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**TORO ENERGY LIMITED
MILLIPEDE TENEMENTS DESKTOP ASSESSMENT
TERRESTRIAL AND SUBTERRANEAN FAUNA**

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ecologia Environment
Level 8, Carillon City Office Tower
207 Murray Street
Perth, WA 6000
Phone: 08 6180 4450
Fax: 08 6180 4451
Email: admin@ecologia.com.au

TABLE OF CONTENTS

EXECUTIVE SUMMARY.....	VI
1 INTRODUCTION.....	1
1.1 PROJECT OVERVIEW.....	1
1.2 LEGISLATIVE FRAMEWORK	1
1.3 ASSESSMENT OBJECTIVES.....	3
2 EXISTING ENVIRONMENT	6
2.1 CLIMATE	6
2.2 BIOGEOGRAPHY	7
2.3 SOILS	7
2.4 VEGETATION	10
2.5 LAND SYSTEMS.....	12
2.6 HYDROGEOLOGY.....	14
3 METHODS	15
3.1 LITERATURE REVIEW	15
3.2 POTENTIAL CONSERVATION SIGNIFICANT VERTEBRATE FAUNA.....	16
3.3 DETERMINING SRE STATUS.....	17
4 RESULTS.....	19
4.1 VERTEBRATE FAUNA	19
4.2 SRE INVERTEBRATE FAUNA.....	29
4.3 STYGOFAUNA.....	30
4.4 TROGLOFAUNA	34
5 DISCUSSION	36
5.1 VERTEBRATE FAUNA	36
5.2 SHORT-RANGE ENDEMIC INVERTEBRATE FAUNA.....	41
5.3 STYGOFAUNA	50
5.4 TROGLOFAUNA	53
6 CONCLUSION	54
7 REFERENCES.....	56

TABLES

Table 2.1 – Vegetation associations of the study area.....	10
Table 2.2 – Land Systems of the study area	12
Table 2.3 – Groundwater aquifer types in the region (RPS Aquaterra 2011)	14
Table 3.1 – Databases searched as part of the literature review	15
Table 3.2 – Previous biological surveys relevant to the study area	15
Table 3.3 – Likelihood of occurrence categories.....	17
Table 3.4 – Western Australian Museum SRE categories (2013)	17
Table 4.1 – Summary of vertebrate fauna groups potentially occurring within the study area.....	23
Table 4.2 – Potential conservation significant vertebrate fauna likelihood of occurrence results	25
Table 4.3 – Summary of SRE invertebrate groups potentially occurring within the study area	29
Table 4.4 – Summary of stygal invertebrate groups potentially occurring within the study area	30
Table 4.5 – Summary of troglobitic invertebrate groups potentially occurring within the study area	34
Table 5.1 – Potential SRE invertebrate taxa occurring in the region of the study area	42
Table 5.2 – Stygal taxa currently known only from the Hinkler Well Calcrete system and surrounds..	51
Table 5.3 – Troglofaunal taxa currently known only from the Centipede tenement mining areas.....	53

FIGURES

Figure 1.1 – Location map of study area	5
Figure 2.1 – Rainfall and Temperature for Wiluna Weather Station (BoM 2014)	6
Figure 2.2 – IBRA region of the study area.....	8
Figure 2.3 – Soils of the study area	9
Figure 2.4 – Vegetation (Shepherd <i>et. al.</i> 2002) of the study area	11
Figure 2.5 – Land systems of the study area	13
Figure 4.1 – Representative photo of mallee/mulga over spinifex sandplain	20
Figure 4.2 – Representative photo of low halophytic shrubland	20
Figure 4.3 – Representative photo of mulga over stony tussock grassland.....	21
Figure 4.4 – Representative photo of melaleuca woodland over calcrete flats	21
Figure 4.5 – Fauna habitats of the study area.....	22
Figure 5.1 – Brush-tailed Mulgara recorded from the vicinity of the study area in 2014 (<i>ecologia</i> in prep.).....	37

APPENDICES

Appendix A Explanation of Conservation Codes.....	60
Appendix B Potential vertebrate fauna assemblage based on literature review	63
Appendix C Potential SRE Invertebrate fauna based on literature review	78
Appendix D Potential Stygofauna based on literature review	84
Appendix E Potential Troglofauna based on literature review.....	92

ACRONYMS

CAMBA	China-Australia Migratory Bird Agreement
DoE	Department of Environment
DPaW	Department of Parks and Wildlife
DSEWPac	Department of Sustainability, Environment, Water, Population and Communities
EIA	Environmental Impact Assessment
EPA	Environmental Protection Authority
EPBC Act	<i>Environment Protection and Biodiversity Conservation Act 1999</i>
JAMBA	Japan-Australian Migratory Bird Agreement
IBRA	Interim Biogeographic Regionalisation for Australia
PER	Public Environment Review
WC Act	<i>Wildlife Conservation Act 1950</i>

EXECUTIVE SUMMARY

Toro Energy Limited commissioned *ecologia* Environment to undertake a desktop assessment of two Millipede tenements, located approximately 20 kilometres south-southwest of Wiluna in the Eastern Murchison region of Western Australia.

Several previous fauna surveys have been undertaken in the vicinity of the Millipede tenements, including the Centipede tenements immediately adjacent to the study area, both to the west and to the east. Thus, there is a relatively high level of existing knowledge regarding the fauna of the general area.

One priority ecological community, the Hinkler Well calcrete, is found within the study area. This calcrete extends for 30 km or so west from Lake Way along the palaeodrainage system of the Abercromby Creek. The Hinkler Well calcrete covers approximately 80 km², of which the study area covers approximately 5-10 %.

Five broad-scale terrestrial fauna habitat types have been identified within the Millipede tenements based on recent habitat mapping conducted in the area:

- Mallee/mulga over spinifex sandplain
- Low halophytic shrubland
- Mulga over stony tussock grassland
- Salt lake
- Melaleuca woodland over calcrete flats

A review of the relevant literature indicated a total of 34 native and 11 introduced mammal, 134 bird, 77 reptile and eight amphibian species that have the potential to occur within the Millipede tenements. Of these, 19 species are considered to be of conservation significance; seven mammal species, 11 bird species, and one reptile species. Eight of these conservation-significant species are considered to have a medium or high likelihood of occurrence within the study area:

- Fork-tailed Swift (*Apus pacificus*; EPBC Act Migratory, WC Act Schedule 3) - Medium
- Sharp-tailed Sandpiper (*Calidris acuminata*; EPBC Act Migratory, WC Act Schedule 3) - Medium
- Rainbow Bee-eater (*Merops ornatus*; EPBC Act Migratory, WC Act Schedule 3) - High
- Grey Falcon (*Falco hypoleucos*; WC Act Schedule 1) - High
- Peregrine Falcon (*Falco peregrinus*; WC Act Schedule 4, DPaW Specially Protected) - High
- Brush-tailed Mulgara (*Dasymercus blythi*; DPaW Priority 4) – Medium
- Australian Bustard (*Ardeotis australis*; DPaW Priority 4) - High
- Bush Stone-curlew (*Burhinus grallarius*; DPaW Priority 4) - High

In addition, 103 invertebrate taxa from SRE groups have been identified as potentially occurring within the study area. Of these, 51 are considered to be potential SREs according to WA Museum guidelines. However, it should be noted that these guidelines assign potential SRE status to any taxon which is poorly understood taxonomically, or cannot be identified to species level or equivalent. Those taxa considered most likely to represent true SRE taxa are:

- Mygalomorph spiders: *Aname* 'sp. B', *Aname* MYG176, *Aname* MYG227, *Kwonkan* MYG175, *Kwonkan* MYG194
- Scorpions: *Urodacus* 'lakeway1', *Urodacus* 'lakeway2', *Urodacus* 'maitland1', *Urodacus* 'maitland2', *Urodacus* 'yeelirrie'
- Pseudoscorpions: *Beierolpium* 'sp. 8/2', *Beierolpium* 'sp. 8/3', *Beierolpium* 'sp. 8/4 small', *Linnaeolpium* sp., *Xenolpium* 'PSE064'
- Isopods: *Acanthodillo* sp. nov. 7, *Buddelundia* sp. nov. 46, *Cubaris* sp. wiluna, *Pseudodiploexochus* sp. nov., Isopoda nov. genus nov. species

162 stygal invertebrate taxa have been identified as potentially occurring within the study area, with crustaceans the dominant group.

The hydrogeology of the study area is conducive to the presence of stygal taxa, with a large part of the study area overlying the Hinkler Well calcrete. The following species are currently known only from the Hinkler Well calcrete and are thus considered the most likely to both occur within the study area and to have a limited distribution.

- Dytiscid Beetles: *Limbodessus hinkleri*, *Limbodessus macrohinkleri*, *Limbodessus raeae*
- Amphipods: Chiltoniidae sp. SAM3
- Bathynellaceans: *Atopobathynella* sp. OES5, *Brevisomabathynella* sp. SAM2
- Copepods: *Schizopera* sp. TK4, *Schizopera* sp. TK7
- Ostracods: *Candonopsis* (*Abcandonopsis*) *linnaei*

A total of 47 troglofaunal invertebrate taxa were identified as potentially occurring within the study area.

The following troglofaunal taxa are currently known only from mining areas in the Centipede tenements, and hence are considered to be of most interest for conservation purposes as they occur close to the study area and are currently known only from mining impact areas.

- Diplurans: Projapygidae sp.
- Isopods: *Haloniscus* sp. OES3, *Haloniscus* sp. OES9

1 INTRODUCTION

1.1 PROJECT OVERVIEW

Toro Energy Limited (Toro) commissioned *ecologia* Environment (*ecologia*) to undertake a desktop assessment of two Millipede tenements (study area), located on the western edge of Lake Way (a large ephemeral salt lake) approximately 20 kilometres south-southwest of Wiluna in the Eastern Murchison region of Western Australia (Figure 1.1).

In order to support and progress a Public Environment Review (PER) application, a biological desktop assessment is required. To date there have been a number of studies conducted in the region including the adjacent Centipede tenements; as such, a desktop assessment was deemed sufficient to satisfy regulatory requirements. The desktop assessment includes terrestrial (vertebrate fauna and short range endemic (SRE) invertebrate fauna) and subterranean fauna (troglofauna and stygofauna).

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:

- *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, the relevant guidelines are:

- EPA Guidance Statement No. 20: *Sampling of Short Range Endemic Invertebrate Fauna for Environmental Impact Assessment in Western Australia* (EPA 2009)
- EPA Guidance Statement No. 56: *Terrestrial Fauna Surveys for Environmental Impact Assessment in Western Australia* (EPA 2004)
- Environmental Assessment Guideline No. 12: *Consideration of subterranean fauna in environmental impact assessment in Western Australia*
- Principles outlined in EPA Position Statement No. 3: *Terrestrial Biological Surveys as an Element of Biodiversity Protection* (EPA 2002)

- The *Technical Guide – Terrestrial Vertebrate Fauna Surveys for Environmental Impact Assessment* (EPA and DEC 2010).

In relation to terrestrial short range endemic (SRE) fauna, the EPA Guidance Statement No. 20 states that:

“Given their potential to be restricted at small spatial scales, SRE species are generally at greater risk of changes in conservation status, local population or taxon extinctions than other, more widely distributed taxa. This risk can be increased by pre-existing threatening processes or as a result of the cumulative impact of developments. Some key threatening processes for SRE fauna include:

- *clearing of native vegetation (habitat removal);*
- *changes to fire regimes;*
- *introduction and/or spread of weeds and soil pathogens;*
- *fragmentation and subdivision of habitats; and*
- *changes to surface hydrology.”*

In addition, it indicates that while some better-known SRE species have been gazetted as threatened or endangered under State legislation (WC Act) and/or Commonwealth legislation (EPBC Act) (Appendix A), the majority have not. Often the lack of knowledge about these species precludes their consideration for gazettal as threatened or endangered. Gazettal under legislation should, therefore, not be the only conservation consideration in environmental impact assessment.

In relation to subterranean fauna, Environmental Assessment Guideline 12 states that:

“Subterranean fauna often display evolutionary adaptations to underground life, particularly reduced pigment and reduced, poorly functioning or non-existent eyes. Fauna that use a subterranean environment for only part of the day or season (e.g. soil-dwelling or burrowing species, cave-dwelling bats and birds) are not considered as subterranean fauna for this EAG. International discussion regarding classification of and links between surface, soil and subterranean fauna are acknowledged, however this definition has been chosen because it focuses attention on those species which are restricted to subterranean environments. This obligate underground existence greatly increases the likelihood of short range endemism and the possibility that a species conservation status may be impacted as a result of implementation of a proposal.

...

The assessment of subterranean fauna is often more complex than for other biodiversity factors due to limited knowledge of species distributions and habitat requirements, and the difficulties of survey. Adequate survey is integral to understanding the species present, nevertheless the EPA recognises that the use of surrogates can augment existing information. The use of surrogates together with the information gathered during survey, aims to raise the level of confidence in the predictions of impacts and provide sufficient confidence that the environmental objective can be met.”

Native 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 study 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 September 2013.

In addition, the Department of Parks and Wildlife (DPaW) maintains a Threatened and Priority list. Threatened flora and fauna that is listed as Schedule 1 under the WC Act are further ranked by the DPaW according to their level of threat using IUCN Red List criteria. Species can be listed as Critically Endangered (CR), Endangered (EN) and Vulnerable (VU). Species that have not yet been adequately surveyed to be listed under Schedule 1 or 2 are listed as Priorities 1, 2 or 3, which are ranked in order of priority for survey and evaluation of conservation status so that consideration can be given to their declaration as threatened fauna. Species that are adequately known, are rare but not threatened, or meet criteria for Near Threatened, or that have been recently removed from the threatened list for other than taxonomic reasons, are placed in Priority 4. These species require regular monitoring. Conservation Dependent species are placed in Priority 5. The three Threatened and five Priority codes are summarised in Appendix A.

1.3 ASSESSMENT OBJECTIVES

Toro commissioned *ecologia* to undertake a desktop assessment of the terrestrial and subterranean fauna of the study area, in order to support and progress a PER application.

The EPA's objectives with regards to biological management are to:

- Avoid adverse impacts on biological diversity comprising the different plants and animals and the ecosystems they form, at the levels of genetic, species and ecosystem diversity.
- Maintain the abundance, species diversity, geographic distribution and productivity of terrestrial fauna and vegetation communities.
- Protect Declared Rare Flora (DRF) consistent with the provisions of the WC Act.
- Protect Specially Protected (Threatened) fauna, consistent with the provisions of the WC Act.
- Protect other flora species of conservation significance.

This assessment was undertaken in a manner that complies with the requirements documented in the EPA's Guidance Statements Nos. 20 (SRE invertebrate fauna) and 56 (terrestrial fauna), Assessment Guideline No. 12 (subterranean fauna) and Position Statement No. 3, thus providing:

- A review of background information, including literature and database searches.
- An inventory of species of biological and conservation significance recorded or likely to occur within the study area and surrounds.
- An inventory of fauna species potentially occurring in the study area, incorporating recent published and unpublished records.
- A map of habitat types and description of vegetation and soil types occurring in the study area.
- An appraisal of the current knowledge base for the area, including a review of previous surveys conducted in the area relevant to the current study.
- A review of regional and biogeographical significance, including the conservation status of species recorded in the study area.



2 EXISTING ENVIRONMENT

2.1 CLIMATE

The survey area is located in the Murchison region of Western Australia. The Murchison experiences an arid climate with two distinct seasons; a hot summer from October to April and a mild winter from May to September. Temperatures are generally high, with summer temperatures frequently exceeding 40°C. Light frosts occasionally occur inland during July and August.

Rainfall is generally localised and unpredictable (some years have recorded zero rainfall), and temperatures are high, resulting in significant annual evaporation. The majority of the Murchison has a bimodal rainfall distribution; from December to March rains result from tropical storms producing sporadic thunderstorms. From May to August, cold fronts move eastwards across the state, reaching the Murchison. These fronts usually produce light rains.

The closest Bureau of Meteorology (BOM) weather station to the study area is Wiluna (station 13012, operating since 1898, (BoM 2014)). This weather station was selected as a reference to provide the best indication of the local climatic conditions of the study area. Climate data is summarised in Figure 2.1.

The mean annual rainfall at Wiluna is 257.4 mm, falling over a mean of 29.2 rain days. Rainfall is least during the late winter to spring period (August to November). Temperatures in the summer months from December to February often exceed 40°C, with winter conditions relatively dry and mild temperatures.

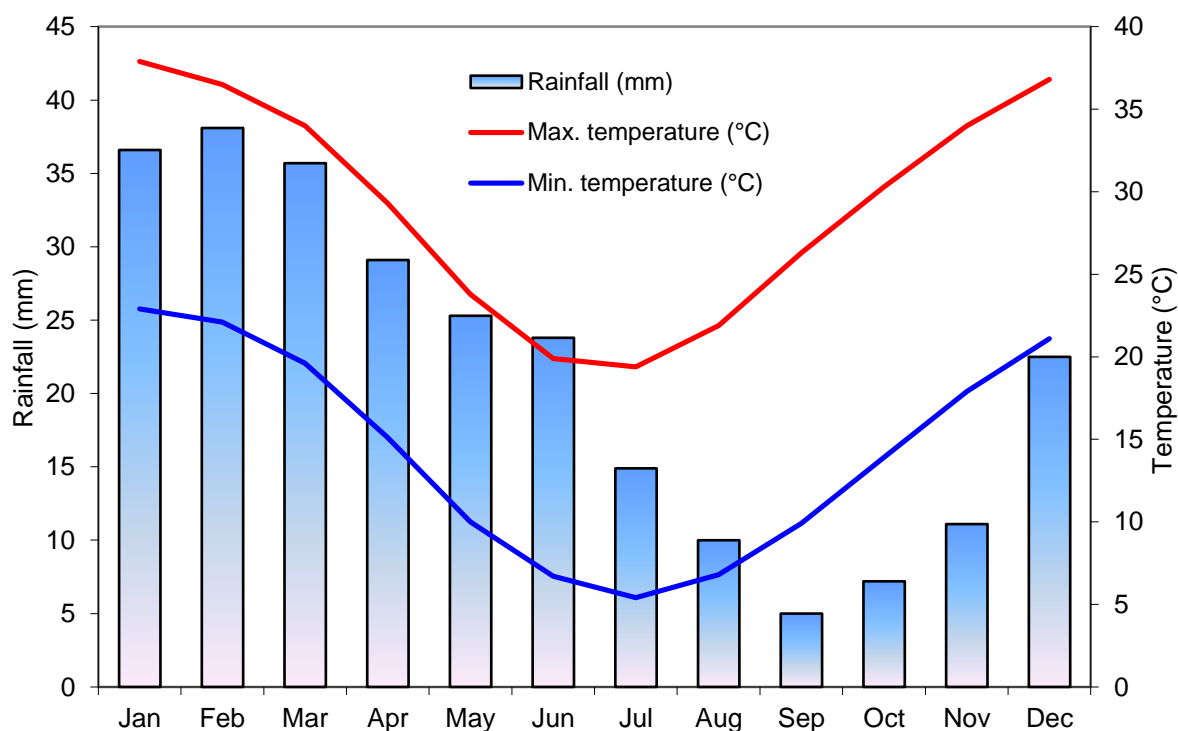


Figure 2.1 – Rainfall and Temperature for Wiluna Weather Station (BoM 2014)

2.2 BIOGEOGRAPHY

The Interim Biogeographic Regionalisation for Australia (IBRA) classifies the Australian continent into regions (bioregions) of similar geology, landform, vegetation, fauna and climate characteristics (DSEWPC 2009). According to IBRA (Version 6.1), the study area lies within the Murchison Bioregion. The Murchison Bioregion is further subdivided into two subregions, those being the Eastern Murchison (MUR01) and Western Murchison (MUR02) subregions. The study area lies entirely within the Eastern Murchison subregion of the Murchison Bioregion (Figure 2.2).

The Eastern Murchison subregion covers 75.2% of the Murchison bioregion. This subregion is characterised by its internal drainage, and extensive areas of elevated red desert sandplains with minimal dune development, salt lake systems associated with the occluded Paleodrainage system, broad plains of red-brown soils and breakaway complexes as well as red sandplains. Vegetation is dominated by Mulga Woodlands often rich in ephemerals; hummock grasslands, saltbush shrublands and Halosarcia shrublands (Cowan 2001).

