species that are known from one or a few locations which are potentially at risk. Species whose occurrences are either small, on lands not managed for conservation or otherwise threatened with habitat destruction or degradation. Species that are well known from one or more locations but are under immediate threat from threatening processes. In urgent need of further survey.
Priority 2 (P2)	Species that are known from one or a few locations, some of which are on lands managed for conservation. Species that are well known from one or more locations but are under threat from threatening processes. In urgent need of further survey. In need of further survey.
Priority 3 (P3)	Species that are well known from several locations and are not under imminent threat. Species known from few but widespread locations with either a large population size or with large areas of suitable habitat remaining, much of which is not under imminent threat. Species that are well known from one or more locations and threatening processes exist that could affect them.

Rare, Near Threatened and other species in need of monitoring

Priority 4 (P4)

Rare – Species that are considered to have been adequately surveyed, or for which sufficient knowledge is available, and which are considered not currently threatened or in need of special protection but could be if present circumstances change.

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.

In need of monitoring - Species that have been removed from the list of threatened species during the past five years for reasons other than taxonomy

Appendix B: Vertebrate Fauna Recorded in the Desktop Assessment and Field Survey

Scientific Name	Common Name	Conservation Status				Database Search						Literature Review																			
		EPBC Act	BC Act	DBCA	IUCN	DBCA (2022)	DAWE (2022)	DBCA (2023b)	ALA (2023)	BirdLife Australia (2023)	DBCA (2023a)	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	Current Survey		
BOVIDAE																															
<i>Bos primigenius</i>	*European cattle									X											X								X		
<i>Capra aegagrus</i>	*Goat									X											X								X		
CAMELIDAE																															
<i>Camelus dromedarius</i>	*Camel									X																		X			
CANIDAE																															
<i>Canis familiaris</i>	*Dog									X											X							X	X		
<i>Vulpes vulpes</i>	*Red fox									X											X							X	X		
DASYURIDAE																															
<i>Antechinus laniger</i>	Kultarr									X																					
<i>Antechinus longicaudatus</i>	Long-tailed dunnart			P4						X																					
<i>Dasyurus blythi</i>	Brush-tailed mulgara			P4						X																					
<i>Dasykaluta rosamondae</i>	Kaluta									X																					
<i>Dasyurus hallucatus</i>	Northern quoll				EN					X	Known																				
<i>Ningauai timealeyi</i>	Pilbara ningauai				EN					X																					
<i>Planigale ingrami</i>	Long-tailed planigale									X																					
<i>Planigale 'species 1'</i>	Pilbara planigale									X																					
<i>Pseudantechinus macdonnellensis</i>	Fat-tailed pseudantechinus									X																					
<i>Pseudantechinus woolleyae</i>	Woolley's pseudantechinus									X																					
<i>Sminthopsis macroura</i>	Stripe-faced dunnart									X																					
<i>Sminthopsis youngsoni</i>	Lesser hairy-footed dunnart									X																					
EMBALLONURIDAE																															
<i>Saccolaimus flaviventris</i>	Yellow-bellied sheath-tailed bat									X																					
<i>Taphozous georgianus</i>	Common sheath-tailed bat									X																					
EQUIDAE																															
<i>Equus africanus</i>	*Donkey									X																					
<i>Equus ferus</i>	*Horse									X																					
FELIDAE																															
<i>Felis catus</i>	*Cat									X																					
LEPORIDAE																															
<i>Oryctolagus cuniculus</i>	*Rabbit									X																					
MACROPODIDAE																															
<i>Lagorchestes conspicillatus leichardti</i>	Spectacled hare-wallaby			P4						X																					
<i>Osphranter robustus</i>	Euro									X																					
<i>Osphranter rufus</i>	Red kangaroo									X																					
<i>Petrogale rothschildi</i>	Rothschild's rock-wallaby									X																					

Scientific Name	Common Name	Conservation Status				Database Search						Literature Review																													
		EPBC Act	BC Act	DBCA	IUCN	DBCA (2022)	DAWE (2022)	DBCA (2023b)	ALA (2023)	BirdLife Australia (2023)	DBCA (2023a)	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	Current Survey												
<i>Acanthiza uropygialis</i>	Chestnut-rumped thornbill								X						X																										
<i>Gerygone fusca</i>	Western gerygone					X			X						X																										
<i>Gerygone magnirostris</i>	Large-billed gerygone								X																																
<i>Gerygone tenebrosa</i>	Dusky gerygone					X			X																																
<i>Smicronnis brevirostris</i>	Weebill					X			X						X																										
ACCIPITRIDAE																																									
<i>Accipiter cirrocephalus</i>	Collared sparrowhawk					X			X						X																										
<i>Accipiter fasciatus</i>	Brown goshawk					X			X						X																										
<i>Aquila audax</i>	Wedge-tailed eagle					X			X						X																										
<i>Circus approximans</i>	Swamp harrier					X			X						X																										
<i>Circus assimilis</i>	Spotted harrier					X			X						X																										
<i>Elanus axillaris</i>	Black-shouldered kite					X			X						X																										
<i>Elanus scriptus</i>	Letter-winged kite					X			X						X																										
<i>Erythrotrichis radiatus</i>	Red goshawk					VU	VU	P4	NT																																
<i>Haliaeetus leucogaster</i>	White-bellied sea-eagle					X			EN																																
<i>Haliaeetus leucogaster</i>	White-bellied sea-eagle					X			EN																																
<i>Haliaastur indus</i>	Brahminy kite					X			X						X																										
<i>Haliaastur sphenurus</i>	Whistling kite					X			X						X																										
<i>Hamirostra melanosternon</i>	Black-breasted buzzard					X			X						X																										
<i>Hieraaetus morphnoides</i>	Little eagle					X			X						X																										
<i>Lopholictinia isura</i>	Square-tailed kite					X			X						X																										
<i>Milvus migrans</i>	Black kite					X			X						X																										
<i>Pandion haliaetus cristatus</i>	Eastern osprey					X			X						X																										
ACROCEPHALIDAE																																									
<i>Acrocephalus australis</i>	Australian reed warbler					X			X						X																										
AEGOTHELIDAE																																									
<i>Aegotheles cristatus</i>	Australian owllet-nightjar					X			X						X																										
ALAUDIDAE																																									
<i>Mirafra javanica</i>	Horsfield's bushlark					X			X						X																										
ALCEDINIDAE																																									
<i>Dacelo leachii</i>	Blue-winged kookaburra					X			X						X																										
<i>Todiramphus chloris</i>	Collared kingfisher					X			X						X																										
<i>Todiramphus pyrropygius</i>	Red-backed kingfisher					X			X						X																										
<i>Todiramphus sanctus</i>	Sacred kingfisher					X			X						X																										
ANATIDAE																																									
<i>Anas castanea</i>	Chestnut teal					X			X						X																										
<i>Anas gracilis</i>	Grey teal					X			X						X																										
<i>Spatula querquedula</i>	Garganey					X			X						X																										

