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**TORO ENERGY
LAKE MAITLAND
PEER REVIEW – VERTEBRATE FAUNA**



A Resource Development
Group Company

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ecologia Environment
Level 8, Carillon City Office Tower
207 Murray Street
PERTH WA 6000
Phone: +61 8 6180 4450
Fax: +61 8 6180 4451
Email: admin@ecologia.com.au

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EXECUTIVE SUMMARY

Toro Energy Limited (Toro) acquired the Lake Maitland uranium deposit from Mega Uranium in August 2013 and plans to seek environmental approval for the mining of this deposit as well as the Millipede deposit. Toro have sought the advice and recommendations of *ecologia* Environment to undertake a peer review of the vertebrate fauna reports previously completed.

Three previous vertebrate fauna assessments have taken place at Lake Maitland; *Lake Maitland Baseline Terrestrial Fauna Survey* (Outback Ecology 2009), *Lake Maitland Infrastructure Areas Baseline Terrestrial Fauna Surveys* (Outback Ecology 2010) and *Terrestrial Fauna Habitat Assessment – Borefield, Accommodation Camp and Access Route* (Outback Ecology 2011). The three assessments completed thus far (Table 2.1) have consisted of one initial field reconnaissance survey, two Level 1 field and habitat assessment surveys and one two phase level 2 and habitat assessment survey.

The scope of works and objectives of each survey were sufficient for a vertebrate fauna EIA level assessment, and were generally met well. Correctness and currency of results were generally accurate and still relevant.

Three key inadequacies were identified:

- Survey adequacy for the Level 2 survey consisted of four trap nights only at each systematic trapping site for each phase. Current guidelines (EPA and DEC 2010) recommend a minimum of seven nights trapping for each phase;
- Systematic sampling was only completed in five of the nine identified fauna habitats, sampling was not completed in the samphire flats habitat despite this habitat being most likely to be impacted upon; and,
- The likelihood of occurrence for the conservation significant species Night Parrot was incorrectly assessed as low based on recent previous records despite the presence of suitable habitat within the study area. This has resulted in this species not being suitably assessed.

Given the inadequacies identified, *ecologia* Environment recommends an additional single phase Level 2 survey that meets current survey guidelines (i.e. minimum of seven nights trapping). The Level 2 survey should aim to compliment the surveys that have already been completed, with a focus on surveying habitats inadequately sampled previously. The Level 2 survey could incorporate habitat mapping for the entire study area and additional targeted conservation significant species searches (e.g. Night Parrot). This will provide an adequate level of information to relevant regulators for EIA.

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1 INTRODUCTION

Toro Energy Limited (Toro) acquired the Lake Maitland uranium deposit from Mega Uranium in August 2013 and plans to seek environmental approval for the mining of this deposit as well as the Millipede deposit. Toro plans to process ore from Centipede and Lake Way along with ore from Millipede and Lake Maitland at one central processing plant located adjacent to the Centipede deposit. Toro intends to refer the Millipede and Lake Maitland deposits to the Environmental Protection Authority (EPA) for assessment, which will require detailed surveys and studies across all proposed disturbance areas.

Mega Uranium undertook and completed environmental assessments and surveys across the Lake Maitland project sufficient to allow the proposal to be assessed under an Environmental Review and Management Programme (ERMP) (equivalent to the current PER level) in 2009. Initial discussions between the OEPA and Toro indicate that the existing environmental assessments and surveys for Lake Maitland would be acceptable for submission in a PER following peer review for correctness of content and adequacy. Toro have sought the advice and recommendations of *ecologia* Environment and appropriate sub-consultants who will undertake a peer review of the following reports:

- Regional and local flora
- Terrestrial fauna
- Short Range Endemic invertebrates (SREs)
- Stygofauna
- Troglifauna
- Aquatic Ecology
- Sediments and erosion
- Soils and waste rock characterization and geochemical assessment
- Human health and ecological risk assessment (human and non-human biota) and
- Air quality impact assessment and monitoring

This peer review report pertains to the *Lake Maitland Baseline Terrestrial Fauna Survey* (Outback Ecology 2009), *Lake Maitland Infrastructure Areas Baseline Terrestrial Fauna Surveys* (Outback Ecology 2010) and *Terrestrial Fauna Habitat Assessment – Borefield, Accommodation Camp and Access Route* (Outback Ecology 2011) reports which were undertaken by Outback Ecology (now MWH).