2.3 SOILS

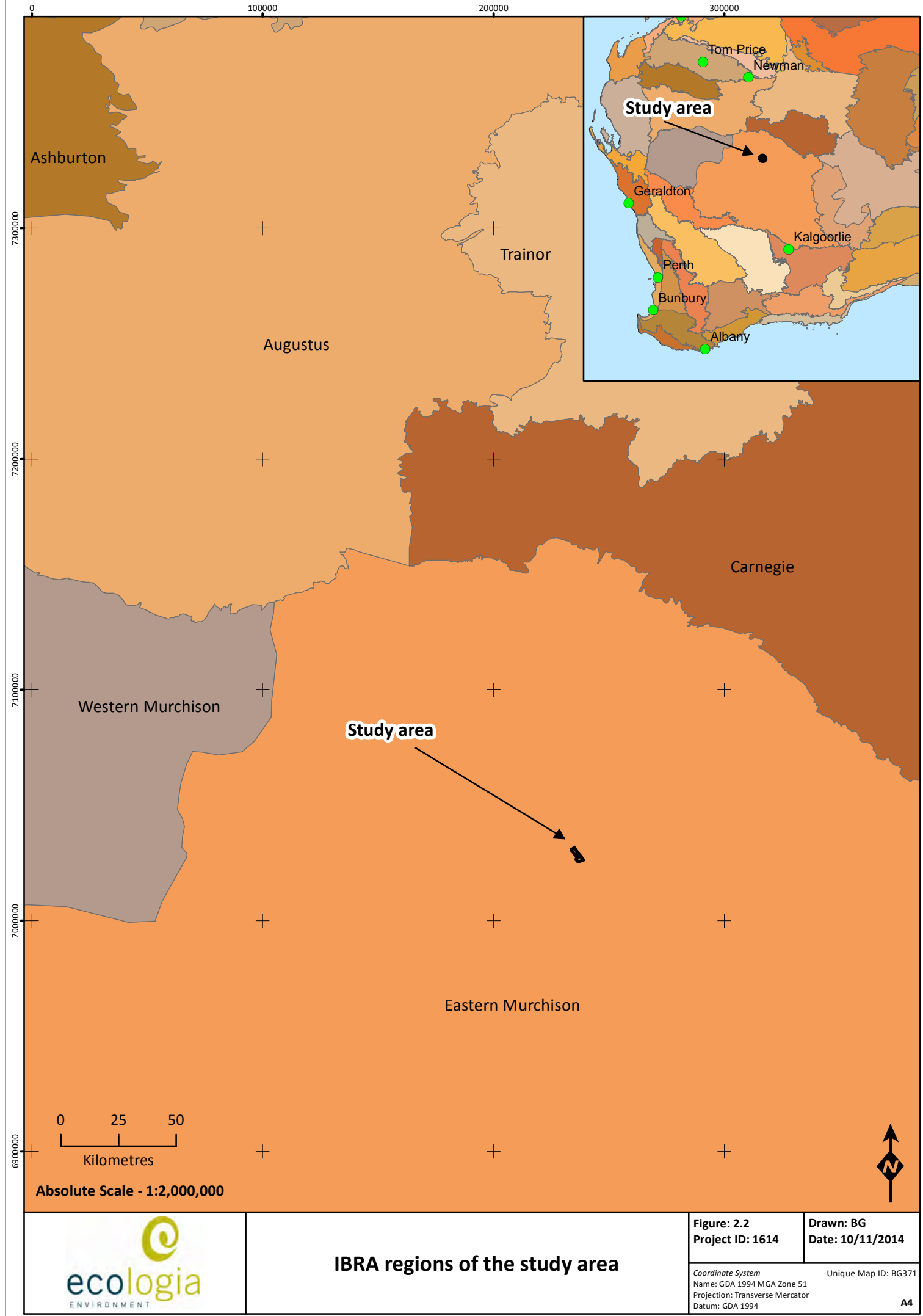
A single soil unit, as classified by Bettenay *et. al.* (1967) occurs within the study area. This soil unit is described below:

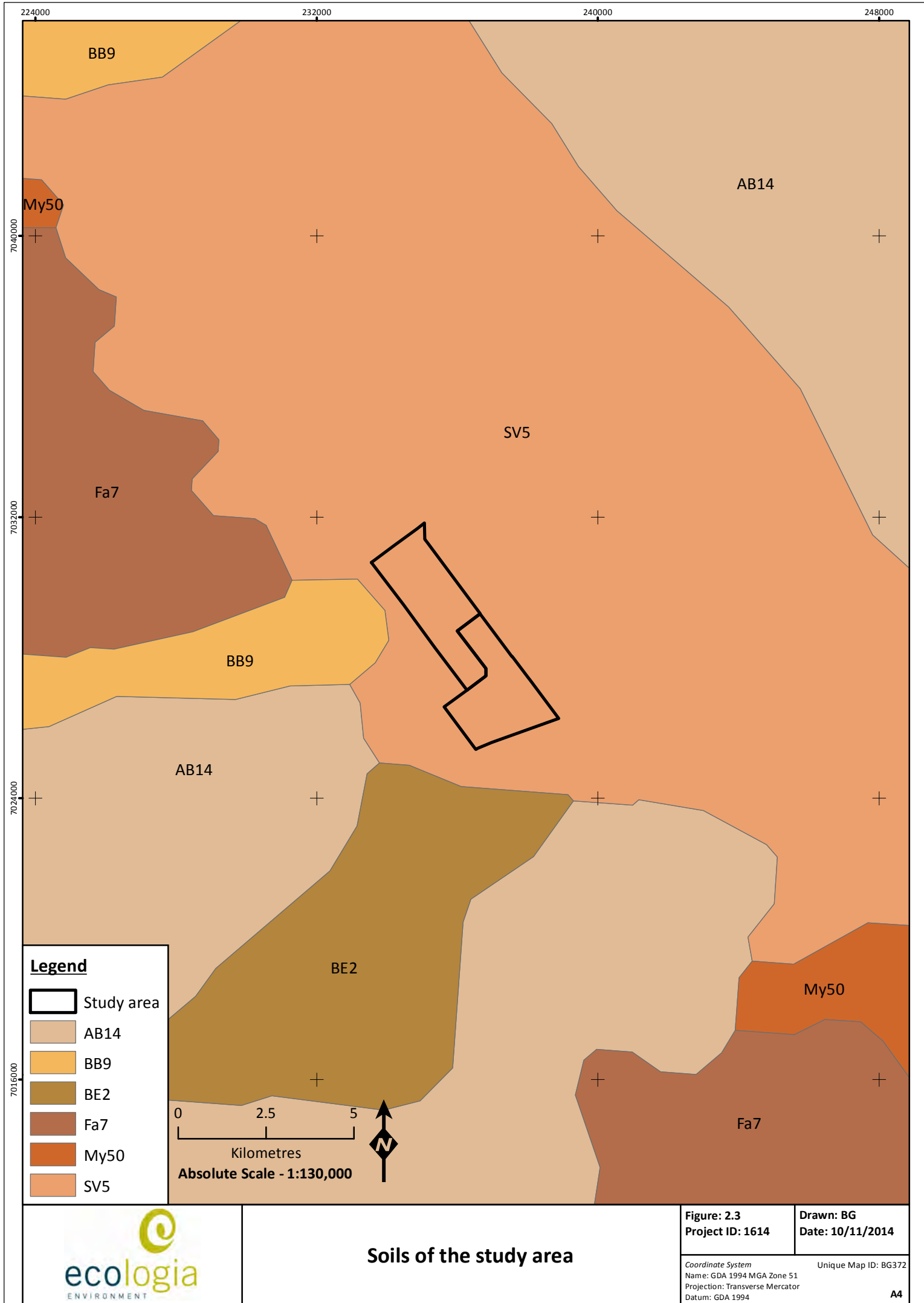
SV5: Saline soils associated with salt lakes; sand and kopi gypsum dunes, and intervening plains: soils are mixed but chief soils are probably shallow (Um1) with various (Dr1) and (Dr2) soils, together with saline (Gn2.13), (Uc1.23), and (Um5.11) soils which sometimes overlie red-brown hardpan.

Tille (2006) compiled available detailed mapping information of Western Australia's Rangelands and Arid Interior into a hierarchy of soil-landscape units, providing descriptions of soil-landscape regions, provinces and zones. The study area is located within the Murchison Province of Western Australia. The Murchison Province is further subdivided into seven soil zones, with the study area located within 279: Salinaland Plains Zone.

The Salinaland Plains Zone is characterised by sandplains (with hardpan wash plains and some mesas, stony plains and salt lakes) on granitic rocks (and some greenstone) of the Yilgarn Craton. Soil types are described as; red sandy earths, red deep sands, red shallow loams and red loamy earths with some red-brown hardpan shallow loams, salt lake soils and red shallow sandy duplexes. The Salinaland Plains Zone is Located in the northern Goldfields from Lakes Barlee and Ballard to Wiluna and Laverton (Tille 2006).

Soil surveys of the adjacent Centipede West study area describes five soil/landform associations from that study area; calcareous (flats and rises), claypan, creekline, drainage line and dune areas (Outback Ecology 2011b). Soil morphology varied across the study area, with calcareous and creekline sites typically shallower with calcareous fragments, and claypan, drainage line and dune sites deeper and sandier with fewer coarse fragments (Outback Ecology 2011b). Soil texture varied, but the majority of soils were classified as sand, sandy loam, or sandy clay loam (Outback Ecology 2011b).





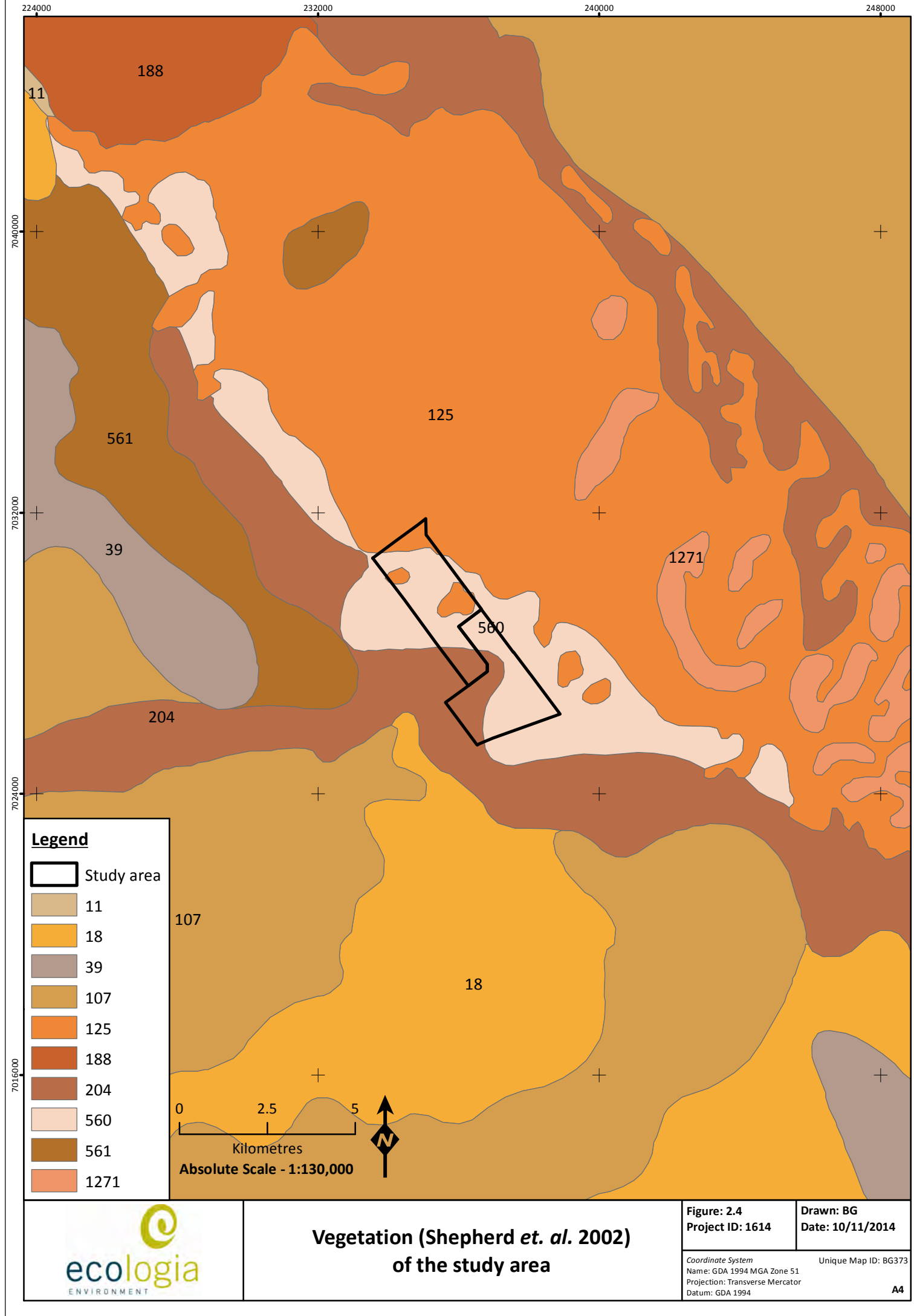
2.4 VEGETATION

The vegetation of Western Australia was originally mapped at the 1:1,000,000 scale by Beard (1979), and was subsequently reinterpreted and updated to reflect the National Vegetation Information System standards (Shepherd *et al.* 2002). Three of the vegetation types identified by Shepherd *et al.* (2002) are found within the study area; Unit 204, 560 and 125. Table 2.1 describes each Shepherd vegetation unit, which correlates with an equivalent Beard unit number, together with its extent in the Murchison IBRA region and its area within the study area.

The dominant vegetation association within the study area is unit 560, occupying 64.7% of the study area. All vegetation units are well represented outside the study area, with the study area occupying less than 1% of the total area of each vegetation unit within the Murchison bioregion.

Table 2.1 – Vegetation associations of the study area

Shepherd Unit (equivalent Beard number)	Description	Total area in Murchison IBRA region (km ²)	Area within the study area (km ²)	Proportion of study area (%)	Proportion of total vegetation unit (%)
204 (a1,8Sr k1,2Ci)	Succulent steppe with open scrub; scattered mulga & <i>Acacia sclerosperma</i> over saltbush & bluebush	1,856.2	2.64	22.4	0.14
560 (a9Si/k3Ci)	Mosaic: Shrublands; bowgada scrub / Succulent steppe; samphire	850	7.63	64.7	0.89
125 (sl)	Bare areas; salt lakes	7,135.6	1.52	12.9	0.02



Legend

- Study area
- 11
- 18
- 39
- 107
- 125
- 188
- 204
- 560
- 561
- 1271

**Vegetation (Shepherd *et. al.* 2002)
of the study area**

Figure: 2.4
Project ID: 1614

Drawn: BG
Date: 10/11/2014

Coordinate System
Name: GDA 1994 MGA Zone 51
Projection: Transverse Mercator
Datum: GDA 1994

Unique Map ID: BG373

A4

2.5 LAND SYSTEMS

From 1985 to 1988 a regional survey of the Murchison was conducted by Curry *et al.* (1994) in an attempt to obtain an inventory and condition of land systems within the Murchison River catchment. The Murchison regional inventory covers approximately 88,360 km of arid zone rangelands situated between Mt Magnet and Meekatharra in the east and the catchments of the Greenough and Wooramel Rivers in the west. This area includes most of the catchment of the Murchison River and its tributaries the Sanford, Roderick and Yalgar Rivers; as well as most of the catchment of Lake Austin. Lands within the area have been described and mapped into 19 broad land types composed of 74 land systems.

The study area falls across two land systems; Carnegie and Cunyu. A summary of area calculations is provided in Table 2.2, which shows the dominant land system of the study area is Carnegie, occupying 97.1% of the study area. Both land systems are well represented outside the study area, with the study area occupying less than 0.1% of both the Carnegie and the Cunyu land systems.

Table 2.2 – Land Systems of the study area

Land System	Description	Total area in Murchison IBRA region (km ²)	Area within the study area (km ²)	Proportion of study area (%)	Proportion of total land system (%)
Carnegie	Salt lakes with extensively fringing saline plains, dunes and sandy banks, supporting low halophytic shrublands and scattered tall acacia shrublands; lake beds are highly saline; gypsiferous and mainly unvegetated.	11,859	11.45	97.1	0.096
Cunyu	Calcrete platforms and intervening alluvial floors and minor areas of alluvial plains, including channels with acacia shrublands and minor halophytic shrublands.	2,903.9	0.34	2.9	0.011

232000

240000

248000

7040000

7032000

7024000

7016000

Killara Land System

Gabanintha Land System

Carnegie Land System

Violet Land System

Cunyu Land System

Mitchell Land System

Mindura Land System

Jundee Land System

Millrose Land System

Yandil Land System

Yanganoo Land System

Wiluna Land System

Bullimore Land System



0 2.5 5

Kilometres

Absolute Scale - 1:130,000

Legend

Study area

**Land systems of the study area**

Figure: 2.5
Project ID: 1614

Drawn: BG
Date: 10/11/2014

Coordinate System
Name: GDA 1994 MGA Zone 51
Projection: Transverse Mercator
Datum: GDA 1994

Unique Map ID: BG374

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2.6 HYDROGEOLOGY

Four primary groundwater aquifers types occur in the region in which the study area occurs; alluvium, calcrete, palaeochannel sand and fractured rock

Table 2.3 – Groundwater aquifer types in the region (RPS Aquaterra 2011)

Aquifer Type	Description
Alluvium	Shallow, unconfined aquifers with a depth to watertable of less than 5 m. Waters generally of low salinity
Calcrete	Secondary porosity and high permeability of calcrete can result in the formation of aquifers. Generally occurs along the lower reaches of the drainage systems where the watertable is less than 5 m below the surface. Waters generally brackish or saline.
Palaeochannel sand	Inferred to be continuous along the major drainage systems of the northern goldfields but continuity is poorly understood. Represent the most important aquifers in the region, and can reach up to 1 km wide and 40 m thick. Commonly overlain by a clay layer up to 80 m thick. Water generally hypersaline, though fresh to brackish zones can occur in drainage tributaries
Fractured rock	Associated with rocks such as greenstones, granitoids and minor intrusive rocks that display secondary porosity and permeability induced by fractures and weathering.

The study area is located on the western edge of Lake Way, in the eastern goldfields region of the Yilgarn Craton. The surficial geology of the study area primarily comprises calcrete and sandplain deposits, and a small section of the Lake Way Playa in the northern-most section of the study area (Outback Ecology 2011d). Lake Way itself is located at the head of the Carey palaeodrainage system, and five major drainages have been identified in the Lake Way area (Rockwater 1978). A series of calcrete aquifers have been identified along each of these major drainages; the most relevant of these is the Hinkler Well calcrete, which occupies a large area of the study area.

Hinkler Well Calcrete: The Hinkler Well calcrete extends westwards from Lake Way along the palaeodrainage system of the Abercromby Creek for some 30-35 km, and covers an area greater than 80 km² (Outback Ecology 2011d; RPS Aquaterra 2011). The area encompassed by the study area is approximately 5 % of the total area of the aquifer.

Groundwater drains into the system from higher areas to the north and south, then flows slowly eastwards towards Lake Way (RPS Aquaterra 2011). Direct recharge of the calcrete aquifer is thought to occur through rainfall events and periodic flows from Abercromby Creek, while indirect recharge is thought to be linked to lateral inflow from surrounding sediments (RPS Aquaterra 2011). Groundwater salinity in the calcrete ranges from 1600 mg/L at Abercromby Well, to 66,000 – 330,000 mg/L just west of Lake Way; this follows the common pattern of groundwater salinity levels increasing down gradient along the regional flow path (Outback Ecology 2011d; RPS Aquaterra 2011).

The Hinkler Well calcrete system provides habitat for stygofauna, and is recognised by DPaw as a priority ecological community on the basis of the unique assemblage of stygal taxa in the calcrete system.

3 METHODS

3.1 LITERATURE REVIEW

Several databases were consulted in the preparation of potential fauna (and conservation significant fauna) lists (Table 3.1). In addition, the results of 10 previous vertebrate fauna assessments, four previous short-range endemic invertebrate assessments, five stygofauna assessments and four troglofauna assessments were compiled (Table 3.2). The online NatureMap database encompasses several datasets which include the WA Museum (WAM), DEC threatened fauna database and DEC survey return database.

Table 3.1 – Databases searched as part of the literature review

Database	Custodian	Search Details
NatureMap	DPaW	Records within 40 km of study area
Protected Matters Search Tool	Department of Sustainability, Environment, Water, Population and Communities (DSEWPac)	Records within 40 km of study area
Birddata	BirdLife Australia	Records within 100 km of the study area
Arachnid database	WAM	Records within 50 km of study area
Crustacea database	WAM	Records within 50 km of study area
Molluscs database	WAM	Records within 50 km of study area

Table 3.2 – Previous biological surveys relevant to the study area

Survey Location and Author(s)	Approximate distance to study area (km)	Comments
Vertebrate fauna		
Wiluna Uranium Project Terrestrial Fauna Assessment (Outback Ecology 2011e)	0-30	Level 1 reconnaissance survey and one phase Level 2 vertebrate fauna survey
Reconnaissance for Wiluna Uranium Project (Outback Ecology 2009b)	0-30	
Lake Way Baseline Terrestrial Fauna Survey (Outback Ecology 2008a)	0-30	One phase Level 2 vertebrate fauna survey
Lake Way Baseline Fauna Studies (Outback Ecology 2002)	0-30	
Lake Maitland to Millipede Fauna Survey (<i>ecologia</i> in prep.)	0-70	Level 1 & Level 2 vertebrate fauna surveys
Jundee Mulgara Assessment (<i>ecologia</i> 2004)	55	Targeted Mulgara survey
Bogada Fauna Assessment (<i>ecologia</i> 2013a)	65	Level 2 vertebrate fauna survey
Lake Maitland Baseline Terrestrial Fauna Survey (Outback Ecology 2009a)	70	Two phase Level 2 vertebrate fauna survey
Lake Maitland Infrastructure Areas Baseline Terrestrial Fauna Surveys (Outback Ecology 2010)	70	
Terrestrial Fauna Habitat Assessment - Borefield, Accommodation Camp and Access Route (Outback Ecology 2011a)	70	Level 1 fauna survey and habitat assessment

Survey Location and Author(s)	Approximate distance to study area (km)	Comments
SRE invertebrate fauna		
Lake Way Baseline Terrestrial Fauna Survey (Outback Ecology 2008a)	0-30	One phase Level 2 SRE invertebrate fauna survey
Wiluna Uranium Project Terrestrial Fauna Assessment (Outback Ecology 2011e)	0-30	Level 1 reconnaissance survey and one phase Level 2 SRE invertebrate fauna survey
Bogada SRE Invertebrate Survey (<i>ecologia</i> 2014b)	65	Level 2 SRE invertebrate fauna survey
Lake Maitland Baseline Terrestrial Fauna Survey (Outback Ecology 2009a)	70	Two phase Level 2 SRE invertebrate fauna survey
Lake Maitland Uranium Project: Terrestrial Short-range Endemic Invertebrate Fauna Assessment (Outback Ecology 2012a)	70	Level 2 SRE invertebrate fauna survey
Stygofauna		
Centipede Project Baseline Stygofauna Survey (Outback Ecology 2008b)	0	One phase Level 2 stygofauna survey [^]
Wiluna Uranium Project Subterranean Fauna Assessment (Outback Ecology 2011d)	0-30	Three phase Level 2 stygofauna survey
Wiluna Uranium Project Stygofauna Memo (Outback Ecology 2012e)	0-30	Level 2 stygofauna survey & literature review results
Bogada Stygofauna Survey (<i>ecologia</i> 2014a)	65	Level 2 stygofauna survey
Lake Maitland Uranium Project (Outback Ecology 2012b)	70	Level 2 stygofauna survey
Troglofauna		
Wiluna Uranium Project Subterranean Fauna Assessment (Outback Ecology 2011d)	0-30	Level 2 troglofauna survey
Blackham Subterranean Survey (<i>ecologia</i> unpublished)	15	Level 2 troglofauna survey
Bogada Troglofauna Survey (<i>ecologia</i> 2013b)	65	Level 2 troglofauna survey
Lake Maitland Uranium Project Troglofauna Survey (Outback Ecology 2012c)	70	Level 2 troglofauna survey

[^] Two phase survey planned but report only documents first phase of sampling

3.2 POTENTIAL CONSERVATION SIGNIFICANT VERTEBRATE FAUNA

After the results of the literature review, database searches and survey results were compiled, fauna species that are listed under current legislative frameworks were identified. Three conservation lists have been developed at national (EPBC Act) and state level (WC Act and DEC priority list).

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

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

Each conservation or biologically significant species potentially occurring in the study area, was assigned a likelihood of occurrence based on the below category (Table 3.3). The level of available information for each species was also taken into consideration so that species are not allocated a low likelihood of occurrence because of insufficient survey information or cryptic behaviours and ecology.

Table 3.3 – Likelihood of occurrence categories

RECORDED	Species recorded within study area
HIGH	Species recorded within, or in proximity to, the study area within 20 years; suitable habitat occurs in the study area
MEDIUM	Species recorded within, or in proximity to, the study area more than 20 years ago. Species recorded outside study area, but within 50 km; suitable habitat occurs in the study area
LOW	Species rarely, or not recorded, within 50 km, and/or suitable habitat does not occur in the study area

3.3 DETERMINING SRE STATUS

SRE status of invertebrate fauna recorded is based on categories developed by the Western Australian Museum. The newly released 2013 WAM SRE categories, which have been developed to describe the SRE status of WA taxa, are using: (a) unambiguous categories; and (b) explanations of uncertainty. This has been accomplished using a two-tier classification system. In the first tier of classification, geographic distribution and taxonomic certainty are the variables used to split taxa into “Confirmed SREs”, “Widespread (not SREs)”, and “Potential SREs”. In the second tier of classification, “Potential SREs” are categorised according to the reasons why they have been placed into this category and the presence of proxy-indicators for Confirmed SRE or Widespread status.

Table 3.4 – Western Australian Museum SRE categories (2013)

	Taxonomic Certainty	Taxonomic Uncertainty
Distribution < 10 000km ²	Confirmed SRE <ul style="list-style-type: none"> • A known distribution of <10,000km². • The taxonomy is well known. • The group is well represented in collections and/ or via comprehensive sampling. 	Potential SRE <ul style="list-style-type: none"> • Patchy sampling has resulted in incomplete knowledge of the geographic distribution of the group. • We have incomplete taxonomic knowledge. • The group is not well represented in collections. • This category is most applicable to situations where there are gaps in our knowledge of the taxon.
Distribution > 10 000km ²	Widespread (not an SRE) <ul style="list-style-type: none"> • A known distribution of >10 000km². • The taxonomy is well known. • The group is well represented in collections and/ or via comprehensive sampling. 	Sub-categories for this SRE designation are outlined below

SRE SUB-CATEGORIES

If a taxon is determined to be a “Potential SRE”, the following sub-categories will further elucidate this status.

A. Data Deficient:

- There is insufficient data available to determine SRE status.

