Kokerbin Nature Reserve
Desktop Fauna Assessment

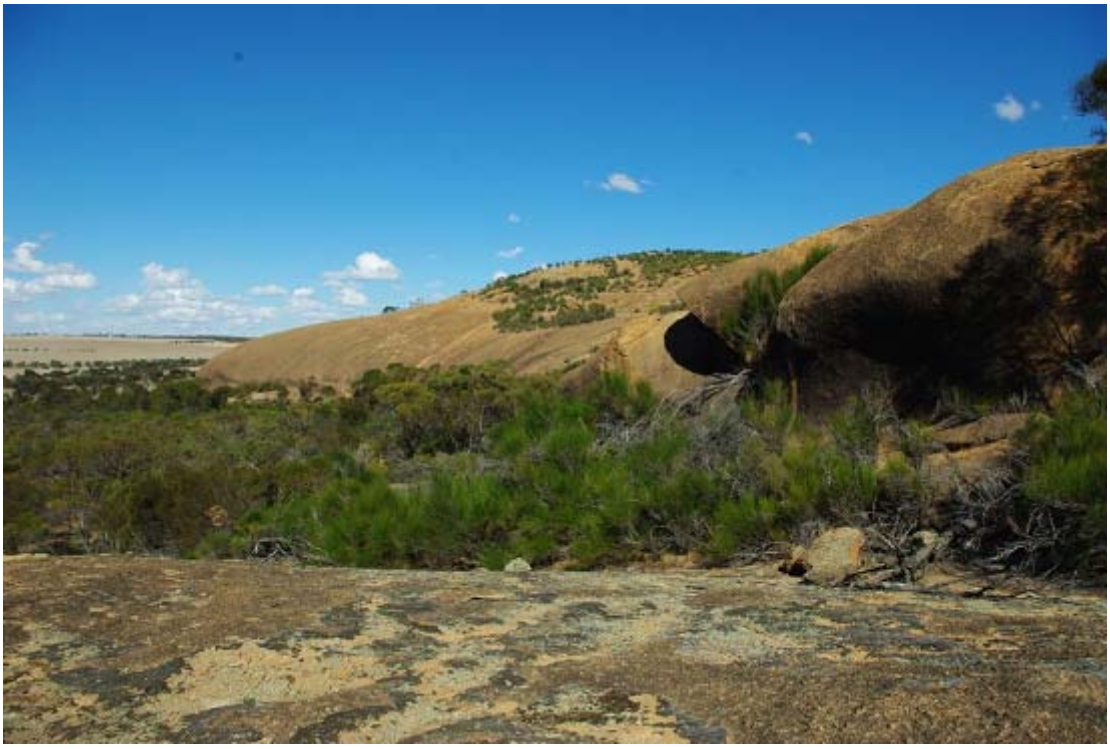

Photo: Kokerbin Rock (G Heather).

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EXECUTIVE SUMMARY

Kokerbin Nature Reserve is located approximately six kilometres north-west of Kwolyin, 15km north-east of Yoting and 40km north-west of Bruce Rock, within the Wheatbelt area of Western Australia. M Griffiths and P Lewis Fauna Consultants were commissioned by the Wheatbelt NRM Inc. to undertake a fauna assessment of Kokerbin Nature Reserve. The fauna assessment comprised a desktop review, site inspection, targeted fauna search and assessment of significant fauna habitats occurring in the Kokerbin Nature Reserve. This report comprises the results of the Desktop Review.

At a broad scale level 9 major fauna habitats are expected from the Kokerbin Nature Reserve. The desktop survey identified 256 native fauna species (plus 13 introduced species) potentially occurring in the Kokerbin Nature area. The potential fauna occurring in the area are listed in Tables 1 – 4. Based on the results of the database searches and literature reviews, it is estimated that 21 native mammal, 151 bird, 74 reptile and 10 frog species may in the Kokerbin Nature Reserve. This fauna list includes several species of conservation significance.

CONTENTS

1. INTRODUCTION

1.1 Project Background

Kokerbin Nature Reserve is located approximately six kilometres north-west of Kowlyin, 15km north-east of Yoting and 40km north-west of Bruce Rock, within the Wheatbelt area of Western Australia. The reserve contains Kokerbin Rock (also known as Kokerbin Hill) a large granite outcrop which covers the majority of the reserve. Kokerbin Rock is recognised as the third largest monolith in Australia, covering an area of 9 hectares and is 122m in height (Shire of Bruce Rock, 2009). Kokerbin Nature Reserve is administered by the Department of Environment and Conservation (DEC) with a picnic area administered by the Shire of Bruce Rock.

The Kokerbin Nature Reserve covers an area of approximately 64 hectares, and lies within a region extensively cleared for agriculture. Nangeen Hill and Kwolyin Nature Reserves occur nearby to the north and north-east.

M Griffiths and P Lewis Fauna Consultants were commissioned by the Wheatbelt NRM Inc.to undertake a fauna assessment of the Kokerbin Nature Reserve. The fauna assessment comprised a desktop review, site inspection, targeted fauna search and assessment of significant fauna habitats occurring in the Kokerbin Nature Reserve.

1.2 Fauna Assessment Objectives

The scope of service was to conduct an ecological survey to provide baseline information and contribute to an informed ecological assessment of the Kokerbin Nature Reserve. This report details the results of the desktop survey of the Kokerbin Nature Reserve. It includes species recorded from the reserve and adjacent areas, species expected to occur within the reserve and also comments on species of conservation significance expected to occur in the reserve or immediate area.. This report will provide background information for a more detailed fauna assessment of the area.

The objectives of the desktop survey include to:

- Conduct a review of background information (a search of all sources for literature, data and map-based information);
- Compile an inventory of vertebrate fauna expected to occur on the site;
- Identify significant fauna species likely to utilise habitat within the project area;
- Document the characteristics of the fauna assemblage of the site including significance at the international, national, state, regional and local level;

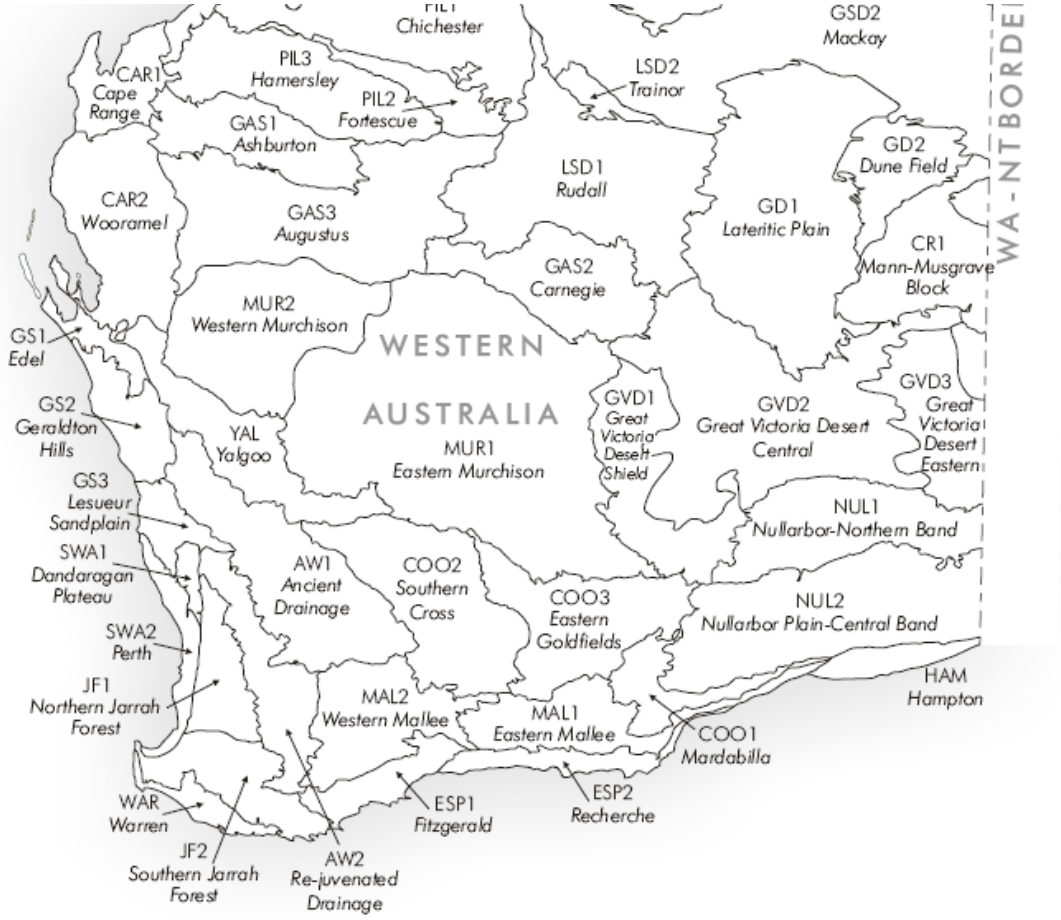
2. BACKGROUND

2.1 Regional Description

The Interim Biogeographic Regionalisation of Australia (IBRA) has identified 26 bioregions in Western Australia (Figure 2). Bioregions are classified on the basis of climate, geology, landforms, vegetation and fauna (Thackway and Cresswell, 1995). IBRA Bioregions are affected by a range of different threatening processes and have varying levels of sensitivity to impact (EPA, 2004).

The Kokerbin Nature Reserve area lies within the Avon Wheatbelt Bioregion, which is further divided into two subregions. Kokerbin Nature is situated within the Ancient Drainage Subregion (Avon Wheatbelt 1, IBRA, 2009, see Figure 2). The Avon Wheatbelt Bioregion falls within the Bioregion Group 1 classification - "regions of the South-West Botanical Province that are extensively cleared for agriculture." (EPA, 2004). Over 85% of the native vegetation of within the Avon Wheatbelt Bioregion has been cleared or extensively modified (Australian Natural Resources Atlas, 2008) for agricultural purposes. As a result, many fauna species have declined, with some local extinctions as only 14% of native vegetation remains.

Figure 1 IBRA Subregions in Western Australia. Note the project lies in AW4: Rejuvenated Drainage subregion of the Avon Wheatbelt bio-region.



Beecham (2001) describes the Avon Wheatbelt as a gently undulating landscape of low relief. Vegetation is dominated by:

- Proteaceous scrubheaths, rich in endemics, on residual lateritic uplands and derived sandplains;
- mixed eucalypt, *Allocasuarina huegeliana* and Jam-York Gum woodlands on Quaternary alluvials and eluvials.

The Ancient Drainage subregion is an ancient peneplain with low relief, gently undulating and has no connected drainage. Salt lake chains occur as remnants of ancient drainage systems that now only function in very wet years (Beecham, 2001). Lateritic uplands are dominated by areas of yellow sandplain. The region has a climate described as semi-arid (Dry) Warm Mediterranean with a total area of 6,566,022 ha.

The dominant land use in this subregion is cultivation (dryland agriculture) and grazing (improved pastures and dryland), with smaller areas of Unallocated Crown Land and Crown reserves, conservation areas, rural residential and mining.

A number of Critical Weight Range Mammals (35-7 000 g weight range mammals) have declined in the Avon Wheatbelt region and are threatened by cat (both feral and domestic) and fox predation. Two species are now considered nationally extinct (the Pig-footed Bandicoot and Crescent Nailtail Wallaby). Several species are locally extinct, while many others occur in small, isolated and fragmented distributions (see Appendix 1). Beecham lists a number of conservation significant fauna species recorded in the Ancient Drainage Subregion. These include(with DEC conservation status categories):

- Red-tailed Phascogale (*Phascogale calura*), Endangered
- Black-flanked Rock Wallaby (*Petrogale lateralis lateralis*), Vulnerable
- Carnaby's cockatoo (*Calyptorhynchus latirostris*), Endangered
- Malleefowl (*Leipoa ocellata*), Vulnerable
- Western Spiny-tailed Skink (*Egernia stokesii badia*), Endangered
- Slender-billed Thornbill (*Acanthiza iredalei*), Vulnerable
- Shield-backed Trapdoor Spider (*Idiosoma nigrum*), Schedule 1
- *Kwonkan eboracum* (a trapdoor spider), Schedule 1
- *Teyl* sp. (BY Main 195312683, 1984/13) (a trapdoor spider), Schedule 1
- Peregrine Falcon (*Falco peregrinus*) , Schedule 4
- Carpet Python (*Morelia spilota imbricata*), Schedule 4
- Woma (*Aspidites ramsayi*, south west population), Schedule 4
- Western Rosella (Inland subspecies, *Platycercus icterotis xanthogenys*) Priority 2
- Barking Owl (Southwest, *Ninox connivens connivens*), Priority 2
- *Lerista viduata*, Priority 1
- *Daphnia jollyi*, Priority 1
- *Limnocythere porphyretica*, Priority 1

Granite Outcrops are recognised as a significant fauna habitat in the region providing seasonal resources and temporary refuge for local fauna. A number of conservation

significant species occur on granite outcrops and several fauna species are restricted to granite in the region. This includes:

- Black-flanked Rock Wallaby (*Nationally Vulnerable*),
- Four species of reptiles are restricted to granite outcrops (eg. *Ctenophorus ornatus*);
- Mygalomorph spider genus Teyl - restricted to granite outcrops with extensive radiation in the southern half of Western Australia (Harvey and Main undated), and a Gondwanan relic of "wet" habitats (Main 1996).
- the larvae chironomid fly *Archaeochlus*
- at least 230 species of aquatic invertebrates occur in granite pools, with about 50 endemic species (Pinder et al. 2000).

The Reserve Management Standard for the Avon Wheatbelt bioregion is poor (less than 5 % and less than 30 % of native vegetation cover remaining, Beecham, 2001). Rising saline groundwater is a significant threatening process in the region estimated to threaten up to 30 % of the landscape. Salinity is managed in few very localised areas and is currently and projected to cause major declines and extinctions in lowland communities, including tall woodlands, mallee and Melaleuca shrublands, freshwater and naturally saline wetland systems (Beecham, 2001). Other biodiversity threatening processes recognised for the region include:

- predation from introduced mammals (feral cat, fox);
- grazing;
- land clearance;
- weed invasion;
- inappropriate fire regimes –fire histories for reserves are also poorly known and documented;.
- Competition and land degradation by European Rabbits and unmanaged Goats.

