

Desktop Vertebrate Fauna Assessment

Granny Smith Mine Expansion 2026

Prepared for: Granny Smith Gold Mine

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EXECUTIVE SUMMARY

Granny Smith Gold Mine is planning on expanding its operations and infrastructure footprint at its site 20km south of Laverton in Western Australia. The assessed project area is 348ha. A fauna habitat assessment was not undertaken in the project area, however, there are habitat data for adjacent areas, which indicate the fauna habitats potentially in the project area are:

- chenopod shrublands;
- mulga over shrubs;
- mulga woodlands over ironstone gravel and rocks;
- mulga over chenopod shrubs;
- open mulga woodland; and
- banded ironstone formations.

As in most areas of the Goldfields and Murchison, the density of trees and shrubs varies appreciably across the project area, with denser vegetation along drainage lines. Some of the project area is highly disturbed or cleared, primarily due to historical exploration activity and station roads.

The project area does not provide an important ecological linkage or fauna movement corridor. Clearing native vegetation is likely to result in the loss of a small number of vertebrate fauna that cannot move away during clearing. The few larger animals, such as goannas, and most of the birds will move into adjacent areas once clearing commences. The proposed vegetation clearing and mining operation may result in indirect impacts on the vertebrate fauna such as a reduction or loss of activity areas and closure of burrows, habitat fragmentation, increased presence of feral predators, road deaths and unnatural noises, vibrations, artificial light sources and vehicle and human movement in an area all of which may result in the death of animals or force some of them into adjacent areas. In the project area, impacts on vertebrate fauna associated with vegetation clearing and mining will be very low in a bioregional context.

The Southern Whiteface (listed as Vulnerable under the *EPBC Act* and *WA BC Act*) has been recorded in other fauna surveys in the adjacent areas, so it will likely be present in the project area. This small bushbird is widespread and relatively abundant in this part of the Goldfields and will readily move if disturbed; therefore, vegetation clearing and mining activity are unlikely to have a significant impact. The Peregrine Falcon may occasionally be recorded in the project area, but it has a large home range and will readily move if disturbed, so it is unlikely to be impacted by vegetation clearing and mining activity. The Long-tailed Dunnart was caught in adjacent areas in 2011, so it is likely present in the project area at low abundance. It is also likely to be in the surrounding area, as the habitat is very similar. The loss of a small number of Long-tailed Dunnarts during vegetation clearing is unlikely to be significant in a bioregional context.

There are no other vertebrate fauna of conservation significance likely to be significantly impacted by clearing vegetation and the development and operation of a mine in the project area. A referral under the *Environment Protection and Biodiversity Conservation Act* is not recommended; however, we would encourage the mine to implement the management recommendations to mitigate impacts on vertebrate fauna.

It is recommended that:

- An induction program that includes a component on managing fauna is mandatory for staff working in the project area;
- Information on protecting fauna and reporting deaths and sightings of feral fauna or fauna species of conservation significance should be incorporated into the induction program;
- Where possible, access routes are aligned to existing roads, tracks or follow the boundaries of broad-scale vegetation associations in the area;

- Where possible, avoid the small rocky hills and ridges;
- Clearing vegetation is undertaken outside the Southern Whiteface breeding season of April to October (includes fledging) but can be influenced by rainfall events, which could trigger breeding activity;
- If clearing is to occur in the Southern Whiteface breeding season, a zoologist familiar with the species will search the area for active nests before vegetation clearing is undertaken. This will appreciably reduce the probability of an active Southern Whiteface nest being disturbed;
- If an active Southern Whiteface nest(s) is found, then a 100m buffer is implemented around the nest site until all chicks have fledged; and
- A vertebrate fauna management and monitoring plan is prepared, identifying management actions to mitigate the potential impacts and a monitoring program to assess ongoing operations.

1. INTRODUCTION

1.1 BACKGROUND

Granny Smith Gold Mine is planning on expanding its operations and infrastructure footprint at its site 20km south of Laverton in Western Australia (Figure 1). The project area (Figure 2) is 348ha.

Terrestrial Ecosystems has conducted various vertebrate fauna surveys and assessments for this mining operation over the past 25 years, demonstrating a strong familiarity with the fauna and their habitats.

1.2 PROJECT OBJECTIVES AND SCOPE OF WORKS

Granny Smith Gold Mine commissioned Terrestrial Ecosystems to prepare a desktop vertebrate fauna risk assessment for the purpose of providing the Department of Energy, Mines, Industry Regulation and Safety (DEMIRS) with sufficient information to assess potential impacts of vegetation clearing and expanding the mining and infrastructure footprint on the vertebrate fauna. The methodology broadly follows that described in the Environmental Protection Authority (EPA; 2020) *Technical Guidance – Terrestrial vertebrate fauna surveys for environmental impact assessment*, except that no site survey was conducted, as data previously collected and collated by Terrestrial Ecosystems was used instead.

The objectives of this fauna risk assessment were to:

- indicate the vertebrate fauna assemblage (reptiles, amphibians, mammals and birds) on and near the project area so that potential impacts on the fauna and fauna assemblage might be adequately assessed;
- identify the presence and/or potential risk of impacts on species of conservation significance that are present or likely to be present in the project area;
- assess the impact and environmental risks associated with the proposed development on the fauna assemblage;
- determine if any additional surveys are required to assess the potential impact on fauna assemblages in the project area, in particular, impacts on species of conservation significance; and
- make recommendations that avoid, mitigate or minimise potential impacts on resident fauna.

To achieve these objectives, Terrestrial Ecosystems:

- searched the Commonwealth Government's online database of matters of national environmental significance (MNES) to identify species potentially occurring within the area that are protected under the *Environment Protection and Biodiversity Conservation Act 1999 (EPBC 1999)* or international migratory bird agreements (JAMBA/CAMBA);
- searched Terrestrial Ecosystems' database (which includes data from the Atlas of Living Australia and Western Australian Museum (WAM) collection) to identify potential vertebrate fauna within the area;
- reviewed previous fauna surveys conducted in and near the project area;
- discussed the likelihood of species listed under the *EPBC Act* and the Western Australian *Biodiversity Conservation Act 2016 (BC Act 2016)* being present in the project area; and
- provided management recommendations to avoid, mitigate and minimise potential impacts on the fauna in the project area.

2. EXISTING ENVIRONMENT

2.1 LOCATION OF PROJECT AREA

The project area is in the Murchison 1 (MUR1 – East Murchison subregion) IBRA bioregion. Cowan (2001) described the East Murchison IBRA subregion as internally draining, with extensive areas of elevated red desert sandplains with minimal dune development. The bioregion includes broad plains with red-brown soils, breakaway complexes, and red sandplains. Vegetation is dominated by Mulga woodlands, often with ephemerals, hummock grasslands, saltbush shrublands and halosarcia shrublands.

Cowan (2001) listed the threatening processes for conservation-significant fauna, such as foxes and cats. Additionally, cattle grazing and mining activities over many years have significantly degraded small parcels of land dotted throughout the landscape.

2.2 LAND USE HISTORY

The dominant land uses for the bioregion are native pasture to support grazing on native pasture, unallocated crown land, and, to a much lesser extent, mining (Cowan 2001). The surrounding areas have been extensively explored for minerals, and there are many small operational and non-operational mining projects in the bioregion.

2.3 CLIMATE

The project area is characterised as semi-arid. Laverton, located ~20km north, has an annual rainfall of 273mm, although this amount varies considerably from year to year. The highest mean maximum and minimum temperatures in Laverton are in January, with averages of 35.8°C and 21.7°C, respectively (Bureau of Meteorology, 2026). The lowest mean daily maximum and minimum temperatures occur in July (Chart 1). Rainfall is mostly in the first half three months of the year, with summer thunderstorms and winter rains driven by low-pressure cells moving eastward.

