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**FORTESCUE METALS GROUP LTD
CHRISTMAS CREEK
TERRESTRIAL VERTEBRATE FAUNA DESKTOP ASSESSMENT**

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DESKTOP ASSESSMENT



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TABLE OF CONTENTS

1	INTRODUCTION	1
1.1	PROJECT OVERVIEW	1
1.2	LEGISLATIVE FRAMEWORK	1
2	BIOPHYSICAL CLIMATE.....	4
2.1	CLIMATE	4
2.2	VEGETATION	5
2.3	LAND SYSTEMS.....	5
2.4	BIOGEOGRAPHY	7
3	METHODS	11
4	FAUNA.....	12
5	FAUNA HABITATS	13
5.1	LOW HALOPHYTIC SHRUBLAND	13
5.2	MULGA WOODLAND.....	13
5.3	SPINIFEX COVERED HILLS AND RANGES.....	14
5.4	CREEKLINES AND WATER SOURCES	15
6	CONSERVATION SIGNIFICANT FAUNA	17
6.1	MAMMALS	25
6.2	BIRDS.....	29
6.3	REPTILES.....	34
7	CONCLUSIONS	35
8	REFERENCES.....	36

TABLES

Table 2.1 – Beard Vegetation Types of Christmas Creek Survey area.....	5
Table 2.2 – Land Systems of the Christmas Creek Survey area.....	6
Table 3.1 – Previous Biological Survey Reports within 50 km of the Survey Area.....	11
Table 3.2 – Fauna Databases Searches.....	11
Table 4.1 – Summary of Previous Survey Results.....	12
Table 6.1 – Conservation Significant Species with a High or Medium Likelihood of Occurrence in the Survey area.....	17
Table 6.2 – Likelihood of Occurrence Categories.....	18
Table 6.3 – Conservation Significant Fauna Potentially Occurring in the Survey area.....	19

FIGURES

Figure 1.1 – Location of the Survey Area.....	3
Figure 2.1 – Climatic Summary Data (Newman Airport).....	4
Figure 2.2 –Vegetation of the Survey area.....	8
Figure 2.3 – Land Systems of the Survey area.....	9
Figure 2.4 – Biogeographic Regions of the Survey area.....	10
Figure 5.1 – Fauna Habitats of the Survey area.....	16
Figure 6.1 – Conservation Significant Mammals Recorded within the Survey Area.....	23
Figure 6.2 – Conservation Significant Birds Recorded within the Survey Area.....	24

APPENDICES

Appendix A Explanation of Conservation Codes.....	40
Appendix B Regional Fauna Records.....	43
Appendix C Species of Conservation Significance with a Low Likelihood of Occurrence within the survey area.....	61

ACRONYMS

BOM	Bureau of Meteorology
CAMBA	China-Australia Migratory Bird Agreement
DEC	Department of Environment and Conservation
DEWHA	Department of Environment, Heritage, Water and the Arts
EIA	Environmental Impact Assessment
EPA	Environmental Protection Authority
EPBC Act	<i>Environment Protection and Biodiversity Conservation Act 1999</i>
IBRA	Interim Biogeographic Regionalisation for Australia
JAMBA	Japan-Australian Migratory Bird Agreement
NHMRC	National Health and Medical Research Centre
WAM	Western Australian Museum
WC Act	<i>Wildlife Conservation Act 1950</i>



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EXECUTIVE SUMMARY

Fortescue Metals Group Limited (Fortescue) has commenced operation of the Pilbara Iron Ore and Infrastructure Project, consisting of several iron ore mines and associated infrastructure in the Pilbara region of Western Australia. Two mine sites, located to the north of the Fortescue Marsh, are collectively known as the Chichester Operations: Cloudbreak and Christmas Creek. The Christmas Creek mine is located approximately 120 km north of Newman.

FMG commissioned *ecologia* Environment to undertake a baseline biological desktop study of the terrestrial vertebrate fauna of Christmas Creek as part of the environmental impact assessment for the project. The primary objective of this study was to provide a habitat assessment of the survey area and identify the species of conservation significance likely to occur.

An analysis of aerial photography and previous vegetation surveys carried out in the areas revealed there are four main fauna habitats present within the survey area: low halophytic shrubland within the Fortescue Marsh, low mulga woodland, spinifex hills and ranges, and creeklines and wells. The marsh, fringing vegetation and permanent water sources are likely to be the most significant habitats present within the survey area as they are uncommon across the Pilbara and potentially provide habitat for conservation significant species including the Night Parrot, Bilby, and several migratory waterbirds. The Fortescue Marsh is also an important nesting area for numerous waterbird species during periods of flood.

Based on a review of previous surveys in the area and database searches, a total of 25 species of conservation significance have the potential to occur within the survey area. Eight of these species have been recorded within the survey area (either directly or through secondary evidence) and a further 13 species have a high or medium likelihood of occurrence. Four species have low likelihood of occurrence within the survey area. The most significant species are those listed on the *Environmental Protection and Biodiversity Conservation Act*: Northern Quoll, Night Parrot, Greater Bilby and Pilbara Leaf-nosed Bat.



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1 INTRODUCTION

1.1 PROJECT OVERVIEW

Fortescue Metals Group (Fortescue) holds a number of mining tenements that cover iron ore resources in the Pilbara region of Western Australia and has commenced operation of the Pilbara Iron Ore and Infrastructure Project. Included in this project is the Christmas Creek mine, and together with the Cloudbreak mine is collectively referred to as the Chichester Operations, located approximately 120 km north of Newman along the northern margin of the Fortescue Marsh. Christmas Creek is soon to achieve full operation.

As part of the environmental approvals process, this document provides a desktop terrestrial vertebrate fauna assessment of Christmas Creek. In this document, the entire study area is referred to as the survey area (Figure 1.1). The total size of the survey area is approximately 550 km².

1.2 LEGISLATIVE FRAMEWORK

The *Environmental Protection Act 1986* is “an Act to provide for an Environmental Protection Authority, for the prevention, control and abatement of environmental pollution, for the conservation, preservation, protection, enhancement and management of the environment and for matters incidental to or connected with the foregoing.” Section 4a of this Act outlines five principles that are required to be addressed to ensure that the objectives of the Act are addressed. Three of these principles are relevant to native fauna and flora:

- *The Precautionary Principle*

Where there are threats of serious or irreversible damage, lack of full scientific certainty should not be used as a reason for postponing measures to prevent environmental degradation.

- *The Principles of Intergenerational Equity*

The present generation should ensure that the health, diversity and productivity of the environment is maintained or enhanced for the benefit of future generations.

- *The Principle of the Conservation of Biological Diversity and Ecological Integrity*

Conservation of biological diversity and ecological integrity should be a fundamental consideration.

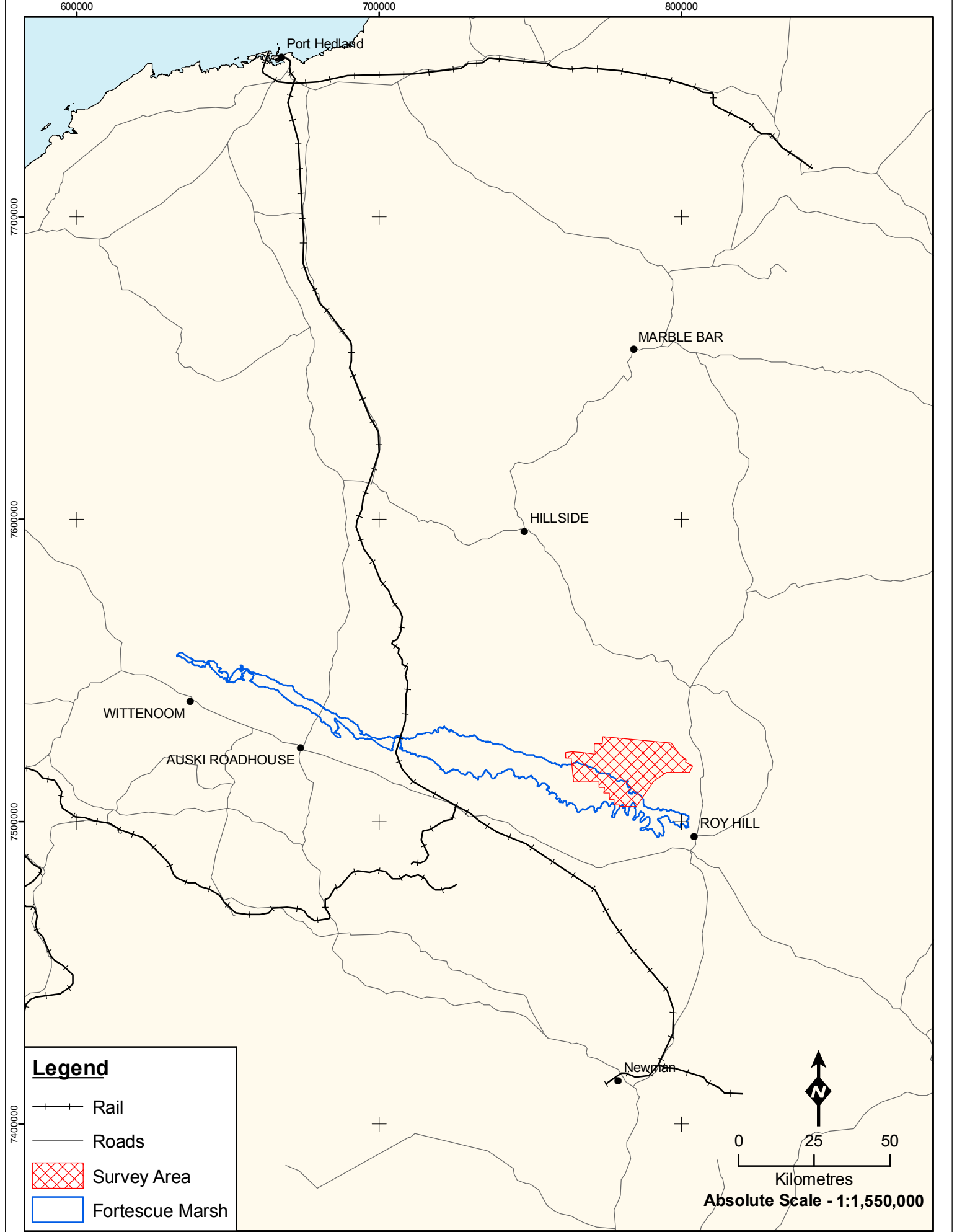
In addition to these principles, projects undertaken as part of the Environmental Impact Assessment (EIA) process are required to address guidelines produced by the Environmental Protection Authority (EPA), in this case Guidance Statement No. 56: *Terrestrial Fauna Surveys for Environmental Impact Assessment in Western Australia* (EPA 2004), and principles outlined in EPA Position Statement No. 3: *Terrestrial Biological Surveys as an Element of Biodiversity Protection* (EPA 2002).

Native flora and fauna in Western Australia that are formally recognised as rare, threatened with extinction, or as having high conservation value are protected at a federal level under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) and at a state level under the *Wildlife Conservation Act 1950* (WC Act). International agreements include the Japan-Australian Migratory Bird Agreement (JAMBA) and the China-Australia Migratory Bird Agreement (CAMBA).



The EPBC Act was developed to provide for the protection of the environment, especially those aspects of the environment that are matters of national environmental significance, to promote ecologically sustainable development through the conservation and ecologically sustainable use of natural resources, and to promote the conservation of biodiversity. The EPBC Act includes provisions to protect native species (and in particular to prevent the extinction and promote the recovery of threatened species) and to ensure the conservation of migratory species. In addition to the principles outlined in Section 4a of the EPBC Act, Section 3a of the EPBC Act includes a principle of ecologically sustainable development dictating that decision-making processes should effectively integrate both long-term and short-term economic, environmental, social and equitable considerations. Schedule 1 of the EPBC Act contains a list of species that are considered Extinct, Extinct in the Wild, Critically Endangered, Endangered, Vulnerable and Conservation Dependent. Definitions of categories relevant to fauna occurring or potentially occurring in the survey area are provided in Appendix A.

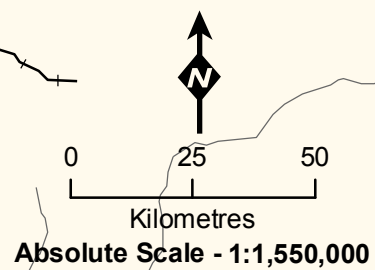
The WC Act was developed to provide for the conservation and protection of wildlife in Western Australia. Under Section 14 of this Act, all flora and fauna within Western Australia is protected; however, the Minister may, via a notice published in the *Government Gazette*, declare a list of fauna identified as rare, likely to become extinct, or otherwise in need of special protection (Appendix A). The current listing was gazetted in August 2010.

In addition, the Department of Environment and Conservation (DEC) maintains a Threatened and Priority Fauna list which includes species removed from the WC Act and other species known from only a few populations or in need of monitoring. Five Priority codes are recognised (Appendix A).



Legend

-  Rail
-  Roads
-  Survey Area
-  Fortescue Marsh



Location of the Christmas Creek Survey Area

Figure: 1.1
Project ID: 1275

Drawn: AH
Date: 20/09/10

Unique Map ID: A185

Coordinate System
 Name: GDA 1994 MGA Zone 50
 Projection: Transverse Mercator
 Datum: GDA 1994

2 BIOPHYSICAL CLIMATE

2.1 CLIMATE

The survey area is situated in the Pilbara region of Western Australia and experiences an arid-tropical climate with two distinct seasons; a hot summer from October to April and a mild winter from May to September. Annual evaporation exceeds rainfall by as much as 500 mm per year. Seasonally low and unreliable rainfall together with high temperatures and high diurnal temperature variations are also characteristic of the region.

In the past the region has received no rainfall during the year, which is typical of a desert climate (Beard 1975). Within the Pilbara, the temperature range is large and maxima are high. Summer temperatures may reach as high as 46 °C, with an annual mean maximum of 31.4 °C, while the winter mean maximum is 25°C (BOM 2010). Light frosts occasionally occur during July and August. The climate experienced throughout the year is usually very dry since high temperatures and humidity seldom occur simultaneously (Beard 1975).

Rainfall in the Pilbara is highly unpredictable and recordings are highest at stations around the Hamersley Range which reach altitudes of up to 900 m. The majority of the Pilbara has a bimodal rainfall distribution, resulting in two rainfall maxima per year. From January to March rain results from tropical storms producing sporadic and drenching thunderstorms. Tropical cyclones moving south from northern Australian waters also bring sporadic heavy rains. From May to June extensive cold fronts move easterly across the state and occasionally reach the Pilbara. These fronts produce only light winter rains that are ineffective for the growth of plants other than herbs and grasses. Larger perennial species require the intense and prolonged storms of summer. Surface water can be found in some pools and springs in the Pilbara all year round, although watercourses only flow briefly due to the short wet season (Beard 1975).

Meteorological data has been recorded at Newman Airport since 1971. This site is the closest to the survey area, being located approximately 100 km to the south. Newman airport was selected to provide an indication of the local climatic conditions experienced within the survey areas (Figure 2.1).

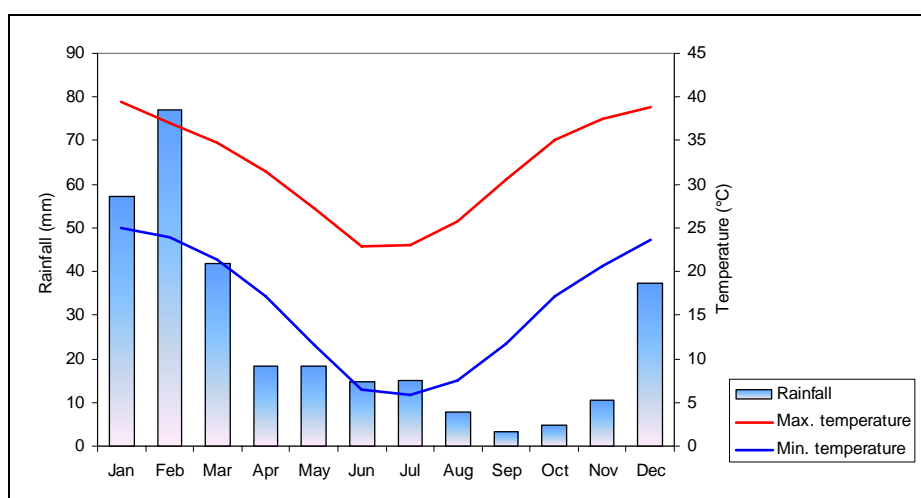


Figure 2.1 – Climatic Summary Data (Newman Airport).

2.2 VEGETATION

The survey area lies in the Fortescue Botanical District of the Pilbara (Beard 1975). Four vegetation communities occur within the survey area (Table 2.1), lying in three main east-west orientated strips (Figure 2.2). From south to north they consist of samphire steppe within the Fortescue Marsh (k_3Ci), open mulga woodland on the flats surrounding the marsh (a_1Lp), and scattered snappy gums (*Eucalyptus leucophloia*) over spinifex grassland in the hills and foot slopes of the Chichester Ranges mixed with open mulga woodland, typically along creeklines and in low lying areas ($a_1Li/e_{16}Lrt_3Hi$). Another strip of vegetation (spinifex hummock grassland with Kanji shrub steppe; $a_2Srt_{1,3}Hi$) lies to the north of the survey area with a small amount (8 km²) occurring within the north-east Christmas Creek area.

Open mulga woodland (a_1Lp) is an extensive vegetation type found in Western Australia. Along with the samphire steppe (k_3Ci) and Kanji shrub steppe ($a_2Srt_{1,3}Hi$), these areas are well represented outside the survey area (Table 2.1). The mixed spinifex grassland and mulga woodland has a high percentage (10.6 %) present within the survey area, however individually both these habitat types are well represented outside the survey area.