Scientific Name	Common Name	Conservation Status				Database Search						Literature Review																											
		EPBC Act	BC Act	DBCA	IUCN	DBCA (2022)	DAWE (2022)	DBCA (2023b)	ALA (2023)	BirdLife Australia (2023)	DBCA (2023a)	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	Current Survey										
												MI	MI	MI																									
<i>Spatula rhynchotis</i>	Australasian shoveler					X		X		X									X											X									
<i>Anas superciliosa</i>	Pacific black duck				X		X	X	X	X																			X										
<i>Aythya australis</i>	Hardhead				X		X	X	X	X																													
<i>Chenonetta jubata</i>	Australian wood duck				X		X	X	X	X																													
<i>Cygnus atratus</i>	Black swan				X		X	X	X	X																													
<i>Dendrocygna arcuata</i>	Wandering whistling-duck				X		X	X	X	X																													
<i>Dendrocygna eytoni</i>	Plumed whistling-duck				X		X	X	X	X																													
<i>Malacorhynchus membranaceus</i>	Pink-eared duck				X		X	X	X	X																													
<i>Tadorna tadornoides</i>	Australian shelduck				X		X	X	X	X																													
ANHINGIDAE																																							
<i>Anhinga novaehollandiae</i>	Australasian darter				X		X	X	X	X																													
APODIDAE																																							
<i>Apus pacificus</i>	Fork-tailed swift				X		X	X	X	X																													
ARDEIDAE																																							
<i>Ardea alba</i>	Great egret				X		X	X	X	X																													
<i>Ardea intermedia</i>	Intermediate egret				X		X	X	X	X																													
<i>Ardea pacifica</i>	White-necked heron				X		X	X	X	X																													
<i>Bubulcus ibis</i>	Cattle egret				X		X	X	X	X																													
<i>Butorides striata</i>	Striated heron				X		X	X	X	X																													
<i>Egretta garzetta</i>	Little egret				X		X	X	X	X																													
<i>Egretta novaehollandiae</i>	White-faced heron				X		X	X	X	X																													
<i>Egretta sacra</i>	Eastern reef egret				X		X	X	X	X																													
<i>Nycticorax caledonicus</i>	Nankeen night heron				X		X	X	X	X																													
ARTAMIDAE																																							
<i>Artamus cinereus</i>	Black-faced woodswallow				X		X	X	X	X																													
<i>Artamus cyanopterus</i>	Dusky woodswallow				X		X	X	X	X																													
<i>Artamus leucorhynchus</i>	White-breasted woodswallow				X		X	X	X	X																													
<i>Artamus minor</i>	Little woodswallow				X		X	X	X	X																													
<i>Artamus personatus</i>	Masked woodswallow				X		X	X	X	X																													
<i>Artamus superciliosus</i>	White-browed woodswallow				X		X	X	X	X																													
<i>Cracticus nigrogularis</i>	Pied butcherbird				X		X	X	X	X																													
<i>Gymnophina tibicen</i>	Australian magpie				X		X	X	X	X																													
<i>Cracticus torquatus</i>	Grey butcherbird				X		X	X	X	X																													
BURRHIDAE																																							
<i>Burhinus grallarius</i>	Bush stone-curlew				X		X	X	X	X																													
<i>Esacus magnirostris</i>	Beach stone-curlew				X		X	X	X	X																													

Scientific Name	Common Name	Conservation Status				Database Search						Literature Review																										
		EPBC Act	BC Act	DBCA	IUCN	DBCA (2022)	DAWE (2022)	DBCA (2023b)	ALA (2023)	BirdLife Australia (2023)	DBCA (2023a)	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	Current Survey									
LARIDAE																																						
<i>Chlidonias leucopterus</i>	White-winged black tern	MI	MI			X	X	X																														
<i>Gelochelidon nilotica</i>	Gull-billed tern	MI	MI		X	X	X	X		X											X																	
<i>Gelochelidon macrotarsa</i>	Australian tern					X	X	X													X																	
<i>Chroicocephalus novaehollandiae</i>	Silver gull				X		X	X		X											X																	
<i>Larus pacificus</i>	Pacific gull						X	X		X																												
<i>Onychoprion anaethetus</i>	Bridled tern		MI		X		X	X													X																	
<i>Thalasseus bergii</i>	Crested tern	MI	MI		X		X	X													X																	
<i>Hydroprogne caspia</i>	Caspian tern	MI	MI		X		X	X		X											X																	
<i>Sterna dougalli</i>	Roseate tern	MI	MI		X		X	X													X																	
<i>Sterna hirundo</i>	Common tern	MI	MI		X		X	X		X											X																	
<i>Chlidonias hybrida</i>	Whiskered tern				X		X	X		X											X																	
<i>Sternula nereis</i>	Fairy tern	VU	VU		VU		X	X		X											X																	
<i>Sternula albibrons</i>	Little tern	MI	MI		X		X	X		X											X																	
<i>Thalasseus bengalensis</i>	Lesser crested tern				X		X	X		X											X																	
LOCUSTELLIDAE																																						
<i>Cincloramphus cruralis</i>	Brown songlark				X		X	X		X											X																	
<i>Poodytes gramineus</i>	Little grassbird						X	X																														
<i>Cincloramphus mathewsi</i>	Rufous songlark				X		X	X		X																												
<i>Poodytes carteri</i>	Spinifexbird				X		X	X		X											X																	
MALURIDAE																																						
<i>Amytornis striatus</i>	Striated grasswren				X																																	
<i>Amytornis whitei</i>	Rufous grasswren																					X																
<i>Malurus assimilis</i>	Purple-backed fairywren				X		X	X		X											X																	
<i>Malurus leucopterus</i>	White-winged fairy-wren				X		X	X		X											X																	
<i>Stipiturus ruficeps</i>	Rufous-crowned emu-wren				X		X	X		X											X																	
MELIPHAGIDAE																																						
<i>Acanthagenys rufogularis</i>	Spiny-cheeked honeyeater						X			X										X																		
<i>Certhionyx variegatus</i>	Pied honeyeater				X		X			X											X																	
<i>Conopophila whitei</i>	Grey honeyeater																					X																
<i>Epthianura aurifrons</i>	Orange chat				X																																	
<i>Epthianura tricolor</i>	Crimson chat				X		X	X		X											X																	
<i>Gavicalis virescens</i>	Singing honeyeater				X		X	X		X											X																	
<i>Lichmera indistincta</i>	Brown honeyeater				X		X	X		X											X																	
<i>Manorina flavigula</i>	Yellow-throated miner				X		X	X		X											X																	
<i>Meliphreptus gularis</i>	Black-chinned honeyeater				X		X	X		X											X																	
<i>Ptilotula keartlandi</i>	Grey-headed honeyeater				X		X	X		X											X																	