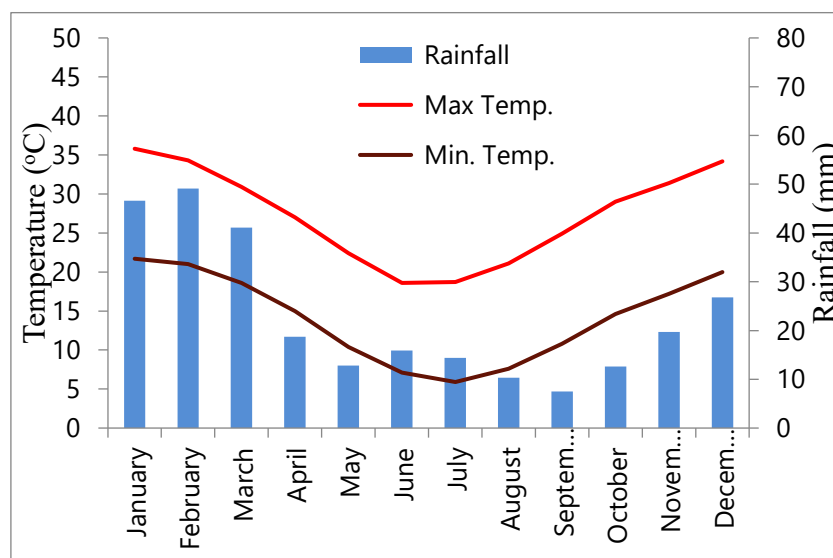


Chart 1. Monthly weather for Laverton

2.4 REGIONAL BIOLOGICAL FAUNA CONTEXT OF PROJECT AREA

Numerous vertebrate fauna surveys have been undertaken in the region. These include:

- Biota Environmental Sciences (2004) *Cosmos Nickel Mine Extension Fauna Survey*. Unpublished report for Sir Samuel Mines NL and URS, Perth.
- Biota Environmental Sciences (2007) *Bannockburn Fauna Habitat and Assemblage Survey*. Unpublished report for Jubilee Mines NL, Perth.
- Coffey Environments (2008) *Level 2 Fauna Assessment for the Duketon Gold Project*. Unpublished report for Regis Resources, Perth.
- Dell, J and How, R.A. (1988) Vertebrate fauna. In: The Biological Survey of the Eastern Goldfields of Western Australia, Part 5, Edjudina - Menzies Study Area. *Records of the Western Australian Museum*, Supplement No 31., pp. 38-77.
- Dunlop, J.N and Paynes, W. (1999) *A vertebrate fauna survey of the North Lake Carey region*. Unpublished report for Placer (Granny Smith) and Homestake, Perth.
- Ecologia Environment (2007) *Jump Up Dam Fauna Assessment*. Unpublished report for Heron Resources, Perth.
- Kingfisher Environmental Consulting (2014) *Sunrise Dam - Tropicana Infrastructure Corridor Fauna Survey*, Unpublished report for AngloGold Ashanti Australia, Perth.
- Ninox Wildlife Consulting (1998) *A Vertebrate Fauna Survey of the Murrin Murrin Expansion Project*. Unpublished report for Anaconda Nickel Ltd, Perth.
- Terrestrial Ecosystems (2010) *Level 2 Fauna Risk Assessment for the Garden Well Project Area*, Unpublished report for Regis Resources, Perth.
- Terrestrial Ecosystems (2011a) *Level 2 Fauna Risk Assessment for the Granny Deeps Project Area*, Unpublished report for Barrick Gold Corporation, Perth.
- Terrestrial Ecosystems (2011a) *Level 2 Fauna Risk Assessment for Granny Deeps Project Area*. Unpublished report for Barrick Gold Corporation, Perth.
- Terrestrial Ecosystems (2011b) *Targeted Survey for Long-tailed Dunnarts for the Granny Deeps Project Area*, Unpublished report for Barrick Gold Corporation, Perth.
- Terrestrial Ecosystems (2012a) *Level 1 Vertebrate Fauna Risk Assessment for the Proposed Exploration Areas around the Granny Open Pit Project area*, Unpublished report for Barrick Gold Corporation, Perth.
- Terrestrial Ecosystems (2012b) *Level 1 Vertebrate Fauna Risk Assessment for the Proposed Mining Areas around the Granny Open Pit Project Area*, Unpublished report for Barrick Gold Corporation, Perth.
- Terrestrial Ecosystems (2014) *Fauna risk assessment of the proposed power station site*. Unpublished report for Goldfields Australia (Granny Smith Mine), Perth.
- Terrestrial Ecosystems (2015) *Fauna risk assessment of the proposed borrow pit expansion*. Unpublished report for Goldfields Australia (Granny Smith Mine), Perth.
- Terrestrial Ecosystems (2017) *Fauna risk assessment of the proposed power line access track and poles*. Unpublished report for Goldfields Australia (Granny Smith Mine), Perth.
- Terrestrial Ecosystems (2018) *Vertebrate Fauna Risk Assessment for the Granny Smith Solar Power Farm Project*, Unpublished report for Granny Smith Mining Company Pty Ltd, Perth.
- Terrestrial Ecosystems (2020b) *Vertebrate Fauna Risk Assessment for the Granny Smith Tailing Storage Facility Expansion*, Unpublished report for Granny Smith Mining Company Pty Ltd, Perth.
- Terrestrial Ecosystems (2021a) *Basic Vertebrate Fauna Assessment for the North Keringal Borefield*. Unpublished letter report for the Granny Smith Gold Mine, Perth.
- Terrestrial Ecosystems (2021b) *Desktop Vertebrate Fauna Assessment for the North Keringal Borefield*. Unpublished letter report for the Granny Smith Gold Mine, Perth.
- Terrestrial Ecosystems (2021c) *Potential impact on Long-tailed Dunnarts by the proposed vegetation clearing and construction of a new TSF west of Cell 3 at Granny Smith Mine*. Unpublished letter report for Gold Fields Australia (Granny Smith Gold Mine), Perth.

- Terrestrial Ecosystems (2022) *Desktop Vertebrate Fauna Assessment for Expansion of the Solar Power Farm Project Area*. Unpublished letter report for the Granny Smith Gold Mine, Perth.
- Terrestrial Ecosystems (2023) *Basic and Detailed Vertebrate Fauna Survey and Assessment for the northern project areas*, Unpublished report for Regis Resources Ltd, Perth.
- Terrestrial Ecosystems (2024) *Basic Vertebrate Fauna Assessment for Expansion of the Renewable Energy Zone*. Unpublished letter report for the Granny Smith Gold Mine, Perth.
- Terrestrial Ecosystems (2025) *Basic Vertebrate Fauna Assessment for Expansion of the Renewable Energy Zone*. Unpublished letter report for the Granny Smith Gold Mine, Perth.
- Western Wildlife (2013) *Ben Hur (M38/339): Level 1 Vertebrate Fauna Survey April 2013*. Unpublished report for Regis Resources, Perth.

Data in the Atlas of Living Australia, which includes data from the Western Australian Museum collection, has also been added to the information contained in Appendix B.

The most useful and representative data for the project area is the information in the Terrestrial Ecosystems (2011a) and Terrestrial Ecosystems (2011b). The Terrestrial Ecosystems (2011a) report is for a Level 2 vertebrate fauna survey in the area immediately adjacent to the project area and the Terrestrial Ecosystems (2011b) report is the results of a targeted survey for Long-tailed Dunnarts in the same area.

The composition of vertebrate fauna assemblages varies from habitat to habitat and site to site within the bioregion, however, the survey data contained in the attached appendices provide a good indication of the vertebrate fauna assemblage that is likely to be found in the project area. These data, therefore, provide a good regional context and indicate the extent of variation in the fauna assemblage that might be anticipated from site to site and over time.

2.4.1 Fauna species at risk

Cowan (2001) identified fauna species as being at risk in the East Murchison subregion, including the Bilby (*Macrotis lagotis*), Marsupial Mole (*Notoryctes typhlops*), Mulgara (*Dasyurus cristicauda*), Malleefowl (*Leipoa ocellata*), Princess Parrot (*Polytelis alexandrae*), Slender-billed Thornbill (*Acanthiza iredalei iredalei*), Giant Desert Skink (*Liopholis kintorei*) and Peregrine Falcon (*Falco peregrinus*).

Since 2001, the Grey Falcon (*Falco hypoleucos*), Night Parrot (*Pezoporus occidentalis*), Sandhill Dunnart (*Sminthopsis psammophila*) and Southern Whiteface (*Aphelocephala leucopsis*) have been added to the list.

This report assesses the potential for these species to be found in the project area and the potential impact that any proposed development might have on these species and other species of conservation significance.

3. METHODOLOGY

3.1 DATABASE SEARCHES

A review of the *EPBC Act 1999* online list of threatened species was undertaken to identify species of conservation interest to the Commonwealth Government under the *EPBC Act* (Appendix A). In addition, a search of the Terrestrial Ecosystems' fauna survey database was undertaken to develop an appreciation of the vertebrate fauna assemblages in relevant sections of the bioregion near the project area.

Other, more general texts were also used to provide supplementary information on vertebrate fauna in the bioregion, including Tyler et al. (2000) for frogs; Storr et al. (1983, 1990, 1999, 2002) and Thompson and Thompson (2010) for reptiles; Johnstone and Storr (1998, 2004) for birds; and Van Dyck and Strahan (2008) for mammals.

Collectively, these sources of information were used to create lists of species that were expected to utilise the project area and broader bioregion. It should be noted that these lists will include species recorded in the general region that may be vagrants, and they will generally not be found in the project area due to a lack of suitable habitat (e.g., water and shorebirds). Vagrants can be recorded almost anywhere. Many records are historical, and the species are no longer in the local area (e.g. Bilby). Many bird, mammal, reptile, and amphibian species have specific habitat requirements that may be present in the general area but not in the project area. Also, the ecology of many of these species is often poorly understood. It can sometimes be difficult to indicate species whose specific habitat requirements are absent in the project area. Therefore, many species will be included in the lists produced from database searches, but will not be present in the actual project area.