Feral Mammal species recorded in the region include the House Mouse (*Mus musculus*), Black Rat (*Rattus rattus*), Red Fox (*Vulpes vulpes*), Feral Cat (*Felis catus*), European Rabbit (*Oryctolagus cuniculus*), Horse (*Equus caballus*), Cattle (*Bos taurus*), Goat (*Capra hircus*) and Sheep (*Ovis aries*).

2.2 Vegetation

The majority of the vegetation in the region has been cleared for agriculture. Native vegetation that remains generally occurs in small and isolated remnants and many areas are degraded by grazing, fire, rising salinity and weed invasion. The vegetation of the region is described by Tille (2006) as:

"Much has been cleared for agricultural development. In their natural state, the northern sandplains support acacia-Allocasuarina-melaleuca thickets. Species present include tammar (*Allocasuarina campestris*), *Melaleuca uncinata*, *M. cordata*, *Acacia neurophylla*, *A. beauverdiana*, *A. resinomarginea* and bull mallee (*Eucalyptus pyriformis*). In the south is a proteaceous scrub-heath of Dryandra, Allocasuarina, Banksia, Hakea, Grevillea and Acacia spp. Scrub-heaths with Banksia and *Xylomelum angustifolium* also occur on these sandplains.

Common species west of the Meckering line are woodlands of York gum and wandoo with salmon gum, morel and gimlet. York gum and jam are found on the loamy soils over fresh rock. There is also some tammar thickets, proteaceous scrub-heaths and mallee on the lateritic residuals, with mallet (*E. astringens*) found below breakaways. On saline valley floors thickets of *Melaleuca thyoides* over samphire (*Halosarcia* spp.) can occur."

Granite outcropping is the major landform occurring within Kokerbin Nature Reserve. Vegetation consists of woodlands and shrublands fringing the granite outcrops and vegetation associated with granite. The vegetation of the Kokerbin Nature Reserve includes:

- Wandoo (*Eucalyptus wandoo*) Woodland fringing the granite outcropping. Small areas occur fringing the granite outcropping.
- Tammar (*Allocasuarina campestris*) shrubland and thickets and Kwongan Heath.
- York Gum (*Eucalyptus loxophleba*) Woodland with *Acacia acuminata*. Sandalwood (*Santalum spicatum*), and a diversity of native annual species (eg Family Asteraceae and Family Apiaceae) and native grasses.
- *Calicopeplus paucifolius* (tall broombush-like shrubs) / Tall Acacia shrubland and thickets fringing granite outcropping. This vegetation sometimes includes intermittent York Gums (*Eucalyptus loxophleba*), and occurs at the base of the granite outcropping. It is likely to be dependant on runoff from the large granite outcrops.
- Granite Outcrop vegetation includes Borya sp., *Kunzea pulchella*, Tea Tree (*Leptospermum* sp.),, Melaleuca spp., *Acacia lasiocalyx* and sporadic stands of Caesia Gum (*Eucalyptus caesia*).

Kokerbin Rock dominates the area containing numerous micro-habitats for fauna including caves, rock crevices and ephemeral rock pools. The ephemeral rock pools are likely to be a significant resource for fauna.

2.3 Previous Survey Work

A number of biological surveys have been conducted in the Kokerbin region. These are discussed below.

The Biological Surveys Committee of Western Australia coordinated an inventory of vegetation, flora and fauna of the Western Australian Wheatbelt. Biological surveys were conducted within the Badjaling and Yoting Areas within bushland remnants (Records of Western Australian Museum, Supplement 12). The fauna component of the survey was conducted from 1974 - 1979.

A total of 107 fauna species were recorded from the Badjaling area comprising 75 bird, 20 reptile, six frog, two native mammal and four introduced mammal species. Unlike birds, reptiles or frogs, mammals were found to be very poorly represented in the area. The isolation of native remnants and relative small size suggest native vegetation in the area is no large enough to conserve even the small mammal fauna of the central Wheatbelt (WAM, 1980).

Species of conservation significance recorded from the Yoting area included:

- Rainbow Bee-eater (*Merops ornatus*, EPBC Migratory).
- Redthroat (*Pyrrholaemus brunneus*)
- White-browed Babbler (*Poecilodryas superciliosa*, DEC Priority 4).
- Western Yellow Robin (*Eopsaltria griseogularis*, threatened Wheatbelt species)
- Purple-crowned Lorikeet (*Glossopsitta porphyrocephala*, threatened Wheatbelt species).

Additionally, several fauna surveys have been conducted at Nangeen Hill which supports a population of the EPBC Vulnerable Black-footed Rock Wallaby (*Petrogale lateralis lateralis*).

2.4 Conservation Significance

Biodiversity in Western Australia is protected, managed and assessed under International, National and State Agreements, Legislation and Policy. For Environmental Impact Assessment, the *Environment Protection and Biodiversity Conservation Act* 1999 and the *Western Australian Wildlife Conservation Act* 1950 are of particular relevance to Western Australian fauna.

EPBC Act

At the national level, fauna are protected under the *Environment Protection and Biodiversity Conservation Act* 1999 (EPBC Act). Schedule 1 of the Commonwealth EPBC Act contains a list of species that are considered Critically Endangered, Endangered, Vulnerable, Extinct, Extinct in the wild and Conservation Dependent. These categories are described in Appendix Four. The significance levels for fauna used in the EPBC Act are those recommended by the International Union for the Conservation of Nature and Natural Resources (IUCN) and reviewed by Mace and Stuart (1994).

Under the provisions of the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) proposed actions which have the potential to have a significant impact on a matter of national environmental significance must be referred to the Commonwealth Minister for the Environment for a decision as to whether assessment is required under the provisions of that Act (EPA, 2004).

The EPBC Act also has lists of migratory species that are recognised under international treaties such as the China Australia Migratory Bird Agreement (CAMBA), the Japan Australia Migratory Bird Agreement (JAMBA) and the Bonn Convention (The Convention on the Conservation of Migratory Species of Wild Animals).

Wildlife Conservation Act

At the state level, significant fauna are listed under the *Western Australian Wildlife Conservation Act 1950: Wildlife Conservation (Specially Protected Fauna) Notice* 2007. Threatened species are listed under four schedules: species that are rare and likely to become extinct, species that area presumed extinct, migratory species listed under international treaties and other specially protected fauna.

The Wildlife Conservation Act uses a set of Schedules but also classifies species using some of the IUCN categories. These categories and Schedules are described in Appendix 2.

Biodiversity Publications

In addition, the Department of Environment, Water, Heritage and Arts (DEWHA, formerly Environment Australia) has supported the publication of reports on the conservation status of most vertebrate fauna species e.g. fish (Wager and Jackson

(1993), reptiles (Cogger *et al.* 1993), birds (Garnett and Crowley 2000), monotremes and marsupials (Maxwell et al. 1996), rodents (Lee 1995) and bats (Duncan *et al.* 1999). These publications also use the IUCN categories, although those used by Cogger et al. (1993) and Wager and Jackson (1993) differ in some respects as these reports pre-date Mace and Stuart's review (1994).

Priority Fauna

In Western Australia, the Department of Environment and Conservation (DEC) has produced a supplementary list of Priority Fauna, being species that do not meet the criteria for listing as threatened fauna under Schedule 1 (of the *Wildlife Conservation Act*) however are poorly known and/or conservation dependant. Some Priority species, however, are also assigned to the IUCN Conservation Dependent category. Levels of Priority are described in Appendix Four.

Conservation Significant Fauna

Fauna species included under conservation acts and/or agreements are formally recognised as of conservation significance under state or federal legislation. Species listed only as Priority by DEC, or that are included in publications such as Garnett and Crowley (2000) and Cogger *et al.* (1993) but not in State or Commonwealth Acts, are also of recognised conservation significance. In addition, species that are at the limit of their distribution, those that have a very restricted range and those that occur in breeding colonies, such as some waterbirds, can be considered of conservation significance, although this level of significance has no legislative or published recognition and is based on interpretation of distribution information. The WA Department of Environmental Protection (2000, now DEC) used this sort of interpretation to identify significant bird species in the Perth metropolitan area as part of Perth Bushplan.

Locally significant fauna are species not listed under Acts or in publications, but considered of at least local significance because of their pattern of distribution. This level may have links to preserving biodiversity at the genetic level (EPA 2002). For example, if a population is isolated but a subset of a widespread (common) species, then it may not be recognised as threatened, but may have unique genetic characteristics. Species on the edge of their range, or that are sensitive to impacts such as habitat fragmentation, may also be classed as locally significant.

Other Legislation:

A species that has statutory protection under any of the following Acts:

- Conservation and Land Management Act 1986 (WA). An Act for the use, protection and management of certain public lands and waters and the flora and fauna.
- Environmental Protection Act 1986 (WA). An Act 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.

- Wildlife Conservation Act 1976 (WA). An Act to provide for the conservation and protection of wildlife
- Aboriginal and Torres Strait Islander Heritage Protection Act 1984 (Commonwealth). An Act to preserve and protect places, areas and object of particular significance to Aboriginal people.

Other levels of conservation significance include:

A species that the scientific community identified as:
- Unknown status.
- Requires monitoring.
- An un-described taxon.
- Not well reserved or unreserved.
- Listed on Western Australian Databases.

A species that the scientific community identifies as unusual:
- Uncommon.
- Endemic.
- Limited range.
- A disjunct population.
- Primitive, relict.
- Declining in extent.
- Scientific importance.

3. METHODS

3.1 Approach

This fauna assessment and report preparation were carried out with reference to guidance and position statements published by the WA Environmental Protection Authority (EPA) on fauna surveys and environmental protection, and Commonwealth biodiversity legislation (e.g. EPA 2002; EPA 2004). The EPA describes a desktop study as:

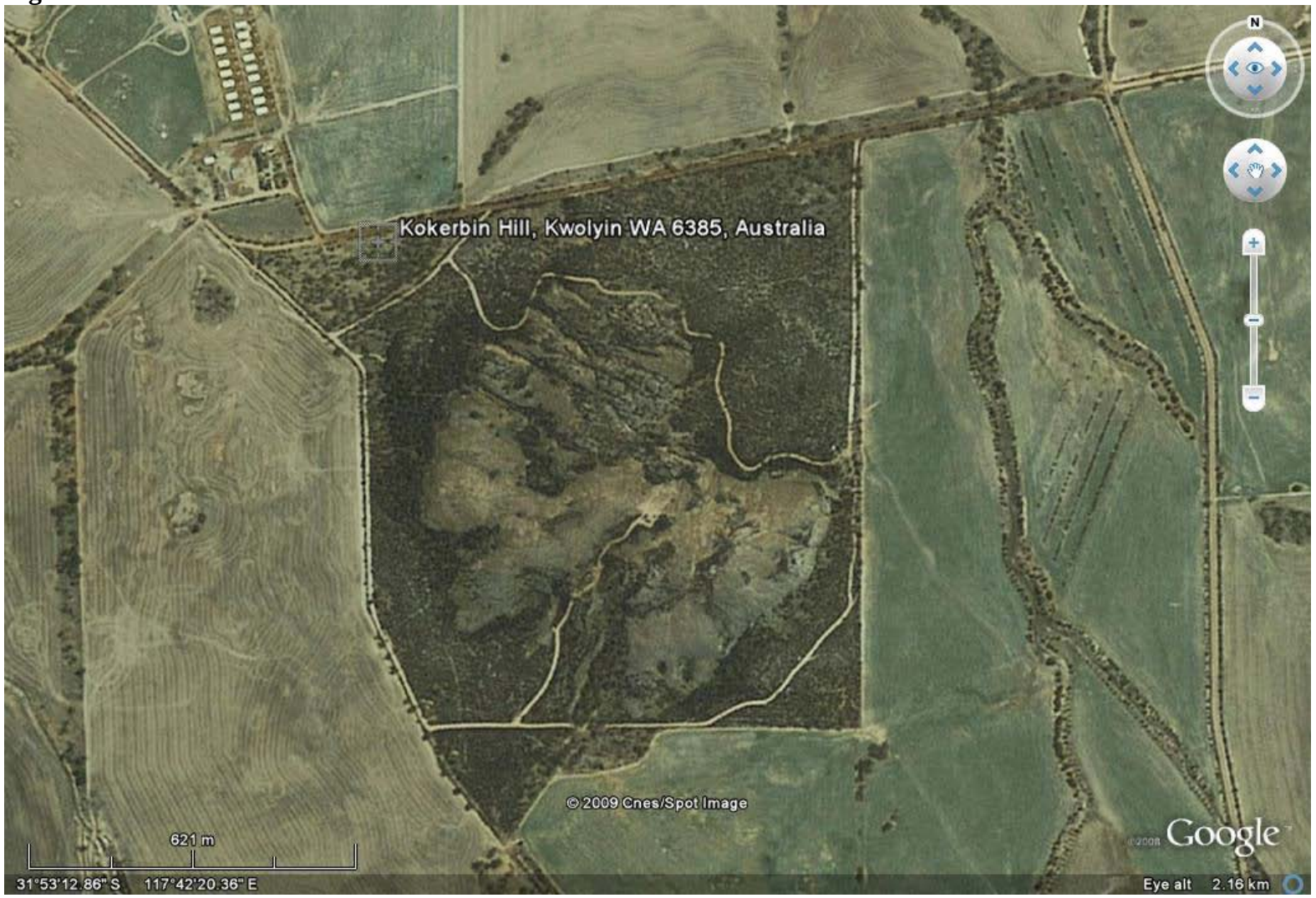
"Background research or 'desktop' study with the purpose to gather background information on the target area (usually at the locality scale). This involves a search of all sources for literature, data and map-based information (EPA, 2004)."