Table 2.1 – Beard Vegetation Types of Christmas Creek Survey area

	Vegetation Type	Total Area in WA (km ²)	Area in Christmas Creek (km ²)	Percent of Total Vegetation Type (%)
k_3Ci	Unwooded samphire steppe	20789	114.1	0.5
a_1Lp	Low woodland with Mulga in patches	79145	317.3	0.4
$a_1Li/e_{16}Lrt_3Hi$	Low mulga woodland/Tree steppe with scattered <i>Eucalyptus leucophloia</i> over <i>Triodia wiseana</i> hummock grassland	1036	109.9	10.6
$a_2Srt_{1,3}Hi$	Kanji (<i>Acacia pyrifolia</i>) shrub steppe with <i>Triodia pungens</i> and <i>T. wiseana</i> hummock grassland	17553	7.9	0.04

2.3 LAND SYSTEMS

An inventory of the land systems occurring in the Pilbara was completed by van Vreeswyk (2004). The survey aimed to provide a comprehensive description and mapping of the biophysical resources of the region, as well as an evaluation of the condition of soils and vegetation throughout. Each land system is classified into a particular land type defined by the landforms and vegetation it contains.

The survey area contains nine land systems: Newman, McKay, Boolgeeda, Jamindie, Turee, Cowra, Warri, Calcrete and Marsh (Figure 2.3). These land systems are described in greater detail in Table 2.2. The majority of land systems are well represented in the region with less than 1% of their total area occurring within the survey area. Exceptions are the Turee, Cowra, and Marsh land systems with 14.8 %, 22.8 % and 12.8 % of their total distribution in the Pilbara occurring within the survey area. Each of these land systems only occurs in the vicinity of the Fortescue Marsh and occupies a total of 0.1 – 0.5% of the Pilbara region. The Cowra and Turee land systems both fringe the Marsh land system that occurs within the Fortescue Marsh. They consist of alluvial plains with tussock grasses, snakewood and mulga shrublands with some halophytic vegetation. The marsh land system consists of irregularly inundated lake beds and floodplains and surrounding halophytic shrublands.

Table 2.2 – Land Systems of the Christmas Creek Survey area.

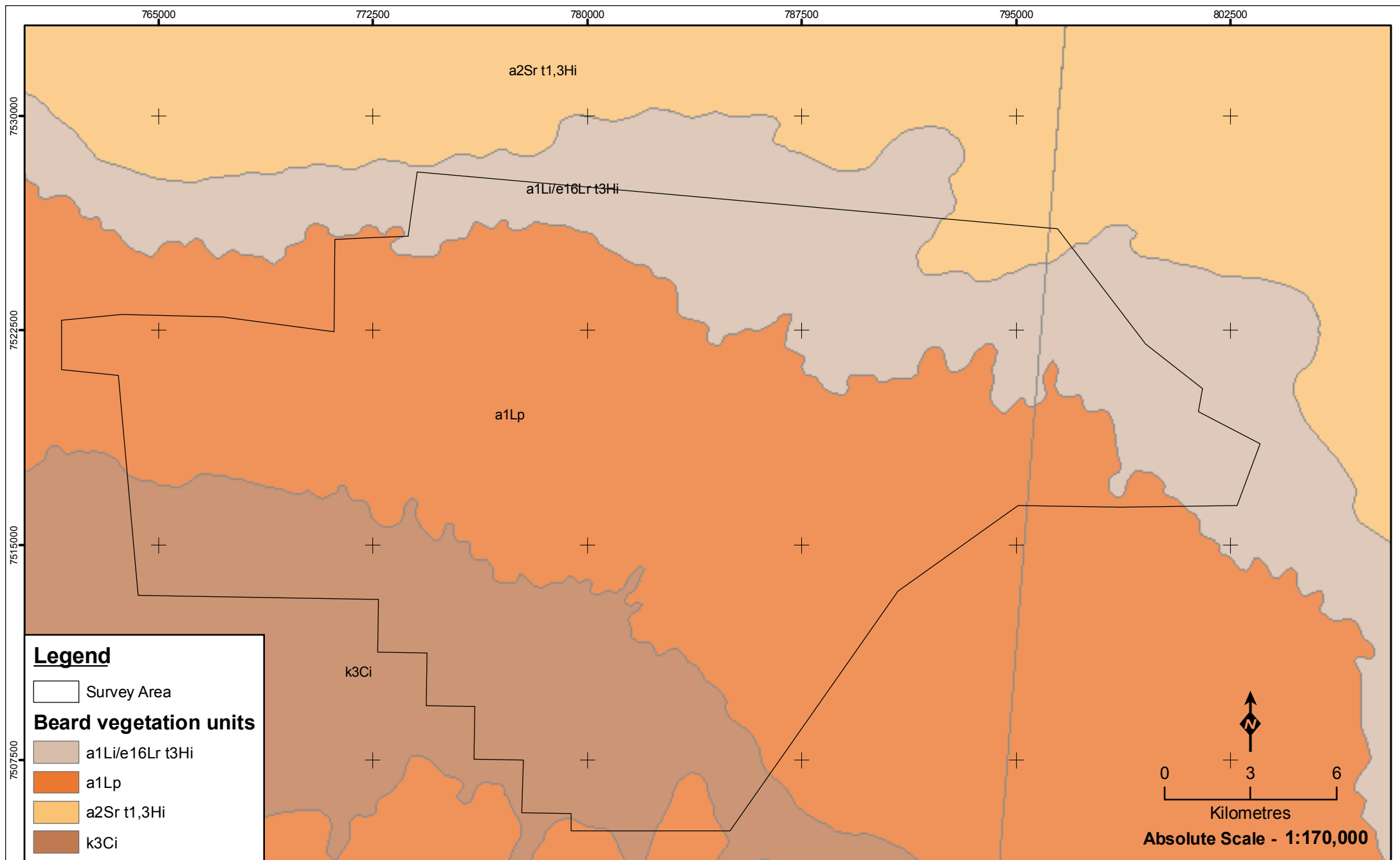
Land System	Description	Total Area in WA (km ²)	Area in Christmas Creek Survey area (km ²)	Percent of Total Land System (%)
<i>Land Type 1</i>	<i>Hills and ranges with spinifex grasslands</i>			
Newman	Rugged jaspilite plateaux, ridges and mountains supporting hard spinifex grasslands	19998	111.6	0.6
McKay	Hills, ridges, plateau remnants and breakaways of meta sedimentary and sedimentary rocks supporting hard spinifex grasslands	4275	18.0	0.4
<i>Land Type 8</i>	<i>Stony plains with spinifex grasslands</i>			
Boolgeeda	Stony lower slopes and plains below hills systems supporting hard and soft spinifex grasslands and mulga shrublands	9996	4.1	0.04
<i>Land Type 12</i>	<i>Wash plains on hardpan with groved mulga shrublands (sometimes with spinifex understorey)</i>			
Jamindie	Stony hardpan plains and rises supporting groved mulga shrublands, occasionally with spinifex understorey	11883	100.7	0.8
<i>Land Type 14</i>	<i>Alluvial plains with tussock grasslands or grassy shrublands</i>			
Turee	Stony alluvial plains with gilgaied and non-gilgaied surfaces supporting tussock grasslands and grassy shrublands	927	137.1	14.8
<i>Land Type 15</i>	<i>Alluvial plains with snakewood shrublands</i>			
Cowra	Plains fringing the Marsh land system and supporting snakewood and mulga shrublands with some halophytic undershrubs	203	46.2	22.8
<i>Land Type 18</i>	<i>Calcreted drainage plains with shrublands or spinifex grasslands</i>			
Warri	Low calcrete platforms and plains supporting mulga and cassia shrubs	2203	6.8	0.3
Calcrete	Low calcrete platforms and plains supporting shrubby hard spinifex grasslands	1670	0.02	0.001
<i>Land Type 20</i>	<i>Salt lakes and fringing alluvial plains with halophytic shrublands</i>			
Marsh	Lakebeds and floodplains subject to regular inundation, supporting samphire shrubland, salt water couch grasslands and halophytic shrubland	977	124.8	12.8

2.4 BIOGEOGRAPHY

The Interim Biogeographic Regionalisation for Australia (IBRA) classifies the Australian continent into regions (bioregions) of similar geology, landform, vegetation, fauna and climate characteristics (DEWHA 2004). According to IBRA (Version 6.1) the survey area is located in the Fortescue Plains subregion of the Pilbara bioregion. It runs parallel to the southern edge of the Chichester subregion, with a small amount of the Chichester subregion extending into the survey area in the north-east Christmas Creek area (Figure 2.4).

The Fortescue Plains subregion covers approximately 11 % of the Pilbara region. Characteristic features are alluvial plains and river frontages with salt-marsh, mulga-bunch grass and short grass communities on alluvial plains. River Gum woodlands fringe the drainage lines. An extensive calcrete aquifer feeds numerous permanent springs in the central Fortescue, supporting large permanent wetlands with extensive stands of river gum and cadjeput woodlands (DEC 2003). The Fortescue Plains subregion occupies an area of 2.04 million ha, with the dominant uses being grazing native pastures, unallocated Crown land and Crown reserves, conservation and Aboriginal land.

The Chichester subregion consists of Archaean granite and basalt plains including basaltic ranges. The plains support a shrub steppe characterised by *Acacia inaequilatera* over *Triodia pungens* hummock grasslands. *Eucalyptus leucophloia* tree steppe occurs on ranges (DEC 2003). The Chichester sub-region occupies an area of 9 million ha, with grazing native pastures, Aboriginal lands and reserves, unallocated Crown land and Crown reserves, and mining leases as the dominant land uses.



Legend

Survey Area

Beard vegetation units

- a1L/e16Lr t3Hi
- a1Lp
- a2Sr t1,3Hi
- k3Ci

**Beard Vegetation
of the Christmas Creek
Survey Area**

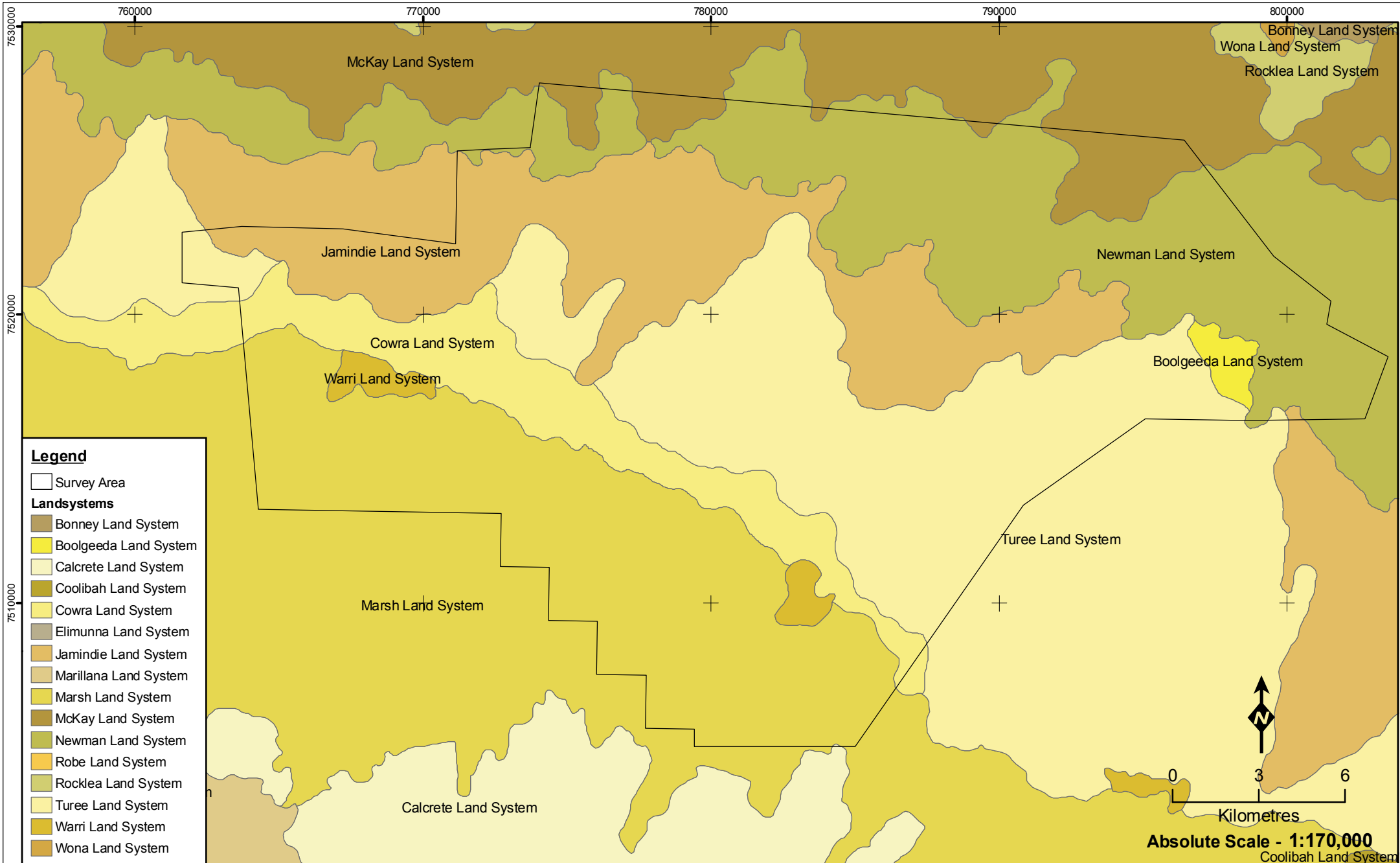
Figure: 2.2
Project ID: 1275

Drawn: AH
Date: 20/09/10

Coordinate System
Name: GDA 1994 MGA Zone 50
Projection: Transverse Mercator
Datum: GDA 1994

Unique Map ID: A216





Landsystems of the Christmas Creek Survey Area

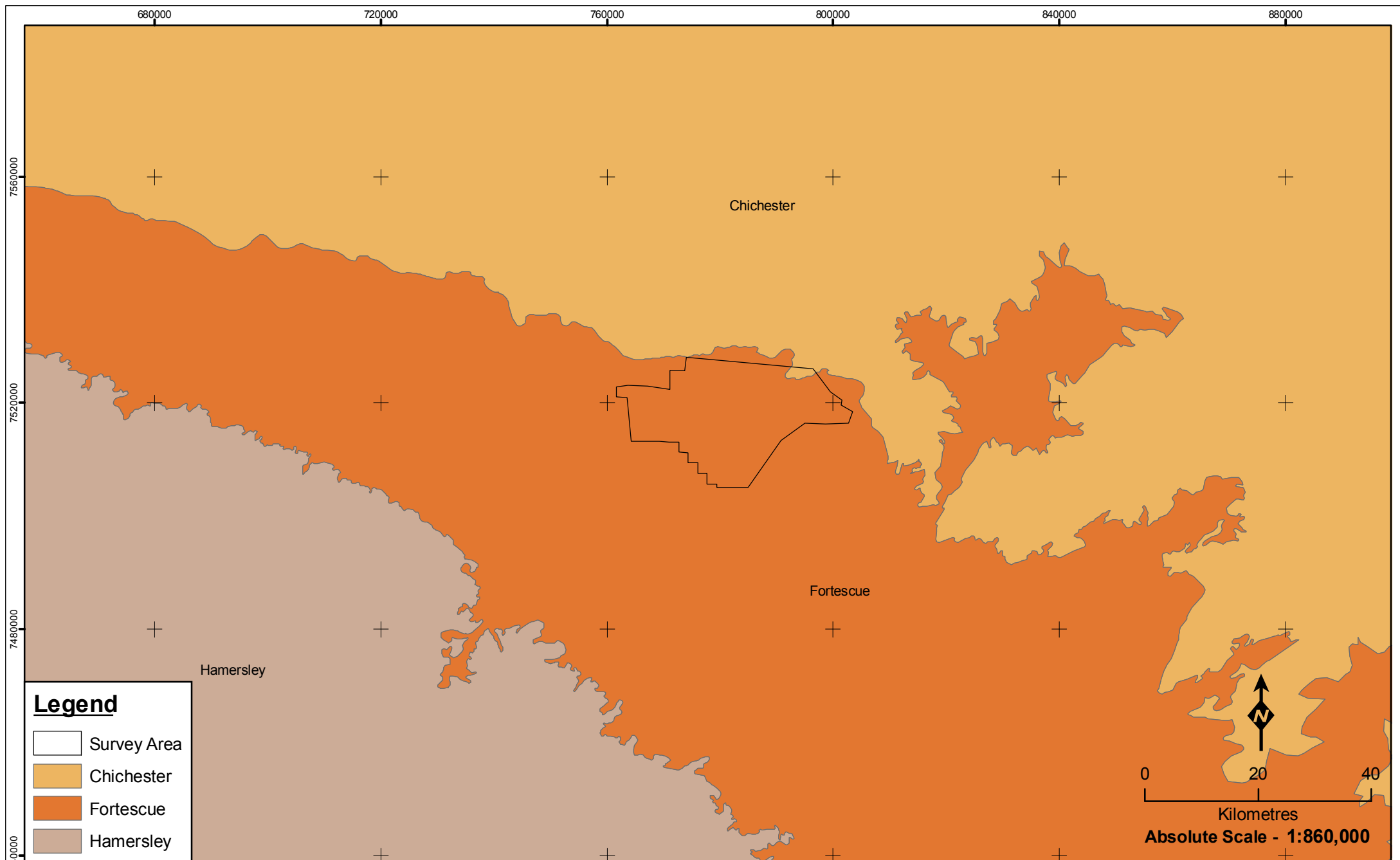
Figure: 2.3
Project ID: 1275

Drawn: AH
Date: 20/09/10

Unique Map ID: A217


A4

Coordinate System
Name: GDA 1994 MGA Zone 50
Projection: Transverse Mercator
Datum: GDA 1994



Legend

- Survey Area
- Chichester
- Fortescue
- Hamersley


 0 20 40
 Kilometres
Absolute Scale - 1:860,000



**Biogeographic Regions
of the Christmas Creek
Survey Area**

Figure: 2.4
Project ID: 1275

Coordinate System
 Name: GDA 1994 MGA Zone 50
 Projection: Transverse Mercator
 Datum: GDA 1994

Drawn: AH
Date: 20/09/10

Unique Map ID: A227

A4

3 METHODS

A desktop assessment of the recorded fauna of the project and surrounding areas was undertaken by *ecologia* in July/August 2010. This assessment comprised a review of available published and unpublished reports and documents (Table 3.1), and formal and informal searches of internal and government databases (Table 3.2). The conservation classification, at both a state and federal level, of all fauna potentially occurring in the area was determined by referring to the EPBC Act, WC Act and DEC Priority fauna list.