There are errors in most databases, including Dandjoo, Atlas of Living Australia and the WA Museum (WAM) collection. These errors occur due to misidentification of individuals, changes in taxonomic names, and incorrect coordinates entered into the database. Terrestrial Ecosystems was unable to verify the primary records, so it has used the information provided. Readers should therefore appreciate that species lists and fauna surveys reported in the appendices may include these errors. These databases also contain historical records and thus include species that are no longer present in the area (e.g. *Myrmecobius fasciatus*, *Bettongia lesueur* and *Macrotis lagotis*).

Because the project area is within 6km of Lake Carey, numerous water birds are likely to be present in database searches, even though there is no available habitat for these species in the project area.

3.2 FAUNA HABITAT ASSESSMENT

A fauna habitat assessment has been undertaken in the areas immediately adjacent to the project area and mapped in Figure 2.

3.3 REPORTING STAFF

Drs G. and S. Thompson drafted this report, and Dr Scott Thompson reviewed the report before it was sent to the client. Both senior scientists have appropriate relevant post-graduate qualifications, extensive experience in conducting fauna assessments in the Goldfields, have published research articles on biodiversity, fauna assemblages, species of conservation significance, survey strategies for Malleefowl, trapping techniques and temporal variations in trapped fauna assemblages based on Goldfields surveys and are therefore appropriately trained and experienced for the task of preparing this assessment.

Dr Scott Thompson is the only environmental practitioner in Western Australia who has independent specialist certification (CEnvP – Ecology Specialist) in combination with post-graduate tertiary qualifications and is a licensed pest management technician (LPMT). This unique set of skills and qualifications ensures that Scott undertakes fauna surveys, assessments, and control programs to the highest standard and with quality assurance. The qualifications and experience of the survey and reporting personnel are shown in Table 1.

Table 1. Project personnel and their qualifications

Name	Experience and qualifications	Tasks
Dr Scott Thompson	BSc. (Env. Sc.), MSc. (Env. Mngt.), PhD (Env. Sc./Mngt), Cert III (Vertebrate Pest Mngt), Cert IV (WHS). CEnvP (Ecology Specialist), 20+ years of experience and a good familiarity with the vertebrate fauna in the Goldfields	Drafting and reviewing the report.
Dr Graham Thompson	Post Grad. Dip. (Zool.), PhD (Zoology), Cert III (Vertebrate Pest Mngt), 20+ years of experience and a good familiarity with the vertebrate fauna in the Goldfields	Reporting.

3.4 TAXONOMY AND NOMENCLATURE

Taxonomy and nomenclature for fauna species used in this report are generally based on the WA Museum (WAM) species lists. Terrestrial Ecosystems has presumed that the fauna identifications referred to in the appendices or in reports used to provide local and regional comparative data were correct, and we have only corrected obvious records where the nomenclature was known to be incorrect.

3.5 LIMITATIONS

This Basic vertebrate fauna risk assessment is based on information contained in the Commonwealth Government's online *Environment Protection and Biodiversity Conservation Act 1999 (EPBC Act)* matters of national environmental significance (MNES) database and other published and unpublished fauna survey data for the adjacent areas. It is acknowledged that multiple surveys conducted in different seasons, repeated over several years, are necessary to fully appreciate the fauna assemblage in the project area.

Lists of species potentially in and around the project area have been compiled from WAM records, Atlas of Living Australia, Dell and How (1988), Dunlop and Paynes (1999), Ecologia Environment (2007), Kingfisher Environmental Consulting (2014), Ninnox Wildlife Consulting (1998), Terrestrial Ecosystems (2010, 2011a, b, 2020a, 2023). Some records in the Atlas of Living Australia and the WAM are very old, and those species are no longer present in the area. Terrestrial Ecosystems has not been able to verify the primary data and, therefore, cannot vouch for the accuracy of these records. All these data sources are known to contain errors, which should be taken into account when reading this assessment. These errors occur due to misidentification of individuals, taxonomic name changes, and incorrect coordinates being entered into the database.

The *EPBC Act* online MNES database for terrestrial fauna includes historical records and places a wide buffer around previously known locations of threatened species. A search of this database will invariably include species that are either locally extinct or were never present in parts of the search area.

The (EPA; 2020) *Technical Guidance – Terrestrial vertebrate fauna surveys for environmental impact assessment* suggested that many variables may limit fauna surveys. Limitations associated with each of these variables are assessed in Table 2.

Table 2. Fauna survey limitations and constraints

Possible limitations	Constraint	Comment
Competency/experience of the survey team, including experience in the bioregion surveyed	No	The environmental scientists who undertook the site assessment, drafted, and reviewed this report are familiar with the vertebrate fauna of this bioregion.
Scope of the survey, e.g. where faunal groups were excluded from the survey	N/A	
Proportion of fauna identified, recorded and/or collected	No	Not applicable.
Accuracy of previous survey work	Yes, negligible	Terrestrial Ecosystems has reported fauna survey data recorded by various authors, but cannot guarantee the accuracy of this information. It is acknowledged that the taxonomy of Western Australian vertebrates is continually being revised, and the nomenclature of some of the species listed in the appendices may have changed since the authors' publication.
Sources of information	Yes, negligible	Vertebrate fauna information was available from online databases and from published and unpublished reports of surveys conducted in the bioregion across various habitat types. Some of these surveys employed a low level of trapping effort, which significantly impacts the capacity of these data to represent the faunal assemblages in the surveyed areas.
Proportion of the task achieved	No	There were adequate vertebrate fauna data to complete this desktop assessment.
Timing/weather/ season/ cycle	N/A	
Disturbances which may affected the results of the survey	No	Disturbance areas throughout the project area have been factored into this assessment.
Adequacy of the survey intensity and proportion of survey achieved, e.g. the extent to which the area was surveyed	N/A	
Completeness	No	All aspects of this assessment have been completed.
Resources	No	Adequate resources were available.
Remoteness and/or access problems	N/A	All areas could be accessed.
Availability of contextual information on the region	No	There are limited fauna survey data for areas around the project area, but data from further afield are adequate to provide a list of species potentially present in the project area.

N/A = not applicable, Significant = major impact on outcome of the assessment, Moderate = impacted parts of the assessment, Negligible = almost no effect on the assessment.

4. RESULTS

4.1 FAUNA HABITAT

A fauna habitat assessment was not undertaken in the project area, however, there are habitat data for adjacent areas, which indicate the fauna habitats potentially in the project area are:

- chenopod shrublands;
- mulga over shrubs;
- mulga woodlands over ironstone gravel and rocks;
- mulga over chenopod shrubs;
- open mulga woodland; and
- banded ironstone formations.

As with most areas in the Goldfields, the density of trees and shrubs varies appreciably across the project area, with denser vegetation along the ephemeral drainage lines. The ephemeral drainage lines flow south-westward, eventually reaching Lake Carey unless they are captured for mining water. The project area was once grazed with cattle, and the proximity to existing mining operations indicates there are anthropogenic impacts in the project area. Plates 1-12 provide representative images of some of the fauna habitat types and disturbance in the immediately adjacent areas.



Plate 1. Chenopod shrublands



Plate 2. Chenopod shrublands



Plate 3. Mulga over shrubs



Plate 4. Mulga over shrubs



Plate 5. Mulga woodlands over ironstone gravel and rocks



Plate 6. Mulga woodlands over ironstone gravel and rocks



Plate 7. Open mulga woodland



Plate 8. Open mulga woodland



Plate 9. Banded ironstone formations



Plate 10. Banded ironstone formations



Plate 11. Mulga over chenopod shrubs



Plate 12. Mulga over chenopod shrubs

4.1.1 Non-native animals

Rabbits, donkeys, cats, cows and wild dog scats have been recorded at numerous locations.

4.2 BIOREGIONAL VERTEBRATE FAUNA

Appendix C provides a summary of the available fauna survey data near the project area. There are appreciable differences in the recorded fauna assemblages within and among fauna surveys, shown in Appendix C. These differences are due in part to the low survey effort often used and also reflect variations in soils and vegetation, as well as temporal variations in faunal assemblages.

Tables 3-7 provide a list of vertebrate species potentially found near the project area that have been compiled based on the fauna survey results shown in Appendix C.