- Factors that fall under this category include:
 - Lack of geographic information;
 - Lack of taxonomic information;
 - The group may be poorly represented in collections; and
 - The individuals sampled (e.g. juveniles) may prevent identification to species level.

B. Habitat Indicators:

- It is becoming increasingly clear that habitat data can elucidate SRE status; and
- Where habitat is known to be associated with SRE taxa and vice versa, it will be noted here.

C. Morphology Indicators:

- A suite of morphological characters are characteristic of SRE taxa; and
- Where morphological characters are known to be associated with SRE taxa and vice- versa, it will be noted here.

D. Molecular Evidence:

- If molecular work has been done on this taxon (or a close relative), it may reveal patterns congruent or incongruent with SRE status.

E. Research and Expertise:

- Previous research and/ or WAM expertise elucidates taxon SRE status; and
- This category takes into account the expert knowledge held within the WAM taxonomy and nomenclature.

4 RESULTS

4.1 VERTEBRATE FAUNA

4.1.1 Broad-scale vertebrate fauna habitats

A previous fauna survey of the study area identified seven broad-scale fauna habitats in the vicinity of the study area (Outback Ecology 2008a);

- Melaleuca stands
- Open mulga over calcrete
- Mallee/mulga complex over spinifex
- Woodland on calcrete flats
- Mixed samphire
- Claypan
- Dune
- Salt lake

More recently, six broad-scale fauna habitats were identified and mapped as part of the Lake Maitland to Millipede vertebrate fauna assessment (*ecologia* in press).

- Mulga over spinifex sandplain
- Mulga over stony tussock grassland
- Mallee/mulga over spinifex sandplain
- Melaleuca woodland over calcrete flats
- Stony hills and footslopes
- Low halophytic shrubland

Based on aerial photographs, and mapping in these previous reports, five fauna habitat types were identified within the Millipede study area. These are described below and mapped in Figure 4.5.

4.1.1.1 Mallee/mulga over spinifex sandplain

Mallee/mulga over spinifex sandplain comprises approximately 44.4 % (523.8 ha) of the study area by area (Figure 4.1). The vegetation is characterised by open mature mulga (*Acacia caesaneura*, *A. pruinocarpa*) woodland with occasional mallees (*Eucalyptus kingsmillii* and *E. lucasii*) over sparse shrubland of *Eremophila forrestii* and *Acacia* spp., with open *Triodia basedowii* hummock grassland. The soil substrate consists of a firm orange-brown clay-sand, suitable for burrowing mammals and reptiles. Leaf-litter is abundant under large mallee and *Acacia* trees and shrubs, while wood-litter is moderate. Similar habitat is present outside the study area and is likely to be well-represented in the surrounding region (Outback Ecology 2011c).



Figure 4.1 – Representative photo of mallee/mulga over spinifex sandplain

4.1.1.2 Low halophytic shrubland

The low halophytic shrubland habitat comprises 32.2 % (380.3 ha) of the study area (Figure 4.2). The vegetation is characterised by chenopods and shrubs including *Maireana*, *Atriplex*, *Salsola*, *Solanum*, *Senna*, *Sclerolaena* and *Frankenia* with sparse *Aristida contorta* tussock grassland. The soil substrate consists of a loose orange-brown sandy-clay, with many quartz pebbles, suitable for burrowing reptiles. Leaf-litter and wood-litter is absent. This habitat is well-represented within the region, particularly in association with salt lakes (Outback Ecology 2011c).



Figure 4.2 – Representative photo of low halophytic shrubland

4.1.1.3 Mulga over stony tussock grassland

Mulga over stony tussock grassland comprises 16.1 % (189.5 ha) of the study area (Figure 4.3). The vegetation is characterised by sparse *Acacia pruinocarpa* or *Acacia caesaneura* woodland over open *Eremophila forrestii* and *Acacia aneura*-complex shrubs, with open *Aristida contorta*, *Eragrostis eriopoda*, *Monachather paradoxus* and *Eriachne* sp. tussock grassland. The soil substrate consists of a firm brownish sandy-clay or clay-loam. Leaf-litter is found only under trees and shrubs, and wood-litter is generally sparse to moderate. Similar habitat is widespread in the region (Outback Ecology 2011c).



Figure 4.3 – Representative photo of mulga over stony tussock grassland

4.1.1.4 Salt lake

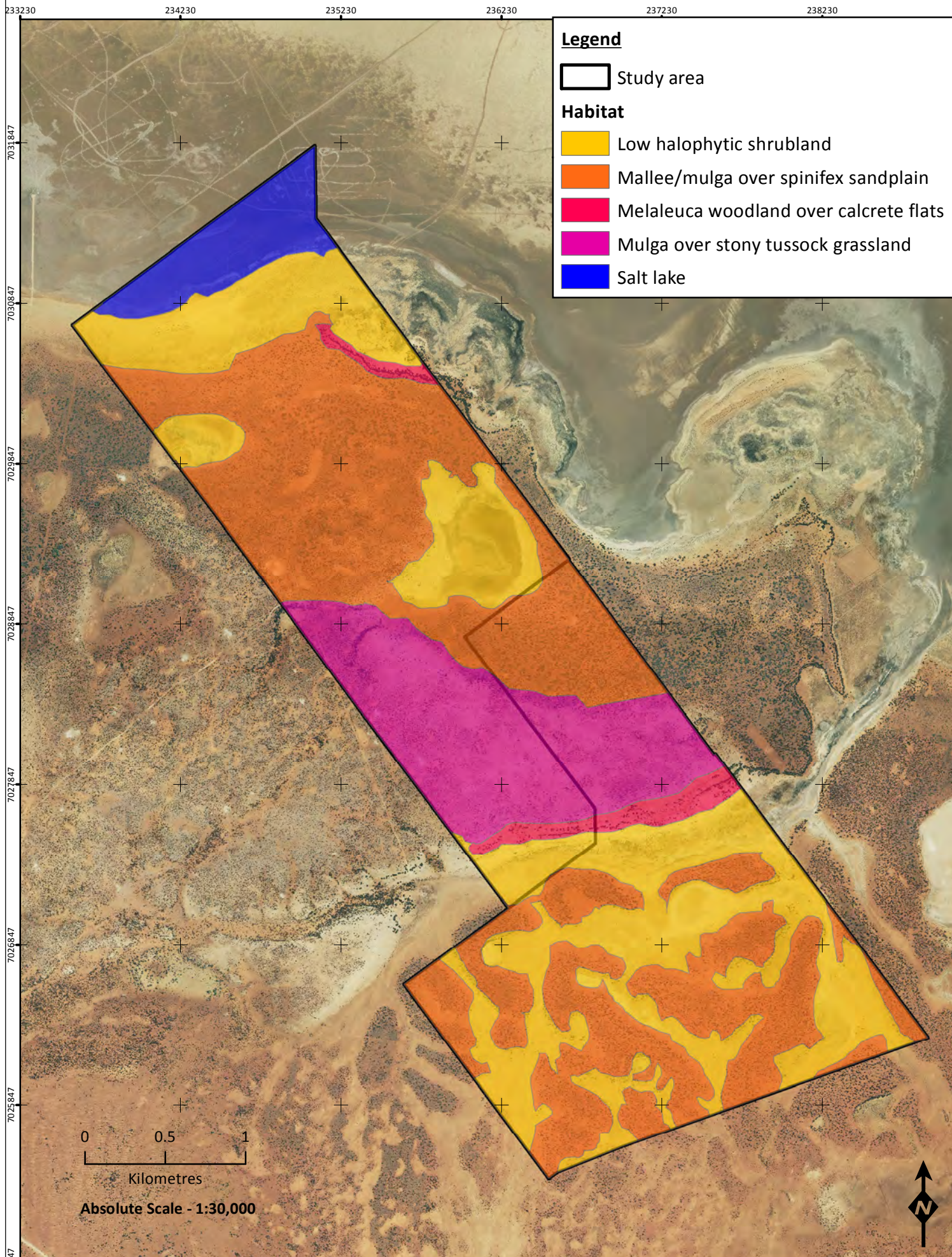
Salt lake habitat occurs in the northern section of the study area, where it extends onto Lake Way itself, and comprises 4.8 % (56.5 ha) of the study area. This habitat type refers to the bare, flat areas of salt lakes and is devoid of vegetation, and consequently leaf litter. The habitat type occurs across much of Lake Way itself.

4.1.1.5 Melaleuca woodland over calcrete flats

The melaleuca woodland over calcrete flats habitat comprises 2.5 % (29.3 ha) of the study area (Figure 4.4). The vegetation is characterised by open *Melaleuca xerophila* woodland over *Acacia* spp., *Sclerolaena* and *Eremophila* shrubland with sparse *Triodia basedowii* hummock grassland and *Eragrostis eriopoda* tussock grassland. The soil substrate consists of a loose orange-brown sandy-clay, with scattered pebbles. Leaf-litter occurs under trees and shrubs, while wood-litter is moderate. This habitat type is relatively limited within the region and is largely restricted to the lake fringes (Outback Ecology 2011c).



Figure 4.4 – Representative photo of melaleuca woodland over calcrete flats



4.1.2 Potential vertebrate fauna assemblage

The results of the literature review (Section 3.1) indicated a total of 45 mammal species, 134 bird species, 77 reptile species and eight amphibian species have the potential to occur within the study area. A breakdown of the families for each group is provided below in Table 2.1. The full results of this assessment are shown in Appendix B. Species of conservation significance are outline below, and further discussed in Section 5.1.1.

Table 4.1 – Summary of vertebrate fauna groups potentially occurring within the study area

Family	No. of native species	No. of conservation significant species	Family	No. of native species	No. of conservation significant species
Native mammals					
Tachyglossidae	1	0	Macropodidae	4	1
Dasyuridae	10	2	Emballonuridae	2	0
Thylacomyidae	1	1	Vespertilionidae	7	0
Peramelidae	1	1	Molossidae	2	0
Notoryctidae	1	1	Muridae	3	0
Potoroidae	1	1	Canidae	1	0
Birds					
Casuariidae	1	0	Cuculidae	4	0
Megapodiidae	1	1	Strigidae	1	0
Phasianidae	1	0	Tytonidae	1	0
Anatidae	6	0	Halcyonidae	2	0
Podicipedidae	2	0	Meropidae	1	1
Columbidae	3	0	Climacteridae	1	0
Podargidae	1	0	Ptilonorhynchidae	1	0
Eurostopodidae	1	0	Maluridae	4	0
Aegothelidae	1	0	Acanthizidae	9	0
Apodidae	1	1	Pardalotidae	2	0
Anhingidae	1	0	Meliphagidae	15	0
Phalacrocoracidae	1	0	Pomatostomidae	2	0
Pelecanidae	1	0	Psophodidae	3	0
Ardeidae	3	1	Neosittidae	1	0
Threskiornithidae	1	0	Campephagidae	3	0
Accipitridae	10	0	Pachycephalidae	3	0
Falconidae	5	2	Artamidae	7	0

Family	No. of native species	No. of conservation significant species	Family	No. of native species	No. of conservation significant species
Rallidae	2	0	Rhipiduridae	1	0
Otididae	1	1	Corvidae	3	0
Burhinidae	1	1	Monarchidae	1	0
Recurvirostridae	3	0	Petroicidae	3	0
Charadriidae	6	1	Megaluridae	3	0
Scolopacidae	1	1	Hirundinidae	4	0
Turnicidae	1	0	Nectariniidae	1	0
Cacatuidae	3	0	Estrildidae	1	0
Psittacidae	6	1	Motacillidae	1	0
Reptiles					
Cheluidae	1	0	Pygopodidae	6	0
Agamidae	11	0	Scincidae	26	1
Diplodactylidae	11	0	Varanidae	7	0
Carphodactylidae	4	0	Typhlopidae	2	0
Gekkonidae	3	0	Elapidae	6	0
Amphibians					
Hylidae	3	0	Limnodynastidae	5	0

4.1.3 Potential conservation significant vertebrate fauna

A review of the existing literature indicated that 19 species of conservation significant vertebrate fauna species have the potential to occur within the study area, comprising seven mammal, 11 bird, and one reptile species. These species are outlined below in Table 4.2.

Table 4.2 – Potential conservation significant vertebrate fauna likelihood of occurrence results

Species	Conservation Significance			Habitat	Previous Records	Likelihood of Occurrence
	EPBC Act	WC Act	DPaW			
Mammals						
Northern Marsupial Mole <i>Notoryctes caurinus</i>	EN	S1	EN	Longitudinal sand dunes, interdunal flats and possibly sandy soils along river flats.	DoE states that the species, or suitable habitat for the species, is likely to occur within the region. No records within 100 km of the study area.	LOW No records within 100 km of the study area. Study area does not contain longitudinal sand dunes or lies within interdunal flats.
Greater Bilby <i>Macrotis lagotis</i>	VU	S1	VU	Variety of habitats on soft soil including spinifex hummock grassland, acacia shrubland, open woodland and cracking clays.	Recorded near Wiluna in 1984 (DPaW 2014). Translocated population present in the region at Lorna Glen Station	LOW No recent records in the vicinity of the survey area and habitat of limited suitability
Golden Bandicoot (Barrow Island) <i>Isodon auratus barrowensis</i>	VU	S1	VU	Rocky sandstone spinifex and vine thickets.	Translocated population occurs in the vicinity at Lorna Glen Station.	LOW Not known to occur within the region, with the exception of a translocated population at Lorna Glen Station which is largely restricted to a fenced enclosure at that location
Burrowing Bettong <i>Bettongia lesueur lesueur</i>	VU	S1	VU	Hummock grassland and scrub	DoE states that the species, or suitable habitat for the species, is likely to occur within the region.	LOW No recent records in the area and currently considered extinct on mainland Australia aside from fenced translocated populations (van Dyck and Strahan 2008).
Black-flanked Rock-wallaby <i>Petrogale lateralis lateralis</i>	VU	S1	VU	Scattered locations amongst rocky outcrops.	One record of questionable veracity c. 70 km to the south of the study area in 2009 (DPaW 2014).	LOW Only a single record within 100 km of the survey area, and aerial photographs indicate no suitable habitat located within the study area.

Species	Conservation Significance			Habitat	Previous Records	Likelihood of Occurrence
	EPBC Act	WC Act	DPaW			
Brush-tailed Mulgara <i>Dasycercus blythi</i>			P4	Sand plains and gibber plains with moderately dense spinifex with 'runways' between clumps.	Mulgara recorded from the Lake Maitland area by Outback Ecology (2009a) presumed to represent this taxon, and numerous records within the vicinity of the survey area (DPaW 2014). Recorded recently on a fauna survey of the nearby Millipede to Lake Maitland haul road study area	MEDIUM Numerous recent records from the region, however none were recorded from trapping sites located within the current study area during the recent Level 2 fauna survey of the Millipede to Lake Maitland haul road study area.
Long-tailed Dunnart <i>Sminthopsis longicaudata</i>			P4	Rocky, hilly areas vegetated with spinifex; occasionally open areas with a stony, rocky mantle.	Two recent records approximately 40 km WNW of the study area (DPaW 2014).	LOW No suitable habitat within the study area, or in close proximity to the study area.
Birds						
Malleefowl <i>Leipoa ocellata</i>	VU	S1	VU	Dry inland scrub, mallee.	A number of records from the region, including records c. 40 km WNW and c. 40km S of the study area (DPaW 2014).	LOW A number of recent records from the region. However, habitat within the study area lacking the dense vegetation of optimal habitat
Princess Parrot <i>Polytelis alexandrae</i>	VU		P4	Sandy deserts; lightly wooded country, including desert oak, open mallee-spinifex and open marble gum woodland.	DoE states that the species, or suitable habitat for the species, may occur within the region. One old record (1964) from c. 50km south of the study area (DPaW 2014).	LOW No recent records from the vicinity of the study area, and habitat within the study area appears to be of limited suitability for the species.
Fork-tailed Swift <i>Apus pacificus</i>	M	S3		Nomadic, almost entirely aerial lifestyle over a variety of habitats; associated with storm fronts.	DoE states that the species, or suitable habitat for the species, is likely to occur within the region.	MEDIUM Although there are no records within the vicinity of the study area, this species is highly nomadic, and is likely occasionally pass over the study area in association with summer storm fronts.

Species	Conservation Significance			Habitat	Previous Records	Likelihood of Occurrence
	EPBC Act	WC Act	DPaW			
Eastern Great Egret <i>Ardea modesta</i>	M	S3		Wide range of wetland habitats, including floodwaters, rivers, shallows of wetlands, intertidal mudflats.	DoE states that the species, or suitable habitat for the species, is likely to occur within the region.	LOW No nearby records and little suitable habitat within the study area. Small chance to occur on salt lakes when inundated
Oriental Plover <i>Charadrius veredus</i>	M	S3		Open plains, including samphire; bare rolling country; bare claypans; open ground near inland swamps.	DoE states that the species, or suitable habitat for the species, may occur within the region.	LOW Suitable habitat exists within the study area; however there are no records in the vicinity of the study area and generally an uncommon species within the region. May occasionally occur on the salt lakes
Sharp-tailed Sandpiper <i>Calidris acuminata</i>	M	S3		Coasts and well-watered parts of the interior. Prefer grassy areas of non-tidal fresh or brackish wetlands, coastal marshes and tidal flats.	One record from a previous survey in the region (Outback Ecology 2011e).	MEDIUM Recent record in the vicinity of the study area, and salt lakes within study area would provide suitable habitat when holding water. This species, and other wader species, are likely to use the salt lake habitat on occasion.
Rainbow Bee-eater <i>Merops ornatus</i>	M	S3		Open country, most vegetation types, dunes, banks; prefer lightly wooded, preferably sandy, country near water.	Recorded on a number of previous surveys in the region (Appendix C), and several records from the region (DPaW 2014).	HIGH Several recent records from the vicinity of the study area and suitable habitat occurs within the study area.
Grey Falcon <i>Falco hypoleucos</i>		S1	VU	Lightly wooded coastal and riverine plains.	One recent record from c. 60 km north of the study area (<i>ecologia</i> internal database).	HIGH Recent record to the north of the study area, with suitable habitat present in the study area. This species is likely to be at least an occasional visitor to the study area, but unlikely to nest due to a lack of suitable nesting structures.

Species	Conservation Significance			Habitat	Previous Records	Likelihood of Occurrence
	EPBC Act	WC Act	DPaW			
Peregrine Falcon <i>Falco peregrinus</i>		S4	Other	Widespread; coastal cliffs, riverine gorges and wooded watercourses.	Two records within 60 km of the survey area to the south, and recorded widely across the region (DPaW 2014).	HIGH Two records relatively near the study area and suitable habitat present within the study area. This species is likely to be at least an occasional visitor to the study area, but unlikely to nest due to a lack of suitable nesting structures.
Australian Bustard <i>Ardeotis australis</i>			P4	Open grasslands, chenopod flats and low heathland.	Recorded on a number of previous surveys in the region (Appendix C), including the recent survey of the Millipede to Lake Maitland haul road study area. Several records from within 100 km of the study area on NatureMap (DPaW 2014).	HIGH Several recent records from surrounding areas and suitable habitat present within study area.
Bush Stone-curlew <i>Burhinus grallarius</i>			P4	Lightly wooded country next to daytime shelter of thickets or long grass.	Recorded previously from the Lake Maitland area (Outback Ecology 2009a) and in the vicinity of the Millipede to Lake Maitland haul road study area, and two records c. 50 km to the south on NatureMap (DPaW 2014).	HIGH Several recent records from surrounding areas and suitable habitat present within study area.
Reptiles						
Great Desert Skink <i>Liopholis kintorei</i>	VU	S1	VU	Desert mosaic landscapes with vegetation of different ages.	DoE states that the species, or suitable habitat for the species, may occur within the region. One old record (1964) approximately 50 km south-west of the study area (DPaW 2014).	LOW No recent records from the vicinity of the study area and habitat within the study area of limited suitability for the species.

4.2 SRE INVERTEBRATE FAUNA

The literature review indicated a total of 103 taxa from SRE groups have been recorded within the vicinity of the study area, although the current paucity of taxonomic information and issues with identification (e.g. female and juvenile mygalomorphs) mean that this number is inexact. Of these, 51 are classified as potential SREs according to the WA Museum Guidelines outlined in Section 3.3 . A summary of these groups is presented below (Table 4.3), while the full listing of taxa is included in Appendix C.

Table 4.3 – Summary of SRE invertebrate groups potentially occurring within the study area

Higher taxa	Family	No. of taxa	No. of potential SRE taxa
Class Arachnida			
Order Araneae Suborder Mygalomorphae	Actinopodidae	2	Nil
	Barychelidae	6	Barychelidae sp. Idiommata sp. Barychelidae indet. sp. <i>Synothele</i> sp. indet.
	Ctenizidae	1	<i>Conothele</i> sp. nov.
	Dipluridae	3	<i>Cethegus</i> sp. <i>Cethegus</i> sp. nov. <i>Cethegus</i> 'fugax'
	Idiopidae	8	?Idiopidae sp. <i>Aganippe</i> sp. <i>Aganippe</i> sp. A <i>Aganippe</i> sp. "occidentalis sp. group" <i>Arbanitis</i> sp. <i>Eucyrtops</i> sp. <i>Gaius</i> sp.
	Nemesiidae	12	Nemesiidae sp. <i>Aname</i> sp. <i>Aname</i> sp. "armigera asp. group" <i>Aname</i> sp. A <i>Aname</i> sp. B <i>Aname</i> MYG001-group <i>Aname</i> MYG176 <i>Aname</i> MYG227 <i>Kwonkan</i> MYG175 <i>Kwonkan</i> MYG194
	Theraphosidae	2	Nil
Order Pseudoscorpiones	Atemnidae	2	<i>Oratemnus</i> sp.
	Chernetidae	1	Nil
	Olpiidae	8	Olpiidae sp. 'indet' <i>Austrohorus</i> sp. <i>Beierolpium</i> 'sp. 8/2' <i>Beierolpium</i> 'sp. 8/3' <i>Beierolpium</i> 'sp. 8/4 small' <i>Linnaeolpium</i> sp. <i>Xenolpium</i> 'PSE064'

Order Scorpiones	Buthidae	5	<i>Isometroides</i> sp.
	Urodacidae	12	<i>Urodacus</i> sp. <i>Urodacus</i> 'lakeway1' <i>Urodacus</i> 'lakeway2' <i>Urodacus</i> 'sp. maitland1' <i>Urodacus</i> 'sp. maitland2' <i>Urodacus</i> 'yeelirrie'
Class Chilopoda			
Order Geophilida	undetermined	1	Geophilida sp.
Order Scolopendrida	Scolopendridae	10	Nil
Class Malacostraca			
Order Isopoda	Armadillidae	13	Gen. nov. sp. nov. <i>Acanthodillo</i> sp. nov. 7 <i>Buddelundia</i> sp. nov. 46 <i>Cubaris</i> sp. 1 <i>Cubaris</i> sp. Wiluna <i>Pseudodiploexochus</i> sp. nov. <i>Spherillo</i> sp. 1 <i>Spherillo</i> sp. 2
	Philosciidae	1	? <i>Andricophiloscia</i> sp. nov.
	Platyarthridae	1	<i>Trichorhina</i> sp. nov.
Class Gastropoda			
	Planorbidae	1	Nil
	Pupillidae	14	Nil

4.3 STYGOFAUNA

The literature review indicated a total of 162 stygal taxa that have been recorded within the vicinity of the study area, although the current paucity of taxonomic information and issues with identification mean this number is inexact. Crustaceans were the dominant invertebrates found, accounting for 133 of the 162 taxa identified in the literature review. Dytiscid beetles (class Insecta) made up a further 16 of the taxa identified, whilst oligochaete worms (class Clitellata), mites (class Arachnida) and springtails (class Entognatha) were also represented. A summary of these stygal groups is presented below (Table 4.4), while the full listing of taxa is included in Appendix D.