Table 3.1 – Previous Biological Survey Reports within 50 km of the Survey Area.

Survey Location and Author(s)	Distance to survey area (km)	Comments
Cloudbreak (Bamford 2005)	0	Two phases of Level 2 survey
FMG Stage B (Biota 2005)	0	Two phases of Level 2 survey
Targeted Night Parrot Surveys (Bamford 2006; 2009; 2010)	0	Targeted surveys for Night Parrot using a variety of techniques
RGP5 Jimblebar to Yandi (ENV 2008)	20 - 80	Level 1 survey
RGP5 Mining Lease M270SA (ENV 2008)	25	Level 1 survey

Table 3.2 – Fauna Databases Searches.

Database	Search Details
<i>ecologia</i> internal database	Results of numerous Level 1 and Level 2 surveys within 50 km of the survey area
Department of Environment and Conservation (DEC) Threatened and Priority Fauna Database	Conservation significant fauna records within 50 km of the survey area
DEC NatureMap	Results of fauna surveys within 40 km of the survey area
Birds Australia Birdata	Results of bird surveys within 50 km of the survey area
Department of Environment, Heritage, Water and the Arts (DEWHA) protected matters database	EPBC Act listed species within 50 km of the survey area

4 FAUNA

The potential fauna assemblage of the survey area was determined using the results of database searches and records of previous surveys within 50 km of the survey area. A comparison of the number of species recorded during regional surveys is presented in Table 4.1.

The potential fauna assemblage of the area comprises 33 native and 9 introduced mammal species, 165 bird species, 95 reptile species, and five amphibian species (Appendix B). Surveys within the adjacent Cloudbreak area of Chichester Operations have recorded 62 % of the native mammals, 84 % of the birds and 80 % of the amphibians potentially occurring there, with a particularly diverse range of bird species recorded. This high diversity is also likely to occur within the survey area due to the wide range of fauna habitat types present found, incorporating wetlands, mulga woodland and the foot slopes of the Chichester Range.

Table 4.1 – Summary of Previous Survey Results.

Survey	Mammals	Birds	Reptiles	Amphibians
	Native (introduced)			
<i>ecologia</i> internal database	24(7)	122	77	2
FMG Stage B Rail Corridor	16(5)	101	42	2
Jimblebar to Yandi	1(3)	52	16	0
Mining Lease M270SA	1(0)	6	3	0
NatureMap	18(4)	98	71	0
Birddata	n/a	106	n/a	n/a
Cloudbreak	21(8)	138	31	4
Total	33(9)	165	95	5

5 FAUNA HABITATS

Based on a review of aerial photography and vegetation surveys previously conducted in the area (Biota 2004; Mattiske Consulting 2005a; Mattiske Consulting 2007) there are four broad fauna habitats present within the survey area (Figure 5.1):

- Low halophytic shrubland.
- Low mulga and other acacia woodland.
- Spinifex-covered hills and ranges.
- Creeklines and wells with acacia shrubland and/or eucalypt open woodland.

These habitats are broadly reflected by both the land system and vegetation mapping, occurring in three main east-west running strips. The halophytic shrubland occurs within the boundary of the Fortescue Marsh, moving into low mulga woodland on alluvial flats (Jamindie and Turee land systems), followed by the spinifex-covered hills and ranges of the Newman and McKay land systems. Running north-south into the Fortescue Marsh are creek and drainage lines supporting either acacia shrubland or eucalypt woodland.

Aerial photography and vegetation mapping was available for all areas of the survey area and was used to predict fauna habitats. However, ground truthing would be required to determine finer scale fauna habitats, for example rocky breakaways within the spinifex hills or areas with a sandy substrate or cracking clay within the mulga woodland.

5.1 LOW HALOPHYTIC SHRUBLAND

The Fortescue Marsh consists of areas of permanent, semi-permanent and ephemeral water bodies surrounded by low halophytic shrubland primarily consisting of *Halosarcia* species with *Muellerolimon salicorniaceum* and other mixed chenopod species. After periods of heavy rain the entire Fortescue Marsh becomes inundated, providing suitable nesting habitat for thousands of waterbirds including pelicans, herons and egrets, cormorants, swans and ducks. As a result, the Fortescue Marsh is an important ecological area within the Pilbara, being classed as an Ecologically Sensitive Area (ESA), an Important Bird Area (IBA) and a Priority Ecological Community (PEC). During the dry season, small pools of water provide an important water source for many species and provides habitat for many waterbird species, including migratory species listed under international agreements (e.g. Common Greenshank, Wood Sandpiper, Red-necked Stint).

Areas of dense low halophytic vegetation are likely to provide suitable habitat for the Night Parrot, (EPBC Act Endangered) which has previously been recorded drinking water from a well approximately 30 km west of the survey area. Areas with a sandy substrate, located above the high-water mark, may also provide potential burrowing habitat for the Bilby (EPBC Act Vulnerable). Very little of this area has been surveyed extensively for fauna.

5.2 MULGA WOODLAND

Mulga woodland is the dominant habitat type running east-west through the centre of the survey area. The mulga woodland consists of open to moderate mulga (*Acacia aneura*) and other mixed *Acacia* spp. low woodland over scattered *Eremophila*, *Senna*, and mixed *Acacia* shrubs. An understorey of spinifex is also present in some areas. Surveys of the neighbouring Cloudbreak area

recorded the mulga woodland as being in various condition with some areas in good condition while others were highly degraded with little or no understorey due to frequent recent fires and grazing (FMG 2005; Mattiske Consulting 2005b). The mulga woodland of the Christmas Creek survey area is likely to be in similar condition.

Within mulga woodland, dead wood, stumps and peeling bark provided habitat for geckos and other small reptiles such as *Gehyra variegata*, which inhabit bark and dead trees, and Fat-tailed Gecko which inhabit spider burrows. Reptile species found solely or predominantly in the mulga woodlands included Mulga Dragon, Western Netted Dragon, and Stripe-tailed Monitor. Several bird species are also typically associated with mulga woodlands, such as Chestnut-rumped Thornbill, Hooded Robin and Red-capped Robin. These species typically forage and nest amongst the mulga trees.

A small amount of cracking clay habitat has been recorded within the survey area (Biota 2005) and it is likely that additional areas occur since cracking clays are known to occur in the Jamindie, Cowra, Marsh and Turee land systems. Several fauna species are strongly associated with cracking clays, including *Diplodactylus mitchelli*, Northern Short-tailed Mouse, Planigale, and Stripe-faced Dunnart.

Species of conservation significance that can be found in mulga woodland habitat include Greater Bilby (EPBC Act Vulnerable), Brush-tailed Mulgara (DEC Priority 4), Australian Bustard (DEC Priority 4), Bush Stone-curlew (DEC Priority 4) and Northern Short-tailed Mouse (DEC Priority 4).

5.3 SPINIFEX COVERED HILLS AND RANGES

The spinifex hillslopes correspond to Beard's (1975) tree steppe and the Newman and McKay land systems, running in an east-west strip across the northern edge of the survey area. This habitat type consists of scattered eucalypts and acacias (e.g. *Eucalyptus leucophloia* and *Acacia pyrifolia*) over spinifex grassland. The ground is typically a red loam-clay and covered with a layer of small to medium-sized pebbles.

A distinct suite of species occurs in this habitat type. The spinifex provides excellent shelter from the heat and protection from predators for many species of skink and dragon which forage for insects between the spinifex clumps. The pebble-covered footslopes also provide ideal habitat for the Western Pebble-mouse and numerous mounds have been observed in these areas (Bamford 2005).

Although the majority of this habitat consists of low rolling hills, along the top of some hills, small rocky ridges and breakaways can occur. The large rocks and crevices present in this habitat type provide habitat for numerous species and several rocky range specialists can be found in this habitat type. Examples include Ring-tailed Dragon, Spiny-tailed Monitor, Painted Finch, and Pygmy Python. If the rocky areas contain large boulder piles there is the potential for Northern Quoll to be present. If caves form then these can also provide roosting areas for bat species, including the conservation significant Ghost Bat and Pilbara Leaf-nosed Bat. One potential roost cave for Ghost Bats was noted during surveys in the Christmas Creek area, although the presence of bats was not confirmed.

Species of conservation significance that can be found in this habitat type include Long-tailed Dunnart (DEC Priority 4), Northern Quoll (EPBC Act Endangered), Peregrine Falcon (WC Act Schedule 4), *Ramphotyphlops ganei* (DEC Priority 4), Western Pebble-mouse (DEC Priority 4), Ghost Bat (DEC Priority 4), and Pilbara Leaf-nosed Bat (EPBC Act Vulnerable).

5.4 CREEKLINES AND WATER SOURCES

The survey area contains numerous small to large sized creeklines, typically running north-south and emptying into the Fortescue Marsh. The riverine vegetation consists primarily of tall eucalypts

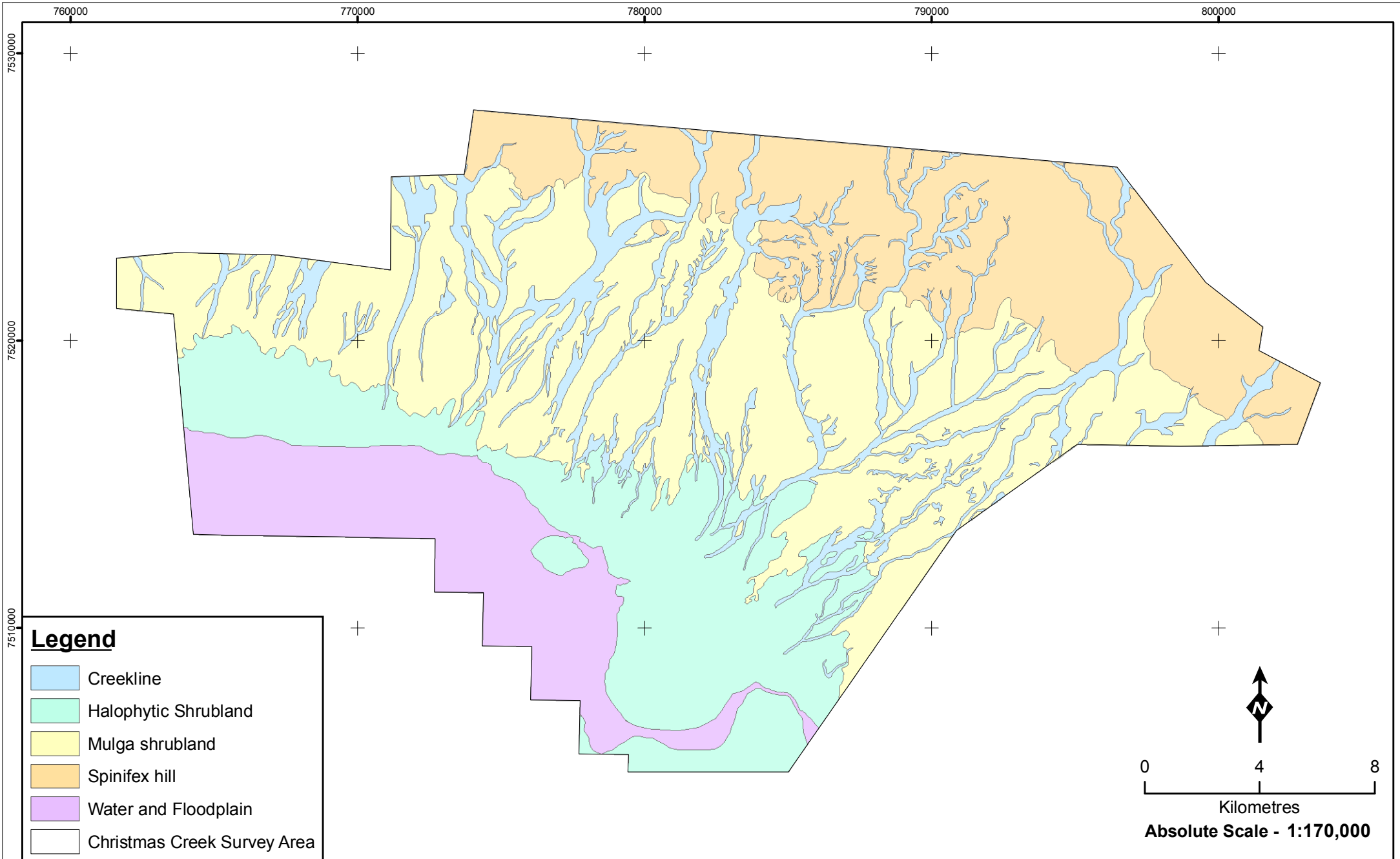
bordering the sandy or gravel creekbed, with acacia shrubs and tussock grass covering the riparian area.

All the creeklines dry up over the dry winter months, although some wells and pools can provide a permanent or semi-permanent water source. These permanent water sources are likely to represent an important water source to the local animals. Numerous species were recorded at the Roy Hill pools, both within and just to the east of the survey area during a brief survey in December 2009 (Bamford 2010).

Accumulations of leaf litter below the eucalypts and along the watercourses provides good habitat for fossorial reptiles such as *Lerista bipes* and *Lerista muelleri*, while the eucalypts provide habitat for the Long-nosed Dragon. Gwardar are also typically common in this habitat type, possibly due to the high abundance of a potential prey species, the House Mouse.

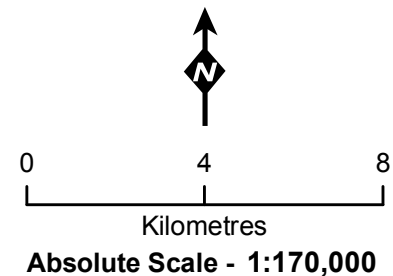
River systems and water sources often have a higher density and diversity of bird species than other habitats. Many bird species show preference for this habitat type, in particular foraging and nesting in the eucalypts. These species include White-plumed Honeyeater, Weebill, and Rainbow Bee-eater (EPBC Act Migratory).

Many of the small insectivorous bat species occur in this habitat type due to the abundance of insects around water bodies. Some species will roost in hollow eucalypt branches or under bark. Northern Quoll can also occur along water courses, utilising hollow logs as shelter.



Legend

- Creekline
- Halophytic Shrubland
- Mulga shrubland
- Spinifex hill
- Water and Floodplain
- Christmas Creek Survey Area



**Fauna Habitat Types
of the Christmas Creek
Survey Area**

Figure: 5.1
Project ID: 1275

Drawn: AH
Date: 20/09/10

Coordinate System
Name: GDA 1994 MGA Zone 50
Projection: Transverse Mercator
Datum: GDA 1994

Unique Map ID: A251

6 CONSERVATION SIGNIFICANT FAUNA

Based on database and literature searches from within 50 km of the survey area, there is the potential for 25 species of conservation significance to occur in the area. Eight of these species have been recorded within the survey area (either directly or through secondary evidence; Figure 6.1, Figure 6.2). Based on previous records and the fauna habitats present, a total of 21 conservation significant species have a high or medium likelihood of occurrence within the survey area (Table 6.1). These species are described in greater detail below and summarised in Table 6.3. Species with a low likelihood of occurrence are summarised in Appendix C.

Table 6.1 – Conservation Significant Species with a High or Medium Likelihood of Occurrence in the Survey area.

Species	EPBC Act	WC Act	DEC
Northern Quoll	EN	S1	
Night Parrot	EN	S1	
Greater Bilby	VU	S1	
Pilbara Leaf-nosed Bat	VU	S1	
Fork-tailed Swift	M	S3	
White-bellied Sea-eagle	M	S3	
Rainbow Bee-eater	M	S3	
Eastern Great Egret	M	S3	
Wood Sandpiper	M	S3	
Common Greenshank	M	S3	
Red-necked Stint	M	S3	
Peregrine Falcon		S4	
<i>Ramphotyphlops ganei</i> (Blind Snake)			P1
Long-tailed Dunnart			P3
Western Pebble-Mouse			P4
Brush-tailed Mulgara			P4
Northern Short-tailed Mouse			P4
Ghost Bat			P4
Bush Stone-curlew			P4
Australian Bustard			P4
Grey Falcon			P4

The likelihood of a conservation significant species being present within the project was determined by examining the following:

- fauna habitats and their condition known to exist within the survey area;
- distance of previously recorded conservation significant species from the survey area;
- frequency of occurrence of conservation significant species records in the region; and
- time surpassed since conservation significant species were recorded within, or outside, the survey area.

For each conservation significant species potentially occurring in the survey area, the examined factors were collated, and assigned to their corresponding category (Table 6.2).

Table 6.2 – Likelihood of Occurrence Categories.

RECORDED	species previously recorded within survey area
HIGH	species recorded within, or in proximity to, the survey area within 50 yrs; suitable habitat occurs
MEDIUM	species recorded outside survey area, but within 100km; limited suitable habitat occurs
LOW	species rarely, or not recorded, within 100km and/or suitable habitat does not occur

Table 6.3 – Conservation Significant Fauna Potentially Occurring in the Survey area.