3.2 Study Area

The Kokerbin Nature Reserve comprises Kokerbin Rock, a large granite outcrop and adjacent native revegetation and is approximately 64 hectares in size. Kokerbin Rock and the associated granite vegetation cover the majority of the reserve comprising approximately 37 hectares. The remaining area is covered in native vegetation adjacent to the granite outcrops.

Kokerbin Nature Reserve is bordered by Kokerbin Hill Rd and O'Gradys Road to the north. The reserve contains the entire bushland remnant surround Kokerbin Hill and is surrounded by cleared agricultural land (see Figure 3).

Figure 2: The Location of the Kokerbin Nature Reserve.



3.3 Nomenclature and taxonomy

As per the recommendations of EPA (2004), the nomenclature and taxonomic order presented in this report are based on the Western Australian Museum's *Checklist of the Vertebrates of Western Australia*. The authorities used for each vertebrate group are: amphibians and reptiles (Aplin and Smith 2001), birds (Christidis and Boles 1994; Johnstone 2001), and mammals (How *et al.* 2001).

Field identification of vertebrate species was based on the following field guides:

Mammals	. . . .	Menkhorst & Knight (2001)
Skinks	. . . .	Storr et al. (1999)
Birds	. . . .	Simpson & Day (2004)
Reptiles	. . . .	Wilson & Swan (2008)
Amphibians	. . . .	Tyler et al. (2000)

3.4 Desktop Survey

Information for this fauna assessment was drawn primarily from NatureMap (Department of Environment and Conservation and Western Australian Museum databases), Birds Australia Atlas Database (Birds Australia, 2009) and EPBC Protected Matters Search Tool. All databases were interrogated in October 2009 (see below). This information was supplemented with species expected in the area based on general patterns of distribution. Sources of information used for these general patterns were: frogs (Tyler *et al.* 2000), reptiles (Storr *et al.* 1983, 1990, 1999 and 2002, and Bush *et. al*. 2007), birds (Blakers *et al.* 1984; Johnstone and Storr 1998; Johnstone and Storr, 2003; Storr, 1984), and mammals (Churchill 1998; Strahan 1995; Menkhorst and Knight 2001).

Database	Type of records held on database	Area searched
NatureMap (WA Museum)	Records of specimens held in the WA Museum and DEC. Includes historical data.	Kokerbin Nature Reserve (plus 40km buffer)
Birds Australia Atlas Database	Records of bird observations in Australia, 1998-2008.	Species list for the 1 degree grid cell containing 117.70591, -31.88787
EPBC Protected Matters Search Tool	Records on matters protected under the EPBC Act, including threatened species and conservation estate.	Kokerbin Nature Reserve (plus~50 km buffer)

4. RESULTS

4.1 Fauna Habitats

At a broad scale level 9 major fauna habitats are expected from the Kokerbin Nature Reserve. These are:

1. Granite Outcrops containing caves and rock crevices
2. Ephemeral Rock Pools within the granite outcropping.
3. Granite Outcrop vegetation includes Borya sp., *Kunzea pulchella*, Tea Tree (*Leptospermum* sp.), .), Melaleuca spp., *Acacia lasiocalyx and* sporadic stands of Caesia Gum (*Eucalyptus caesia*)..
4. *Calicopeplus paucifolius* (tall broombush-like shrubs) / Tall Acacia shrubland and thickets fringing granite outcropping. This vegetation sometimes includes intermittent York Gums (*Eucalyptus loxophleba*), and occurs at the base of the granite outcropping. It is likely to be dependent on runoff from the large granite outcrops.Wandoo (*Eucalyptus wandoo*) Woodland
5. York Gum (*Eucalyptus loxophleba*) Woodland with *Acacia acuminata*, Sandalwood (*Santalum spicatum*).
6. Tammar (*Allocasuarina campestris*) shrubland and Kwongan Heath.
7. Degraded areas and cleared farmland, generally former woodlands and fringing heath.

4.2 Vertebrate Fauna

The desktop survey identified 256 native fauna species (plus 13 introduced species) potentially occurring in the Kokerbin Nature Reserve and adjacent areas. The potential fauna occurring in the area are listed in Tables 1 – 4. Based on the results of the database searches and literature reviews, it is estimated that 21 native mammal, 151 bird, 74 reptile and 10 frog species may occur within the Kokerbin Nature Reserve. This fauna list includes several species of conservation significance.

These lists are derived from the results of database and literature searches. Literature records include NatureMap (records within 40km of Kokerbin Nature Reserve, from NatureMap), species recorded in the Kokerbin Nature Reserve area during the Western Australian Museum Wheatbelt Survey (WAM), Birds Australia records (BA), and fauna identified as occurring in the area from field guides. Fauna species previously recorded in Kokerbin Nature Reserve are also noted (KNR).

4.2.1 Amphibians

Eleven frog species are expected to occur in the Kokerbin Nature Reserve area (see Table 1). A number of burrowing species are expected including the Turtle Frog (*Myobatrachus gouldii*), Western Spotted Frog (*Heleioporus albopunctatus*), several Neobatrachus species and the Crawling Toadlet (*Pseudophryne guentheri*).

Table 1: **Amphibians expected at Kokerbin Nature Reserve**. Species recorded in the region by the Western Australian Museum (WAM) or at Kokerbin Nature Reserve (KNR) are indicated.

Family and Species Name	Common Name	Nature Map	KNR	WAM	Status
Myobatrachidae					
Crinia glauerti	Clicking Frog	X			
Crinia pseudinsignifera	Bleating Froglet	X			
Heleioporus albopunctatus	Western Spotted Frog	X		X	
Limnodynastes dorsalis	Western Banjo Frog	X		X	
Myobatrachus gouldii	Turtle Frog	X		X	
Neobatrachus albipes	White-footed Trilling Frog	X		X	
Neobatrachus kunapalari	Kunapalari Frog	X		X	
Neobatrachus pelobatoides	Humming Frog	X		X	
Neobatrachus sutor	Shoemaker Frog	X			
Pseudophryne guentheri	Crawling Toadlet	X		X	
NUMBER OF SPECIES EXPECTED **NUMBER OF SPECIES RECORDED**		**10**		7	

Litoria moorei and *Litoria adelaidensis* occur in the region near the extreme edge of their range however both species are not expected due to an absence of permanent water within Kokerbin Nature Reserve. No frog species occurring or expected to occur within the project area are of conservation significance.

4.2.1 Reptiles

Seventy four reptile species may occur in the Kokerbin Nature Reserve area (see Appendix 3). This includes 11 Geckoes (Family Gekkonidae), six Legless Lizards (Family Pygopodidae), 25 skinks (Family Scincidae), seven Dragons (Family Agamidae), two Goannas (Family Varanidae), five Blind Snakes (Family Typhlopidae), three Pythons (family Boidae) and 15 Front-fanged Snakes (Family Elapidae). These species are listed in Appendix 1 and Table 2.

NatureMap lists one reptile species recorded from the Kokerbin Nature Reserve – the conservation Significant Carpet Python. Four reptile species of high conservation significance have been recorded from the Kokerbin region. These include:

1. Western Spiny-tailed Skink (*Egernia stokesii badia*). Schedule 1, recorded from Kellerberrin and Wyalkatchem.
2. South-west Woma (*Aspidites ramsayi*). Priority 1, Schedule 4. Old records from Quairading and Kellerberrin.
3. South-west Carpet Python (*Morelia spilota imbricata*). Schedule 4. Recorded from Kokerbin Nature Reserve.
4. Southern Death Adder (*Acanthophis antarticus*). DEC Priority 3. Recorded from Brookton.

A number of additional reptiles expected in the area may be considered to be locally significant. This includes species occurring at the edge of their known range, habitat specialists or species with restricted ranges or considered to be uncommon. A number of species expected in the Kokerbin Nature Reserve region are locally significant and include:

- *Delma greyii*. Occurs inland to Buntine and Kellerberrin within Banksia Woodland and Heath on sandplain (Bush *et al*, 2007).
- *Ctenophorus ornatus*. Occurs on granite outcrops.
- *Ctenophorus cristatus*. Occurs at Beverley at the edge of its known range.
- *Ctenophorus salinarum*. Restricted to salt lakes, occurs at Cunderdin.
- *Ramphotyphlops pinguis*. Occurs in the region on the edge of its range.
- *Antaresia stimsoni*. Occurs mostly on granite outcrops and rocky areas.

These and other reptile species of conservation significance are discussed in Chapter 5.

Table 2: Reptiles expected at Kokerbin Nature Reserve. Species recorded in the region by the Western Australian Museum (WAM) or at Kokerbin Nature Reserve (KNR) are indicated as well as species recorded on the Nature Map database and in Literature (LIT).

Family and Species Name	Common Name	Nature Map	KOK	WAM	Status
Gekkonidae					
Christinus marmoratus	Marbled Gecko	X			
Crenodactylus ocelatus	Clawless Gecko	X		X	
Diplodactylus alboguttatus	White-spotted Ground Gecko	X			
Diplodactylus granariensis	Western Stone Gecko	X		X	
Diplodactylus pulcher	Beautiful Gecko	X		X	
Gehyra variegata	Tree Dtella	X		X	
Heteronotia binoei	Bynoe's Gecko	X			
Lucasium maini	Main's Ground Gecko	LIT		X	
Oedura reticulata	Reticulated Velvet Gecko	X		X	
Strophurus spinigerus	Western Spiny-tailed Gecko	X		X	
Underwoodisaurus milii	Barking Gecko	X			
Pygopodidae					
Aprasia repens	South-west Sandplain Aprasia	LIT			
Delma australis	Marbled Faced Delma	X			
Delma fraseri	Fraser's Delma	X		X	
Delma grayii	Side-barred Delma	X			
Lialis burtonis	Burton's Legless-Lizard	X			
Pygopus lepidopodus	Common Scaly-foot	X			
Scincidae					
Cryptoblepharus buchananii	Fence Skink	X			
Ctenotus fallens	West Coast Ctenotus	LIT			
Ctenotus impar	Odd Striped Ctenotus	X			
Ctenotus leonhardii		X			
Ctenotus pantherinus	Leopard Skink	X		X	
Ctenotus schomburgkii	Barred Wedge-snouted Ctenotus	X		X	
Eremiascincus richardsonii	Broad-banded Sand Swimmer	X			
Egernia kingi	Kings Skink	LIT			
Egernia multiscutata	Bull-headed Skink	LIT			
Egernia inornata	Unadorned Desert Skink	LIT			
Egernia napoleonis	Woodland Crevice Skink	LIT			
Egernia stokesii	Western Spiny-tailed Skink	X			Sch. 1
Eremiascincus richardsonii	Broad-banded Sandswimmer	X			
Hemiergis initialis	Southern Five-toed Mulch Skink	LIT			
Hemiergis peronii	Four-toed Earless skink	LIT			
Lerista distinguenda		X			
Lerista gerrardii	Bold-striped Robust Lerista	LIT			
Lerista kingi	Common Mulch Lerista	X			
Lerista macropisthopus		X			
Menetia greyii	Common Dwarf Skink	X		X	
Morethia butleri		LIT			
Morethia lineoocellata		X			
Morethia obscura	Woodland Flecked Skink	X		X	
Tiliqua occipitalis	Western Blue-tongue	X		X	
Tiliqua rugosa	Bobtail	X		X	
Agamidae					
Ctenophorus cristatus	Crested Dragon	LIT			
Ctenophorus maculatus	Spotted Dragon	X			
Ctenophorus ornatus	Ornate Dragon	X			

Family and Species Name	Common Name	Nature Map	KOK	WAM	Status
Ctenophorus reticulatus	Western Netted Dragon	X		X	
Ctenophorus scutulatus	Lozenge-marked Dragon	LIT			
Moloch horridus	Thorny Devil	X		X	
Pogona minor	Western Bearded Dragon	X		X	
Varanidae					
Varanus gouldii	Sand Goanna	X		X	
Varanus tristis	Black-headed Tree Goanna	X			
Typhlopidae					
Ramphotyphlops australis	Southern Blind Snake	X			
Ramphotyphlops bituberculatus	Prong-snouted Blind Snake	LIT			
Ramphotyphlops hamatus	Northern Hooksnouted Blind Snale	X			
Ramphotyphlops pinguis	Fat Blind Snake	LIT			
Ramphotyphlops waitii	Common Beaked Blind Snake	X			
Boidae					
Antaresia stimsoni subsp. stimsoni	Stimson's Python	X			
Aspidites ramsayi Woma	Southwest Woma	X			**Sch 4**
Morelia spilota imbricata	Carpet Python	X	X		**Sch 4**
Elapidae					
Acanthophis antarticus	Southern Death Adder	LIT			P3
Brachyurophis fasciolata	Narrow-banded Shovel-nosed Snake	X			
Brachyurophis semifasciata	Southern Shovel-nosed Snake	X			
Demansia psammophis	Yellow-faced Whip Snake	X			
Echiopsis curta	Bardick	X			
Furina ornata	Moon Snake	LIT			
Neelaps bimaculatus	Black-naped Snake	LIT			
Parasuta gouldii	Gould's Snake	X		X	
Parasuta nigriceps	Black-backed Snake	LIT			
Pseudechis australis	Mulga Snake	X		X	
Pseudonaja affinis	Dugite	X			
Pseudonaja modesta	Ringed Brown Snake	X			
Pseudonaja nuchalis	Gwardar	X		X	
Simoselaps bertholdi	Jan's Banded Snake	X		X	
Suta fasciata	Rosen's Snake	LIT			
NUMBER OF SPECIES EXPECTED		74			

4.2.1 Birds

A total of 151 bird species are expected to occur in the Kokerbin area (see Table 3). This list includes species recorded under the Birds Australia Bird Atlas Scheme, species recorded in the area by the Western Australian Museum (WAM), and species recorded at Kokerbin Nature Reserve (KNR). A number of species considered to be locally significant are also listed (LS). This includes species described as declining in the Wheatbelt region in the literature.

