

Terrestrial Fauna Survey
(Level 1)

of

Marillana Iron Ore Project
Camp, Road and Airstrip
Option B

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Version 2

On behalf of:

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The conclusions are based upon field data and the environmental monitoring and/or testing carried out over a limited period of time and are therefore merely indicative of the environmental condition of the site at the time of preparing the report. Also it should be recognised that site conditions, can change with time.

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EXECUTIVE SUMMARY

This report details the results of a Level 1 fauna assessment of Brockman Resources Limited proposed camp, road and airstrip (Option B) situated near their Marillana Iron Ore Project area, about 50km east of Auski Roadhouse (Munjina) in the Pilbara, Western Australia (Figure 1).

The Option B area that required survey totalled about 200 ha and was comprised of the airstrip (~170 ha - 2km long and 150m wide), camp areas (~18 ha) and the road corridor (~14 ha – 4.5km long and 35m wide).

The assessment has included a desktop study, which included a review of available fauna related data for the area and a field reconnaissance survey. Field survey work was carried out by Greg Harewood (B.Sc. Zoology) during a two day period on the 26th and 27th September, 2011.

The broad scale fauna habitats within the study area are based on vegetation structure as identified during the flora and vegetation survey (Botanica 2011). The location and approximate extent of each identified unit is shown in Figure 3 with a description below. More detail on the vegetation units present can be found in the flora and vegetation report (Botanica 2011).

- Open Low Woodland (*Acacia pteraneura*) over Grassland (*Triodia basedowii*).
- Very Open Shrub Mallee (*Eucalyptus odontocarpa/Hakea lorea*) over Grassland (*Triodia basedowii*).
- Open Low Woodland (*Acacia pteraneura*) over Sparse Scrub (*Acacia bivenosa*).
- Open Low Shrub (*Acacia victoriae*) over Open Dwarf Scrub (*Frankenia ambita*)

Plates 1 to 4 illustrate the nature of the main fauna habitats existing within the project area.

A complete list of vertebrate fauna possibly inhabiting or frequenting the study area is held in Appendix B. With respect to native vertebrate fauna, 27 mammals (includes 12 bat species), 107 bird, 89 reptile and one frog species have previously been recorded in the general area, some of which have the potential to occur in or utilise at times, the proposed development area.

A total of 30 native fauna species were observed (or positively identified from foraging evidence, scats, tracks, skeletons or calls) within the study area during the two day

reconnaissance survey carried out in September 2011. Evidence of two introduced species was also observed.

Evidence of the Australian bustard using the study area was found in the form of several tracks and scats. No other fauna species of conservation significance (listed on state or federal threatened/migratory species lists or Department of Environment and Conservation (DEC) priority species) were positively identified as having used the study area during the Level 1 field reconnaissance survey.

Species of conservation significance that may be present at times include one species considered in need of special protection under state legislation (Peregrine Falcon), four DEC priority species (Grey Falcon, Australian Bustard, Bush Stone Curlew and the Northern Short-tailed Mouse) and two migratory bird species (Fork-tailed Swift, and Rainbow Bee-eater).

The potential impact on specific species of conservation significance previously recorded in the general area is provided in Table 2 below. Additional information on specific fauna species is provided in Appendix D.

Likelihood of Occurrence and Degree of Potential Impact – Fauna Species of Conservation Significance (continues on following page).

Common Name	Genus & Species	Conservation Status	Likelihood of Occurrence	Potential Impact on Preferred Habitat	Degree of Impact	Justification
Spotted Ctenotus	<i>Ctenotus uber johnstonei</i>	P2	Unlikely	None	Nil	No suitable habitat. Area out of species range
Unnamed Blind Snake	<i>Ramphotyphlops ganei</i>	P1	Unlikely	None	Nil	No suitable habitat.
Pilbara Olive Python	<i>Liasis olivaceus barroni</i>	S1 VU	Unlikely	None	Nil	No suitable habitat.
Great Egret	<i>Ardea alba</i>	S3, Mig	Unlikely	None	Nil	No suitable habitat
Cattle Egret	<i>Ardea ibis</i>	S3, Mig	Unlikely	None	Nil	No suitable habitat
Grey Falcon	<i>Falco hypoleucos</i>	P4	Possible	None Likely	Nil/Very Low	Uncommon but widespread species that can use degraded habitats.
Peregrine Falcon	<i>Falco peregrinus</i>	S4	Possible	None Likely	Nil/Very Low	Uncommon but widespread species that can use degraded habitats.
Australian Bustard	<i>Ardeotis australis</i>	P4	Known to occur	Modification/loss of a small area of habitat	Nil/Very Low	Widespread species, habitat common in area.
Bush Stone-curlew	<i>Burhinus grallarius</i>	P4	Possible	Modification/loss of a small area of habitat	Nil/Very Low	Widespread species, habitat common in area.

Common Name	Genus & Species	Conservation Status	Likelihood of Occurrence	Potential Impact on Preferred Habitat	Degree of Impact	Justification
Oriental Plover	<i>Charadis veredus</i>	S3, Mig	Unlikely	None	Nil	No suitable habitat.
Night Parrot	<i>Pezoporus occidentalis</i>	S1, EN	Unlikely	None	Nil	Small area of marginal habitat at best.
Fork-tailed Swift	<i>Apus pacificus</i>	S3, Mig	Flyover Only	None	Nil	Aerial species.
Rainbow Bee-eater	<i>Merops ornatus</i>	S3, Mig	Possible	Modification/loss of a small area of habitat	Nil/Very Low	Common, widespread species that can use degraded habitats.
Star Finch (western)	<i>Neochmia ruficauda subclarescens</i>	P4	Unlikely	None	Nil	No suitable habitat
Northern Quoll	<i>Dasyurus hallucatus</i>	S1, EN	Unlikely	None	Nil	Preferred habitat lacking, very infrequent transients only.
Bilby	<i>Macrotis lagotis</i>	S1, VU	Unlikely	None	Nil	No records from immediate vicinity despite several surveys.
Pilbara Leaf-nosed Bat	<i>Rhinonictis aurantius p</i>	S1, VU	Unlikely	None	Nil	Preferred roosting habitat absent
Ghost Bat	<i>Macroderma gigas</i>	P4	Unlikely	None	Nil	Preferred roosting habitat absent
Western Pebble-mound Mouse	<i>Pseudomys chapmani</i>	P4	Unlikely	None	Nil	No suitable habitat.
Northern Short-tailed Mouse	<i>Leggadina lakedownensis</i>	P4	Possible	Modification/loss of a small area of habitat	Low	No previous records. Small area of impact. Habitat common in wider area.

(See Appendix A for conservation codes)

The broadly defined fauna habitats present within the development area were identified as being common and widespread in the wider area and the faunal assemblage identified as potentially present is unlikely to be different to that found in similar habitat located elsewhere in the region. It can therefore be concluded that the project area does not contain habitat of high ecological significance from a faunal perspective or contain faunal assemblages that are ecologically significant.

The assessment results also suggest that no species of conservation significance has the potential to be directly affected to any significant degree by the proposal. Available evidence suggests that a significant proportion of the species discussed are locally extinct or unlikely to use the site due to a lack of suitable habitat. Those species that potentially utilise the site are relatively wide ranging and/or will persist in adjoining unaffected areas.

No significant impact on any *Environment Protection and Biodiversity Conservation Act 1999 (EPBC Act)* threatened or migratory fauna species is anticipated, principally

because none can be considered likely to be using the site to any significant degree. The site also does not appear to contain habitat that could be considered critical for the recovery of any listed threatened species.

The proposed development will necessarily require the clearing of existing fauna habitat. Planning for the proposal should take into account the potential presence of some species of conservation significance and fauna in general so that any impacts can be minimised or offset. Existing management plans and protocols that aim to minimise impact on fauna should be employed where relevant with specific attention being paid to those facets highlighted in Section 7.2 when considered reasonable and practical to implement.

1. INTRODUCTION

This report details the results of a Level 1 fauna assessment of Brockman Resources Limited proposed camp, road and airstrip (Option B) situated near their Marillana Iron Ore Project area, about 50km east of Auski Roadhouse (Munjina) in the Pilbara, Western Australia. The study site is centred at approximately 22.505376°S and 119.144804°E (Figures 1 & 2).

The Option B area that required survey totalled about 200 ha and was comprised of the airstrip (~170 ha - 2km long and 150m wide), camp areas (~18 ha) and the road corridor (~14 ha – 4.5km long and 35m wide).

2. SCOPE OF WORKS

The scope of works was designed to comply with requirements of a Level 1 terrestrial fauna survey as defined in Environmental Protection Authority (EPA) Guidance Statement 56 (EPA 2004):

- Background research or 'desktop' study

The purpose is to gather background information on the target area (usually at the locality scale). This involves a search of all sources for literature, data and map-based information.

- Reconnaissance survey

The purposes are:

- i) to verify the accuracy of the background study;
- ii) to further delineate and characterise the fauna and faunal assemblages present in the target area; and
- iii) to identify potential impacts.

The reconnaissance survey requires a site visit by suitably qualified personnel for the purpose of undertaking selective, low intensity sampling of the fauna and faunal assemblages, and to provide habitat descriptions and habitat maps of the project area (EPA 2004).

3. BIOGEOGRAPHICAL SETTING

The study area falls within the Pilbara biogeographic region as defined by the Interim Biogeographic Regionalisation for Australia (IBRA) (Thackway and Cresswell 1995). The Pilbara bioregion has four main geological components (subregions) with the project area falling within the Fortescue Plains

Biogeographical subregion (Pilbara 2 – PIL2 – Fortescue Plains subregion – Kendrick 2001).

The Fortescue Plains subregion is described as:

Alluvial plains and river frontage. Extensive salt marsh, mulga-bunch grass, and short grass communities on alluvial plains in the east. Deeply incised gorge systems in the western (lower) part of the drainage. River gum woodlands fringe the drainage lines. Northern limit of Mulga (*Acacia aneura*). An extensive calcrete aquifer (originating within a palaeo-drainage valley) feeds numerous permanent springs in the central Fortescue, supporting large permanent wetlands with extensive stands of river gum and cadjeput *Melaleuca* woodlands. Climatic conditions are semi desert tropical, with average rainfall of 300 mm, falling mainly in summer cyclonic events. Drainage occurs to the north-west. Subregional area is 2,041,914ha (Kendrick 2001).

Van Vreeswyk *et al.* (2004) undertook a regional inventory of the Pilbara region to document the land systems present and their condition. The inventory covered 181,723 km², bounded by the Indian Ocean and Roebourne Plains to the north and west, extending to Broome in the north-east and the Ashburton River catchment in the south.

The study area falls within portions of four land systems these being:

- Boolgeeda Land System - Stony lower slopes and plains below hill systems supporting hard and soft spinifex grasslands or mulga shrublands.
- Divide Land System - Sandplains and occasional dunes supporting shrubby hard spinifex grasslands.
- Cowra Land System - Plains fringing the Marsh land system and supporting snakewood and mulga shrublands with some halophytic undershrubs.
- Calcrete Land System - Low calcrete platforms and plains supporting shrubby hard spinifex grasslands.

4. METHODOLOGY

4.1 POTENTIAL FAUNA INVENTORY - DESKTOP STUDY

4.1.1 Database Searches

Searches of the following databases were undertaken to aid in the compilation of a list of vertebrate fauna potentially occurring within the study area:

- DEC's NatureMap Database Search (combined data from DEC, Western Australian Museum and Birds Australia) (DEC 2011): and
- Protected matters search tool (Department of Sustainability, Environment, Water, Population and Communities - DSEWPaC 2011).

It should be noted that these lists are based on observations from a broader area than the study site and therefore may include species that would only ever occur as vagrants in the actual study area due to a lack of suitable habitat or the presence of only marginal habitat. The databases also often included very old records and in some cases the species in question have become locally or regionally extinct.

Information from these sources should therefore be taken as indicative only and local knowledge and information needs also to be taken into consideration when determining what actual species may be present within the specific area being investigated.

4.1.2 Previous Fauna Surveys in the Area

Fauna surveys, assessments and reviews have been undertaken in nearby areas in the past, though not all are publically available and could not be referenced. The most significant of those available have been used as the primary reference material for compiling the potential fauna list for the general area. Those reports referred to included, but were not limited to:

- Biota (2010). Yandicoogina Junction South West and Oxbow Fauna Survey. Unpublished report for Rio Tinto Iron Ore.
- ecologia (2009) Marillana Iron Ore Project - Vertebrate Fauna Assessment. Unpublished report for Brockman Resources Ltd.
- ecologia (2010). Brockman Resources Limited Rail Option 2 - Level 2 Vertebrate Fauna Survey. Unpublished Report for Brockman Resources Ltd.
- ecologia (2011) Munjina - Roy Hill Road Realignment VCP. Unpublished report for Brockman Resources Ltd.

As with the databases searches some reports refer to species that would not occur in the study area due to a lack of suitable habitat (extent and/or quality) and this fact was taken into consideration when compiling the potential fauna species list for the study area. It should also be noted that the NatureMap database is likely to include some records from previous fauna surveys in the area including some of those listed above.

4.1.3 Existing Publications

The following represent the main publications used to identify and refine the potential fauna species list for the study area:

- Barrett, G., Silcocks, A., Barry, S., Cunningham, R. and Poulter, R. (2003). The New Atlas of Australian Birds. Royal Australasian Ornithologists Union, Victoria.
- Bush, B. and Maryan, B. (2011). Field Guide to Snakes of the Pilbara, Western Australia. WA Museum, Perth.
- Churchill, S. (2008). Australian Bats. Second Edition, Allen & Unwin.
- Johnstone, R.E. and Storr, G.M. (1998). Handbook of Western Australian Birds: Volume 1 – Non-passerines (Emu to Dollarbird). Western Australian Museum, Perth Western Australia.
- Johnstone, R.E. and Storr, G.M. (2004). Handbook of Western Australian Birds: Volume 2 – Passerines (Blue-winged Pitta to Goldfinch). Western Australian Museum, Perth Western Australia.
- Menkhorst, P. and Knight, F. (2011). A Field Guide to the Mammals of Australia. Third Edition, Oxford University Press, Melbourne.
- Storr, G.M., Smith, L.A. and Johnstone R.E. (1983). Lizards of Western Australia II: Dragons and Monitors. WA Museum, Perth.
- Storr, G.M., Smith, L.A. and Johnstone R.E. (1990). Lizards of Western Australia III: Geckos and Pygopods. WA Museum, Perth.
- Storr, G.M., Smith, L.A. and Johnstone R.E. (1999). Lizards of Western Australia I: Skinks. Revised Edition, WA Museum, Perth.
- Storr, G.M., Smith, L.A. and Johnstone R.E. (2002). Snakes of Western Australia. Revised Edition, WA Museum, Perth.
- Tyler M.J. & Doughty P. (2009). Field Guide to Frogs of Western Australia, Fourth Edition, WA Museum, Perth.
- Van Dyck, S. & Strahan, R. Eds (2008) The Mammals of Australia. Third edition. Queensland Museum.
- Wilson, S. and Swan, G. (2010) A Complete Guide to Reptiles of Australia. Third Edition, Reed, New Holland, Sydney.

4.1.4 Fauna of Conservation Significance

The conservation significance of fauna species has been assessed using data from the following sources:

- *Environment Protection and Biodiversity Conservation Act 1999 (EPBC Act)*. Administered by the Australian Government Department of Sustainability, Environment, Water, Population and Communities (DSEWPaC);
- *Wildlife Conservation Act 1950 (WC Act)*. Administered by the Western Australian Department of Environment and Conservation (DEC);
- Red List produced by the Species Survival Commission (SSC) of the World Conservation Union (also known as the IUCN Red List - the acronym derived from its former name of the International Union for Conservation of Nature and Natural Resources). The Red List has no legislative power in Australia but is used as a framework for State and Commonwealth categories and criteria; and the
- DEC Priority Fauna list. A non-legislative list maintained by the DEC for management purposes.

The *EPBC Act* also requires the compilation of a list of migratory species that are recognised under international treaties including the:

- Japan Australia Migratory Bird Agreement 1981 (JAMBA);
- China Australia Migratory Bird Agreement 1998 (CAMBA);
- Republic of Korea-Australia Migratory Bird Agreement 2007 (ROKAMBA); and
- Bonn Convention 1979 (The Convention on the Conservation of Migratory Species of Wild Animals).

(Note - Species listed under JAMBA are also protected under Schedule 3 of the *WC Act*.)

All migratory bird species listed in the annexes to these bilateral agreements are protected in Australia as matters of national environmental significance (NES) under the *EPBC Act*.

The conservation status of all vertebrate fauna species listed as occurring or possibly occurring in the vicinity of the Project area has been assessed using the most recent lists published in accordance with the above-mentioned instruments and is indicated as such in the fauna listings of this report. A full listing of conservation codes are provided in Appendix A.

4.1.5 Invertebrates

It can be difficult to identify what may be significant invertebrate species (e.g. Short Range Endemics - SREs) as there is a lack of knowledge and taxonomic expertise relating to invertebrates. Where invertebrates are collected during surveys, a high percentage are likely to be unknown, or for known species there can be limited knowledge or information on their distribution (Harvey 2002).

For this project, the assessment for conservation significant invertebrates has been limited to those listed by in the DEC and *EPBC Act* database searches (which rely on distribution records and known habitat preferences). Generally very little is known about short range endemic invertebrates in the Pilbara (Kendrick 2001) and therefore no assessment of the potential for SREs to be present has been made.

4.1.6 Taxonomy and Nomenclature

Taxonomy and nomenclature for fauna species used in this report is generally taken from the DEC's WA Fauna Census Database which is assumed to follow Aplin and Smith (2001) for amphibians and reptiles, How *et al.* (2001) for mammals and Johnstone (2001) for birds.

Common names are taken from the Western Australia Museum (WAM) recognised primary common name listings when specified, though where common names are not provided they have been acquired from other publications. Sources include Van Dyck & Strahan (2008), Bush *et al* (2007), Wilson and Swan (2010), Bush *et al* (2002), Tyler *et al.* (2000), Christidis and Boles (2008) and Glauret (1961). Not all common names are generally accepted.

4.2 SITE SURVEYS

Field survey work was carried out by Greg Harewood (B.Sc. Zoology) over a two day period on the 26th and 27th September, 2011.

4.2.1 Fauna Habitat Assessment

Vegetation units identified during the flora and vegetation survey, carried out by Botanica Consulting (2011), have been used to define broad fauna habitat types across the site. This information has been supplemented with observations made during the fauna survey.

The main aim of the habitat assessment was to determine if it was likely that any species of conservation significance would be utilising the areas that maybe impacted on as a consequence of development at the site proceeding. The habitat information obtained was also used to aid in finalising the overall potential fauna list.

As part of the desktop literature review, available information on the habitat requirements of the species of conservation significance listed as possibly occurring in the area was researched. During the field survey the habitats within the study area were assessed and specific elements identified, if present, to determine the likelihood of listed threatened species utilising the area and its significance to them.

4.2.2 Opportunistic Fauna Observations

Opportunistic observations of fauna species was made during while traversing the study area on foot. This included searching microhabitats such as logs, rocks, leaf litter and observations of bird species with binoculars.

5. SURVEY CONSTRAINTS

The assessment reported on here has included a desktop analysis and a site reconnaissance survey that included opportunistic fauna observations made during a two day period. No seasonal sampling has been conducted. The conclusions presented are based upon field data and the environmental monitoring and/or testing carried out over a limited period of time and are therefore merely indicative of the environmental condition of the site at the time of preparing the report. Also it should be recognised that site conditions, can change with time.

Some fauna species are reported as potentially occurring within the study area based on there being suitable habitat (quality and extent) within the study area or immediately adjacent. With respect to opportunistic observations, the possibility exists that certain species may not have been detected during field investigations due to:

- seasonal inactivity during field survey;
- species present within micro habitats not surveyed;
- cryptic species able to avoid detection; and
- transient wide-ranging species not present during survey period.

The lack of observational data on some species should therefore not be taken as necessarily indicating that a species is absent from the site.

The habitat requirements and ecology of many of the species known to occur in the wider area are often not well understood or documented. It can therefore be difficult to exclude species from the potential list based on a lack of a specific habitat or microhabitat within the study area. As a consequence of this limitation the potential fauna list produced is most likely an overestimation of those species that actually utilise the study area for some purpose. Some

species may be present in the general area but may only use the study area itself on rare occasions or as vagrants.

In recognition of survey limitations a precautionary approach has been adopted for this assessment. Any fauna species that would possibly occur within the study area as identified through ecological databases, publications, discussions with local experts/residents and the habitat knowledge of the Author has been assumed to potentially occur in the study area.

6. RESULTS

6.1 POTENTIAL FAUNA INVENTORY - DESKTOP STUDY

A list of expected fauna species that could occur in the study area was compiled from information obtained during the desktop study and is presented in Appendix B. This listing was refined after information gathered during the site reconnaissance survey was assessed. The results of some previous fauna surveys carried out in the general area are summarised in this species listing as are the DEC NatureMap database search results. The raw database search results from NatureMap (DEC 2011) and the Protected Matters Search Tool (DSEWPac 2011) are contained within Appendix C.