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<i>Ptilotula penicillata</i>	White-plumed honeyeater					X		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X		
<i>Ptilotula plumula</i>	Grey-fronted honeyeater					X		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X		
<i>Sugomel niger</i>	Black honeyeater					X		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X		
MEROPIIDAE																															
<i>Merops ornatus</i>	Rainbow bee-eater					X		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	
MONARCHIDAE																															
<i>Grallina cyanoleuca</i>	Maggie-lark					X		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	
MOTACILLIDAE																															
<i>Anthus novaeseelandiae</i>	Australian pipit					X		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	
<i>Motacilla alba</i>	White wagtail							X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	
<i>Motacilla cinerea</i>	Grey wagtail		MI					May	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	
<i>Motacilla flava</i>	Yellow wagtail		MI					Known	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	
<i>Motacilla tschutschensis</i>	Eastern yellow wagtail		MI						X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	
NEOSITTIDAE																															
<i>Daphoenositta chrysoptera</i>	Varied sittella									X																					
NUMIDIDAE																															
<i>Numida meleagris</i>	*Helmeted guineafowl								X																						
OREOICIDAE																															
<i>Oreoica gutturalis</i>	Crested bellbird								X		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
OTIDIDAE																															
<i>Ardeotis australis</i>	Australian bustard								X		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
PACHYCEPHALIDAE																															
<i>Colluricincla harmonica</i>	Grey shrike-thrush								X		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
<i>Pachycephala lanioides</i>	White-breasted whistler								X		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
<i>Pachycephala melanura</i>	Mangrove golden whistler								X		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
<i>Pachycephala rufiventris</i>	Rufous whistler								X		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
PARDALOTIDAE																															
<i>Pardalotus rubricatus</i>	Red-browed pardalote								X		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
<i>Pardalotus striatus</i>	Striated pardalote								X		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
PASSERIDAE																															
<i>Passer montanus</i>	*Eurasian tree sparrow								X																						
PELECANIDAE																															
<i>Pelecanus conspicillatus</i>	Australian pelican								X		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
PETROICIDAE																															
<i>Peneothello pulverulenta</i>	Mangrove robin								X		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
<i>Melanodryas cucullata</i>	Hooded robin								X		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
<i>Petroica goodenovii</i>	Red-capped robin								X		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X

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PHALACROCORACIDAE																																
<i>Phalacrocorax carbo</i>	Great cormorant					X				X		X															X					
<i>Microcarbo melanoleucos</i>	Little pied cormorant					X				X		X															X					
<i>Phalacrocorax sulcirostris</i>	Little black cormorant					X				X		X															X					
<i>Phalacrocorax varius</i>	Pied cormorant					X				X		X															X					
PHASIANIDAE																																
<i>Coturnix pectoralis</i>	Stubble quail																															
<i>Pavo cristatus</i>	*Indian peafowl									X																						
<i>Synolicus ypsilophora</i>	Brown quail					X				X		X															X					
PODARGIDAE																																
<i>Podargus strigoides</i>	Tawny frogmouth					X				X		X																				
PODICIPEDIDAE																																
<i>Podiceps cristatus</i>	Great crested grebe					X				X																						
<i>Poliiocephalus poliocephalus</i>	Hoary-headed grebe					X				X		X																				
<i>Tachybaptus novaehollandiae</i>	Australasian grebe					X				X		X																				
POMATOSTOMIDAE																																
<i>Pomatostomus superciliosus</i>	White-browed babbler					X				X																						
<i>Pomatostomus temporalis</i>	Grey-crowned babbler					X				X		X																				
PSITTACIDAE																																
<i>Barnardius zonarius</i>	Australian ringneck					X				X		X																				
<i>Melopsittacus undulatus</i>	Budgerigar					X				X		X																				
<i>Pezoporus occidentalis</i>	Night parrot	EN	CR		CR										May																	
PTILINORHYNCHIDAE																																
<i>Chlamydera guttata</i>	Western bowerbird					X				X		X																				
RALLIDAE																																
<i>Fulica atra</i>	Eurasian coot					X				X		X																				
<i>Hypotaenidia philippensis</i>	Buff-banded rail					X				X		X																				
<i>Porphyrio porphyrio</i>	Purple swamphen					X				X		X																				
<i>Porzana fluminea</i>	Australian spotted crane					X				X		X																				
<i>Tribonyx ventralis</i>	Black-tailed native-hen					X				X		X																				
RECURVIROSTRIDAE																																
<i>Cladorhynchus leucocephalus</i>	Banded stilt					X				X		X																				
<i>Himantopus himantopus</i>	Black-winged stilt					X				X		X																				
<i>Recurvirostra novaehollandiae</i>	Red-necked avocet					X				X		X																				
RHIPIDURIDAE																																
<i>Rhipidura albiscapa</i>	Grey fantail					X				X		X																				
<i>Rhipidura leucophrys</i>	Willie wagtail					X				X		X																				