Forty eight species have been previously recorded at Kokerbin Nature Reserve (see Table 3).

Three species of conservation significance have been previously recorded in the area. These are

1. Rainbow Bee-eater (EPBC Migratory). Recorded at Kokerbin Nature Reserve.
2. White-browed Babbler (DEC Priority 4). Recorded at Kokerbin Nature Reserve.
3. Peregrine Falcon (DEC Schedule 1). Recorded nearby at Nangeen Hill Nature Reserve in habitat present at Kokerbin – granite outcrop.

An additional 14 species of conservation significance are expected to occur in the Kokerbin Nature Reserve area. Conservation significant fauna are discussed in Chapter 5. Several species listed as Migratory under the EPBC Act (and also listed under JAMBA and CAMBA) may periodically utilise the salt lake drainage system adjacent to the reserve. Three introduced species are also expected.

Table 3: Birds expected at Kokerbin Nature Reserve. Species recorded in the region by the Western Australian Museum (WAM) or at Kokerbin Nature Reserve (KNR) are indicated as well as species recorded on the Nature Map and Birds Australia (BA) databases and in Literature (LIT). Species recorded at nearby Nageen Hill are also listed (NH).

Family and Species Name	Common Name	Nature Map	BA	WAM	KNR	Status
Dromaiidae (emus)						
Dromaius novaehollandiae	Emu					
Phasianidae						
Coturnix pectoralis	Stubble Quail		X			
Anatidae						
Biziura lobata	Musk Duck	X	X			
Cygnus atratus	Black Swan	X	X	X		
Tadorna tadornoides	Australian Shelduck		X	X		
Chenonetta jubata	Australian Wood Duck		X			
Anas superciliosa	Pacific Black Duck	X	X			
Anas gracilis	Grey Teal	X	X	X		
Aythya australis	Hardhead		X			
Malacorhynchus membranaceus	Pink-eared Duck	X	X			
Anas rhynchotis	Australasian Shoveler		X			
Anas castanea	Chestnut Teal		X			
Oxyura australis	Blue-billed Duck		X			
Podicipedidae (Grebes)						
Tachybaptus novaehollandiae	Australasian Grebe		X			
Poliocephalus poliocephalus	Hoary-headed Grebe	X	X	X		
Columbidae						
Columba livia	Rock Dove		X			INT
Streptopelia senegalensis	Laughing Dove		X	X		INT
Phaps chalcoptera	Common Bronzewing		X	X	X	
Ocyphaps lophotes	Crested Pigeon		X	X	X	
Podargidae (frogmouths)						
Podargus strigoides	Tawny Frogmouth		X	X	X	
Aegothelidae						
Aegotheles cristatus	Australian Owlet-nightjar	X	X	X		
Caprimulgidae (nightjars)						
Eurostopodus argus	Spotted Nightjar			X		
Apodidae (swifts)						
Apus pacificus	Fork-tailed Swift		X			MIG
Ardeidae (Herons, Egrets)						
Egretta novaehollandiae	White-faced Heron	X	X	X		
Ardea pacifica	White-necked Heron		X	X		
Threskiornis spinicollis	Straw-necked Ibis		X			
Accipitridae						
Elanus axillaris	Black-shouldered Kite		X	X		
Lophoictinia isura	Square-tailed Kite		X			LS
Haliastur sphenurus	Whistling Kite		X			
Accipiter fasciatus	Brown Goshawk		X		X	
Accipiter cirrhocephalus	Collared Sparrowhawk		X		X	
Circus approximans	Swamp Harrier		X			
Circus assimilis	Spotted Harrier		X	X		
Aquila audax	Wedge-tailed Eagle		X	X	X	
Hieraaetus morphnoides	Little Eagle		X	X		
Falconidae (falcons)						
Falco peregrinus	Peregrine Falcon		X		NH	Sch 4
Falco longipennis	Australian Hobby		X			

Family and Species Name	Common Name	Nature Map	BA	WAM	KNR	Status
Falco berigora	Brown Falcon		X	X		
Falco cenchroides	Nankeen Kestrel	X	X	X	X	
Rallidae (crakes and rails)						
Tribonyx ventralis	Black-tailed Native-hen	X	X			
Fulica atra	Eurasian Coot	X	X			
Porzana pusilla	Baillon's Crake		X	X		
Burhinidae						
Burhinus grallarius	Bush Stone-curlew	X	X			P 4
Scolopacidae						
Tringa stagnatalis	Marsh Sandpiper			X		MIG
Tringa nebularia	Common Greenshank		X	X		MIG
Tringa glareola	Wood Sandpiper					MIG
Tringa hypoleucos	Common Sandpiper					MIG
Calidris ruficollis	Red-necked Stint		X			
Laridae						
Larus novaehollandiae	Silver Gull	X	X			
Sterna nilotica	Gull-billed Tern		X			
Recurvirostridae						
Himantopus himantopus	Black-winged Stilt	X	X	X		
Cladorhynchus leucocephalus	Banded Stilt		X	X		
Recurvirostra novaehollandiae	Red-necked Avocet		X	X		
Erythrogonys cinctus	Red-kneed Dotterel		X			
Charadrius ruficapillus	Red-capped Plover		X	X		
Elseyornis melanops	Black-fronted Dotterel		X			
Charadrius australis	Inland Dotterel		X			
Vanellus tricolor	Banded Lapwing		X	X		
Otidae (bustards)						
Ardeotis australis	Australian Bustard					P 4
Turnicidae						
Turnix velox	Little Button-quail		X			
Turnix varius	Painted Button		X	X		
Cacatuidae (cockatoos)						
Calyptorhynchus banksii	Red-tailed Black-Cockatoo		X			
Cacatua roseicapilla	Galah		X	X	X	
Cacatua pastinator	Western Corella		X			
Cacatua sanguinea	Little Corella		X	X		
Nymphicus hollandicus	Cockatiel		X	X		
Psittacidae						
Glossopsitta porphyrocephala	Purple-crowned Lorikeet		X	X		LS
Platycercus icterotis	Western Rosella		X			Sch 1
Polytelis anthopeplus	Regent Parrot		X			LS
Melopsittacus undulatus	Budgerigar		X			
Barnardius zonarius	Australian Ringneck	X	X	X	X	
Psephotus varius	Mulga Parrot		X	X		
Neophema elegans	Elegant Parrot		X			
Cuculidae (cuckoos)						
Cuculus pallidus	Pallid Cuckoo		X	X	X	
Cacomantis flabelliformis	Fan-tailed Cuckoo		X			
Chrysococcyx osculans	Black-eared Cuckoo		X	X		
Chrysococcyx basalis	Horsfield's Bronze-Cuckoo		X	X	X	
Chrysococcyx lucidus	Shining Bronze-Cuckoo		X		X	
Tytonidae (barn owls)						

Family and Species Name	Common Name	Nature Map	BA	WAM	KNR	Status
Tyto alba	Barn Owl	X	X	X	X	
Strigidae (hawk-owls)						
Ninox novaeseelandiae	Southern Boobook Owl		X	X	X	
Halcyonidae						
Dacelo novaeguineae	Laughing Kookaburra		X			INT
Todiramphus pyrrhopygia	Red-backed Kingfisher		X			
Todiramphus sanctus	Sacred Kingfisher		X			
Meropidae (bee-eaters)						
Merops ornatus	Rainbow Bee-eater		X	X	X	MIG
Climacteridae						
Climacteris rufa	Rufous Treecreeper		X			LS
Maluridae (fairy-wrens)						
Malurus splendens	Splendid Fairy-wren		X			
Malurus pulcherrimus	Blue-breasted Fairy-wren	X	X			LS
Malurus leucopterus	White-winged Fairy-wren		X	X		
Pardalotidae						
Pardalotus punctatus	Spotted Pardalote			X		
Pardalotus striatus	Striated Pardalote		X	X	X	
Hylacola cauta whitlocki	Shy Heathwren		X			P4
Sericornis brunneus	Redthroat	X	X	X		LS
Smicrornis brevirostris	Weebill		X	X	X	
Gerygone fusca	Western Gerygone		X	X	X	
Acanthiza apicalis	Inland Thornbill		X		X	
Acanthiza uropygialis	Chestnut-rumped Thornbill		X	X	X	
Acanthiza chrysorrhoa	Yellow-rumped Thornbill	X	X	X	X	
Meliphagidae						
Anthochaera carunculata	Red Wattlebird		X	X	X	
Acanthagenys rufogularis	Spiny-cheeked Honeyeater		X	X	X	
Manorina flavigula	Yellow-throated Miner		X	X	X	
Lichenostomus virescens	Singing Honeyeater		X	X	X	
Lichenostomus leucotis	White-eared Honeyeater		X		X	
Lichenostomus ornatus	Yellow-plumed Honeyeater		X		X	
Lichenostomus plumulus	Grey-fronted Honeyeater					
Melithreptus brevirostris	Brown-headed Honeyeater		X	X		
Lichmera indistincta	Brown Honeyeater		X	X	X	
Phylidonyris albifrons	White-fronted Honeyeater		X	X		
Certhionyx niger	Black Honeyeater		X			
Certhionyx variegatus	Pied Honeyeater		X			
Epthianura tricolor	Crimson Chat		X			
Epthianura albifrons	White-fronted Cat		X	X	X	
Glyciphila melanops	Tawny-crowned Honeyeater		X	X		
Phylidonyris niger	White-cheeked Honeyeater		X			
Melithreptus lunatus	White-naped Honeyeater		X		X	
Pomatostomidae						
Pomatostomus superciliosus ashbyi	White-browed Babbler	X	X	X	X	P4
Neosittidae (sittellas)						
Daphoenositta chrysoptera	Varied Sittella		X	X		
Campephagidae						
Coracina novaehollandiae	Black-faced Cuckoo-shrike		X	X	X	
Lalage sueurii	White-winged Triller		X	X	X	
Pachycephalidae						
Oreoica gutturalis	Crested Bellbird	X	X			P 4
Pachycephala pectoralis	Golden Whistler		X			
Pachycephala rufiventris	Rufous Whistler		X	X	X	

Family and Species Name	Common Name	Nature Map	BA	WAM	KNR	Status
Colluricincla harmonica	Grey Shrike-thrush		X	X	X	
Artamidae						
Artamus personatus	Masked Woodswallow		X			
Artamus cinereus	Black-faced Woodswallow		X	X	X	
Artamus cyanopterus	Dusky Woodswallow		X	X		
Cracticus torquatus	Grey Butcherbird		X	X	X	
Cracticus nigrogularis	Pied Butcherbird		X	X	X	
Gymnorhina tibicen	Australian Magpie		X	X	X	
Strepera versicolor	Grey Currawong		X		X	
Dicruridae (flycatchers)						
Myiagra inquieta	Restless Flycatcher					
Grallina cyanoleuca	Magpie-lark		X	X	X	
Rhipidura fuliginosa	Grey (White-tailed) Fantail		X	X	X	
Rhipidura leucophrys	Willie Wagtail		X	X	X	
Corvidae						
Corvus coronoides	Australian Raven		X	X	X	
Corvus bennetti	Little Crow					
Petroicidae						
Microeca fascinans	Jacky Winter		X	X		
Petroica boodang	Scarlet Robin		X			
Petroica goodenovii	Red-capped Robin		X	X	X	
Melanodryas cucullata	Hooded Robin					
Eopsaltria griseogularis	Western Yellow Robin		X	X		LS
Drymodes brunneopygia	Southern Scrub-robin		X			LS
Sylviidae						
Cincloramphus mathewsi	Rufous Songlark		X		X	
Cincloramphus cruralis	Brown Songlark		X	X		
Zosteropidae						
Zosterops lateralis	Silvereye		X	X	X	
Hirundinidae (swallows)						
Cheramoeca leucosternus	White-backed Swallow		X	X		
Hirundo neoxena	Welcome Swallow		X	X		
Hirundo nigricans	Tree Martin		X	X	X	
Hirundo ariel	Fairy Martin		X			
Dicaeidae						
Dicaeum hirundinaceum	Mistletoebird		X			
Passeridae						
Taeniopygia guttata	Zebra Finch	X	X	X		
Motacillidae						
Anthus novaeseelandiae	Richard's Pipit		X	X		
TOTAL NUMBER OF SPECIES EXPECTED		**151**				
TOTAL NUMBER OF SPECIES RECORDED				81	48	

Note:
Locally Significant includes: species listed under the IUCN as least concern and declining Woodland Species (listed in Saunders and Ingram, 1995)
MIG: Migratory under the EPBC Act.
P4: Priority 4 (DEC)
Sch 1: Schedule 1 under the Wildlife Conservation Act.
INT: Introduced.

4.2.1 Mammals

Thirty one mammal species are expected to occur in the Kokerbin Nature Reserve area including 21 native and 10 introduced species (see Table 4). This list includes four species of high conservation significance and seven species considered locally significant (LS, see Chapter 5).

The conservation significant Black-flanked Rock-wallaby (*Petrogale lateralis lateralis*) has been recorded at Kokerbin Nature Reserve. This species inhabits caves and rock crevices within Kokerbin Rock (M. Griffiths, pers. obs.).

The Chuditch (*Dasyurus geoffroyi*) is a species of conservation significance occurring in the forests and woodlands of the Perth Hills with recent records from near Westdale (J. Turpin pers. obs.) and Northam (M. Griffiths pers. obs. 2009), with other records from Beverley and near Kauring (NatureMap, 2009). The Chuditch can cover large areas and occupies a large home range and so may occur in the area as a vagrant.

The Brushtail Possum (*Trichosurus vulpecula*) and Tammar Wallaby (*Macropus eugenii*) formerly occurred across much of the region and still persist in small and isolated populations in the Wheatbelt. Both species have also been included as they have the potential to occur in the area.

The majority of mammal species expected in the Kokerbin Nature Reserve are small mammals (dunnarts, Western Pygmy Possum, native rodents), the Short-beaked Echidna, several bat species and several introduced species.