Species	Conservation Significance			Habitat	Previous Records	Likelihood of Occurrence
	EPBC Act	WC Act	DEC			
Mammals						
Northern Quoll (<i>Dasyurus hallucatus</i>)	EN	S1		Rocky areas, also eucalypt forest and woodland	An individual recorded 3km west of survey area in 1980 (NatureMap). Scats recorded from Mt Nicholas and within Cloudbreak area (Biota 2005).	MEDIUM Secondary evidence of presence and a single record adjacent to survey area. Some suitable habitat may occur in rocky areas and major creeklines.
Greater Bilby (<i>Macrotis lagotis</i>)	VU	S1		Spinifex hummock grassland and acacia scrub	Record of an individual 50 km west of survey area (Biota 2005), and recently active burrows 8 km west of survey area (Bamford 2005).	MEDIUM Burrows recorded to the west of Christmas Creek in Cloudbreak. Areas of suitable habitat present along marsh and in mulga woodland.
Pilbara Leaf-nosed Bat (<i>Rhinonictis aurantia</i>)	VU	S1		Roosts in caves with high humidity and temperature	Record from Cloudbreak, 40 km west of survey area (<i>ecologia</i> internal database).	MEDIUM No suitable roosting habitat but will occasionally forage within the survey area.
Ghost Bat (<i>Macroderma gigas</i>)			P4	Caves, rockpiles and abandoned mines	Records from Cloudbreak (Bamford 2010), Roy Hill and Chichester Ranges (Biota 2005).	MEDIUM Record of an individual foraging along edge of marsh in Cloudbreak. No suitable roosting habitat but may occasionally forage within the survey area.
Western Pebble-mouse (<i>Pseudomys chapmani</i>)			P4	Spurs and rocky hills with many small pebbles vegetated by spinifex	Active mounds recorded from Cloudbreak (Bamford 2005), FMG B corridor and Christmas Creek (Biota 2005) and numerous surveys surrounding the survey area (<i>ecologia</i> internal database).	HIGH Numerous active mounds recorded within and surrounding the survey area. Large amount of suitable habitat along spinifex hillslopes.
Northern Short-tailed Mouse (<i>Leggadina lakedownensis</i>)			P4	Spinifex and tussock grassland on cracking clays. Also acacia shrubland, samphire, woodlands, stony ranges	Several records from FMG Stage B Rail Corridor including within Christmas Creek area (Biota 2005).	RECORDED Recorded from Christmas Creek, primarily from tussock grasslands on cracking clay but also a range of other habitat types.

Species	Conservation Significance			Habitat	Previous Records	Likelihood of Occurrence
	EPBC Act	WC Act	DEC			
Long-tailed Dunnart (<i>Sminthopsis longicaudata</i>)			P4	Rocky habitat with spinifex or open habitat with a rocky mantle	Recorded from FMG rail corridor near Mt Nicholas (Biota 2005).	MEDIUM Few records north of Fortescue Marsh, but similar habitat to where it was recorded at Mt Nicholas present along spinifex hillslopes.
Brush-tailed Mulgara (<i>Dasyercus blythi</i>)			P4	Sandy areas with moderately dense spinifex with 'runways' between clumps	Records from FMG Stage B Rail Corridor, near Mt Nicholas (Biota 2005). Potential burrows recorded within Cloudbreak area.	MEDIUM Potential burrows observed at Cloudbreak, but no evidence of individuals recorded. Small amount of suitable habitat in survey area.
Birds						
Night Parrot (<i>Pezoporus occidentalis</i>)	EN	S1		Triodia hummock grassland or chenopod shrublands. Thick unburnt vegetation most suitable	Record from Cloudbreak (Bamford 2005), but no further records despite annual targeted surveys.	MEDIUM Recorded from Minga Well at Cloudbreak, may occur in the samphire and spinifex country of the Fortescue Marshes at Christmas Creek.
Fork-tailed Swift (<i>Apus pacificus</i>)	M	S3		Almost entirely aerial, particularly associated with storm fronts	Record from Mindy Mindy in association with a storm front (Biota 2005).	MEDIUM Highly nomadic aerial species. Will occasionally overfly survey area but will not utilise it directly.
White-bellied Sea-eagle (<i>Haliaeetus leucogaster</i>)	M	S3		Coastal and near coastal water bodies	Records from Minga Well (<i>ecologia</i> internal database) and the Fortescue Marsh within Christmas Creek area (Bamford 2010).	RECORDED Uncommon in area, although suitable habitat present along Marsh where water present.
Rainbow Bee-eater (<i>Merops ornatus</i>)	M	S3		Open country, most vegetation types, dunes, banks.	Recorded from almost all surveys within and surrounding the survey area (Bamford 2010); (Biota 2005) .	RECORDED Recorded within survey area. Suitable habitat for hunting and breeding.
Eastern Great Egret (<i>Ardea modesta</i>)	M	S3		Floodwaters, rivers, shallows of wetlands, intertidal mud-flats	Recorded at Roy Hill (Bamford 2010) and several records from Fortescue River (Birdata).	HIGH Suitable hunting habitat present in permanent pools or when water present in marsh and along creeklines

Species	Conservation Significance			Habitat	Previous Records	Likelihood of Occurrence
	EPBC Act	WC Act	DEC			
Wood Sandpiper (<i>Tringa glareola</i>)	M	S3		Freshwater swamps, river pools, claypans, salt lakes	Record from Fortescue Marsh, within survey area (Bamford 2010).	RECORDED Suitable hunting habitat present in permanent pools or when water present in marsh and along creeklines
Common Greenshank (<i>Tringa nebularia</i>)	M	S3		Coastal and inland lakes	Record from Fortescue Marsh, within survey area (Bamford 2010).	RECORDED Suitable hunting habitat present in permanent pools or when water present in marsh and along creeklines
Red-necked Stint (<i>Calidris ruficollis</i>)	M	S3		Coastal and inland shorelines	Record from Fortescue Marsh within 10 km of survey area (Bamford 2010).	HIGH Suitable hunting habitat present in permanent pools or when water present in marsh and along creeklines
Peregrine Falcon (<i>Falco peregrinus</i>)		S4		Coastal cliffs, riverine gorges and wooded watercourses	Recorded from Christmas Creek, Roy Hill, FMG Stage B rail corridor (Biota 2005) and Cloudbreak areas (Bamford 2010).	RECORDED Recorded hunting within survey area. Suitable hunting habitat along rivers and gorges. Some potential breeding habitat in rocky areas.
Bush Stone-curlew (<i>Burhinus grallarius</i>)			P4	Lightly wooded country next to daytime shelter of thickets or long grass	Several records from within and surrounding survey area (Biota 2005).	RECORDED Recorded within survey area and suitable habitat for foraging and breeding present along creeklines throughout the mulga woodland.
Australian Bustard (<i>Ardeotis australis</i>)			P4	Open grasslands, chenopod flats and low heathland	Recorded from most surveys within and surrounding survey area (Biota 2005).	RECORDED Recorded within survey area and suitable habitat for foraging and breeding present throughout the mulga woodland.
Grey Falcon (<i>Falco hypoleucos</i>)			P4	Lightly wooded coastal and riverine plains.	Recorded from along Sandy Creek in Cloudbreak (Bamford 2010) , and Nullagine (DEC records).	HIGH Recorded adjacent to survey area. Wide-ranging species. Some suitable habitat for hunting and breeding along creeklines.

Species	Conservation Significance			Habitat	Previous Records	Likelihood of Occurrence
	EPBC Act	WC Act	DEC			
Reptiles						
<i>Ramphotyphlops ganei</i>			P1	Unknown. Possibly associated with moist gorges and gullies	Recorded 20 km east of Christmas Creek (<i>ecologia</i> internal database).	HIGH Species rarely recorded, but suitable habitat present in gullies throughout area of spinifex hillslopes.

Note: Description of conservation significant codes provided in Appendix A.

770000

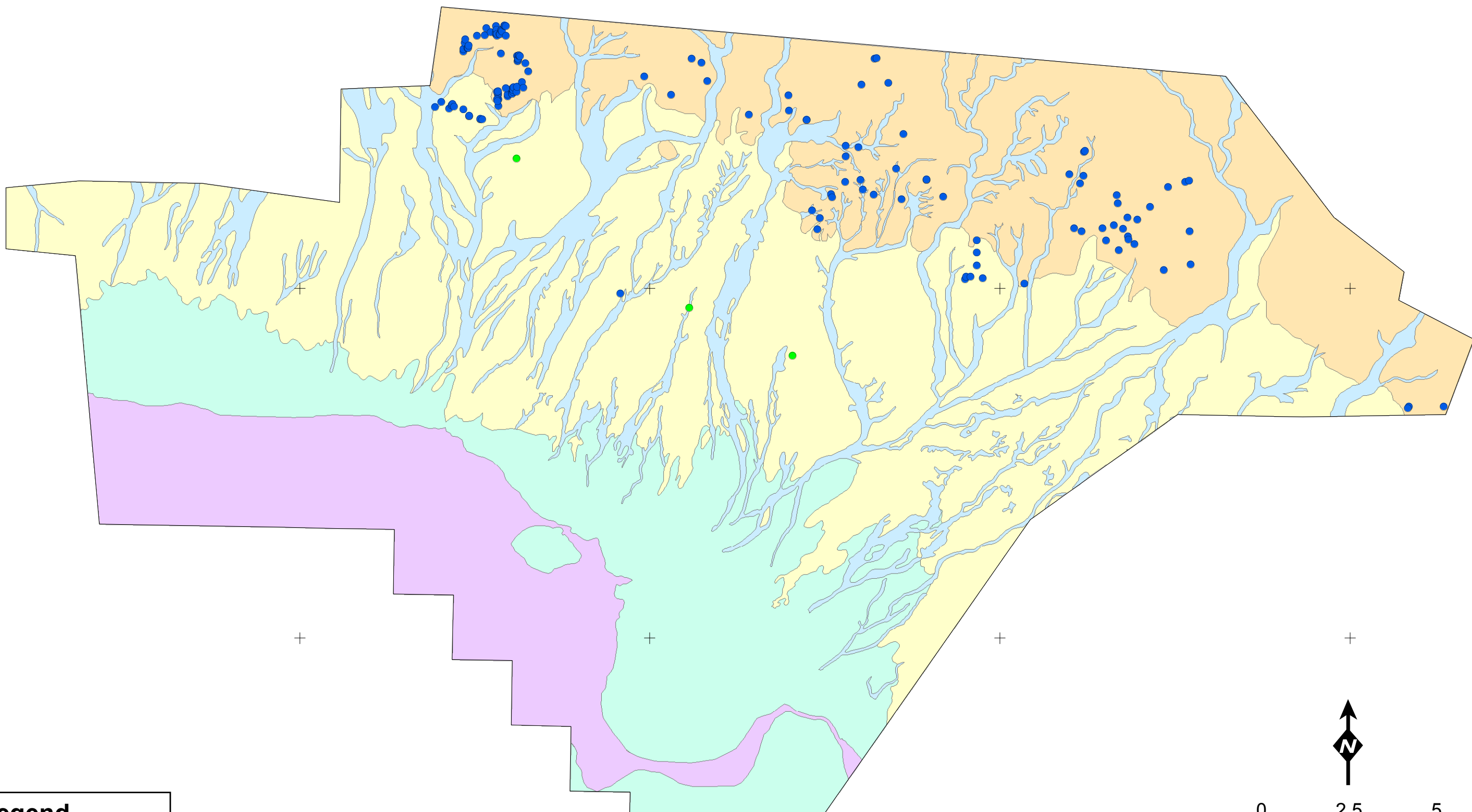
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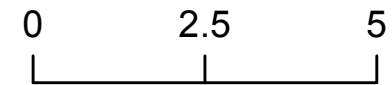
7520000

7510000



Legend

- Pebble Mouse Mound
- Short-tailed Mouse



Absolute Scale - 1:110,000



**Conservation Significant
Mammals Recorded within the
Christmas Creek Survey Area**

**Figure: 6.1
Project ID: 1275**

**Drawn: AH
Date: 20/09/10**

Coordinate System
Name: GDA 1994 MGA Zone 50
Projection: Transverse Mercator
Datum: GDA 1994

Unique Map ID: A228

770000

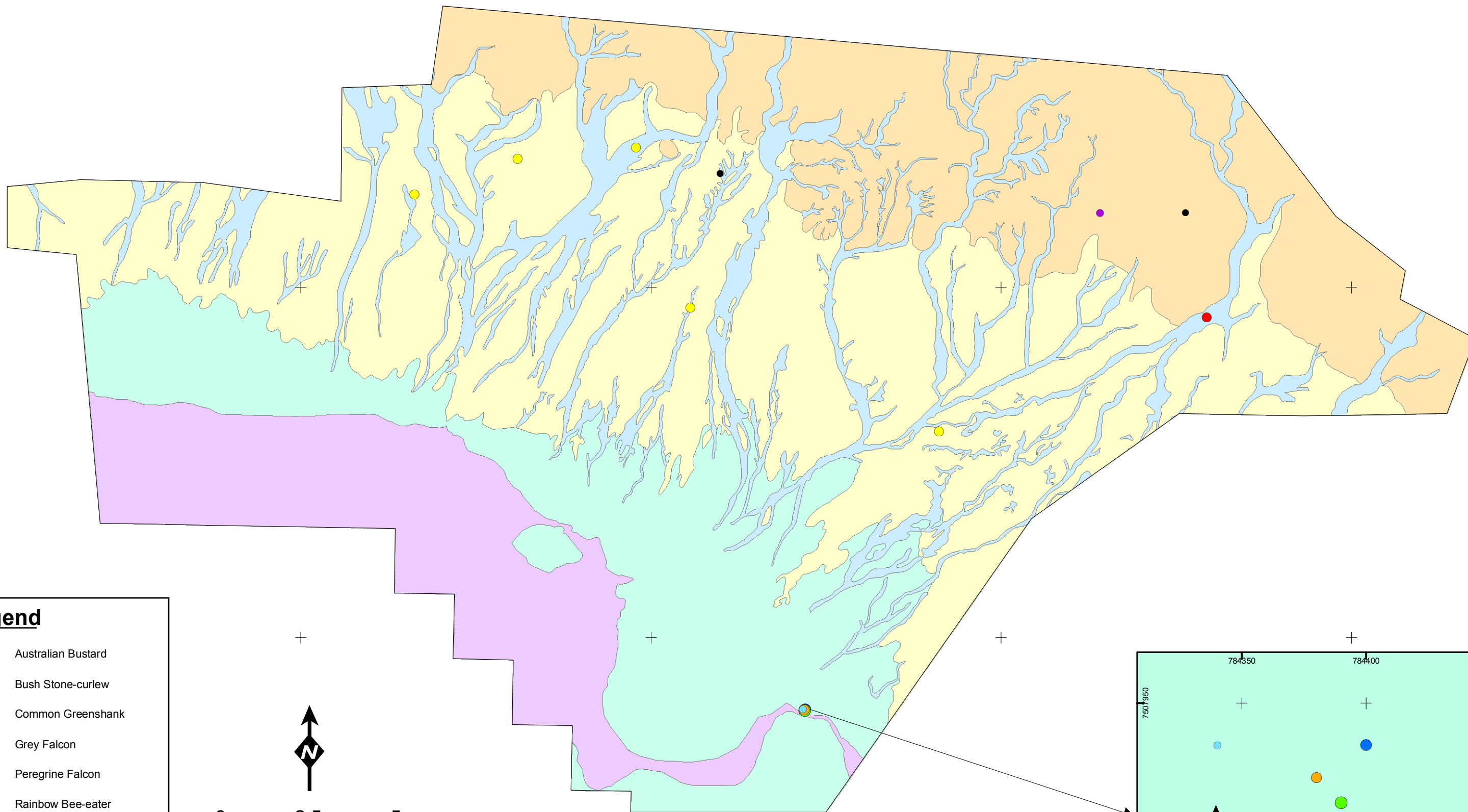
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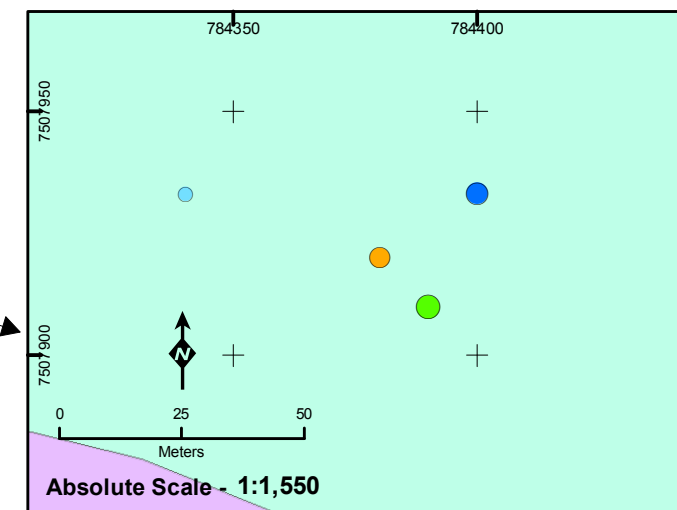
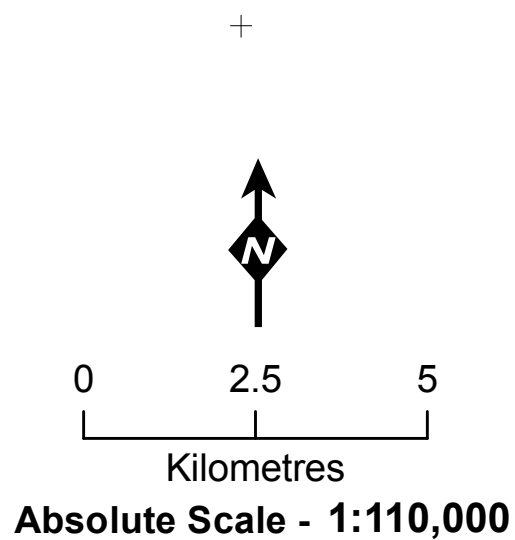
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7510000



Legend

- Australian Bustard
 - Bush Stone-curlew
 - Common Greenshank
 - Grey Falcon
 - Peregrine Falcon
 - Rainbow Bee-eater
 - White-bellied Sea-eagle
 - Wood Sandpiper
- Christmas Creek Survey Area



Conservation Significant Birds Recorded within the Christmas Creek Survey Area

Figure: 6.2
Project ID: 1275

Drawn: AH
Date: 20/09/10

Coordinate System
Name: GDA 1994 MGA Zone 50
Projection: Transverse Mercator
Datum: GDA 1994

Unique Map ID: A252

6.1 MAMMALS

6.1.1 Northern Quoll (*Dasyurus hallucatus*)

Conservation Status: EPBC Act Vulnerable, WC Act Schedule 1

Distribution and Habitat: Northern Quolls formerly occurred across northern Australia from the Pilbara region in Western Australia to south-eastern Queensland. A 75% reduction in habitat range occurred during the 20th century, so that the species is now restricted to the Pilbara and north Kimberley in Western Australia and a few discrete populations across the Northern Territory and eastern Queensland (Braithwaite and Griffiths 1994). Northern Quolls are most common on dissected rocky escarpments, but are also found in eucalypt forest and woodland (Oakwood 2008).