Table 3. Birds potentially found near the project area

Family	Species	Common Name
Casuariidae	<i>Dromaius novaehollandiae</i>	Emu
Anatidae	<i>Cygnus atratus</i>	Black Swan
	<i>Tadorna tadornoides</i>	Australian Shelduck
	<i>Chenonetta jubata</i>	Australian Wood Duck
	<i>Anas superciliosa</i>	Pacific Black Duck
	<i>Anas gracilis</i>	Grey Teal
	<i>Malacorhynchus membranaceus</i>	Pink-eared Duck
	<i>Aythya australis</i>	Hardhead
	<i>Biziura lobata</i>	Musk Duck
Megapodiidae	<i>Leipoa ocellata</i>	Malleefowl
Phasianidae	<i>Coturnix pectoralis</i>	Stubble Quail
Podicipedidae	<i>Poliocephalus poliocephalus</i>	Hoary-headed Grebe
Columbidae	<i>Phaps chalcoptera</i>	Common Bronzewing
	<i>Ocyphaps lophotes</i>	Crested Pigeon
Otididae	<i>Ardeotis australis</i>	Australian Bustard
Cuculidae	<i>Chrysococcyx basalis</i>	Horsfield's Bronze-Cuckoo
	<i>Chrysococcyx osculans</i>	Black-eared Cuckoo
Aegothelidae	<i>Aegotheles cristatus</i>	Australian Owlet-nightjar
Podargidae	<i>Podargus strigoides</i>	Tawny Frogmouth
Caprimulgidae	<i>Eurostopodus argus</i>	Spotted Nightjar
Apodidae	<i>Apus pacificus</i>	Pacific Swift
Rallidae	<i>Tribonyx ventralis</i>	Black-tailed Nativehen
Rallidae	<i>Fulica atra</i>	Eurasian Coot
Recurvirostridae	<i>Himantopus leucocephalus</i>	Pied Stilt
	<i>Cladorhynchus leucocephalus</i>	Banded Stilt
	<i>Recurvirostra novaehollandiae</i>	Red-necked Avocet
Charadriidae	<i>Vanellus tricolor</i>	Banded Lapwing
	<i>Charadrius ruficapillus</i>	Red-capped Plover
	<i>Elseya melanops</i>	Black-fronted Dotterel
Turnicidae	<i>Turnix velox</i>	Little Buttonquail
Ardeidae	<i>Ardea pacifica</i>	White-necked Heron
	<i>Egretta novaehollandiae</i>	White-faced Heron
Accipitridae	<i>Haliaeetus albicilla</i>	White-tailed Eagle
	<i>Hieraaetus morphnoides</i>	Little Eagle
	<i>Aquila audax</i>	Wedge-tailed Eagle
	<i>Circus assimilis</i>	Spotted Harrier
	<i>Accipiter fasciatus</i>	Brown Goshawk
	<i>Accipiter cirrocephalus</i>	Collared Sparrowhawk

Family	Species	Common Name
Cuculidae	<i>Heteroscenes pallidus</i>	Pallid Cuckoo
Strigidae	<i>Ninox boobook</i>	Southern Boobook
Alcedinidae	<i>Todiramphus pyrrhopygius</i>	Red-backed Kingfisher
Meropidae	<i>Merops ornatus</i>	Rainbow Bee-eater
Falconidae	<i>Falco cenchroides</i>	Nankeen Kestrel
	<i>Falco longipennis</i>	Australian Hobby
	<i>Falco berigora</i>	Brown Falcon
	<i>Falco peregrinus</i>	Peregrine Falcon
Cacatuidae	<i>Eolophus roseicapilla</i>	Galah
	<i>Nymphicus hollandicus</i>	Cockatiel
Psittaculidae	<i>Neopsephotus bourkii</i>	Bourke's Parrot
	<i>Barnardius zonarius</i>	Australian Ringneck
	<i>Psephotus varius</i>	Mulga Parrot
	<i>Melopsittacus undulatus</i>	Budgerigar
Ptilonorhynchidae	<i>Chlamydera guttata</i>	Western Bowerbird
Climacteridae	<i>Climacteris affinis</i>	White-browed Treecreeper
	<i>Climacteris rufus</i>	Rufous Treecreeper
Maluridae	<i>Amytornis striatus</i>	Striated Grasswren
	<i>Malurus lamberti</i>	Variiegated Fairywren
	<i>Malurus splendens</i>	Splendid Fairywren
	<i>Malurus leucopterus</i>	White-winged Fairywren
Meliphagidae	<i>Certhionyx variegatus</i>	Pied Honeyeater
	<i>Purnella albifrons</i>	White-fronted Honeyeater
	<i>Manorina flavigula</i>	Yellow-throated Miner
	<i>Acanthagenys rufogularis</i>	Spiny-cheeked Honeyeater
	<i>Anthochaera carunculata</i>	Red Wattlebird
	<i>Gavicalis virens</i>	Singing Honeyeater
	<i>Ptilotula penicillata</i>	White-plumed Honeyeater
	<i>Ptilotula plumula</i>	Grey-fronted Honeyeater
	<i>Conopophila whitei</i>	Grey Honeyeater
	<i>Epthianura tricolor</i>	Crimson Chat
	<i>Epthianura aurifrons</i>	Orange Chat
	<i>Sugomel nigrum</i>	Black Honeyeater
	<i>Lichmera indistincta</i>	Brown Honeyeater
Pardalotidae	<i>Pardalotus rubricatus</i>	Red-browed Pardalote
	<i>Pardalotus striatus</i>	Striated Pardalote
Acanthizidae	<i>Pyrrholaemus brunneus</i>	Redthroat

Family	Species	Common Name
	<i>Acanthiza iredalei</i>	Slender-billed Thornbill
	<i>Acanthiza apicalis</i>	Inland Thornbill
	<i>Acanthiza chrysorrhoa</i>	Yellow-rumped Thornbill
	<i>Acanthiza uropygialis</i>	Chestnut-rumped Thornbill
	<i>Acanthiza robustirostris</i>	Slaty-backed Thornbill
	<i>Smicrornis brevirostris</i>	Weebill
	<i>Gerygone fusca</i>	Western Gerygone
	<i>Aphelocephala leucopsis</i>	Southern Whiteface
Pomatostomidae	<i>Pomatostomus superciliosus</i>	White-browed Babbler
Cinclosomatidae	<i>Cinclosoma castaneothorax</i>	Chestnut-breasted Quail-thrush
Campephagidae	<i>Coracina maxima</i>	Ground Cuckooshrike
	<i>Coracina novaehollandiae</i>	Black-faced Cuckooshrike
	<i>Lalage tricolor</i>	White-winged Triller
Neosittidae	<i>Daphoenositta chrysoptera</i>	Varied Sittella
Oreocidae	<i>Oreocitta gutturalis</i>	Crested Bellbird
Pachycephalidae	<i>Colluricincla harmonica</i>	Grey Shrike-thrush
	<i>Pachycephala rufiventris</i>	Rufous Whistler
Artamidae	<i>Artamus personatus</i>	Masked Woodswallow
	<i>Artamus superciliosus</i>	White-browed Woodswallow
	<i>Artamus cinereus</i>	Black-faced Woodswallow

	<i>Artamus cyanopterus</i>	Dusky Woodswallow
	<i>Artamus minor</i>	Little Woodswallow
	<i>Cracticus torquatus</i>	Grey Butcherbird
	<i>Cracticus nigrogularis</i>	Pied Butcherbird
	<i>Gymnorhina tibicen</i>	Australian Magpie
	<i>Strepera versicolor</i>	Grey Currawong
Rhipiduridae	<i>Rhipidura leucophrys</i>	Willie Wagtail
	<i>Rhipidura albiscapa</i>	Grey Fantail
Monarchidae	<i>Grallina cyanoleuca</i>	Magpie-lark
Corvidae	<i>Corvus orru</i>	Torresian Crow
	<i>Corvus bennetti</i>	Little Crow
	<i>Corvus coronoides</i>	Australian Raven
Petroicidae	<i>Microeca fascinans</i>	Jacky Winter
	<i>Petroica goodenovii</i>	Red-capped Robin
	<i>Melanodryas cucullata</i>	Hooded Robin
Locustellidae	<i>Cincloramphus cruralis</i>	Brown Songlark
	<i>Cincloramphus mathewsi</i>	Rufous Songlark
Hirundinidae	<i>Hirundo rustica</i>	Barn Swallow
	<i>Hirundo neoxena</i>	Welcome Swallow
	<i>Petrochelidon nigricans</i>	Tree Martin
	<i>Cheramoeca leucosterna</i>	White-backed Swallow
Dicaeidae	<i>Dicaeum hirundinaceum</i>	Mistletoebird
Estrildidae	<i>Taeniopygia guttata</i>	Zebra Finch
Motacillidae	<i>Anthus novaeseelandiae</i>	Australasian Pipit

Table 4. Amphibians potentially found near the project area

Family	Species	Common Name
Limnodynastidae	<i>Neobatrachus kunapalari</i>	Wheatbelt Frog
	<i>Neobatrachus sutor</i>	Shoemaker Frog
	<i>Neobatrachus wilmorei</i>	Plonking Frog
	<i>Platyplectrum spenceri</i>	Spencer's Burrowing Frog