1.1 LEGISLATION AND POLICY BACKGROUND OF PEER REVIEW

1.1.1 Compliance

This peer review will satisfy the requirements of all necessary statutory legislation, guidance and policy, including but not limited to:

Terrestrial vertebrate fauna

- EPA Technical Guide, Terrestrial Vertebrate Fauna Surveys Environmental Impact Assessment (EPA and DEC 2010);
- EPA Position Statement No. 3, Terrestrial Biological Surveys as an Element of Biodiversity Protection (EPA 2002); and
- EPA Guidance Statement No. 56, Terrestrial Fauna Surveys for Environmental Impact Assessment in Western Australia (EPA 2004a).

1.1.2 Approach

A review was undertaken of all environmental reports pertaining to the acquired Lake Maitland Project for breadth of scope, technical methodology, correctness of content and adequacy. The main findings of the peer review were to determine:

- a) Correctness of findings and conclusions of all reports;
- b) Adequacy of scope, methodology and results of all reports;
- c) Compliance of all reports with statutory legislation and policy; and
- d) Recommendations to address knowledge gaps (if applicable).

2 REVIEW RESULTS

The vertebrate fauna assessment of Lake Maitland consists of three separate assessments, all completed by Outback Ecology Services. The details of assessments and documents reviewed in this literature review are shown in Table 2.1.

Table 2.1 – Summary of survey types and timing

Report	Survey types	Number of personnel	Survey dates
<i>Lake Maitland Baseline Terrestrial Fauna Survey</i> (Outback Ecology 2009)	Desktop assessment	N/A	N/A
	Field reconnaissance survey	Not specified	22-25 January 2007
	Level 2 field survey and habitat assessment	Three people	7 – 16 May 2007
Three people		7 – 13 December 2007	
<i>Lake Maitland Infrastructure Areas Baseline Terrestrial Fauna Surveys</i> (Outback Ecology 2010)	Desktop assessment	N/A	N/A
	Level 1 field survey and habitat assessment	Not specified	14-21 October 2009
<i>Lake Maitland Terrestrial Fauna Habitat Assessment - Borefield, Accommodation Camp and Access Route</i> (Outback Ecology 2011)	Desktop assessment	N/A	N/A
	Level 1 field survey and habitat assessment	One person	2-6 August 2010

2.1 CORRECTNESS OF FINDINGS AND CONCLUSIONS

The major findings of the reports are considered to be generally correct. A summary of the key findings is given below:

- Desktop searches including database searches and results of previous surveys show a total of 43 mammal, 168 bird, 87 reptile and nine amphibian species have the potential to occur in the study area;
- Habitat assessments have resulted in a total of nine broad scale fauna habitats as occurring within the study area. Of these habitats, three were considered sensitive; Kopi dune, lake edge spinifex and samphire flats;
- A two phase Level 2 survey was completed, consisting of five systematic trap sites utilizing standard trapping methods. A further two sites were surveyed using non-systematic trapping methods;
- A total of 24 mammal, 60 bird and 39 species of reptile were recorded during the Level 2 survey;
- A total of 20 species of conservation significance have the potential to occur. A further 19 conservation significant waterbird and wader species were assessed as potentially utilising Lake Maitland temporarily during flood;
- Two species of conservation significance have been recorded; Brush-tailed Mulgara (*Dasyercus blythi*) and Bush Stone-curlew (*Burhinus grallarius*). A further eight species were recorded as potential or likely to occur (Malleefowl, Slender-billed Thornbill (no longer listed as conservation significant), Australian Bustard, Major Mitchell’s Cockatoo, Peregrine Falcon, Grey Falcon, Rainbow Bee-eater and Fork-tailed Swift). The remaining species were assessed as unlikely to occur.

The assessment the Night Parrot (EPBC Act Endangered) as unlikely to occur is inaccurate based on the level of assessment completed thus far. The assessment was based on “the majority, and more

recent records for this species are from the Pilbara”, which is incorrect. As targeted search effort for this species was not completed, suitable habitat exists within the study area, and the study area is within this species historical range, the status of this species within the study area is undetermined at this stage.