Ecology: Northern Quolls are the smallest of the Australian quolls. They are both arboreal and terrestrial and use a variety of den sites including rock crevices, tree hollows, logs, termite mounds, house roofs and goanna burrows (Oakwood 2008). Northern Quolls are nocturnal and opportunistic omnivores feeding primarily on small vertebrates, large insects and soft fruits. Breeding tends to occur near creeklines, where individuals go to drink when water is available.

The most common cause of adult mortality is predation by dingoes, feral cats, snakes, owls and kites (Maxwell *et al.* 1996; Oakwood 2008). Other causes of mortality include domestic dogs, motor vehicles and pesticide poisoning. The level of predation is increased through the removal of groundcover by fire.

Likelihood of Occurrence: There are very few records of Northern Quoll from the southern Chichester region, with the closest record along a large creekline 3km west of the survey area in the Cloudbreak area (Global Biodiversity Information Facility; NatureMap). Northern Quoll scats have also been recorded from rocky areas within the Cloudbreak area (Biota 2005). Aerial photography only shows limited areas of rocky breakaways that may provide a small amount of suitable denning habitat for Northern Quoll. A few large creeklines running through the survey area may also provide some habitat. Overall, due to the small amount of suitable habitat present, it is not expected that many, if any, Northern Quolls are resident within the survey area. Individuals, especially males, are likely to occasionally move through the area in search of food, water or females.

6.1.2 Greater Bilby (*Macrotis lagotis*)

Conservation Status: EPBC Act Vulnerable, WC Act Schedule 1

Distribution and Habitat: Once common over 70% of mainland Australia's arid and semiarid regions, Greater Bilbies are currently patchily distributed through the Tanami, Great Sandy and Gibson Deserts (Maxwell *et al.* 1996). Isolated populations also occur in south-west Queensland and to the north-east of Alice Springs. Bilbies occur in a variety of habitats, including spinifex grassland, acacia shrubland, open woodland, and cracking clays (Maxwell *et al.* 1996; Johnson 2008). The species underwent a sudden and widespread collapse in population size in the early 1900s, and the distribution may still be contracting and fragmenting. Reasons for the decline include predation by feral predators on both young and adult bilbies, competition from rabbits and livestock, reduced food as a result of changed fire regimes, and drought (Maxwell *et al.* 1996; O'Malley 2006; Johnson 2008).

Ecology: The Bilby is a nocturnal marsupial with soft silky fur (Pavey 2006a). It uses its strong forelimbs and claws to construct an extensive tunnel system of up to 3 metres long and 1.8 metres deep in which it shelters during the day. Its long tongue is an adaptation to their specialised diet of seeds, insects, bulbs, fruit and fungi (Johnson 2008).

Likelihood of Occurrence: A Bilby was recorded from near Kardardarrie Well, 8 km west of the survey area in 2004 (Biota 2005). A dead individual was also recorded from Mulga Downs Station in 1997 (DEC database). Bilby burrows, thought to have been recently used, were recorded in 2005 near Cockeye Bore within the Cloudbreak area (Bamford 2005). Numerous diggings have also been recorded from across the survey area, potentially from Bilbies although this has not been confirmed. Bilbies therefore occur, on at least an occasional basis, within the mulga woodland of the Cloudbreak area and are likely to occur in areas of similar habitat within the Christmas Creek area. Areas of sandy or sandy-loam soil along the edge of the Fortescue Marsh may also provide suitable habitat. There is currently no evidence of any resident individuals within the survey area, although additional surveys are warranted.

6.1.3 Pilbara Leaf-nosed Bat (*Rhinioncteris aurantia*)

Conservation Status: EPBC Act Vulnerable, WC Act Schedule 1

Distribution and Habitat: The Pilbara Leaf-nosed Bat is the Pilbara form of the Orange Leaf-nosed Bat (*Rhinioncteris aurantia*). While it is considered a separate form, formal reclassification has been hampered by the small sample size of the Pilbara population (Armstrong 2008). Recent evidence suggests two main stronghold areas for the Pilbara Leaf-nosed Bat; in the western Pilbara and north of Marble Bar (Armstrong 2008). In the western Pilbara, they roost in caves formed in gorges that dissect siliceous sedimentary geology. They are most often observed in flight over waterholes in gorges, although they are rare even in the Hamersley Ranges where this habitat is common (Armstrong 2008). The Pilbara Leaf-nosed Bat chooses roosts in areas of high relief with gorges and watercourses (Armstrong 2001).

Ecology: At dusk Pilbara Leaf-nosed Bats emerge from their roosting sites to feed on insects (Van Dyck and Strahan 2008). They are susceptible to disturbance and will abandon roost caves if disturbed. Colonies in mines in the eastern Pilbara are subject to several pressures including human visitation and the collapse and flooding of disused mines (Armstrong 2008; DEWHA 2008b).

Likelihood of Occurrence: Pilbara Leaf-nosed Bats are known from the Hamersley and Chichester Ranges, but have rarely been recorded close to the Fortescue Marsh. Anabat recordings of the species were made from Thieves Well, in the north-west of the adjacent Cloudbreak area in April 2010 (*ecologia* internal database). No roosting habitat for the species has been recorded within the survey area, but they are likely to roost elsewhere and occasionally visit the area to hunt.

6.1.4 Ghost Bat (*Macroderma gigas*)

Conservation Status: DEC Priority 4

Distribution and Habitat: The Ghost Bat has a patchy but widespread distribution across northern Australia. Preferred roosting habitats in the Pilbara include caves beneath bluffs of low, rounded hills composed of Marra Mamba geology, and granite rock piles. They have also been known to roost in large colonies within sandstone caves, under boulder piles and in abandoned mines (Churchill 1998).

Ecology: The Ghost Bat is carnivorous and takes prey to an established feeding site to be eaten. These feeding sites are usually a rock overhang or small cave, and are easily recognised by the accumulation of discarded prey parts littering the floor (Richards *et al.* 2008). Foraging occurs in an area of approximately 60 ha, in a radius of approximately two kilometres from its roost (Tidemann *et al.* 1985). Colonies typically consist of a few bats to over 400 (Richards *et al.* 2008).

The species is regarded as being shy of human presence and may abandon its roost if disturbed. This makes the species of considerable conservation concern since, although Ghost Bats disperse widely when not breeding, to date only 10 maternity sites have been found (Richards *et al.* 2008).

Likelihood of Occurrence: A single ghost bat was trapped in a mist-net near the Fortescue Marsh in November 2007 (Bamford 2010). The species is more common in the Chichester and Hamersley Ranges where there is suitable caves for roosting, however the Ghost Bat is a moderately large bat and is known to occasionally range over a broad area. As a result there are several records of the species foraging within and on the edge of the Fortescue region.

There is thought to be little roosting habitat for the species within the survey area, but they are likely to roost elsewhere and occasionally visit the area to hunt.

6.1.5 Western Pebble-mouse (*Pseudomys chapmani*)

Conservation Status: DEC Priority 4

Distribution and Habitat: The Western Pebble-mouse occurs across central and southern Pilbara and extends into the smaller ranges of the Little Sandy Desert (Start 2008). Abandoned mounds have been found in the Gascoyne and Murchison, indicating a recent decline in distribution. This decline is most likely attributable to foxes and exotic herbivores. However, the species appears relatively secure in its remaining range (Start 2008). Western Pebble-mice inhabit gently sloping hills of rocky ranges where the ground is stony and vegetated by spinifex and a sparse overstorey of eucalypts and scattered shrubs of senna, acacia and *ptilotus*.

Ecology: In suitable habitats, pebble mounds of this species can be found in large numbers, although not all of these mounds are active and occupied by mice at the same time. The demographic structure of the groups that inhabit the mounds and their patterns of movement around the mounds is still unknown (Anstee 1996; Anstee *et al.* 1997). Mounds can cover an area of 0.5-9.0 m² and a single mound can house up to 25 mice (Start 2008). Breeding occurs throughout the year with females producing several litters of four young per year (Start 2008).

Likelihood of Occurrence: Numerous active and inactive mounds of the Western Pebble-mouse have been recorded throughout the spinifex-covered hillslopes along the northern edge of the survey area (Bamford 2005); (Biota 2005); *ecologia* internal database). This area provides excellent habitat for the species and they are likely to be moderately common in the area.

6.1.6 Northern Short-tailed Mouse (*Leggadina lakedownensis*)

Conservation Status: DEC Priority 4

Distribution and Habitat: Populations of this small, secretive rodent are distributed across northern Australia but records have been sporadic (Moro and Kutt 2008). They occupy a diverse range of habitats from the monsoon tropical coast to semiarid climates, including spinifex and tussock grasslands, samphire and sedgeland, acacia shrublands, tropical eucalypt and melaleuca woodlands and stony ranges. Most habitats, however, are seasonally inundated on red or white sandy-clay soils (Moro and Kutt 2008).

Ecology: Their diet consists primarily of invertebrate, with plants supplementing their water requirements (Moro and Kutt 2008). Populations fluctuate greatly in response to rainfall, sometimes reaching plague proportions. The species is nocturnal and solitary, spending the day in simple, single-chambered burrows (Moro and Kutt 2008). Studies of this species in Queensland suggest that grazing pressure from pastoral and feral animals can threaten populations of *L. lakedownensis*. However, a population can re-establish itself after the grazing pressure has been reduced (Kutt and Kemp 2005).

Likelihood of Occurrence: Several Northern Short-tailed Mice were captured during the FMG Stage B Rail fauna survey, including from within the Christmas Creek area (Biota 2005). Individuals were primarily recorded from tussock grassland on cracking clay soils, although they were also recorded from a range of other habitats within the mulga woodland. The species is likely to occur within the survey area, particularly in areas of cracking clays within the mulga woodland and halophytic shrubland.

6.1.7 Long-tailed Dunnart (*Sminthopsis longicaudata*)

Conservation Status: DEC Priority 3

Distribution and Habitat: Although rarely encountered, in Western Australia it occurs in the Pilbara, Murchison, north-eastern Goldfields, Ashburton and Gibson Desert regions (Burbidge *et al.* 2008). Long-tailed Dunnarts are mostly found in rocky country in the western arid zone, although occasionally in open country with a gravel/stony mantle.

Ecology: They feed on arthropods such as beetles, ants, spiders, cockroaches, centipedes, grasshoppers, and larvae. Its long tail is muscular at the base allowing it to be held in a variety of positions probably acting as a balancer; this, along with striated foot pads suggest it is adapted to climbing (Burbidge *et al.* 2008). It is not possible to identify any threatening processes at this stage as only little is known about this species. Threats could be inappropriate fire regimes and habitat modification as a result of the activities of introduced herbivores such as horses and cattle, invasion by buffel grass and predation by feral cats and foxes (Pavey 2006b).

Likelihood of Occurrence: The Long-tailed Dunnart was recorded near Mt Nicholas during the FMG Stage B Rail fauna survey in mid-dense hummock grassland (Biota 2005). Similar habitat is present across the spinifex-covered hillslopes within the survey area. However, the Long-tailed Dunnart is most common in the southern Pilbara, Gascoyne and Murchison regions of Western Australia, with few records from north of the Fortescue Marsh. As a result, the Long-tailed Dunnart is thought to have a medium likelihood of occurrence within the survey area.

6.1.8 Brush-tailed Mulgara (*Dasycercus blythi*)

Conservation Status: DEC Priority 4

Distribution and Habitat: The Brush-tailed Mulgara has only recently been reclassified and separated from the genetically and morphologically distinct Crest-tailed Mulgara (*Dasycercus cristicauda*) (Woolley 2006). As such the more widespread Brush-tailed Mulgara is not listed in the EPBC Act (1999) and is listed as Priority 4 (fauna in need of monitoring) on the DEC Priority and Threatened Fauna list (2008). However, since previous records did not distinguish between the two species there is some ambiguity over the exact distribution of both species. Brush-tailed Mulgara occur in spinifex grasslands throughout much of the arid zone, digging burrows in flats between low sand dunes (Woolley 2008).

Ecology: Believed to be generally solitary, Brush-tailed Mulgara construct several single entranced, multi-tunnelled burrows within their home range (Woolley 2008). According to Koertner *et al.* (2007), home ranges and burrows encompass both mature spinifex and open regrowth areas and Brush-tailed Mulgara do not prefer one of either habitat type, but this might increase the risk of predation, especially following fire. Brush-tailed Mulgara are nocturnal hunters, feeding on arthropods and small vertebrates. Breeding is believed to occur in late winter to spring (Woolley 2008).

Likelihood of Occurrence: Diggings, scats and tracks were recorded from near Mt Nicholas (Biota 2005). Little suitable habitat (sandy spinifex sandplain) has been recorded within the survey area although there is the potential for pockets of suitable habitat to be present within the mulga woodland or on the edge of the Fortescue Marsh.

6.2 BIRDS

6.2.1 Night Parrot (*Pezoporus occidentalis*)

Conservation Status: EPBC Act Endangered, WC Act Schedule 1

Distribution and Habitat: Historical evidence indicates that Night Parrots were distributed over much of semi-arid and arid Australia (Garnett and Crowley 2000). Extremely secretive and hard to flush, there are only 6 accepted records of Night Parrots since 1935, with three from the Pilbara region (1979, 1980 and 2005; DEWHA 2008a). The most recent record is from Minga well during a fauna survey at Fortescue Metals Group's Cloudbreak lease (Bamford 2005). Preferred habitat is thought to be spinifex grasslands or samphire and chenopod shrublands on claypans, floodplains or the margins of salt lakes, creeks or other water bodies (Johnstone and Storr 1998; Higgins 1999; DEWHA 2008a).

Ecology: The Night Parrot is a rarely encountered, nocturnal parrot that spends much of its time on the ground. It is thought that the Night Parrot roosts during the day under dense vegetation such as spinifex clumps, in caves or even burrows (Higgins 1999). They are thought to be granivorous, particularly feeding on seeding spinifex, but may also eat some herbage. The presence of soil in the upper mandible of museum specimens also suggests that they may dig for roots or tubers (Higgins 1999).

The species has been variously described as sedentary but with large home ranges, nomadic, and seasonally migratory in response to conditions.

The apparent decline of the Night Parrot is most likely attributable to predation by cats and foxes, competition with introduced herbivores (livestock, rabbits, camels), degradation of water holes by livestock and altered fire regimes (Higgins 1999).

Likelihood of Occurrence: Two Night Parrots were observed drinking at Minga Well in April 2005 (Bamford 2005). The birds were thought to be present due to the drought conditions occurring in the Pilbara at the time. Additional surveys conducted at least annually from 2005-2009 have employed a range of techniques to locate additional birds, including call playback, mist netting, waterhole observations, motion-sensing cameras, and searching for feathers in the nests of other birds. To date no further individuals have been recorded. Due to the extremely cryptic nature of the species it is not possible to determine if the lack of sightings is due to a lack of birds or due to the inadequacy of the survey methods for detecting such a cryptic species.

Based on the predicted preferred habitat for the species, the chenopod shrubland within and surrounding the Fortescue Marsh provides good conditions for the species and it should be considered as likely to occur, on at least an occasional basis, in these habitats within the survey area.

6.2.2 Fork-tailed Swift (*Apus pacificus*)

Conservation Status: EPBC Act Migratory, WC Act Schedule 3

Distribution and Habitat: The Fork-tailed Swift is distributed from central Siberia and throughout Asia, breeding in north-east and mid-east Asia, and wintering in Australia and south New Guinea. It is a relatively common trans-equatorial migrant from October to April throughout mainland Australia

(Simpson and Day 2004). In Western Australia the species begins to arrive in the Kimberley in late September, the Pilbara in November and in the South-west by mid-December (Johnstone and Storr 1998). In Western Australia, the Fork-tailed Swift is considered uncommon to moderately common near the north-west, west and south-east coasts, common in the Kimberley and rare or scarce elsewhere (Johnstone and Storr 1998).

Ecology: Fork-tailed Swifts are nomadic in response to broad-scale weather pattern changes. They are attracted to thunderstorms where they can be seen in flocks, occasionally up to 2,000 birds. They rarely land, living almost exclusively in the air and feeding entirely on aerial insects, especially nuptial swarms of beetles, ants, termites and native bees (Simpson and Day 2004).

Likelihood of Occurrence: Fork-tailed Swifts are highly nomadic and can travel large distances. As a result they are likely to occasionally forage in the sky above the survey area, however they will not utilise habitats within the survey area directly.