Myobatrachidae	<i>Pseudophryne occidentalis</i>	Western Toadlet
Pelodyadidae	<i>Cyclorana cultripes</i>	Knife-footed Frog
	<i>Cyclorana maini</i>	Main's Frog
	<i>Cyclorana occidentalis</i>	Western Water-holding Frog

Table 5. Mammals potentially found near the project area

Family	Species	Common Name
Tachyglossidae	<i>Tachyglossus aculeatus</i>	Short-beaked Echidna
Bovidae	<i>Bos taurus</i>	Cow
	<i>Capra hircus</i>	Goat
	<i>Ovis aries</i>	Sheep
Camelidae	<i>Camelus dromedarius</i>	Dromedary
Canidae	<i>Canis lupus</i>	Dingo

	<i>Vulpes vulpes</i>	Red Fox
Felidae	<i>Felis catus</i>	Feral Cat
Molossidae	<i>Austronomus australis</i>	White-striped Freetail Bat
	<i>Mormopterus planiceps</i>	Southern Free-tail Bat
	<i>Mormopterus</i> sp. 4	South-western Free-tail Bat
Vespertilionidae	<i>Chalinolobus gouldii</i>	Gould's Wattled Bat

Family	Species	Common Name
	<i>Chalinolobus morio</i>	Chocolate Wattled Bat
	<i>Nyctophilus geoffroyi</i>	Lesser Long-eared Bat
	<i>Scotorepens balstoni</i>	Inland Broad-nosed Bat
Dasyuridae	<i>Antechinomys laniger</i>	Kultarr
	<i>Dasyercus blythi</i>	Brush-tailed Mulgara
	<i>Ningauai ridei</i>	Wongai Ningauai
	<i>Ningauai yvonneae</i>	Mallee Ningauai
	<i>Pseudantechinus woolleyae</i>	Woolley's False Antechinus
	<i>Sminthopsis crassicaudata</i>	Fat-tailed Dunnart
	<i>Sminthopsis dolichura</i>	Little Long-tailed Dunnart
	<i>Sminthopsis hirtipes</i>	Hairy-footed Dunnart
	<i>Antechinomys longicaudatus</i>	Long-tailed Dunnart

Family	Species	Common Name
	<i>Sminthopsis macroura</i>	Stripe-faced Dunnart
	<i>Sminthopsis murina</i>	Slender-tailed Dunnart
	<i>Sminthopsis ooldea</i>	Ooldea Dunnart
Macropodidae	<i>Macropus fuliginosus</i>	Western Grey Kangaroo
	<i>Osphranter robustus</i>	Euro
	<i>Osphranter rufus</i>	Red Kangaroo
Phalangeridae	<i>Trichosurus vulpecula</i>	Common Brushtail Possum
Leporidae	<i>Oryctolagus cuniculus</i>	Rabbit
Equidae	<i>Equus asinus</i>	Donkey
	<i>Equus caballus</i>	Horse
Muridae	<i>Mus musculus</i>	House Mouse
	<i>Notomys alexis</i>	Spinifex Hopping Mouse
	<i>Pseudomys hermannsburgensis</i>	Sandy Inland Mouse

Table 6. Reptiles potentially found near the project area

Family	Species	Common Name
Agamidae	<i>Ctenophorus caudicinctus</i>	Ring-tailed Dragon
	<i>Ctenophorus clayi</i>	Black-collared Dragon
	<i>Ctenophorus fordi</i>	Mallee Dragon
	<i>Ctenophorus inermis</i>	Military Dragon
	<i>Ctenophorus infans</i>	Ring-tailed Dragon
	<i>Ctenophorus isolepis</i>	Central Military Dragon
	<i>Ctenophorus maculatus</i>	Spotted Dragon
	<i>Ctenophorus nuchalis</i>	Central Netted Dragon
	<i>Ctenophorus reticulatus</i>	Western Netted Dragon
	<i>Ctenophorus salinarum</i>	Saltpan Dragon
	<i>Ctenophorus scutulatus</i>	Lozenge-marked Dragon
	<i>Diporiphora amphiboluroides</i>	Mulga Dragon
	<i>Moloch horridus</i>	Thorny Devil
	<i>Pogona minor</i>	Western Bearded Dragon
	<i>Tympanocryptis pseudopsephos</i>	Pebble Dragon
Carphodactylidae	<i>Nephrurus laevis</i>	Smooth Knob-tail
	<i>Nephrurus levis</i>	Three-lined Knob-tail
	<i>Nephrurus vertebralis</i>	Midline Knob-tail
	<i>Underwoodisaurus milii</i>	Barking Gecko
Diplodactylidae	<i>Diplodactylus conspicillatus</i>	Fat-tailed Gecko
	<i>Diplodactylus granariensis</i>	Wheatbelt Stone Gecko
	<i>Diplodactylus pulcher</i>	Beautiful Gecko
	<i>Lucasium bungabinna</i>	Southern Sandplain Gecko
	<i>Lucasium damaeum</i>	Beaded Gecko

Family	Species	Common Name
	<i>Lucasium squarrosus</i>	Mottled Ground Gecko
	<i>Lucasium stenodactylum</i>	Crowned Gecko
	<i>Rhynchoedura ornata</i>	Beaked Gecko
	<i>Strophurus assimilis</i>	Goldfields Spiny-tailed Gecko
	<i>Strophurus ciliaris</i>	Spiny-tailed Gecko
	<i>Strophurus elderi</i>	Jewelled Gecko
	<i>Strophurus spinigerus</i>	South-western Spiny-tailed Gecko
	<i>Strophurus strophurus</i>	Western Spiny-tailed Gecko
	<i>Strophurus wellingtonae</i>	Western Shield Spiny-tailed Gecko
Elapidae	<i>Brachyurophis fasciolatus</i>	Narrow-banded Burrowing Snake
	<i>Brachyurophis semifasciata</i>	Half-girdled Snake
	<i>Furina ornata</i>	Orange-naped Snake
	<i>Suta monachus</i>	Hooded Snake
	<i>Pseudechis australis</i>	Mulga Snake
	<i>Pseudechis butleri</i>	Spotted Mulga Snake
	<i>Pseudonaja mengdeni</i>	Western Brown Snake
	<i>Pseudonaja modesta</i>	Ringed Brown Snake
	<i>Simoselaps bertholdi</i>	Jan's Banded Snake
	<i>Suta fasciata</i>	Rosen's Snake
Gekkonidae	<i>Christinus marmoratus</i>	Marbled Gecko
	<i>Gehyra purpurascens</i>	Purplish Dtetla
	<i>Gehyra variegata</i>	Variegated Gehyra
	<i>Heteronotia binoei</i>	Bynoe's Gecko

Family	Species	Common Name
	<i>Gehyra xenopus</i>	Crocodile-faced Dterra
Pygopodidae	<i>Delma butleri</i>	Unbanded Delma
	<i>Delma fraseri</i>	Fraser's Delma
	<i>Delma nasuta</i>	Sharp-snouted Delma
	<i>Lialis burtonis</i>	Burton's Legless Lizard
	<i>Pygopus nigriceps</i>	Western Hooded Scaly-foot
Scincidae	<i>Cryptoblepharus australis</i>	Inland Snake-eyed Skink
	<i>Cryptoblepharus buehneri</i>	Buchanan's Snake-eyed Skink
	<i>Ctenotus ariadnae</i>	Ariadna's Ctenotus
	<i>Ctenotus atlas</i>	Southern Mallee Ctenotus
	<i>Ctenotus calurus</i>	Blue-tailed Finesnout Ctenotus
	<i>Ctenotus colletti</i>	Buff-tailed Finesnout Ctenotus
	<i>Ctenotus dux</i>	Fine Side-lined Ctenotus
	<i>Ctenotus grandis</i>	Grand Ctenotus
	<i>Ctenotus greeri</i>	Spotted-necked Ctenotus
	<i>Ctenotus hanloni</i>	Nimble Ctenotus
	<i>Ctenotus helenae</i>	Clay-soil Ctenotus
	<i>Ctenotus leonhardii</i>	Leonhardi's Ctenotus
	<i>Ctenotus nasutus</i>	Nasute Finsnout Ctenotus
	<i>Ctenotus pantherinus</i>	Leopard Ctenotus
	<i>Ctenotus piankai</i>	Coarse Sands Ctenotus
	<i>Ctenotus quattuordecimlineatus</i>	Fourteen-lined Ctenotus
	<i>Ctenotus schomburgkii</i>	Barred Wedgesnout Ctenotus
	<i>Ctenotus severus</i>	Stern Ctenotus
	<i>Ctenotus uber</i>	Spotted Ctenotus
	<i>Cyclodomorphus melanops</i>	Spinifex Slender Blue-tongue