Many native mammal species recorded in the Kokerbin Nature Reserve area occur in small and fragmented populations as a result of large scale habitat clearance. The small size of the Kokerbin Nature Reserve may reduce the number of species expected, as larger mammal (requiring large home ranges), habitat specialists (occurring in specific habitat types) or species occurring in low numbers may be unable to persist in the reserve, particularly in the long-term.

Table 4: Mammals expected at Kokerbin Nature Reserve. Species recorded in the region by the Western Australian Museum (WAM) or at Kokerbin Nature Reserve (KNR) are indicated as well as species recorded on the Nature Map database and in Literature (LIT).

Family and Species Name	Common Name	Nature Map	WAM	KNR	Status
Tachyglossidae					
Tachyglossus aculeatus	Echidna	X			
Dasyuridae					
Dasyurus geoffroii	Chuditch (Western Quoll)	X			**Sch 1**
Sminthopsis crassicaudata	Fat-tailed Dunnart	X			**LS**
Sminthopsis dolichura	Little Long-tailed Dunnart	X	X		**LS**
Sminthopsis gilberti	Gilbert's Dunnart	X	X		**LS**
Phalangeridae					
Trichosurus vulpecula subsp. v	Common Brush-tail Possum	X			**LS**
Burramyidae					

Family and Species Name	Common Name	Nature Map	WAM	KNR	Status
Cercartetus concinnus	Western Pygmy Possum				**LS**
Macropodidae					
Macropus eugenii	Tammar	X			**P5**
Macropus fuliginosus	Western Grey Kangaroo	X			
Macropus robustus	Euro	X			
Petrogale lateralis lateralis	Black-footed Rock-wallaby	X		X	**Sch 1**
Molossidae					
Mormopterus sp. 3	Western Freetail Bat				
Tadarida australis	White-striped Freetail Bat	X			
Vespertilionidae					
Chalinolobus gouldii	Gould's Wattled Bat	X			
Chalinolobus morio	Chocolate Wattled Bat	X			
Nyctophilus geoffroyi	Lesser Long-eared Bat	X			
Nyctophilus timoriensis	Greater Long-eared Bat				**P 4**
Scotorepens balstoni	Inland Broad-nosed Bat				
Vespadelus regulus	Southern Forest Bat	X			
Muridae					
Notomys mitchelli	Mitchell's Hopping Mouse				**LS**
Pseudomys albocinerius	Ash Grey Mouse				**LS**
INTRODUCED MAMMALS					
Canis lupus dingo / C. familiaris	Dingo / Dog				
Vulpes vulpes	European Red Fox	X	X		
Felis catus	Feral Cat	X			
Oryctolagus cuniculus	European Rabbit	X	X		
Mus musculus	House Mouse	X	X		
Rattus rattus	Black Rat	X	X		
Capra hircus	Goat				
Equus caballus	Horse	X			
Bos taurus	Cattle				
Ovis aries	Sheep				
NUMBER OF NATIVE SPECIES EXPECTED		**21**			
INTRODUCED SPECIES EXPECTED **TOTAL NUMBER OF SPECIES RECORDED**		**10** **31**			

4.3 Invertebrate Fauna

Invertebrates are often under surveyed during fauna assessments because there are so many species and their taxonomy is so poorly understood. However, an increasing level of attention is given to a group of taxa known as Short-range Endemics (SREs). Harvey (2002) notes that the majority of invertebrate species that have been classified as short-range endemics have common life history characteristics such as poor powers of dispersal or confinement to discontinuous habitats. Several groups, therefore, have particularly high instances of short-range endemic species: Gastropoda (snails and slugs), Oligochaeta (earthworms), Onychophora (velvet worms), Araneae (mygalomorph spiders), Schizomida (schizomids; spider-like arachnids), Diplopoda (millipedes), Phreatoicidea (phreatoicidean crustaceans), and Decapoda (freshwater crayfish).

Short-range Endemic fauna are often restricted to rare or isolated habitats. In the Wheatbelt these include ironstone ridges, granite outcrops, rock pools, caves and salt lakes.

A number of invertebrate species have been recorded in the Kokerbin Nature Reserve area with 318 species (from 872 records) recorded within 40km of Kokerbin Nature Reserve on the NatureMap database (NatureMap, 2009). This includes several species of conservation significance:

1. *Idiosoma nigrum*, Shield-backed Trapdoor Spider T
2. *Ixalodectes flectocercus*, (cricket) P1
3. *Teyl* sp. (at least 3 species) – Mygalomorph Spiders

5. CONSERVATION SIGNIFICANT FAUNA

5.1 Conservation Significance Levels

Fauna species of high conservation significance are documented in this report as those species listed under state legislation (Wildlife Conservation Act), national legislation (EPBC Act) or considered threatened by the Department of Environment and Conservation (DEC Priority Fauna, see also Appendix 2). Additional fauna species of conservation significance documented in this report include those species listed as threatened in publications such as Garnett and Crowley (2000) or listed as declining woodland species (Saunders and Ingram, 1995). Fauna species of regional conservation significance are those species that are at the limit of their distribution or those that have a very restricted range. Although this level of significance has no legislative or published recognition and is based on interpretation of distribution information.

All of the above criteria describe fauna species of conservation significance.

5.2 Conservation Significant Fauna in the Kokerbin Nature Reserve Region

At least 42 species of conservation significance have been recorded in the Kokerbin Nature Reserve region. These species are listed in Table 5.

Table 3 lists the likelihood of significant fauna occurring within the proposed Kokerbin Nature Reserve. Fauna species are classified as Recorded (during previous surveys), Likely (recorded nearby, suitable habitat present), Moderate (recorded in region, suitable habitat present), Low (suitable habitat present, no recent records for the species in the region), Unlikely (suitable habitat absent).

Some additional conservation significant mammal species formerly occurred in the. Some of these species are now considered extinct (see Appendix 1) and some are now considered to be absent from the region with no recent records. Extant species formerly occurring in the region include the Woylie (*Bettongia penicillata*) and Numbat (*Myrmecobius fasciatus*). These species still remain within woodlands of the temperate south-west. The Greater Bilby (*Macrotis lagotis*) also formerly occurred in the region, however there have been no recent records of this species near the project area.

Table 5: Conservation Significant Fauna recorded in the Kokerbin region.

Species Name	Common Name	Status	Habitat	Comments	Likely at Project
MAMMALS					
Dasyurus geoffroii	Chuditch	VUL Sch 1	Woodland, forest, mallee	Records from Beverley and Northam	Low Vagrant
Phascogale tapoatafa	Brush-tailed Phascogale	VUL Sch 1	Tree Hollows Forest, Woodland	Records from York and Beverley	Low
Phascogale calura	Red-tailed Phascogale	END Sch 1	*Allocasuarina* woodland with hollows	Records from Brookton, Pingelly, Corrigin	Moderate
Petrogale lateralis lateralis	**Black-flanked Rock-wallaby**	**VUL Sch 1**	**Granite Outcrops**	**Recorded at Kokerbin, Mt. Caroline**	**Recorded**
Macropus eugenii	Tammar Wallaby	DEC P5	Heath, Mallee Woodland	Recorded near Quairading, Pingelly	Moderate - Low
Nyctophilus timoriensis	Greater Long-eared Bat	DEC P4	Woodland Shrubland	Records near Pingelly	Unlikely
Isoodon obesulus	Quenda	DEC P4	Woodland, wetlands, heath	Records from Brookton and Pingelly	Unlikely
Macropus irma	Western Brush Wallaby	DEC P4	Woodland, Mallee, heath	Records from Beverley and Corrigin	Moderate -Low
Trichosurus vulpecula	Common Brushtail Possum	Regionally significant	Woodland, hollows	Records from Northam and near Kellerberrin	Moderate
Sminthopsis crassicaudata	Fat-tailed Dunnart	Regionally significant	Woodland, shrubland	Records from Kellerberin, Shackleton	**Likely**
Sminthopsis dolichura	Little Long-tailed Dunnart	Regionally significant	Woodland, shrubland	Records from Kellerberin and Shackleton	**Likely**
Sminthopsis gilberti	Gilbert's Dunnart	Regionally significant	Woodland, shrubland	Recorded at Badjaling Nature Reserve	**Likely**
Cercartetus concinnus	Western Pygmy Possum	Regionally significant	Woodland, mallee, sandplain	Records from Beverley and Kauring	**Likely**
Notomys mitchelli	Mitchell's Hopping Mouse	Regionally significant	Sandplain, heath, mallee	Records from Beverley and Aldersyde	Moderate
Pseudomys albocinerius	Ash Grey Mouse	Regionally significant	Heath, Banksia	Records from Beverley and Aldersyde	Moderate
BIRDS					
Leipoa ocellata	Malleefowl	VUL Sch 1	Shrubland Woodland	Recorded from Dryandra	Unlikely
Merops ornatus	**Rainbow Bee-eater**	**EPBC MIG**	**Woodland, Watercourses**	**Recorded at Kokerbin Nature Reserve**	**Recorded**
Apus pacificus	Fork-tailed Swift	EPBC MIG	Aerial	Recorded at Northam	**Vagrant**
	Migratory Waders	EPBC MIG	Wetlands: Fresh/ Saline	No suitable habitat at Kokerbin Reserve	Unlikely
Ardea alba	Great Egret	EPBC MIG	Wetlands: Fresh / Saline	Recorded at Beverley	Unlikely
Platycercus icterotis xanthogenys	Western Rosella (inland ssp.)	Sch 1	Eucalypt and Allocasuarina Woodland	Recorded from Pikaring Hill (Yoting)	Moderate

Species Name	Common Name	Status	Habitat	Comments	Likely at Project
Falco peregrinus	**Peregrine Falcon**	**Sch 4**	**ridges, cliffs, woodland**	**Recorded from Nangeen Hill**	**Likely**
Burhinus grallarius	Bush Stone-curlew	Priority 4	Woodland, Shrubland	Recorded from Beverley, Kellerberrin	Moderate
Ardeotis australis	Australian Bustard	Priority 4	Wooded grasslands	Recorded from Northam, York	Moderate
Hylacola cauta whitlocki	Shy Heathwren	Priority 4	Dense mallee shrub thicket	Recorded from Kellerberrin	Moderate
Pomatostomus superciliosus ashbyi	**White-browed Babbler**	**Priority 4**	**Woodland, shrubland**	**Recorded at Kokerbin Nature Reserve**	**Recorded**
Oreoica gutturalis gutturalis	Crested Bellbird	Priority 4	Mallee Heath Woodland	Recorded at Kellerberrin	Moderate
Falcunculus frontatus	Crested Shrike-tit	Priority 4	Woodland	No local records	Unlikely
Lophoictinia isura	Square-tailed Kite	IUCN listed	Woodland and Heath	Recorded from Beverley and Shackleton	Moderate
Glossopsitta porphyrocephala	Purple-crowned Lorikeet	Regional Decline	Woodland, Mallee	Recorded from Quairading	**Likely**
Polytelis anthopeplus	Regent Parrot	Regional Decline	Forest, Woodland	Recorded from Yoting	**Likely**
Drymodes brunneopygia	Southern Scrub-robin	Regional Decline	dense mallee dense shrubs	Recorded from Charles Gardner Reserve, South Tammin	Moderate
Anthochaera carunculata	Rufous Treecreeper	Regional Decline	Woodland	Recorded from Dulbelling	Moderate
Malurus pulcherrimus	Blue-breasted Fairy-wren	Regional Decline	Woodland	Recorded near Charles Gardner Reserve, South Tammin	**Likely**
Eopsaltria griseogularis	Western Yellow Robin	Regional Decline	Woodland	Recorded at Yoting Water Reserve	**Likely**
REPTILES					
Morelia spilota imbricata	**Carpet Python**	**Sch 4**	**Woodland, forest, heath, granite**	**Recorded from Kokerbin Nature Reserve**	**Recorded**
Aspidites ramsayi	Southwest Woma	Sch. 4	Sandplains, shrublands	Old records from Quairading	Unlikely
Egernia stokesii	Western Spiny-tailed Skink	Sch. 1	Eucalypt Woodlands	Records from Kellerberrin and Wyalkatchem	Unlikely
Acanthophis antarticus	Southern Death Adder	P3	Woodlands, outcrops, gullies	Record from Brookton	Low
INVERTEBRATES					
Idiosoma nigrum	Shield-backed Trapdoor Spider	Sch. 1	Ironstone Hills, Woodlands, shrublands	Recorded from Quairading Nature Reserve, Beverley, Kellerberrin	**Likely**
Ixalodectes flectocercus	A cricket	DEC P1		Recorded from Quairading Nature Reserve, Beverley	**Likely**
Teyl sp. (at least 3	Mygalomorph	SRE	Granite	Records near	**Likely**

Species Name	Common Name	Status	Habitat	Comments	Likely at Project
species)	Spiders		Outcrops	Kokerbin	

5.3 Conservation Significant Fauna at Kokerbin Nature Reserve

Seven vertebrate fauna species of conservation significance have been previously recorded at Kokerbin Nature Reserve and surrounds. These include:

1. Black-flanked Rock-wallaby (EPBC Vulnerable)
2. Carpet Python (DEC Schedule 1)
3. Rainbow Bee-eater (EPBC Migratory)
4. White-browed Babbler (DEC P4)
5. Peregrine Falcon (DEC Schedule 4).

An additional 12 conservation significant species have been recorded in the local area and are considered likely to occur within Kokerbin Nature Reserve. These include:

1. Little Long-tailed Dunnart (*Sminthopsis dolichura*) (locally significant)
2. Gilbert's Dunnart (*Sminthopsis gilberti*) (locally significant)
3. Fat-tailed Dunnart (*Sminthopsis crassicaudata*) (locally significant)
4. Western Pygmy Possum (*Cercartetus concinnus*) (locally significant)
5. Regent Parrot (regional decline)
6. Blue-breasted Fairy-wren (regional decline)
7. Western Yellow Robin (regional decline)
8. Purple-crowned Lorikeet (Regional decline)
9. Shield-backed Trapdoor Spider (*Idiosoma nigrum*) (DEC Schedule 1)
10. *Ixalodectes flectocercus* (a cricket) (DEC Priority 1)
11. *Teyl sp.* (locally restricted range, may be more than one species)

The details of conservation significant species occurring in the Kokerbin Nature Reserve area are discussed below.