2.2 ADEQUACY OF SURVEY

2.2.1 Scope of Works

A total of three separate assessments, consisting of various levels of surveying have been completed (Table 2.1).

The overall objectives of the terrestrial vertebrate fauna assessments for the Lake Maitland Project were to:

- a) Develop an inventory of terrestrial vertebrate fauna species identified from the Project area, or likely to be present within the Project area;
- b) Identify terrestrial vertebrate fauna species of conservation significance potentially occurring over the study area;
- c) Identify and describe the broad vertebrate fauna habitats and identify sensitive habitats within the study area;
- d) Assess site information in the regional context by comparisons with available data from other localities within the bioregion, and to provide an assessment of current and potential impacts on significant fauna populations and habitats; and
- e) Provide quantitative data that can provide a baseline against which future impacts and rehabilitation can be assessed, and form the basis of a monitoring program.

The majority of the scopes have been met, with the exception of the assessment of potential impacts to the Night Parrot (EPBC Act Endangered), as this species presence has been inadequately assessed within the study area.

2.2.2 Sampling/Survey adequacy

2.2.2.1 Desktop Assessments

A total of three desktop assessments have taken place within the Lake Maitland study area. The desktop assessments reviewed a total of eight databases, four previous fauna surveys within the study area and four previous surveys in the surrounding region of the study area.

The desktop assessment is relatively comprehensive, and is likely to have identified all potential species occurring in the study area. However, several species included in the desktop assessment appear to be incorrect as they are unlikely to occur in the study area based on the current species distribution. Reasons for this include either simple data entry errors and/or the taxonomy of species recorded from surveys has not been updated based on current information of the taxonomy of vertebrate fauna species (e.g. Western Grey Kangaroo, Yellow-plumed honeyeater, Cinnamon Quail-thrush, Common Dunnart)

2.2.2.2 Field assessments

The three assessments completed thus far (Table 2.1) have consisted of one initial field reconnaissance survey, two Level 1 field and habitat assessment surveys and one two phase level 2 and habitat assessment survey.

Level 1 surveys were conducted in accordance with relevant guidelines and are of satisfactory adequacy.

The scale and nature of proposed impact, and the bioregional location of the study area dictate a two phase (multi season) Level 2 survey is required, in this regard, the Level 2 survey is compliant with relevant guidelines (EPA 2004b; EPA and DEC 2010)

Systematic trapping for small reptiles and mammals consisted of standardised trapping grid layout containing pitfall traps (both bucket and PVC pipes), funnel traps, baited Elliot box traps and baited Sheffield wire cage traps. A total of five systematic trapping sites were established, each trapped for a total of four nights for each phase. Systematic 20 min avifauna surveys were conducted at each systematic survey site.

Non-systematic sampling consisted of opportunistic sightings, secondary evidence, spotlighting and anecdotal evidence. A total of 360 minutes of non-systematic sampling techniques were completed at each systematic sampling site and at two additional sites. A total of eight locations were sampled using Anabats to detect bat fauna. A total of 100 trap nights were completed at a targeted site for conservation significant species Mulgara.

Survey sampling techniques, both systematic and non-systematic for the Level 2 survey are consistent and compliant with relevant guidelines. At the time of surveying, survey duration was not specified in guidelines, hence the trapping duration of four nights could be deemed acceptable. However, the release of the *EPA Technical Guide, Terrestrial Vertebrate Fauna Surveys Environmental Impact Assessment* (EPA and DEC 2010) in 2010 states a minimum of seven nights trapping or more is in general a reasonable survey duration. It is noted increasing the number of traps to increase trapping effort, in contrast to survey duration is not sufficient as this does not cater for adverse weather conditions affecting trapping efficiency. As a result, systematic trapping survey adequacy does not meet current guidelines.

2.2.2.3 Conservation significant fauna

The desktop assessment revealed a total of 20 species of conservation significance (four mammals, 14 birds and two reptiles) as potentially occurring in the study area. A further 19 waterbirds and waders listed as migratory or marine species under the EPBC Act were recorded under the desktop assessment. There is unlikely to be further potential conservation significant species.