The list of potential fauna takes into consideration that firstly the species in question is not known to be locally extinct and secondly that suitable habitat for each species, as identified during the habitat assessment, is present within the study area, though compiling an accurate list has limitations (see Section 5). As a consequence of the various limitations the potential fauna list produced is most likely an overestimation of those species that actually utilise the study area for some purpose.

6.2 SITE SURVEYS

6.2.1 Fauna Habitat Assessment

The broad scale fauna habitats within the study area are based on vegetation structure as identified during the flora and vegetation survey (Botanica 2011). The location and approximate extent of each identified unit is shown in Figure 3 with a description below. More detail on the vegetation units present can be found in the flora and vegetation report (Botanica 2011).

- Open Low Woodland (*Acacia pteraneura*) over Grassland (*Triodia basedowii*).
- Very Open Shrub Mallee (*Euclayptus odontocarpa/Hakea lorea*) over Grassland (*Triodia basedowii*).

- Open Low Woodland (*Acacia ptetraneura*) over Sparse Scrub (*Acacia bivenosa*).
- Open Low Shrub (*Acacia victoriae*) over Open Dwarf Scrub (*Frankenia ambita*)

Plates 1 to 4 illustrate the nature of the main fauna habitats existing within the project area.

6.2.2 Opportunistic Fauna Surveys

The results of the opportunistic fauna survey are listed in Appendix B and summarised in Table 1. A total of 30 native fauna species were observed (or positively identified from foraging evidence, scats, tracks, skeletons or calls) within the study area during the two day reconnaissance survey carried out in September 2011. Evidence of two introduced species was also observed.

Evidence of the Australian bustard using the study area was found in the form of several tracks and scats. No other fauna species of conservation significance (listed on state or federal threatened/migratory species lists or DEC priority species) were positively identified as having used the study area during the Level 1 field reconnaissance survey.

6.3 FAUNA INVENTORY – SUMMARY

6.3.1 Vertebrate Fauna

Table 1 summarises the numbers of potential species based on vertebrate class considered likely to be present in the general vicinity of the study area. A complete list of vertebrate fauna most likely to frequent the site or nearby areas is held in Appendix B. The results of the DEC NatureMap fauna database search and the *EPBC Act* database search are held in Appendix C.

Not all species listed in existing databases and publications as potentially occurring within the region (i.e. *EPBC Act*'s Threatened Fauna and Migratory species lists, DEC's NatureMap Fauna Database and various reports and publications) are likely to be present within the study area. Some species have been excluded from this list based on the lack of suitable habitat or known/highly likely local extinction even if suitable habitat is present.

It should be noted that even if some additional species are omitted from the listing for the specific study area the resulting list would still very likely represent an over estimation of the fauna species utilising the site (either on a regular or infrequent basis) as a result of the precautionary approach adopted for the assessment.

Table 1: Summary of Potential Vertebrate Fauna Species (as listed in Appendix B)

Group	Total number of potential species	Potential number of specially protected species	Potential number of migratory species	Potential number of priority species	Number of species observed L1 Survey 2011
Amphibians	1	0	0	0	0
Reptiles	89	0	0	0	1
Birds	107	1	2	3	27
Non-Volant Mammals	23 ⁸	0	0	1	4 ²
Volant Mammals (Bats)	12	0	0	0	0
Total	232 ⁸	1	2	4	32 ²

Superscript = number of introduced species included in total.

A review of the *EPBC Act's* threatened fauna list, DEC's Threatened Fauna Database and Priority List, unpublished reports and scientific publications identified 20 specially protected, priority or migratory vertebrate fauna species as potentially occurring in the general vicinity of the study area. Based on the habitats present and documented distributions it is considered possible that seven (7) of these species may use the study area for some purpose at times. Species have been omitted from the potential list for the site (Appendix B), principally due to lack of suitable habitat on-site or known local extinction.

Additional details on significant species that potentially utilise the study area are given in Appendix D.

In summary, a single fauna species of conservation significance (as listed on state or federal threatened species lists or DEC priority species) was positively identified as utilising the study area during the Level 1 reconnaissance survey, this being:

- *Ardeotis australis* Australian Bustard - P4 (DEC Priority Species)
Footprints attributed to this species were observed during the field survey and it has been noted in the immediate area before (ecologia 2009, 2011).

The current status of many species on site and/or in the general area can be difficult to determine. However, based on the habitats present and, in some

cases, recent nearby records, six additional species of conservation significance can be regarded as possibly utilising the study area for some purpose at times, these being:

- *Falco hypoleucos* Grey Falcon - P4 (DEC Priority Species)
This species may occasionally forage in the general area but would not be specifically attracted to the site itself.
- *Falco peregrinus* Peregrine Falcon - S4 (WC Act)
The species potentially utilises some sections of the study area as part of a much larger home range. The site contains no suitable nesting habitat.
- *Burhinus grallarius* Bush Stone Curlew - P4 (DEC Priority Species)
May infrequently traverse the area but it would not be specifically attracted to the site and would only ever be present as individuals or very small groups for small periods of time.
- *Apus pacificus* Fork-tailed Swift – S3 (WC Act), Migratory (EPBC Act)
Rare seasonal visitor. It is potentially an occasional summer visitor to the area but is entirely aerial and largely independent of terrestrial habitats.
- *Merops ornatus* Rainbow Bee-eater – S3 (WC Act), Migratory (EPBC Act)
Numerous records from local region and recorded within the nearby Marillana project area (ecologia 2009, 2011). Possibly breeds in the general area but population levels would not be significant.
- *Leggadina lakedownensis* Northern Short-tailed Mouse - P4 (DEC Priority Species)
Despite not being recorded during the Marillana fauna survey by ecologia (2009) they consider the species to have a moderate potential to occur in the general area due to the presence of suitable habitat and some nearby records.

The following species of conservation significance, while possibly present in the general area and/or the wider region are not listed as potential species due to the study area being outside of their currently recognised range, a lack of suitable habitat or known/very likely local or regional extinction (and no subsequent recruitment from adjoining areas):

- *Ctenotus uber johnstonei* Spotted Ctenotus – P4 (DEC Priority Species)
The lack of suitable habitat, its currently defined restricted geographical distribution well away from the study area and lack of local records suggests that it is very unlikely to be found within the proposal area.
- *Ramphotyphlops ganei* Unnamed Blind Snake – P1 (DEC Priority Species)

The apparent lack of suitable habitat and the fact that the species was not captured nearby during surveys (ecologia 2009) suggests that this species is very unlikely to be found within the proposal area.

- *Liasis olivaceus barroni* Pilbara Olive Python – S1 (WC Act), Vulnerable (EPBC Act)
Preferred rocky habitats and areas such as gorges, caves and rock crevices are not present within the site.
- *Ardea alba* Great Egret – S3 (WC Act), Migratory (EPBC Act)
No suitable habitat.
- *Ardea ibis* Cattle Egret – S3 (WC Act), Migratory (EPBC Act)
No suitable habitat.
- *Charadis veredus* Oriental Plover – S3 (WC Act), Migratory (EPBC Act)
No suitable habitat.
- *Charadis veredus* Night Parrot – S1 (WC Act), Endangered (EPBC Act)
Habitat present considered marginal at best. Unlikely to utilise the study area.
- *Neochmia ruficauda subclarescens* Star Finch (western) – P4 (DEC Priority Species))
No suitable habitat.
- *Dasyurus hallucatus* Northern Quoll – S1 (WC Act), Endangered (EPBC Act)
Lack of this species preferred denning habitat within the study area and the lack of records in the immediate vicinity despite several trapping surveys (ecologia 2009, 2010 and Biota 2010) suggests it would only ever occur on very rare occasions within the study area, if ever, and then only as transient individuals.
- *Dasyurus hallucatus* Bilby – S1 (WC Act), Vulnerable (EPBC Act)
Lack of actual records or any secondary evidence (e.g. burrows) of this species in the immediate vicinity despite several surveys (ecologia 2009, 2010, 2011) suggests this species does not persist in the area.
- *Rhinonictoris aurantius* Pilbara Leaf-nosed Bat – S1 (WC Act), Vulnerable (EPBC Act)
There are no suitable dry or wet season roosting sites for this species within the study area. May occasionally forage in the general area but this would be dependent on suitable roost sites being present in nearby ranges or woodland areas.
- *Macroderma gigas* Ghost Bat – P4 (DEC Priority Species)
There are no suitable roosting sites for this species within or in close proximity to the study area. May occasionally forage in the general area but this would be dependent on suitable roost sites being present in nearby ranges.

- *Pseudomys chapmani* Western Pebble-mound Mouse – P4 (DEC Priority Species)
No suitable habitat.

6.3.2 Invertebrate Fauna

No listed threatened or priority invertebrate species appeared in the DEC and EPBC Act database searches (DEC 2011, DSEWPaC 2011).

7. ECOLOGICAL IMPACTS AND MANAGEMENT

7.1 POTENTIAL IMPACTS

In general the most significant potential impacts to fauna of any development include:

- Loss of vegetation/fauna habitat that is used for foraging, breeding, roosting, or dispersal (includes loss of hollow bearing trees),
- Fragmentation of vegetation/fauna habitat which may restrict the movement of some fauna species,
- Modifications to surface hydrology, siltation of creek lines,
- Changes to fire regimes,
- Pollution (e.g. oil spills),
- Noise/Light/Dust,
- Spread of plant pathogens (e.g. dieback) and weeds,
- Potential increase in the number of predatory feral species (e.g. foxes, cats) and
- Death or injury of fauna during clearing and construction.

The most likely/inevitable impacts of the proposed development are:

- The loss of fauna habitat, some of which is or maybe utilised by fauna of conservation significance,
- Death or injury of fauna during clearing and construction.

The impact on the conservation significant species listed as potentially being present will vary depending on their current degree of utilisation/population densities and preferred habitat requirements (e.g. quantity and quality of potential foraging and breeding habitat that is affected).

The potential impact on specific species of conservation significance previously recorded in the general area is provided in Table 2 below. Additional information on specific fauna species is provided in Appendix D.

Table 2: Likelihood of Occurrence and Degree of Potential Impact – Fauna Species of Conservation Significance (continues on following page).

Common Name	Genus & Species	Conservation Status	Likelihood of Occurrence	Potential Impact on Preferred Habitat	Degree of Impact	Justification
Spotted Ctenotus	<i>Ctenotus uber johnstonei</i>	P2	Unlikely	None	Nil	No suitable habitat. Area out of species range
Unnamed Blind Snake	<i>Ramphotyphlops ganei</i>	P1	Unlikely	None	Nil	No suitable habitat.
Pilbara Olive Python	<i>Liasis olivaceus barroni</i>	S1 VU	Unlikely	None	Nil	No suitable habitat.
Great Egret	<i>Ardea alba</i>	S3, Mig	Unlikely	None	Nil	No suitable habitat
Cattle Egret	<i>Ardea ibis</i>	S3, Mig	Unlikely	None	Nil	No suitable habitat
Grey Falcon	<i>Falco hypoleucos</i>	P4	Possible	None Likely	Nil/Very Low	Uncommon but widespread species that can use degraded habitats.
Peregrine Falcon	<i>Falco peregrinus</i>	S4	Possible	None Likely	Nil/Very Low	Uncommon but widespread species that can use degraded habitats.
Australian Bustard	<i>Ardeotis australis</i>	P4	Known to occur	Modification/loss of a small area of habitat	Nil/Very Low	Widespread species, habitat common in area.
Bush Stone-curlew	<i>Burhinus grallarius</i>	P4	Possible	Modification/loss of a small area of habitat	Nil/Very Low	Widespread species, habitat common in area.
Oriental Plover	<i>Charadis veredus</i>	S3, Mig	Unlikely	None	Nil	No suitable habitat.
Night Parrot	<i>Pezoporus occidentalis</i>	S1, EN	Unlikely	None	Nil	Small area of marginal habitat at best.
Fork-tailed Swift	<i>Apus pacificus</i>	S3, Mig	Flyover Only	None	Nil	Aerial species.
Rainbow Bee-eater	<i>Merops ornatus</i>	S3, Mig	Possible	Modification/loss of a small area of habitat	Nil/Very Low	Common, widespread species that can use degraded habitats.
Star Finch (western)	<i>Neochmia ruficauda subclarescens</i>	P4	Unlikely	None	Nil	No suitable habitat
Northern Quoll	<i>Dasyurus hallucatus</i>	S1, EN	Unlikely	None	Nil	Preferred habitat lacking, very infrequent transients only.
Bilby	<i>Macrotis lagotis</i>	S1, VU	Unlikely	None	Nil	No records from immediate vicinity despite several surveys.

Common Name	Genus & Species	Conservation Status	Likelihood of Occurrence	Potential Impact on Preferred Habitat	Degree of Impact	Justification
Pilbara Leaf-nosed Bat	<i>Rhinonicteris aurantius p</i>	S1, VU	Unlikely	None	Nil	Preferred roosting habitat absent
Ghost Bat	<i>Macroderma gigas</i>	P4	Unlikely	None	Nil	Preferred roosting habitat absent
Western Pebble-mound Mouse	<i>Pseudomys chapmani</i>	P4	Unlikely	None	Nil	No suitable habitat.
Northern Short-tailed Mouse	<i>Leggadina lakedownensis</i>	P4	Possible	Modification/loss of a small area of habitat	Low	No previous records. Small area of impact. Habitat common in wider area.

(See Appendix A for conservation codes)

7.2 MINIMISING IMPACTS

Brockman Resources Limited have a series of environmental management plans and protocols in place for other aspects of the Marillana Iron Ore Project that aim to minimise potential environmental impacts during all facets of their operations. The implementation of these standard plans and protocols will ensure impacts of the proposed airstrip and associated infrastructure are minimised as far as reasonable and practical while allowing development to progress.

The following proposed management recommendations are considered most important and while likely to form part of existing procedures and protocols should be made a priority during site development and operation. It is recommended that:

- Planning for development should aim to minimise as much as reasonable and practical the area of remnant vegetation requiring removal.
- During site works, areas requiring clearing should be clearly marked and access to other areas restricted to prevent accidental clearing of areas to be retained.
- Disruption to surface and sub-surface hydrology should be minimised where possible and levees and drains designed to mimic natural drainage flows where disruptions will occur.
- No dead, standing or fallen timber should be removed unnecessarily. Logs (hollow or not) and other debris resulting from land clearing should be used to enhance fauna habitat in untouched and rehabilitated areas if possible.

- A Construction and Operations Fire Management Plan should be prepared to reduce the risk of unplanned fires and provide contingency measures to minimise any associated impacts. The plan will include a contingency and response plan in the event of any bushfires that commence as a result of the works on site.
- All staff working on site should be made aware that native fauna is protected. Personnel working on the project should not be allowed to bring firearms, other weapons or pets onsite.
- Native fauna injured during clearing or normal site operations should be taken to a designated veterinary clinic or a DEC nominated wildlife carer.
- Fuel storage facilities should be bunded.
- Any trenching required for pipeline installation of other services should be kept open for only as long as necessary and suitable escape ramps (45°) and bridging provided every 50m if the site is to be left unattended for extended periods (>1day). Trenches should be cleared of trapped fauna by “fauna-rescue personnel” at least twice daily. The first daily clearing shall take place no later than three hours after sunrise and shall be repeated between the hours of 3:00 pm and 6:00 pm. The open trenches should be cleared of trapped fauna by “fauna-rescue personnel”, and fauna details recorded, no more than one hour prior to backfilling of trenches.

8. LEGISLATIVE OBLIGATIONS

8.1 WILDLIFE CONSERVATION ACT 1950

The objective of the *Wildlife Conservation Act 1950* is to provide for the protection of wildlife. The Act is administered by the Executive Director of the Department of Environment and Conservation, under the direction and control of the Minister for the Environment. Under section 14, “Protection of Fauna”, of this Act, all fauna is wholly protected throughout the State at all times, unless declared by the Minister by notice in the Government Gazette. Under section 14(2)(ba) of The Act, Fauna Notices are made by the Minister for the Environment listing specially protected fauna.

Disturbance or destruction of any native fauna over and above that reasonably required for construction works and access is considered an offence under the Act and the proponent should take the necessary steps to inform all those involved in sites works of this fact. As discussed in the previous section the proponent should also, as part of their management plan implement procedures

that will reduce the chances of wildlife being injured or killed during clearing, construction and operations at the site.

8.2 ENVIRONMENTAL PROTECTION ACT 1986

The purpose of the Environmental Protection Act (1986) is “...to provide for an *Environmental Protection Authority, for the prevention, control and abatement of pollution and environmental harm, for the conservation, preservation, protection enhancement and management of the environment and for matters incidental to or connected with the foregoing*”.

The powers of the Environmental Protection Act 1986 are administered by the Department of Environment and Conservation (DEC), which in relevant cases advises to the Environmental Protection Authority (EPA). The jurisdiction of the DEC comprises the protection of environmental systems, pollution prevention and waste management. In particular, the DEC manages and protects rivers, streams, creeks, estuaries, drains, wetlands and groundwater, but not marine waters, of Western Australia.

Legislation proclaimed on 8 July 2004 protects all native vegetation in Western Australia. Under the law, clearing native vegetation is prohibited, unless a clearing permit is granted by the DEC, or the clearing is for an exempt purpose. These exemptions ensure that low impact day to day activities involving clearing can be undertaken. People that wish to clear are required to submit an application if an exemption does not apply.

Any future development at the site will be assessed against the ten clearing principles related to native vegetation in the EP Act. These principles provide a guide for when native vegetation should not be cleared. The DEC must consider these principles in making a decision on whether or not to issue a clearing permit. The DEC has set out the minimum requirements and standards for addressing each of the ten principles in detail in its assessment methodology.

Native vegetation should not be cleared if:

- (a) it comprises a high level of biological diversity;
- (b) it comprises the whole or a part of, or is necessary for the maintenance of, a significant habitat for fauna indigenous to Western Australia;
- (c) it includes, or is necessary for the continued existence of, rare flora;
- (d) it comprises the whole or a part of, or is necessary for the maintenance of a threatened ecological community;

- (e) it is significant as a remnant of native vegetation in an area that has been extensively cleared;
- (f) it is growing in, or in association with, an environment associated with a watercourse or wetland;
- (g) the clearing of the vegetation is likely to cause appreciable land degradation;
- (h) the clearing of the vegetation is likely to have an impact on the environmental values of any adjacent or nearby conservation area;
- (i) the clearing of the vegetation is likely to cause deterioration in the quality of surface or underground water; or
- (j) clearing the vegetation is likely to cause, or exacerbate, the incidence of flooding.

One purpose of the assessment reported on here is to provide information relevant to principle (a) & (b). Based on the assessment results and despite the fact that the area is or is possibly being utilised by some species of conservation significance it is the Author's opinion that the site doesn't have what would be considered a high level of biological diversity or constitute the whole or a part of, or is necessary for the maintenance of, a significant habitat for fauna indigenous to Western Australia.

This opinion is based on the fact that the area of impact will be relatively small and fauna habitats present within the development area are common and widespread in the Marillana area. The faunal assemblage identified as potentially present is unlikely to be different to that found in similar habitats located elsewhere in the region. It can therefore be concluded that the project area does not contain habitats of high ecological significance from a faunal perspective or contain faunal assemblages that are ecologically significant.

8.3 COMMONWEALTH ENVIRONMENT PROTECTION & BIODIVERSITY CONSERVATION ACT 1999

A number of fauna species known to or potentially present within the study area are listed under the federal *Environment Protection and Biodiversity Conservation Act (EPBC Act, 1999)*. The objective of the *EPBC Act* is to provide for the protection of the environment, especially those aspects that are of national significance, promote ecologically sustainable development, the conservation of biodiversity and a cooperative approach to the protection and management of the environment.

Development proposals ("actions") that are likely to have a significant impact on any listed species should be referred to the Department of Sustainability, Environment, Water, Population and Communities (DSEWPoC) for assessment.

The aim of a referral is to provide certainty about whether a proposal does or doesn't need approval under the *EPBC Act*. The proposed action should be considered at its broadest possible scope. This includes all stages and components of the action, all related activities, and all related infrastructure such as roads and powerlines, if applicable.

It is the proponent's responsibility to determine if their proposed action (e.g. clearing and development of an area of native bushland) requires referral. To aid in determining if a proposal is likely to have a significant impact DSEWPac provide a series of Significant Impact Guidelines (DEH 2006). These guidelines outline a 'self-assessment' process, including detailed criteria, to assist persons in deciding whether or not referral may be required.

The criteria are intended to provide general guidance on the types of actions that will require approval and the types of actions that will not require approval. The criteria are not intended to be exhaustive or definitive. If a proponent is unsure whether their proposed action is likely to have a significant impact on a matter of national environmental significance it should be referred to the SEWPaC for a binding decision on whether approval is required (DEH 2006).

8.3.1 Listed Threatened Species

No listed *EPBC Act* threatened fauna species are considered by the Author likely to be utilising the study area to any substantial degree. It is therefore the Author's opinion that development of the site at any scale would not constitute a significant impact (as defined by the DSEWPac) on any *EPBC Act* listed threatened fauna species.