Scientific Name	Common Name	Conservation Status				Database Search						Literature Review																										
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		EN	EN	EN	EN	May																																
<i>Rhipidura phasiana</i>	Mangrove grey fantail					X					X										X																	
ROSTRATULIDAE																																						
<i>Rostratula australis</i>	Australian painted snipe	EN	EN		EN					May																												
SCOLOPACIDAE																																						
<i>Actitis hypoleucos</i>	Common sandpiper	MI	MI			X				Known	X		X																									
<i>Arenaria interpres</i>	Ruddy turnstone	MI	MI			X					X		X																									
<i>Callidris acuminata</i>	Sharp-tailed sandpiper	MI	MI		VU	X					X		X																									
<i>Callidris alba</i>	Sanderling	MI	MI			X				Known	X		X																									
<i>Callidris canutus</i>	Red knot	MI/EN	EN		NT	X				Known	X		X																									
<i>Callidris ferruginea</i>	Curlew sandpiper	MI/CR	CR		NT	X				Known	X		X																									
<i>Callidris melanotos</i>	Pectoral sandpiper	MI	MI			X					X		X																									
<i>Callidris minuta</i>	Little stint										X																											
<i>Callidris ruficollis</i>	Red-necked stint	MI	MI		NT	X				Known	X		X																									
<i>Callidris subminuta</i>	Long-toed stint	MI	MI			X				Known	X		X																									
<i>Callidris tenuirostris</i>	Great knot	MI/CR	CR		EN	X				Known	X		X																									
<i>Gallinago megala</i>	Swinhoe's snipe	MI	MI								X																											
<i>Gallinago stenura</i>	Pin-tailed snipe	MI	MI			X					X		X																									
<i>Callidris falcinellus</i>	Broad-billed sandpiper	MI	MI			X				Known	X		X																									
<i>Limnodromus semipalmatus</i>	Asian dowitcher	MI	MI		NT	X				Known	X		X																									
<i>Limosa lapponica menzibieri</i>	Bar-tailed godwit (northern siberian)	CR	CR																																			
<i>Limosa limosa</i>	Black-tailed godwit	MI	MI		NT	X				Known	X		X																									
<i>Numenius madagascariensis</i>	Eastern curlew	MI/CR	CR		EN	X				Known	X		X																									
<i>Numenius minutus</i>	Little curlew	MI	MI			X				Known	X		X																									
<i>Numenius phaeopus</i>	Whimbrel	MI	MI			X				Known	X		X																									
<i>Phalaropus lobatus</i>	Red-necked phalarope	MI	MI			X				Known	X		X																									
<i>Callidris pugnax</i>	Ruff	MI	MI			X				Known	X		X																									
<i>Tringa brevipes</i>	Grey-tailed tattler	MI	MI		P4	X					X		X																									
<i>Tringa glareola</i>	Wood sandpiper	MI	MI			X					X		X																									
<i>Tringa nebularia</i>	Common greenshank	MI	MI			X				Known	X		X																									
<i>Tringa stagnatilis</i>	Marsh sandpiper	MI	MI			X				Known	X		X																									
<i>Tringa totanus</i>	Common redshank	MI	MI			X				Known	X		X																									
<i>Xenus cinereus</i>	Terek sandpiper	MI	MI			X				Known	X		X																									
STRIGIDAE																																						
<i>Ninox boobook</i>	Boobook owl					X							X																									
<i>Ninox connivens</i>	Barking owl					X																																

Scientific Name	Common Name	Conservation Status				Database Search						Literature Review																												
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<i>Ctenotus rubicundus</i>						X					X											X																		
<i>Ctenotus rufescens</i>						X					X																X													
<i>Ctenotus saxatilis</i>	Rock ctenotus					X					X															X														
<i>Ctenotus schomburgkii</i>						X					X															X														
<i>Ctenotus serventyi</i>						X					X																													
<i>Ctenotus uber johnstonei</i>				P2		X					X																													
<i>Cyclodomorphus melanops</i>						X					X																													
<i>Egernia cygnitox</i>	Western Pilbara spiny-tailed skink					X					X																													
<i>Egernia epiisolus</i>	Eastern Pilbara spiny-tailed skink					X					X																													
<i>Eremiascincus isolepis</i>						X					X																													
<i>Eremiascincus musivus</i>	Mosaic desert skink					X					X																													
<i>Eremiascincus pallidus</i>	Western narrow-banded skink					X					X																													
<i>Eremiascincus richardsonii</i>	Broad-banded sand swimmer					X					X																													
<i>Lerista bipes</i>						X					X																													
<i>Lerista chalybura</i>						X					X																													
<i>Lerista clara</i>						X					X																													
<i>Lerista jacksoni</i>						X					X																													
<i>Lerista labialis</i>						X					X																													
<i>Lerista muelleri</i>						X					X																													
<i>Lerista timida</i>						X					X																													
<i>Liopholis striata</i>	Night skink					X					X																													
<i>Menetia greyii</i>						X					X																													
<i>Morethia ruficauda</i>						X					X																													
<i>Notoscincus ornatus</i>						X					X																													
<i>Proablepharus reginae</i>						X					X																													
<i>Tiliqua multifasciata</i>	Central blue-tongue					X					X																													
TYPHLOPIDAE																																								
<i>Anilius ammodytes</i>						X					X																													
<i>Anilius grypus</i>						X					X																													
<i>Anilius hamatus</i>						X					X																													
<i>Anilius pilbarensis</i>						X					X																													
<i>*In dotyphlops braminus</i>						X					X																													
VARANIDAE																																								
<i>Varanus acanthurus</i>	Spiny-tailed goanna					X					X																													
<i>Varanus brevicauda</i>	Short-tailed pygmy goanna					X					X																													
<i>Varanus bushi</i>	Pilbara mulga goanna					X					X																													
<i>Varanus eremius</i>	Pygmy desert goanna					X					X																													

Appendix C: Vertebrate Fauna Habitat Assessment

Site ID	Latitude	Longitude	Date assessed	Landform	Habitat Type	Aspect	Slope	Soil Type	Soil Availability	Outcropping	Rock Type	Rock Size	Vegetation Litter	Dominant Vegetation Type	Rocky Cracks / Crevices	Burrowing Suitability	Hollows	Water present	Disturbances
VALT-001	-20.4248	118.5492	26/04/2023	Sandy Plain	Sand Plain	Flat	Flat	Sand	Evenly Spread	Negligible	-	-	Scarce	Spinifex Hummock Grassland, Shrubland	Nil	Very High	None	Prone to Flooding	Road/ Access Track
VALT-002	-20.4224	118.5452	26/04/2023	Sandy Plain	Sand Plain	Flat	Flat	Clayey Sand	Evenly Spread	Negligible	-	-	Scarce	Spinifex Hummock Grassland, Shrubland	Nil	Very High	None	Prone to Flooding	Road/ Access Track
VALT-003	-20.4191	118.5356	26/04/2023	Sandy Plain	Sand Plain	Flat	Flat	Sand	Evenly Spread	Negligible	-	-	Scarce	Spinifex Hummock Grassland, Shrubland	Nil	Very High	None	Prone to Flooding	Road/ Access Track
VALT-004	-20.4169	118.5271	26/04/2023	Sandy Plain	Sand Plain	Flat	Flat	Sand	Evenly Spread	Negligible	-	-	Scarce	Spinifex Hummock Grassland, Shrubland	Nil	Very High	None	Prone to Flooding	Road/ Access Track
VALT-005	-20.4445	118.5464	26/04/2023	Sandy Plain	Sand Plain	Flat	Flat	Sand	Evenly Spread	Negligible	-	-	Scarce	Spinifex Hummock Grassland, Shrubland	Nil	Very High	None	Prone to Flooding	Road/ Access Track
VALT-006	-20.7550	118.5189	26/04/2023	Sandy Plain	Sand Plain	Flat	Flat	Sand	Evenly Spread	Negligible	-	-	Scarce	Spinifex Hummock Grassland, Shrubland	Nil	Very High	None	Prone to Flooding	Road/ Access Track
VALT-007	-20.4646	118.5379	26/04/2023	Sandy Plain	Sand Plain	Flat	Flat	Sand	Evenly Spread	Negligible	-	-	Scarce	Spinifex Hummock Grassland, Shrubland	Nil	Very High	None	Prone to Flooding	Road/ Access Track
VALT-008	-20.7542	118.5201	27/04/2023	Major Drainage	Major Drainage	Flat	Flat	Sand	Evenly Spread	Negligible	-	-	Few Large Patches	Melaleuca	Nil	Very High	Scarce	Prone to Flooding	Road/ Access Track, Mining Exploration
VALT-009	-20.7542	118.5193	27/04/2023	Sandy Plain	Sand Plain	South/ West	Low	Sand	Evenly Spread	Negligible	-	-	Many Small Patches	Scattered Shrubs, Tussock Grassland	Nil	Very High	None	Prone to Flooding	Cattle Grazing, Road/ Access Track
VALT-010	-20.7550	118.5155	27/04/2023	Sandy Plain	Sand Plain	Flat	Flat	Sand	Evenly Spread	Negligible	-	-	Scarce	Scattered Shrubs, Spinifex Hummock Grassland	Nil	Very High	None	None	Road/ Access Track
VALT-011	-20.7554	118.5134	27/04/2023	Sandy Plain	Sand Plain	Flat	Flat	Sand	Evenly Spread	Negligible	-	-	Few Small Patches	Shrubland, Spinifex Hummock Grassland	Nil	Very High	None	None	Cattle Grazing, Road/ Access Track