Of the potential species, an assessment of likelihood of occurrence of species based on habitats present and previous species records was completed. Two species (Brush-tailed Mulgara and Bush Stone-curlew) were recorded during the survey, a further eight species were recorded as potential or likely to occur (Malleefowl, Slender-billed Thornbill (no longer listed as conservation significant), Australian Bustard, Major Mitchell's Cockatoo, Peregrine Falcon, Grey Falcon, Rainbow Bee-eater and Fork-tailed Swift). The remaining species were assessed as unlikely to occur. The 19 conservation significant waterbird and wader species were assessed as potentially utilising Lake Maitland temporarily during flood.

Targeted searches were completed for Malleefowl, Mulgara, Striated Grasswren, Great Desert Skink and Slender-billed Thornbill.

2.2.2.4 Fauna habitat mapping

A total of nine broad-scale fauna habitats have been recorded from the Lake Maitland study area and associated infrastructure areas:

- Spinifex plains;
- Shrubland on sandplain;
- Mulga woodland;

- Mallee over spinifex;
- Lake edge spinifex;
- Dense woodland on calcrete flats;
- Calcrete plain;
- Samphire flats; and
- Kopi dune.

The habitat assessment appears comprehensive and is likely to have recorded all fauna habitats present.

The area of occupancy of each fauna habitat within the study area is not calculated. Critical habitat for potential conservation significant fauna is not calculated.

Given the number of fauna habitats identified in the study area, the level of systematic trapping sites used to sample the fauna is inadequate (five habitats systematically trapped). The samphire habitat did not contain a systematic trapping site, despite this habitat likely to occupy a large proportion of the study area and will be most severely impacted upon by the project.

2.2.3 Results

The literature review is comprehensive, although contains a number of species which are unlikely to occur in the study area based on species distribution.

Vertebrate fauna assemblage results appear typical of the region and for the most part reported accurately.

Species accumulation curves (SACs) were generated for each species group (birds, mammals and reptiles) for each phase of the Level 2 survey and for the combined data. SACs were calculated with number of survey days on the x axis and number of species on the y axis. The assessment of SACs were interpreted as showing an adequate level of survey, particularly for mammals and birds. However it is noted 11 species of reptile were recorded on phase 2 only, with the visual representation of the SAC for reptiles on a steady continued increase, indicating further sampling may record further species.

The assessment of likelihood of occurrence for potential conservation significant species is accurate, with the exception of Night Parrot. The likelihood of occurrence assessment states suitable habitat exists, which is accurate, however the species is considered not expected to occur, based on *“the majority, and more recent records for this species are from the Pilbara”*, which is incorrect. The type specimen for species description was collected from Lake Austin near Cue, on approximately the same latitude as the study area (DPaW 2014). The Night Parrot Interim Recovery Plan for Western Australia identifies *“the salt lakes of inland Western Australia”* as one of five key distribution areas and also noted recent potential sightings south of the study area amongst salt lake systems in the southern wheatbelt region (Blyth 1996). Furthermore, a number of potential sightings have recently been made (2012) within the DPaW managed estate Lorna Glen, which is approximately 100 km north of the study area (pers. com. Neil Hamilton).

The Night Parrot has recently been re-discovered in south-west Queensland by Australian naturalist John Young. Monitoring work currently being conducted suggests the Night Parrot readily calls, allowing for detection. Given no survey effort in detection of the Night Parrot was completed, and that suitable habitat occurs and the study area is within the species historical distribution, the Night Parrot has been inadequately assessed. A targeted survey to determine its status within the study area is required.

Sensitive habitats are accurately identified, with lake edge spinifex, kopi dune and samphire flats correctly recorded as being regionally important for vertebrate fauna.

2.3 CURRENCY OF RESULTS

Since the completion of the Level 2 survey, new guidelines have been released stating the general minimum number of trapping nights required for a Level 2 survey is seven nights (EPA and DEC 2010), resulting in survey effort completed to be insufficient to meet current guidelines.

Due to the time passed since the comprehensive Level 2 survey, a number of taxonomic revisions have occurred for various vertebrate fauna groups. The Mulgara is now clearly recognised as two species, Brush-tailed Mulgara (*Dasyercus blythi*) (DPaW Priority 4) and Crest-tailed Mulgara (*Dasyercus cristicauda*) (EPBC Vulnerable, WC Act Schedule 1) (Woolley 2005; Woolley 2006). Importantly, it is considered the Brush-tailed Mulgara is most likely present within the study area based on distributions of the two species.