8.3.2 Listed Migratory Species

EPBC Act listed migratory fauna species identified as being present in the general area of the development site at times were:

- *Apus pacificus* Fork-tailed Swift – Migratory
- *Merops ornatus* Rainbow Bee-eater – Migratory

An action has, will have, or is likely to have a significant impact on migratory species if it does, will, or is likely to:

- substantially modify (including by fragmenting, altering fire regimes, altering nutrient cycles or altering hydrological cycles), destroy or isolate an area of important habitat of the migratory species; or
- result in invasive species that is harmful to the migratory species becoming established in an area of important habitat of the migratory species; or

- seriously disrupt the lifecycle (breeding, feeding, migration or resting behaviour) of an ecologically significant proportion of the population of the species.

An area of important habitat is:

- habitat utilised by a migratory species occasionally or periodically within a region that supports an ecologically significant proportion of the population of the species;
- habitat that is of critical importance to the species at particular life-cycle stages;
- habitat utilised by a migratory species which is at the limit of the species range; or
- habitat within an area where the species is declining.

To have a significant impact on a migratory species as defined under the DSEWPC Significant Impact Guidelines (DEH 2006), any proposed development would need to trigger at least one of the abovementioned significant impact criteria thresholds. Each of these is briefly assessed below.

Substantially modify, destroy or isolate an area of important habitat of the migratory species

The study area does not represent important habitat for any of the migratory species listed as potentially utilising the site.

The Fork-tailed swift is an aerial species that rarely roosts. It would not be specifically attracted to the area and if ever present would only stay temporarily. Rainbow Bee-eaters are seasonally widespread and common in southern WA and utilise both natural and totally degraded habitats. They potentially use the site and adjoining areas for foraging, roosting and possibly breeding but they would not be specifically attracted to the site. The percentage of the population present at any one time would be very small and insignificant as they rarely congregated in colonies.

This criteria will therefore not be compromised by the development proceeding.

Result in invasive species that is harmful to the migratory species becoming established in an area of important habitat of the migratory species

There is no evidence available to suggest that sections of the study area represents important habitat to any of the migratory species listed as potentially utilising the site. It is extremely unlikely that the proposed development of the

land would result in an invasive species that is harmful to migratory species becoming established on the site or in the vicinity.

This criteria will not be compromised by the development proceeding.

Seriously disrupt the lifecycle of an ecologically significant proportion of the population of the species.

There is no evidence available to suggest that sections of the study area represents important habitat to any of the migratory species listed as potentially utilising the site. The proposal area or adjoining areas do not support, at any time of the year, a significant proportion of the population of any migratory species.

This criteria will not be compromised by the development proceeding.

In all cases it is considered unlikely that the impact caused by development at the site would trigger any of the abovementioned criteria.

9. CONCLUSION

The Level 1 fauna survey of the study area was undertaken in September 2011 for the purposes of categorising the fauna assemblages and to identify fauna habitats present within the proposal area.

With respect to native vertebrate fauna, 27 mammals (includes 12 bat species), 107 bird, 89 reptile and one frog species have previously been recorded in the general area, some of which have the potential to occur in or utilise at times, the proposed development area. Based on habitat preferences, previous detailed survey results and currently documented distributions it has been concluded to be unlikely that any threatened (vulnerable, endangered, rare or likely to become extinct) species frequent the study area except possibly as vagrants, on rare occasions.

One species (Peregrine Falcon) considered in need of special protection under state legislation may possibly utilise the study area with an additional four DEC priority species (Grey Falcon, Australian Bustard, Bush Stone Curlew and the Northern Short-tailed Mouse) having some potential of also being present at times. Two migratory bird species (Fork-tailed Swift, and Rainbow Bee-eater) also have the potential to utilise the project area at times, though only one (Rainbow Bee-eater) is likely to be present on a regular (though seasonal) basis.

The fauna habitats present within the proposal area have been identified as being common and widespread in the Marillana area and the faunal assemblage identified as potentially present is unlikely to be different to that found in similar habitats located elsewhere in the region. It can therefore be

concluded that the project area does not contain habitat of high ecological significance from a faunal perspective or contain faunal assemblages that are ecologically significant. Clearing principles, as defined under the *EP Act* relating specifically to fauna, are therefore considered unlikely to be compromised by the proposal proceeding.

The assessment results also suggest that no species of conservation significance has the potential to be directly affected to any significant degree by the proposal. Available evidence suggests that a significant proportion of the species discussed are locally extinct or unlikely to use the site due to a lack of suitable habitat. Those species that potentially utilise the site are relatively wide ranging and/or will persist in adjoining unaffected areas.

No significant impact on any EPBC Act threatened or migratory fauna species is anticipated, principally because none can be considered likely to be using the site to any significant degree. The site also does not appear to contain habitat that could be considered critical for the recovery of any listed threatened species.

The proposed development will necessarily require the clearing of existing fauna habitat. Planning for the proposal should take into account the potential presence of some species of conservation significance and fauna in general so that any impacts can be minimised or offset. Existing management plans and protocols that aim to minimise impact on fauna should be employed where relevant with specific attention being paid to those facets highlighted in Section 7.2 when considered reasonable and practical to implement.

10. BIBLIOGRAPHY

(not necessarily cited)

Aplin, K.P. and Smith, L.A. (2001). Checklist of the frogs and reptiles of Western Australia, Records of the Western Australian Museum Supplement No. 63, 51-74.

Armstrong, K.N. and Anstee, S.D. (2000). The Ghost Bat in the Pilbara: 100 Years On.

Bamford Consulting Ecologists (2005). Fauna survey of proposed iron ore mine: Cloudbreak. Unpublished report for Fortescue Metals Group.

Barrett, G., Silcocks, A., Barry, S., Cunningham, R. and Poulter, R. (2003). The New Atlas of Australian Birds. Royal Australasian Ornithologists Union, Victoria.

Beard, J.S. (1990). Plant life of Western Australia. Kangaroo Press, NSW.

Biota Environmental Sciences (Biota) (2010). Yandicoogina Junction South West and Oxbow Fauna Survey. Unpublished report for Rio Tinto Iron Ore.

Botanica Consulting (2011). Marillana Iron Ore Project Camp, Road and Airstrip - Option B. Flora & Vegetation Survey. Unpublished report for Brockman Resources Ltd.

Braithwaite, R. W. and Griffiths, A. (1994). Demographic variation and range contraction in the northern quoll *Dasyurus hallucatus* (Marsupialia: Dasyuridae). Wildlife Research, 21: 203-217.

Burbidge, A. (2004). Threatened Animals of Western Australia.

Bush, B. and Maryan, B. (2011). Field Guide to Snakes of the Pilbara, Western Australia. WA Museum, Perth.

Christidis, I. and Boles, W.E. (1994). The Taxonomy and Species of Birds of Australia and its Territories. RAOU, Monograph 2.

Christidis, L. and Boles, W.E. (2008) Systematics and Taxonomy of Australian Birds. CSIRO Publishing, Melbourne

Churchill, S. (2008). Australian Bats. Second Edition, Allen & Unwin.

Cogger, H.G., (2000). Reptiles and Amphibians of Australia. Reed, Sydney.

Cogger, H.G., Cameron E.E., Sadler R.A. & Eggler, P. (1993). The Action Plan for Australian Reptiles. [Online]. Canberra, ACT: Australian Nature Conservation Agency. Available from: <http://www.environment.gov.au/biodiversity/threatened/action/reptiles/index.html>

Department of Environment and Conservation (DEC) (2011). NatureMap Database Search – “By Circle” Centre 119°08' 53" E, 22°30' 29" S (plus 40km buffer). Accessed 25th September 2011.

Department of the Environment and Heritage (2006), EPBC Act - Principal Significant Impact Guidelines 1.1, Matters of National Environmental Significance. EPBC Act Policy Statement.

Department of the Environment, Water, Heritage and the Arts (DEWHA) (2008). Approved Conservation Advice for *Pezoporus occidentalis* (Night Parrot). Canberra.

Department of Sustainability, Environment, Water, Population and Communities (DSEWPaC) (2011). EPBC Act Protected Matters Report: Coordinates - 22.505606°S and 119.144984°E (10km Buffer) Available from: <http://www.environment.gov.au>. Accessed 25/09/11 @ 12:38:48.

Duncan, A. & Baker, G. B. & Montgomery, N. & Natural Heritage Trust (Australia) (1999). The action plan for Australian bats / edited by Anne Duncan, G. Barry Baker and Narelle Montgomery; with assistance from Lindy Lumsden *et al.* Natural Heritage Trust, Canberra.

ecologia Environment (ecologia) (1995). Yandi Stage II Iron Ore Project Biological Assessment Survey. Unpublished Report for BHPBIO Pty Ltd.

ecologia Environment (ecologia) (2006a). Exploration Leases Ministers North Biological Survey. Unpublished Report for BHPBIO Pty Ltd.

ecologia Environment (ecologia) (2006b). Jirridi Terrestrial Vertebrate Fauna Survey. Unpublished Report for BHPBIO Pty Ltd.

ecologia Environment (ecologia) (2006c). Marillana Biological Survey [Tenement ML70/270 SA Sec 2]. Unpublished Report for BHPBIO Pty Ltd.

ecologia Environment (ecologia) (2006d). Yandi E3,5,6 and W1,2 Targeted Biological Survey. Unpublished Report for BHPBIO Pty Ltd.

ecologia Environment (ecologia) (2008a). Marillana Creek (Yandi) Iron Ore Mine Modification Level 2 Fauna Survey. Unpublished Report for BHPBIO Pty Ltd.

ecologia Environment (ecologia) (2008b). RGP5 Yandi Level 2 Fauna Survey. Unpublished Report for KBR.

ecologia Environment (ecologia) (2008c). RGP5 Yandi to Kurrajura Siding and Yandi Repeater One: Flora and Vegetation Report. Unpublished Report for BHPBIO Pty Ltd.

ecologia Environment (ecologia) (2009) Marillana Iron Ore Project - Vertebrate Fauna Assessment. Unpublished report for Brockman Resources Ltd.

ecologia Environment (ecologia) (2010). Brockman Resources Limited Rail Option 2 - Level 2 Vertebrate Fauna Survey. Unpublished Report for Brockman Resources Ltd.

ecologia Environment (ecologia) (2011) Munjina - Roy Hill Road Realignment VCP. Unpublished report for Brockman Resources Ltd.

Ehmann, H. and Watson, M. (2008). Grey Falcon, *Falco hypoleuca*. Government of Australia. South Australian Arid Lands Natural. South Australia.

Environmental Protection Authority (EPA) (2002). Terrestrial Biological Surveys As An Element of Biodiversity Protection. Position Statement No. 3. EPA, Perth.

Environmental Protection Authority (EPA) (2004). Guidance for the Assessment of Environmental Factors - Terrestrial fauna surveys for environmental impact assessment in Western Australia. Guidance Statement No 56 EPA, Perth.

Environmental Protection Authority (EPA) and Department of Environment and Conservation (DEC) (2010), Technical Guide – Terrestrial Vertebrate Fauna Surveys for Environmental Impact Assessments (eds B.M. Hyder, J. Dell and M.A. Cowan), Perth Western Australia.

Garnett, S. T. and Crowley, G. M. (2000). The Action Plan for Australian Birds. Environment Australia, Canberra.

Glauret, L. (1961). A Handbook of the Lizards of Western Australia. Handbook 6, Western Australian Naturalists Club, Perth.

Greer, A.E. (2006). Encyclopedia of Australian Reptiles. Australian Museum Online <http://www.amonline.net.au/herpetology/research/encyclopedia.pdf>
Version date: 7 August 2006.

Halpurn Glick Maunsell (HGM) (1999). Marillana Creek Iron Ore Project - Review of Biological Reporting. Unpublished Report for BHP Iron Ore Pty Ltd.

Higgins, P. J. (1999). Handbook of Australian, New Zealand and Antarctic Birds. Volume 4: Parrots to Dollarbird. Oxford University Press, Melbourne.

Hill B.M. and Ward S.J. (2009). National Recovery Plan for the Northern quoll *Dasyurus hallucatus*. Department of Natural Resources, Environment, The Arts and Sport, Darwin.

How, R., Cooper, N.K. and Bannister, J.L. (2001). Checklist of the mammals of Western Australia, Records of the Western Australian Museum Supplement No. 63, 91-98.

Integrated Environmental Services. (IES) (1981). Ecological appraisal of Yandicoogina project area, Western Australia. Unpublished technical report to CSR Limited, NSW.

Johnstone, R.E. (2001). Checklist of the birds of Western Australia, Records of the Western Australian Museum Supplement No. 63, 75-90.

Johnstone, R.E. and Storr, G.M. (1998). Handbook of Western Australian Birds: Volume 1 – Non-passerines (Emu to Dollarbird). Western Australian Museum, Perth Western Australia.

Johnstone, R.E. and Storr, G.M. (2004). Handbook of Western Australian Birds: Volume 2 – Passerines (Blue-winged Pitta to Goldfinch). Western Australian Museum, Perth Western Australia.

Keighery, B.J. (1994). Bushland Plant Survey: a Guide to Plant Community Surveys for the Community. Wildflower Society of Western Australia (Inc.) Nedlands, Western Australia.

Kendrick, P. (2001). Pilbara 2 (PIL2 – Fortescue Plains subregion). IN: A Biodiversity Audit of Western Australia's 53 Biogeographical Subregions in 2002. The Department of Conservation and Land Management.

Kendrick, P (2007). The non-volant vertebrate fauna of the Burrup Peninsula, Western Australia. The Western Australian Naturalist, Volume 25 No 4 - February 28, 2007.

Maxwell, S., Burbidge, A.A. and Morris, K. (eds). (1996). The 1996 Action Plan for Australian Marsupials and Monotremes. Wildlife Australia Endangered Species Program Project Number 50. Environment Australia, Canberra.

Menkhorst, P. and Knight, F. (2011). A Field Guide to the Mammals of Australia. Third Edition, Oxford University Press, Melbourne.

Morcombe, M. (2004). Field Guide to Australian Birds. Steve Parish Publishing, Archerfield, Queensland.

Pearson, DJ (1993). Distribution, status and conservation of pythons in Western Australia, In: Lunney, D & Ayers, D (Eds) Herpetology in Australia: a Diverse Discipline, pp. 383-395, Royal Zoological Society of NSW, Sydney.

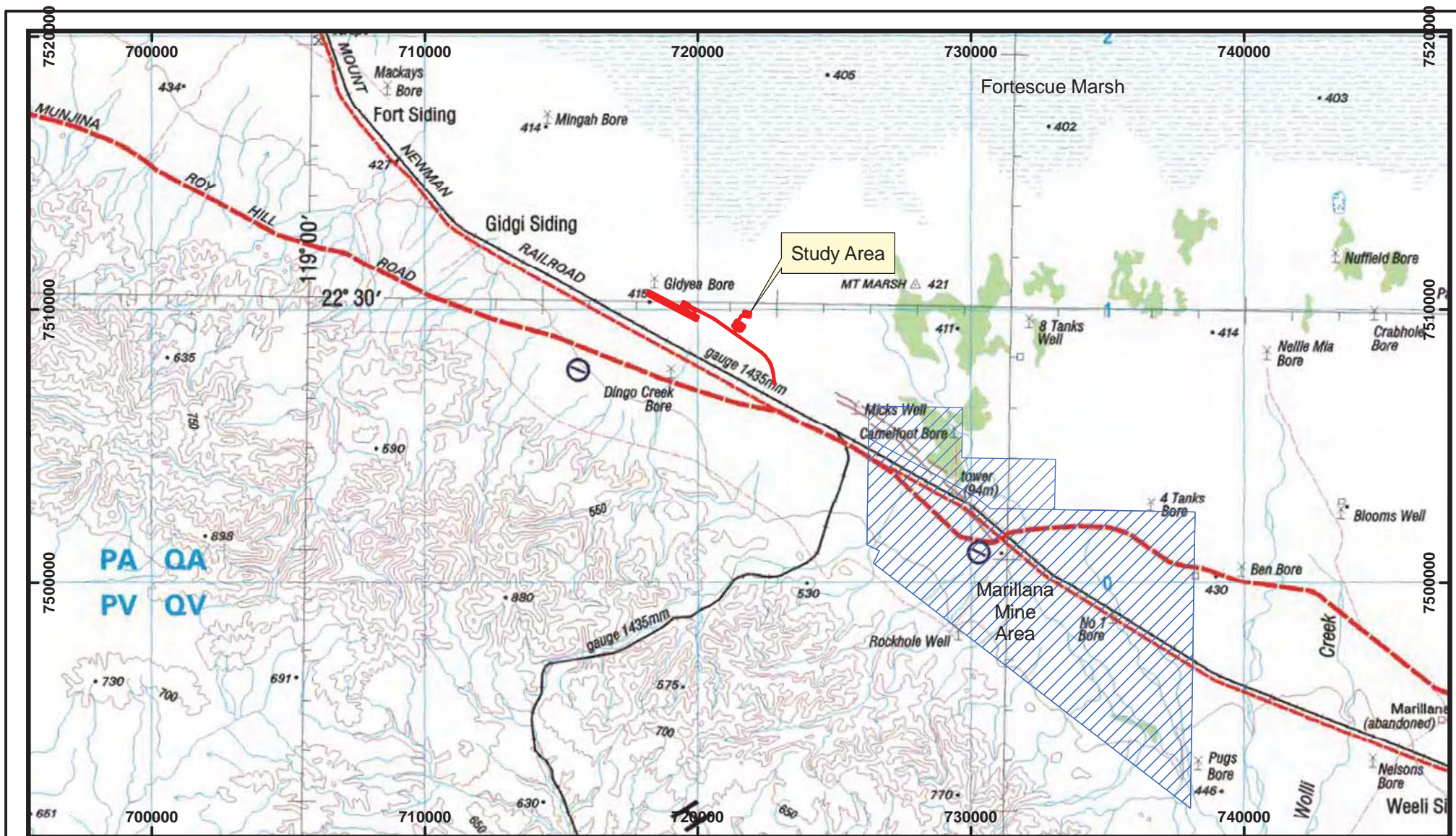
Pearson, D. (2003). Giant Pythons of the Pilbara. Landscape. 19(1).

Pizzey, G. and Knight, F. (2007). The Field Guide to the Birds of Australia. Harper Collins, Sydney. 8th Edition.

Simpson, K. and Day, N. (2010). Field Guide to the Birds of Australia. Penguin Books, Ringwood.

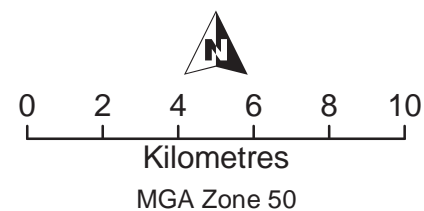
- Storr, G.M., Smith, L.A. and Johnstone R.E. (1983). Lizards of Western Australia II: Dragons and Monitors. WA Museum, Perth.
- Storr, G.M., Smith, L.A. and Johnstone R.E. (1990). Lizards of Western Australia III: Geckos and Pygopods. WA Museum, Perth.
- Storr, G.M., Smith, L.A. and Johnstone R.E. (1999). Lizards of Western Australia I: Skinks. Revised Edition, WA Museum, Perth.
- Storr, G.M., Smith, L.A. and Johnstone R.E. (2002). Snakes of Western Australia. Revised Edition, WA Museum, Perth.
- Terrestrial Ecosystems (2010). Fauna Risk Assessment for Roy Hill Iron Ore Pty Ltd Proposed Hillside South Railway Corridor. Unpublished report for Animal Plant Mineral Pty Ltd.
- Thompson G. (2010) Summary of Northern quoll workshop. Unpublished notes. Perth, April 2010.
- Tutt, M., S. Fekete, S. Mitchell, P. Brace & D. Pearson (2004). Unravelling the mysteries of Pilbara Olive Python ecology. Threatened Species Network Community Grants Final Report- Project WA11/101. Karratha: Nickol Bay Naturalists' Club/WA & CALM.
- Tutt, M. S. Mitchell, P. Brace & D. Pearson (2002). Conserving Pilbara olive pythons on the Burrup. Threatened Species Network community grants annual report, Project WA04/100. Karratha: Nickol Bay Naturalists' Club/WA & CALM
- Tyler M.J. & Doughty P. (2009). Field Guide to Frogs of Western Australia, Fourth Edition, WA Museum, Perth.
- Tyler M.J., Smith L.A. and Johnstone R.E. (2000). Frogs of Western Australia, Revised Edition, WA Museum, Perth.
- Thackway, R. and Cresswell, I. D. (1995). An Interim Biogeographic Regionalisation for Australia. Australian Nature Conservation Agency, Canberra.
- Van Dyck, S. & Strahan, R. Eds (2008) The Mammals of Australia. Third edition Queensland Museum.
- Van Vreeswyk, A.M.E., Payne, A. L., Leighton, K. A., & Henning, P. (2004). An inventory and condition survey of the Pilbara region, Western Australia, Technical Bulletin No.92. Department of Agriculture Western Australia, South Perth.
- Wilson, S. and Swan, G. (2010) A Complete Guide to Reptiles of Australia. Third Edition, Reed, New Holland, Sydney.