Table 4.4 – Summary of stygal invertebrate groups potentially occurring within the study area

Higher taxa	Family	No. of taxa
Class Arachnida		
Subclass Acarina	undetermined	Acarina sp. Oribata sp. Astigmata sp. Halacaroida Prostigmata larvae
Class Branchiopoda		
Infraclass Diplostraca	undetermined	Diplostraca sp.

Higher taxa	Family	No. of taxa
Order Anostraca	Parartemiidae	<i>Parartemia laticaudata</i>
Order Notostraca	Triopsidae	<i>Triops</i> sp.
Class Entognatha		
Order Anthropleona	undetermined	Arthropleona sp.
Class Insecta		
Order Coleoptera	Dytiscidae	Bidessini sp. Bidessini larvae Dytiscidae sp. Dytiscidae larvae <i>Limbodessus</i> sp. <i>Limbodessus barwidgeensis</i> <i>Limbodessus hahni</i> <i>Limbodessus</i> cf. <i>hinkleri</i> <i>Limbodessus hinkleri</i> <i>Limbodessus ?hinkleri</i> <i>Limbodessus macrohinkleri</i> <i>Limbodessus millbilliensis</i> <i>Limbodessus morgani</i> <i>Limbodessus raeae</i> <i>Limbodessus usitatus</i> <i>Limbodessus wilunaensis</i>
Class Clitellata (Subclass Oligochaeta)		
Order Haplotaxida	Enchytraeidae	Enchytraeidae sp. Enchytraeidae sp. indet. Enchytraeidae sp. OES1 Enchytraeidae sp. OES2
	Naididae	Naididae sp. Naididae sp. OES1 Naididae sp. OES2
	Phreodrilidae	Phreodrilidae sp.
Class Amphipoda		
Order Amphipoda	undetermined	Amphipod sp.
	Ceinidae	Ceinidae sp.
	Chiltoniidae	Chiltoniidae sp. OES1 Chiltoniidae sp. SAM1 Chiltoniidae sp. SAM1a Chiltoniidae sp. SAM1b Chiltoniidae sp. SAM2 Chiltoniidae sp. SAM3 Chiltoniidae sp. ?SAM3 Chiltoniidae sp. SAM4
	Paramelitidae	Paramelitidae sp. SAM1 Paramelitidae sp. SAM2
Superorder Syncarida	undetermined	Syncarida sp.
Superorder Syncarida Order Bathynellacea	Bathynellidae	Bathynellidae sp. Bathynellidae sp. OES1

Higher taxa	Family	No. of taxa
	Parabathynellidae	? <i>Atopobathynella</i> sp. Parabathynellidae sp. Parabathynellidae sp. OES13 <i>Atopobathynella wattsi</i> <i>Atopobathynella ?wattsi</i> <i>Atopobathynella</i> sp. OES5 <i>Atopobathynella</i> sp. OES6 <i>Atopobathynella</i> sp. OES8 <i>Atopobathynella</i> sp. OES9 <i>Atopobathynella</i> sp. SAM2 <i>Brevisomabathynella clayi</i> <i>Brevisomabathynella cooperi</i> <i>Brevisomabathynella eberhardi</i> <i>Brevisomabathynella jundeeensis</i> <i>Brevisomabathynella parooensis</i> <i>Brevisomabathynella</i> sp. SAM2 <i>Brevisomabathynella</i> sp. SAM3 <i>Brevisomabathynella</i> sp. SAM4 <i>Brevisomabathynella</i> sp. SAM15 <i>Brevisomabathynella uramurdahensis</i> <i>Brevisomabathynella</i> sp. OES5 <i>Brevisomabathynella</i> sp. OES6 <i>Brevisomabathynella</i> sp. OES7 <i>Brevisomabathynella</i> sp. OES9
Order Isopoda	undetermined	Oniscidea sp.
	Philosciidae	<i>Andriphiloscia pedisetosa</i>
	Platyarthridae	Platyarthridae gen. nov. sp. nov. <i>Paraplatyarthrus cooperi</i> sp. nov.
	Scyphacidae	<i>Haloniscus longiantennatus</i> <i>Haloniscus</i> sp. OES1 <i>Haloniscus</i> sp. OES8 <i>Haloniscus stilifer</i>
Class Maxillopoda (Subclass Copepoda)		
	undetermined	Copepoda sp.
Order Calanoida	Acartiidae	<i>Acartia</i> sp. ? <i>Acartia</i> sp.
Order Cyclopoida	undetermined	Cyclopoida sp.
	Cyclopidae	<i>Dussartcyclops uniarticulatus</i> <i>Fierscyclops fiersi</i> <i>Halicyclops</i> sp. <i>Halicyclops</i> sp. TK1 <i>Halicyclops</i> sp. TK2 <i>Halicyclops</i> sp. TK3 <i>Halicyclops ambiguus</i> <i>Halicyclops eberhardi</i> <i>Halicyclops kieferi</i> <i>Mesocyclops brooksi</i>

Higher taxa	Family	No. of taxa
		<i>Metacyclops varicans</i> <i>Metacyclops cf. monacanthus</i> <i>Microcyclus varicans</i> <i>Pescecyclus laurentiisae</i>
Order Harpacticoida	undetermined	Harpacticoida sp.
	Ameiridae	<i>Ameiropsyllus</i> sp. 1 n. sp. <i>Haifameira pori</i> ? <i>Haifameira</i> sp. <i>Kinnecaris esbe</i> sp. nov. <i>Kinnecaris lakewayi</i> <i>Kinnecaris lined</i> sp. nov. <i>Kinnecaris linel</i> sp. nov. <i>Kinnecaris linesae</i> <i>Kinnecaris</i> sp. TK3 <i>Kinnecaris uranusi</i> <i>Nitocrella trajani</i> <i>Nitokra</i> sp. TK1 <i>Nitokra</i> sp. TK2 <i>Nitokra</i> sp. TK3 <i>Nitokra esbe</i> <i>Nitokra lacustris</i> <i>Nitokra lacustris pacificus</i> <i>Nitokra macrorefis</i> <i>Nitokra mefarefis</i> <i>Nitokra mefarefis</i> <i>Nitokra mefarefis</i> <i>Nitokra microrefis</i> <i>Nitokra yeelirrie</i> <i>Parapseudoleptomesochra karami</i> <i>Parapseudoleptomesochra rouchi</i> <i>Parapseudoleptomesochra</i> sp. <i>Parapseudoleptomesochra</i> sp. TK1 <i>Parapseudoleptomesochra</i> sp. TK2 <i>Parapseudoleptomesochra</i> sp. ?TK2
	Canthocamptidae	<i>Australocamptus diversus</i> <i>Australocamptus similis</i>
	Diosaccidae/Miraciidae	<i>Schizopera akation</i> <i>Schizopera akolos</i> sp. nov. <i>Schizopera analspinulosa</i> <i>Schizopera austindownsi</i> <i>Schizopera dimorpha</i> n. sp. <i>Schizopera cf. dimorpha</i> <i>Schizopera emphysema</i> <i>Schizopera jundeei</i> <i>Schizopera kronosi</i> n. sp. <i>Schizopera leptafurca</i> <i>Schizopera</i> sp. 1 <i>Schizopera</i> sp. TK1

Higher taxa	Family	No. of taxa
		<i>Schizopera</i> sp. TK2 <i>Schizopera</i> sp. TK3 <i>Schizopera</i> sp. TK4 <i>Schizopera</i> sp. TK5 <i>Schizopera</i> sp. TK6 <i>Schizopera</i> sp. TK7 <i>Schizopera</i> sp. TK8 <i>Schizopera uramurdahi</i> <i>Schizopera uranusi</i>
Ostracoda		
Order Podocopida		Ostracoda sp.
	Candonidae	<i>Candonopsis</i> sp. n. sp. 1 <i>Candonopsis</i> sp. n. sp. 2 <i>Candonopsis</i> sp. n. sp. 3 <i>Candonopsis</i> sp. <i>Candonopsis</i> sp. IK1 <i>Candonopsis</i> sp. IK2 <i>Candonopsis dani</i> <i>Candonopsis williamsi</i> <i>Candonopsis (Abcandonopsis) linnaei</i>
	Limnocytheridae	<i>Gomphodella</i> sp. <i>Gomphodella glomerosa</i>

4.4 TROGLOFAUNA

The literature review indicated a total of 47 troglofauna taxa that have been recorded in the vicinity of the study area, although the current paucity of taxonomic information and issues with identification mean this number is inexact. Crustaceans (22 taxa) and arachnids (16 taxa) were the dominant groups identified from the literature. A summary of the troglofaunal groups is listed below (Table 4.5), and the full listing of taxa is included in Appendix E.

Table 4.5 – Summary of troglobitic invertebrate groups potentially occurring within the study area

Higher taxa	Family	No. of taxa
Class Arachnida		
Order Araneae	Gnaphosidae	Eilica group
	Oonopidae	<i>Prethopalpus callani</i> <i>Opopaea</i> 'sp. nov.'
	Trochanteriidae	<i>Desognanops humphreysi</i> <i>Desognanops</i> 'sp. nov. Yeelirrie'
Order Palpigradi	Eukoeneiidae	<i>Eukoeneia</i> sp.
Order Pseudoscorpiones	Chtoniidae	<i>Tyrannochthonius</i> indet. <i>Tyrannochthonius</i> sp. OES1 <i>Tyrannochthonius</i> sp. OES2 <i>Tyrannochthonius</i> sp. OES3 <i>Tyrannochthonius</i> sp. OES4

Higher taxa	Family	No. of taxa
		<i>Tyrannochthonius</i> sp. OES5 <i>Tyrannochthonius</i> sp. OES6 <i>Tyrannochthonius</i> 'sp. nov. Yeelirrie' <i>Tyrannochthonius</i> 'sp. nov. Millbillillie' <i>Tyrannochthonius</i> 'sp. nov. Yakabindie Station'
Class Chilopoda		
Order Scolopendrida	Scolopendridae	Scolopendridae sp. OES1
Class Diplopoda		
Order Polyxenida	undetermined	Polyxenida sp. Polyxenida sp. OES1
Class Entognatha		
Order Diplura	undetermined	Projapygidae sp.
Class Gastropoda		
Subclass Pulmonata	Punctidae	Punctidae sp.
Class Insecta		
Order Hemiptera	Meenoplidae	Meenoplidae sp.
Order Thysanura	Nicoletiidae	? <i>Trinemura</i> sp.
Class Malacostraca		
Order Isopoda	undetermined	Isopoda '1536'
	Armadillidae	Unknown Genus sp. nov. Armadillidae sp. OES2 <i>Troglarmadillo</i> sp. <i>Troglarmadillo</i> sp. nov.
	Philosciidae	Philosciidae '1536' Unknown Genus A Unknown Genus B
	Platyarthridae	<i>Trichorhina</i> sp. OES5 <i>Trichorhina</i> sp. OES6 <i>Trichorhina</i> sp. OES9 <i>Trichorina</i> '1536'
	Scyphidae	<i>Haloniscus</i> sp. <i>Haloniscus</i> sp. OES3 <i>Haloniscus</i> sp. OES4 <i>Haloniscus</i> sp. OES5 <i>Haloniscus</i> sp. OES6 <i>Haloniscus</i> sp. OES7 <i>Haloniscus</i> sp. OES9 <i>Haloniscus</i> sp. OES10 <i>Haloniscus</i> sp. OES12 <i>Haloniscus</i> sp. OES14
Class Pauropoda		
Order Pauropodina	undetermined	Pauropodina sp.
Class Symphyla		
Undetermined	undetermined	Symphyla sp.

5 DISCUSSION

5.1 VERTEBRATE FAUNA

A diverse range of vertebrate fauna have the potential to occur within the study area, although the species diversity is relatively typical for an arid zone regional fauna assessment (*ecologia* internal database) and the majority of species listed are widely distributed in the arid zone of Western Australia. An exception to this is the Black-headed Worm-lizard (*Aprasia picturata*) which is known only from the vicinity of Leonora (Wilson and Swan 2013), and was recently identified from the vicinity of the study area (*ecologia* in prep.).

In addition to the conservation significant fauna discussed here, Lake Way has the potential to provide habitat for a variety of migratory shorebird species if inundated, as evidenced by a previous record of Sharp-tailed Sandpiper.

5.1.1 Potential conservation significant vertebrate fauna

5.1.1.1 Mammals

5.1.1.1.1 Brush-tailed Mulgara (*Dasyurus blythi*)

Conservation status: DPaW Priority 4. The Brush-tailed Mulgara has only recently been reclassified and separated from the genetically and morphologically distinct Crest-tailed Mulgara (*Dasyurus cristicauda*; EPBC Act Vulnerable) Woolley 2006 (Woolley 2006). As such, the more widespread Brush-tailed Mulgara is not listed in the EPBC Act, but is listed as Priority 4 (fauna in need of monitoring) on the DPaW Priority and Threatened Fauna list (2010).

Distribution and habitat: Brush-tailed Mulgara occur in spinifex grasslands throughout much of the arid zone, digging burrows in flats between low sand dunes (Woolley 2008). Believed to be generally solitary, Brush-tailed Mulgaras 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, with Brush-tailed Mulgaras not preferring either habitat type over the other. However, utilisation of open habitats might increase the risk of predation, especially following fire.

Ecology: Brush-tailed Mulgara are nocturnal hunters, feeding on arthropods and small vertebrates. Breeding is thought to occur from late winter to spring (Woolley 2008).

Likelihood of occurrence: Medium. The Brush-tailed Mulgara was recently recorded from the vicinity of the study area during the Level 2 vertebrate fauna assessment of the Millipede to Lake Maitland haul road study area (Figure 5.1), and has been recorded from the region on a number of previous occasions (e.g. DPaW 2014). However, habitat within the study area appears less suitable for the species.



Figure 5.1 – Brush-tailed Mulgara recorded from the vicinity of the study area in 2014 (*ecologia* in prep.).

5.1.1.2 Birds

5.1.1.2.1 Fork-tailed Swift (*Apus pacificus*)

Conservation Status: EPBC Act Migratory, WC Act Schedule 3.

Distribution and Habitat: The Fork-tailed Swift is a small, insectivorous species with a white throat and rump, and a deeply forked tail (Morcombe 2000). Its distribution spans from central Siberia and throughout Asia, breeding in north-east and mid-east Asia, and wintering in Australia and southern 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 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 of 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: Medium. Although there are no records within 100 km of the study area (DPaW 2014), the Fork-tailed Swift is highly nomadic, and may occasionally feed over the study area in association with storm fronts.

5.1.1.3 Sharp-tailed Sandpiper (*Calidris acuminata*)

Conservation status: EPBC Act Migratory, WC Act Schedule 3.

Distribution and habitat: The Sharp-tailed Sandpiper spends the non-breeding season mostly in Australia, mainly in the south-east. The species is widespread in a variety of freshwater and saline habitats, and is more often found on the coasts than in the interior, where it prefers well-watered areas (Higgins and Davies 1996; Johnstone and Storr 1998). Sharp-tailed Sandpipers are widespread

from Cape Arid to Carnarvon, around coastal and subcoastal plains of Pilbara Region to the south-west and east Kimberley Division. Inland records indicate the species is widespread and scattered from Newman, east to Lake Cohen, south to Boulder and west to Meekatharra (Higgins and Davies 1996).

In Australasia, the Sharp-tailed Sandpiper prefers muddy edges of shallow fresh or brackish wetlands, with inundated or emergent sedges, grass, saltmarsh or other low vegetation. They may be attracted to mats of algae and water weed either floating or washed up around terrestrial wetlands and coastal areas with much beachcast seaweed (Higgins and Davies 1996).

Ecology: The Sharp-tailed Sandpiper is migratory, breeding in northern Siberia and moving to non-breeding areas south of the equator (Higgins and Davies 1996). They are usually found in ones, twos or small parties, occasionally flocks of up to 300, and rarely in large aggregations of up to 20,000 soon after arrival or shortly before departure (Johnstone and Storr 1998).

Likelihood of occurrence: Medium. The salt lake environs within the study area are likely to provide suitable habitat for this species (and other migratory wader species) when inundated. The species was recorded recently from salt lakes in the area (Outback Ecology 2011e)

5.1.1.4 Rainbow Bee-eater (*Merops ornatus*)

Conservation Status: EPBC Act Migratory, WC Act Schedule 3.

Distribution and Habitat: The Rainbow Bee-eater ranges from 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). Rainbow Bee-eaters are most susceptible to predation during breeding, as it spends significantly more time on the ground in this period.

Likelihood of Occurrence: High. There are numerous records from the vicinity of the study area, including on the recent Level 2 vertebrate fauna assessment of the Millipede to Lake Maitland study area (Appendix B). The species is likely to occur widely within the study area, predominantly during the spring and summer months.

5.1.1.5 Grey Falcon (*Falco hypoleucos*)

Conservation Status: DPaW Priority 4.

Distribution and Habitat: Grey Falcons are a rare, nomadic species sparsely distributed across much of arid and semi-arid Australia. 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 scarce over an extremely large area, sightings of this species are very uncommon.

The Grey Falcon occurs in a wide variety of arid habitats, including open woodlands and open acacia shrubland, hummock and tussock grasslands and 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 (Ehmann and Watson 2008; Garnett and Crowley 2000).

Likelihood of Occurrence: High. Suitable foraging habitat exists within the study area, though the species is unlikely to use the study area for nesting due to a lack of suitable nesting sites.

5.1.1.6 Peregrine Falcon (*Falco peregrinus*)

Conservation Status: WC Act Schedule 4, DPaW Specially Protected Fauna.

Distribution and Habitat: This nomadic or sedentary falcon is widespread in many parts of Australia and some of Australia's continental islands, but absent from most deserts and the Nullarbor Plain. 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). The Peregrine Falcon occurs most commonly near cliffs along coasts, rivers and ranges, and around wooded watercourses and lakes.

Ecology: Peregrine Falcons feed almost entirely on birds, especially parrots and pigeons. They nest primarily on ledges on 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).

Likelihood of Occurrence: High. The Peregrine Falcon is widely distributed across much of Western Australia, with two records shown 60 km south of the study area (DPaW 2014). The species is likely to be an occasional visitor to the study area as suitable foraging habitat exists within the study area; however, it is unlikely to use the study area for nesting due to a lack of suitable sites.

5.1.1.7 Australian Bustard (*Ardeotis australis*)

Conservation Status: DPaW Priority 4.

Distribution and Habitat: The Australian Bustard 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).

Ecology: 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. The Australian 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). Australian Bustards readily desert nests in response to disturbance by humans, sheep or cattle (Garnett and Crowley 2000).

Likelihood of Occurrence: High. There are a number of records of the species from the region, including secondary evidence detected at several sites in the vicinity of the study area during a recent Level 2 survey (*ecologia* in prep.). Habitat within the study area is also considered suitable for the species.

5.1.1.8 Bush Stone-curlew (*Burhinus grallarius*)

Conservation Status: DPaW 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 shelters (Johnstone and Storr 1998). Historically, this species was widely distributed throughout most of WA, but has since declined, particularly in the southern part of the State. Recent estimates indicate an Australian population of 15,000 individuals (Garnett and Crowley 2000). The Bush Stone-curlew inhabits woodlands, dry and open grasslands, and croplands with cover nearby (NPWS 1999).

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; NPWS 1999). They are usually seen in pairs, although may occasionally flock together during the breeding season (August to January) and are generally nocturnal, being especially active on moonlit nights (NPWS 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). 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: High. There are a number of records of the species from the region, including a sighting from the vicinity of the study area during a recent Level 2 survey (*ecologia* in prep.) and a previous record from the Lake Maitland area (Outback Ecology 2009a). Habitat within the study area is considered suitable for the species.

5.2 SHORT-RANGE ENDEMIC INVERTEBRATE FAUNA

A total of 52 invertebrate taxa potentially occurring within the study area have been identified as potential short-range endemics. Each of these is discussed briefly below. It should be noted that the WA Museum criteria used here means non-SRE (or widespread) status is only assigned to taxa that are taxonomically well-understood and have a known distribution in excess of 10,000km, and are identified to species level or equivalent (see Section 3.3). This is in accordance with the precautionary principle, but does result in taxa being treated as potential SREs due to identification problems when in some cases they are unlikely to represent true SRE taxa. Where applicable, comments regarding this have been included in the taxon discussions below.

Table 5.1 – Potential SRE invertebrate taxa occurring in the region of the study area

Higher taxon	Family	Taxon	Comments
Arachnida			
Order Araneae Suborder Mygalomorphae	Barychelidae	Barychelidae sp.	Two juvenile specimens (one incomplete) collected from Lake Maitland (Outback Ecology 2009a). Juvenile mygalomorphs are generally not positively identifiable, and these specimens could not be identified beyond family level (Main 2009). Hence, they are treated as potential SREs under the ' Data Deficient ' category due to the lack of specific identification (see Section 3.3).
		Barychelidae 'indet. sp.'	A single specimen collected from Lake Way which could not be identified beyond the family level as the specimen was a juvenile (Outback Ecology 2011e). Hence, it is treated as a potential SRE under the ' Data Deficient ' category due to the lack of specific identification (see Section 3.3).
		<i>Idiommatata</i> sp.	A single juvenile specimen collected from Lake Way (Outback Ecology 2008a). Adult male mygalomorphs are generally required for positive identification, and the genus <i>Idiommatata</i> is currently taxonomically poorly understood so it is currently not possible to determine if this specimen represents a SRE species (Framenau and Harvey 2010). Hence, it is treated as a potential SRE under the ' Data Deficient ' category due to taxonomic uncertainty and the lack of specific identification (see Section 3.3).
		<i>Synothele</i> sp. indet.	A single juvenile specimen collected from Lake Maitland (Outback Ecology 2012d). Being a juvenile, this specimen could not be identified with certainty (Phoenix Environmental 2011). Hence, it is treated as a potential SRE under the ' Data Deficient ' category due to the lack of specific identification (see Section 3.3). However, it may represent the widespread species <i>Synothele meadhunteri</i> which is commonly encountered in the region (Phoenix Environmental 2011).
	Ctenizidae	<i>Conothele</i> sp. nov.	Two specimens collected from Lake Maitland (Outback Ecology 2009a). The distribution of the species is currently unknown due to a lack of male specimens, hence it is currently not possible to determine if this species is a SRE (Framenau and Harvey 2010; Outback Ecology 2009a); however it may have a restricted distribution (Main 2009). Hence, it is treated as a potential SRE under the ' Data Deficient ' category due to lack of distribution information and taxonomic uncertainty (see Section 3.3).
	Dipluridae	<i>Cethegus</i> sp.	The single specimen collected from Lake Way is a juvenile, preventing specific identification (Framenau and Harvey 2010). The status, distribution and taxonomy of this genus are also not well-understood (Framenau and Harvey 2010). Hence, this specimen is treated as a potential SRE under the ' Data Deficient ' category due to lack of distribution information and taxonomic uncertainty (see Section 3.3). It has previously been indicated that this specimen is unlikely to represent an SRE (Framenau and Harvey 2010). However, it may represent <i>C. 'fugax'</i> , which has more recently been described as a potential SRE species-complex due to high levels of genetic divergence between populations (see below).