Site ID	Latitude	Longitude	Date assessed	Landform	Habitat Type	Aspect	Slope	Soil Type	Soil Availability	Outcropping	Rock Type	Rock Size	Vegetation Litter	Dominant Vegetation Type	Rocky Cracks / Crevices	Burrowing Suitability	Hollows	Water present	Disturbances
VALT-012	-20.7268	118.5024	26/04/2023	Sandy Plain	Sand Plain	Flat	Flat	Sand	Evenly Spread	Negligible	-	-	Scarce	Spinifex Hummock Grassland, Shrubland	Nil	Very High	None	Prone to Flooding	Road/ Access Track
VALT-013	-20.7077	118.4907	26/04/2023	Sandy Plain	Sand Plain	Flat	Flat	Sand	Evenly Spread	Negligible	-	-	Scarce	Spinifex Hummock Grassland, Shrubland	Nil	Very High	None	Prone to Flooding	Road/ Access Track
VALT-014	-20.6738	118.4688	26/04/2023	Sandy Plain	Sand Plain	Flat	Flat	Sand	Evenly Spread	Negligible	-	-	Scarce	Spinifex Hummock Grassland, Shrubland	Nil	Very High	None	Prone to Flooding	Road/ Access Track
VALT-015	-20.6318	118.4484	27/04/2023	Sandy Plain	Sand Plain	Flat	Flat	Sand	Evenly Spread	Negligible	-	-	Scarce	Scattered Shrubs, Spinifex Hummock Grassland	Nil	Very High	None	None	Cattle Grazing
VALT-016	-20.6294	118.4537	27/04/2023	Sandy Plain	Sand Plain	Flat	Flat	Sand	Evenly Spread	Negligible	-	-	Few Small Patches	Scattered Shrubs, Spinifex Hummock Grassland	Nil	Very High	None	Scarce	Cattle Grazing, Road/ Access Track
VALT-017	-20.6315	118.4549	27/04/2023	Sandy Plain	Sand Plain	Flat	Flat	Sand	Evenly Spread	Negligible	-	-	Scarce	Shrubland, Spinifex Hummock Grassland	Nil	Very High	None	None	Cattle Grazing
VALT-018	-20.5418	118.4519	26/04/2023	Sandy Plain	Sand Plain	Flat	Flat	Sand	Evenly Spread	Negligible	-	-	Scarce	Spinifex Hummock Grassland, Shrubland	Nil	Very High	None	Prone to Flooding	Road/ Access Track
VALT-019	-20.5967	118.4361	27/04/2023	Sandy Plain	Sand Plain	Flat	Flat	Sand	Evenly Spread	Negligible	-	-	Few Small Patches	Scattered Shrubs, Spinifex Hummock Grassland	Nil	Very High	None	None	Cattle Grazing
VALT-020	-20.5222	118.4819	27/04/2023	Major Drainage Line	Major Drainage Line	Flat	Flat	Sandy Loam	Evenly Spread	Negligible	-	Gravel (1 - 4 cm)	Few Small Patches	Shrubland, Tussock Grassland	Nil	Very High	None	Prone to Flooding	Cattle Grazing, Road/ Access Track
VALT-021	-20.5067	118.5068	26/04/2023	Sandy Plain	Sand Plain	Flat	Flat	Sand	Evenly Spread	Negligible	-	-	Scarce	Shrubland, Tussock Grassland, Spinifex Hummock Grassland	Nil	Very High	None	Prone to Flooding	Road/ Access Track

Site ID	Latitude	Longitude	Date assessed	Landform	Habitat Type	Aspect	Slope	Soil Type	Soil Availability	Outcropping	Rock Type	Rock Size	Vegetation Litter	Dominant Vegetation Type	Rocky Cracks / Crevices	Burrowing Suitability	Hollows	Water present	Disturbances
VALT-022	-20.4837	118.5061	26/04/2023	Sandy Plain	Sand Plain	Flat	Flat	Sand	Evenly Spread	Negligible	-	-	Scarce	Shrubland, Tussock Grassland, Spinifex Hummock Grassland	Nil	Very High	None	Prone to Flooding	Road/ Access Track
VALT-023	-20.7554	118.5170	26/04/2023	Sandy Plain	Sand Plain	Flat	Flat	Sand	Evenly Spread	Negligible	-	-	Scarce	Spinifex Hummock Grassland, Shrubland	Nil	Very High	None	Prone to Flooding	Road/ Access Track
VALT-024	-20.5011	118.5118	26/04/2023	Sandy Plain	Sand Plain	Flat	Flat	Sand	Evenly Spread	Negligible	-	-	Scarce	Shrubland, Spinifex Hummock Grassland	Nil	Very High	None	Prone to Flooding	Road/ Access Track
VALT-025	-20.7435	118.5117	26/04/2023	Sandy Plain	Sand Plain	Flat	Flat	Sand	Evenly Spread	Negligible	-	-	Scarce	Spinifex Hummock Grassland, Shrubland	Nil	Very High	None	Prone to Flooding	Road/ Access Track
VALT-026	-20.4677	118.5413	26/04/2023	Sandy Plain	Sand Plain	Flat	Flat	Sand	Evenly Spread	Negligible	-	-	Scarce	Spinifex Hummock Grassland, Shrubland	Nil	Very High	None	Prone to Flooding	Road/ Access Track
VALT-027	-20.6360	118.4510	26/04/2023	Sandy Plain	Sand Plain	Flat	Flat	Sand	Evenly Spread	Negligible	-	-	Scarce	Spinifex Hummock Grassland, Shrubland	Nil	Very High	None	Prone to Flooding	Road/ Access Track
VALT-028	-20.4352	118.5430	26/04/2023	Sandy Plain	Sand Plain	Flat	Flat	Sand	Evenly Spread	Negligible	-	-	Scarce	Spinifex Hummock Grassland, Shrubland	Nil	Very High	None	Prone to Flooding	Road/ Access Track
VALT-029	-20.5319	118.4762	28/04/2023	Major Drainage	Major Drainage	East	Low	Sand	Evenly Spread	Negligible	-	-	Few Small Patches	Scattered Shrubs, Scattered Eucalypts, Spinifex Hummock Grassland, Tussock Grassland	Nil	Very High	None	Prone to Flooding	Cattle Grazing
VALT-030	-20.4522	118.5286	26/04/2023	Sandy Plain	Sand Plain	Flat	Flat	Sand	Evenly Spread	Negligible	-	-	Scarce	Spinifex Hummock Grassland	Nil	Very High	None	Prone to Flooding	Road/ Access Track
VALT-031	-20.5759	118.4344	26/04/2023	Sandy Plain	Sand Plain	Flat	Flat	Sand	Evenly Spread	Negligible	-	-	Scarce	Spinifex Hummock Grassland, Shrubland	Nil	Very High	None	None	Road/ Access Track