FIGURES



Legend

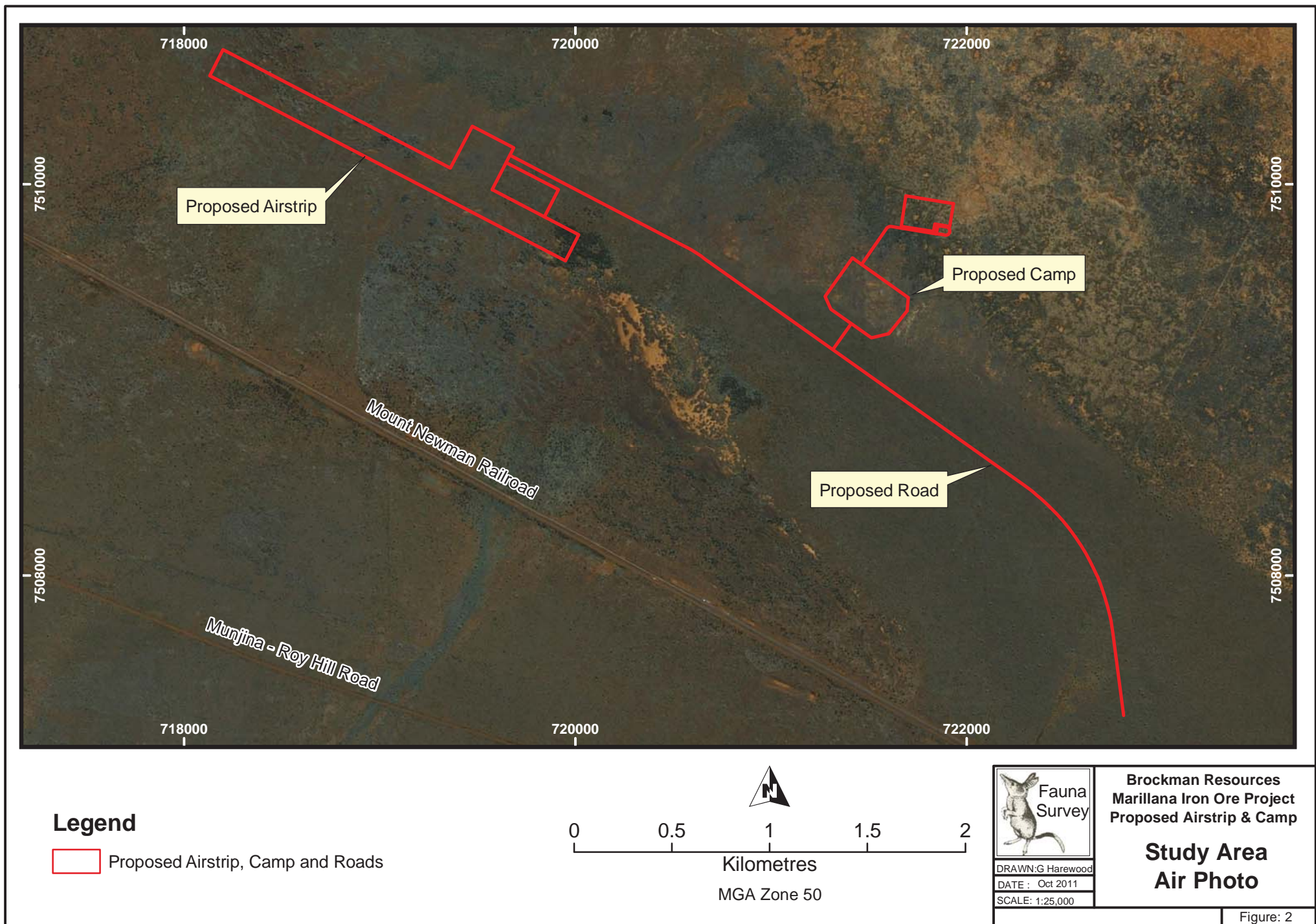
- Proposed Airstrip, Camp and Roads
- Marillana Mine Area



DRAWN: G Harewood
DATE : Sept 2011
SCALE: 1:200,000

Brockman Resources
Marillana Iron Ore Project
Proposed Airstrip & Camp

Study Area and Surrounds





7510000 mN

721000 mE

- Quadrat Location
- A.pteraneura open low woodland A over Triodia basedowii grassland
- E.odontocarpa/H. lorea very open shrub mallee over Triodia basedowii grassland
- A. pteraneura open low woodland A over sparse scrub of Acacia bivenosa
- A.victoriae open low shrub B over open dwarf scrub B of Frankenia ambita

Botanica Consulting

**Vegetation Map
Proposed Airstrip & Camp
Marilliana Iron Ore Project
Brockman Resources**

Date: 18/10/2011

Author: S Grundy

Office: Boulder

Drawing:

Scale: 1:20000

Projection: MGA Zone 50 (GDA94)

0 200 400 800
metres

Munjinna Roy Hill Rd

PLATES



Plate 1: Open Low Woodland (*Acacia pteraneura*) over Grassland (*Tridia basedowii*)



Plate 2: Very Open Shrub Mallee (*Euclayptus odontocarpa*/*Hakea lorea*) over Grassland (*Tridia basedowii*)



Plate 3: Open Low Woodland (*Acacia ptetraneura*) over Sparse Scrub (*Acacia bivenosa*)



Plate 4: Open Low Shrub (*Acacia victoriae*) over Open Dwarf Scrub (*Frankenia ambita*)

APPENDIX A

CONSERVATION CATEGORIES

EPBC Act (1999) Threatened Fauna Categories

Category	Code	Description
Extinct	E	There is no reasonable doubt that the last member of the species has died.
*Extinct in the wild	EW	A species (a) is known only to survive in cultivation, in captivity or as a naturalised population well outside its past range; or (b) has not been recorded in its known and/or expected habitat, at appropriate seasons, anywhere in its past range, despite exhaustive surveys over a time frame appropriate to its life cycle and form.
*Critically endangered	CE	A species is facing an extremely high risk of extinction in the wild in the immediate future.
*Endangered	EN	A species: (a) is not critically endangered; and (b) is facing a very high risk of extinction in the wild in the near future.
*Vulnerable	VU	A species (a) is not critically endangered or endangered; and (b) is facing a high risk of extinction in the wild in the medium-term future.
Conservation dependent	CD	A species is the focus of a specific conservation program the cessation of which would result in the species becoming vulnerable, endangered or critically endangered
*Migratory	Migratory	(a) all migratory species that are: (i) native species; and (ii) from time to time included in the appendices to the Bonn Convention; and (b) all migratory species from time to time included in annexes established under JAMBA, CAMBA and ROKAMBA; and (c) all native species from time to time identified in a list established under, or an instrument made under, an international agreement approved by the Minister.
Marine	Ma	Species in the list established under s248 of the EPBC Act

Note: Only species in those categories marked with an asterisk are matters of national environmental significance under the *EPBC Act*.

Western Australian Wildlife Conservation Act (1950) Threatened Fauna Categories

Category	Code	Description
Schedule 1	S1	<p>Fauna which is rare or likely to become extinct</p> <p>Threatened fauna (Schedule 1) are further ranked by the DEC according to their level of threat using IUCN Red List criteria:</p> <p>CR: Critically Endangered - considered to be facing an extremely high risk of extinction in the wild.</p> <p>EN: Endangered - considered to be facing a very high risk of extinction in the wild.</p> <p>VU: Vulnerable - considered to be facing a high risk of extinction in the wild.</p>
Schedule 2	S2	Fauna which is presumed extinct
Schedule 3	S3	Birds which are subject to an agreement between the governments of Australia and Japan (JAMBA) relating to the protection of migratory birds and birds in danger of extinction
Schedule 4	S4	Fauna that is otherwise in need of special protection

Western Australian DEC Priority Fauna Categories

Category	Code	Description
Priority 1	P1	Taxa that are known from one or a few collections or sight records (generally less than five), all on lands not managed for conservation, e.g. agricultural or pastoral lands, urban areas, Shire, Westrail and Main Roads WA road, gravel and soil reserves, and active mineral leases and under threat of habitat destruction or degradation. Taxa may be included if they are comparatively well known from one or more localities but do not meet adequacy of survey requirements and appear to be under immediate threat from known threatening processes..
Priority 2	P2	Taxa that are known from one or a few collections or sight records, some of which are on lands not under imminent threat of habitat destruction or degradation, e.g. national parks, conservation parks, nature reserves, State forest, vacant Crown land, water reserves, etc. Taxa may be included if they are comparatively well known from one or more localities but do not meet adequacy of survey requirements and appear to be under threat from known threatening processes.
Priority 3	P3	Taxa that are known from collections or sight records from several localities not under imminent threat, or from few but widespread localities with either large population size or significant remaining areas of apparently suitable habitat, much of it not under imminent threat. Taxa may be included if they are comparatively well known from several localities but do not meet adequacy of survey requirements and known threatening processes exist that could affect them.
Priority 4	P4	<p>(a) Rare. Taxa that are considered to have been adequately surveyed, or for which sufficient knowledge is available, and that are considered not currently threatened or in need of special protection, but could be if present circumstances change. These taxa are usually represented on conservation lands.</p> <p>(b) Near Threatened. Taxa that are considered to have been adequately surveyed and that do not qualify for Conservation Dependent, but that are close to qualifying for Vulnerable.</p> <p>(c) Taxa that have been removed from the list of threatened species during the past five years for reasons other than taxonomy.</p>
Priority 5	P5	Taxa that are not threatened but are subject to a specific conservation program, the cessation of which would result in the taxa becoming threatened within five years.

IUCN Red List Threatened Species Categories

Category	Code	Description
Extinct	EX	Taxa for which there is no reasonable doubt that the last individual has died.
Extinct in the Wild	EW	Taxa which is known only to survive in cultivation, in captivity or and as a naturalised population well outside its past range and it has not been recorded in known or expected habitat despite exhaustive survey over a time frame appropriate to its life cycle and form.
Critically Endangered	CR	Taxa facing an extremely high risk of extinction in the wild.
Endangered	EN	Taxa facing a very high risk of extinction in the wild.
Vulnerable	VU	Taxa facing a high risk of extinction in the wild.
Near Threatened	NT	Taxa which has been evaluated but does not qualify for CR, EN or VU now but is close to qualifying or likely to qualify in the near future.
Least Concern	LC	Taxa which has been evaluated but does not qualify for CR, EN, VU, or NT but is likely to qualify for NT in the near future.
Data Deficient	DD	Taxa for which there is inadequate information to make a direct or indirect assessment of its risk of extinction based on its distribution and/or population status.

A full list of categories and their meanings are available at:

<http://www.iucnredlist.org/technical-documents/categories-and-criteria/2001-categories-criteria>

APPENDIX B

FAUNA OBSERVED OR POTENTIALLY IN REGION OF STUDY AREA

Fauna Observed or Potentially in Region of Study Area

Marillana - Proposed Camp, Road and Airstrip

Approximate centroid - 22.505606°S and 119.144984°E

Compiled by Greg Harewood - October 2011
Recorded (Captured/Sighted/Heard/Signs) = X

Harewood, G. (2011). Terrestrial Fauna Survey (Level 1) of Proposed Camp, Road and Airstrip – Option B. Unpublished Report for Brockman Resources Ltd.
ecologia Environment (2009). Marillana Iron Ore Project Vertebrate Fauna Assessment. Unpublished report for Brockman Resources Ltd.
Biota Environmental Sciences (Biota) (2010). Yandicoogina Junction South West and Oxbow Fauna Survey. Unpublished Report for Rio Tinto Iron Ore.
Various Regional Surveys (Combined Results) - Yandicoogina (IES1981), Yandi (ecologia 1995; ecologia 2006d; ecologia 2008a; ecologia 2008b), Marillana Creek (HGM 1999), Marillana (Tenement ML70/270 SA Sec 2) (ecologia 2006c), Jirridi (ecologia 2006b), Ministers North (ecologia 2006a) and Yandi to Kurrajura (ecologia 2008c).
DEC (2011). NatureMap Database search. "By Circle" 119°08' 53" E, 22°30' 29" S – Study Area (plus 40km buffer). 25 September 2011.

Class Family Species	Common Name	Conservation Status	Harewood '11 Marillana Airstrip	ecologia '09 Marillana Mine Site	Biota '10 Yandicoogina	Various Regional Surveys	DEC '11 NatureMap
Amphibia							
Hylidae Tree or Water-Holding Frogs							
<i>Cyclorana maini</i>	Sheep Frog	LC				X	X
Reptilia							
Carphodactylidae Knob-tailed Geckos							
<i>Nephurus wheeleri cinctus</i>	Banded Knob-tailed Gecko			X		X	X

WC Act Status - S1 to S4, EPBC Act Status - EX = Extinct, EN = Endangered, VU = Vulnerable, Mg = Migratory, DEC Priority Status - P1 to P5, Int. Agmts - CA = CAMBA, JA = JAMBA, RK = ROKAMBA, IUCN Red List Category Definitions = LC, NT, DD ect - see <http://www.iucnredlist.org/technical-documents/categories-and-criteria/2001-categories-criteria>

Class Family Species	Common Name	Conservation Status	Harewood '11 Marillana Airstrip	ecologia '09 Marillana Mine Site	Biota '10 Yandicoogina	Various Regional Surveys	DEC '11 NatureMap
Diplodactylidae Geckoes							
<i>Crenadactylus ocellatus</i>	Clawless Gecko					X	X
<i>Diplodactylus conspicillatus</i>	Fat-tailed Gecko			X		X	X
<i>Diplodactylus pulcher</i>	Western Saddled Ground Gecko						X
<i>Diplodactylus savagei</i>	Southern Pilbara Beak-faced Gecko					X	X
<i>Lucasium stenodactylum</i>	Sand-plain Gecko			X	X	X	X
<i>Oedura marmorata</i>	Marbled Velvet Gecko				X	X	X
<i>Rhynchoedura ornata</i>	Beaked Gecko			X		X	X
<i>Strophurus ciliaris</i>	Northern Spiny-tailed Gecko					X	
<i>Strophurus elderi</i>	Jewelled Gecko					X	X
<i>Strophurus jeanae</i>						X	X
<i>Strophurus strophurus</i>	Ring-tailed Gecko			X			
<i>Strophurus wellingtonae</i>	Western Shield Spiny-tailed Gecko			X		X	X

WC Act Status - S1 to S4, EPBC Act Status - EX = Extinct, EN = Endangered, VU = Vulnerable, Mg = Migratory, DEC Priority Status - P1 to P5, Int. Agmts - CA = CAMBA, JA = JAMBA, RK = ROKAMBA, IUCN Red List Category Definitions = LC, NT, DD ect - see <http://www.iucnredlist.org/technical-documents/categories-and-criteria/2001-categories-criteria>

Class Family Species	Common Name	Conservation Status	Harewood '11 Marillana Airstrip	ecologia '09 Marillana Mine Site	Biota '10 Yandicoogina	Various Regional Surveys	DEC '11 NatureMap
Gekkonidae Geckoes							
<i>Gehyra pilbara</i>						X	X
<i>Gehyra purpurascens</i>	Purple Arid Dtella						X
<i>Gehyra variegata</i>	Variegated Dtella			X		X	X
<i>Heteronotia binoei</i>	Bynoe's Gecko			X		X	X
Pygopodidae Legless Lizards							
<i>Delma butleri</i>	Unbanded Delma						X
<i>Delma haroldi</i>							X
<i>Delma nasuta</i>	Sharp-snouted Delma				X	X	X
<i>Delma pax</i>	Peace Delma			X	X	X	X
<i>Delma tincta</i>	Excitable Delma			X		X	X
<i>Lialis burtonis</i>	Burton's Legless Lizard			X		X	X
<i>Pygopus nigriceps</i>	Hooded Scaly Foot						X

WC Act Status - S1 to S4, EPBC Act Status - EX = Extinct, EN = Endangered, VU = Vulnerable, Mg = Migratory, DEC Priority Status - P1 to P5, Int. Agmts - CA = CAMBA, JA = JAMBA, RK = ROKAMBA, IUCN Red List Category Definitions = LC, NT, DD ect - see <http://www.iucnredlist.org/technical-documents/categories-and-criteria/2001-categories-criteria>

Class Family Species	Common Name	Conservation Status	Harewood '11 Marillana Airstrip	ecologia '09 Marillana Mine Site	Biota '10 Yandicoogina	Various Regional Surveys	DEC '11 NatureMap
Agamidae Dragon Lizards							
<i>Amphibolurus longirostris</i>	Long-nosed Dragon			X	X	X	X
<i>Caimanops amphiboluroides</i>	Mulga Dragon			X		X	X
<i>Ctenophorus caudicinctus</i>	Ring-tailed Dragon			X	X	X	X
<i>Ctenophorus isolepis</i>	Central Military Dragon		X	X	X	X	X
<i>Ctenophorus nuchalis</i>	Central Netted Dragon			X		X	X
<i>Diporiphora valens</i>							X
<i>Pogona minor</i>	Western Bearded Dragon			X		X	X
<i>Tympanocryptis cephal</i>	Pebble Dragon			X			X

WC Act Status - S1 to S4, EPBC Act Status - EX = Extinct, EN = Endangered, VU = Vulnerable, Mg = Migratory, DEC Priority Status - P1 to P5, Int. Agmts - CA = CAMBA, JA = JAMBA, RK = ROKAMBA, IUCN Red List Category Definitions = LC, NT, DD ect - see <http://www.iucnredlist.org/technical-documents/categories-and-criteria/2001-categories-criteria>

Class Family Species	Common Name	Conservation Status	Harewood '11 Marillana Airstrip	ecologia '09 Marillana Mine Site	Biota '10 Yandicoogina	Various Regional Surveys	DEC '11 NatureMap
Varanidae							
Monitor's or Goanna's							
<i>Varanus acanthurus</i>	Spiny-tailed Monitor			X		X	X
<i>Varanus brevicauda</i>	Short-tailed Pygmy Monitor			X		X	X
<i>Varanus bushi</i>	Pilbara Mulga Monitor			X		X	X
<i>Varanus caudolineatus</i>	Stripe-tailed Pygmy Monitor			X		X	X
<i>Varanus eremius</i>	Pygmy Desert Monitor			X		X	X
<i>Varanus giganteus</i>	Perentie					X	X
<i>Varanus gouldii</i>	Bungarra or Sand Monitor			X		X	X
<i>Varanus panoptes</i>	Yellow-spotted Monitor					X	X
<i>Varanus tristis</i>	Racehorse Monitor					X	X

WC Act Status - S1 to S4, EPBC Act Status - EX = Extinct, EN = Endangered, VU = Vulnerable, Mg = Migratory, DEC Priority Status - P1 to P5, Int. Agmts - CA = CAMBA, JA = JAMBA, RK = ROKAMBA, IUCN Red List Category Definitions = LC, NT, DD ect - see <http://www.iucnredlist.org/technical-documents/categories-and-criteria/2001-categories-criteria>

Class Family Species	Common Name	Conservation Status	Harewood '11 Marillana Airstrip	ecologia '09 Marillana Mine Site	Biota '10 Yandicoogina	Various Regional Surveys	DEC '11 NatureMap
Scincidae Skinks							
<i>Carlia munda</i>	Shaded-litter Rainbow-skink			X	X	X	X
<i>Carlia triacantha</i>							X
<i>Cryptoblepharus buchananii</i>	Buchanan's Snake-eyed Skink						X
<i>Ctenotus ariadnae</i>				X		X	X
<i>Ctenotus duricola</i>						X	X
<i>Ctenotus grandis</i>	Grand Ctenotus			X		X	X
<i>Ctenotus hanloni</i>	Nimble Ctenotus				X	X	X
<i>Ctenotus helenae</i>	Clay-soil Ctenotus			X		X	X
<i>Ctenotus leonhardii</i>	Leonhardi's Skink					X	
<i>Ctenotus pantherinus</i>	Leopard Ctenotus			X	X	X	X
<i>Ctenotus piankai</i>						X	
<i>Ctenotus quattuordecimlineatus</i>						X	
<i>Ctenotus saxatilis</i>	Rock Ctenotus			X		X	X
<i>Ctenotus schomburgkii</i>	Barred Wedge-snout Ctenotus						X

WC Act Status - S1 to S4, EPBC Act Status - EX = Extinct, EN = Endangered, VU = Vulnerable, Mg = Migratory, DEC Priority Status - P1 to P5, Int. Agmts - CA = CAMBA, JA = JAMBA, RK = ROKAMBA, IUCN Red List Category Definitions = LC, NT, DD ect - see <http://www.iucnredlist.org/technical-documents/categories-and-criteria/2001-categories-criteria>

Class Family Species	Common Name	Conservation Status	Harewood '11 Marillana Airstrip	ecologia '09 Marillana Mine Site	Biota '10 Yandicoogina	Various Regional Surveys	DEC '11 NatureMap
<i>Ctenotus serventyi</i>						X	X
<i>Ctenotus uber</i>	Spotted Ctenotus			X			X
<i>Cyclodomorphus melanops melanops</i>	Spinifiex Slender Blue-tongue			X	X	X	X
<i>Egernia depressa</i>	Pygmy Spiny-tailed Skink					X	
<i>Lerista amicornum</i>							X
<i>Lerista bipes</i>	North-western Sandslider			X		X	X
<i>Lerista labialis</i>						X	X
<i>Lerista muelleri</i>	Common Mulch Skink			X		X	X
<i>Lerista neander</i>						X	
<i>Menetia greyii</i>	Dwarf Skink			X		X	X
<i>Menetia surda</i>							X
<i>Notoscincus ornatus</i>							X
<i>Proablepharus reginae</i>						X	X
<i>Tiliqua multifasciata</i>	Central Blue-tongue			X		X	X