		<i>Cethegus</i> sp. nov.	Four female specimens collected from Lake Maitland (Outback Ecology 2009a). Specific identification is complicated by the lack of male specimens (Main 2009), so it is not possible to determine if these specimens represent a SRE species. Hence, they are treated as potential SREs under the ' Data Deficient ' category due to identification and taxonomic difficulties (see Section 3.3).
		<i>Cethegus</i> 'fugax'	A single male specimen collected from Lake Maitland was identified a <i>C. fugax</i> , but this taxon is currently considered to represent a species-complex as subpopulations show high levels of genetic divergence (Phoenix Environmental 2011). Hence, this specimen is treated as a potential SRE under the ' Data Deficient ' category due to taxonomic uncertainty (see Section 3.3).
	Idiopidae	(?)Idiopidae sp.	A single female, possibly from the genera <i>Aganippe</i> or <i>Eucyrtops</i> , was collected from Lake Maitland (Outback Ecology 2009a), but is not discussed further within the report. Hence, it is treated as a potential SRE under the ' Data Deficient ' category due to the lack of specific identification (see Section 3.3).
		<i>Aganippe</i> sp.	A single specimen was collected from Lake Maitland (Outback Ecology 2009a), but is not discussed further within the report. A further series of female specimens were subsequently collected from Lake Maitland (Outback Ecology 2012d), but could not be identified due to the lack of male specimens. Hence, they are treated as potential SREs under the ' Data Deficient ' category due to the lack of specific identification (see Section 3.3). The genus contains both widespread and range-restricted species (Phoenix Environmental 2011).
		<i>Aganippe</i> sp. A	A juvenile specimen collected from Lake Way (Outback Ecology 2008a). Without a male specimen, it is not possible to ascertain the distribution and status of this species (Framenau and Harvey 2010), however it may have a restricted distribution (Main 2008). Taking this into account, here it is treated as a potential SRE under the ' Data Deficient ' category due to the lack of specific identification (see Section 3.3).
		<i>Aganippe</i> sp. (A " <i>occidentalis</i> sp. group")	A female specimen from the <i>A. occidentalis</i> group was collected from Lake Way (Outback Ecology 2008a). Without a male specimen, it is not possible to ascertain the distribution and status of this species (Framenau and Harvey 2010), however it may have a restricted distribution (Main 2008). Taking this into account, here it is treated as a potential SRE under the ' Data Deficient ' category due to the lack of specific identification (see Section 3.3).
		<i>Arbanitis</i> sp.	A single specimen collected from Lake Maitland (Outback Ecology 2009a), but is not discussed further within the report. Hence, it is treated as a potential SRE under the ' Data Deficient ' category due to the lack of specific identification (see Section 3.3).
		<i>Eucyrtops</i> sp.	Three specimens from the genus <i>Eucyrtops</i> have been collected from Lake Way (Framenau and Harvey 2010; Outback Ecology 2008a), however none were adults males so it is not possible to identify them beyond the

			genus level. Hence, they are treated as potential SREs under the ' Data Deficient ' category due to the lack of specific identification (see Section 3.3).
		<i>Gaius</i> sp.	Two specimens collected from Lake Maitland were identified as belonging to the genus <i>Gaius</i> but were female so could not be identified further (Outback Ecology 2009a). Hence, they are treated as potential SREs under the ' Data Deficient ' category due to the lack of specific identification (see Section 3.3). However, specimens from the genus collected from the area subsequently have been identified as <i>G. villosus</i> , a widespread species (Outback Ecology 2009a), and it is therefore likely that the earlier specimens being discussed here also represent this species.
	Nemesiidae	Nemesiidae sp.	A single juvenile specimen was collected from Lake Maitland, but could not be identified beyond the family level, though it could possibly have been a representative of genera <i>Teyl</i> or <i>Aname</i> (Outback Ecology 2009a). Hence, it is treated as a potential SRE under the ' Data Deficient ' category due to the lack of specific identification (see Section 3.3).
		<i>Aname</i> sp. "armigera species group"	A number of female and juvenile specimens from this group were collected from both Lake Maitland and Lake Way (Framenau and Harvey 2010). These differ from the <i>Aname</i> MYG173, MYG176 and MYG177 species discussed below, but specific identification was not possible due to the lack of male specimens (Framenau and Harvey 2010). Hence, they are treated as potential SREs under the ' Data Deficient ' category due to the lack of specific identification (see Section 3.3). However, it is considered unlikely that these specimens do actually represent SREs (Framenau and Harvey 2010).
		<i>Aname</i> sp.	Several female and juvenile specimens collected from Lake Maitland and Lake Way could not be identified beyond genus level (Outback Ecology 2008a, 2009a, 2012d). Hence, they are treated as potential SREs under the ' Data Deficient ' category due to the lack of specific identification (see Section 3.3), and it is possible that they do have restricted distributions (Main 2008).
		<i>Aname</i> sp. A	Two female specimens collected from Lake Maitland (Outback Ecology 2009a). These may also represent members of the "armigera" group but specific identification is not possible without male specimens (Main 2009). Hence, they are treated as potential SREs under the ' Data Deficient ' category due to the lack of specific identification (see Section 3.3). However, the "armigera" group is generally widespread (Main 2009), it is considered unlikely that these specimens do actually represent SREs.
		<i>Aname</i> sp. B	Four specimens collected from Lake Maitland (Outback Ecology 2009a) have been variously identified as adult females (Main 2009) or possibly juveniles, potentially of <i>Aname</i> 'MYG176', 'MYG177', or the "armigera" group (Framenau and Harvey 2010). Hence, they are treated as potential SREs under the ' Data Deficient ' category due to the lack of specific identification (see Section 3.3), and it is possible that they do have restricted

			distributions (Main 2009).
		<i>Aname</i> MYG001-group	Two juveniles collected from Lake Maitland could not be identified further due to their immaturity (Phoenix Environmental 2011). They are considered likely to represent <i>Aname</i> MYG177 which is now not considered to be an SRE (Phoenix Environmental 2011). However, due to the lack of confirmed identification, it is here treated as a potential SRE under the 'Data Deficient' category due to the lack of specific identification (see Section 3.3).
		<i>Aname</i> MYG176	Three specimens collected from the north-west corner of the Lake Way study area are the only known records of this species (Framenau and Harvey 2010; Outback Ecology 2011e). They belong to the 'red-headed' <i>Aname</i> group which is thought to comprise a complex of species (unpublished data cited in Framenau and Harvey 2010). Species in the complex are difficult to distinguish even based on male morphology; however, these specimens differ considerably in genital morphology from specimens from the Pilbara and are not present in the reference collection of the Western Australian Museum (Framenau and Harvey 2010). Hence, this species is considered to be a potential SRE .
		<i>Aname</i> MYG227	A single male specimen collected from Lake Maitland (Outback Ecology 2012d). It is considered to represent a member of the <i>A. mainae</i> complex, but shows a very shiny carapace and is not known from any additional specimens in the WA Museum collection (Phoenix Environmental 2011). Hence, this species is considered to be a potential SRE .
		<i>Kwonkan</i> MYG175	Two males collected from Lake Maitland (Outback Ecology 2009a) and a single male collected from Lake Way (Outback Ecology 2011e) are the only known specimens of this taxon. The taxon is distinct from all named species of the genus, though bearing some similarity to <i>K. silvestre</i> (Main 2009). It is also referred to as <i>Kwonkan</i> sp. nov. B and is considered likely to have a restricted distribution (Main 2009). Hence, it is considered to be a potential SRE .
		<i>Kwonkan</i> MYG194	A single specimen collected from Lake Maitland (Outback Ecology 2009a) is the sole known collection of the species (Framenau and Harvey 2010). Also referred to as <i>Kwonkan</i> sp. nov. A, it has been described as likely to represent the same species as <i>Kwonkan</i> MYG175 (Main 2009), but more recently is described as distinctly different based on several aspects of morphology (Framenau and Harvey 2010). It is considered likely to have a restricted distribution and is considered to be a potential SRE .
Order Pseudoscorpiones	Atemnidae	<i>Oratemnus</i> sp.	A single juvenile collected near Lake Way (Outback Ecology 2011e) and two specimens collected approximately 50 km to the north of the study area (ecologia 2014b). The systematics of this genus, and the taxonomy of individual species within it, is unclear. Hence, these specimens are listed as potential SREs under the 'Data Deficient' category due to the lack of specific identification and taxonomic uncertainty (see Section 3.3). However, it is considered likely that most <i>Oratemnus</i> species will turn out to be widely distributed

	Olpiidae		(Burger <i>et al.</i> 2011).
		Olpiidae sp. 'indet.'	A single juvenile specimen collected from Lake Way could not be identified beyond the family level because of its immaturity (Outback Ecology 2011e). Hence, it is treated as a potential SRE under the ' Data Deficient ' category due to the lack of specific identification (see Section 3.3).
		<i>Austrohorus</i> sp.	Three specimens collected from the Lake Maitland area (Outback Ecology 2012d). The specimens appear very similar to other specimens from northern and central Western Australia (Harvey 2011). However, the specimens could not be identified below genus level based on current knowledge, so they are treated potential SREs under the ' Data Deficient ' category due to the lack of specific identification (see Section 3.3).
		<i>Beierolpium</i> 'sp. 8/2'	Single specimens collected from the Centipede East study area (Outback Ecology 2011e) and the Lake Maitland area (Outback Ecology 2012d). A full systematic revision of this genus in Western Australia is required to firmly establish the identity of this species and assess their SRE status (Framenau and Harvey 2010). Hence, <i>Beierolpium</i> 'sp. 8/2' is considered a potential SRE under the ' Data Deficient ' category due to taxonomic uncertainty (see Section 3.3).
		<i>Beierolpium</i> 'sp. 8/3'	Three specimens collected from the Lake Way area (Outback Ecology 2008a) and a single specimen collected from approximately 50 km to the north of the study area (<i>ecologia</i> 2014b). A full systematic revision of this genus in Western Australia is required to firmly establish the identity of this species and assess their SRE status (Burger <i>et al.</i> 2012). Hence, <i>Beierolpium</i> 'sp. 8/3' is considered a potential SRE under the ' Data Deficient ' category due to taxonomic uncertainty (see Section 3.3).
		<i>Beierolpium</i> 'sp. 8/4 small'	Two specimens collected from approximately 50 km to the north of the study area (<i>ecologia</i> 2014b). These are part of a small morphogroup of this genus/species from WA (<i>ecologia</i> 2014b). However, as for the previous two species above, a full systematic revision of this genus in Western Australia is required to firmly establish the identity of this species and assess their SRE status (Burger <i>et al.</i> 2012). Hence, <i>Beierolpium</i> 'sp. 8/4 small' is considered a potential SRE under the ' Data Deficient ' category due to taxonomic uncertainty (see Section 3.3).
		<i>Linnaeolpium</i> sp.	Two specimens of this recently-described genus collected from Lake Maitland (Outback Ecology 2012d). This species is thought to represent a new species but its distribution is currently unknown; there are only three specimens known from outside the Pilbara, including the two specimens mentioned here. All three specimens have been collected within a 5km radius (Harvey 2011). This taxon is considered a potential SRE under the ' Data Deficient ' category based on lack of distribution information (see Section 3.3).
		<i>Xenolpium</i> 'PSE064'	Five specimens collected from approximately 50 km to the north of the study area (<i>ecologia</i> 2014b). There are few records of this genus in Western Australia, and further taxonomic investigation is required to determine their status (Burger <i>et al.</i> 2012). Hence, they are considered to be potential SREs under the ' Data Deficient ' category due to taxonomic uncertainty (see Section 3.3).

Order Scorpiones	Buthidae	<i>Isometroides</i> sp.	Three specimens collected from Lake Way (Outback Ecology 2008a, 2011e) and two specimens from Lake Maitland (Outback Ecology 2009a, 2012d). These specimens are not described as potential SREs in most reports (Outback Ecology 2008a, 2009a, 2011e), but the most recent information available suggests they may represent SREs (Outback Ecology 2012d). In addition, the genus is poorly known and species identification was not possible for any of the specimens (Framenau and Harvey 2010; Volschenk 2012). Hence, they are considered to be potential SREs under the ‘Data Deficient’ category due to lack of specific identification and taxonomic uncertainty (see Section 3.3).
	Urodacidae	<i>Urodacus</i> sp.	Two specimens collected from the Lake Maitland area could not be identified beyond genus level as they were both female (Outback Ecology 2012d). Hence, they are treated as potential SREs under the ‘Data Deficient’ category due to the lack of specific identification (see Section 3.3).
		<i>Urodacus</i> ‘lakeway1’	One specimen collected from the Lake Way area (Outback Ecology 2008a). This taxon is currently known only from this collection, but the genus <i>Urodacus</i> has been undergoing revision and the taxonomy of the group is still unclear, with numerous unnamed species and variable morphologies (Outback Ecology 2008a). Hence, this taxon is considered a potential SRE under the ‘Data Deficient’ category due to taxonomic uncertainty (see Section 3.3).
		<i>Urodacus</i> ‘lakeway2’	Two specimens collected from the Lake Way area (Outback Ecology 2008a). This taxon is currently known only from these collections, but the genus <i>Urodacus</i> has been undergoing revision and the taxonomy of the group is still unclear (Outback Ecology 2008a). Hence, this taxon is considered a potential SRE under the ‘Data Deficient’ category due to taxonomic uncertainty (see Section 3.3).
		<i>Urodacus</i> ‘sp. maitland1’	One specimen collected from the Lake Maitland area (Outback Ecology 2009a). The genus <i>Urodacus</i> has been undergoing revision and the taxonomy of the group is still unclear (Outback Ecology 2009a). Hence, this taxon is considered a potential SRE under the ‘Data Deficient’ category due to taxonomic uncertainty (see Section 3.3).
		<i>Urodacus</i> ‘sp maitland2’	One specimen collected from the Lake Maitland area (Outback Ecology 2009a). The genus <i>Urodacus</i> has been undergoing revision and the taxonomy of the group is still unclear (Outback Ecology 2009a). Hence, this taxon is considered a potential SRE under the ‘Data Deficient’ category due to taxonomic uncertainty (see Section 3.3).
		<i>Urodacus</i> ‘yeelirrie’	9-10 specimens collected from the Lake Way area (Outback Ecology 2011e) and a single specimen collected from Lake Maitland (Outback Ecology 2012d). This taxon is a member of a species-complex of 20-30 morphospecies formerly grouped as <i>U. armatus</i> , most of which are known from only a handful of specimens (Outback Ecology 2011e). <i>U. ‘yeelirrie’</i> is known only from the Yeelirrie area and these Lake Way collections, and is considered likely to be a SRE species. Hence, it is classified as a potential SRE .
Chilopoda			

Order Geophilida	undetermined	Geophilida sp.	A single specimen collected from Lake Maitland (Outback Ecology 2009a). Geophilids are difficult to identify due to a lack of taxonomic understanding; it has been suggested that some species could be SREs but the lack of information makes this difficult to assess (Outback Ecology 2009a). Hence, this specimen is treated as a potential SRE under the 'Data Deficient' category due to the lack of specific identification (see Section 3.3).
Malacostraca			
Order Isopoda	Armadillidae	Genus nov. species nov.	A single specimen collected from the Lake Maitland area (Outback Ecology 2012d). This is an extremely ornate isopod and shows many characteristics not present in other Western Australian isopod genera (Judd 2011). A similar specimen has been collected from the Newman area; however this is clearly a different taxon to the Lake Maitland specimen (Judd 2011). Hence, this taxon is considered to be a potential SRE , with expert advice indicating that it almost certainly does represent an SRE taxon (Judd 2011).
		<i>Acanthodillo</i> sp. nov. 7	Eight specimens collected from the Lake Maitland area (Outback Ecology 2012d). Whilst currently attributed to the genus <i>Acanthodillo</i> , these specimens most likely belong to a different (and probably new) genus, but taxonomic revision is required to clarify this (Judd 2011). These represent a new species, and are not known from any other localities (Judd 2011). Hence, they are considered to be potential SREs .
		<i>Buddelundia</i> sp. nov. 46	A single specimen collected from the Lake Maitland area (Outback Ecology 2012d). The single specimen is a female, and does not represent the typical arid zone form of <i>Buddelundia</i> and there do not appear to be any collections of the taxon from elsewhere (Judd 2011). The general morphological characteristics of the species have also not been recorded in isopods outside of the Pilbara region thus far (Judd 2012). Hence, this taxon is considered to be a potential SRE .
		<i>Cubaris</i> sp. 1	One of the most commonly collected species from the Lake Maitland area during a recent survey (Outback Ecology 2012d). This specimen is likely to be the same species as collections made at Yakabindie and Yeelirrie, and are likely to represent a new species (Judd 2011). These known locations are all in close proximity to each other, so this species is considered to be a potential SRE .
		<i>Cubaris</i> sp. wiluna	Nine specimens collected from approximately 50 km to the north of the study area (ecologia 2014b). The species has also been found approximately 50 km to the south east of the study area; it is considered to represent a new species with restricted distribution (Judd 2012). Hence, it is considered to be a potential SRE .
		<i>Pseudodiploexochus</i> sp. nov.	A single specimen collected from the Lake Maitland area (Outback Ecology 2012d). This represents a new species, with a single collection from Yeelirrie thought to be the same species (Judd 2011). The genus is most common in high rainfall areas of the state and is thought to comprise moisture-dependent relictual species (Judd 2011). Hence, this species is treated as a potential SRE , and is considered highly likely to be an SRE species (Judd 2011).
		<i>Spherillo</i> sp. 1	A number of specimens collected from Lake Maitland (Outback Ecology 2012d). The genus is widespread in WA but none have been described and their distributions are poorly understood (Judd 2011). Hence, this

			taxon is treated as a potential SRE due to uncertainties surrounding identity, taxonomy and geographic range (see Section 3.3).
		<i>Spherillo</i> sp. 2	A single specimen collected from the Lake Way Area (Outback Ecology 2011e). The genus is widespread in Western Australia but no species have yet been described. This specimen resembles a species that occurs north of Perth and in the Pilbara and is unlikely to represent an SRE species (Judd 2010). However, a complete review of the genus is required to confirm this (Judd 2010), so this specimen is treated as a potential SRE under the ' Data Deficient ' category due to taxonomic uncertainty (see Section 3.3). A second series of individuals also described as <i>Spherillo</i> sp. 2 was collected from the Lake Maitland area (Outback Ecology 2012d), but given the differences in descriptions between the two reports it seems that the individuals described as <i>Spherillo</i> sp. 2 in each report may not represent the same taxon. The individuals from Lake Maitland are reportedly only known from that locality (Judd 2012) and are therefore considered to be potential SREs .
	Philosciidae	? <i>Andricophiloscia</i> sp. nov.	Four specimens collected from samphire flats in the Lake Maitland area (Outback Ecology 2012d). These have been tentatively identified as belonging to the genus <i>Andricophiloscia</i> based on morphological characters (Judd 2011). Two species have been described from WA, but these specimens do not represent either of these species (Judd 2011). Members of the Philosciidae are very rarely collected in the region and very little is known about their distribution anywhere in WA (Judd 2011). Hence, they are considered to be potential SREs under the ' Data Deficient ' category due to uncertainties regarding taxonomic and geographic range.
	Platyarthridae	<i>Trichorhina</i> sp.	Seven specimens collected from the Lake Maitland area (Outback Ecology 2012d). Many members of the genus are now placed in the family Trichorhinidae but the single Western Australian species is still awaiting taxonomic revision (Judd 2011). Identification to species level in Western Australia is not possible given current knowledge, but the <i>Trichorhina</i> are an ancient genus containing many potential SRE taxa (Judd 2012). Hence, these specimens are considered to be potential SREs .

5.3 STYGOFAUNA

The Yilgarn region is notably rich in stygofaunal diversity (Humphreys 2006, 2008), so it is unsurprising that a relatively high number of stygal taxa have been identified from the vicinity of the study area (Appendix D). The Hinkler Well calcrete system encompasses a large part of the study area and is listed as a priority ecological community. Crustaceans are the dominant stygofaunal invertebrates within the vicinity of the study area (Table 4.4), which is consistent with global patterns of stygofaunal diversity (Humphreys 2006). Dytiscid beetles are also relatively prominent, which is also unsurprising as the Australian arid zone is reported to have the greatest dytiscid diversity in the world (Leys *et al.* 2003).

The Hinkler Well calcrete provides suitable habitat for stygofauna, and stygofauna surveys in the adjacent Centipede study area have recorded stygal taxa from the Hinkler Well calcrete (Outback Ecology 2011d). Hence, it is considered almost certain that stygofauna will occur within the study area. Taxa that are currently known only from the Hinkler Well calcrete system are listed in Table 5.2. These taxa are thus considered to have both a high likelihood of occurrence within the study area, and the potential to be restricted in distribution and hence to be of the greatest conservation significance.

Table 5.2 – Stygal taxa currently known only from the Hinkler Well Calcrete system and surrounds.

Higher taxon	Family	Taxon	Comments
Insecta			
Coleoptera	Dytiscidae	<i>Limbodessus hinkleri</i>	106 specimens collected from the Centipede study area; identified by morphological and genetic characteristics (Outback Ecology 2011d). Appear to be confined to the Hinkler Well calcrete (Outback Ecology 2008b). However, the species appears to be widely distributed within this calcrete, having been recorded as far east as the far eastern edge of the calcrete bordering the Lake Way playa and as far west as the western side of the Goldfields Hwy, some 20 km west of Lake Way (Outback Ecology 2011d).
		<i>Limbodessus macrohinkleri</i>	Two specimens collected from the Centipede study area; identified by morphological and genetic characteristics (Outback Ecology 2011d). Appear to be confined to the Hinkler Well calcrete (Outback Ecology 2008b). However, known from as far west as 13 km west of the Goldfields Highway, suggesting a relatively wide distribution within the calcrete (Outback Ecology 2011d)
		<i>Limbodessus raeae</i>	Listed from the Centipede study area based on published records (Outback Ecology 2012e).
Malacostraca			
Amphipoda	Chiltoniidae	Chiltoniidae sp. SAM3	74 specimens from the Centipede study area. An undescribed species identified by morphological characteristics (Outback Ecology 2011d). The taxon appears to be widely distributed within the Hinkler Well calcrete, having been recorded as far east as the far eastern edge of the calcrete bordering the Lake Way playa and as far west as the western side of the Goldfields Hwy, some 20 km west of Lake Way (Outback Ecology 2011d).
Bathynellacea	Parabathynellidae	Atopobathynella sp. OES5	51 specimens from the Centipede study area. Undescribed species identified via morphological characteristics (Outback Ecology 2011d).
		Brevisomabathynella sp. SAM2	Known only from four bore holes in the Centipede study area fringing Lake Way. Recorded from hypersaline waters (Outback Ecology 2012e). Collected from hypersaline waters (Outback Ecology 2012e).
Maxillopoda			
Harpacticoida	Diosaccidae/Miraciidae	Schizopera sp. TK4	Known from a single specimen from the Centipede study area (Outback Ecology 2012e). Similar to Schizopera sp. TK1 from Lake Maitland and may represent the same species, but additional material required to clarify this (Outback Ecology 2011d).

		Schizopera sp. TK7	19 specimens from the Centipede study area (Outback Ecology 2011d). Collected from three bores within close proximity to each other close to the edge of the Lake Way plays (Outback Ecology 2012e).
Ostracoda			
Podocopida	Candonidae	<i>Candonopsis (Abcandonopsis) linnaei</i>	Described from the Hinkler Well calcrete; 15 specimens collected from the Centipede study area (Outback Ecology 2011d). Also known from material collected 13 km west of the Goldfields Highway, suggesting a relatively wide distribution within the Hinkler Well Calcrete (Outback Ecology 2011d)

5.4 TROGLOFAUNA

The troglofaunal diversity of the region appears to be relatively low compared to that of stygofauna. However, a number of putative troglofaunal taxa have been detected during troglofauna surveys in the region, including in the adjacent Centipede tenements (Outback Ecology 2011d). Habitat within the study area is considered suitable for troglofauna, as it shares many aspects of geology with the adjacent Centipede tenements from which putative troglofauna have been collected (Outback Ecology 2011d). However, the high water table in many areas may limit the amount of suitable habitat (Outback Ecology 2011d). It has been proposed that putative troglofauna collected from the Centipede tenement may be more correctly described as edaphofauna (soil animals) rather than obligate troglofauna (Outback Ecology 2011d), though morphological similarities between the two groups mean this is difficult to ascertain with certainty, and in any case should not decrease their importance or conservation priority (Bennelongia 2011).