Site ID	Latitude	Longitude	Date assessed	Landform	Habitat Type	Aspect	Slope	Soil Type	Soil Availability	Outcropping	Rock Type	Rock Size	Vegetation Litter	Dominant Vegetation Type	Rocky Cracks / Crevices	Burrowing Suitability	Hollows	Water present	Disturbances
VALT-032	-20.4648	118.5202	26/04/2023	Sandy Plain	Sand Plain	Flat	Flat	Sand	Evenly Spread	Negligible	-	-	Scarce	Spinifex Hummock Grassland, Shrubland	Nil	Very High	None	Prone to Flooding	Road/ Access Track
VALT-033	-20.5311	118.4777	28/04/2023	Major Drainage Line	Major Drainage Line	Flat	Flat	Sand	Evenly Spread	Negligible	-	-	Few Small Patches	Scattered Shrubs, Scattered Eucalypts, Tussock Grassland	Nil	Very High	Scarce	Prone to Flooding	Cattle Grazing
VALT-034	-20.4469	118.5136	26/04/2023	Sandy Plain	Sand Plain	Flat	Flat	Sand	Evenly Spread	Negligible	-	-	Scarce	Spinifex Hummock Grassland, Shrubland	Nil	Very High	None	Prone to Flooding	Road/ Access Track
VALT-035	-20.6643	118.3552	28/04/2023	Sandy Plain	Sand Plain	Flat	Flat	Sand	Evenly Spread	Negligible	-	-	Few Small Patches	Shrubland, Spinifex Hummock Grassland	Nil	Very High	None	None	Cattle Grazing
VALT-036	-20.4414	118.5282	26/04/2023	Sandy Plain	Sand Plain	Flat	Flat	Sand	Evenly Spread	Negligible	-	-	Scarce	Spinifex Hummock Grassland	Nil	Very High	None	Prone to Flooding	Road/ Access Track
VALT-037	-20.6507	118.3698	28/04/2023	Sandy Plain	Sand Plain	Flat	Flat	Sand	Evenly Spread	Negligible	-	-	Scarce	Shrubland, Spinifex Hummock Grassland	Nil	Very High	None	None	Cattle Grazing, Road/ Access Track
VALT-038	-20.4489	118.5068	26/04/2023	Sandy Plain	Sand Plain	Flat	Flat	Sand	Evenly Spread	Negligible	-	-	Scarce	Spinifex Hummock Grassland, Shrubland	Nil	Very High	None	Prone to Flooding	Road/ Access Track
VALT-039	-20.6355	118.3831	28/04/2023	Sandy Plain	Sand Plain	Flat	Flat	Sand	Evenly Spread	Negligible	-	-	Few Small Patches	Shrubland, Spinifex Hummock Grassland	Nil	Very High	None	None	None Discernible
VALT-040	-20.5399	118.4554	26/04/2023	Sandy Plain	Sand Plain	Flat	Flat	Sand	Evenly Spread	Negligible	-	-	Scarce	Spinifex Hummock Grassland, Shrubland	Nil	Very High	None	Prone to Flooding	Road/ Access Track
VALT-041	-20.6135	118.4040	28/04/2023	Sandy Plain	Sand Plain	Flat	Flat	Sandy Loam	Evenly Spread	Negligible	-	-	None Discernible	Scattered Shrubs, Spinifex Hummock Grassland	Nil	Very High	None	None	Cattle Grazing
VALT-042	-20.6910	118.4760	26/04/2023	Sandy Plain	Sand Plain	Flat	Flat	Sand	Evenly Spread	Negligible	-	-	Scarce	Spinifex Hummock Grassland, Shrubland	Nil	Very High	None	Prone to Flooding	Road/ Access Track