5.2.1 Mammals

Chuditch (*Dasyurus geoffroii*) EPBC VULNERABLE

The Chuditch is listed under Schedule 1 of the Wildlife Conservation Act, and as Vulnerable under the EPBC Act. It currently survives only in south-western Western Australia, in areas dominated by eucalypt forest or woodland and mallee shrubland (Strahan, 1995) and also persists amongst rocky outcrops. This carnivorous marsupial occupies large home ranges, is highly mobile and appears able to utilise bush remnants and corridors (DEC, 2008). The Chuditch has been recorded from Northam and Mukinbudin, and has been reported from Goomalling (M.Griffiths, pers.comm. 2009). Other records come from the Southern Cross area suggesting the species may persist on the eastern side of the Wheatbelt. As the Chuditch is far ranging it may occur in the Kokerbin area as a vagrant.

Brush-tailed Phascogale (*Phascogale tapoatafa*) SCHEDULE 1
The Brush-tailed Phascogale is listed under Schedule 1 of the Wildlife Conservation Act. This arboreal marsupial occurs in forest and woodland where suitable tree hollows are available. Populations fluctuate dramatically in response to invertebrate prey abundance (DEC, 2008). The Brush-tailed Phascogale has recorded near Beverley and York however is considered unlikely to occur at Kokerbin Nature Reserve.

Red-tailed Phascogale (*Phascogale calura*) SCHEDULE 1
The Red-tailed Phascogale is listed as Endangered under the EPBC Act and under Schedule 1 of the Wildlife Conservation Act. Prior to agricultural expansion in the 1800s, the Red-tailed Phascogale was widespread throughout Western Australia and extended eastward to the Murray Darling basin (DEWHA, 2009). The species is now restricted to remnants of native vegetation throughout the wheat belt of south-western Western Australia (Kitchener 1981). They have been recorded from as far north as Beverly, with records in the Kokerbin region coming from Brookton, Pingelly and Corrigin.

The Red-tailed Phascogale can persist in small bush remnants, as small as 67 ha (DEWHA, 2009). The Red-tailed Phascogale's preferred habitats are Allocasuarina woodlands with hollow-containing eucalypts however have been recorded in Eucalypt Woodland (J. Turpin, pers. obs.). This species has been recorded in the region and Kokerbin Nature Reserve is large enough is support a population. However due to a lack of preferred habitat the likelihood of the species occurring within the reserve is considered moderate at best.

Black-flanked Rock-wallaby (*Petrogale lateralis lateralis*) SCHEDULE 1
Listed as Vulnerable under the EPBC Act and Threatened (Schedule 1) under the Wildlife Conservation Act, *Petrogale lateralis lateralis* has declined dramatically in its range, with few scattered populations across Western Australia.

A contributing factor to why the populations of *Petrogale lateralis lateralis* remain isolated and fragmented is the specificity of their habitat requirements which may limit the species dispersal (Creese, 2007). Rock-wallabies inhabit rocky outcrops

with steep cliffs, ledges, gorges, terraces, caves and large rock piles, often occurring near waterholes (Creese, 2007). Competition for food resources with introduced and abundant native herbivores (eg. Feral Goat and the Euro), predation from introduced and native predators (eg. Feral Cat, Fox and Wedge-tailed Eagle) and habitat degradation (through grazing, fire and the Feral Goat) have been implicated as threatening processes limiting rock wallaby populations (Species Bank, 2009).

The Black-flanked Rock-wallaby was formerly widespread across the Wheatbelt region occurring on many rocky hills and granite outcrops. The Black-flanked Rock-wallaby is known from Kokerbin Nature Reserve inhabiting rock crevices and caves at Kokerbin Rock following its self-reintroduction from neighbouring populations after having recovered in numbers from fox baiting.

Tammar Wallaby (*Macropus eugenii*) PRIORITY 5

The Tammar Wallaby is listed as Priority 5 by DEC. This species was formerly distributed across much of south-western Australia but now occurs in a few scattered populations including Dryandra and near Pingelly (DEC, 2009). The Tammar Wallaby inhabits coastal scrub, heath, forest, mallee and woodland. This species has been previously recorded north of Yoting and may persist in the region.

Quenda (Southern Brown Bandicoot) *Isoodon obesulus* PRIORITY 5

The Quenda is listed as Priority 5 by DEC and has declined over much of its range including on the Swan Coastal Plain. The Southern Brown Bandicoot occurs in the south-west of Western Australia north to Yanchep and Gingin, south to Albany and east to Esperance. This species previously occurred north to Moore River and east throughout the Wheatbelt but like many mammals in the region has undergone a large range reduction (Maxwell et al. 1996). On the Swan Coastal Plain it is patchily distributed, as a result of land clearance, habitat degradation and feral predators, and often occurs in small and fragmented populations (DEC, 2008). It is commonly associated with dense, low vegetation. This species is considered locally extinct in the Kokerbin region.

Western Brush Wallaby (*Macropus irma*) PRIORITY 4
The Western Brush Wallaby is listed as Priority 4 by DEC. This species occurs in south-western Australia, from Kalbarri to Cape Arid. The Western Brush Wallaby formerly occurred over a much larger area however has suffered a large range reduction and fragmentation of populations due to clearing for agriculture and predation by introduced predators (DEC, 2008). The optimum habitat for the Western Brush Wallaby is open forest or woodland, in which it favours open, seasonally wet flats with low grasses and open, scrubby thickets (Strahan, 1995), and areas of dense vegetation. It is also found in mallee and heathland (DEC, 2008). The Brush Wallaby has been recorded in the Beverley area and occurs in reasonable numbers throughout intact bushland west of Beverley (J. Turpin. Pers. obs.).

Greater Long-eared Bat (Central Form, *Nyctophilus timoriensis*) PRIORITY 4

The central form of the Greater Long-eared Bat is listed as Priority 4 by DEC. The Greater Long-eared Bat occurs in Eucalypt Woodland and tall woodlands of the Coolgardie Bioregion (where it roosts in tree hollows) with a tall shrub understorey. This species also inhabits Mallee and Acacia shrublands and has been found to the fringes of the Nullarbor Plain (DEWHA, 2009).

Common Brushtail Possum (*Trichosurus vulpecula*) Regionally Significant

The Common Brushtail Possum has undergone a significant reduction in distribution in Western Australia, and the Midwest in particular (How and Hilcox, 2000). In Western Australia, it is now generally confined to the temperate south-west, Kimberley and Pilbara coast. This species inhabits a range of habitats including forests and woodlands containing large hollow bearing trees and ground refuges (such as hollow logs, DEC, 2008). The Brushtail Possum persists in small isolated populations within the Wheatbelt including at Goomalling and along the Irwin River (J. Turpin, pers. obs.). This species may occur in the Kokerbin area.

Other Mammal Species

A number of other mammal species expected to occur in the Kokerbin Nature Reserve area are considered locally significant. This includes:

- Fat-tailed Dunnart (*Sminthopsis crassicaudata*)
- Little Long-tailed Dunnart (*Sminthopsis dolichura*)
- Gilbert's Dunnart (*Sminthopsis gilberti*)
- Western Pygmy Possum (*Cercartetus concinnus*)
- Mitchell's Hopping Mouse (*Notomys mitchelli*)
- Ash Grey Mouse (*Pseudomys albocinerius*)

Gilbert's Dunnart and Little Long-tailed Dunnarts have been recorded at Badjaling Nature Reserve. The others have been recorded locally and are expected to occur in the Kokerbin area. These species are considered locally significant since they persist in small and isolated populations as a result of large scale habitat clearance.

5.2.2 Birds

Malleefowl (Leipoa ocellata) EPBC VULNERABLE

The Malleefowl is listed as Vulnerable under the EPBC and Wildlife Conservation Acts. In Western Australia Malleefowl occur mainly in scrubs and thickets of Mallee (*Eucalyptus* spp.), Boree (*Melaleuca lanceolata*) and Bowgada (*Acacia linophylla*), and also other dense litter-forming shrublands including Mulga (*Acacia aneura*) Shrublands (Johnstone and Storr, 2004). The species distribution was once larger and less fragmented, but the widespread clearing of suitable habitat, coupled with the degradation of habitat by fire and livestock, and fox predation has reduced Malleefowl numbers considerably.

The Malleefowl previously inhabited a large part of arid inland Western Australia however has undergone a dramatic range reduction in the region. Malleefowl are unlikely to occur at Kokerbin Nature Reserve.

Fork-tailed Swift (*Apus pacificus*) EPBC MIGRATORY
The Fork-tailed Swift is listed as Migratory under the EPBC Act and under Schedule 3 of the Wildlife Conservation Act. The Fork-tailed Swift is an aerial species largely independent of terrestrial habitats. It has been recorded from the region however is likely to occur at Kokerbin Nature Reserve only as a rare visitor.

Rainbow Bee-eater (*Merops ornatus*) EPBC MIGRATORY
The Rainbow Bee-eater is listed as Migratory under the EPBC Act and under Schedule 3 of the Wildlife Conservation Act. This species inhabits open woodland, open forest, grasslands and arid woodlands especially along watercourses. During the breeding season, the Rainbow Bee-eater requires an open, sandy area to construct its nesting tunnel (Morcombe, 2000), such as creek banks or grasslands.

The Rainbow Bee-eater has been recorded at Kokerbin Nature Reserve. The Rainbow Bee-eater is likely to be a spring/summer breeding visitor to the project area (Birds Australia, 2009), and may even construct its nesting burrows in disturbed soil along roadsides. It is a widespread species.

MIGRATORY WADERS / WATERBIRDS EPBC MIGRATORY

Common Greenshank (*Tringa nebularia*)
Marsh Sandpiper (*Tringa stagnatalis*)
Wood Sandpiper (*Tringa glareola*)
Common Sandpiper (*Tringa hypoleucos*)

The above species have been recorded from the region however due to a lack of suitable habitat are unlikely to occur at Kokerbin Nature Reserve.

Western Rosella (*Platycercus icterotis xanthogenys)* SCHEDULE 1
The Western Rosella (inland subspecies) is classified under Schedule 1 of the *Wildlife Conservation Act.* This subspecies of the Western Rosella occurs in eucalypt and Casuarina woodlands and scrubs, especially of Salmon Gum and tall mallees (DEC, 2008). *Platycercus icterotis xanthogenys* occurs in the Wheatbelt region from Toodyay south and east to Ravensthorpe (DEWHA, 2009). This species may occur in the Kokerbin area and has been recorded near Yoting (Birds Australia, 2009)

Peregrine Falcon (*Falco peregrinus*) SCHEDULE 4
The Peregrine Falcon is classified as Specially Protected Fauna under Schedule 4 of the *Wildlife Conservation Act*. This species is found in a variety of habitats, including rocky ledges, cliffs, watercourses, open woodland and acacia shrublands. The distribution of the Peregrine Falcon is often tied to the abundance of prey as this species predates heavily on other birds. The Peregrine Falcon lays its eggs in recesses of cliff faces, tree hollows or in large abandoned nests of other birds (Birds Australia, 2009). The Peregrine Falcon mates for life with pairs maintaining a home range of about 20 -30 km square throughout the year. Blakers et al. (1984) consider that Australia is one of the strongholds of the species, since it has declined in many other parts of the world.

The Peregrine Falcon has been recorded from the Nangeen Hill Nature Reserve, from large granite outcrops (Birds Australia, 2009). It is likely to occur at Kokerbin Nature Reserve.

Australian Bustard (*Ardeotis australis*) DEC PRIORITY 4
The Australian Bustard is classified as Priority 4 by the DEC and Near Threatened by Garnett and Crowley (2000). This species is associated with a variety of grassland, grassy woodland and shrubland habitats, with the main threats to its survival being a combination of habitat loss/degradation and predation by feral cats and foxes. It is nomadic and may range over very large areas.

Crested Bellbird (*Oreoica gutturalis gutturalis*) DEC PRIORITY 4
The southern sub-species of the Crested Bellbird is listed as Priority 4 by DEC. This sedentary and solitary species inhabits the drier mallee woodlands and heaths of the southern parts of Western Australia (DEC, 2008). *Oreoica gutturalis gutturalis* has been recorded near Kellerberrin and Bruce Rock and may occur within Kokerbin Nature Reserve (Birds Australia, 2009).

Bush Stone-curlew (Burhinus grallarius) DEC PRIORITY 4
The ground-dwelling Bush Stone-curlew is listed as Priority 4 by the DEC and Near Threatened by Garnett and Crowley (2000). The Bush Stone-curlew inhabits lightly timbered open woodlands (DEC, 2008) and dense Acacia shrublands (J. Turpin, pers. obs.). The Bush Stone-curlew is also known to occur in dense Acacia shrublands on Banded Ironstone ridges (such as at Weld Range, J Turpin, pers. obs.). This species has suffered significant declines and is sparsely distributed in the southern parts of Western Australia (Birds Australia, 2009).

The Bush Stone-Curlew has been recorded near Beverley and Pingelly and has the potential to occur in the Kokerbin area.

Crested Shrike-tit (*Falcunculus frontatus*) DEC PRIORITY 4
The south-western sub-species of the Crested Shrike-tit is listed as Priority 4 by DEC. This species occurs from north of Perth to Esperance (Birds Australia, 2009) and is an uncommon inhabitant of semi-arid woodlands. The Western Crested Shrike-tit has been recorded in extensive woodlands west of Beverley however there are no local records around Quairading (Birds Australia, 2009) and due to a lack of habitat is unlikely to occur at Kokerbin Nature Reserve.