Family	Species	Common Name
	<i>Egernia depressa</i>	Southern Pygmy Spiny-tailed Skink
	<i>Egernia formosa</i>	Goldfields Crevice Skink
	<i>Eremiascincus richardsonii</i>	Broad-banded Sand-swimmer
	<i>Lerista bipes</i>	North-western Sandslider
	<i>Lerista desertorum</i>	Central Desert Robust Slider
	<i>Lerista distinguenda</i>	South-western Orange-tailed Slider
	<i>Lerista kingi</i>	King's Slider
	<i>Lerista macropisthopus</i>	Unpatterned Robust Slider
	<i>Lerista muelleri</i>	Wood Mulch-slider
	<i>Lerista picturata</i>	Southern Robust Slider
	<i>Lerista timida</i>	Timid Slider
	<i>Liopholis inornata</i>	Desert Skink
	<i>Liopholis striata</i>	Nocturnal Desert Skink
	<i>Menetia greyii</i>	Common Dwarf Skink
	<i>Morethia butleri</i>	Woodland Morethia Skink
	<i>Proablepharus reginae</i>	Western Soil-crevice Skink
	<i>Tiliqua multifasciata</i>	Central Blue-tongue
	<i>Tiliqua occipitalis</i>	Western Blue-tongued Lizard
Typhlopidae	<i>Anilius australis</i>	Austral Blind Snake
	<i>Anilius bicolor</i>	Dark-spined Blind Snake
	<i>Anilius hamatus</i>	Pale-headed Blind Snake
	<i>Anilius waitii</i>	Waite's Blind Snake
Varanidae	<i>Varanus caudolineatus</i>	Stripe-tailed Monitor
	<i>Varanus eremius</i>	Pygmy Desert Monitor
	<i>Varanus giganteus</i>	Perentie
	<i>Varanus gouldii</i>	Gould's Goanna
	<i>Varanus panoptes</i>	Yellow-spotted Monitor
	<i>Varanus tristis</i>	Black-headed Monitor

4.3 SPECIES OF CONSERVATION SIGNIFICANCE

Fauna species of conservation significance are protected by the Commonwealth *EPBC Act 1999*, and this list includes species covered by international treaties such as the Japan-Australia Migratory Bird Agreement (JAMBA) and China-Australia Migratory Bird Agreement (CAMBA) and the Western Australia (WA) *BC Act 2016*. The WA *BC Act 2016* provides for the publication of the *Wildlife Conservation (Specially Protected Fauna) Notice*, which lists species under multiple categories. In addition, the DBCA maintains a list of fauna that require monitoring, prioritised according to current knowledge of their distribution, abundance, and threatening processes. The *EPBC Act 1999* and *BC Act 2016* imply legislative requirements for managing anthropogenic impacts to minimise the effects of disturbances on species and their habitats. Priority species lack statutory

protection, but the DBCA wishes to monitor potential impacts on them. Environmental consultants and proponents of developments are encouraged to avoid and minimise impacts on these species.

Definitions of the significant fauna under the *WA BC Act* are provided in Appendix C. Wetland and wetland migratory bird species have been excluded from the following list and assessments, as there is no suitable habitat for these species in the project area. Two threatened species of fauna and one priority potentially occur in the project area. More information about these species of conservation significance is found in Appendix D.

Table 7. Conservation species recorded in the database searches for the region

Species	BC Act and DBCA priority species list	EPBC conservation significant species	Comment on the potential presence of the species
Night Parrot <i>Pezoporus occidentalis</i>	Critically Endangered	Critically Endangered	There are no mature spinifex hummocks in the project area; the preferred habitat for the Night Parrot is not present, so it is highly unlikely that the Night Parrot is present.
Malleefowl <i>Leipoa ocellata</i>	Vulnerable	Vulnerable	No active Malleefowl mounds have been recorded during any of the previous site assessments completed by Terrestrial Ecosystems (2011b, a, 2012a, b, 2017, 2018, 2020b, 2021a, 2024).
Grey Falcon <i>Falco hypoleucos</i>	Vulnerable	Vulnerable	The Grey Falcon has not been recorded on site or in other fauna surveys near the project area, so it is unlikely to be present. If it were present, it would readily move upon disturbance and is unlikely to be significantly affected.
Princess Parrot <i>Polytelis alexandrae</i>	P4	Vulnerable	The Princess Parrot is unlikely to occur in the project area, as it has a strong preference for sandy plains vegetated with spinifex and River Red Gum (<i>Eucalyptus camaldulensis</i>), Marble Gum (<i>E. gongylocarpa</i>) and Desert Oak (<i>Allocasuarina decasneana</i>) trees. If recorded in the project area, it would almost certainly be a transient species.
Southern Whiteface <i>Aphelocephala leucopsis</i>	Vulnerable	Vulnerable	The Southern Whiteface was recorded in the 2011 avifauna survey at sites 6, 20, 26, 28, 37, 44, and 49 (Terrestrial Ecosystems 2011a), and again in 2026 during targeted avifauna field surveys.
Fork-tailed Swift <i>Apus pacificus</i>	Migratory	Migratory	It may be infrequently seen in the region, however, clearing vegetation and mining operations are highly unlikely to impact this species, given that it is predominantly aerial and rarely comes to ground in Australia.
Grey Wagtail <i>Motacilla cinerea</i>	Migratory	Migratory	Highly unlikely to occur in the project area, as it has not been recorded in other surveys in the bioregion.
Peregrine Falcon <i>Falco peregrinus</i>	Other specially protected fauna		It may be infrequently seen in the region, however, clearing vegetation and mining operations are highly unlikely to significantly impact this species.
Woma <i>Aspidites ramsayi</i>	Priority 1		Highly unlikely to occur in the project area, as it is rarely found in sparsely vegetated Mulga fauna habitats on hard clayey soils. It is very rarely seen in this part of the Goldfields and was considered locally extinct after 1980 (Maryan 2002).
Long-tailed Dunnart <i>Antechinomys longicaudatus</i>	Priority 4		There are no rocky ridges or breakaways in the project area, so it is improbable that the Long-tailed Dunnart is present.
Mulgara <i>Dasycercus blythi</i>	Priority 4		Highly unlikely to occur in the project area, as it is not generally found in sparsely vegetated Mulga fauna habitats on hard clayey soils
Central Long-eared Bat <i>Nyctophilus major tor</i>	Priority 3		The project area is beyond the northern geographical boundary of this species extant distribution, so it is unlikely to be present.

5. DISCUSSION

5.1 ADEQUACY OF THE FAUNA SURVEY DATA FOR THE FAUNA HABITATS REPRESENTED IN THE PROJECT AREA

The EPA's (2020) Technical Guidance on terrestrial fauna surveys indicated that the type of survey should be determined based on:

- level of existing regional knowledge;
- type and comprehensiveness of recent local surveys;
- degree of existing disturbance or fragmentation at the regional scale;
- extent, distribution and significance of habitats;
- significance of species likely to be present;
- sensitivity of the environment to the proposed activities; and
- scale and nature of impact.

Fauna survey data provided by Terrestrial Ecosystems (2011a, b) is a good indication of the vertebrate fauna assemblage in the project. The project area is mostly sparsely vegetated, with minimal leaf litter on the ground, suggesting a low abundance of small vertebrates. Although this survey was undertaken in 2011, the area is not subject to fires as the vegetation is too sparse and there has been little other disturbance that would have appreciably altered the vertebrate fauna assemblage.

5.1.1 Amphibians

Amphibians typically found in sparsely vegetated mulga woodlands in the Goldfields are listed in Table 4. The burrowing frogs (e.g. *Neobatrachus kunapalari*, *Neobatrachus sutor*, *Cyclorana maini* and *Platyplectrum spenceri*) only come to the surface to feed and breed after substantial rain, so they are unlikely to be recorded in most fauna surveys. *Pseudophryne occidentalis* finds shelter under rocks and in crevices during the dry periods and enters temporary ponds to breed after major rainfall events. All species are widespread in the Goldfields and abundant. There are no amphibian fauna of conservation significance in the Goldfields.

5.1.2 Reptiles

Reptile species richness in the project area will be comparable to similar mulga woodlands elsewhere in the bioregion. The list provided in Table 6 represents species likely to be found over a large area of diverse habitat types. Typically, between 25 and 35 species of reptiles are caught in predominantly open mulga woodland (Coffey Environments 2008, Terrestrial Ecosystems 2010, 2011a, 2020a) but none are of conservation significance. Fauna habitats in the project area are expected to be similar to those in adjacent areas, so the loss of reptiles during vegetation clearing is unlikely to be significant in a bioregional context.

The clearing of vegetation and mining activity in the project area is unlikely to significantly impact the reptile fauna of the bioregion.

5.1.3 Birds

The number of birds and bird species in the northern Goldfields fluctuates based on seasons and recent rainfall (Craig and Chapman 2003). Semi-arid and arid areas of inland Australia support a diverse range of transient and nomadic species that move through large areas in search of available resources. Heavy rain that is followed by flowering and seeding of many plant species is often sufficient to draw a large number of these nomadic

species to the general area. These species move to other areas once the resource is depleted or better resources are available in adjacent areas.