Site ID	Latitude	Longitude	Date assessed	Landform	Habitat Type	Aspect	Slope	Soil Type	Soil Availability	Outcropping	Rock Type	Rock Size	Vegetation Litter	Dominant Vegetation Type	Rocky Cracks / Crevices	Burrowing Suitability	Hollows	Water present	Disturbances
VALT-043	-20.5955	118.4202	26/04/2023	Sandy Plain	Sand Plain	Flat	Flat	Sand	Evenly Spread	Negligible	-	-	Scarce	Spinifex Hummock Grassland, Shrubland	Nil	Very High	None	None	Road/ Access Track
VALT-044	-20.5631	118.4400	26/04/2023	Sandy Plain	Sand Plain	Flat	Flat	Sand	Evenly Spread	Negligible	-	-	Scarce	Spinifex Hummock Grassland, Shrubland	Nil	Very High	None	Prone to Flooding	Road/ Access Track
VALT-045	-20.5551	118.4294	29/04/2023	Sandy Plain	Sand Plain	Flat	Flat	Sand	Evenly Spread	Negligible	-	-	Scarce	Shrubland, Tussock Grassland	Nil	Very High	None	None	Cattle Grazing, Road/ Access Track
VALT-046	-20.5089	118.5047	26/04/2023	Sandy Plain	Sand Plain	Flat	Flat	Sand	Evenly Spread	Negligible	-	-	Scarce	Shrubland, Spinifex Hummock Grassland	Nil	Very High	None	None	Road/ Access Track
VALT-047	-20.5540	118.3438	29/04/2023	Sandy Plain	Sand Plain	Flat	Flat	Sand	Evenly Spread	Negligible	-	-	Scarce	Scattered Shrubs, Tussock Grassland	Nil	Very High	None	None	Cattle Grazing, Road/ Access Track
VALT-048	-20.5315	118.4441	26/04/2023	Sandy Plain	Sand Plain	Flat	Flat	Sand	Evenly Spread	Negligible	-	-	Scarce	Spinifex Hummock Grassland, Shrubland	Nil	Very High	None	None	Road/ Access Track
VALT-049	-20.6357	118.3438	29/04/2023	Sandy Plain	Drainage Area	Flat	Flat	Sand	Evenly Spread	Negligible	-	-	Few Small Patches	Scattered Shrubs, Scattered Eucalypts, Spinifex Hummock Grassland, Tussock Grassland	Nil	Very High	None	Prone to Flooding	Cattle Grazing, Road/ Access Track
VALT-050	-20.5180	118.4641	26/04/2023	Sandy Plain	Sand Plain	Flat	Flat	Clayey Sand	Evenly Spread	Negligible	-	-	Scarce	Spinifex Hummock Grassland, Shrubland	Nil	Very High	None	Prone to Flooding	Road/ Access Track
VALT-051	-20.4189	118.5285	28/04/2023	Hardpan Plain	Hardpan Plain	Flat	Flat	Clayey Sand	Evenly Spread	Negligible	-	-	Scarce	Scattered Shrubs, Spinifex Hummock Grassland	Nil	High	None	None	Cattle Grazing, Road/ Access Track
VALT-052	-20.5220	118.4579	26/04/2023	Sandy Plain	Drainage Area	Flat	Flat	Clayey Sand	Evenly Spread	Negligible	-	-	Scarce	Spinifex Hummock Grassland, Shrubland	Nil	Very High	None	Prone to Flooding	Road/ Access Track

Site ID	Latitude	Longitude	Date assessed	Landform	Habitat Type	Aspect	Slope	Soil Type	Soil Availability	Outcropping	Rock Type	Rock Size	Vegetation Litter	Dominant Vegetation Type	Rocky Cracks / Crevices	Burrowing Suitability	Hollows	Water present	Disturbances
VALT-053	-20.4158	118.5050	30/04/2023	Sandy Plain	Drainage Area	Flat	Flat	Sand	Evenly Spread	Negligible	-	-	Many Small Patches	Shrubland, Spinifex Hummock Grassland	Nil	Very High	None	None	Road/ Access Track, None Discernible
VALT-054	-20.5260	118.4629	26/04/2023	Sandy Plain	Sand Plain	Flat	Flat	Clayey Sand	Evenly Spread	Negligible	-	-	Few Small Patches	Spinifex Hummock Grassland, Shrubland	Nil	Very High	None	Prone to Flooding	Road/ Access Track
VALT-055	-20.4155	118.5179	26/04/2023	Sandy Plain	Sand Plain	Flat	Flat	Sand	Evenly Spread	Negligible	-	-	Scarce	Hummock Grassland, Scattered Shrubs	Nil	Very High	None	Prone to Flooding	Road/ Access Track
VALT-056	-20.5447	118.4304	26/04/2023	Sandy Plain	Sand Plain	Flat	Flat	Sand	Evenly Spread	Negligible	-	-	Scarce	Spinifex Hummock Grassland, Shrubland	Nil	Very High	None	Prone to Flooding	Road/ Access Track
VALT-057	-20.4305	118.5490	26/04/2023	Sandy Plain	Sand Plain	Flat	Flat	Sand	Evenly Spread	Negligible	-	-	Scarce	Spinifex Hummock Grassland, Shrubland	Nil	Very High	None	None	Road/ Access Track
VALT-058	-20.5629	118.4133	29/04/2023	Sandy Plain	Sand Plain	Flat	Flat	Sand	Evenly Spread	Negligible	-	-	Scarce	Scattered Shrubs, Tussock Grassland	Nil	Very High	None	None	Cattle Grazing, Road/ Access Track
VALT-059	-20.4547	118.5469	26/04/2023	Sandy Plain	Sand Plain	Flat	Flat	Sand	Evenly Spread	Negligible	-	-	Scarce	Spinifex Hummock Grassland, Shrubland	Nil	Very High	None	Prone to Flooding	Road/ Access Track
VALT-060	-20.5715	118.4052	29/04/2023	Sandy Plain	Sand Plain	Flat	Flat	Sand	Evenly Spread	Negligible	-	-	Scarce	Scattered Shrubs, Tussock Grassland	Nil	Very High	None	None	Cattle Grazing, Road/ Access Track
VALT-061	-20.4777	118.5397	30/04/2023	Sandy Plain	Sand Plain	Flat	Flat	Sand	Evenly Spread	Negligible	-	-	Scarce	Scattered Shrubs, Spinifex Hummock Grassland	Nil	Very High	None	None	Cattle Grazing, Road/ Access Track
VALT-062	-20.5836	118.3929	29/04/2023	Sandy Plain	Sand Plain	Flat	Flat	Sand	Evenly Spread	Negligible	-	-	Scarce	Scattered Shrubs, Tussock Grassland	Nil	Very High	None	None	Cattle Grazing, Road/ Access Track