Shy Heathwren (*Hylacola cauta whitlocki*) DEC PRIORITY 4
The western sub-species of the Shy Heathwren is listed as Priority 4 by DEC. This species inhabits areas of woodland with dense heathy understory. The subspecies *whitlocki* occurs in heathy woodlands of the south-west of Western Australia (Duncan et. al., 2006). The Shy Heathwren is documented as declining in the Wheatbelt (Saunders & Ingram, 1995) with significant loss of habitat in the south-west Wheatbelt. This species has been recorded from the Kellerberrin area (Birds Australia, 2009).

White-browed Babbler (*Pomatostomus superciliosus ashbyi*) DEC PRIORITY 4
The Action Plan for Australian Birds (Garnett and Crowley, 2000) lists *Pomatostomus superciliosus ashbyi* as near threatened as over half the subspecies' habitat has been cleared. The Western Wheatbelt White browed Babbler occurs in eucalypt forests and woodlands in the south-west of Western Australia. Clearance for agriculture has removed most of the White-browed Babbler's habitat in the Wheatbelt of Western Australia (Saunders and Ingram, 1995).

The Western Wheatbelt subspecies of the White-browed Babbler is listed as Priority 4 by DEC. This species occurs within Eucalypt Woodland and Acacia Shrubland, particularly amongst dense vegetation (J. Turpin, pers. obs.). Due to extensive vegetation clearance the Wheatbelt subspecies occurs in a number of small and fragmented populations. This species has been recorded from Kokerbin Nature Reserve (Birds Australia, 2009).

Square-tailed Kite (*Lophoictinia isura*) LEAST CONCERN

The Square-tailed Kite is listed as threatened (Least Concern) under the Action Plan for Australian Birds (Garnet and Crowley, 2000). The Square-tailed Kite is sparsely distributed over much of Australian mainland, with a few scattered records from the region (Birds Australia, 2009). The Square-tailed Kite is a specialised predator of the canopy, foraging primarily over forest, woodland, mallee and heath (Garnett and Crowley, 2000). This species has been recorded from Shackleton.

Declining Woodland Species
A number of south-west Australian woodland bird species are recognized as declining by Saunders and Ingram (1995). Theses included Regent Parrot (*Polytelis anthopeplus*), Purple-crowned Lorikeet (*Glossopsitta porphyrocephala*), Southern Scrub-robin (*Drymodes brunneopygia*), Rufous Treecreeper (Anthochaera carunculata), Blue-breasted Fairy-wren (*Malurus pulcherrimus*) and Western Yellow Robin (*Eopsaltria griseogularis*). The retention of these species in their natural abundances is of particular conservation significance as these species are now increasingly absent or rare over much of the Wheatbelt (Duncan et. al., 2006).

The Southern Scrub-robin is assessed as 'Lower Risk (Least Concern)' by Garnett and Crowley (2000) because of this species' tendency to disappear from fragmented vegetation blocks. This species occurs in Mallee, dry scrub, heaths, lignum on claypans and coastal tea-tree thickets.

The Wheatbelt population of the Western Yellow Robin is assessed as 'Lower Risk (Least Concern)' by Garnett and Crowley (2000) because much of this subspecies' habitat has been cleared for agriculture and the subspecies continues to disappear from remnants. *E. g. rosinae* occurs in the Wheatbelt within the 200 - 500 mm rainfall zone (in an approximate strip between Shark Bay and the Nullarbor). *E. g. rosinae* intergrades with *E. g. griseogularis* (conservation significant on the Swan Coastal Plain) in the higher rainfall areas of the south-west. The Western Yellow Robin occurs in Eucalypt woodland, mallee and acacia shrubland. The Western Yellow Robin is widespread from the southern Murchison to the Goldfields and parts of the lower South-West, but has disappeared from much of the Wheatbelt (Garnett and Crowley, 2000).

The Regent Parrot is assessed as 'Lower Risk (Least Concern)' by Garnett and Crowley (2000) because a decline in population density has been observed in at least half the range of this subspecies. Clearing for agriculture and the decline of suitable nest trees (particularly *Eucalyptus salmonophloia*) due to salinity may be responsible for the decline in the wheatbelt. *P. a. anthopeplus* occurs in the south-west of Western Australia.

The Purple-crowned Lorikeet has been recorded from Badjaling Nature Reserve while the Western Yellow Robin and Regent Parrot have been recorded nearby at Yoting. The Blue-breasted Fairy-Wren has been recorded from the local area and is considered likely to occur within Kokerbin Nature Reserve. The Southern Scrub Robin and Rufous Treecreeper also have the potential to occur in the Kokerbin area.

5.2.3 Reptiles

Carpet Python (*Morelia spilota imbricata*) SCHEDULE 4

Morelia spilota imbricata, the south-western race of the Carpet Python is listed under Schedule 4 (Other Specially Protected Fauna) of the Wildlife Conservation Act. *Morelia spilota imbricata* occurs in south-west Western Australia, from Northampton, south to Albany and eastwards to Kalgoorlie. It also occurs in large undisturbed remnant bushland near Perth and the Darling Ranges, Yanchep National Park, and Garden Island (Bush et al., 2007). This species occurs in Banksia woodland, Eucalypt Woodland, forests, dense coastal scrub, granite and limestone outcrops and along watercourses (Bush et al., 2007). Carpet Pythons are arboreal, terrestrial, and rock-dwelling and can shelter in burrows made by other animals, hollow tree limbs, or rock crevices. The South-west Carpet Python has declined in distribution due to the loss of habitat (associated with land clearance), and changed fire regimes. Predation by exotic predators (foxes and feral cats) may have also contributed to the decline of python populations (Department of Environment and Conservation, 2007).

The Carpet Python has been recorded from Kokerbin Nature Reserve (NatureMap, 2009).

Southwest Woma (*Aspidites ramsayi*) SCHEDULE 4

The Woma is listed under Schedule 4 (Other Specially Protected Fauna) of the Wildlife Conservation Act. This large python is known from four potentially disjunct populations in Western Australia- the South-west, the arid north-west, Tanami Desert and Peron Peninsula. The south-west population extends from Yuna (near Geraldton), south to Boddington and east to the western edge of the Nullarbor Plain (Storr, Smith and Johnstone, 2002). Womas were formerly abundant in the south-western sandplain habitats, however, recent records for the species are few and come from widespread localities (including Eradu and Watheroo areas). The Womas decline in the south-west is largely as a result of clearing of habitat for agricultural development and grazing (Department of Environment and Conservation, 2007). Fox predation may have also contributed to population decline. Most of the habitat suitable for the Woma within the vicinity of the project area has been cleared. There is potential for this species to persist in some of the larger remnant vegetation areas in the region and has been previously recorded from the Quairading area.

Western Spiny-tailed Skink (*Egernia stokesii*) EPBC ENDANGERED

The Western Spiny-tailed Skink is listed as Endangered under the EPBC Act and under Schedule 1 of the Wildlife Conservation Act. This species occurs in the Murchison region and in the Wheatbelt, from Mullewa south to Kellerberrin. In the Wheatbelt this species has been recorded from Eucalypt Woodlands, including from the Morawa area.

The Western Spiny-tailed Skink lives in small community groups and each group has a single characteristic faecal pile ('latrine') that is usually located outside occupied logs (How et al. 2003). The presence of these faecal piles has been previously used to survey for this species in the Mid-West and Murchison regions (How *et al*. 2003). How *et al*. (2003) located several populations of the Western Spiny-tailed Skink in the Northern Wheatbelt region, from Buntine Nature Reserve, Perenjori town, Bowgada Nature Reserve north-east of Morawa and south of Rothsay.

Egernia stokesii badia is restricted to the northern wheatbelt and southern Murchison, and appears to have a very fragmented distribution. It occurs in eucalypt woodland with "considerable numbers of large fallen logs over 25 cm in diameter" (How et al. 2003). This species has been recorded in the region with records from Kellerberrin and Wyalkatchem (NatureMap, 2009). While Kokerbin Nature Reserve lies just outside the known range for *Egernia stokesii badia* there is potential for this species to occur there.

Southern Death Adder (*Acanthophis antarticus*) DEC PRIORITY 3

The Southern Death Adder is listed as Priority 3 by DEC. This species is patchily distributed in the southwest, occurring in the Northern Darling Range and central Wheatbelt and along the south eastern coast of Western Australia (Bush, et. al., 2007). The Southern Death Adder occurs in woodlands with deep leaf litter and usually associated with rocky outcrops and deep gullies (Bush et. al. 2007). This species has

been recorded very sparsely in the central Wheatbelt, with records from Brookton (NatureMap, 2009). It has the potential to occur in the Kokerbin area.

5.2.4 Invertebrates

Shield-backed Trapdoor Spider (*Idiosoma nigrum*) SCHEDULE 1

The Shield-back Trapdoor Spider (*Idiosoma nigrum*) is listed under Schedule 1 of the WA *Wildlife Conservation Act 1950*. It is confined to the northern Wheatbelt and adjacent parts of the Murchison, where it occurs in scattered populations often associated with rocky slopes. A number of populations occur on the slopes of ironstone hills, including at Weld Range, and at Karara, Mungada, and Wongan Hills (J. Turpin, pers. obs.). Other populations are associated with open York Gum (*Eucalyptus loxophleba*), Salmon Gum (*E. salmonophloia*), wheatbelt Wando (*E. capillosa*) woodland, with Jam (*A. acuminata*) forming a sparse understorey (Main, 1987, 1991, 1992) and some burrows have also been found in granite soils (Main, 1992). *Idiosoma nigrum* is generally found in microhabitats associated with low-lying woodlands or bush vegetation (Main 2003).

The Shield-back Trapdoor Spider (*Idiosoma nigrum*) is one on the most arid-adapted mygalomorph spiders in Australia (Main 1982). This is due to a combination of morphological and behavioural attributes, such as a deep burrow which provides a narrow range of temperature and humidity beneath the surface, 'twig-lining' of the burrow rim to increase the prey foraging area and a sclerotised abdominal cuticle which reduces evaporative water loss and also plugs the burrow to stop the entry of predators (Main, 1982).

The Shield-back Trapdoor Spider, like many Mygalomorph spiders, has a restricted distribution due to a limited capacity for dispersal and occurrence in discontinuous habitat. This species has no capability for aerial dispersal (a characteristic found in many Mygalomorph spiders) and as a result emergent spiderlings are restricted to the local area, generally establishing their burrows within several centimetres of the matriarch female, forming a family cluster. Gene flow is facilitated by male-biased dispersal (≤ 500 m; B. Y. Main, pers. comm.), as males only leave their burrows in search of females, while females spend their entire life in the burrow and its proximity (Main, 1982, 2003).

Idiosoma nigrum (like many mygalomorph spiders) is an ambush predator and constructs a burrow shelter underground (WAM, 2008). The distinctive burrow contains a trap door and a twig-lining radiating from the burrow entrance which acts as prey-detection device. This twig-line feeding strategy increases the spider's foraging area and its chances of catching food, especially when prey is scarce (DEWHA, 2009). Diet includes particularly ants, but also beetles, cockroaches, and millipedes and moths.

Shield-backed Trapdoor Spider burrows can be up to 35mm in diameter and 32cm deep (DEWHA, 2009). The burrow is deep enough (up to 32 cm) to ensure that air in the lower burrow remains humid and relatively cool in summer. The spider's thickened cuticle helps reduces the rate of water loss from its body and provides a defence against predators – plugging the burrow and acting as a shield.

The trap door is often decorated with short vertical twigs and a fan of leaves often forming two clumps (see cover photograph). In addition, the burrow noticeably constricts 4-5cm below the entrance; this is where the spider will block its burrow with its armoured abdomen if threatened from above. The combination of the twig lining, trapdoor with vertical twigs and burrow constriction below the ground surface make *Idiosoma nigrum* burrows easily identifiable in the field.

The Shield-backed Trapdoor Spider is a long-lived species - females can live for over 20 years. Shield-backed Trapdoor Spiders remain within the vicinity of their burrow, only venturing short distances to find food (DEWHA, 2009). Both males and females reach maturity in a minimum of 5-6 years, by which time males undergo a final molt, reproduce and subsequently die. The females are capable of reproducing every second year until the age of about 20 (Main, 2003).

Currently *I. nigrum* suffers the greatest threat of local extinction in the central and southern parts of its range (Main 1991). In agricultural areas the main threat to *I. nigrum*, is habitat fragmentation and degradation due to cropping and grazing (Main 1987, 1991; Yen 1995). Grazing and vehicles compact the soil and reduce the amount of leaf litter on the ground (Yen 1995).

I. nigrum is also particularly sensitive to habitat changes, as adult spiders cannot dig a new burrow once the old one is destroyed (Main 1985). Fire may also represent a threat to *I. nigrum*. It has been shown in another trapdoor spider (*Anidiops villosus*), with similar dispersal patterns to *I. nigrum*, that removal of the understorey and litter layer by fire can lead to local extinction, with limited potential for recolonisation from nearby patches (Main 1991; Main 1992; Yen 1995).

The Shield-backed Trapdoor Spider has been recorded from Quairading Nature Reserve, Beverley and Kellerberrin and due to the presence of suitable habitat is likely to occur at Kokerbin Nature Reserve.

Cricket (*Ixalodectes flectocercus*) PRIORITY 1

The cricket *Ixalodectes flectocercus*, is listed as Priority 1 by DEC. This species is poorly known with records from only five locations from Merredin to Beverley and has been recorded at Quairading Nature Reserve adjacent to the Quairading townsite. *Ixalodectes flectocercus* is also listed as Critically Endangered by the IUCN.

Quairading Nature Reserve comprises 527 hectares of remnant vegetation comprising Tamma Shrubland, York Gum, Salmon Gum, Wandoo and Casuarina woodlands, and Nookaminnie Rock (a large granite outcrop). Since the species has been recorded in the Kokerbin region in similar habitats *Ixalodectes flectocercus* is considered likely to occur at Kokerbin Nature Reserve.