WC Act Status - S1 to S4, EPBC Act Status - EX = Extinct, EN = Endangered, VU = Vulnerable, Mg = Migratory, DEC Priority Status - P1 to P5, Int. Agmts - CA = CAMBA, JA = JAMBA, RK = ROKAMBA, IUCN Red List Category Definitions = LC, NT, DD ect - see <http://www.iucnredlist.org/technical-documents/categories-and-criteria/2001-categories-criteria>

Class Family Species	Common Name	Conservation Status	Harewood '11 Marillana Airstrip	ecologia '09 Marillana Mine Site	Biota '10 Yandicoogina	Various Regional Surveys	DEC '11 NatureMap
Typhlopidae Blind Snakes							
<i>Ramphotyphlops ammodytes</i>				X		X	X
<i>Ramphotyphlops grypus</i>						X	X
<i>Ramphotyphlops hamatus</i>						X	X
<i>Ramphotyphlops pilbarensis</i>							X
<i>Ramphotyphlops waitii</i>						X	X
Boidae Pythons, Boas							
<i>Antaresia perthensis</i>	Pygmy Python					X	X
<i>Aspidites melanocephalus</i>	Black-headed Python					X	

WC Act Status - S1 to S4, EPBC Act Status - EX = Extinct, EN = Endangered, VU = Vulnerable, Mg = Migratory, DEC Priority Status - P1 to P5, Int. Agmts - CA = CAMBA, JA = JAMBA, RK = ROKAMBA, IUCN Red List Category Definitions = LC, NT, DD ect - see <http://www.iucnredlist.org/technical-documents/categories-and-criteria/2001-categories-criteria>

Class Family Species	Common Name	Conservation Status	Harewood '11 Marillana Airstrip	ecologia '09 Marillana Mine Site	Biota '10 Yandicoogina	Various Regional Surveys	DEC '11 NatureMap
Elapidae Elapid Snakes							
<i>Acanthophis pyrrhus</i>	Desert Death Adder					X	
<i>Acanthophis wellsi</i>	Pilbara Death Adder					X	X
<i>Brachyuropsis approximans</i>	North-western Shovel-nosed Snake					X	X
<i>Demansia psammophis</i>	Yellow-faced Whipsnake			X	X	X	X
<i>Demansia rufescens</i>	Rufous Whipsnake					X	X
<i>Furina ornata</i>	Moon Snake					X	X
<i>Parasuta monachus</i>	Monk Snake			X		X	X
<i>Pseudechis australis</i>	Mulga Snake			X		X	X
<i>Pseudonaja modesta</i>	Ringed Brown Snake					X	X
<i>Pseudonaja nuchalis</i>	Gwardar			X		X	X
<i>Suta fasciata</i>	Rosen's Snake					X	X
<i>Suta punctata</i>	Spotted Snake			X			X
<i>Vermicella snelli</i>							X

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Class Family Species	Common Name	Conservation Status	Harewood '11 Marillana Airstrip	ecologia '09 Marillana Mine Site	Biota '10 Yandicoogina	Various Regional Surveys	DEC '11 NatureMap
Aves							
Casuariidae Emus, Cassowaries							
<i>Dromaius novaehollandiae</i>	Emu	LC	X	X		X	X
Phasianidae Quails, Pheasants							
<i>Coturnix pectoralis</i>	Stubble Quail	LC			X		
<i>Coturnix ypsilophora</i>	Brown Quail	LC		X			

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Class Family Species	Common Name	Conservation Status	Harewood '11 Marillana Airstrip	ecologia '09 Marillana Mine Site	Biota '10 Yandicoogina	Various Regional Surveys	DEC '11 NatureMap
Accipitridae Kites, Goshawks, Eagles, Harriers							
<i>Accipiter cirrocephalus</i>	Collared Sparrowhawk	LC		X		X	X
<i>Accipiter fasciatus</i>	Brown Goshawk	LC		X		X	X
<i>Aquila audax</i>	Wedge-tailed Eagle	LC	X	X		X	X
<i>Aquila morphnoides</i>	Little Eagle	LC		X	X	X	X
<i>Circus assimilis</i>	Spotted Harrier	LC		X		X	X
<i>Elanus caeruleus</i>	Black-shouldered Kite	LC		X		X	X
<i>Haliastur sphenurus</i>	Whistling Kite	LC		X	X	X	X
<i>Hamirostra isura</i>	Square-tailed Kite	LC				X	X
<i>Hamirostra melanosternon</i>	Black-breasted Buzzard	LC		X		X	X
<i>Milvus migrans</i>	Black Kite	LC		X		X	X

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Class Family Species	Common Name	Conservation Status	Harewood '11 Marillana Airstrip	ecologia '09 Marillana Mine Site	Biota '10 Yandicoogina	Various Regional Surveys	DEC '11 NatureMap
Falconidae Falcons							
<i>Falco berigora</i>	Brown Falcon	LC	X	X		X	X
<i>Falco cenchroides</i>	Australian Kestrel	LC		X	X	X	X
<i>Falco hypoleucos</i>	Grey Falcon	P4 NT				X	X
<i>Falco longipennis</i>	Australian Hobby	LC		X		X	X
<i>Falco peregrinus</i>	Peregrine Falcon	S4 LC				X	X
Otididae Bustards							
<i>Ardeotis australis</i>	Australian Bustard	P4 NT	X	X		X	X
Turnicidae Button-quails							
<i>Turnix velox</i>	Little Button-quail	LC	X	X		X	X
Burhinidae Stone Curlews							
<i>Burhinus grallarius</i>	Bush Stone-curlew	P4 NT					X
Glareolidae Pratincoles							
<i>Stiltia isabella</i>	Australian Pratincole	LC					X

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Class Family Species	Common Name	Conservation Status	Harewood '11 Marillana Airstrip	ecologia '09 Marillana Mine Site	Biota '10 Yandicoogina	Various Regional Surveys	DEC '11 NatureMap
Columbidae Pigeons, Doves							
<i>Geopelia cuneata</i>	Diamond Dove	LC	X	X	X	X	X
<i>Geopelia striata</i>	Peaceful Dove				X	X	X
<i>Geophaps plumifera</i>	Spinifex Pigeon	LC		X	X	X	X
<i>Ocyphaps lophotes</i>	Crested Pigeon	LC	X	X	X	X	X
<i>Phaps chalcoptera</i>	Common Bronzewing	LC		X		X	X
Psittacidae Parrots							
<i>Cacatua roseicapilla</i>	Galah	LC	X	X		X	X
<i>Cacatua sanguinea</i>	Little Corella	LC		X	X	X	X
<i>Melopsittacus undulatus</i>	Budgerigar	LC	X	X		X	X
<i>Neophema bourkii</i>	Bourke's Parrot					X	X
<i>Nymphicus hollandicus</i>	Cockatiel	LC		X		X	X
<i>Platycercus varius</i>	Mulga Parrot	LC				X	X
<i>Platycercus zonarius</i>	Australian Ringneck	LC		X	X	X	X

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Class Family Species	Common Name	Conservation Status	Harewood '11 Marillana Airstrip	ecologia '09 Marillana Mine Site	Biota '10 Yandicoogina	Various Regional Surveys	DEC '11 NatureMap
Cuculidae Parasitic Cuckoos							
<i>Chrysococcyx basalis</i>	Horsfield's Bronze Cuckoo	LC	X	X	X	X	X
<i>Chrysococcyx osculans</i>	Black-eared Cuckoo	LC				X	X
<i>Cuculus pallidus</i>	Pallid Cuckoo	LC		X		X	X
Centropodidae Coucals							
<i>Centropus phasianinus</i>	Pheasant Coucal	LC		X	X		
Strigidae Hawk Owls							
<i>Ninox novaeseelandiae</i>	Boobook Owl	LC		X		X	X
Tytonidae Barn Owls							
<i>Tyto alba</i>	Barn Owl	LC		X		X	
Podargidae Frogmouths							
<i>Podargus strigoides</i>	Tawny Frogmouth	LC		X		X	X
Caprimulgidae Nightjars							
<i>Eurostopodus argus</i>	Spotted Nightjar	LC		X		X	X

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Class Family Species	Common Name	Conservation Status	Harewood '11 Marillana Airstrip	ecologia '09 Marillana Mine Site	Biota '10 Yandicoogina	Various Regional Surveys	DEC '11 NatureMap
Aegothelidae Owlet-nightjars							
<i>Aegotheles cristatus</i>	Australian Owlet-nightjar	LC				X	X
Apodidae Swifts, Swiftlets							
<i>Apus pacificus</i>	Fork-tailed Swift	S3 Mig CA JA RK L				X	
Halcyonidae Tree Kingfishers							
<i>Dacelo leachii</i>	Blue-winged Kookaburra	LC		X	X	X	X
<i>Todiramphus pyrrhopygia</i>	Red-backed Kingfisher	LC	X	X	X	X	X
<i>Todiramphus sanctus</i>	Sacred Kingfisher	LC		X		X	X
Meropidae Bee-eaters							
<i>Merops ornatus</i>	Rainbow Bee-eater	S3 Mig JA LC		X	X	X	X
Climacteridae Treecreepers							
<i>Climacteris melanura</i>	Black-tailed Treecreeper			X		X	

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Class Family Species	Common Name	Conservation Status	Harewood '11 Marillana Airstrip	ecologia '09 Marillana Mine Site	Biota '10 Yandicoogina	Various Regional Surveys	DEC '11 NatureMap
Maluridae Fairy Wrens, GrassWrens							
<i>Amytornis striatus</i>	Striated Grasswren					X	X
<i>Malurus lamberti</i>	Variegated Fairy-wren	LC	X	X	X	X	X
<i>Malurus leucopterus</i>	White-winged Fairy-wren	LC	X	X		X	X
<i>Stipiturus ruficeps</i>	Rufous-crowned Emu-wren	LC				X	X
Acanthizidae Thornbills, Geryones, Fieldwrens & Whitefaces							
<i>Acanthiza apicalis</i>	Broad-tailed Thornbill	LC				X	X
<i>Acanthiza chrysorrhoa</i>	Yellow-rumped Thornbill	LC					X
<i>Acanthiza robustirostris</i>	Slaty-backed Thornbill	LC				X	X
<i>Acanthiza uropygialis</i>	Chestnut-rumped Thornbill	LC		X		X	X
<i>Calamanthus campestris</i>	Rufous Fieldwren	LC					X
<i>Gerygone fusca</i>	Western Gerygone	LC		X	X	X	X
<i>Smicrornis brevirostris</i>	Weebill	LC	X	X	X	X	X

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Class Family Species	Common Name	Conservation Status	Harewood '11 Marillana Airstrip	ecologia '09 Marillana Mine Site	Biota '10 Yandicoogina	Various Regional Surveys	DEC '11 NatureMap
Pardalotidae Pardalotes							
<i>Pardalotus rubricatus</i>	Red-browed Pardalote	LC		X	X	X	X
<i>Pardalotus striatus</i>	Striated Pardalote	LC		X	X	X	X

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Class Family Species	Common Name	Conservation Status	Harewood '11 Marillana Airstrip	ecologia '09 Marillana Mine Site	Biota '10 Yandicoogina	Various Regional Surveys	DEC '11 NatureMap
Meliphagidae Honeyeaters, Chats							
<i>Acanthagenys rufogularis</i>	Spiny-cheeked Honeyeater	LC	X	X	X	X	X
<i>Certhionyx niger</i>	Black Honeyeater	LC		X		X	X
<i>Certhionyx variegatus</i>	Pied Honeyeater	LC		X		X	
<i>Epthianura tricolor</i>	Crimson Chat	LC		X		X	X
<i>Lacustroica whitei</i>	Grey Honeyeater						X
<i>Lichenostomus keartlandi</i>	Grey-headed Honeyeater	LC	X	X	X	X	X
<i>Lichenostomus penicillatus</i>	White-plumed Honeyeater	LC	X	X	X	X	X
<i>Lichenostomus plumulus</i>	Grey-fronted Honeyeater	LC					X
<i>Lichenostomus virescens</i>	Singing Honeyeater	LC	X	X	X	X	X
<i>Lichmera indistincta</i>	Brown Honeyeater	LC	X	X	X	X	X
<i>Manorina flavigula</i>	Yellow-throated Miner	LC	X	X	X	X	X
<i>Melithreptus gularis</i>	Black-chinned Honeyeater	LC				X	X
<i>Phylidonyris albifrons</i>	White-fronted Honeyeater	LC				X	X

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Class Family Species	Common Name	Conservation Status	Harewood '11 Marillana Airstrip	ecologia '09 Marillana Mine Site	Biota '10 Yandicoogina	Various Regional Surveys	DEC '11 NatureMap
Petroicidae Australian Robins							
<i>Petroica cucullata</i>	Hooded Robin	LC		X	X	X	X
<i>Petroica goodenovii</i>	Red-capped Robin	LC	X	X		X	X
Pomatostomidae Babblers							
<i>Pomatostomus superciliosus superciliosus</i>	White-browed Babbler (inland)	LC				X	X
<i>Pomatostomus temporalis</i>	Grey-crowned Babbler	LC		X	X	X	X
Cinclosomatidae Whipbirds, Wedgebills, Quail Thrushes							
<i>Psophodes occidentalis</i>	Western Wedgebill	LC					X
Neosittidae Sitellas							
<i>Daphoenositta chrysoptera</i>	Varied Sittella	LC				X	X
Pachycephalidae Crested Shrike-tit, Crested Bellbird, Shrike Thrushes, Whistlers							
<i>Colluricincla harmonica</i>	Grey Shrike-thrush	LC		X	X	X	X
<i>Oreoica gutturalis pallescens</i>	Crested Bellbird (inland/nth)	LC		X	X	X	X
<i>Pachycephala rufiventris</i>	Rufous Whistler	LC	X	X	X	X	X

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Class Family Species	Common Name	Conservation Status	Harewood '11 Marillana Airstrip	ecologia '09 Marillana Mine Site	Biota '10 Yandicoogina	Various Regional Surveys	DEC '11 NatureMap
Dicruridae Monarchs, Magpie Lark, Flycatchers, Fantails, Drongo							
<i>Grallina cyanoleuca</i>	Magpie-lark	LC		X	X	X	X
<i>Rhipidura leucophrys</i>	Willie Wagtail	LC	X	X	X	X	X
Campephagidae Cuckoo-shrikes, Trillers							
<i>Coracina maxima</i>	Ground Cuckoo-shrike	LC				X	X
<i>Coracina novaehollandiae</i>	Black-faced Cuckoo-shrike	LC		X	X	X	X
<i>Lalage tricolor</i>	White-winged Triller	LC		X		X	X
Artamidae Woodswallows, Butcherbirds, Currawongs							
<i>Artamus cinereus</i>	Black-faced Woodswallow	LC	X	X	X	X	X
<i>Artamus personatus</i>	Masked Woodswallow	LC		X	X	X	X
Cracticidae Currawongs, Magpies & Butcherbirds							
<i>Cracticus nigrogularis</i>	Pied Butcherbird	LC		X		X	X
<i>Cracticus tibicen</i>	Australian Magpie	LC	X	X		X	X
<i>Cracticus torquatus</i>	Grey Butcherbird	LC		X		X	X

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Class Family Species	Common Name	Conservation Status	Harewood '11 Marillana Airstrip	ecologia '09 Marillana Mine Site	Biota '10 Yandicoogina	Various Regional Surveys	DEC '11 NatureMap
Corvidae Ravens, Crows							
<i>Corvus bennetti</i>	Little Crow	LC			X	X	X
<i>Corvus orru</i>	Torresian Crow	LC		X	X	X	X
Ptilonorhynchidae Bowerbirds							
<i>Ptilonorhynchus maculatus guttatus</i>	Western Bowerbird					X	X
Alaudidae Old World Larks							
<i>Mirafrja javanica</i>	Horsfield's Bushlark	LC		X		X	X
Motacillidae Old World Pipits, Wagtails							
<i>Anthus australis</i>	Australian Pipit	LC		X		X	X
Estrilidae Grass Finches & Mannikins							
<i>Taeniopygia guttata</i>	Zebra Finch	LC	X	X	X	X	X
Dicaeidae Flowerpeckers							
<i>Dicaeum hirundinaceum</i>	Mistletoebird	LC		X		X	X

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Class Family Species	Common Name	Conservation Status	Harewood '11 Marillana Airstrip	ecologia '09 Marillana Mine Site	Biota '10 Yandicoogina	Various Regional Surveys	DEC '11 NatureMap
Hirundinidae Swallows, Martins							
<i>Cheramoeca leucosternus</i>	White-backed Swallow	LC				X	
<i>Hirundo neoxena</i>	Welcome Swallow	LC		X			X
<i>Hirundo nigricans</i>	Tree Martin	LC		X	X	X	X
Sylviidae Old World Warblers							
<i>Cincloramphus cruralis</i>	Brown Songlark	LC		X		X	X
<i>Cincloramphus mathewsi</i>	Rufous Songlark	LC		X	X	X	X
<i>Eremiornis carteri</i>	Spinifex-bird	LC	X	X		X	X
Mammalia							
Tachyglossidae Echidnas							
<i>Tachyglossus aculeatus</i>	Echidna	LC					

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Class Family Species	Common Name	Conservation Status	Harewood '11 Marillana Airstrip	ecologia '09 Marillana Mine Site	Biota '10 Yandicoogina	Various Regional Surveys	DEC '11 NatureMap
Dasyuridae Carnivorous Marsupials							
<i>Dasykaluta rosamondae</i>	Little Red Kaluta	LC		X		X	X
<i>Ningui timealeyi</i>	Pilbara Ningui	LC			X	X	X
<i>Planigale ingrami</i>	Long-tailed Planigale	LC					X
<i>Planigale maculata</i>	Common Planigale	LC				X	X
<i>Pseudantechinus woolleyae</i>	Woolley's Pseudantechinus	LC				X	X
<i>Sminthopsis macroura</i>	Stripe-faced Dunnart	LC		X		X	X
<i>Sminthopsis youngsoni</i>	Lesser Hairy-footed Dunnart	LC		X		X	X
Macropodidae Kangaroos, Wallabies							
<i>Macropus robustus</i>	Euro	LC				X	X
<i>Macropus rufus</i>	Red Kangaroo	LC	X	X		X	X
Emballonuridae Sheath-tailed Bats							
<i>Saccolaimus flaviventris</i>	Yellow-bellied Sheathtail-bat	NT		X	X	X	X
<i>Taphozous georgianus</i>	Common Sheathtail-bat	LC		X	X	X	X
<i>Taphozous hilli</i>	Hill's Sheathtail-bat	LC		X		X	X

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Class Family Species	Common Name	Conservation Status	Harewood '11 Marillana Airstrip	ecologia '09 Marillana Mine Site	Biota '10 Yandicoogina	Various Regional Surveys	DEC '11 NatureMap
Molossidae Freetail Bats							
<i>Chaerephon jobensis</i>	Northern Freetail-bat	LC		X		X	X
<i>Mormopterus beccarii</i>	Beccari's Freetail-bat	LC		X		X	X
<i>Tadarida australis</i>	White-striped Freetail-bat	LC			X	X	X
Vespertilionidae Ordinary Bats							
<i>Chalinolobus gouldii</i>	Gould's Wattled Bat	LC		X	X	X	X
<i>Chalinolobus morio</i>	Chocolate Wattled Bat	LC				X	X
<i>Nyctophilus bifax daedalus</i>	Northwestern Long-eared Bat			X		X	X
<i>Nyctophilus geoffroyi</i>	Lesser Long-eared Bat	LC		X		X	X
<i>Scotorepens greyii</i>	Little Broad-nosed Bat			X	X	X	X
<i>Vespadelus finlaysoni</i>	Finlayson's Cave Bat	LC		X	X	X	X

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Class Family Species	Common Name	Conservation Status	Harewood '11 Marillana Airstrip	ecologia '09 Marillana Mine Site	Biota '10 Yandicoogina	Various Regional Surveys	DEC '11 NatureMap
Muridae Rats, Mice							
<i>Leggadina lakedownensis</i>	Short-tailed Mouse	P4 NT					X
<i>Mus musculus</i>	House Mouse	Introduced		X		X	X
<i>Notomys alexis</i>	Spinifex Hopping-mouse	LC		X		X	X
<i>Pseudomys desertor</i>	Desert Mouse	NT		X		X	X
<i>Pseudomys hermannsburgensis</i>	Sandy Inland Mouse	LC		X	X	X	X
Canidae Dogs, Foxes							
<i>Canis lupus dingo</i>	Dingo	LC	X	X		X	X
<i>Canis lupus familiaris</i>	Dog	Introduced				X	X
Felidae Cats							
<i>Felis catus</i>	Cat	Introduced	X	X		X	X
Equidae Horses							
<i>Equus asinus</i>	Donkey	Introduced			X		X
<i>Equus caballus</i>	Horse	Introduced		X			X

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Class Family Species	Common Name	Conservation Status	Harewood '11 Marillana Airstrip	ecologia '09 Marillana Mine Site	Biota '10 Yandicoogina	Various Regional Surveys	DEC '11 NatureMap
Bovidae Horned Ruminants							
<i>Bos taurus</i>	European Cattle	Introduced	X	X	X	X	X
Camelidae Camels							
<i>Camelus dromedarius</i>	Camel	Introduced				X	
Leporidae Rabbits, Hares							
<i>Oryctolagus cuniculus</i>	Rabbit	Introduced		X			X

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APPENDIX C

DEC NATUREMAP & PROTECTED MATTERS DATABASE SEARCH RESULTS

NatureMap - Marillana - Frogs

Created By Greg Harewood on 25/09/2011

Kingdom Animalia
Species Group Amphibians
Method 'By Circle'
Centre 119°08' 53" E, 22°30' 29" S
Buffer 40km

	Name ID	Species Name	Naturalised	Conservation Code	¹ Endemic To Query Area
1.	25375	<i>Cyclorana maini</i> (Sheep Frog)			
2.	25392	<i>Litoria rubella</i> (Little Red Tree Frog)			
3.	25445	<i>Uperoleia russelli</i> (Northwest Toadlet)			

Conservation Codes
T - Rare or likely to become extinct
X - Presumed extinct
IA - Protected under international agreement
S - Other specially protected fauna
1 - Priority 1
2 - Priority 2
3 - Priority 3
4 - Priority 4
5 - Priority 5

¹ For NatureMap's purposes, species flagged as endemic are those whose records are wholly contained within the search area. Note that only those records complying with the search criterion are included in the calculation. For example, if you limit records to those from a specific datasource, only records from that datasource are used to determine if a species is restricted to the query area.