No putative troglofauna taxa identified in the literature search are gazetted as threatened. However, as is the case with SRE invertebrate and stygofaunal taxa, few troglofaunal taxa are formally gazetted as yet (see Section 1.2). Those taxa considered to be of most conservation concern are those known only from mining areas in the Centipede tenements (Table 5.3).

Table 5.3 – Troglofaunal taxa currently known only from the Centipede tenement mining areas.

Higher taxon	Family	Taxon	Comments
Entognatha			
Diplura	undetermined	Projapygidae sp.	One collected in a net haul from the Centipede study area (Outback Ecology 2011d).
Malacostraca			
Isopoda	Scyphacidae	<i>Haloniscus</i> sp. OES3	125 specimens collected across 15 bores within the Centipede study area (Outback Ecology 2011d). Collected from the fringes of the Lake Way playa, in litter traps deployed at depths of c. 1 m in compact, fine-grained alluvial sediment (Outback Ecology 2011d).
		<i>Haloniscus</i> sp. OES9	A single specimen collected from the Centipede study area (Outback Ecology 2011d). Collected from similar habitat to <i>Haloniscus</i> sp. OES3 (Outback Ecology 2011d).

Additionally, the WA Museum identifies a single molluscan troglofaunal taxon as having a potentially restricted distribution; Punctidae sp. The taxon is known from a single specimen collected in a litter trap in a bore at Uramurdah Lake on Millbillie Station. This is approximately 15 km north of the study area, so this taxon also has potential to occur within the study area.

6 CONCLUSION

The main conclusions of this desktop assessment of the terrestrial and subterranean fauna of the Millipede study area are:

- A relatively high level of survey effort has been expended in the vicinity of the study area
- Five broad-scale terrestrial fauna habitat types have been identified within the study area based on recent habitat mapping conducted in the area:
 - Mallee/mulga over spinifex sandplain
 - Low halophytic shrubland
 - Mulga over stony tussock grassland
 - Salt lake
 - Melaleuca woodland over calcrete flats
- The geology of the study area primarily comprises calcrete and sandplain deposits, and a small section of the Lake Way Playa in the northern-most section of the study area. The Hinkler Well calcrete occupies a relatively large section of the study area, and is highly suitable habitat for stygofauna. It is also listed as a Priority Ecological Community.
- A total of 34 native and 11 introduced mammal, 134 bird, 77 reptile and eight amphibian species have been identified as potentially occurring within the study area.
- Seven native mammal species identified as potentially occurring within the study area are considered to be of conservation significance. Of these, one species is considered to have a medium or higher chance of occurring within the study area
 - Brush-tailed Mulgara (*Dasycercus blythi*; DPaW Priority 4) – Medium
- 11 bird species identified as potentially occurring within the study area are considered to be of conservation significance. Of these, seven species are considered to have a medium or high chance of occurring within the study area
 - Fork-tailed Swift (*Apus pacificus*; EPBC Act Migratory, WC Act Schedule 3) - Medium
 - Sharp-tailed Sandpiper (*Calidris acuminata*; EPBC Act Migratory, WC Act Schedule 3) - Medium
 - Rainbow Bee-eater (*Merops ornatus*; EPBC Act Migratory, WC Act Schedule 3) - High
 - Grey Falcon (*Falco hypoleucos*; WC Act Schedule 1) - High
 - Peregrine Falcon (*Falco peregrinus*; WC Act Schedule 4, DPaW Specially Protected) - High
 - Australian Bustard (*Ardeotis australis*; DPaW Priority 4) - High
 - Bush Stone-curlew (*Burhinus grallarius*; DPaW Priority 4) - High
- One reptile species identified as potentially occurring within the study area is considered to be of conservation significance, but is considered to have a low chance of occurrence within the study area. However, the range-restricted *Aprasia picturata* has recently been recorded in the vicinity of the study area.

- No amphibian species identified as potentially occurring within the study area are considered to be of conservation significance.
- A total of 103 invertebrate taxa from SRE groups have been identified as potentially occurring within the study area. Of these, 51 are considered to be potential SREs according to WA Museum guidelines. However, these guidelines assign potential SRE status to any taxon which is poorly understood taxonomically, or cannot be identified to species level or equivalent. Those taxa considered the most likely to represent true SRE taxa are:
 - Mygalomorph spiders: *Aname* 'sp. B', *Aname* MYG176, *Aname* MYG227, *Kwonkan* MYG175, *Kwonkan* MYG194
 - Scorpions: *Urodacus* 'lakeway1', *Urodacus* 'lakeway2', *Urodacus* 'maitland1', *Urodacus* 'maitland2', *Urodacus* 'yeelirrie'
 - Pseudoscorpions: *Beierolpium* 'sp. 8/2', *Beierolpium* 'sp. 8/3', *Beierolpium* 'sp. 8/4 small', *Linnaeolpium* sp., *Xenolpium* 'PSE064'
 - Isopods: *Acanthodillo* sp. nov. 7, *Buddelundia* sp. nov. 46, *Cubaris* sp. wiluna, *Pseudodiploexochus* sp. nov., Isopoda nov. genus nov. species
- A total of 162 stygal invertebrate taxa were identified as potentially occurring within the study area. The hydrogeology of the study area is conducive to the presence of stygal taxa, with a large part of the study area overlying the Hinkler Well calcrete. The following taxa are currently known only from the Hinkler Well calcrete and are thus considered the most likely to both occur within the study area and to have a limited distribution.
 - Dytiscid Beetles: *Limbodessus hinkleri*, *Limbodessus macrohinkleri*, *Limbodessus raeae*
 - Amphipods: Chiltoniidae sp. SAM3
 - Bathynellaceans: *Atopobathynella* sp. OES5, *Brevisomabathynella* sp. SAM2
 - Copepods: *Schizopera* sp. TK4, *Schizopera* sp. TK7
 - Ostracods: *Candonopsis* (*Abcandonopsis*) *linnaei*
- A total of 47 troglofaunal invertebrate taxa were identified as potentially occurring within the study area. Troglofaunal diversity is relatively low compared to stygal diversity, and a significant proportion of the putative troglofauna recorded are likely to represent edaphofauna. The following taxa are currently known only from mining areas in the Centipede tenements, and hence are considered to be the most significant in terms of conservation
 - Diplurans: Projapygidae sp.
 - Isopods: *Haloniscus* sp. OES3, *Haloniscus* sp. OES9

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APPENDIX A EXPLANATION OF CONSERVATION CODES

DRAFT

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 Parks and Wildlife Priority Codes.

Threatened	Definition
Critically Endangered (CR)	Considered to be facing an extremely high risk of extinction in the wild.
Endangered (EN)	Considered to be facing a very high risk of extinction in the wild.
Vulnerable (VU)	Considered to be facing a high risk of extinction in the wild.
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

POTENTIAL VERTEBRATE FAUNA ASSEMBLAGE BASED ON LITERATURE REVIEW

DRAFT

Table B.1: Regional fauna list - mammals

Family and Species	Common name	EPBC Act	WC Act	DPaW	Outback Ecology (2009) Lake Maitland Baseline Terrestrial Fauna Survey	Outback Ecology (2010) Wiluna Uranium Terrestrial Fauna Habitat Assessment	Outback Ecology (2009) Reconnaissance for Wiluna Uranium Project	Outback Ecology (2008) Lake Way Baseline Terrestrial Fauna Survey	Outback Ecology (2002) Lake Way Baseline Fauna Studies	Outback Ecology (2009) Lake Maitland Infrastructure Areas Baseline Terrestrial Fauna Surveys	Outback Ecology (2011) Terrestrial Fauna Habitat Assessment - Borefield, Accommodation Camp and Access Route	ecologia (2004) Jundee Mulgara Assessment	ecologia (in prep) Toro Haul Road Level 1 & 2 Fauna Assessment	ecologia Internal Database	NatureMap	DoE Protected Matters Search
TACHYGLOSSIDAE																
<i>Tachyglossus aculeatus</i>	Short-beaked Echidna				•	•	•	•		•	•				•	
DASYURIDAE																
<i>Antechinomys laniger</i>	Kultarr														•	
<i>Dasycercus blythi</i>	Brush-tailed Mulgara			P4									•		•	
<i>Dasycercus blythi/cristicauda</i>	Mulgara sp.				•											
<i>Ningauia ridei</i>	Wongai Ningau				•	•		•					•	•	•	
<i>Pseudantechinus woolleyae</i>	Woolley's Pseudantechinus														•	
<i>Sminthopsis crassicaudata</i>	Fat-tailed Dunnart					•					•				•	
<i>Sminthopsis dolichura</i>	Little Long-tailed Dunnart												•	•	•	
<i>Sminthopsis hirtipes</i>	Hairy-footed Dunnart														•	
<i>Sminthopsis macroura</i>	Stripe-faced Dunnart				•	•								•	•	
<i>Sminthopsis ooldea</i>	Ooldea Dunnart				•								•	•	•	
<i>Sminthopsis longicaudata</i>	Long-tailed Dunnart			P4											•	
THYLACOMYIDAE																
<i>Macrotis lagotis</i>	Greater Bilby	VU	S1	VU												•
PERAMELIDAE																
<i>Isodon auratus barrowensis</i>	Golden Bandicoot (Barrow Island)	VU	S1	VU												•
NOTORYCTIDAE																
<i>Notoryctes caurinus</i>	Northern Marsupial Mole	EN	S1	EN												•
POTOROIDAE																
<i>Bettongia lesueur lesueur</i>	Burrowing Bettong (Boodie)	VU	S1	VU												•
MACROPODIDAE																
<i>Macropus fuliginosus</i>	Western Grey Kangaroo									•						
<i>Macropus robustus</i>	Euro				•	•	•	•		•	•		•	•	•	
<i>Macropus rufus</i>	Red Kangaroo				•	•	•	•		•	•		•	•	•	
<i>Petrogale lateralis lateralis</i>	Black-flanked Rock-wallaby	VU	S1	VU											•	
EMBALLONURIDAE																
<i>Saccolaimus flaviventris</i>	Yellow-bellied Sheathtail Bat													•		
<i>Taphozous hilli</i>	Hill's Sheathtail Bat				•			•								

Family and Species	Common name	EPBC Act	WC Act	DPaW	Outback Ecology (2009) Lake Maitland Baseline Terrestrial Fauna Survey	Outback Ecology (2010) Wiluna Uranium Terrestrial Fauna Habitat Assessment	Outback Ecology (2009) Reconnaissance for Wiluna Uranium Project	Outback Ecology (2008) Lake Way Baseline Terrestrial Fauna Survey	Outback Ecology (2002) Lake Way Baseline Fauna Studies	Outback Ecology (2009) Lake Maitland Infrastructure Areas Baseline Terrestrial Fauna Surveys	Outback Ecology (2011) Terrestrial Fauna Habitat Assessment - Borefield, Accommodation Camp and Access Route	ecologia (2004) Jundee Mulgara Assessment	ecologia (in prep) Toro Haul Road Level 1 & 2 Fauna Assessment	ecologia Internal Database	NatureMap	DoE Protected Matters Search
VESPERTILIONIDAE																
<i>Chalinolobus gouldii</i>	Gould's Wattled Bat				•	•	•	•					•	•	•	
<i>Nyctophilus geoffroyi</i>	Lesser Long-eared Bat				•	•	•	•					•	•	•	
<i>Scotorepens balstoni</i>	Inland Broad-nosed Bat				•	•	•	•					•	•	•	
<i>Scotorepens greyii</i>	Little Broad-nosed Bat													•		
<i>Vespadelus baverstocki</i>	Inland Forest Bat					•	•								•	
<i>Vespadelus finlaysoni</i>	Finlayson's Cave Bat				•	•	•	•						•		
<i>Vespadelus regulus</i>	Southern Forest Bat														•	
MOLOSSIDAE																
<i>Mormopterus</i> sp. 3	Inland Freetail Bat				•	•	•	•					•	•		
<i>Tadarida australis</i>	White-striped Freetail Bat				•			•					•	•	•	
MURIDAE																
<i>Notomys alexis</i>	Spinifex Hopping-mouse				•			•			•		•		•	
<i>Pseudomys desertor</i>	Desert Mouse				•							•	•		•	
<i>Pseudomys hermannsburgensis</i>	Sandy Inland Mouse				•			•			•	•	•	•	•	
CANIDAE																
<i>Canis lupus dingo</i>	Dingo									•	•			•		
INTRODUCED MAMMALS																
* <i>Mus musculus</i>	House Mouse				•	•		•	•	•		•	•	•	•	•
* <i>Canis lupus</i>	Dog/Dingo				•	•		•					•			
* <i>Felis catus</i>	Cat				•	•		•			•			•		•
* <i>Vulpes vulpes</i>	Fox				•	•	•	•								•
* <i>Capra hircus</i>	Goat									•						•
* <i>Ovis aries</i>	Sheep				•											
* <i>Equus asinus</i>	Donkey					•										•
* <i>Equus caballus</i>	Horse					•	•	•								
* <i>Camelus dromedarius</i>	Camel									•	•		•			•
* <i>Oryctolagus cuniculus</i>	Rabbit				•	•	•	•		•	•		•	•		•
* <i>Bos taurus</i>	Cow				•	•		•		•	•		•			

* Introduced species

Table B.2: Regional fauna list - birds

Family and Species	Common name	EPBC Act	WC Act	DPaW	Outback Ecology (2009) Lake Maitland Baseline Terrestrial Fauna Survey	Outback Ecology (2010) Wiluna Uranium Terrestrial Fauna Habitat Assessment	Outback Ecology (2009) Reconnaissance for Wiluna Uranium Project	Outback Ecology (2008) Lake Way Baseline Terrestrial Fauna Survey	Outback Ecology (2002) Lake Way Baseline Fauna Studies	Outback Ecology (2009) Lake Maitland Infrastructure Areas Baseline Terrestrial Fauna Surveys	Outback Ecology (2011) Terrestrial Fauna Habitat Assessment - Borefield, Accommodation Camp and Access Route	ecologia (in prep) Toro Haul Road Level 1 & 2 Fauna Assessment	ecologia Internal Database	NatureMap	DoE Protected Matters Search	Birddata
CASUARIIDAE																
<i>Dromaius novaehollandiae</i>	Emu				•			•	•	•	•	•	•	•		•
MEGAPODIIDAE																
<i>Leipoa ocellata</i>	Malleefowl	VU	S1	VU										•	•	
PHASIANIDAE																
<i>Coturnix pectoralis</i>	Stubble Quail													•		•
ANATIDAE																
<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												•			•
PODICIPEDIDAE																
<i>Tachybaptus novaehollandiae</i>	Australasian Grebe													•		•
<i>Poliiocephalus poliocephalus</i>	Hoary-headed Grebe												•	•		
COLUMBIDAE																
* <i>Columba livia</i>	Feral Pigeon (Rock Dove)														•	
<i>Phaps chalcoptera</i>	Common Bronzewing				•	•		•		•		•	•	•		•
<i>Ocyphaps lophotes</i>	Crested Pigeon				•	•	•	•	•	•		•	•	•		•
<i>Geopelia cuneata</i>	Diamond Dove				•					•			•	•		•
PODARGIDAE																
<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												•	

Family and Species	Common name	EPBC Act	WC Act	DPaW	Outback Ecology (2009) Lake Maitland Baseline Terrestrial Fauna Survey	Outback Ecology (2010) Wiluna Uranium Terrestrial Fauna Habitat Assessment	Outback Ecology (2009) Reconnaissance for Wiluna Uranium Project	Outback Ecology (2008) Lake Way Baseline Terrestrial Fauna Survey	Outback Ecology (2002) Lake Way Baseline Fauna Studies	Outback Ecology (2009) Lake Maitland Infrastructure Areas Baseline Terrestrial Fauna Surveys	Outback Ecology (2011) Terrestrial Fauna Habitat Assessment - Borefield, Accommodation Camp and Access Route	ecologia (in prep) Toro Haul Road Level 1 & 2 Fauna Assessment	ecologia Internal Database	NatureMap	DoE Protected Matters Search	Birddata
ANHINGIDAE																
<i>Anhinga novaehollandiae</i>	Australasian Darter															•
PHALACROCORACIDAE																
<i>Phalacrocorax sulcirostris</i>	Little Black Cormorant													•		•
PELECANIDAE																
<i>Pelecanus conspicillatus</i>	Australian Pelican													•		•
ARDEIDAE																
<i>Ardea pacifica</i>	White-necked Heron															•
<i>Ardea modesta</i>	Eastern Great Egret	M	S3												•	
<i>Egretta novaehollandiae</i>	White-faced Heron												•			•
THRESKIORNITHIDAE																
<i>Threskiornis spinicollis</i>	Straw-necked Ibis													•		•
ACCIPITRIDAE																
<i>Elanus axillaris</i>	Black-shouldered Kite				•								•			
<i>Lophoictinia isura</i>	Square-tailed Kite					•										•
<i>Hamirostra melanosternon</i>	Black-breasted Buzzard					•	•	•						•		
<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		S1										•			
<i>Falco peregrinus</i>	Peregrine Falcon		S4	Other												•
RALLIDAE																

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<i>Tribonyx ventralis</i>	Black-tailed Native-hen												•			•
<i>Fulica atra</i>	Eurasian Coot													•		•
OTIDIDAE																
<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>Cladorhynchus leucocephalus</i>	Banded Stilt															•
CHARADRIIDAE																
<i>Charadrius ruficapillus</i>	Red-capped Plover													•		•
<i>Charadrius veredus</i>	Oriental Plover	M	S3												•	
<i>Charadrius australis</i>	Inland Dotterel												•			
<i>Elseyornis melanops</i>	Black-fronted Dotterel				•								•			
<i>Erythronyx cinctus</i>	Red-kneed Dotterel					•										
<i>Vanellus tricolor</i>	Banded Lapwing					•		•		•			•			•
SCOLOPACIDAE																
<i>Calidris acuminata</i>	Sharp-tailed Sandpiper	M	S3			•										
TURNICIDAE																
<i>Turnix velox</i>	Little Button-quail												•			•
CACATUIDAE																
<i>Eolophus roseicapillus</i>	Galah				•	•		•		•		•	•			•
<i>Cacatua sanguinea</i>	Little Corella				•											•
<i>Nymphicus hollandicus</i>	Cockatiel				•								•	•		•
PSITTACIDAE																
<i>Polytelis alexandrae</i>	Princess Parrot	VU		P4											•	
<i>Barnardius zonarius</i>	Australian Ringneck				•	•	•	•	•	•		•	•			•
<i>Psephotus varius</i>	Mulga Parrot				•	•		•				•	•			•
<i>Melopsittacus undulatus</i>	Budgerigar				•							•	•	•		•

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<i>Neopsephotus bourkii</i>	Bourke's Parrot											•				•
<i>Neophema splendida</i>	Scarlet-chested Parrot													•		
CUCULIDAE																
<i>Chalcites basal</i>	Horsfield's Bronze-Cuckoo												•			•
<i>Chalcites osculans</i>	Black-eared Cuckoo												•			•
<i>Chalcites lucidus</i>	Shining Bronze-cuckoo												•			
<i>Cacomantis pallidus</i>	Pallid Cuckoo					•							•	•		•
STRIGIDAE																
<i>Ninox novaeseelandiae</i>	Southern Boobook							•					•	•		•
TYTONIDAE																
<i>Tyto javanica</i>	Eastern Barn Owl															•
HALCYONIDAE																
<i>Todiramphus pyrrhopygius</i>	Red-backed Kingfisher					•							•	•		•
<i>Todiramphus sanctus</i>	Sacred Kingfisher													•		•
MEROPIIDAE																
<i>Merops ornatus</i>	Rainbow Bee-eater	M	S3			•	•	•		•		•	•		•	•
CLIMACTERIDAE																
<i>Climacteris affinis</i>	White-browed Treecreeper													•		•
PTILONORHYNCHIDAE																
<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>	Variegated Fairy-wren				•	•		•				•	•	•		•
<i>Amytornis striatus</i>	Striated Grasswren													•		•
ACANTHIZIDAE																
<i>Calamanthus campestris</i>	Rufous Fieldwren															•
<i>Pyrrholaemus brunneus</i>	Redthroat				•	•	•	•				•				•
<i>Smicrornis brevirostris</i>	Weebill				•	•		•		•		•		•		•
<i>Gerygone fusca</i>	Western Gerygone									•				•		•

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<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 leucotis</i>	White-eared Honeyeater							•								
<i>Lichenostomus keartlandi</i>	Grey-headed Honeyeater				•			•								
<i>Lichenostomus plumulus</i>	Grey-fronted Honeyeater				•											•
<i>Lichenostomus ornatus</i>	Yellow-plumed Honeyeater				•			•								
<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>Anthochaera carunculata</i>	Red Wattlebird															•
<i>Epthianura tricolor</i>	Crimson Chat				•							•	•	•		•
<i>Epthianura albifrons</i>	White-fronted Chat															•
<i>Sugomel niger</i>	Black Honeyeater												•	•		•
<i>Lichmera indistincta</i>	Brown Honeyeater				•			•						•		•
POMATOSTOMIDAE																
<i>Pomatostomus temporalis</i>	Grey-crowned Babbler					•		•				•	•	•		•
<i>Pomatostomus superciliosus</i>	White-browed Babbler				•		•			•		•				•
PSOPHODIDAE																
<i>Cinclosoma castanotus</i>	Chestnut Quail-thrush				•											•
<i>Cinclosoma marginatum</i>	Western Quail-thrush											•	•	•		•

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<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				•	•						•	•	•		•
ARTAMIDAE																
<i>Artamus personatus</i>	Masked 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				•	•		•				•	•	•		•
<i>Strepera versicolor</i>	Grey Currawong							•								•
RHIPIDURIDAE																
<i>Rhipidura leucophrys</i>	Willie Wagtail				•	•	•	•	•	•		•	•	•		•
CORVIDAE																
<i>Corvus coronoides</i>	Australian Raven									•						•
<i>Corvus bennetti</i>	Little Crow				•	•	•	•	•			•	•	•		•
<i>Corvus orru</i>	Torresian Crow											•		•		•
MONARCHIDAE																
<i>Grallina cyanoleuca</i>	Magpie-lark				•			•		•		•	•	•		•
PETROICIDAE																
<i>Microeca fascinans</i>	Jacky Winter					•										
<i>Petroica goodenovii</i>	Red-capped Robin				•	•						•	•	•		•

Family and Species	Common name	EPBC Act	WC Act	DPaW	Outback Ecology (2009) Lake Maitland Baseline Terrestrial Fauna Survey	Outback Ecology (2010) Wiluna Uranium Terrestrial Fauna Habitat Assessment	Outback Ecology (2009) Reconnaissance for Wiluna Uranium Project	Outback Ecology (2008) Lake Way Baseline Terrestrial Fauna Survey	Outback Ecology (2002) Lake Way Baseline Fauna Studies	Outback Ecology (2009) Lake Maitland Infrastructure Areas Baseline Terrestrial Fauna Surveys	Outback Ecology (2011) Terrestrial Fauna Habitat Assessment - Borefield, Accommodation Camp and Access Route	ecologia (in prep) Toro Haul Road Level 1 & 2 Fauna Assessment	ecologia Internal Database	NatureMap	DoE Protected Matters Search	Birddata
<i>Melanodryas cucullata</i>	Hooded Robin											•	•			•
MEGALURIDAE																
<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				•	•		•		•		•	•	•		•
MOTACILLIDAE																
<i>Anthus novaeseelandiae</i>	Australasian Pipit				•				•			•	•			•