Site ID	Latitude	Longitude	Date assessed	Landform	Habitat Type	Aspect	Slope	Soil Type	Soil Availability	Outcropping	Rock Type	Rock Size	Vegetation Litter	Dominant Vegetation Type	Rocky Cracks / Crevices	Burrowing Suitability	Hollows	Water present	Disturbances
VALT-063	-20.6482	118.4550	1/05/2023	Sandy Plain	Sand Plain	Flat	Flat	Sand	Evenly Spread	Negligible	-	-	Scarce	Scattered Shrubs, Spinifex Hummock Grassland	Nil	Very High	None	None	Cattle Grazing, Road/Access Track
VALT-064	-20.5944	118.3850	29/04/2023	Sandy Plain	Sand Plain	Flat	Flat	Sand	Evenly Spread	Negligible	-	-	Scarce	Scattered Shrubs, Tussock Grassland	Nil	Very High	None	None	Cattle Grazing, Road/Access Track
VALT-065	-20.6100	118.4394	1/05/2023	Sandy Plain	Sand Plain	Flat	Flat	Sand	Evenly Spread	Negligible	-	-	Scarce	Scattered Shrubs, Spinifex Hummock Grassland	Nil	Very High	None	None	Cattle Grazing, None Discernible
VALT-066	-20.6089	118.3689	29/04/2023	Sandy Plain	Drainage Area	Flat	Flat	Sand	Evenly Spread	Negligible	-	-	Scarce	Scattered Shrubs, Tussock Grassland	Nil	Very High	None	Prone to Flooding	Cattle Grazing, Road/Access Track
VALT-067	-20.5757	118.4350	1/05/2023	Claypan	Claypan	Flat	Flat	Light Clay	Evenly Spread	Negligible	-	-	None Discernible	Scattered Shrubs, Spinifex Hummock Grassland	Nil	Nil	None	Prone to Flooding	None Discernible
VALT-068	-20.6187	118.3600	29/04/2023	Sandy Plain	Sand Plain	Flat	Flat	Sand	Evenly Spread	Negligible	-	-	Scarce	Scattered Shrubs, Tussock Grassland	Nil	Very High	None	None	Cattle Grazing, Road/Access Track
VALT-069	-20.5660	118.4415	30/04/2023	Sandy Plain	Sand Plain	Flat	Flat	Sand	Evenly Spread	Negligible	-	-	Few Small Patches	Scattered Shrubs, Scattered Eucalypts, Spinifex Hummock Grassland	Nil	Very High	None	None	Cattle Grazing
VALT-070	-20.6254	118.3532	29/04/2023	Sandy Plain	Drainage Area	Flat	Flat	Sand	Evenly Spread	Negligible	-	-	Scarce	Scattered Shrubs, Tussock Grassland	Nil	Very High	None	Prone to Flooding	Cattle Grazing, Road/Access Track
VALT-071	-20.6260	118.3935	28/04/2023	Sandy Plain	Sand Plain	Flat	Flat	Sandy Loam	Evenly Spread	Negligible	-	-	None Discernible	Scattered Shrubs, Spinifex Hummock Grassland, Scattered Eucalypts	Nil	Very High	None	None	Cattle Grazing

Site ID	Latitude	Longitude	Date assessed	Landform	Habitat Type	Aspect	Slope	Soil Type	Soil Availability	Outcropping	Rock Type	Rock Size	Vegetation Litter	Dominant Vegetation Type	Rocky Cracks / Crevices	Burrowing Suitability	Hollows	Water present	Disturbances
VALT-072	-20.6413	118.3388	29/04/2023	Sandy Plain	Sand Plain	Flat	Flat	Sand	Evenly Spread	Negligible	-	-	Scarce	Scattered Shrubs, Tussock Grassland	Nil	Very High	None	None	Cattle Grazing, Road/ Access Track
VALT-073	-20.4993	118.5212	1/05/2023	Sandy Plain	Sand Plain	Flat	Flat	Sandy Clay Loam	Evenly Spread	Negligible	-	-	Few Small Patches	Shrubland, Spinifex Hummock Grassland	Nil	Very High	None	None	Road/ Access Track
VALT-074	-20.5085	118.4815	26/04/2023	Sandy Plain	Sand Plain	Flat	Flat	Clayey Sand	Evenly Spread	Negligible	-	-	Scarce	Spinifex Hummock Grassland, Shrubland	Nil	Very High	None	None	Road/ Access Track
VALT-075	-20.4982	118.4956	2/05/2023	Sandy Plain	Sand Plain	Flat	Flat	Sand	Evenly Spread	Negligible	-	-	Few Small Patches	Shrubland, Spinifex Hummock Grassland	Nil	Very High	None	None	Cattle Grazing, Road/ Access Track
VALT-076	-20.5141	118.4919	26/04/2023	Sandy Plain	Sand Plain	Flat	Flat	Clayey Sand	Evenly Spread	Negligible	-	-	Few Small Patches	Spinifex Hummock Grassland, Shrubland	Nil	Very High	None	None	Road/ Access Track
VALT-077	-20.4826	118.5251	26/04/2023	Sandy Plain	Drainage Area	Flat	Flat	Sand	Evenly Spread	Negligible	-	-	Scarce	Spinifex Hummock Grassland, Shrubland	Nil	Very High	None	Proned to Flooding	Road/ Access Track
VALT-078	-20.5084	118.5100	2/05/2023	Sandy Plain	Sand Plain	Flat	Flat	Sand	Evenly Spread	Negligible	-	-	Few Small Patches	Shrubland, Spinifex Hummock Grassland	Nil	Very High	None	None	Cattle Grazing, Road/ Access Track
VALT-080	-20.6618	118.4676	2/05/2023	Sandy Plain	Sand Plain	Flat	Flat	Sandy Loam	Evenly Spread	Negligible	-	-	Few Small Patches	Scattered Shrubs, Scattered Eucalypts, Spinifex Hummock Grassland	Nil	Very High	None	None	Frequent Fire, Road/ Access Track
VALT-081	-20.6403	118.3767	3/05/2023	Sandy Plain	Sand Plain	Flat	Flat	Sand	Evenly Spread	Negligible	-	-	Scarce	Scattered Shrubs, Spinifex Hummock Grassland	Nil	Very High	None	None	Cattle Grazing
VALT-082	-20.4260	118.5277	4/05/2023	Sandy Plain	Hardpan Plain	Flat	Flat	Clayey Sand	Evenly Spread	Negligible	-	-	Scarce	Scattered Shrubs, Spinifex Hummock Grassland	Nil	High	None	Proned to Flooding	Cattle Grazing, Road/ Access Track

Site ID	Latitude	Longitude	Date assessed	Landform	Habitat Type	Aspect	Slope	Soil Type	Soil Availability	Outcropping	Rock Type	Rock Size	Vegetation Litter	Dominant Vegetation Type	Rocky Cracks / Crevices	Burrowing Suitability	Hollows	Water present	Disturbances
VALT-083	-20.5292	118.4636	26/04/2023	Sandy Plain	Drainage Area	Flat	Flat	Clayey Sand	Evenly Spread	Negligible	-	-	Few Small Patches	Spinifex Hummock Grassland, Shrubland	Nil	Very High	None	Prone to Flooding	Road/ Access Track
VALT-084	-20.5298	118.4602	4/05/2023	Claypan	Claypan	Flat	Flat	Light Clay	Evenly Spread	Negligible	-	-	None Discernible	Spinifex Hummock Grassland	Nil	Low	None	Prone to Pooling	Cattle Grazing
VALT-085	-20.4410	118.5459	2/05/2023	Sandy Plain	Sand Plain	Flat	Flat	Sand	Evenly Spread	Negligible	-	-	Few Small Patches	Shrubland, Spinifex Hummock Grassland	Nil	High	None	None	Cattle Grazing, Road/ Access Track

Appendix D: Water Features Recorded During the Field Survey

Water feature ID	Coordinates	Date assessed	Length (m)	Width (m)	Water present above surface	Depth (m)	Water present in intermediate zone	Groundwater vegetation present	Emergent macrophyte present	Aquatic vegetation	Fauna present	Photo
WALT-001	-20.5222, 118.4819	27/04/2023	60	20	Yes	1	Yes	No	No	No	No	