NatureMap - Marillana - Reptiles

Created By Greg Harewood on 25/09/2011

Kingdom Animalia
Species Group Reptiles
Method 'By Circle'
Centre 119°08' 53" E, 22°30' 29" S
Buffer 40km

	Name ID	Species Name	Naturalised	Conservation Code	¹ Endemic To Query Area
1.	25332	<i>Acanthophis wellsi</i> (Pilbara Death Adder)			
2.	30833	<i>Amphibolurus longirostris</i>			
3.	25318	<i>Antaresia perthensis</i> (Pygmy Python)			
4.	25241	<i>Antaresia stimsoni</i> subsp. <i>stimsoni</i>			
5.	25331	<i>Brachyuophis approximans</i>			
6.	24861	<i>Caimanops amphiboluioides</i>			
7.	25015	<i>Carlia munda</i>			
8.	25017	<i>Carlia triacantha</i>			
9.	25339	<i>Chelodina steindachneri</i> (Flat-shelled Turtle)			
10.	24919	<i>Crenadactylus ocellatus</i> subsp. <i>horni</i>			
11.	30893	<i>Cryptoblepharus buchananii</i>			
12.	25020	<i>Cryptoblepharus plagiocephalus</i>			
13.	30892	<i>Cryptoblepharus ustulatus</i>			
14.	25458	<i>Ctenophorus caudicinctus</i> (Ring-tailed Dragon)			
15.	24865	<i>Ctenophorus caudicinctus</i> subsp. <i>caudicinctus</i>			
16.	25459	<i>Ctenophorus isolepis</i> (Crested Dragon)			
17.	24874	<i>Ctenophorus isolepis</i> subsp. <i>citrinus</i>			
18.	24876	<i>Ctenophorus isolepis</i> subsp. <i>isolepis</i>			
19.	24882	<i>Ctenophorus nuchalis</i> (Central Netted Dragon)			
20.	24886	<i>Ctenophorus reticulatus</i> (Western Netted Dragon)			
21.	24889	<i>Ctenophorus scutulatus</i>			
22.	25025	<i>Ctenotus ariadnae</i>			
23.	25036	<i>Ctenotus duricola</i>			
24.	25462	<i>Ctenotus grandis</i>			
25.	25041	<i>Ctenotus grandis</i> subsp. <i>grandis</i>			
26.	25043	<i>Ctenotus grandis</i> subsp. <i>titan</i>			
27.	25044	<i>Ctenotus hanloni</i>			
28.	25045	<i>Ctenotus helenae</i>			
29.	25463	<i>Ctenotus pantherinus</i> (Leopard Ctenotus)			
30.	25060	<i>Ctenotus pantherinus</i> subsp. <i>acripes</i>			
31.	25064	<i>Ctenotus pantherinus</i> subsp. <i>ocellifer</i>			
32.	25065	<i>Ctenotus pantherinus</i> subsp. <i>pantherinus</i>			
33.	25072	<i>Ctenotus rubicundus</i>			
34.	25071	<i>Ctenotus rutilans</i>			
35.	25073	<i>Ctenotus saxatilis</i> (Rock Ctenotus)			
36.	25074	<i>Ctenotus schomburgkii</i>			
37.	25077	<i>Ctenotus serventyi</i>			
38.	25081	<i>Ctenotus uber</i> subsp. <i>johnstonei</i>		P2	
39.	25090	<i>Cyclodomorphus melanops</i> subsp. <i>melanops</i>			
40.	24997	<i>Delma butleri</i>			
41.	24998	<i>Delma elegans</i>			
42.	25000	<i>Delma haroldi</i>			
43.	25001	<i>Delma nasuta</i>			
44.	25002	<i>Delma pax</i>			
45.	25004	<i>Delma tincta</i>			
46.	25468	<i>Demansia psammophis</i> (Yellow-faced Whipsnake)			
47.	25295	<i>Demansia psammophis</i> subsp. <i>cupreiceps</i>			
48.	25297	<i>Demansia rufescens</i> (Rufous Whipsnake)			
49.	24926	<i>Diplodactylus conspicillatus</i> (Fat-tailed Gecko)			
50.	24940	<i>Diplodactylus pulcher</i>			
51.	24944	<i>Diplodactylus savagei</i>			
52.	24899	<i>Diporiphora valens</i>			
53.	25094	<i>Egernia formosa</i>			

	Name ID	Species Name	Naturalised	Conservation Code	¹ Endemic To Query Area
54.	25301	<i>Furina ornata</i> (Moon Snake)			
55.	24956	<i>Gehyra pilbara</i>			
56.	24958	<i>Gehyra punctata</i>			
57.	24957	<i>Gehyra purpurascens</i>			
58.	24959	<i>Gehyra variegata</i>			
59.	24961	<i>Heteronotia binoei</i> (Bynoe's Gecko)			
60.	24962	<i>Heteronotia spelea</i> (Desert Cave Gecko)			
61.	30926	<i>Lerista amicornum</i>			
62.	25125	<i>Lerista bipes</i>			
63.	30929	<i>Lerista jacksoni</i>			
64.	25146	<i>Lerista labialis</i>			
65.	25155	<i>Lerista muelleri</i>			
66.	30925	<i>Lerista verhmens</i>			
67.	25183	<i>Lerista zietzi</i>			
68.	25005	<i>Lialis burtonis</i>			
69.	25238	<i>Liasis olivaceus</i> subsp. <i>barroni</i>		T	
70.	24902	<i>Lophognathus longirostris</i>			
71.	30933	<i>Lucasium stenodactylum</i>			
72.	30934	<i>Lucasium wombeyi</i>			
73.	25184	<i>Menetia greyii</i>			
74.	25187	<i>Menetia surda</i> subsp. <i>surda</i>			
75.	25495	<i>Morethia ruficauda</i>			
76.	25193	<i>Morethia ruficauda</i> subsp. <i>exquisita</i>			
77.	24972	<i>Nephurus wheeleri</i> subsp. <i>cinctus</i>			
78.	25499	<i>Notoscincus ornatus</i>			
79.	25197	<i>Notoscincus ornatus</i> subsp. <i>ornatus</i>			
80.	24976	<i>Oedura marmorata</i> (Marbled Velvet Gecko)			
81.	25254	<i>Parasuta monachus</i>			
82.	25510	<i>Pogona minor</i>			
83.	24905	<i>Pogona minor</i> subsp. <i>minima</i> (Dwarf Bearded Dragon)		T	
84.	24907	<i>Pogona minor</i> subsp. <i>minor</i>			
85.	24908	<i>Pogona minor</i> subsp. <i>mittelli</i>			
86.	25199	<i>Proablepharus reginae</i>			
87.	25261	<i>Pseudechis australis</i> (Mulga Snake)			
88.	25263	<i>Pseudonaja modesta</i> (Ringed Brown Snake)			
89.	25264	<i>Pseudonaja nuchalis</i> (Gwardar)			
90.	25009	<i>Pygopus nigriceps</i>			
91.	25270	<i>Ramphotyphlops ammodytes</i>			
92.	25276	<i>Ramphotyphlops ganei</i>		P1	
93.	25277	<i>Ramphotyphlops grypus</i>			
94.	25279	<i>Ramphotyphlops hamatus</i>			
95.	25315	<i>Ramphotyphlops pilbarensis</i>			
96.	25288	<i>Ramphotyphlops waitii</i>			
97.	24982	<i>Rhynchoedura ornata</i> (Beaked Gecko)			
98.	24927	<i>Strophurus elderi</i>			
99.	24932	<i>Strophurus jeanae</i>			
100.	24949	<i>Strophurus wellingtonae</i>			
101.	25269	<i>Suta fasciata</i> (Rosen's Snake)			
102.	25307	<i>Suta punctata</i> (Spotted Snake)			
103.	25202	<i>Tiliqua multifasciata</i> (Central Blue-tongue)			
104.	30814	<i>Tympanocryptis cephalus</i> (Pebble Dragon)			
105.	25209	<i>Varanus acanthurus</i> (Spiny-tailed Monitor)			
106.	25210	<i>Varanus breviceuda</i> (Short-tailed Pygmy Monitor)			
107.	30825	<i>Varanus bushi</i> (Pilbara Mulga Monitor)			
108.	25211	<i>Varanus caudolineatus</i>			
109.	25212	<i>Varanus eremius</i> (Pygmy Desert Monitor)			
110.	25216	<i>Varanus giganteus</i> (Perentie)			
111.	25218	<i>Varanus gouldii</i> (Bungarra or Sand Monitor)			
112.	25524	<i>Varanus panoptes</i> (Yellow-spotted Monitor)			
113.	25223	<i>Varanus panoptes</i> subsp. <i>rubidus</i>			
114.	25224	<i>Varanus pilbarensis</i> (Pilbara Rock Monitor)			
115.	25526	<i>Varanus tristis</i> (Racehorse Monitor)			
116.	25227	<i>Varanus tristis</i> subsp. <i>tristis</i> (Racehorse Monitor)			
117.	25311	<i>Vermicella snelli</i>			

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 1 - Priority 1
 2 - Priority 2
 3 - Priority 3

NatureMap - Marillana - Birds

Created By Greg Harewood on 25/09/2011

Kingdom Animalia
Species Group Birds
Method 'By Circle'
Centre 119°08' 53" E, 22°30' 29" S
Buffer 40km

	Name ID	Species Name	Naturalised	Conservation Code	¹ Endemic To Query Area
1.	24559	<i>Acanthagenys rufogularis</i> (Spiny-cheeked Honeyeater)			
2.	24260	<i>Acanthiza apicalis</i> (Broad-tailed Thornbill)			
3.	24261	<i>Acanthiza chrysorrhoa</i> (Yellow-rumped Thornbill)			
4.	24264	<i>Acanthiza robustirostris</i> (Slaty-backed Thornbill)			
5.	24265	<i>Acanthiza uropygialis</i> (Chestnut-rumped Thornbill)			
6.	25535	<i>Accipiter cirrocephalus</i> (Collared Sparrowhawk)			
7.	24281	<i>Accipiter cirrocephalus</i> subsp. <i>cirrocephalus</i>			
8.	25536	<i>Accipiter fasciatus</i> (Brown Goshawk)			
9.	25544	<i>Aegotheles cristatus</i> (Australian Owlet-nightjar)			
10.	25647	<i>Amytornis striatus</i> (Striated Grasswren)			
11.	24540	<i>Amytornis striatus</i> subsp. <i>whitei</i>			
12.	24312	<i>Anas gracilis</i> (Grey Teal)			
13.	24316	<i>Anas superciliosa</i> (Pacific Black Duck)			
14.	25553	<i>Anhinga melanogaster</i> (Darter)			
15.	25670	<i>Anthus australis</i> (Australian Pipit)			
16.	24599	<i>Anthus australis</i> subsp. <i>australis</i>			
17.	-365	<i>Anthus novaeseelandiae</i>			
18.	24285	<i>Aquila audax</i> (Wedge-tailed Eagle)			
19.	25538	<i>Aquila morphnoides</i> (Little Eagle)			
20.	25556	<i>Ardea alba</i> (Great Egret)			
21.	24340	<i>Ardea novaehollandiae</i> (White-faced Heron)			
22.	24341	<i>Ardea pacifica</i> (White-necked Heron)			
23.	24610	<i>Ardeotis australis</i> (Australian Bustard)		P4	
24.	25566	<i>Artamus cinereus</i> (Black-faced Woodswallow)			
25.	24352	<i>Artamus cinereus</i> subsp. <i>melanops</i>			
26.	24355	<i>Artamus minor</i> (Little Woodswallow)			
27.	24356	<i>Artamus personatus</i> (Masked Woodswallow)			
28.	-386	<i>Barnardius zonarius</i>			
29.	24359	<i>Burhinus grallarius</i> (Bush Stone-curlew)		P4	
30.	25715	<i>Cacatua roseicapilla</i> (Galah)			
31.	24725	<i>Cacatua roseicapilla</i> subsp. <i>assimilis</i>			
32.	25716	<i>Cacatua sanguinea</i> (Little Corella)			
33.	-343	<i>Cacomantis pallidus</i>			
34.	24269	<i>Calamanthus campestris</i> (Rufous Fieldwren)			
35.	24563	<i>Certhionyx niger</i> (Black Honeyeater)			
36.	-377	<i>Chalcites basal</i>			
37.	24373	<i>Charadrius melanops</i> (Black-fronted Dotterel)			
38.	24321	<i>Chenonetta jubata</i> (Australian Wood Duck)			
39.	24431	<i>Chrysococcyx basalis</i> (Horsfield's Bronze Cuckoo)			
40.	24434	<i>Chrysococcyx osculans</i> (Black-eared Cuckoo)			
41.	24833	<i>Cincloramphus cruralis</i> (Brown Songlark)			
42.	24834	<i>Cincloramphus mathewsi</i> (Rufous Songlark)			
43.	25580	<i>Cinclosoma castaneothorax</i> (Chestnut-breasted Quail-thrush)			
44.	24288	<i>Circus approximans</i> (Swamp Harrier)			
45.	24289	<i>Circus assimilis</i> (Spotted Harrier)			
46.	25675	<i>Colluricincla harmonica</i> (Grey Shrike-thrush)			
47.	24613	<i>Colluricincla harmonica</i> subsp. <i>rufiventris</i>			
48.	24361	<i>Coracina maxima</i> (Ground Cuckoo-shrike)			
49.	25568	<i>Coracina novaehollandiae</i> (Black-faced Cuckoo-shrike)			
50.	24362	<i>Coracina novaehollandiae</i> subsp. <i>novaehollandiae</i>			
51.	24363	<i>Coracina novaehollandiae</i> subsp. <i>subpallida</i>			
52.	24416	<i>Corvus bennetti</i> (Little Crow)			
53.	25593	<i>Corvus orru</i> (Torresian Crow)			

	Name ID	Species Name	Naturalised	Conservation Code	¹ Endemic To Query Area
54.	24418	<i>Corvus orru</i> subsp. <i>ceciliae</i> (Western Crow)			
55.	24420	<i>Cracticus nigrogularis</i> (Pied Butcherbird)			
56.	25595	<i>Cracticus tibicen</i> (Australian Magpie)			
57.	24422	<i>Cracticus tibicen</i> subsp. <i>dorsalis</i> (White-backed Magpie)			
58.	24423	<i>Cracticus tibicen</i> subsp. <i>tibicen</i> (Black-backed Magpie)			
59.	25596	<i>Cracticus torquatus</i> (Grey Butcherbird)			
60.	24435	<i>Cuculus pallidus</i> (Pallid Cuckoo)			
61.	25547	<i>Dacelo leachii</i> (Blue-winged Kookaburra)			
62.	24304	<i>Dacelo leachii</i> subsp. <i>leachii</i>			
63.	25673	<i>Daphoenositta chrysoptera</i> (Varied Sittella)			
64.	24325	<i>Dendrocygna eytoni</i> (Plumed Whistling Duck)			
65.	25607	<i>Dicaeum hirundinaceum</i> (Mistletoebird)			
66.	24470	<i>Dromaius novaehollandiae</i> (Emu)			
67.	-330	<i>Egretta novaehollandiae</i>			
68.	-353	<i>Elanus axillaris</i>			
69.	-326	<i>Elseyornis melanops</i>			
70.	24631	<i>Emblema pictum</i> (Painted Finch)			
71.	-322	<i>Eolophus roseicapillus</i>			
72.	24568	<i>Epthianura aurifrons</i> (Orange Chat)			
73.	24570	<i>Epthianura tricolor</i> (Crimson Chat)			
74.	24837	<i>Eremiornis carteri</i> (Spinifex-bird)			
75.	24379	<i>Erythronys cinctus</i> (Red-kneed Dotterel)			
76.	24368	<i>Eurostopodus argus</i> (Spotted Nightjar)			
77.	25621	<i>Falco berigora</i> (Brown Falcon)			
78.	24471	<i>Falco berigora</i> subsp. <i>berigora</i>			
79.	25622	<i>Falco cenchroides</i> (Australian Kestrel)			
80.	24472	<i>Falco cenchroides</i> subsp. <i>cenchroides</i>			
81.	24473	<i>Falco hypoleucos</i> (Grey Falcon)		P4	
82.	25623	<i>Falco longipennis</i> (Australian Hobby)			
83.	24474	<i>Falco longipennis</i> subsp. <i>longipennis</i>			
84.	25624	<i>Falco peregrinus</i> (Peregrine Falcon)		S	
85.	24401	<i>Geopelia cuneata</i> (Diamond Dove)			
86.	25585	<i>Geopelia striata</i> (Peaceful Dove)			
87.	24403	<i>Geopelia striata</i> subsp. <i>placida</i>			
88.	24404	<i>Geophaps plumifera</i> (Spinifex Pigeon)			
89.	25530	<i>Gerygone fusca</i> (Western Gerygone)			
90.	24271	<i>Gerygone fusca</i> subsp. <i>fusca</i>			
91.	24443	<i>Grallina cyanoleuca</i> (Magpie-lark)			
92.	24293	<i>Haliaeetus leucogaster</i> (White-bellied Sea-Eagle)			
93.	24295	<i>Haliastur sphenurus</i> (Whistling Kite)			
94.	24296	<i>Hamirostra isura</i> (Square-tailed Kite)			
95.	24297	<i>Hamirostra melanostemon</i> (Black-breasted Buzzard)			
96.	-354	<i>Hieraaetus morphnoides</i>			
97.	25734	<i>Himantopus himantopus</i> (Black-winged Stilt)			
98.	24489	<i>Hirundo ariel</i> (Fairy Martin)			
99.	24491	<i>Hirundo neoxena</i> (Welcome Swallow)			
100.	25629	<i>Hirundo nigricans</i> (Tree Martin)			
101.	24572	<i>Lacustroica whitei</i> (Grey Honeyeater)			
102.	-394	<i>Lalage sueurii</i>			
103.	24367	<i>Lalage tricolor</i> (White-winged Triller)			
104.	24575	<i>Lichenostomus keartlandi</i> (Grey-headed Honeyeater)			
105.	24578	<i>Lichenostomus penicillatus</i> (White-plumed Honeyeater)			
106.	24579	<i>Lichenostomus plumulus</i> (Grey-fronted Honeyeater)			
107.	24581	<i>Lichenostomus virescens</i> (Singing Honeyeater)			
108.	25661	<i>Lichmera indistincta</i> (Brown Honeyeater)			
109.	24582	<i>Lichmera indistincta</i> subsp. <i>indistincta</i>			
110.	25651	<i>Malurus lamberti</i> (Variegated Fairy-wren)			
111.	24544	<i>Malurus lamberti</i> subsp. <i>assimilis</i>			
112.	25652	<i>Malurus leucopterus</i> (White-winged Fairy-wren)			
113.	24548	<i>Malurus leucopterus</i> subsp. <i>leucopterus</i>		T	
114.	24583	<i>Manorina flavigula</i> (Yellow-throated Miner)			
115.	-323	<i>Melanodryas cucullata</i>			
116.	25665	<i>Melithreptus gularis</i> (Black-chinned Honeyeater)			
117.	24736	<i>Melopsittacus undulatus</i> (Budgerigar)			
118.	24598	<i>Merops ornatus</i> (Rainbow Bee-eater)			
119.	25542	<i>Milvus migrans</i> (Black Kite)			
120.	25545	<i>Mirafra javanica</i> (Horsfield's Bushlark)			
121.	24302	<i>Mirafra javanica</i> subsp. <i>horsfieldii</i>			
122.	24639	<i>Neochmia ruficauda</i> subsp. <i>clarescens</i>			
123.	24737	<i>Neophema bourkii</i> (Bourke's Parrot)			