† Species recorded just outside study area

* Introduced species

Table B.3: Regional fauna list - reptiles

Family and Species	Common name	EPBC Act	WC Act	DPaW	Outback Ecology (2009) Lake Maitland Baseline Terrestrial Fauna Survey	Outback Ecology (2010) Wiluna Uranium Terrestrial Fauna Habitat Assessment	Outback Ecology (2009) Reconnaissance for Wiluna Uranium Project	Outback Ecology (2008) Lake Way Baseline Terrestrial Fauna Survey	Outback Ecology (2002) Lake Way Baseline Fauna Studies	Outback Ecology (2009) Lake Maitland Infrastructure Areas Baseline Terrestrial Fauna Surveys	Outback Ecology (2011) Terrestrial Fauna Habitat Assessment - Borefield, Accommodation Camp and Access Route	ecologia (in prep) Toro Haul Road Level 1 & 2 Fauna Assessments	ecologia Internal Database	NatureMap	DoE Protected Matters Search
CHELUIDAE															
<i>Chelodina steindachneri</i>	Flat-shelled Turtle				•			•							
AGAMIDAE															
<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>Ctenophorus salinarum</i>	Claypan Dragon				•			•						•	
<i>Ctenophorus scutulatus</i>	Lozenge-marked Dragon				•	•						•	•	•	
<i>Gowidon longirostris</i>	Long-nosed Dragon													•	
<i>Moloch horridus</i>	Thorny Devil				•			•							
<i>Pogona minor</i>	Dwarf Bearded Dragon				•				•			•	•	•	
<i>Tympanocryptis cephalus</i>	Pebble Dragon												•	•	
DIPLODACTYLIDAE															
<i>Diplodactylus conspicillatus</i>	Fat-tailed Gecko				•							•	•	•	
<i>Diplodactylus granariensis</i>						•	•						•		
<i>Diplodactylus pulcher</i>					•	•		•					•	•	
<i>Lucasium damaeum</i>						•									
<i>Lucasium squarrosum</i>												•		•	
<i>Lucasium stenodactylum</i>						•	•	•		•					
<i>Rhynchoedura ornata</i>	Beaked Gecko				•	•		•				•	•	•	
<i>Strophurus elderi</i>					•	•			•				•	•	
<i>Strophurus sp.</i>					•										
<i>Strophurus strophurus</i>						•		•							
<i>Strophurus wellingtonae</i>												•	•	•	
CARPHODACTYLIDAE															

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<i>Nephrurus laevisissimus</i>						•		•						•	
<i>Nephrurus vertebralis</i>					•	•				•		•		•	
<i>Nephrurus wheeleri</i>					•	•		•							
<i>Underwoodisaurus milii</i>	Barking Gecko													•	
GEKKONIDAE															
<i>Gehyra purpurascens</i>					•		•	•	•						
<i>Gehyra variegata</i>					•	•		•	•	•		•	•	•	
<i>Heteronotia binoei</i>	Bynoe's Gecko				•	•	•	•				•	•	•	
PYGOPODIDAE															
<i>Aprasia picturata</i>	Black-headed Worm-lizard											†		•	
<i>Delma butleri</i>								•					•	•	
<i>Delma nasuta</i>					•									•	
<i>Delma petersoni</i>														•	
<i>Lialis burtonis</i>					•							•			
<i>Pygopus nigriceps</i>						•		•				•	•	•	
SCINCIDAE															
<i>Cryptoblepharus buechananii</i>								•							
<i>Cryptoblepharus plagiocephalus</i>					•			•							
<i>Ctenotus ariadnae</i>												•		•	
<i>Ctenotus atlas</i>					•		•	•							
<i>Ctenotus calurus</i>													•	•	
<i>Ctenotus grandis</i>					•									•	
<i>Ctenotus aff. grandis</i>												•			
<i>Ctenotus inornatus</i> (ex-C. helenae)					•	•						•	•	•	
<i>Ctenotus leonhardii</i>					•			•	•			•	•	•	
<i>Ctenotus pantherinus</i>	Leopard Ctenotus				•	•		•				•	•	•	
<i>Ctenotus quattuordecimlineatus</i>						•		•						•	

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<i>Ctenotus schomburgkii</i>					•							•	•	•	
<i>Ctenotus severus</i>					•	•									
<i>Ctenotus uber</i>													•	•	
<i>Egernia depressa</i>	Pygmy Spiny-tailed Skink				•	•				•		•	•	•	
<i>Egernia formosa</i>														•	
<i>Eremiascincus richardsonii</i>	Broad-banded Sand Swimmer				•								•	•	
<i>Lerista bipes</i>					•	•		•					•		
<i>Lerista desertorum</i>					•	•		•				•	•	•	
<i>Lerista timida</i>					•	•		•	•			•	•	•	
<i>Liopholis inornata</i>	Desert Skink													•	
<i>Liopholis kintorei</i>	Great Desert Skink	VU	S1	VU											•
<i>Liopholis striata</i>	Night Skink													•	
<i>Menetia greyii</i>					•	•		•	•			•	•	•	
<i>Morethia butleri</i>						•		•						•	
<i>Tiliqua multifasciata</i>	Central Blue-tongue				•									•	
VARANIDAE															
<i>Varanus brevicauda</i>	Short-tailed Pygmy Monitor											•	•	•	
<i>Varanus caudolineatus</i>										•		•	•	•	
<i>Varanus eremius</i>	Pygmy Desert Monitor				•							•		•	
<i>Varanus giganteus</i>	Perentie					•					•			•	
<i>Varanus gouldii</i>	Sand Monitor				•	•	•	•		•		•			
<i>Varanus panoptes</i>	Yellow-spotted Monitor				•			•				•		•	
<i>Varanus tristis tristis</i>	Racehorse Monitor													•	
TYPHLOPIDAE															
<i>Ramphotyphlops hamatus</i>						•		•						•	
<i>Ramphotyphlops waitii</i>													•	•	
ELAPIDAE															
<i>Brachyurophis approximans</i>	North-western Shovel-nosed Snake					•								•	

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<i>Demansia psammophis</i>	Yellow-faced Whipsnake					•			•				•		
<i>Parasuta monachus</i>	Hooded Snake				•	•							•		
<i>Pseudonaja mengdeni</i>	Western Brown Snake											•		•	
<i>Pseudonaja modesta</i>	Ringed Brown Snake					•						•			
<i>Simoselaps bertholdi</i>	Jan's Banded Snake					•				•		•	•	•	

† Species recorded just outside study area

Table B.4: Regional fauna list - amphibians

Family and Species	Common name	EPBC Act	WC Act	DPaW	Outback Ecology (2009) Lake Maitland Baseline Terrestrial Fauna Survey	Outback Ecology (2010) Wiluna Uranium Terrestrial Fauna Habitat Assessment	Outback Ecology (2009) Reconnaissance for Wiluna Uranium Project	Outback Ecology (2008) Lake Way Baseline Terrestrial Fauna Survey	Outback Ecology (2002) Lake Way Baseline Fauna Studies	Outback Ecology (2008) Lake Maitland Project Baseline Terrestrial Fauna Surveys	ecologia (in prep) Toro Haul Road Level 1 & 2 Fauna Assessment	ecologia Internal Database	NatureMap
HYLIDAE													
<i>Cyclorana maini</i>	Sheep Frog											•	•
<i>Cyclorana platycephala</i>	Water-holding Frog												•
<i>Litoria rubella</i>	Little Red Tree Frog								•		†	•	
LIMNODYNASTIDAE													
<i>Neobatrachus aquilonius</i>	Northern Burrowing Frog												•
<i>Neobatrachus kunapalari</i>	Kunapalari Frog												•
<i>Neobatrachus sudellae</i>	Desert Trilling Frog												•
<i>Neobatrachus sutor</i>	Shoemaker Frog											•	•
<i>Neobatrachus wilmorei</i>	Plonking Frog											•	

† Species recorded just outside study area

APPENDIX C

POTENTIAL SRE INVERTEBRATE FAUNA BASED ON LITERATURE REVIEW

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Table C.1: Regional fauna list - Taxa from short range endemic invertebrate groups

Order	Family	Lowest Taxon Identification	Synonyms	SRE Status	Outback Ecology 2008 Toro Energy Lake Way Baseline Terrestrial Fauna Survey	Outback Ecology 2011 Toro Energy Wiluna Uranium Project Terrestrial Fauna Assessment	Outback Ecology 2009 Mega Uranium Lake Maitland Baseline Terrestrial Fauna Survey	Outback Ecology 2012 Mega Lake Maitland Lake Maitland Uranium Project: Terrestrial SRE Invertebrate Fauna Assessment	ecologia Internal Database	Database searches	
										WA Museum	NatureMap
Arachnida (Order Aranaea)											
Aranaea: Mygalomorphae	Actinopodidae	Missulena insignis		Widespread							•
Aranaea: Mygalomorphae	Actinopodidae	Missulena occatoria		Widespread							•
Aranaea: Mygalomorphae	Barychelidae	Barychelidae sp.		Potential - Data Deficient (Identification)			•				
Aranaea: Mygalomorphae	Barychelidae	Idiommata sp.		Potential - Data Deficient (Identification)	•						
Aranaea: Mygalomorphae	Barychelidae	Mandjelia 'wanjarri'		Widespread		•					
Aranaea: Mygalomorphae	Barychelidae	indet.' sp.		Potential - Data Deficient (Identification)		•					
Aranaea: Mygalomorphae	Barychelidae	Synothele sp. indet.		Potential - Data Deficient (Identification)				•			
Aranaea: Mygalomorphae	Barychelidae	Synothele meadhunteri	cf. Idiommata sp.	Widespread	•						•
Aranaea: Mygalomorphae	Ctenizidae	Conothele sp. nov.		Potential - Data Deficient (Geographic)			•				
Aranaea: Mygalomorphae	Dipluridae	Cethegus sp.		Potential - Data Deficient (Identification)		•	•				
Aranaea: Mygalomorphae	Dipluridae	Cethegus sp. nov.		Potential - Data Deficient (Identification)			•				
Aranaea: Mygalomorphae	Dipluridae	Cethegus 'fugax'		Potential - Data Deficient (Taxonomic)				•			
Aranaea: Mygalomorphae		?Idiopidae sp.		Potential - Data Deficient (Identification)			•				
Aranaea: Mygalomorphae	Idiopidae	Aganippe sp.		Potential - Data Deficient (Identification)			•	•			
Aranaea: Mygalomorphae	Idiopidae	Aganippe sp. A		Potential - Data Deficient (Identification)	•						
Aranaea: Mygalomorphae	Idiopidae	Aganippe sp. "occidentalis sp. group"		Potential - Data Deficient (Identification)	•						
Aranaea: Mygalomorphae	Idiopidae	Arbanitis sp.		Potential - Data Deficient (Identification)			•				
Aranaea: Mygalomorphae	Idiopidae	Eucyrtops sp.		Potential - Data Deficient (Identification)	•	•					
Aranaea: Mygalomorphae	Idiopidae	Gaius sp.		Potential - Data Deficient (Identification)			•				
Aranaea: Mygalomorphae	Idiopidae	Gaius villosus	Anidiops villosus	Widespread			•				•
Aranaea: Mygalomorphae	Nemesiidae	Nemesiidae sp.		Potential - Data Deficient (Identification)			•				
Aranaea: Mygalomorphae	Nemesiidae	Aname sp. "armigera sp. group"		Potential - Data Deficient (Identification)	•						

Order	Family	Lowest Taxon Identification	Synonyms	SRE Status	Outback Ecology 2008 Toro Energy Lake Way Baseline Terrestrial Fauna Survey	Outback Ecology 2011 Toro Energy Wiluna Uranium Project Terrestrial Fauna Assessment	Outback Ecology 2009 Mega Uranium Lake Maitland Baseline Terrestrial Fauna Survey	Outback Ecology 2012 Mega Lake Maitland Lake Maitland Uranium Project: Terrestrial SRE Invertebrate Fauna Assessment	ecologia Internal Database	Database searches	
										WA Museum	NatureMap
Aranaea: Mygalomorphae	Nemesiidae	<i>Aname</i> sp.		Potential - Data Deficient (Identification)	•	•	•	•			
Aranaea: Mygalomorphae	Nemesiidae	<i>Aname</i> sp. A		Potential - Data Deficient (Identification)			•				
Aranaea: Mygalomorphae	Nemesiidae	<i>Aname</i> sp. B		Potential - Data Deficient (Identification)			•				
Aranaea: Mygalomorphae	Nemesiidae	<i>Aname</i> MYG001-group		Potential - Data Deficient (Identification)				•			
Aranaea: Mygalomorphae	Nemesiidae	<i>Aname</i> MYG173		Widespread		•		•			
Aranaea: Mygalomorphae	Nemesiidae	<i>Aname</i> MYG176		Potential - Morphological Indicators		•					
Aranaea: Mygalomorphae	Nemesiidae	<i>Aname</i> MYG177		Widespread		•					
Aranaea: Mygalomorphae	Nemesiidae	<i>Aname</i> MYG227		Potential - Research and Expertise				•			
Aranaea: Mygalomorphae	Nemesiidae	<i>Kwonkan</i> MYG175	<i>Kwonkan</i> sp. nov. B	Potential - Data Deficient (Geographic)		•	•				
Aranaea: Mygalomorphae	Nemesiidae	<i>Kwonkan</i> MYG194	<i>Kwonkan</i> sp. nov. A	Potential - Data Deficient (Geographic)			•				
Aranaea: Mygalomorphae	Theraphosidae	<i>Selenotholus foelschei</i>		Widespread					•		•
Aranaea: Mygalomorphae	Theraphosidae	<i>Selenocosmia sterlingi</i>		Widespread			•				
Arachnida (Order Pseudoscorpiones)											
Pseudoscorpiones	Atemnidae	<i>Oratemnus distinctus</i>		Widespread	•						•
Pseudoscorpiones	Atemnidae	<i>Oratemnus</i> sp.		Potential - Data Deficient (Identification)		•			•		
Pseudoscorpiones	Chernetidae	<i>Nesidiochernes</i> 'PSE065'		Widespread					•		
Pseudoscorpiones	Olpiidae	Olpiidae sp. 'indet'		Potential - Data Deficient (Identification)		•					
Pseudoscorpiones	Olpiidae	<i>Austrohorus</i> sp.		Potential - Data Deficient (Identification)				•			
Pseudoscorpiones	Olpiidae	<i>Beierolpium</i> 'sp. 8/2'		Potential - Data Deficient (Taxonomic)		•					
Pseudoscorpiones	Olpiidae	<i>Beierolpium</i> 'sp. 8/3'		Potential - Data Deficient (Taxonomic)	•			•	•		
Pseudoscorpiones	Olpiidae	<i>Beierolpium</i> 'sp. 8/4 small'		Potential - Data Deficient (Taxonomic)					•		
Pseudoscorpiones	Olpiidae	<i>Indolpium</i> sp.		Widespread	•	•	•	•			
Pseudoscorpiones	Olpiidae	<i>Linnaeolpium</i> sp.		Potential - Data Deficient (Geographic)				•			
Pseudoscorpiones	Olpiidae	<i>Xenolpium</i> 'PSE064'		Potential - Data Deficient (Taxonomic)					•		

Order	Family	Lowest Taxon Identification	Synonyms	SRE Status	Outback Ecology 2008 Toro Energy Lake Way Baseline Terrestrial Fauna Survey	Outback Ecology 2011 Toro Energy Wiluna Uranium Project Terrestrial Fauna Assessment	Outback Ecology 2009 Mega Uranium Lake Maitland Baseline Terrestrial Fauna Survey	Outback Ecology 2012 Mega Lake Maitland Lake Maitland Uranium Project: Terrestrial SRE Invertebrate Fauna Assessment	ecologia Internal Database	Database searches	
										WA Museum	NatureMap
Arachnida (Order Scorpiones)											
Scorpiones	Buthidae	<i>Lychas</i> 'adonis'		Widespread	•	•	•	•			
Scorpiones	Buthidae	<i>Lychas annulatus</i>		Widespread	•	•	•	•			
Scorpiones	Buthidae	<i>Lychas jonesae</i>		Widespread		•		•	•		
Scorpiones	Buthidae	<i>Lychas</i> 'splendens'		Widespread		•					
Scorpiones	Buthidae	<i>Isometroides</i> sp.		Potential - Data Deficient (Identification)	•	•	•	•			
Scorpiones	Urodacidae	<i>Urodacus</i> sp.		Potential - Data Deficient (Identification)				•			
Scorpiones	Urodacidae	<i>Urodacus</i> 'gibson 3'		Widespread		•			•		
Scorpiones	Urodacidae	<i>Urodacus hoplurus</i>		Widespread				•	•		•
Scorpiones	Urodacidae	<i>Urodacus</i> 'lakeway1'		Potential - Data Deficient (Taxonomic)	•						
Scorpiones	Urodacidae	<i>Urodacus</i> 'lakeway2'		Potential - Data Deficient (Taxonomic)	•						
Scorpiones	Urodacidae	<i>Urodacus</i> 'laverton2'		Widespread		•			•		
Scorpiones	Urodacidae	<i>Urodacus</i> 'Laverton 5'		Widespread				•			
Scorpiones	Urodacidae	<i>Urodacus</i> 'sp. maitland1'		Potential - Data Deficient (Taxonomic)			•				
Scorpiones	Urodacidae	<i>Urodacus</i> 'sp. maitland2'		Potential - Data Deficient (Taxonomic)			•				
Scorpiones	Urodacidae	<i>Urodacus similis</i>		Widespread							•
Scorpiones	Urodacidae	<i>Urodacus</i> ? <i>yaschenkoi</i>		Widespread			•				
Scorpiones	Urodacidae	<i>Urodacus</i> 'yeelirrie'		Potential - Data Deficient (Taxonomic)		•		•			
Chilopoda											
Geophilida		Geophilida sp.		Potential - Data Deficient (Identification)			•				
Scolopendrida	Scolopendridae	<i>Arthrorhabdis paucispinus</i>		Widespread			•				
Scolopendrida	Scolopendridae	<i>Cormocephalus aurantiipes</i>		Widespread	•		•				•
Scolopendrida	Scolopendridae	<i>Cormocephalus strigosus</i>		Widespread			•				
Scolopendrida	Scolopendridae	<i>Cormocephalus turneri</i>		Widespread	•		•				•

Order	Family	Lowest Taxon Identification	Synonyms	SRE Status	Outback Ecology 2008 Toro Energy Lake Way Baseline Terrestrial Fauna Survey	Outback Ecology 2011 Toro Energy Wiluna Uranium Project Terrestrial Fauna Assessment	Outback Ecology 2009 Mega Uranium Lake Maitland Baseline Terrestrial Fauna Survey	Outback Ecology 2012 Mega Lake Maitland Lake Maitland Uranium Project: Terrestrial SRE Invertebrate Fauna Assessment	ecologia Internal Database	Database searches	
										WA Museum	NatureMap
Scolopendrida	Scolopendridae	<i>Cormocephalus ?turneri</i>		Widespread			•				
Scolopendrida	Scolopendridae	<i>Ethmostigmus curtipes</i>		Widespread			•				
Scolopendrida	Scolopendridae	<i>Ethmostigmus pachysoma</i>		Widespread							•
Scolopendrida	Scolopendridae	<i>Ethmostigmus rubripes</i>		Widespread			•				
Scolopendrida	Scolopendridae	<i>Scolopendra laeta</i>		Widespread	•		•				•
Scolopendrida	Scolopendridae	<i>Scolopendra morsitans</i>		Widespread	•						•
Malacostraca											
Isopoda	Armadillidae	Gen. nov. sp. nov.		Potential - Data Deficient (Taxonomic)				•			
Isopoda	Armadillidae	<i>Acanthodillo</i> sp. nov. 7		Potential - Data Deficient (Geographic)				•			
Isopoda	Armadillidae	<i>Buddelundia labiata</i>		Widespread				•			
Isopoda	Armadillidae	<i>Buddelundia</i> sp.		Widespread		•				•	
Isopoda	Armadillidae	<i>Buddelundia</i> sp. nov. 16	<i>Buddelundia</i> sp. nov. 55	Widespread					•		
Isopoda	Armadillidae	<i>Buddelundia</i> sp. nov. 39		Widespread					•		
Isopoda	Armadillidae	<i>Buddelundia</i> sp. nov. 46		Potential - Data deficient (Geographic)				•			
Isopoda	Armadillidae	<i>Cubaris</i> sp. 1		Potential - Data Deficient (Geographic)				•			
Isopoda	Armadillidae	<i>Cubaris</i> sp. wiluna		Potential - Research and Expertise					•		
Isopoda	Armadillidae	<i>Pseudodiploexochus</i> sp. nov.		Potential - Research and Expertise				•			
Isopoda	Armadillidae	<i>Spherillo</i> sp.		Widespread						•	
Isopoda	Armadillidae	<i>Spherillo</i> sp. 1		Potential - Data Deficient (Taxonomic)				•			
Isopoda	Armadillidae	<i>Spherillo</i> sp. 2		Potential - Data Deficient (Taxonomic)		•		•			
Isopoda	Philosciidae	? <i>Andricophiloscia</i> sp. nov.		Potential - Data Deficient (Geographic)				•			
Isopoda	Platyarthridae	<i>Trichorhina</i> sp. nov.		Potential - Data Deficient (Identification)				•			
Gastropoda											
	Planorbidae	<i>Glyphophysa (Glyptophysa)</i> sp.		Widespread	•						

Order	Family	Lowest Taxon Identification	Synonyms	SRE Status	Outback Ecology 2008 Toro Energy Lake Way Baseline Terrestrial Fauna Survey	Outback Ecology 2011 Toro Energy Wiluna Uranium Project Terrestrial Fauna Assessment	Outback Ecology 2009 Mega Uranium Lake Maitland Baseline Terrestrial Fauna Survey	Outback Ecology 2012 Mega Lake Maitland Lake Maitland Uranium Project: Terrestrial SRE Invertebrate Fauna Assessment	ecologia Internal Database	Database searches	
										WA Museum	NatureMap
	Pupillidae	<i>Gastrocopta bannertonensis</i>		Widespread						•	
	Pupillidae	<i>Gastrocopta cf.</i>		Widespread						•	
	Pupillidae	<i>Gastrocopta cf. pediculus</i>		Widespread						•	
	Pupillidae	<i>Gastrocopta larapinta</i>		Widespread	•					•	
	Pupillidae	<i>Gastrocopta margaretae</i>		Widespread						•	
	Pupillidae	<i>Pupoides sp.</i>		Widespread		•				•	
	Pupillidae	<i>Pupoides beltianus</i>		Widespread					•	•	
	Pupillidae	<i>Pupoides cf. beltianus</i>	<i>Pupoides sp. cf. P. beltianus</i>	Widespread		•				•	
	Pupillidae	<i>Pupoides ?adelaidae</i>		Widespread						•	
	Pupillidae	<i>Pupoides adelaidae</i>		Widespread	•		•	•		•	
	Pupillidae	<i>Pupoides cf. adelaidae</i>		Widespread						•	
	Pupillidae	<i>Pupoides cf. eremicolus</i>		Widespread						•	
	Pupillidae	<i>Pupoides myoporinae</i>		Widespread	•		•	•		•	
	Pupillidae	<i>Pupoides cf. myoporinae</i>		Widespread						•	

APPENDIX D

POTENTIAL STYGOFUNA BASED ON LITERATURE REVIEW

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Table D.1: Regional fauna list – Stygofauna