6.2.3 White-bellied Sea-eagle (*Haliaeetus leucogaster*)

Conservation Status: EPBC Act Migratory, WC Act Schedule 3

Distribution and Habitat: The White-bellied Sea-Eagle is considered moderately common in the Houtman Abrolhos Islands off Geraldton and in addition to Australia, the species is found in New Guinea, Indonesia, China, south-east Asia and India.

White-bellied Sea-eagles occur in coastal and near coastal areas across Australia inhabiting most types of habitats except closed forest.

Ecology: It feeds mainly off aquatic animals, such as fish, turtles and sea snakes, but it takes birds and mammals as well. It breeds almost wholly on islands, building a large stick nest, which is used for many seasons in succession (Johnstone and Storr 1998; RPS 2008). The breeding season ranges from may to September in the north and in winter and spring in Australia's south (Morcombe 2000).

Likelihood of Occurrence: In 2009 there was one sighting of this species from within the survey area, from a pool along the Fortescue River in the south-east of the survey area (Bamford 2010). Another individual was recorded adjacent to the survey area in Cloudbreak in 2010 (*ecologia* internal database). The White-bellied sea-eagle is uncommon as far inland as the Fortescue Marsh, but will occasionally hunt in the area, particularly when creeks and rivers contain water.

6.2.4 Rainbow Bee-eater (*Merops ornatus*)

Conservation Status: EPBC Act Migratory, WC Act Schedule 3

Distribution and Habitat: The Rainbow Bee-eater is scarce to common throughout much of Western Australia, except for the arid interior, preferring lightly wooded, preferably sandy, country near water (Johnstone and Storr 1998).

Ecology: In Western Australia the Rainbow Bee-eater can occur as a resident, breeding visitor, post-nuptial nomad, passage migrant or winter visitor. It nests in burrows usually dug at a slight angle on flat ground, sandy banks or cuttings, and often at the margins of roads or tracks (Simpson and Day 2004). Eggs are laid at the end of the metre long tunnel from August to January (Boland 2004). Bee-eaters are most susceptible to predation.

Likelihood of Occurrence: The Rainbow Bee-eater is common in the Pilbara region and has been recorded from almost all surveys within and surrounding the survey area (Bamford 2010); (Biota

2005). The species will forage throughout the survey area and is likely to breed along creeklines throughout the area or on flat sandy ground near the Fortescue Marsh during spring.

6.2.5 Eastern Great Egret (*Ardea modesta*)

Conservation Status: EPBC Act Migratory, WC Act Schedule 3

Distribution and Habitat: Eastern Great Egrets mainly inhabit shallow water bodies; both fresh (lakes, lagoons, swamps and floodwaters) and saline (mangrove creeks, estuaries and tidal pools) (Johnstone and Storr 1998). They occur across a large part of Western Australia, including the south-west, Kimberley and Pilbara (Johnstone and Storr 1998). The Great Egret is common to very common in the well-watered Kimberley flatlands, and scarce to moderately common elsewhere within its range (Johnstone and Storr 1998).

Ecology: This species' diet consists predominantly of small fish and crustaceans. They breed colonially in trees standing in water around wooded swamps and river pools, 4-13 m above water (Morcombe 2000). The nest is build as a rough, loose, shallow platform. Four eggs are laid in summer in the Kimberley and during the spring in regions further south (Johnstone and Storr 1998).

Likelihood of Occurrence: The Eastern Great Egret has been recorded from creeks and water bodies surrounding the survey area (Bamford 2010). They are likely to hunt within the the survey area along creeks and the Fortescue Marsh when they contain water.

6.2.6 Wood Sandpiper (*Tringa glareola*)

Conservation Status: EPBC Act Migratory, WC Act Schedule 3

Distribution and Habitat: The Wood Sandpiper is a trans-equatorial migrant, breeding in north Europe and Asia, and spending the non-breeding months in Africa, south Asia and Australia. Generally uncommon, particularly in the interior, they arrive in Australia in August and leave again in May (Johnstone and Storr 1998).

Ecology: The Wood Sandpiper occurs singly, in pairs or small parties. Preferred habitat consists of shallows of wooded fresh waters, lakes, flooded pasture and occasionally in mangroves (Morcombe 2000).

Likelihood of Occurrence: The Wood Sandpiper has been recorded foraging along pools on the Fortescue River within, and just outside, the south-east Christmas Creek survey area (Bamford 2010). It is likely to forage within the survey area along creeks and the Fortescue Marsh when they contain water.

6.2.7 Common Greenshank (*Tringa nebularia*)

Conservation Status: EPBC Act Migratory, WC Act Schedule 3

Distribution and Habitat: The Common Greenshank is a non-breeding visitor to well-watered regions of Australia that can be observed in all months. It is uncommon to moderately common on coasts and coastal plains and rare to scarce elsewhere (Johnstone and Storr 1998). It can be found in shallow fresh waters (e.g. claypans, swamps, river pools) and salt waters (e.g. estuaries, samphire flats, reef flats).

Ecology: Like most waders they feed on small invertebrates, but will also take small fish.

Likelihood of Occurrence: The Common Greenshank has been recorded foraging along pools on the Fortescue River within the south-east Christmas Creek survey area (Bamford 2010). It is likely to forage within the survey area along creeks and the Fortescue Marsh when they contain water.

6.2.8 Red-necked Stint (*Calidris ruficollis*)

Conservation Status: EPBC Act Migratory, WC Act Schedule 3

Distribution and Habitat: Red-necked Stints are primarily coastal, occurring on the edge of sheltered estuaries, beaches and saltlakes both on the mainland and on offshore islands. They can also occasionally occur on inland saltlakes and freshwater swamps. The species is a non-breeding migrant, arriving from Siberia and Alaska in October and returning in March. They are common to very common on most coasts, rare in the northern interior and moderately common in the southern interior.

Ecology: The species typically occurs in small flocks and is highly gregarious with other species. They are omnivorous, feeding on insects and molluscs captured from exposed mudflats as well as seeds and plant matter.

Likelihood of Occurrence: The species is rare in the Pilbara interior with only a single record from within 100 km of the survey area. A single individual was recorded from 'a big pool on Roy Hill' in May 2005 (Bamford 2010). No coordinates are given, but this location is on the Fortescue River either within or just outside the south-east Christmas Creek area. The species may occasionally forage within the survey area during spring/summer along creeks and the Fortescue Marsh when they contain water.

6.2.9 Peregrine Falcon (*Falco peregrinus*)

Conservation Status: WC Act Schedule 4

Distribution and Habitat: This nomadic or sedentary falcon is widespread in many parts of Australia and some of its continental islands, but absent from most deserts and the Nullarbor Plain. The Peregrine Falcon occurs most commonly near cliffs along coasts, rivers and ranges and around wooded watercourses and lakes. The species is considered to be moderately common in the Stirling Range, uncommon in the Kimberley, Hamersley and Darling Ranges, and rare or scarce elsewhere (Johnstone and Storr 1998).

Ecology: Peregrines feed almost entirely on birds, especially parrots and pigeons. Peregrines primarily nest on ledges in cliffs, granite outcrops and in quarries, but may also nest in tree hollows around wetlands. Eggs are predominantly laid in September (Johnstone and Storr 1998; Olsen *et al.* 2006). Limiting factors and threats on this species include human disturbance at nest sites, decline of prey caused by introducing mammal predators and reproductive failure following exposure of pesticides (Cooper and Beauchesne 2007).

Likelihood of Occurrence: Peregrine Falcons have been recorded once within the survey area (Biota 2005), and on numerous occasions across all habitat types adjacent to the survey area (Bamford 2010); (Biota 2005); *ecologia* internal database). Breeding may occur in the rocky areas to the north of the survey area and birds will hunt in the ranges, along creeklines and in the Fortescue Marsh.

6.2.10 Bush Stone-curlew (*Burhinus grallarius*)

Conservation Status: DEC Priority 4

Distribution and Habitat: The Bush Stone-curlew occurs across much of Australia, except the arid interior and central south coast, preferring lightly wooded country near thickets or long grass that act as daytime shelter (Johnstone and Storr 1998). Historically, this species was widely distributed throughout much of WA, but it is now considered rare, with an estimated Australian population of 15,000 individuals (Garnett and Crowley 2000).

Ecology: The species is insectivorous, preying primarily upon beetles, although they will also eat seeds and shoots, frogs, lizards and snakes (Marchant and Higgins 1993; NSW National Parks and Wildlife Service 1999). They are usually seen in pairs, although may occasionally flock together during the breeding season (August to January) and are generally nocturnal, especially on moonlight nights (NSW National Parks and Wildlife Service 1999). Since Bush Stone-curlews are a ground dwelling and non-migratory species they are quite susceptible to local disturbances by humans and to predation by cats and foxes (Frith 1976; Johnstone and Storr 1998). Additional threats are altered fire regimes, degradation of habitat due to overgrazing by domestic stock as well as poisoning by eating pollard baits laid to control rabbits (NSW National Parks and Wildlife Service 1999). They are most common where land disturbance is minimal and generally become rare or extinct around human settlements (Johnstone and Storr 1998).

Likelihood of Occurrence: Bush Stone-curlews have been recorded predominantly from creeklines in the Mulga woodland habitat of the Christmas Creek area (Biota 2005). They are likely to both breed and forage within the area.

6.2.11 Australian Bustard (*Ardeotis australis*)

Conservation Status: DEC Priority 4

Distribution and Habitat: The Australian Bustard is a large ground-dwelling bird that occurs Australia-wide and utilises a number of open habitats, including open or lightly wooded grasslands, chenopod flats, plains and heathlands (Johnstone and Storr 1998).

It is a nomadic species, ranging over very large areas and its abundance varies locally and seasonally from scarce to common, largely dependent on rainfall and food availability.

Ecology: The bustard has an omnivorous diet, feeding on grasses, seeds, fruit, insects and small vertebrates. Although the population size is still substantial, there has been a large historical decline in abundance, particularly south of the tropics, but also across northern Australia (Garnett and Crowley 2000). This is a result of hunting, degradation of its grassland habitat by sheep and rabbits and predation by foxes and cats (Frith 1976; Garnett and Crowley 2000). Bustards readily desert nests in response to disturbance by humans, sheep or cattle (Garnett and Crowley 2000).

Likelihood of Occurrence: Records of the Australian Bustard have been made across the survey area, almost entirely from the mulga woodland habitat (Biota 2005). They are likely to both breed and forage within the area.

6.2.12 Grey Falcon (*Falco hypoleucos*)

Conservation Status: DEC Priority 4

Distribution and Habitat: Grey Falcons are a rare, nomadic, raptor sparsely distributed across much of arid and semi-arid Australia. In Western Australia, they are restricted to the northern half, occurring in a variety of habitats ranging from wooded drainage systems through to open spinifex plains. Grey Falcons once occurred across much of Western Australia, with sightings as far south as York and New Norcia during colonial times. However, the current distribution is now thought to be restricted to north of 26 °S (Johnstone and Storr 1998). Because the distribution of this species is

very scarce over an extremely large area, sightings of this species are very uncommon. The Grey Falcon occurs very sparsely in a wide variety of arid habitats including open woodlands and open acacia shrubland, hummock and tussock grasslands, low shrublands and may also be seen around swamps and waterholes that attract prey (Ehmann and Watson 2008).

Ecology: Like other falcons this species preys primarily on birds, such as parrots and pigeons, although reptiles and mammals are also taken (Ehmann and Watson 2008). Two to three eggs are laid in winter in the nests of other birds of prey and ravens, typically in tall eucalypt trees near water (Garnett and Crowley 2000; Ehmann and Watson 2008). It is mostly nomadic when not breeding but may also become a longer term resident in coastal and moister inland refuge areas. The breeding season is from July to October. Clearing and grazing of arid zone habitat, destruction of raptors because they were thought to prey on domestic poultry, and the use of pesticides have had an adverse effect on the species (Venn 2003).

Likelihood of Occurrence: Records of the Grey Falcon have been made from Cloudbreak, as well as from Roy Hill to the east (Bamford 2010)). They are likely to hunt, and occasionally breed, within the survey area.

6.3 REPTILES

6.3.1 *Ramphotyphlops ganei*

Conservation Status: DEC Priority 1

Distribution and Habitat: *R. ganei* has been found within the Pilbara region between Newman and Pannawonica (Wilson and Swan 2008). It has been suggested that they prefer to live in subterranean habitats near moist gullies and gorges (Wilson and Swan 2008) although there is a record from sandy soil vegetated with spinifex (NatureMap).

Ecology: Very little is known about this elusive blind snake due to its fossorial lifestyle. Blind snakes are exclusively insectivorous, and like other members of their genus, *R. ganei* probably burrow into social insect colonies to feed on termites and ants, as well as their eggs and pupae (Wilson and Swan 2008). This species is most likely threatened by removal of suitable habitat, and by drilling and/or any other mining activities impacting the subterranean environment.

Likelihood of Occurrence: There are only a few records of *R. ganei* in close proximity to the survey area; from 20 km east of the survey area (*ecologia* internal database) and Newman, 100 km south-east of the survey area (DEC database). The species is known to be extremely cryptic and difficult to capture. Similar habitat to where it has been previously recorded (gullies in the spinifex-covered ranges of the Newman and McKay land systems) is present across the northern edge of the survey area. It is considered likely that the species occurs in this habitat type within the survey area.

7 CONCLUSIONS

The survey area lies on the edge of the Fortescue Marsh, extending into the foot slopes of the Chichester Range. The northern part of the survey area, containing mulga woodland and spinifex hills and ranges is part of extensive and contiguous fauna habitats occurring outside the survey area. The southern part of the survey area lies on the border of the Fortescue Marsh. This area contains a variety of unique fauna habitats that are important for a number of conservation significant species, as well as providing important nesting grounds for a variety of waterbirds when the marsh is in flood.

Overall, the vegetation has been described as varying from poor to good condition and numerous conservation significant species have been recorded within the survey area, or have a high likelihood of occurrence based on regional records. This indicates that the survey area contains several important fauna habitats in moderate to good condition.

Currently not all areas within the survey area have had fauna survey work completed. Additional on-ground reconnaissance and surveys of the area would be required to gain additional information on fauna habitats and species present.

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APPENDIX A EXPLANATION OF CONSERVATION CODES

Appendix A1 Definitions of relevant categories under the *Environment Protection and Biodiversity Conservation Act*.

Category	Definition
Endangered (EN)	The species is likely to become extinct unless the circumstances and factors threatening its abundance, survival or evolutionary development cease to operate; or its numbers have been reduced to such a critical level, or its habitats have been so drastically reduced, that it is in immediate danger of extinction.
Vulnerable (VU)	Within the next 25 years, the species is likely to become endangered unless the circumstances and factors threatening its abundance, survival or evolutionary development cease to operate.
Migratory (M)	Species are defined as migratory if they are listed in an international agreement approved by the Commonwealth Environment Minister, including: <ul style="list-style-type: none"> • the Bonn Convention (Convention on the Conservation of Migratory Species of Wild Animal) for which Australia is a range state; • the agreement between the Government of Australian and the Government of the Peoples Republic of China for the Protection of Migratory Birds and their environment (CAMBA); or • the agreement between the Government of Japan and the Government of Australia for the Protection of Migratory Birds and Birds in Danger of Extinction and their Environment (JAMBA).

Appendix A2 Definition of Schedules under the *Wildlife Conservation Act 1950*.

Schedule	Definition
Schedule 1 (S1)	Fauna which are rare or likely to become extinct, are declared to be fauna that is in need of special protection.
Schedule 2 (S2)	Fauna which are presumed to be extinct, are declared to be fauna that is in need of species protection.
Schedule 3 (S3)	Birds which are subject to an agreement between the governments of Australia and Japan relating to the protection of migratory birds and birds in danger of extinction, are declared to be fauna that is in need of species protection.
Schedule 4 (S4)	Declared to be fauna that is in need of species protection, otherwise than for the reasons mentioned above.

Appendix A3 Definition of Department of Environment and Conservation Priority Codes.

Priority	Definition
Priority 1 (P1)	<i>Taxa with few, poorly known populations on threatened lands.</i> Taxa which are known from few specimens or sight records from one or a few localities, on lands not managed for conservation, e.g. agricultural or pastoral lands, urban areas, active mineral leases. The taxon needs urgent survey and evaluation of conservation status before consideration can be given to declaration as threatened fauna.
Priority 2 (P2)	<i>Taxa with few, poorly known populations on conservation lands.</i> Taxa which are known from few specimens or sight records from one or a few localities, on lands not under immediate threat of habitat destruction or degradation, e.g. national parks, conservation parks, nature reserves, State forest, vacant crown land, water reserves, etc. The taxon needs urgent survey and evaluation of conservation status before consideration can be given to declaration as threatened fauna.
Priority 3 (P3)	<i>Taxa with several, poorly known populations, some on conservation lands.</i> Taxa which are known from few specimens or sight records from several localities, some of which are on lands not under immediate threat of habitat destruction or degradation. The taxon needs urgent survey and evaluation of conservation status before consideration can be given to declaration as threatened fauna.
Priority 4 (P4)	<i>Taxa in need of monitoring.</i> Taxa which 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 if present circumstances change. These taxa are usually represented on conservation lands.
Priority 5 (P5)	<i>Taxa in need of monitoring.</i> Taxa which are not considered threatened but are subject to a specific conservation program, the cessation of which would result in the species becoming threatened within five years.