	Name ID	Species Name	Naturalised	Conservation Code	¹ Endemic To Query Area
124.	25748	<i>Ninox novaeseelandiae</i> (Boobook Owl)			
125.	24820	<i>Ninox novaeseelandiae</i> subsp. <i>boobook</i>			
126.	24742	<i>Nymphicus hollandicus</i> (Cockatiel)			
127.	24407	<i>Ocyphaps lophotes</i> (Crested Pigeon)			
128.	24618	<i>Oreoica gutturalis</i> (Crested Bellbird)			
129.	25680	<i>Pachycephala rufiventris</i> (Rufous Whistler)			
130.	24624	<i>Pachycephala rufiventris</i> subsp. <i>rufiventris</i>			
131.	24627	<i>Pardalotus rubricatus</i> (Red-browed Pardalote)			
132.	25682	<i>Pardalotus striatus</i> (Striated Pardalote)			
133.	24629	<i>Pardalotus striatus</i> subsp. <i>uropygialis</i>			
134.	24648	<i>Pelecanus conspicillatus</i> (Australian Pelican)			
135.	-391	<i>Petrochelidon ariel</i>			
136.	-393	<i>Petrochelidon nigricans</i>			
137.	24658	<i>Petroica cucullata</i> (Hooded Robin)			
138.	24659	<i>Petroica goodenovii</i> (Red-capped Robin)			
139.	24743	<i>Pezoporus occidentalis</i> (Night Parrot)		T	
140.	24409	<i>Phaps chalcoptera</i> (Common Bronzewing)			
141.	24593	<i>Phylidonyris albiglans</i> (White-fronted Honeyeater)			
142.	24841	<i>Platalea flavipes</i> (Yellow-billed Spoonbill)			
143.	24748	<i>Platycercus varius</i> (Mulga Parrot)			
144.	25721	<i>Platycercus zonarius</i> (Australian Ringneck)			
145.	24751	<i>Platycercus zonarius</i> subsp. <i>zonarius</i>			
146.	25703	<i>Podargus strigoides</i> (Tawny Frogmouth)			
147.	24681	<i>Poliiocephalus poliocephalus</i> (Hoary-headed Grebe)			
148.	24683	<i>Pomatostomus superciliosus</i> (White-browed Babbler)			
149.	25706	<i>Pomatostomus temporalis</i> (Grey-crowned Babbler)			
150.	-408	<i>Psephotus varius</i>			
151.	24390	<i>Psophodes occidentalis</i> (Western Wedgebill)			
152.	-347	<i>Ptilonorhynchus guttatus</i>			
153.	24757	<i>Ptilonorhynchus maculatus</i> subsp. <i>guttatus</i> (Western Bowerbird)			
154.	24278	<i>Pyrrholaemus brunneus</i> (Redthroat)			
155.	25614	<i>Rhipidura leucophrys</i> (Willie Wagtail)			
156.	24454	<i>Rhipidura leucophrys</i> subsp. <i>leucophrys</i>			
157.	30948	<i>Smicrornis brevirostris</i> (Weebill)			
158.	24482	<i>Stiltia isabella</i> (Australian Pratincole)			
159.	24556	<i>Stipiturus ruficeps</i> subsp. <i>ruficeps</i>			
160.	-339	<i>Sugomel niger</i>			
161.	25705	<i>Tachybaptus novaehollandiae</i> (Australasian Grebe)			
162.	30870	<i>Taeniopygia guttata</i> (Zebra Finch)			
163.	30871	<i>Taeniopygia guttata</i> subsp. <i>castanotis</i>			
164.	24845	<i>Threskiornis spinicollis</i> (Straw-necked Ibis)			
165.	24308	<i>Todiramphus pyrrhopygia</i> (Red-backed Kingfisher)			
166.	-366	<i>Todiramphus pyrrhopygius</i>			
167.	25549	<i>Todiramphus sanctus</i> (Sacred Kingfisher)			
168.	24309	<i>Todiramphus sanctus</i> subsp. <i>sanctus</i>			
169.	24806	<i>Tringa glareola</i> (Wood Sandpaper)			
170.	24808	<i>Tringa nebularia</i> (Common Greenshank)			
171.	24851	<i>Turnix velox</i> (Little Button-quail)			
172.	24386	<i>Vanellus tricolor</i> (Banded Lapwing)			

Conservation Codes

T - Rare or likely to become extinct
X - Presumed extinct
IA - Protected under international agreement
S - Other specially protected fauna
1 - Priority 1
2 - Priority 2
3 - Priority 3
4 - Priority 4
5 - Priority 5

¹ For NatureMap's purposes, species flagged as endemic are those whose records are wholly contained within the search area. Note that only those records complying with the search criterion are included in the calculation. For example, if you limit records to those from a specific datasource, only records from that datasource are used to determine if a species is restricted to the query area.

NatureMap - Marillana - Mammals

Created By Greg Harewood on 25/09/2011

Kingdom Animalia
Species Group Mammals
Method 'By Circle'
Centre 119°08' 53" E, 22°30' 29" S
Buffer 40km

	Name ID	Species Name	Naturalised	Conservation Code	¹ Endemic To Query Area
1.	24251	<i>Bos taurus</i> (European Cattle)			
2.	25454	<i>Canis lupus</i>			
3.	24039	<i>Canis lupus subsp. dingo</i> (Dingo)			
4.	24181	<i>Chaerephon jobensis</i> (Northern Freetail-bat)			
5.	24186	<i>Chalinolobus gouldii</i> (Gould's Wattled Bat)			
6.	24187	<i>Chalinolobus morio</i> (Chocolate Wattled Bat)			
7.	24091	<i>Dasykaluta rosamondae</i> (Little Red Kaluta)			
8.	24093	<i>Dasyurus hallucatus</i> (Northern Quoll)		T	
9.	24257	<i>Equus asinus</i> (Donkey)			
10.	24258	<i>Equus caballus</i> (Horse)			
11.	24041	<i>Felis catus</i> (Cat)			
12.	24217	<i>Leggadina lakedownensis</i> (Short-tailed Mouse)		P4	
13.	24180	<i>Macroderma gigas</i> (Ghost Bat)		P4	
14.	25489	<i>Macropus robustus</i>			
15.	24135	<i>Macropus robustus subsp. erubescens</i> (Euro)			
16.	24136	<i>Macropus rufus</i> (Red Kangaroo)			
17.	24168	<i>Macrotis lagotis</i> (Bilby)		T	
18.	24182	<i>Mormopterus beccarii</i> (Beccari's Freetail-bat)			
19.	24223	<i>Mus musculus</i> (House Mouse)			
20.	24094	<i>Ningui ridei</i> (Wongai Ningui)			
21.	24095	<i>Ningui timealeyi</i> (Pilbara Ningui)			
22.	24224	<i>Notomys alexis</i> (Spinifex Hopping-mouse)			
23.	24193	<i>Nyctophilus bifax subsp. daedalus</i> (Northwestern Long-eared Bat)			
24.	24194	<i>Nyctophilus geoffroyi</i> (Lesser Long-eared Bat)			
25.	24085	<i>Oryctolagus cuniculus</i> (Rabbit)			
26.	24101	<i>Planigale ingrami</i> (Long-tailed Planigale)			
27.	24102	<i>Planigale maculata</i> (Common Planigale)			
28.	24106	<i>Pseudantechinus woolleyae</i> (Woolley's Pseudantechinus)			
29.	24233	<i>Pseudomys chapmani</i> (Western Pebble-mound Mouse)		P4	
30.	24235	<i>Pseudomys desertor</i> (Desert Mouse)			
31.	24237	<i>Pseudomys hermannsburgensis</i> (Sandy Inland Mouse)			
32.	24179	<i>Rhinonicteris aurantius</i> (Orange Leafnosed-bat)		T	
33.	24174	<i>Saccolaimus flaviventris</i> (Yellow-bellied Sheathtail-bat)			
34.	24200	<i>Scotorepens greyii</i> (Little Broad-nosed Bat)			
35.	24116	<i>Sminthopsis macroura</i> (Stripe-faced Dunnart)			
36.	24120	<i>Sminthopsis youngsoni</i> (Lesser Hairy-footed Dunnart)			
37.	24185	<i>Tadarida australis</i> (White-striped Freetail-bat)			
38.	24175	<i>Taphozous georgianus</i> (Common Sheathtail-bat)			
39.	24176	<i>Taphozous hilli</i> (Hill's Sheathtail-bat)			
40.	24205	<i>Vespadelus finlaysoni</i> (Finlayson's Cave Bat)			
41.	24248	<i>Zyzomys argurus</i> (Common Rock-rat)			

Conservation Codes

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3 - Priority 3
4 - Priority 4
5 - Priority 5

¹ For NatureMap's purposes, species flagged as endemic are those whose records are wholly contained within the search area. Note that only those records complying with the search criterion are included in the calculation. For example, if you limit records to those from a specific datasource, only records from that datasource are used to determine if a species is restricted to the query area.



Australian Government

Department of Sustainability, Environment,
Water, Population and Communities

EPBC Act Protected Matters Report: Coordinates

This report provides general guidance on matters of national environmental significance and other matters protected by the EPBC Act in the area you have selected.

Information on the coverage of this report and qualifications on data supporting this report are contained in the caveat at the end of the report.

Information about the EPBC Act including significance guidelines, forms and application process details can be found at <http://www.environment.gov.au/epbc/assessmentsapprovals/index.html>

Report created: 25/09/11 12:38:48

[Summary](#)

[Details](#)

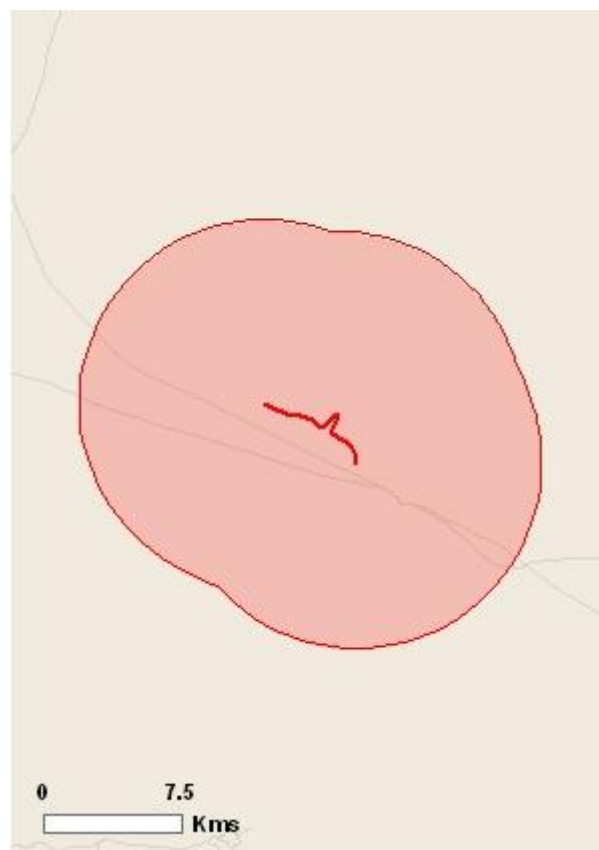
[Matters of NES](#)

[Other matters protected by
the EPBC Act](#)

[Extra Information](#)

[Caveat](#)

[Acknowledgements](#)



This map may contain data which are
©Commonwealth of Australia (Geoscience
Australia), ©PSMA 2010

[Coordinates](#)

Buffer: 10.0Km

Summary

Matters of National Environmental Significance

This part of the report summarises the matters of national environmental significance that may occur in, or may relate to, the area you nominated. Further information is available in the detail part of the report, which can be accessed by scrolling or following the links below. If you are proposing to undertake an activity that may have a significant impact on one or more matters of national environmental significance then you should consider the Administrative Guidelines on Significance - see <http://www.environment.gov.au/epbc/assessmentsapprovals/guidelines/index.html>.

World Heritage Properties:	None
National Heritage Places:	None
Wetlands of International Significance (Ramsar Wetlands):	None
Great Barrier Reef Marine Park:	None
Commonwealth Marine Areas:	None
Threatened Ecological Communities:	None
Threatened Species:	6
Migratory Species:	8

Other Matters Protected by the EPBC Act

This part of the report summarises other matters protected under the Act that may relate to the area you nominated. Approval may be required for a proposed activity that significantly affects the environment on Commonwealth land, when the action is outside the Commonwealth land, or the environment anywhere when the action is taken on Commonwealth land. Approval may also be required for the Commonwealth or Commonwealth agencies proposing to take an action that is likely to have a significant impact on the environment anywhere.

The EPBC Act protects the environment on Commonwealth land, the environment from the actions taken on Commonwealth land, and the environment from actions taken by Commonwealth agencies. As heritage values of a place are part of the 'environment', these aspects of the EPBC Act protect the Commonwealth Heritage values of a Commonwealth Heritage place and the heritage values of a place on the Register of the National Estate. Information on the new heritage laws can be found at <http://www.environment.gov.au/heritage/index.html>

Please note that the current dataset on Commonwealth land is not complete. Further information on Commonwealth land would need to be obtained from relevant sources including Commonwealth agencies, local agencies, and land tenure maps.

A permit may be required for activities in or on a Commonwealth area that may affect a member of a listed threatened species or ecological community, a member of a listed migratory species, whales and other cetaceans, or a member of a listed marine species. Information on EPBC Act permit requirements and application forms can be found at <http://www.environment.gov.au/epbc/permits/index.html>.

Commonwealth Lands:	None
Commonwealth Heritage Places:	None
Listed Marine Species:	5
Whales and Other Cetaceans:	None

Critical Habitats:	None
Commonwealth Reserves:	None

Report Summary for Extra Information

This part of the report provides information that may also be relevant to the area you have nominated.

Place on the RNE:	1
State and Territory Reserves:	None
Regional Forest Agreements:	None
Invasive Species:	4
Nationally Important Wetlands:	1

Details

Matters of National Environmental Significance

Threatened Species		[Resource Information]
Name	Status	Type of Presence
BIRDS		
Pezoporus occidentalis		
Night Parrot [59350]	Endangered	Species or species habitat likely to occur within area
MAMMALS		
Dasyurus hallucatus		
Northern Quoll [331]	Endangered	Species or species habitat likely to occur within area
Macrotis lagotis		
Greater Bilby [282]	Vulnerable	Species or species habitat likely to occur within area
Rhinonicteris aurantia (Pilbara form)		
Pilbara Leaf-nosed Bat [82790]	Vulnerable	Species or species habitat likely to occur within area
PLANTS		
Lepidium catapycnon		
Hamersley Lepidium, Hamersley Catapycnon [9397]	Vulnerable	Species or species habitat likely to occur within area
REPTILES		
Liasis olivaceus barroni		
Olive Python (Pilbara subspecies) [66699]	Vulnerable	Species or species habitat may occur within area
Migratory Species		[Resource Information]
Name	Status	Type of Presence
Migratory Marine Birds		
Apus pacificus		
Fork-tailed Swift [678]		Species or species habitat may occur within area
Ardea alba		
Great Egret, White Egret [59541]		Species or species habitat may occur within area
Ardea ibis		

Cattle Egret [59542]	Species or species habitat may occur within area
----------------------	--

Migratory Terrestrial Species

[Merops ornatus](#)

Rainbow Bee-eater [670]	Species or species habitat may occur within area
-------------------------	--

[Pezoporus occidentalis](#)

Night Parrot [59350]	Endangered	Species or species habitat likely to occur within area
----------------------	------------	--

Migratory Wetlands Species

[Ardea alba](#)

Great Egret, White Egret [59541]	Species or species habitat may occur within area
----------------------------------	--

[Ardea ibis](#)

Cattle Egret [59542]	Species or species habitat may occur within area
----------------------	--

[Charadrius veredus](#)

Oriental Plover, Oriental Dotterel [882]	Species or species habitat may occur within area
--	--

Other Matters Protected by the EPBC Act

Listed Marine Species

[Resource Information]

Name	Status	Type of Presence
------	--------	------------------

Birds

[Apus pacificus](#)

Fork-tailed Swift [678]	Species or species habitat may occur within area
-------------------------	--

[Ardea alba](#)

Great Egret, White Egret [59541]	Species or species habitat may occur within area
----------------------------------	--

[Ardea ibis](#)

Cattle Egret [59542]	Species or species habitat may occur within area
----------------------	--

[Charadrius veredus](#)

Oriental Plover, Oriental Dotterel [882]	Species or species habitat may occur within area
--	--

[Merops ornatus](#)

Rainbow Bee-eater [670]	Species or species habitat may occur within area
-------------------------	--

Extra Information

Places on the RNE

[Resource Information]

Note that not all Indigenous sites may be listed.

Name	Status
------	--------

Natural

[Fortescue Marshes WA](#)

Indicative Place

Invasive Species

[Resource Information]

Weeds reported here are the 20 species of national significance (WoNS), along with other introduced plants that are considered by the States and Territories to pose a particularly significant threat to biodiversity. The following feral animals are reported: Goat, Red Fox, Cat, Rabbit, Pig, Water Buffalo and Cane Toad. Maps from Landscape Health Project, National Land and Water Resources Audit, 2001.

Name	Status	Type of Presence
------	--------	------------------

Mammals

[Felis catus](#)

Cat, House Cat, Domestic Cat [19]	Species or species habitat likely to occur within area
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[Oryctolagus cuniculus](#)

Rabbit, European Rabbit [128]

Species or species habitat likely to occur within area

[Vulpes vulpes](#)

Red Fox, Fox [18]

Species or species habitat likely to occur within area

Plants

[Cenchrus ciliaris](#)

Buffel-grass, Black Buffel-grass
[20213]

Species or species habitat likely to occur within area

Nationally Important Wetlands

[[Resource Information](#)]

[Fortescue Marshes, WA](#)

Caveat

The information presented in this report has been provided by a range of data sources as acknowledged at the end of the report.

This report is designed to assist in identifying the locations of places which may be relevant in determining obligations under the Environment Protection and Biodiversity Conservation Act 1999. It holds mapped locations of World Heritage and Register of National Estate properties, Wetlands of International Importance, Commonwealth and State/Territory reserves, listed threatened, migratory and marine species and listed threatened ecological communities. Mapping of Commonwealth land is not complete at this stage. Maps have been collated from a range of sources at various resolutions.

Not all species listed under the EPBC Act have been mapped (see below) and therefore a report is a general guide only. Where available data supports mapping, the type of presence that can be determined from the data is indicated in general terms. People using this information in making a referral may need to consider the qualifications below and may need to seek and consider other information sources.

For threatened ecological communities where the distribution is well known, maps are derived from recovery plans, State vegetation maps, remote sensing imagery and other sources. Where threatened ecological community distributions are less well known, existing vegetation maps and point location data are used to produce indicative distribution maps.

For species where the distributions are well known, maps are digitised from sources such as recovery plans and detailed habitat studies. Where appropriate, core breeding, foraging and roosting areas are indicated under 'type of presence'. For species whose distributions are less well known, point locations are collated from government wildlife authorities, museums, and non-government organisations; bioclimatic distribution models are generated and these validated by experts. In some cases, the distribution maps are based solely on expert knowledge.

Only selected species covered by the following provisions of the EPBC Act have been mapped:

- migratory and
- marine

The following species and ecological communities have not been mapped and do not appear in reports produced from this database:

- threatened species listed as extinct or considered as vagrants
- some species and ecological communities that have only recently been listed
- some terrestrial species that overfly the Commonwealth marine area
- migratory species that are very widespread, vagrant, or only occur in small numbers.

The following groups have been mapped, but may not cover the complete distribution of the species:

- non-threatened seabirds which have only been mapped for recorded breeding sites;

- seals which have only been mapped for breeding sites near the Australian continent.

Such breeding sites may be important for the protection of the Commonwealth Marine environment.

Coordinates

-22.496979 119.12068,-22.502918 119.133514,-22.50252 119.138448,-22.505114
119.144095,-22.506645 119.1466,-22.508585 119.149641,-22.502646 119.155059,-22.502963
119.157399,-22.507354 119.155229,-22.510984 119.153414,-22.513761 119.157746,-22.516168
119.161502,-22.517374 119.162929,-22.518518 119.163866,-22.521085 119.165217,-22.526507
119.166254

Acknowledgements

This database has been compiled from a range of data sources. The department acknowledges the following custodians who have contributed valuable data and advice:

- [-Department of Environment, Climate Change and Water, New South Wales](#)
- [-Department of Sustainability and Environment, Victoria](#)
- [-Department of Primary Industries, Parks, Water and Environment, Tasmania](#)
- [-Department of Environment and Natural Resources, South Australia](#)
- [-Parks and Wildlife Service NT, NT Dept of Natural Resources, Environment and the Arts](#)
- [-Environmental and Resource Management, Queensland](#)
- [-Department of Environment and Conservation, Western Australia](#)
- [-Department of the Environment, Climate Change, Energy and Water](#)
- [-Birds Australia](#)
- [-Australian Bird and Bat Banding Scheme](#)
- [-Australian National Wildlife Collection](#)
- Natural history museums of Australia
- [-Museum Victoria](#)
- [-Australian Museum](#)
- [-SA Museum](#)
- [-Queensland Museum](#)
- [-Online Zoological Collections of Australian Museums](#)
- [-Queensland Herbarium](#)
- [-National Herbarium of NSW](#)
- [-Royal Botanic Gardens and National Herbarium of Victoria](#)
- [-Tasmanian Herbarium](#)
- [-State Herbarium of South Australia](#)
- [-Northern Territory Herbarium](#)
- [-Western Australian Herbarium](#)
- [-Australian National Herbarium, Atherton and Canberra](#)
- [-University of New England](#)
- [-Ocean Biogeographic Information System](#)
- [-Australian Government, Department of Defence](#)
- [-State Forests of NSW](#)
- Other groups and individuals

The Department is extremely grateful to the many organisations and individuals who provided expert advice and information on numerous draft distributions.