Teyl. Species SRE INVERTEBRATES

Teyl is an ancient trapdoor spider genus and its distribution appears to be relictual, associated with the wetter, boggy meadows and aprons of granite outcrops (Withers and Edward 1997). The genus is currently undergoing taxonomic revision with a number of undescribed species – at least three occur in the Kokerbin area (*Teyl* sp. 15,

Teyl sp. 17 and *Teyl* sp. 7, NatureMap, 2009). It appears that all Teyl species are restricted to granite outcrops or granite-related habitats (apron, granitic soils; Withers and Edward, 1997). Like many Mygalomorph spiders Teyl aestivates during the dry periods by encasing itself in its sealed burrow.

Due to its specific habitat requirements (restricted to granite outcrops), Teyl species are considered likely to occur at Kokerbin Nature Reserve.

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Appendix 1: STATUS OF CRITICAL WEIGHT RANGE MAMMALS IN THE KOKERBIN NATURE REGION

Species	**Current Conservation Status (WA)**	**Status in AW1 Subregion**
Mala (*Lagorchestes hirsutus*)	Threatened (Extinct in the wild)	Locally Extinct
Red-tailed Phascogale (*Phascogale calura*)	Threatened (Endangered)	Threatened (Endangered)
Western Barred Bandicoot (*Perameles bougainville bougainville*)	Threatened (Endangered)	Locally Extinct
Chuditch (*Dasyurus geoffroii*)	Threatened (Vulnerable)	Locally Extinct
Numbat (*Myrmecobius fasciatus*)	Threatened (Vulnerable)	Locally Extinct
Bilby (*Macrotis lagotis*)	Threatened (Vulnerable)	Locally Extinct
Boodie (*Bettongia lesueur lesueur*)	Threatened (Vulnerable)	Locally Extinct
Banded Hare-wallaby (*Lagostrophus fasciatus fasciatus*)	Threatened (Vulnerable)	Locally Extinct
Black-flanked Rock-wallaby (*Petrogale lateralis lateralis*)	Threatened (Vulnerable)	Threatened (Vulnerable)
Greater Stick-nest Rat (*Leporillus conditor*)	Threatened (Vulnerable)	Locally Extinct
Woylie (*Bettongia penicillata ogilbyi*)	DEC Priority 4	Locally Extinct
Tammar Wallaby (*Macropus eugenii derbianus*)	DEC Priority 4	Locally Extinct
Quenda (*Isoodon obesulus fusciventer*)	DEC Priority 4	Locally Extinct
Western Brush Wallaby (*Macropus irma*)	DEC Priority 4	Priority 4
Common Brushtail Possum (*Trichosurus vulpecula*)	No listing	Conservation Dependent

Source Watson et. al. (2008), CALM (1994).

Appendix 2. Categories used in the assessment of conservation status.

IUCN categories (based on review by Mace and Stuart 1994**) as used for the Environmental Protection and Biodiversity Conservation (EPBC) Act and the WA Wildlife Conservation Act**.

CATEGORY	DEFINITION
Extinct.	Taxa not definitely located in the wild during the past 50 years.
Extinct in the Wild.	Taxa known to survive only in captivity.
Critically Endangered.	Taxa facing an extremely high risk of extinction in the wild in the immediate future.
Endangered.	Taxa facing a very high risk of extinction in the wild in the near future.
Vulnerable.	Taxa facing a high risk of extinction in the wild in the medium-term future.
Near Threatened.	Taxa that risk becoming Vulnerable in the wild.
Conservation Dependent.	Taxa whose survival depends upon ongoing conservation measures. Without these measures, a conservation dependent taxon would be classed as Vulnerable or more severely threatened.
Data Deficient (Insufficiently Known).	Taxa suspected of being Rare, Vulnerable or Endangered, but whose true status cannot be determined without more information.
Least Concern.	Taxa that are not Threatened.

Definitions of relevant categories under the EPBC Act.

CATEGORY	DEFINITION
Endangered (EN)	The species is likely to become extinct unless the circumstances and factors threatening its abundance, survival or evolutionary development cease to operate; or its numbers have been reduced to such a critical level, or its habitats have been so drastically reduced, that it is in immediate danger of extinction.
Vulnerable (VU)	Within the next 25 years, the species is likely to become endangered unless the circumstances and factors threatening its abundance, survival or evolutionary development cease to operate.
Migratory (M)	Species are defined as migratory if they are listed in an international agreement approved by the Commonwealth Environment Minister, including: • the Bonn Convention ((Convention on the Conservation of Migratory Species of Wild Animals) for which Australia is a range state; • The Agreement between the Government of Australia and the Government of the Peoples Republic of China for the Protection of Migratory Birds and their Environment (CAMBA); or • The Agreement between the Government of Japan and the Government of Australia for the Protection of Migratory Birds and Birds in Danger of Extinction and their Environment (JAMBA).

Schedules used in the WA Wildlife Conservation Act.

CATEGORY	DEFINITION
Schedule 1.	Species that are Rare and Likely to become Extinct
Schedule 2.	Species that area presumed extinct.
Schedule 3	Migratory species listed under international treaties.
Schedule 4.	Other Specially Protected Fauna.

Department of Environment and Conservation Priority Species (species not listed under the Conservation Act, but for which there is some concern).

CATEGORY	DEFINITION
Priority One (P1)	Taxa with few, poorly known populations on threatened lands. Taxa which are known from few specimens or sight records from one or a few localities, on lands not managed for conservation, e.g. agricultural or pastoral lands, urban areas, active mineral leases. The taxon needs urgent survey and evaluation of conservation status before consideration can be given to declaration as threatened fauna.
Priority Two (P2)	Taxa with few, poorly known populations on conservation lands. Taxa which are known from few specimens or sight records from one or a few localities, on lands not under immediate threat of habitat destruction or degradation, e.g. national parks, conservation parks, nature reserves, State forest, vacant crown land, water reserves, etc. The taxon needs urgent survey and evaluation of conservation status before consideration can be given to declaration as threatened fauna.
Priority Three (P3)	Taxa with several, poorly known populations, some on conservation lands. Taxa which are known from few specimens or sight records from several localities, some of which are on lands not under immediate threat of habitat destruction or degradation. The taxon needs urgent survey and evaluation of conservation status before consideration can be given to declaration as threatened fauna.
Priority Four (P4)	Taxa in need of monitoring. Taxa which are considered to have been adequately surveyed, or for which sufficient knowledge is available, and which are considered not currently threatened or in need of special protection, but could if present circumstances change. These taxa are usually represented on conservation lands.
Priority Five (P5)	Taxa in need of monitoring Taxa which are not considered threatened but are subject to a specific conservation program, the cessation of which would result in the species becoming threatened within five years (IUCN Conservation Dependant).

Appendix 3. Invertebrate Fauna recorded in the Kokerbin Area.

Species recorded within 40km from Kokerbin Nature Reserve (Source: NatureMap, 2009).

Aedes camptorhynchus
Agraptocorixa eurynome
Agraptocorixa parvipunctata
Agraptocorixa sp.
Allodessus bistrigatus
Alona rigidicaudis s.l.
Alona sp. nov. b (Venemores)
Anisops hyperion
Anisops sp.
Anisops thienemanni
Anopheles annulipes
Antiporus gilberti
Artemia parthenogenetica
Artoria sp. 3
Artoria sp. 5
Asteron-complex sp. 4
Atrichopogon sp. 2
Australocyclops australis
Australocypris 'bennetti' ms
Australutica sp. 1
Austroagrion coeruleum
Austrochiltonia subtenuis
Austrolestes annulosus
Berosus munitipennis
Berosus sp.
Bezzia sp. 2
Boeckella triarticulata
Bothriembryon praecelsus X
Brachionus angularis
Calamoecia ampulla
Calamoecia trilobata
Candalides acastus
Candonocypris novaezelandiae
Catasarcus marginispinis
Cercophonius sp.
Cherax destructor
Chironomus aff. alternans (V24)
Chironomus occidentalis
Chironomus tepperi
Cladopelma curtivalva
Cladotanytarsus sp. A
Cletocamptus dietersi
Helochares tenuistriatus
Hemianax papuensis
Hemicordulia tau
Heptasteron sp. 1
Hetaerica sp. 1
Hexarthra fennica
Holoplatys sp. 2
Hyphydrus elegans
Hypoblemum sp. 1
Idiosoma nigrum Shield-backed Trapdoor Spider
Ischnura aurora aurora
Isidorella sp.
Isometroides sp.
Ixalodectes flectocercus (cricket) P1
Kerasteron sp. 1
Keratella australis
Keratella slacki
Kiefferulus intertinctus
Kiefferulus martini
Lampona sp. 5
Lamponina elongata
Lamponina scutata
Latrodectus hasseltii
Lecane bulla
Lecane ludwigii
Limnocythere dorsosicula
Limnophyes sp. A
Limnoxenus zelandicus
Liodessus dispar
Liodessus inornatus
Liparetrus albosetosus
Liparetrus capillatus
Liparetrus flavidus
Liparetrus germari
Liparetrus jenkinsi
Liparetrus opacicollis
Liparetrus sp.
Lychas sp. 1
Lychas sp. 2
Lychas sp. 3
Lychas sp. 5
Lycidas chrysomelas
Neostorena sp. 15
Neostorena sp. 19
Neostorena sp. 20
Neostorena sp. 3
Neostorena sp. 4
Nerthra femoralis
Nilobezzia sp. 1
Nilobezzia sp. 2
Nostera sp. 1
Nostera sp. 2
Nostera sp. 4
Notalina spira
Notsodipus muckera
Oecetis sp.
Opisthoncus sp. 1QU
Opopaea sp. 1
Opopaea sp. 2
Opopaea sp. 3
Opopaea sp. 5
Opopaea sp. 6
Opopaea sp. 7
Orthetrum caledonicum
Paralimnophyes pullulus
Paramerina levidensis
Paraplatoides sp. 1
Pararchaea sp. 2
Parartemia contracta P1
Parartemia serventyi
Paratanytarsus sp. B
Paroster niger
Pentasteron intermedium
Philodina sp. a
Phoracantha recurva
Phoroncidia sp. 6
Pieris rapae
Planicirclus alticarinatus
Platynectes sp.
Pleuroxus inermis
Polypedilum nubifer
Polypedilum watsoni
Porosia bigibossa
Pristina aequiseta

Clynotis sp. 1
Clynotis sp. 2
Clynotis sp. 7
Coelopynia pruinosa
Corasoides? sp. 5
Corynoneura sp. (V49)
Cricotopus albitarsus
Croitana croites
Cryptochironomus griseidorsum
Culex sp.
Culicoides sp.
Cypretta baylyi
Daphnia carinata
Daphniopsis truncata
Diacypris sp.
Diacypris spinosa
Dicrotendipes conjunctus
Dicrotendipes pseudoconjunctus
Diplacodes bipunctata

Ecnomus pansus/turgidus
Enochrus sp.
Ephemeroporus barroisi s.l.
Eucyclops australiensis
Euryopis sp. 3
Euryopis sp. 6
Euryopis sp. 8
Euryopis sp. 9
Filinia sp. nov. (Caley Soak)

Forsterina sp. 1

Gamasomorpha sp. 7
Gamasomorpha sp. 9
Geitoneura klugii subsp. klugii
Gmogola sp. 3
Gmogola sp. B
Grayenulla australensis
Grymeus sp. 3
Grymeus sp. 4
Grymeus sp. 6
Grymeus sp. 9
Habronestes sp. 1
Habronestes sp. 2
Habronestes sp. 3
Habronestes sp. 4
Habronestes sp. 5
Habronestes sp. 6
Habronestes sp. 9
Hadrotarsus sp. 2
Haloniscus searlei
Lycidas sp. 1
Lycidas sp. 16
Lycidas sp. 26
Lycidas sp. 3
Lycidas sp. 4
Lycidas sp. 6
Lycidas sp. 8
Lycosa leuckartii

Lycosa sp. 1
Lycosa sp. 10
Lycosa sp. 14
Lycosa sp. 16
Lycosa sp. 17
Lycosa sp. 20
Lycosa sp. 3
Lycosa sp. 6
Lycosa sp. 7

Lycosa sp. 9
Lycosa storri

Maratus vespertilio
Margaromma sp. 1
Margaromma sp. 2
Matilda sp. 1
Megaporus howitti
Meridiecyclops baylyi
Merridinia sp. 2
Mesochra baylyi
Mesocyclops brooksi

Mesodina hayi
Metacyclops sp. 3 (nr platypus in Morton)
Metacymia marmorea

Micronecta gracilis
Micronecta robusta
Micropholcomma? sp. 1
Micropholcomma? sp. 2
Micropholcomma? sp. 4
Micropholcomma? sp. 8
Microvelia oceanica
Missulena sp. 2
Missulena sp. 5
Monohelea sp. 1
Musculium kendricki
Myrmarachne sp. 1
Myrmopopaea sp.
Mytilocypris tasmanica chapmani
Necterosoma penicillatus
Neostorena sp. 1
Neostorena sp. 12
Procladius paludicola
Procladius villosimanus
Pseudolampona boree
Rak sp. nov. b (Venemores)
Rebilus sp. 1
Reticypris sp.
Reticypris sp. 556 (n. sp.)
Rhantus sp.

Rhantus suturalis
Rotaria sp. a
Sarscypridopsis aculeata
Steatoda sp. 1
Steatoda sp. 3
Sternopriscus multimaculatus
Sternopriscus sp.
Storena formosa
Storosa sp. 1

Synemon sp.
Tanytarsus barbitarsis
Tanytarsus fuscithorax/semibarbitarsus
Tanytarsus nr bispinosus
Tasmanocoenis tillyardi
Telephorus sp.
Testudinella patina
Textracella sp. 1
Teyl sp. 15
Teyl sp. 17
Teyl sp. 7
Theclinesthes miskini subsp. miskini

Triplectides australis
Tubifex tubifex

Uresiphita ornithopteralis
Urodacus sp. 4
Wandella barbarella
Xanthagrion erythroneurum
Zebraplatys fractivittata
Zebraplatys sp. 1