APPENDIX B REGIONAL FAUNA RECORDS

Appendix B1 Mammals

Family and Species	Common name	Conservation Classification			ecologia internal database	Cloudbreak (Bamford 2005)	Cloudbreak Night Parrot Surveys (Bamford 2006-2009)	FMG Rail Stage B (Biota 2005)	RGP5 Jimblebar to Yandi (ENV 2008)	M270SA (ENV 2008)	NatureMap	DEWHA	DEC Priority Fauna Database
		EPBC Act	WC Act	DEC									
TACHYGLOSSIDAE													
<i>Tachyglossus aculeatus</i>	Short-beaked Echidna					•		•					
DASYURIDAE													
<i>Dasyercus blythi</i>	Brush-tailed Mulgara			P4				•			•	•	
<i>Dasykaluta rosamondae</i>	Kaluta				•	•		•			•		
<i>Dasyurus hallucatus</i>	Northern Quoll	EN	S1					•			•	•	•
<i>Ningauai timealeyi</i>	Pilbara Ningauai				•	•		•			•		
<i>Planigale sp.</i>	Common Planigale					•		•					
<i>Pseudantechinus woolleyae</i>	Woolley's False Antechinus						•						
<i>Sminthopsis longicaudata</i>	Long-tailed Dunnart			P4				•					
<i>Sminthopsis macroura</i>	Stripe-faced Dunnart				•	•		•			•		
<i>Sminthopsis youngsoni</i>	Lesser Hairy-footed Dunnart							•					
THYLACOMYIDAE													
<i>Macrotis lagotis</i>	Greater Bilby	VU	S1					S				•	•
MACROPODIDAE													
<i>Macropus robustus</i>	Euro				•	•		•			•		
<i>Macropus rufus</i>	Red Kangaroo				•	•	•	•	•	•	•		
<i>Petrogale rothschildi</i>	Rothschild's Rock-wallaby				•			•					
MEGADERMATIDAE													
<i>Macroderma gigas</i>	Ghost Bat			P4	•		•						•
HIPPOSIDERIDAE													
<i>Rhinonictes aurantia</i>	Pilbara Leaf-nosed Bat	VU	S1		•							•	•
EMBALLONURIDAE													
<i>Saccolaimus flaviventris</i>	Yellow-bellied Sheathtail Bat				•	•					•		
<i>Taphozous georgianus</i>	Common Sheathtail Bat				•	•					•		

Family and Species	Common name	Conservation Classification			ecologia internal database	Cloudbreak (Bamford 2005)	Cloudbreak Night Parrot Surveys (Bamford 2006-2009)	FMG Rail Stage B (Biota 2005)	RGP5 Jimblebar to Yandi (ENV 2008)	M270SA (ENV 2008)	NatureMap	DEWHA	DEC Priority Fauna Database
		EPBC Act	WC Act	DEC									
<i>Taphozous hilli</i>	Hill's Sheathtail Bat				•								
MOLOSSIDAE													
<i>Chaerophon jobensis</i>	Northern Freetail Bat				•	•	•				•		
<i>Mormopterus beccarii</i>	Beccari's Freetail Bat				•						•		
<i>Tadarida australis</i>	White-striped Freetail Bat					•							
VESPERTILIONIDAE													
<i>Chalinolobus gouldii</i>	Gould's Wattled Bat				•	•					•		
<i>Nyctophilus bifax daedalus</i>	Eastern Long-eared Bat				•								
<i>Nyctophilus geoffroyi</i>	Lesser Long-eared Bat				•	•							
<i>Scotorepens greyii</i>	Little Broad-nosed Bat				•	•					•		
<i>Vespadelus finlaysoni</i>	Finlayson's Cave Bat				•	•							
MURIDAE													
<i>Leggadina lakedownensis</i>	Northern Short-tailed Mouse			P4	•			•			•		•
<i>Notomys alexis</i>	Spinifex Hopping-mouse				•						•		
<i>Pseudomys chapmani</i>	Western Pebble-mouse			P4	•	S		S					•
<i>Pseudomys desertor</i>	Desert Mouse				•	•	•	•			•		
<i>Pseudomys hermannsburgensis</i>	Sandy Inland Mouse				•			•			•		
<i>Zyzomys argurus</i>	Common Rock-rat				•	•					•		
INTRODUCED MAMMALS													
<i>Mus musculus</i>	House Mouse				•	•		•			•		
<i>Canis lupus</i>	Dog/Dingo				•	•	•	•			•		
<i>Vulpes vulpes</i>	Red Fox								•				
<i>Felis catus</i>	Cat				•	•	•						
<i>Oryctolagus cuniculus</i>	European Rabbit				•		•		•		•		
<i>Equus asinus</i>	Donkey				•	•	•	•					
<i>Equus caballus</i>	Horse				•	•		•					
<i>Camelus dromedarius</i>	One-humped Camel				•	•		•					

Family and Species	Common name	Conservation Classification			ecologia internal database	Cloudbreak (Bamford 2005)	Cloudbreak Night Parrot Surveys (Bamford 2006-2009)	FMG Rail Stage B (Biota 2005)	RGP5 Jimblebar to Yandi (ENV 2008)	M270SA (ENV 2008)	NatureMap	DEWHA	DEC Priority Fauna Database
		EPBC Act	WC Act	DEC									
<i>Bos taurus</i>	Cow				•		•		•		•		

S = secondary evidence

Appendix B2 Birds

Family and Species	Common name	Conservation Classification			ecologia internal database	Cloudbreak (Bamford 2005)	Cloudbreak Night Parrot Surveys (Bamford 2006-2009)	FMG Rail Stage B (Biota 2005)	RGP5 Jimblebar to Yandi (ENV 2008)	M270SA (ENV 2008)	NatureMap	Birdata	DEWHA	DEC Priority Fauna Database
		EPBC Act	WC Act	DEC										
CASUARIIDAE														
<i>Dromaius novaehollandiae</i>	Emu				•	•	•	•	•		•	•		
PHASIANIDAE														
<i>Coturnix pectoralis</i>	Stubble Quail						•	•						
<i>Coturnix ypsilophora</i>	Brown Quail				•	•	•							
ANATIDAE														
<i>Dendrocygna eytoni</i>	Plumed Whistling-duck				•		•				•	•		
<i>Cygnus atratus</i>	Black Swan					•	•							
<i>Tadorna tadornoides</i>	Australian Shelduck					•	•	•				•		
<i>Chenonetta jubata</i>	Australian Wood Duck											•		
<i>Malacorhynchus membranaceus</i>	Pink-eared Duck					•	•							
<i>Anas gracilis</i>	Grey Teal				•	•	•				•	•		
<i>Anas superciliosa</i>	Pacific Black Duck				•	•	•				•	•		
<i>Aythya australis</i>	Hardhead				•							•		
PODICIPEDIDAE														
<i>Tachybaptus novaehollandiae</i>	Australasian Grebe				•		•				•	•		
<i>Poliiocephalus poliocephalus</i>	Hoary-headed Grebe				•		•				•			
COLUMBIDAE														
<i>Phaps chalcoptera</i>	Common Bronzewing				•	•	•	•			•	•		
<i>Ocyphaps lophotes</i>	Crested Pigeon				•	•	•	•	•		•	•		
<i>Geophaps plumifera</i>	Spinifex Pigeon				•		•	•	•		•	•		
<i>Geopelia cuneata</i>	Diamond Dove				•	•	•	•	•		•	•		
<i>Geopelia striata</i>	Peaceful Dove				•		•	•	•		•	•		
PODARGIDAE														

Family and Species	Common name	Conservation Classification			ecologia internal database	Cloudbreak (Bamford 2005)	Cloudbreak Night Parrot Surveys (Bamford 2006-2009)	FMG Rail Stage B (Biota 2005)	RGP5 Jimblebar to Yandi (ENV 2008)	M270SA (ENV 2008)	NatureMap	Birdata	DEWHA	DEC Priority Fauna Database
		EPBC Act	WC Act	DEC										
<i>Podargus strigoides</i>	Tawny Frogmouth				•	•	•	•	•		•	•		
EUROSTOPODIDAE														
<i>Eurostopodus argus</i>	Spotted Nightjar				•	•	•				•	•		
AEGOTHELIDAE														
<i>Aegotheles cristatus</i>	Australian Owlet-nightjar				•	•	•	•				•		
APODIDAE														
<i>Apus pacificus</i>	Fork-tailed Swift	M	S3		•			•					•	
ANHINGIDAE														
<i>Anhinga novaehollandiae</i>	Australasian Darter										•	•		
PHALACROCORACIDAE														
<i>Microcarbo melanoleucos</i>	Little Pied Cormorant								•			•		
<i>Phalacrocorax sulcirostris</i>	Little Black Cormorant				•							•		
PELECANIDAE														
<i>Pelecanus conspicillatus</i>	Australian Pelican				•						•			
CICONIIDAE														
<i>Ephippiorhynchus asiaticus</i>	Black-necked Stork											•		
ARDEIDAE														
<i>Ardea pacifica</i>	White-necked Heron				•	•	•	•			•	•		
<i>Ardea modesta</i>	Eastern Great Egret	M	S3		•			•			•	•	•	
<i>Egretta novaehollandiae</i>	White-faced Heron				•	•	•	•			•	•		
<i>Ardea ibis</i>	Cattle Egret	M	S3									•	•	
<i>Egretta garzetta</i>	Little Egret											•		
THRESKIORNITHIDAE														
<i>Threskiornis spinicollis</i>	Straw-necked Ibis							•				•		
<i>Platalea regia</i>	Royal Spoonbill				•							•		

Family and Species	Common name	Conservation Classification			ecologia internal database	Cloudbreak (Bamford 2005)	Cloudbreak Night Parrot Surveys (Bamford 2006-2009)	FMG Rail Stage B (Biota 2005)	RGP5 Jimblebar to Yandi (ENV 2008)	M270SA (ENV 2008)	NatureMap	Birdata	DEWHA	DEC Priority Fauna Database
		EPBC Act	WC Act	DEC										
<i>Platalea flavipes</i>	Yellow-billed Spoonbill					•				•	•			
ACCIPITRIDAE														
<i>Elanus axillaris</i>	Black-shouldered Kite				•	•	•	•						
<i>Lophoictinia isura</i>	Square-tailed Kite				•	•				•	•			
<i>Hamirostra melanosternon</i>	Black-breasted Buzzard						•	•						
<i>Haliaeetus leucogaster</i>	White-bellied Sea-Eagle	M	S3		•	•				•		•		
<i>Haliastur sphenurus</i>	Whistling Kite				•	•	•	•		•	•			
<i>Milvus migrans</i>	Black Kite				•	•	•	•			•			
<i>Accipiter fasciatus</i>	Brown Goshawk				•	•	•			•	•			
<i>Accipiter cirrocephalus</i>	Collared Sparrowhawk				•	•	•				•			
<i>Circus assimilis</i>	Spotted Harrier				•	•	•			•	•			
<i>Aquila audax</i>	Wedge-tailed Eagle				•	•	•	•		•	•			
<i>Hieraaetus morphnoides</i>	Little Eagle				•	•	•			•	•			
FALCONIDAE														
<i>Falco cenchroides</i>	Nankeen Kestrel				•	•	•	•		•	•			
<i>Falco berigora</i>	Brown Falcon				•	•	•	•		•	•			
<i>Falco longipennis</i>	Australian Hobby				•	•	•			•	•			
<i>Falco hypoleucos</i>	Grey Falcon			P4	•	•				•			•	
<i>Falco subniger</i>	Black Falcon						•							
<i>Falco peregrinus</i>	Peregrine Falcon		S4		•	•	•			•	•		•	
RALLIDAE														
<i>Gallirallus philippensis</i>	Buff-banded Rail										•			
<i>Porzana tabuensis</i>	Spotless Crake				•									
<i>Tribonyx ventralis</i>	Black-tailed Native-hen					•	•							
<i>Fulica atra</i>	Eurasian Coot						•							
OTIDIDAE														

Family and Species	Common name	Conservation Classification			ecologia internal database	Cloudbreak (Bamford 2005)	Cloudbreak Night Parrot Surveys (Bamford 2006-2009)	FMG Rail Stage B (Biota 2005)	RGP5 Jimblebar to Yandi (ENV 2008)	M270SA (ENV 2008)	NatureMap	Birdata	DEWHA	DEC Priority Fauna Database
		EPBC Act	WC Act	DEC										
<i>Ardeotis australis</i>	Australian Bustard			P4	•	•	•	•			•	•		•
BURHINIDAE														
<i>Burhinus grallarius</i>	Bush Stone-curlew			P4	•		•				•			•
RECURVIROSTRIDAE														
<i>Himantopus himantopus</i>	Black-winged Stilt						•				•			
<i>Recurvirostra novaehollandiae</i>	Red-necked Avocet				•		•							
<i>Cladyrhynchus leucocephalus</i>	Banded Stilt						•							
CHARADRIIDAE														
<i>Charadrius ruficapillus</i>	Red-capped Plover						•							
<i>Charadrius australis</i>	Inland Dotterel							•						
<i>Charadrius veredus</i>	Oriental Plover	M	S3									•		
<i>Eseyornis melanops</i>	Black-fronted Dotterel				•	•	•				•	•		
<i>Erythrogonys cinctus</i>	Red-kneed Dotterel				•	•	•				•			
<i>Vanellus tricolor</i>	Banded Lapwing						•				•			
SCOLOPACIDAE														
<i>Tringa nebularia</i>	Common Greenshank	M	S3				•				•			
<i>Tringa glareola</i>	Wood Sandpiper	M	S3		•		•				•			
<i>Calidris ruficollis</i>	Red-necked Stint	M	S3				•							
TURNICIDAE														
<i>Turnix velox</i>	Little Button-quail				•	•	•	•			•	•		
GLAREOLIDAE														
<i>Stiltia isabella</i>	Australian Pratincole						•				•			
LARIDAE														
<i>Gelochelidon nilotica</i>	Gull-billed Tern						•							
<i>Chlidonias hybrida</i>	Whiskered Tern						•							
CACATUIDAE														

Family and Species	Common name	Conservation Classification			ecologia internal database	Cloudbreak (Bamford 2005)	Cloudbreak Night Parrot Surveys (Bamford 2006-2009)	FMG Rail Stage B (Biota 2005)	RGP5 Jimblebar to Yandi (ENV 2008)	M270SA (ENV 2008)	NatureMap	Birdata	DEWHA	DEC Priority Fauna Database
		EPBC Act	WC Act	DEC										
<i>Eolophus roseicapillus</i>	Galah				.	.	.	.	.		.	.
<i>Cacatua sanguinea</i>	Little Corella				.	.	.	.	.		.	.
<i>Nymphicus hollandicus</i>	Cockatiel				.	.	.	.	.		.	.
PSITTACIDAE														
<i>Barnardius zonarius</i>	Australian Ringneck				.	.	.	.	.		.	.
<i>Psephotus varius</i>	Mulga Parrot					.								
<i>Melopsittacus undulatus</i>	Budgerigar				.	.	.	.	.	.	.	.
<i>Neopsephotus bourkii</i>	Bourke's Parrot				.	.	.	.			.
<i>Neophema elegans</i>	Elegant Parrot					.	.							
<i>Pezoporus occidentalis</i>	Night Parrot	EN	S1			.					.		.	.
CUCULIDAE														
<i>Centropus phasianinus</i>	Pheasant Coucal				.		.							
<i>Chalcites basal</i>	Horsfield's Bronze-Cuckoo				.	.	.	.				.
<i>Chalcites osculans</i>	Black-eared Cuckoo				.		.				.			
<i>Cacomantis pallidus</i>	Pallid Cuckoo				.	.	.	.				.
STRIGIDAE														
<i>Ninox connivens</i>	Barking Owl						.							
<i>Ninox novaeseelandiae</i>	Southern Boobook				.	.	.	.	.		.	.
TYTONIDAE														
<i>Tyto javanica</i>	Eastern Barn Owl				.	.	.					.
HALCYONIDAE														
<i>Dacelo leachii</i>	Blue-winged Kookaburra				.	.	.	.			.	.
<i>Todiramphus pyrrhopygius</i>	Red-backed Kingfisher				.	.	.	.	.		.	.
<i>Todiramphus sanctus</i>	Sacred Kingfisher				.		.	.			.	.
MEROPIDAE														
<i>Merops ornatus</i>	Rainbow Bee-eater	M	S3		.	.	.	.	.		.	.	.