Order	Family	Lowest Taxon Identification	Synonyms	Outback Ecology 2008 Toro Energy Centipede Project Baseline Stygofauna Survey	Outback Ecology 2011 Toro Energy Wiluna Uranium Project Subterranean Fauna Assessment	Outback Ecology 2012 Mega Lake Maitland Lake Maitland Uranium Project	Outback Ecology 2012 Wiluna Uranium Project Stygofauna Memo	ecologia Internal Database	Database searches	
									WA Museum	NatureMap
Arachnida (Acarina)										
		Acarina sp.		•						
		Oribata sp.		•						
		Astigmata sp.		•						
		Halacaroida		•						
		Prostigmata larvae		•						
Branchiopoda										
		Diplostraca sp.							•	
Anostraca	Parartemiidae	Parartemia laticaudata							•	
Notostraca	Triopsidae	Triops sp.							•	
Entognatha (Collembola)										
Arthropleona		Arthropleona sp.		•						
Insecta										
Coleoptera	Dytiscidae	Bidessini sp.		•						
Coleoptera	Dytiscidae	Bidessini larvae		•	•					
Coleoptera	Dytiscidae	Dytiscidae sp.		•						
Coleoptera	Dytiscidae	Dytiscidae larvae		•						
Coleoptera	Dytiscidae	Limbodessus sp.			•					
Coleoptera	Dytiscidae	Limbodessus barwidgensis				•				
Coleoptera	Dytiscidae	Limbodessus hahni					•			
Coleoptera	Dytiscidae	Limbodessus cf hinkleri		•						
Coleoptera	Dytiscidae	Limbodessus hinkleri		•	•		•			
Coleoptera	Dytiscidae	Limbodessus ?hinkleri			•					
Coleoptera	Dytiscidae	Limbodessus macrohinkleri		•	•		•			
Coleoptera	Dytiscidae	Limbodessus millbilliensis			•		•			
Coleoptera	Dvtiscidae	Limbodessus moraani					•			

Order	Family	Lowest Taxon Identification	Synonyms	Outback Ecology 2008 Toro Energy Centipede Project Baseline Stygo fauna Survey	Outback Ecology 2011 Toro Energy Wiluna Uranium Project Subterranean Fauna Assessment	Outback Ecology 2012 Mega Lake Maitland Lake Maitland Uranium Project	Outback Ecology 2012 Wiluna Uranium Project Stygo fauna Memo	ecologia Internal Database	Database searches	
									WA Museum	NatureMap
Coleoptera	Dytiscidae	<i>Limbodessus raeae</i>					•			
Coleoptera	Dytiscidae	<i>Limbodessus usitatus</i>				•				
Coleoptera	Dytiscidae	<i>Limbodessus wilunaensis</i>			•					
Clitellata (Oligochaeta)										
Haplotaxida	Enchytraeidae	Enchytraeidae sp.	?Enchytraeidae sp.	•	•		•			
Haplotaxida	Enchytraeidae	Enchytraeidae sp. indet.						•		
Haplotaxida	Enchytraeidae	Enchytraeidae sp. OES1				•				
Haplotaxida	Enchytraeidae	Enchytraeidae sp. OES2				•				
Haplotaxida	Naididae	Naididae sp.	Tubificina sp.	•	•		•			
Haplotaxida	Naididae	Naididae sp. OES1				•				
Haplotaxida	Naididae	Naididae sp. OES2				•				
Haplotaxida	Phreodrilidae	Phreodrilidae sp.			•		•			
Malacostraca										
		Syncarida sp.							•	
Amphipoda		Amphipoda sp.		•					•	
Amphipoda	Ceinidae	Ceinidae sp.		•						
Amphipoda	Chiltoniidae	Chiltoniidae sp. OES1				•			•	
Amphipoda	Chiltoniidae	Chiltoniidae sp. SAM1			•		•			
Amphipoda	Chiltoniidae	Chiltoniidae sp. SAM1a							•	
Amphipoda	Chiltoniidae	Chiltoniidae sp. SAM1b							•	
Amphipoda	Chiltoniidae	Chiltoniidae sp. SAM2			•		•		•	
Amphipoda	Chiltoniidae	Chiltoniidae sp. SAM3			•		•		•	
Amphipoda	Chiltoniidae	Chiltoniidae sp. ?SAM3			•					
Amphipoda	Chiltoniidae	Chiltoniidae sp. SAM4				•			•	
Amphipoda	Paramelitidae	Paramelitidae sp. SAM1			•		•		•	
Amphipoda	Paramelitidae	Paramelitidae sp. SAM2			•		•			
Bathynellacea	Bathynellidae	Bathynellidae sp.		•	•		•			

Order	Family	Lowest Taxon Identification	Synonyms	Outback Ecology 2008 Toro Energy Centipede Project Baseline Stygo fauna Survey	Outback Ecology 2011 Toro Energy Wiluna Uranium Project Subterranean Fauna Assessment	Outback Ecology 2012 Mega Lake Maitland Lake Maitland Uranium Project	Outback Ecology 2012 Wiluna Uranium Project Stygo fauna Memo	ecologia Internal Database	Database searches	
									WA Museum	NatureMap
Bathynellacea	Bathynellidae	Bathynellidae sp. OES1				•				
Bathynellacea	Parabathynellidae	?Atopobathynella sp.		•						
Bathynellacea	Parabathynellidae	Parabathynellidae sp.		•	•					
Bathynellacea	Parabathynellidae	Parabathynellidae sp. OES13			•		•		•	
Bathynellacea	Parabathynellidae	Atopobathynella wattsi			•		•		•	
Bathynellacea	Parabathynellidae	Atopobathynella ?wattsi			•					
Bathynellacea	Parabathynellidae	Atopobathynella sp. OES5			•		•		•	
Bathynellacea	Parabathynellidae	Atopobathynella sp. OES6				•				
Bathynellacea	Parabathynellidae	Atopobathynella sp. OES8							•	
Bathynellacea	Parabathynellidae	Atopobathynella sp. OES9							•	
Bathynellacea	Parabathynellidae	Atopobathynella sp. SAM2							•	
Bathynellacea	Parabathynellidae	Brevisomabathynella clayi					•		•	
Bathynellacea	Parabathynellidae	Brevisomabathynella cooperi							•	
Bathynellacea	Parabathynellidae	Brevisomabathynella eberhardi							•	
Bathynellacea	Parabathynellidae	Brevisomabathynella jundeeensis							•	
Bathynellacea	Parabathynellidae	Brevisomabathynella parooensis							•	
Bathynellacea	Parabathynellidae	Brevisomabathynella sp. SAM2			•		•		•	
Bathynellacea	Parabathynellidae	Brevisomabathynella sp. SAM3			•		•			
Bathynellacea	Parabathynellidae	Brevisomabathynella sp. SAM4			•		•			
Bathynellacea	Parabathynellidae	Brevisomabathynella sp. SAM15							•	
Bathynellacea	Parabathynellidae	Brevisomabathynella uramurdahensis			•				•	
Bathynellacea	Parabathynellidae	Brevisomabathynella sp. OES5			•		•		•	
Bathynellacea	Parabathynellidae	Brevisomabathynella sp. OES6			•		•		•	
Bathynellacea	Parabathynellidae	Brevisomabathynella sp. OES7							•	
Bathynellacea	Parabathynellidae	Brevisomabathynella sp. OES9							•	
Isopoda		Oniscidea sp.		•						
Isopoda	Philosciidae	Andriphiloscia pedisetosa					•		•	

Order	Family	Lowest Taxon Identification	Synonyms	Outback Ecology 2008 Toro Energy Centipede Project Baseline Stygo fauna Survey	Outback Ecology 2011 Toro Energy Wiluna Uranium Project Subterranean Fauna Assessment	Outback Ecology 2012 Mega Lake Maitland Lake Maitland Uranium Project	Outback Ecology 2012 Wiluna Uranium Project Stygo fauna Memo	ecologia Internal Database	Database searches	
									WA Museum	NatureMap
Isopoda	Platyarthridae	Platyarthridae gen. nov. sp. nov.							•	
Isopoda	Platyarthridae	<i>Paraplatyarthrus cooperi</i> sp. nov.							•	
Isopoda	Scyphacidae	<i>Haloniscus longiantennatus</i>					•		•	
Isopoda	Scyphacidae	<i>Haloniscus</i> sp. OES1				•			•	
Isopoda	Scyphacidae	<i>Haloniscus</i> sp. OES8			•		•			
Isopoda	Scyphacidae	<i>Haloniscus stilifer</i>					•		•	
Maxillopoda (Copepoda)										
		Copepoda sp.			•				•	
Calanoida	Acartiidae	<i>Acartia</i> sp.							•	
Calanoida	Acartiidae	? <i>Acartia</i> sp.							•	
Cyclopoida		Cyclopoida sp.			•					
Cyclopoida	Cyclopidae	<i>Dussartcyclops uniarticulatus</i>	<i>Goniocyclops uniarticulatus</i>		•		•		•	
Cyclopoida	Cyclopidae	<i>Fierscyclops fiersi</i>		•	•		•		•	
Cyclopoida	Cyclopidae	<i>Halicyclops</i> sp.			•				•	
Cyclopoida	Cyclopidae	<i>Halicyclops</i> sp. TK1	<i>Halicyclops</i> 'macroeberhardi'			•				
Cyclopoida	Cyclopidae	<i>Halicyclops</i> sp. TK2	<i>Halicyclops</i> 'microeberhardi'; <i>Halicyclops</i> microeberherdi n. sp.			•			•	
Cyclopoida	Cyclopidae	<i>Halicyclops</i> sp. TK3				•				
Cyclopoida	Cyclopidae	<i>Halicyclops ambiguus</i>					•		•	
Cyclopoida	Cyclopidae	<i>Halicyclops eberhardi</i>		•	•	•	•			
Cyclopoida	Cyclopidae	<i>Halicyclops kieferi</i>			•		•		•	
Cyclopoida	Cyclopidae	<i>Mesocyclops brooksi</i>				•	•		•	
Cyclopoida	Cyclopidae	<i>Metacyclops varicans</i>							•	
Cyclopoida	Cyclopidae	<i>Metacyclops</i> cf. <i>monacanthus</i>	<i>Metacyclops monacanthus</i> cf.						•	
Cyclopoida	Cyclopidae	<i>Microcyclops varicans</i>				•				
Cyclopoida	Cyclopidae	<i>Pesceocyclops laurentisae</i>	<i>Metacyclops laurentisae</i>	•	•		•		•	
Harpacticoida		Harpacticoida sp.			•				•	
Harpacticoida	Ameiridae	<i>Ameiropsyllus</i> sp. 1 n. sp.	<i>Ameiropsyllus</i> sp. TK1	•	•	•	•			

Order	Family	Lowest Taxon Identification	Synonyms	Outback Ecology 2008 Toro Energy Centipede Project Baseline Stygo fauna Survey	Outback Ecology 2011 Toro Energy Wiluna Uranium Project Subterranean Fauna Assessment	Outback Ecology 2012 Mega Lake Maitland Lake Maitland Uranium Project	Outback Ecology 2012 Wiluna Uranium Project Stygo fauna Memo	ecologia Internal Database	Database searches	
									WA Museum	NatureMap
Harpacticoida	Ameiridae	<i>Haifameira pori</i>			•		•		•	
Harpacticoida	Ameiridae	? <i>Haifameira</i> sp.							•	
Harpacticoida	Ameiridae	<i>Kinnecaris esbe</i> sp. nov.							•	
Harpacticoida	Ameiridae	<i>Kinnecaris lakewayi</i>	<i>Kinnecaris lakewayi</i> sp. nov.; <i>Kinnecaris</i> sp. TK1; <i>Kinnecaris</i> sp. TK2		•		•		•	
Harpacticoida	Ameiridae	<i>Kinnecaris lined</i> sp. nov.							•	
Harpacticoida	Ameiridae	<i>Kinnecaris linel</i> sp. nov.							•	
Harpacticoida	Ameiridae	<i>Kinnecaris linesae</i>	<i>Kinnecaris linesae</i> sp. nov.						•	
Harpacticoida	Ameiridae	<i>Kinnecaris</i> sp. TK3	<i>Kinnecaris</i> 'maitlandi'			•				
Harpacticoida	Ameiridae	<i>Kinnecaris uranusi</i>	<i>Kinnecaris uranusi</i> sp. nov.						•	
Harpacticoida	Ameiridae	<i>Nitocrella trajani</i>					•		•	
Harpacticoida	Ameiridae	<i>Nitokra</i> sp. TK1	<i>Nitokra megaregis</i> n. sp.	•	•		•			
Harpacticoida	Ameiridae	<i>Nitokra</i> sp. TK2	<i>Nitokra microregis</i> n. sp.	•	•		•			
Harpacticoida	Ameiridae	<i>Nitokra</i> sp. TK3				•				
Harpacticoida	Ameiridae	<i>Nitokra esbe</i>							•	
Harpacticoida	Ameiridae	<i>Nitokra lacustris</i>							•	
Harpacticoida	Ameiridae	<i>Nitokra lacustris pacificus</i>				•				
Harpacticoida	Ameiridae	<i>Nitokra macrorefis</i>							•	
Harpacticoida	Ameiridae	<i>Nitokra mefarefis</i>							•	
Harpacticoida	Ameiridae	<i>Nitokra mefarefis</i>							•	
Harpacticoida	Ameiridae	<i>Nitokra mefarefis</i>	<i>Nitokra mefarefis</i> n. sp.						•	
Harpacticoida	Ameiridae	<i>Nitokra microrefis</i>							•	
Harpacticoida	Ameiridae	<i>Nitokra yeelirrie</i>	<i>Nitokra yeelirrie</i> n. sp.						•	
Harpacticoida	Ameiridae	<i>Parapseudoleptomesochra karami</i>							•	
Harpacticoida	Ameiridae	<i>Parapseudoleptomesochra rouchi</i>					•		•	
Harpacticoida	Ameiridae	<i>Parapseudoleptomesochra</i> sp.							•	
Harpacticoida	Ameiridae	<i>Parapseudoleptomesochra</i> sp. TK1	<i>Parapseudoleptomesochra</i> sp. 1; <i>Parapseudoleptomesochra</i> sp. 1 n. sp.	•	•		•		•	
Harpacticoida	Ameiridae	<i>Parapseudoleptomesochra</i> sp. TK2	<i>Parapseudoleptomesochra</i> sp. 2		•		•		•	

Order	Family	Lowest Taxon Identification	Synonyms	Outback Ecology 2008 Toro Energy Centipede Project Baseline Stygo fauna Survey	Outback Ecology 2011 Toro Energy Wiluna Uranium Project Subterranean Fauna Assessment	Outback Ecology 2012 Mega Lake Maitland Lake Maitland Uranium Project	Outback Ecology 2012 Wiluna Uranium Project Stygo fauna Memo	ecologia Internal Database	Database searches	
									WA Museum	NatureMap
Harpacticoida	Ameiridae	<i>Parapseudoleptomesochra</i> sp. ?TK2			•		•			
Harpacticoida	Canthocamptidae	<i>Australocamptus diversus</i>							•	
Harpacticoida	Canthocamptidae	<i>Australocamptus similis</i>		•	•	•	•		•	
Harpacticoida	Diosaccidae/Miraciidae	<i>Schizopera akation</i>	<i>Schizopera akation</i> sp. nov.						•	
Harpacticoida	Diosaccidae/Miraciidae	<i>Schizopera akolos</i> sp. nov.							•	
Harpacticoida	Diosaccidae/Miraciidae	<i>Schizopera analspinulosa</i>	<i>Schizopera analspinulosa</i> sp. nov.; <i>Schizopera analspinulosa</i> s. str.						•	
Harpacticoida	Diosaccidae/Miraciidae	<i>Schizopera austindownsi</i>		•	•		•		•	
Harpacticoida	Diosaccidae/Miraciidae	<i>Schizopera dimorpha</i> n. sp.							•	
Harpacticoida	Diosaccidae/Miraciidae	<i>Schizopera</i> cf. <i>dimorpha</i>							•	
Harpacticoida	Diosaccidae/Miraciidae	<i>Schizopera emphysema</i>							•	
Harpacticoida	Diosaccidae/Miraciidae	<i>Schizopera jundeei</i>							•	
Harpacticoida	Diosaccidae/Miraciidae	<i>Schizopera kronosi</i> n. sp.							•	
Harpacticoida	Diosaccidae/Miraciidae	<i>Schizopera leptafurca</i>	<i>Schizopera leptafurca</i> sp. nov.						•	
Harpacticoida	Diosaccidae/Miraciidae	<i>Schizopera</i> sp. 1							•	
Harpacticoida	Diosaccidae/Miraciidae	<i>Schizopera</i> sp. TK1				•				
Harpacticoida	Diosaccidae/Miraciidae	<i>Schizopera</i> sp. TK2					•			
Harpacticoida	Diosaccidae/Miraciidae	<i>Schizopera</i> sp. TK3			•					
Harpacticoida	Diosaccidae/Miraciidae	<i>Schizopera</i> sp. TK4	<i>Schizopera</i> cf. sp. 1 n. sp.	•	•		•			
Harpacticoida	Diosaccidae/Miraciidae	<i>Schizopera</i> sp. TK5				•				
Harpacticoida	Diosaccidae/Miraciidae	<i>Schizopera</i> sp. TK6				•				
Harpacticoida	Diosaccidae/Miraciidae	<i>Schizopera</i> sp. TK7			•		•			
Harpacticoida	Diosaccidae/Miraciidae	<i>Schizopera</i> sp. TK8				•				
Harpacticoida	Diosaccidae/Miraciidae	<i>Schizopera uramurdahi</i>		•	•		•		•	
Harpacticoida	Diosaccidae/Miraciidae	<i>Schizopera uranusi</i>							•	
Ostracoda										
		Ostracoda sp.			•				•	
Podocopida	Candonidae	<i>Candonopsis</i> sp. n. sp. 1		•						

Order	Family	Lowest Taxon Identification	Synonyms	Outback Ecology 2008 Toro Energy Centipede Project Baseline Stygo fauna Survey	Outback Ecology 2011 Toro Energy Wiluna Uranium Project Subterranean Fauna Assessment	Outback Ecology 2012 Mega Lake Maitland Lake Maitland Uranium Project	Outback Ecology 2012 Wiluna Uranium Project Stygo fauna Memo	ecologia Internal Database	Database searches	
									WA Museum	NatureMap
Podocopida	Candonidae	<i>Candonopsis</i> sp. n. sp. 2		•						
Podocopida	Candonidae	<i>Candonopsis</i> sp. n. sp. 3		•						
Podocopida	Candonidae	<i>Candonopsis</i> sp.			•					
Podocopida	Candonidae	<i>Candonopsis</i> sp. IK1	<i>Candonopsis</i> 'wayi'		•		•			
Podocopida	Candonidae	<i>Candonopsis</i> sp. IK2	<i>Candonopsis</i> 'maitlandi'			•				
Podocopida	Candonidae	<i>Candonopsis dani</i>			•	•	•		•	
Podocopida	Candonidae	<i>Candonopsis williamsi</i>							•	
Podocopida	Candonidae	<i>Candonopsis (Abcandonopsis) linnaei</i>			•		•			
Podocopida	Limnocytheridae	<i>Gomphodella</i> sp.					•			
Podocopida	Limnocytheridae	<i>Gomphodella glomerosa</i>			•				•	

APPENDIX E

POTENTIAL TROGLOFAUNA BASED ON LITERATURE REVIEW

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Table E.1: Regional fauna list – Troglafauna

Order	Family	Lowest Taxon Identification	Synonyms	Outback Ecology 2011 Toro Energy Wiluna Uranium Project Subterranean Fauna Assessment	Outback Ecology 2012 Mega Lake Maitland Lake Maitland Uranium Project Level 2 Troglafauna Assessment	ecologia Internal Database	Database searches	
							WA Museum	NatureMap
Arachnida								
Araneae	Gnaphosidae	Eilica group					•	
Araneae	Oonopidae	Prethopalpus callani					•	
Araneae	Oonopidae	Opopaea 'sp. nov.'					•	
Araneae	Trochanteriidae	Desognanops humphreysi					•	•
Araneae	Trochanteriidae	Desognanops 'sp. nov. Yeelirrie'					•	
Palpigradi	Eukoeneniidae	Eukoenenia sp.					•	
Pseudoscorpiones	Chthoniidae	Tyrannochthonius indet.			•			
Pseudoscorpiones	Chthoniidae	Tyrannochthonius sp. OES1		•			•	
Pseudoscorpiones	Chthoniidae	Tyrannochthonius sp. OES2		•			•	
Pseudoscorpiones	Chthoniidae	Tyrannochthonius sp. OES3		•			•	
Pseudoscorpiones	Chthoniidae	Tyrannochthonius sp. OES4			•		•	
Pseudoscorpiones	Chthoniidae	Tyrannochthonius sp. OES5			•		•	
Pseudoscorpiones	Chthoniidae	Tyrannochthonius sp. OES6			•		•	
Pseudoscorpiones	Chthoniidae	Tyrannochthonius 'sp. nov. Yeelirrie'					•	
Pseudoscorpiones	Chthoniidae	Tyrannochthonius `sp. nov. Millbillillie`					•	
Pseudoscorpiones	Chthoniidae	Tyrannochthonius 'sp. nov. Yakabindie Station'					•	
Chilopoda								
Scolopendrida	Scolopendridae	Scolopendridae sp. OES1			•			
Diplopoda								
Polyxenida		Polyxenida sp.		•				
Polyxenida		Polyxenida sp. OES1		•			•	
Entognatha								
Diplura		Projapygidae sp.		•				
Gastropoda								
	Punctidae	Punctidae sp.					•	
Insecta								
Hemiptera	Meenoplidae	Meenoplidae sp.		•	•			

Order	Family	Lowest Taxon Identification	Synonyms	Outback Ecology 2011 Toro Energy Wiluna Uranium Project Subterranean Fauna Assessment	Outback Ecology 2012 Mega Lake Maitland Lake Maitland Uranium Project Level 2 Troglotauna Assessment	ecologia Internal Database	Database searches	
							WA Museum	NatureMap
Thysanura	Nicoletiidae	? <i>Trinemura</i> sp.		•				
Malacostraca								
Isopoda	fam. Indet.	Isopoda '1536'				•		
Isopoda	Armadillidae	Unknown Genus sp. nov.				•		
Isopoda	Armadillidae	Armadillidae sp. OES2					•	
Isopoda	Armadillidae	<i>Troglarmadillo</i> sp.					•	
Isopoda	Armadillidae	<i>Troglarmadillo</i> sp. nov.				•		
Isopoda	Philosciidae	Philosciidae '1536'				•		
Isopoda	Philosciidae	Unknown Genus A				•		
Isopoda	Philosciidae	Unknown Genus B				•		
Isopoda	Platyarthridae	<i>Trichorhina</i> sp. OES5		•				
Isopoda	Platyarthridae	<i>Trichorhina</i> sp. OES6			•			
Isopoda	Platyarthridae	<i>Trichorhina</i> sp. OES9					•	
Isopoda	Platyarthridae	<i>Trichorina</i> '1536'				•		
Isopoda	Scyphacidae	<i>Haloniscus</i> sp.		•				
Isopoda	Scyphacidae	<i>Haloniscus</i> sp. OES3		•			•	
Isopoda	Scyphacidae	<i>Haloniscus</i> sp. OES4		•			•	
Isopoda	Scyphacidae	<i>Haloniscus</i> sp. OES5		•			•	
Isopoda	Scyphacidae	<i>Haloniscus</i> sp. OES6		•			•	
Isopoda	Scyphacidae	<i>Haloniscus</i> sp. OES7		•				
Isopoda	Scyphacidae	<i>Haloniscus</i> sp. OES9		•				
Isopoda	Scyphacidae	<i>Haloniscus</i> sp. OES10		•				
Isopoda	Scyphacidae	<i>Haloniscus</i> sp. OES12			•			
Isopoda	Scyphacidae	<i>Haloniscus</i> sp. OES14			•			
Pauropoda								
Pauropodina		Pauropodina sp.		•	•			
Symphyla								
		Symphyla sp.		•				