Please feel free to provide feedback via the [Contact Us](#) page.

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Last updated: Thursday, 16-Sep-2010 09:13:25 EST

[Department of Sustainability, Environment, Water, Population and Communities](#)

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| [Australian Government](#) |

APPENDIX D

SIGNIFICANT SPECIES PROFILES

Spotted Ctenotus *Ctenotus uber johnstonei*

Status and Distribution: This sub-species of the spotted ctenotus is listed as Priority 2 by DEC and is currently known only from an area of chenopod shrubland at the base of a sandstone hill near Balgo (western edge of Tanami Desert) (Wilson and Swan 2010).

Habitat: Only found to date associated with chenopod shrublands on alluvial plains (Wilson & Swan 2010).

Likely presence in study area: The lack of suitable habitat, its currently defined restricted geographical distribution well away from the study area and lack of local records suggests that it is very unlikely to be found within the proposal area. *Ctenotus uber* was caught by ecologia (2009) during the Marillana fauna surveys but it was not identified as this particular subspecies. Not listed as a potential species.

Potential impact of development: No impact on this species or its preferred habitat is will occur.

Unnamed Blind Snake *Ramphotyphlops ganei*

Status and Distribution: This species is listed as Priority 1 by DEC. Known from widely separated areas between Newman and Pannawonica (Wilson and Swan 2010).

Habitat: Little know as only recently described (1998) but possibly associated with moist gorges and gullies (Wilson & Swan 2010). Bush and Maryan (2011) report a specimen captured “on a stony hill with spinifex on Marillana Station”.

Likely presence in study area: The apparent lack of suitable habitat and the fact that the species was not captured nearby during surveys (ecologia 2009) suggests that this species is very unlikely to be found within the proposal area. Not listed as a potential species.

Potential impact of development: No impact on this species or its preferred habitat is considered likely to occur.

Pilbara Olive Python *Liasis olivaceus barroni*

Status and Distribution: This sub-species is listed as Schedule 1 under the *WC Act* and as Vulnerable under the *EPBC Act*. The pilbara olive python is known only from ranges within the Pilbara region, north-western Western Australia (including some islands of the Dampier Archipelago) and the northern Ashburton

region. It is known to occur at 21 locations within the Pilbara including populations at Pannawonica, Millstream, Tom Price and the Burrup Peninsula (including the adjacent mainland) (Pearson 1993; Burbidge 2004, Pearson 2006, Kendrick 2007). Storr *et al* (2002) reports a population at Mount Augustus in the Gascoyne though its genetic relationship with the pilbara population is not mentioned.

Habitat: The Pilbara olive python prefers escarpments, gorges and water holes in the ranges of the Pilbara region (Pearson 1993; Wilson & Swan 2010). Radio-telemetry has shown that individuals are usually in close proximity to water and rock outcrops that attract suitable sized prey species (Pearson 2003).

Microhabitat preferences include gnamma holes (rock pools), rock piles, rock crevices, caves, burrows beneath rocks, hollow logs and under spinifex (Pearson 1993, Tutt *et al* 2004). Individuals at Pannawonica have been found sheltering in overburden heaps, railway embankments and natural caves. Individuals at Tom Price utilise man-made water sources, such as sewerage treatment ponds and recreational lakes (Pearson 2003). In late winter or early spring males will travel large distances to find and mate with females.

Likely presence in study area: Preferred rocky habitats and areas such as gorges, caves and rock crevices are not present within the site. This species is therefore very unlikely to frequent the study area. Not listed as a potential species.

Potential impact of development: No impact on this species or its preferred habitat is considered likely to occur.

Great Egret *Ardea alba*

Status and Distribution: This species of egret is listed as Schedule 3 under the *WC Act* and as migratory under the *EPBC Act* including international agreements to which Australia is a signatory. The great egret is common and very widespread in any suitable permanent or temporary habitat (Morcombe 2004).

Species or species habitat listed as likely to occur in general area within EPBC database search.

Habitat: Wetlands, flooded pasture, dams, estuarine mudflats, mangroves and reefs (Morcombe 2004).

Likely presence in study area: No suitable habitat. Not listed as a potential species.

Potential impact of development: No impact on this species or its habitat will occur as a consequence of development occurring at the site.

Cattle Egret *Ardea ibis*

Status and Distribution: This species of egret is listed as Schedule 3 under the *WC Act* and as migratory under the *EPBC Act* including international agreements to which Australia is a signatory. The cattle egret is common in the north sections of its range but is an irregular visitor to the better watered parts of the state (Johnstone and Storr 1998). The population is expanding (Morcombe 2004).

Species or species habitat listed as likely to occur in general area within *EPBC* database search.

Habitat: Moist pastures with tall grasses, shallow open wetlands and margins, mudflats (Morcombe 2004).

Likely presence in study area: No suitable habitat. Not listed as a potential species.

Potential impact of development: No impact on this species or its habitat will occur as a consequence of development occurring at the site.

Grey Falcon *Falco hypoleucos*

Status and Distribution: Listed as Priority 4 by the DEC. Within WA found in the northern half south to about 26°S (Gascoyne, Lake Carnegie and Warburton), casual further south (Johnstone and Storr 1998).

Habitat: Lightly treed plains, gibber deserts, sand ridges, pastoral lands, timbered water courses but seldom in driest deserts (Pizzey & Knight 2007). Typically nest in tall eucalypt trees near water (Garnett and Crowley 2000; Ehmann and Watson 2008).

Likely presence in study area: This species may occasionally forage in the general area but would not be specifically attracted to the site itself. Grey falcons are rare and nomadic with a sparse distribution and therefore its frequency of occurrence in the immediate area would be very low.

Potential impact of development: No impact on this species is anticipated and it will continue to utilise the area to the same extent it does now despite the proposed development proceeding.

Peregrine Falcon *Falco peregrinus*

Status and Distribution: This species is listed as Schedule 4 under the *WC Act*. Individuals of this species are uncommon/rare but wide ranging across Australia. Moderately common at higher levels of the Stirling Range, uncommon in hilly, north west Kimberley, Hamersley and Darling Ranges; rare or scarce elsewhere (Johnstone and Storr 1998).

Habitat: Diverse from rainforest to arid shrublands, from coastal heath to alpine (Morcombe 2004). Mainly about cliffs along coasts, rivers and ranges and about wooded watercourses and lakes (Johnstone and Storr 1998). The species utilises the ledges, cliff faces and large hollows/broken spouts of trees for nesting. It will also occasionally use the abandoned nests of other birds of prey. Also known to utilise decommissioned open cut pit walls for nesting.

Likely presence in study area: The species potentially utilises some sections of the study area as part of a much larger home range. The site contains no suitable nesting habitat.

Potential impact of development: No impact on this species will occur as a consequence of development occurring at the site and it can be expected to continue to utilise the area to the same extent it does now despite the proposed development proceeding.

Australian Bustard *Ardeotis australis*

Status and Distribution: This species is listed as Priority 4 by the DEC. A nomadic species that is common away from settled areas over much of Australia (Morcombe, 2004).

Habitat: Grasslands, especially tussock grasses, like speargrass, Mitchell grass, spinifex; arid scrub with saltbush, bluebush; open dry woodland of mulga, mallee and, heath (Morcombe 2004).

Likely presence in study area: Footprints attributed to this species were observed during the field survey and it has been observed in the immediate area before (ecologia 2009, 2011).

Potential impact of development: Loss of an area of potential habitat though no significant impact on this species is anticipated as it is likely to be present only infrequently, in low numbers. There are vast areas of suitable habitat in surrounding areas.

Bush Stone Curlew *Burhinus grallarius*

Status and Distribution: Listed as Priority 4 by DEC. Occurs over much of the western half of the state (and Kimberley) but rare to uncommon in the south of its range due to fox predation (Johnstone and Storr 1998).

Habitat: Lightly wooded country (including partly cleared forests) near daytime shelter e.g. thickets or long grass (Johnstone and Storr 1998).

Likely presence in study area: Footprints attributed to this species were observed during a recent field survey nearby (ecologia 2011).

Potential impact of development: Loss of an area of potential habitat though no significant impact on this species is anticipated as it is likely to be present only infrequently, in very low numbers. There are vast areas of suitable habitat in surrounding areas.

Oriental Plover *Charadis veredus*

Status and Distribution: The oriental plover is listed as Schedule 3 under the WC Act and as migratory under the EPBC Act including international agreements to which Australia is a signatory. Breeds in Mongolia and Manchuria – regular summer migrant to Australia (September to March) (Pizzey & Knight 2007). Kimberley, north western interior (Lake Gregory) and north west coastal plains (south to tropic); casual or vagrant elsewhere (south to 32°15'S) (Johnstone and Storr 1998).

Habitat: Mainly sparsely vegetated plains including samphire and short grasses flats. Also beaches, tidal flats, salt works and sewage ponds (Johnstone and Storr 1998).

Likely presence in study area: No suitable habitat. Not listed as a potential species.

Potential impact of development: No impact on this species or its habitat will occur as a consequence of development occurring at the site.

Night Parrot *Pezoporus occidentalis*

Status and Distribution: This sub-species is listed as Schedule 1 under the WC Act and as Endangered under the EPBC Act. Historical evidence indicates that Night Parrots were distributed over much of semi-arid and arid Australia (Garnett and Crowley 2000). Extremely secretive and hard to flush, there are only six accepted records of Night Parrots since 1935, with three from the Pilbara region

(1979, 1980 and 2005; DEWHA 2008). The most recent record is from Minga Well (35 km north east of Marillana) during a fauna survey at Fortescue Metals Group's Cloudbreak lease (Bamford 2005).

Habitat: Preferred habitat is thought to be spinifex grasslands or samphire and chenopod shrublands on claypans, floodplains or the margins of salt lakes, creeks or other water bodies (Johnstone and Storr 1998; Higgins 1999; DEWHA 2008).

Likely presence in study area: Though limited in number, all previous observations of the night parrot in the area have been in very close proximity to the Fortescue Marsh where samphire, lignum and fringing hummock grassland dominate. The DEC has previously stated that the Marillana project area is too far removed from the Fortescue Marsh to provide suitable habitat (email from Dr Stephen van Leeuwen dated 15 Feb 2010). The DEC did however suggest that that in an extremely good season the parrot may use the mulga woodland and hummock grassland of the Marillana project area though at this stage they have no way to quantify this proposition but have concluded none the less that the risk of any impact is likely to be minimal.

Potential impact of development: No impact on this species or its preferred habitat is considered likely to occur.

Fork-tailed Swift *Apus pacificus*

Status and Distribution: The Fork-tailed Swift is listed as Schedule 3 under the *WC Act* and as migratory under the *EPBC Act* including international agreements to which Australia is a signatory. It is a summer migrant (Oct-Apr) to Australia (Morcombe 2004).

Habitat: Low to very high airspace over varied habitat from rainforest to semi desert (Morcombe 2004).

Likely presence in study area: It is potentially an occasional summer visitor to the area but is entirely aerial and largely independent of terrestrial habitats.

Potential impact of development: No impact on this species will occur.

Rainbow Bee-eater *Merops ornatus*

Status and Distribution: This species is listed as Schedule 3 under the *WC Act* and as migratory under the *EPBC Act* including international agreements to which Australia is a signatory. The Rainbow Bee-eater is a common summer migrant to southern Australia but in the north they are resident (Morcombe 2004).

Habitat: Open Country, of woodlands, open forest, semi arid scrub, grasslands, clearings in heavier forest, farmlands (Morcombe 2004). Breeds underground in areas of suitable soft soil firm enough to support tunnel building. Nest is a burrow usually dug at a slight angle in flat ground, sometimes into sandy banks or cuttings and often on margins of roads and tracks (Johnstone and Storr 1998).

Likely presence in study area: Numerous records from local region and recorded within the nearby Marillana project area (ecologia 2009, 2011). Possibly breeds in the general area but population levels would not be significant as it usually breeds in pairs, rarely in small colonies (Johnstone and Storr 1998).

Potential impact of proposed development: No significant impact on this species is anticipated as individuals' present onsite at any one time are unlikely to represent a substantial proportion of the population. This species can be expected to continue to utilise the area, as it does now, despite any future development.

Star Finch (western) *Neochmia ruficauda subclaescens*

Status and Distribution: Listed as Priority 4 by DEC. Disjunct in well-watered northern and central semiarid and arid flatlands: north-east and south-west Kimberley, and the Pilbara and Gascoyne (from the De Grey River south to Mount Augustus) , with isolated populations or casual occurrences on North-west Cape peninsula, the lower Gascoyne (Carnarvon and Rocky Pool) and the Wooramel (Johnstone and Storr 1998).

Habitat: Mainly long grass, *Typha*, rushes, *Phragmites* and shrubs in swamps, around lagoons and beside permanent pools on larger watercourses. Also irrigated crops (including sugar cane, sorghum and other grasses) and pastures, sewage ponds and rank grasslands and herbage along drains and roads in dry situations (Johnstone and Storr 1998).

Likely presence in study area: No suitable habitat. Not listed as a potential species.

Potential impact of proposed development: No impact on this species or its preferred habitat is will occur.

Northern Quoll *Dasyurus hallucatus*

Status and Distribution: This species is listed as Schedule 1 under the *WC Act* and as Endangered under the *EPBC Act*. Northern quolls formerly occurred across northern Australia from the Pilbara region in Western Australia to south-eastern Queensland. A 75% reduction in habitat range occurred during the

20th century, so that the species is now restricted to the Pilbara and north Kimberley in Western Australia and a few discrete populations across the Northern Territory and eastern Queensland (Braithwaite and Griffiths 1994).

Northern quolls also occur on a number of offshore islands in Western Australia (Adolphus, Augustus, Bigge, Boongaree, Capstan, Dolphin, Hidden, Koolan, Purrungku, Uwins and Wollaston: (Kendrick 2007).

Habitat: Northern quolls do not have highly specific habitat requirements and they can occur in a variety of habitats across their range. It is however known that important areas for northern quoll, consistent across its range, are the rocky hills, scree slopes and river systems/creek lines which have larger hollow bearing trees. Northern Quolls do not need permanent water, but are often found here, probably due to the increase abundance of prey. Other areas surrounding the above mentioned “important” habitats including open spinifex meadows, gibber plains, hill systems and similar landforms that provide foraging habitat and are also necessary for survival (Thompson 2010).

Refuge from fire and predation are critical to the survival of individual Northern Quolls (Thompson 2010). Documented daytime refuge sites (“dens”) included burrows, termite mounds, hollow logs, hollow trees, crevices and caves (Menkhorst & Knight 2011).

Likely presence in study area: Lack of this species preferred denning habitat within the study area and the lack of records in the immediate vicinity despite several trapping surveys (ecologia 2009, 2010 and Biota 2010) suggests it would only ever occur on very rare occasions within the study area, if ever, and then only as transient individuals. Not listed as a potential species.

Potential impact of development: No impact on this species or its preferred habitat will occur as a consequence of development occurring at the site.

Bilby *Macrotis lagotis*

Status and Distribution: The Bilby is listed as Schedule 1 under the *WC Act* and as Vulnerable under the *EPBC Act*. Current known distribution in suitable habitat extends from Tanami Desert west to near Broome and south to Warburton. There exists a few known scattered populations of Bilby in the Pilbara, and their numbers are thought to be in significant decline. How *et al.* (1991) recorded this species at numerous locations on the Abydos Plains. ATA Environmental (2007) reported burrows and diggings at numerous locations along the FMG rail corridor from Port Hedland to Cloud Break. These burrows and diggings were predominantly located on red sandy soils in a spinifex meadow with occasional trees; however, they have also recently been recorded

in open burnt habitat (Thompson and Thompson 2008). An active Bilby burrow with recent tracks was located by Terrestrial Ecosystems about 15km north-east of the Redmont camp in a creek bed. Davis *et al.* (2005) reported a Bilby had been seen on Mulga Downs Station near Kardarderrie Well on the northern border of the Fortescue Marsh by FMG staff and active burrows were found at Cockeye Bore. Davis *et al.* (2005) reported finding a number of Bilby burrows on the northern fringe of the Fortescue Marsh in a spinifex meadow south of the Cloud Break mine.

Habitat: Current habitat in W.A. limited to Acacia shrublands, spinifex and hummock grassland (Menkhorst and Knight 2011).

Likely presence in study area: Lack of actual records or any secondary evidence (e.g. burrows) of this species in the immediate vicinity despite several surveys (ecologia 2009, 2010, 2011) suggests this species does not persist in the area. Not listed as a potential species.

Potential impact of development: No impact on this species is anticipated.

Pilbara Leaf-nosed Bat *Rhinonictis aurantius* (Pilbara form)

Status and Distribution: This sub-species is listed as Schedule 1 under the *WC Act* and as Vulnerable under the *EPBC Act*. Colonies of the Pilbara Leaf-nosed Bat are found in three distinct areas: in the mines of the eastern Pilbara; scattered throughout the Hamersley Range in smaller colonies; and in sandstone formations south of the Hamersley Range in a small number of significant colonies. This includes the confirmed roosts at Bamboo Creek mine, Copper Hills mine, Klondyke Queen mine, Lalla Rookh mine and one cave in the Barlee Range; and 16 other likely permanent occurrences. Locations are defined as sites that support a colony, such as a cave or mine.

Habitat: During the dry season this species roosts in caves and mine adits with stable, warm and humid microclimates. It is thought that forest areas can be used in the wet season if conditions are hot and humid (Churchill 2008).

Likely presence in study area: There are no suitable dry or wet season roosting sites for this species within the study area. May occasionally forage in the general area but this would be dependent on suitable roost sites being present in nearby ranges or woodland areas. Not listed as a potential species.

Potential impact of development: No impact on this species or its preferred habitat will occur.

Ghost Bat *Macroderma gigas*

Status and Distribution: This species is listed as Priority 4 by the DEC. Previously distributed across most of inland and northern Australia, this species is now restricted to the north of the continent from the arid Pilbara to rainforests of north Queensland (Churchill 2008, Van Dyck and Strahan 2008). Armstrong and Anstee (2000), in their summary of the geographic distribution of *M. gigas* in the Pilbara, reported that they had been present in the Abydos Plain, Chichester Plateau, Gascoyne Range, George Range, Hamersley Plateau and Oakover Valley.

Habitat: Requires undisturbed caves, rock piles and mine shafts for roosting. They forage for food over a wide range of habitats including arid spinifex hillsides, black soil grasslands, monsoon forest, open savannah woodland, tall open forest, deciduous vine forest and tropical rainforest (Churchill 2008). Its preferred habitat in the Hamersley Range is caves beneath bluffs of low rounded hills composed of Marra Mamba geology and granite rock piles in the eastern Pilbara (Armstrong and Anstee 2000).

Likely presence in study area: There are no suitable roosting sites for this species within or in close proximity to the study area. May occasionally forage in the general area but this would be dependent on suitable roost sites being present in nearby ranges. Not listed as a potential species.

Potential impact of development: No impact on this species or its preferred habitat will occur.

Western Pebble-mound Mouse *Pseudomys chapmani*

Status and Distribution: This species is listed as Priority 4 by the DEC. *P. chapmani* is endemic to WA. Its current range extends from the ranges of the central and southern Pilbara to the ranges of the Little Sandy Desert. Suitable habitat for Western Pebble-mice is common but patchily distributed in the Pilbara bioregion. The persistence of abandoned mounds in the Gascoyne region, Murchison regions and isolated coastal ranges in the Pilbara indicates considerable decline in range. This decline has been attributed to foxes and exotic herbivores and possibly other factors.

Habitat: Found on stony hillsides with hummock grassland. The species is well-known for the characteristic pebble-mounds which it constructs over underground burrow systems. These mounds are most common on spurs and lower slopes of rocky hills.

Likely presence in study area: No suitable habitat.

Potential impact of development: No significant impact on this species or its habitat will occur as a consequence of the proposal proceeding.

Northern Short-tailed Mouse *Leggadina lakedownensis*

Status and Distribution: This species is listed as Priority 4 by the DEC. The northern short-tailed mouse is distributed across northern Australia from the Pilbara across the southern top end of the Northern Territory to Cape York and the desert uplands south of Charters Towers, Queensland (Menkhorst and Knight 2011). Records indicate that the northern short-tailed mouse has been caught along the Fortescue River to the north and south of the Fortescue Marsh, east of the Abydos-Woodstock area and around Wittenoom (Terrestrial Ecosystems 2010). This species was also recorded in the Chichester Range to the north of the Fortescue Marsh (ecologia 2008c).

Habitat: The species has been recorded from diverse habitats ranging from the monsoon tropical coast to semiarid climates, including spinifex and tussock grasslands, samphire and sedgelands, acacia shrublands, tropical eucalyptus and melaleuca woodlands and stony ranges. Most habitats are seasonally inundated on red or white sandy-clay soils (Van Dyck and Strahan 2008). Stony hummock grassland in the Pilbara (Menkhorst and Knight 2011).

Likely presence in study area: Despite not being recorded during the Marillana fauna survey by ecologia (2009) they consider the species to have a moderate potential to occur in the general area due to the presence of suitable habitat and some nearby records.

Potential impact of development: Potential for the loss of some habitat but given the extent of similar habitat in the region, impact on this species overall status is unlikely to be significant.