The project area is likely to support a similar assemblage to that present in the adjacent areas. Birds of conservation significance potentially found in the bioregion include the Southern Whiteface, Malleefowl, Peregrine Falcon and the Princess Parrot. The Southern Whiteface is likely to be present in low abundance as it is widespread and in low abundance in this part of the Goldfields, and was recorded in the 2011 avifauna survey (Terrestrial Ecosystems 2011a) and more recently in 2026 nearby. This small bushbird will readily move if disturbed, so vegetation clearing is unlikely to have a significant impact on this species in the project area as long as nesting sites are avoided. Malleefowl are present in the region but are unlikely to be present in the project area due to the sparseness of the vegetation and the presence of feral cats. The Princess Parrot is a nomadic species that moves around the arid interior, often in search of water and resources. It is rarely recorded this far away from the sandy deserts, making it highly unlikely to be found in the project area. The Peregrine Falcon typically has an extensive home range in the Goldfields, and clearing a small section of the project area, particularly if similar habitat exists in adjacent areas, is unlikely to significantly impact this species. The proposed vegetation clearing and mining activities in the project area are unlikely to significantly impact the avian fauna of the bioregion.

5.1.4 Mammals

The number of small terrestrial mammals potentially caught in the project area would be low due to the sparsely vegetated habitat. Although records of Numbats (*Myrmecobius fasciatus*), Burrowing Bettongs (*Bettongia lesueur*) and Bilbies (*Macrotis lagotis*) are shown in the Atlas of Living Australia and Western Australian Museum records (Appendix B), they are no longer present in this area, having been predated on by foxes, cats and dogs many years ago. Long-tailed Dunnarts have been recorded in the substantive rock ridge areas, and in the Granny Smith mining area (Terrestrial Ecosystems 2011b, a), so they are likely to be present in low abundance. However, they are likely to be widespread, albeit in low abundance in adjacent areas, so a loss of Long-tailed Dunnarts in the project area is unlikely to be a significant impact.

It is probable that the project area supports a population of feral cats (Onus et al. 2011), and possibly wild dogs in the project area and surrounds.

5.1.5 Biodiversity value of the project area

An ecological assessment of a site should consider its biodiversity value at the genetic, species and ecosystem levels, and its ecological functional value at the ecosystem level. There are inadequate data to assess the ecological value at the genetic level.

The available fauna survey data (Appendix B) provides a good indication of the vertebrate fauna present in the project area.

From a fauna perspective, the project area has been grazed, resulting in degradation of the fauna habitats over many decades. The feral cat is likely present, and this species has, over many years, significantly impacted the native vertebrate fauna. The habitat types identified in the project area are abundant in adjacent areas; therefore, the vertebrate fauna present there will also be found there. There will be localised impacts from vegetation clearing; however, this disturbance will not be significant in a regional context.

5.1.6 Ecological functional value at the ecosystem level

Vertebrate species potentially in the project area are wide-ranging and have been recorded in various other fauna surveys in the bioregion (Appendix B). Some of the project areas have been highly disturbed by historical mining or exploration activities, resulting in a depleted vertebrate fauna assemblage. The most significant impacts on vertebrate fauna in the project area and surrounds will have been feral cats and, to a lesser extent, cattle and wild dogs.

5.1.7 Maintenance of threatened ecological communities

No threatened ecological communities were identified in or near the project area. The condition of the fauna habitat varied from highly degraded to good. There is evidence of historical exploration activity and cattle grazing in the project area. The impact of this disturbance may have reduced the vertebrate terrestrial fauna assemblages in the project area.

5.1.8 Ecological linkages

The project area does not provide an important ecological linkage or a terrestrial fauna movement corridor.

5.1.9 Abundance and distribution of similar habitats in the adjacent areas

The assessed project area is 348ha. There is an abundance of similar habitats in adjacent areas and throughout the bioregion.

6. POTENTIAL IMPACTS

6.1 POTENTIAL IMPACTS ON FAUNA

Clearing of vegetation will potentially affect vertebrate fauna in the project area in numerous ways, including death/injury of fauna during vegetation clearing, impacts with vehicles and the loss of habitat.

Although there are anticipated short-term impacts on the generic vertebrate fauna assemblage, they are not considered to result in significant impacts when considered in a bioregional context in the longer term. The overall impact on fauna species and species of conservation significance will be minimal, provided the recommended management procedures are implemented and adhered to.

6.1.1 Animal deaths during the clearing process and displacement of fauna

Clearing vegetation and activities associated with the proposed mining development will result in the loss of small fauna and those that retreat to burrows, such as reptiles and mammals. Nocturnal species are unlikely to be active when most land-clearing and construction work is taking place, which will inevitably result in these individuals being killed or injured in their burrows or as they attempt to escape. Larger terrestrial animals and avian species will most often move to adjacent areas. These species will be required to establish new activity areas and home ranges, which could result in the temporary displacement of resident species; however, this loss of fauna is unlikely to have a significant impact in a bioregional context.

6.1.2 Reduction or loss of activity areas and closure of burrows

Clearing vegetation and associated mine development activities are likely to destroy reptile and mammal burrows or foraging habitats that are currently in use or could be used again. Clearing vegetation that forms part of individuals' activity areas can force these animals into adjacent areas. These areas may offer fewer resources, placing individuals under survival pressure. It could also cause individuals to move into other individuals' territories, increasing competition for resources. Forced relocations could increase the possibility of predation. Indirect impacts

6.1.3 Habitat fragmentation and edge effects

In addition to the apparent impact of vegetation clearing, there can be an equally significant or greater impact on the adjacent areas because of 'edge effects'. Edge effects can disrupt ecological processes, such as predation, dispersal, and animal movements, and alter assemblage structure. Consequently, the impact area will always be much larger than the cleared area. Small mammals can respond both positively and negatively to edges depending on their ecological traits (Laurance 1991, 1994, Goosem and Marsh 1997, Goosem 2000). Edge and disturbance effects can lead to altered and, most often, higher levels of predation, restricting or increasing fauna movements and altering assemblage structure (Oxley et al. 1974, Paton 1994, Baker et al. 1998, Temple 1998, Luck et al. 1999, Goosem et al. 2001). Goldingay and Whelan (1997) and Clarke and Oldland (2007) reported that edge effects can extend up to 150-200m from the edge for some species, meaning the impact area on vertebrate fauna is likely larger than the cleared footprint.

Vehicle tracks and haul roads also tend to develop weed infestations that can impact natural fauna habitats.

In addition to the direct impacts of vegetation clearing, infrastructure, including tracks, has the potential to fragment habitat. Cleared linear tracks of land are 'unnatural' in much of the habitat. These linear structures partition existing activity areas, isolate sections of established communities, and may alter long- and medium-

term movement patterns around established home ranges, particularly for small mammals and reptiles. A reduction in the population due to this development would be difficult to detect, given our current knowledge of the spatial ecology of most small mammals known to occur in the area. The project area contains sparse vegetation and existing vehicle tracks. The impacts of habitat fragmentation due to additional vehicle tracks would therefore be quite low.

6.1.4 Introduced fauna and weeds

An increase in habitat fragmentation and human activity is often associated with an increase in the abundance of introduced species such as the house mouse (*Mus musculus*), foxes (*Vulpes vulpes*), cat (*Felis catus*) and wild dogs (*Canis lupus*). This increase may be due to declining habitat health, increased roadkill, and poor waste disposal. House mice, foxes, cats and wild dogs are known to be established in the area. In many situations, they have become a 'naturalised' species in the Australian bush. Increases in fox, dog, or cat numbers can have a detrimental impact on native fauna by preying on and competing with native species, severely disrupting the natural balance. The feral cat is a particularly damaging predator on native fauna, and any increase in their numbers could have a detrimental effect on local native fauna (Kinnear 1993, Bamford 1995, Woinarski et al. 2017, Woinarski et al. 2018, Murphy et al. 2019); hence, it is important to ensure that populations of the feral predators, such as cats, are under control. Infrastructure known to support feral species, such as rubbish disposal sites and bins, should be managed to minimise population increases.

Introduced plant species can successfully and rapidly invade areas of cleared native vegetation or otherwise disturbed by humans. Introduced plant species may replace native species that provide shelter or foraging areas for native fauna. Major changes to the structure of vegetation will alter the fauna habitat and consequently may influence fauna species composition. Preparing and implementing a weed management plan will largely reduce their threat to native fauna species. Road fauna deaths

An increase in road fauna deaths is likely to occur where new roads / tracks are constructed or upgraded, affecting kangaroos, nocturnal birds and ground-dwelling large carnivorous predators. Species such as goannas and raptors are attracted to carrion on road verges and therefore have a greater propensity to be killed by vehicles.