Family and Species	Common name	Conservation Classification			ecologia internal database	Cloudbreak (Bamford 2005)	Cloudbreak Night Parrot Surveys (Bamford 2006-2009)	FMG Rail Stage B (Biota 2005)	RGP5 Jimblebar to Yandi (ENV 2008)	M270SA (ENV 2008)	NatureMap	Birdata	DEWHA	DEC Priority Fauna Database
		EPBC Act	WC Act	DEC										
PTILINORHYNCHIDAE														
<i>Ptilonorhynchus guttatus</i>	Western Bowerbird				•						•	•		
MALURIDAE														
<i>Malurus splendens</i>	Splendid Fairy-wren					•								
<i>Malurus leucopterus</i>	White-winged Fairy-wren				•	•	•	•	•		•	•		
<i>Malurus lamberti</i>	Variiegated Fairy-wren				•	•	•	•	•	•	•	•		
<i>Stipiturus ruficeps</i>	Rufous-crowned Emu-wren				•	•	•	•						
<i>Amytornis striatus</i>	Striated Grasswren							•			•	•		
ACANTHIZIDAE														
<i>Calamanthus campestris</i>	Rufous Fieldwren							•			•			
<i>Pyrrholaemus brunneus</i>	Redthroat				•			•				•		
<i>Smicronis brevirostris</i>	Weebill				•	•	•	•	•		•	•		
<i>Gerygone fusca</i>	Western Gerygone				•	•	•	•	•			•		
<i>Acanthiza robustirostris</i>	Slaty-backed Thornbill				•	•	•	•			•			
<i>Acanthiza chrysorrhoa</i>	Yellow-rumped Thornbill										•			
<i>Acanthiza uropygialis</i>	Chestnut-rumped Thornbill				•	•	•	•			•	•		
<i>Acanthiza apicalis</i>	Inland Thornbill				•			•				•		
<i>Aphelocephala leucopsis</i>	Southern Whiteface							•	•					
PARDALOTIDAE														
<i>Pardalotus rubricatus</i>	Red-browed Pardalote				•			•			•	•		
<i>Pardalotus striatus</i>	Striated Pardalote				•	•	•	•	•		•	•		
MELIPHAGIDAE														
<i>Certhionyx variegatus</i>	Pied Honeyeater				•			•						
<i>Lichenostomus virescens</i>	Singing Honeyeater				•	•	•	•	•	•	•	•		
<i>Lichenostomus keartlandi</i>	Grey-headed Honeyeater				•	•	•	•			•	•		
<i>Lichenostomus plumulus</i>	Grey-fronted Honeyeater					•								

Family and Species	Common name	Conservation Classification			ecologia internal database	Cloudbreak (Bamford 2005)	Cloudbreak Night Parrot Surveys (Bamford 2006-2009)	FMG Rail Stage B (Biota 2005)	RGP5 Jimblebar to Yandi (ENV 2008)	M270SA (ENV 2008)	NatureMap	Birdata	DEWHA	DEC Priority Fauna Database
		EPBC Act	WC Act	DEC										
<i>Lichenostomus penicillatus</i>	White-plumed Honeyeater				.	.	.	.	.		.	.
<i>Purnella albifrons</i>	White-fronted Honeyeater				.									
<i>Manorina flavigula</i>	Yellow-throated Miner				.	.	.	.	.	.	.	.
<i>Acanthagenys rufogularis</i>	Spiny-cheeked Honeyeater				.	.	.	.	.		.	.
<i>Conopophila whitei</i>	Grey Honeyeater				.		.							
<i>Epthianura tricolor</i>	Crimson Chat				.	.	.	.			.	.
<i>Epthianura aurifrons</i>	Orange Chat						.				.			
<i>Sugomel niger</i>	Black Honeyeater				.		.				.			
<i>Lichmera indistincta</i>	Brown Honeyeater				.	.	.	.	.		.	.
<i>Melithreptus gularis</i>	Black-chinned Honeyeater				.	.	.	.		
POMATOSTOMIDAE														
<i>Pomatostomus temporalis</i>	Grey-crowned Babbler				.	.	.	.	.		.	.
<i>Pomatostomus superciliosus</i>	White-browed Babbler				.	.	.	.			.
PSOPHODIDAE														
<i>Cinclosoma castaneothorax</i>	Chestnut-breasted Quail-thrush				.			.						
<i>Psophodes occidentalis</i>	Chiming Wedgebill				.						.			
NEOSITTIDAE														
<i>Daphoenositta chrysoptera</i>	Varied Sittella				.	.	.	.		
CAMPEPHAGIDAE														
<i>Coracina maxima</i>	Ground Cuckoo-shrike				.	.	.	.		
<i>Coracina novaehollandiae</i>	Black-faced Cuckoo-shrike				.	.	.	.	.		.	.
<i>Lalage sueurii</i>	White-winged Triller				.	.	.	.			.	.
PACHYCEPHALIDAE														
<i>Pachycephala rufiventris</i>	Rufous Whistler				.	.	.	.	.		.	.
<i>Colluricincla harmonica</i>	Grey Shrike-thrush				.	.	.	.	.		.	.
<i>Oreoica gutturalis</i>	Crested Bellbird				.	.	.	.	.		.	.

Family and Species	Common name	Conservation Classification			ecologia internal database	Cloudbreak (Bamford 2005)	Cloudbreak Night Parrot Surveys (Bamford 2006-2009)	FMG Rail Stage B (Biota 2005)	RGP5 Jimblebar to Yandi (ENV 2008)	M270SA (ENV 2008)	NatureMap	Birdata	DEWHA	DEC Priority Fauna Database
		EPBC Act	WC Act	DEC										
ARTAMIDAE														
<i>Artamus personatus</i>	Masked Woodswallow				•		•	•			•	•		
<i>Artamus leucorhynchus</i>	White-browed Woodswallow							•						
<i>Artamus cinereus</i>	Black-faced Woodswallow				•	•	•	•	•	•	•	•		
<i>Artamus minor</i>	Little Woodswallow				•		•			•	•			
<i>Cracticus torquatus</i>	Grey Butcherbird				•	•	•	•		•	•			
<i>Cracticus nigrogularis</i>	Pied Butcherbird				•	•	•	•	•		•			
<i>Cracticus tibicen</i>	Australian Magpie				•	•	•	•	•		•			
RHIPIDURIDAE														
<i>Rhipidura albiscapa</i>	Grey Fantail				•	•	•	•	•					
<i>Rhipidura leucophrys</i>	Willie Wagtail				•	•	•	•	•	•	•			
CORVIDAE														
<i>Corvus bennetti</i>	Little Crow				•	•	•	•	•			•		
<i>Corvus orru</i>	Torresian Crow				•	•	•	•	•	•	•			
MONARCHIDAE														
<i>Grallina cyanoleuca</i>	Magpie-lark				•	•	•	•	•		•	•		
PETROICIDAE														
<i>Petroica goodenovii</i>	Red-capped Robin				•	•	•	•	•		•	•		
<i>Melanodryas cucullata</i>	Hooded Robin				•	•	•	•			•	•		
ALAUDIDAE														
<i>Mirafrja javanica</i>	Horsfield's Bushlark				•	•	•	•	•		•	•		
ACROCEPHALIDAE														
<i>Acrocephalus australis</i>	Australian Reed-Warbler				•							•		
MEGALURIDAE														
<i>Megalurus gramineus</i>	Little Grassbird													

Family and Species	Common name	Conservation Classification			ecologia internal database	Cloudbreak (Bamford 2005)	Cloudbreak Night Parrot Surveys (Bamford 2006-2009)	FMG Rail Stage B (Biota 2005)	RGP5 Jimblebar to Yandi (ENV 2008)	M270SA (ENV 2008)	NatureMap	Birdata	DEWHA	DEC Priority Fauna Database
		EPBC Act	WC Act	DEC										
<i>Cincloramphus mathewsi</i>	Rufous Songlark				•		•	•			•	•		
<i>Cincloramphus cruralis</i>	Brown Songlark					•	•	•	•		•	•		
<i>Eremiornis carteri</i>	Spinifexbird				•	•	•	•			•			
HIRUNDINIDAE														
<i>Cheramoeca leucosterna</i>	White-backed Swallow								•					
<i>Hirundo neoxena</i>	Welcome Swallow				•							•		
<i>Petrochelidon ariel</i>	Fairy Martin				•		•	•			•	•		
<i>Petrochelidon nigricans</i>	Tree Martin				•	•	•	•	•			•		
NECTARINIIDAE														
<i>Dicaeum hirundinaceum</i>	Mistletoebird				•	•	•	•			•	•		
ESTRILDIDAE														
<i>Taeniopygia guttata</i>	Zebra Finch				•	•	•	•	•	•	•	•		
<i>Neochmia ruficauda subclaescens</i>	Star Finch			P4	•	•	•							•
<i>Emblema pictum</i>	Painted Finch				•	•	•	•			•	•		
MOTACILLIDAE														
<i>Anthus novaeseelandiae</i>	Australasian Pipit				•		•	•	•		•	•		

Appendix B3 Reptiles

Family and Species	Common name	Conservation Classification			ecologia internal database	Cloudbreak (Bamford 2005)	Cloudbreak Night Parrot Surveys (Bamford 2006-2009)	FMG Rail Stage B (Biota 2005)	RGP5 Jimblebar to Yandi (ENV 2008)	M270SA (ENV 2008)	NatureMap	DEWHA	DEC Priority Fauna Database
		EPBC Act	WC Act	DEC									
CHELUIDAE													
<i>Chelodina steindachneri</i>	Steindachner's Turtle				•	•	•	•			•		
GEKKONIDAE													
<i>Diplodactylus conspicillatus</i>	Fat-tailed Gecko				•	•		•					
<i>Diplodactylus savagei</i>					•								
<i>Gehyra pilbara</i>					•		•		•				
<i>Gehyra punctata</i>					•			•	•	•	•		
<i>Gehyra purpurascens</i>											•		
<i>Gehyra variegata</i>					•	•		•	•	•	•		
<i>Heteronotia binoei</i>	Bynoe's Gecko				•	•		•	•		•		
<i>Heteronotia spelea</i>	Desert Cave Gecko				•	•							
<i>Lucasium stenodactylum</i>	Sand-plain Gecko				•			•			•		
<i>Lucasium wombeyi</i>					•			•			•		
<i>Nephurus wheeleri</i>	Banded Knob-tailed Gecko				•				•				
<i>Oedura marmorata</i>	Marbled Velvet Gecko				•								
<i>Rhynchoedura ornata</i>	Beaked Gecko				•						•		
<i>Strophurus elderi</i>	Jewelled Gecko							•			•		
<i>Strophurus jeanae</i>					•						•		
<i>Strophurus wellingtonae</i>					•			•			•		
PYGOPODIDAE													
<i>Delma butleri</i>					•						•		
<i>Delma elegans</i>					•								
<i>Delma haroldi</i>								•			•		
<i>Delma nasuta</i>					•			•			•		
<i>Delma pax</i>					•			•			•		
<i>Delma tinctoria</i>					•			•			•		

Family and Species	Common name	Conservation Classification			ecologia internal database	Cloudbreak (Bamford 2005)	Cloudbreak Night Parrot Surveys (Bamford 2006-2009)	FMG Rail Stage B (Biota 2005)	RGP5 Jimblebar to Yandi (ENV 2008)	M270SA (ENV 2008)	NatureMap	DEWHA	DEC Priority Fauna Database
		EPBC Act	WC Act	DEC									
<i>Lialis burtonis</i>	Burton's Snake-lizard				•	•		•	•		•		
<i>Pygopus nigriceps</i>	Western Hooded Scaly-foot				•			•					
SCINCIDAE													
<i>Carlia munda</i>					•	•		•			•		
<i>Carlia triacantha</i>											•		
<i>Cryptoblepharus ustulatus</i>					•	•					•		
<i>Ctenotus ariadnae</i>								•			•		
<i>Ctenotus atlas</i>											•		
<i>Ctenotus duricola</i>					•			•			•		
<i>Ctenotus grandis</i>					•						•		
<i>Ctenotus greeri</i>											•		
<i>Ctenotus hanloni</i>								•			•		
<i>Ctenotus helenae</i>					•			•	•		•		
<i>Ctenotus leonhardii</i>					•								
<i>Ctenotus pantherinus</i>	Leopard Ctenotus				•	•		•			•		
<i>Ctenotus piankai</i>					•			•					
<i>Ctenotus quattuordecimlineatus</i>	Fourteen-lined Ctenotus				•								
<i>Ctenotus rubicundus</i>					•	•							
<i>Ctenotus saxatilis</i>	Rock Ctenotus				•	•		•			•		
<i>Ctenotus serventyi</i>								•					
<i>Ctenotus uber</i>					•								
<i>Cyclodomorphus melanops</i>	Spinifex Slender Blue-tongue				•	•		•	•		•		
<i>Egernia depressa</i>	Pygmy Spiny-tailed Skink				•								
<i>Lerista amicornum</i>											•		
<i>Lerista bipes</i>					•						•		
<i>Lerista labialis</i>											•		
<i>Lerista muelleri</i> spp group					•	•		•	•		•		
<i>Menetia greyii</i>					•	•		•			•		

Family and Species	Common name	Conservation Classification			ecologia internal database	Cloudbreak (Bamford 2005)	Cloudbreak Night Parrot Surveys (Bamford 2006-2009)	FMG Rail Stage B (Biota 2005)	RGP5 Jimblebar to Yandi (ENV 2008)	M270SA (ENV 2008)	NatureMap	DEWHA	DEC Priority Fauna Database
		EPBC Act	WC Act	DEC									
<i>Menetia surda</i>					•						•		
<i>Morethia flammicauda</i>					•								
<i>Morethia ruficauda</i>					•	•		•			•		
<i>Notoscincus ornatus</i>											•		
<i>Proablepharus reginae</i>					•						•		
<i>Tiliqua multifasciata</i>	Centralian Blue-tongue				•	•	•						
AGAMIDAE													
<i>Amphibolurus longirostris</i>	Long-nosed Dragon				•	•	•	•	•		•		
<i>Caimanops amphiboluroides</i>	Mulga Dragon				•			•			•		
<i>Ctenophorus caudicinctus</i>	Ring-tailed Dragon				•	•	•	•	•		•		
<i>Ctenophorus isolepis</i>	Central Military Dragon				•		•	•	•	•	•		
<i>Ctenophorus nuchalis</i>	Central Netted Dragon				•	•					•		
<i>Ctenophorus reticulatus</i>	Western Netted Dragon				•	•		•			•		
<i>Pogona minor</i>	Dwarf Bearded Dragon				•			•	•		•		
<i>Tympanocryptis cephalus</i>	Pebble Dragon				•						•		
VARANIDAE													
<i>Varanus acanthurus</i>	Spiny-tailed Monitor				•	•		•			•		
<i>Varanus brevicauda</i>	Short-tailed Pygmy Monitor					•					•		
<i>Varanus bushi</i>	Pilbara Monitor				•								
<i>Varanus caudolineatus</i>	Stripe-tailed Monitor				•	•		•			•		
<i>Varanus eremius</i>	Pygmy Desert Monitor				•						•		
<i>Varanus giganteus</i>	Perentie							•	•		•		
<i>Varanus gouldii</i>	Gould's Monitor										•		
<i>Varanus panoptes</i>	Yellow-spotted Monitor				•	•	•				•		
<i>Varanus tristis</i>	Black-headed Monitor				•	•					•		
TYPHLOPIDAE													
<i>Ramphotyphlops ammodytes</i>					•	•		•			•		

Family and Species	Common name	Conservation Classification			ecologia internal database	Cloudbreak (Bamford 2005)	Cloudbreak Night Parrot Surveys (Bamford 2006-2009)	FMG Rail Stage B (Biota 2005)	RGP5 Jimblebar to Yandi (ENV 2008)	M270SA (ENV 2008)	NatureMap	DEWHA	DEC Priority Fauna Database
		EPBC Act	WC Act	DEC									
<i>Ramphotyphlops ganei</i>				P1	•						•	•	
<i>Ramphotyphlops grypus</i>	Beaked Blind Snake				•	•	•				•		
<i>Ramphotyphlops hamatus</i>										•			
<i>Ramphotyphlops pilbarensis</i>	Pilbara Blind Snake				•								
<i>Ramphotyphlops waitii</i>										•			
PYTHONIDAE													
<i>Antaresia perthensis</i>	Pygmy Python				•		•						
<i>Antaresia stimsoni</i>	Stimson's Python				•					•			
<i>Aspidites melanocephalus</i>	Black-headed Python				•	•							
<i>Liasis olivaceus barroni</i>	Pilbara Olive Python	VU	S1					•			•	•	
ELAPIDAE													
<i>Acanthophis wellsi</i>	Pilbara Death Adder				•		•						
<i>Brachyuropis approximans</i>	NW Shovel-nosed Snake				•					•			
<i>Demansia psammophis</i>	Yellow-faced Whipsnake				•			•		•			
<i>Demansia rufescens</i>	Rufous Whipsnake				•					•			
<i>Furina ornata</i>	Moon Snake				•					•			
<i>Parasuta monachus</i>	Monk Snake				•								
<i>Pseudechis australis</i>	Mulga Snake				•			•	•	•			
<i>Pseudonaja mengdeni</i>	Gwardar				•					•			
<i>Pseudonaja modesta</i>	Ringed Brown Snake				•			•		•			
<i>Suta fasciata</i>	Rosen's Snake				•		•			•			
<i>Suta punctata</i>	Little Spotted Snake				•			•		•			
<i>Vermicella snelli</i>	Pilbara Bandy Bandy				•								

Appendix B3 Amphibians

Family and Species	Common name	Conservation Classification			ecologia internal database	Cloudbreak (Bamford 2005)	Cloudbreak Night Parrot Surveys (Bamford 2006-2009)	FMG Rail Stage B (Biota 2005)	RGP5 Jimblebar to Yandi (ENV 2008)	M270SA (ENV 2008)	NatureMap	DEWHA	DEC Priority Fauna Database
		EPBC Act	WC Act	DEC									
HYLIDAE													
<i>Cyclorana maini</i>	Main's Frog				•		•	•					
<i>Cyclorana platycephala</i>	Water-Holding Frog						•						
<i>Litoria rubella</i>	Little Red Tree Frog				•	•	•						
LIMNODYNASTIDAE													
<i>Notaden nicholli</i>	Desert Spadefoot						•						
MYOBATRACHIDAE													
<i>Pseudophryne douglasi</i>	Gorge Toadlet						•						

**APPENDIX C SPECIES OF CONSERVATION SIGNIFICANCE WITH A
LOW LIKELIHOOD OF OCCURRENCE WITHIN THE
SURVEY AREA**

Species	Conservation Significance			Habitat	Previous Records	Likelihood of Occurrence
	EPBC Act	WC Act	DEC			
Birds						
Cattle Egret (<i>Ardea ibis</i>)	M			Grassy habitats, shallow water bodies and wetlands	Record from Fortescue River (Birdata)	LOW Few local records and uncommon in the Pilbara
Oriental Plover (<i>Charadrius veredus</i>)	M			Sparsely vegetated plains, including samphire	Known to occur in Pilbara, but no local records	LOW Very few records from Pilbara interior
Star Finch (western subspecies) (<i>Neochmia ruficauda subclarescens</i>)			P4	Vegetation around watercourses, particularly thick reed beds.	Recorded from Minga Well in Cloudbreak (Bamford 2010), and Roy Hill (Biota 2005).	LOW Recorded adjacent to survey area. Small amount of suitable foraging habitat may be present surrounding Roy Hill pools but ground truthing is required to confirm this.
Reptiles						
Pilbara Olive Python (<i>Liasis olivaceus barroni</i>)	VU	S1		Gorges and escarpments; areas of permanent water	Record from Newman (DEC database) and Chichester Ranges, 30 km north-west of Cloudbreak	LOW Unlikely to be present in most areas, but may occur in rocky areas of the Chichester Ranges