The Slender-billed Thornbill is no longer listed as conservation significant.

Since the completion of field surveys involving targeted conservation significant fauna searches, naturalist John Young has rediscovered the Night Parrot. Current monitoring of the population suggests the Night Parrot is readily detected via their call, leading to an effective survey methodology for this species.

2.4 COMPLIANCE

Assessments completed of the study area meet statutory legislation. The level 2 field assessment does not meet the guidelines within the *EPA Technical Guide, Terrestrial Vertebrate Fauna Surveys Environmental Impact Assessment* (EPA and DEC 2010), which states a minimum of seven nights trapping should be completed (four nights for both phases completed).

2.5 RECOMMENDATIONS AND GAP ASSESSMENT

Based on trapping survey effort (four nights per phase) which fails to meet the seven nights trapping requirement of current guidelines (EPA and DEC 2010), time passed since the Level 2 survey (2007) and inadequate systematic trapping within habitat types present (five out of nine fauna habitats trapped), an additional phase of a Level 2 survey of the study area is recommended. The Level 2 survey should aim to compliment trapping already completed, with a focus of trapping in habitats inadequately sampled. The Level 2 survey should incorporate additional targeted conservation significant species searches, particularly for Night Parrot.

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3 RECOMMENDATIONS

- Scope of works and objectives of each survey were generally met well;
- Correctness and currency of results were generally accurate and still relevant;
- Three key inadequacies were identified:
 - Survey adequacy for the Level 2 survey consisted of four trap nights only for each phase. Current guidelines (EPA and DEC 2010) recommend a minimum of seven nights trapping for each phase;
 - Systematic sampling was completed in five of the nine identified fauna habitats only, sampling was not completed in samphire flats habitat despite this habitat most likely to be impacted upon; and,
 - The status of conservation significant species the Night Parrot within the study area has not been sufficiently assessed.
- Given the inadequacies identified, *ecologia* recommends an additional phase of a level 2 survey, incorporating targeted conservation significant fauna searches (including for Night Parrot).

An additional phase of a Level 2 survey incorporating minimum seven nights trapping plus additional conservation significant fauna searches (particularly for Night Parrot) is recommended. This will provide an adequate level of information to relevant regulators for EIA.

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4 REFERENCES

- Blyth, J. 1996. Night Parrot (*Pezoporus occidentalis*) Interim Recovery Plan for Western Australia 1996 to 1998. Threatened Species and Communities Unit - Department of Environment and Conservation, Perth.
- Department of Parks and Wildlife. 2014. NatureMap: Mapping Western Australia's Biodiversity.
2002. Position Statement No. 3: Terrestrial Biological Surveys as an Element of Biodiversity Protection. Environmental Protection Authority. Perth.
- 2004a. Guidance for the Assessment of Environmental Factors, Statement No. 56: Terrestrial Fauna Surveys for Environmental Impact Assessment in Western Australia.
- Environmental Protection Authority. 2004b. Guidance Statement No. 56: Terrestrial Fauna Surveys for Environmental Impact Assessment in Western Australia.
- Environmental Protection Authority and Department of Environment and Conservation. 2010. Technical Guide - Terrestrial Vertebrate Fauna Surveys for Environmental Impact Assessment. Technical report for the Environmental Protection Authority and the Department of Environment and Conservation.
- Outback Ecology Services. 2009. Lake Maitland Baseline Terrestrial Fauna Survey. Unpublished report for Mega Uranium Pty Ltd.
- Outback Ecology Services. 2010. Lake Maitland Infrastructure Areas Baseline Terrestrial Fauna Surveys. Unpublished report for Mega Uranium Pty Ltd.
- Outback Ecology Services. 2011. Lake Maitland Terrestrial Fauna Habitat Assessment - Borefield, Accommodation Camp and Access Route. Unpublished Report for Mega Lake Maitland Pty Ltd.
- Woolley, P. A. 2005. The species of *Dasyercus* Peters, 1875 (Marsupialia: Dasyuridae). *Memoirs of Museum Victoria* 62(2): 213-221.
- Woolley, P. A. 2006. Studies on the Crest-tailed Mulgara *Dasyercus cristicauda* and the Brush-tailed Mulgara *Dasyercus blythi* (Marsupialia: Dasyuridae). *Australian Mammalogy* 28: 117-120.