6.1.5 Fire

Increased human activity is often associated with an altered fire regime, which leads to a degradation of natural ecosystems. Fire has been identified as one of the most threatening processes for several conservation-significant species, as several small mammals and birds rely on long-unburnt vegetation. Large and widespread fires are unlikely to pose a significant threat to native fauna near the project area due to the sparse vegetation.

6.1.6 Anthropogenic activity

Unnatural noises, vibrations, artificial light sources, and vehicle and human movement in an area may be sufficient to force individuals or fauna species to move from adjacent areas or alter their activity periods. This form of disturbance is likely to occur during the vegetation clearing and when mining activity commences. The overall impact is likely to be confined to a relatively small area and is unlikely to be significant.

6.1.7 Dust

Dust generated from shifting topsoil and spoil, and vehicle traffic can potentially degrade surrounding vegetation, reducing its ability to absorb sunlight and influencing photosynthetic rates. Degradation of these

areas may potentially render the habitat unsuitable for fauna. Dust suppression and management programs are an essential component of minimising impacts on fauna in areas adjacent to the mine. An effective dust management and monitoring program is required.

7. VERTEBRATE FAUNA RISK ASSESSMENT

Fauna surveys to support environmental approval are part of the environmental risk assessment undertaken to consider what potential impacts a development might have on the biodiversity of a particular area and region. Potential impacts on fauna from the proposed development are identified and briefly described above. Tables 8, 9, and 10 provide a summary of the risk assessment associated with this project.

Any risk assessment is a product of the likelihood of an impact occurring and the consequences of that impact. Likelihood and consequences are categorised and described below. The assessed risk level (likelihood x consequences) is then calculated as the overall risk for the development. This is followed by an assessment of the acceptability of the risks associated with each impact.

Disturbances and vegetation clearing have an impact on the fauna at multiple scales – site, local, landscape and regional. Each of these is considered in the risk assessment. This assessment should be considered in the context of the summary in Table 10.

Table 8. Fauna impact risk assessment descriptors

Likelihood		
Level	Description	Criteria
A	Rare	The environmental event may occur, or one or more species of fauna of conservation significance may be present in exceptional circumstances.
B	Unlikely	The environmental event could occur, or one or more species of fauna of conservation significance could be present at some time.
C	Moderate	The environmental event should occur, or one or more fauna species of conservation significance should be present at some time.
D	Likely	The environmental event will probably occur, or one or more fauna species of conservation significance will be present in most circumstances.
E	Almost certain	The environmental event is expected to occur, or one or more fauna species of conservation significance are expected to be present in most circumstances.
Consequences		
Level	Description	Criteria
1	Insignificant	Insignificant impacts on fauna of conservation significance or regional biodiversity, and the loss of individuals will be negligible in the context of the availability of similar fauna or fauna assemblages in the area.
2	Minor	Impact on fauna localised and no significant impact on species of conservation significance in the study area. Loss of species at the local scale.
3	Moderate	An appreciable loss of fauna in a regional context or a limited impact on species of conservation significance in the study area.
4	Major	Significant impact on species of conservation significance or their habitat in the project area and/or regional biodiversity and/or a significant loss in the biodiversity at the landscape scale.
5	Catastrophic	Loss of species at the regional scale and/or a significant loss of species categorised as 'vulnerable' or 'endangered' under the <i>EPBC Act 1999</i> at a regional scale.
Acceptability of Risk		
Level of risk	Management Action Required	
Low	No action is required.	
Moderate	Avoid if possible. This will require routine management with internal audits and a review of monitoring results annually.	
High	Externally approved management plan to reduce risks, monitor major risks annually with external audit and review of management plan outcomes annually. May a referral to the Commonwealth under the <i>EPBC Act 1999</i> .	
Extreme	Unacceptable, and the project should be redesigned or not proceed.	

Table 9. Levels of acceptable risk

		Likelihood				
		Rare or very low (A)	Unlikely or low (B)	Moderate (C)	Likely (D)	Almost certain (E)
Consequence	Insignificant (1)	Low	Low	Low	Low	Low
	Minor (2)	Low	Low	Low	Moderate	Moderate
	Moderate (3)	Low	Moderate	Moderate	High	High
	Major (4)	Moderate	Moderate	High	High	Extreme
	Catastrophic (5)	Moderate	High	High	Extreme	Extreme

Table 10. A risk assessment of the impact of ground disturbance activity on fauna

			Before management				With management		
	Potential impacts		Inherent risk			Risk controls	Residual risk		
Factor			Likelihood	Consequence	Significance		Likelihood	Consequence	Significance
Fauna survey data	Inadequate survey data to adequately assess the risks	Unknown loss of fauna, fauna of conservation significance, and fauna assemblages, and an incomplete fauna assessment.	B	2	Low				
	Inadequacy of comparative data	Limits on the availability of comparative data reduced the capacity to assess the uniqueness of the fauna assemblages in the project area.	B	2	Low				
Clearing vegetation	Loss of fauna habitat – local scale	Loss of terrestrial fauna in the project area.	E	1	Low				
	Loss of fauna habitat – landscape scale	Loss of some fauna during vegetation clearing.	B	1	Low				
	Loss of fauna habitat – regional scale	A small loss of some fauna in the region.	B	1	Low				
	Loss of a threatened ecological fauna community	Loss of an undetected threatened ecological fauna community.	A	3	Low				
	Habitat fragmentation	Fauna movement is restricted, resulting in the death of fauna and a loss of biodiversity.	A	2	Low				
Death or loss of fauna of conservation significance	Loss of a unique terrestrial fauna ecosystem	Loss of an ecosystem containing fauna with high species richness, high abundance and numerous top of the food chain predators.	A	2	Low				
	Night Parrot	Loss of a Night Parrot or a small population of Night Parrots.	A	3	Low				
	Malleefowl	Loss of a Malleefowl or a small population of Malleefowl.	A	2	Low				
	Grey Falcon	Loss of a Grey Falcon or a small population of Grey Falcon.	A	2	Low				

			Before management				With management		
	Princess Parrot	Loss of a Princess Parrot or a small population of Princess Parrot.	A	2	Low				
	Southern Whiteface	Loss of a Southern Whiteface or a small population of Southern Whiteface.	C	3	Mod	Implement management recommendations	B	2	Low
	Fork-tailed Swift	Loss of a Fork-tailed Swift or a small population of Fork-tailed Swift.	A	2	Low				
	Grey Wagtail	Loss of a Grey Wagtail or a small population of Grey Wagtail.	A	2	Low				
	Peregrine Falcon	Loss of a Peregrine Falcon or a small population of Peregrine Falcons.	A	2	Low				
	Woma	Loss of a Woma or a small population of Woma.	A	2	Low				
	Mulgara	Loss of a Mulgara or a small population of Mulgara.	A	2	Low				
	Central Long-eared Bat	Loss of a Central Long-eared Bat or a small population of Central Long-eared Bat.	B	2	Low				
	Long-tailed Dunnart	Loss of a Long-tailed Dunnart or a small population of Long-tailed Dunnart.	E	2	Mod				
Human impacts	Increase or spread of weeds	Changed vegetation and a resulting loss of suitable habitat for native fauna.	E	2	Mod	Implementation of a weed management plan.	D	2	Low
	Road kills	Animals being killed by vehicles as they cross roads.	E	1	Low	Limiting speeds	E	1	Low
	Increase in feral fauna; specifically the fox, wild dog and cat	Increased predation on the native fauna	C	3	Mod	Implementation of a feral animal control program(s)	C	2	Low
	Dust	Increased potential for dust	E	2	Mod	Implementation of a dust management plan.	C	2	Low

7.1 NATIVE VEGETATION CLEARING PRINCIPLES AS THEY PERTAIN TO VERTEBRATE FAUNA

The *Environmental Protection Act (1986)* provides criteria to judge the potential impact of a development on clearing native vegetation on flora and fauna. These criteria are listed below, with a response indicating how clearing of the vegetation in the project area might be judged against these principles as they relate to fauna and fauna assemblages in the project area. Where possible, native vegetation should not be cleared if any of the following principles are compromised.

Table 11. Assessment of impact using the native vegetation clearing principles

Principle	Response
It comprises a high level of biological diversity.	Clearing vegetation will not compromise a high level of biodiversity. The project area may support a small population of Southern Whiteface, a small bush bird listed as Vulnerable under the <i>EPBC Act</i> and <i>WA BC Act</i> . This bird is widespread in this part of the Goldfields and will readily move if disturbed. Active management will reduce potential impacts on this species. The project area may also support a low abundance of Long-tailed Dunnarts. These small dasyurids are likely widespread in adjacent areas, so the loss of a few individuals in the project area is unlikely to be significant in a bioregional context.
It comprises the whole or a part of, or is necessary for the maintenance of, a significant habitat for fauna indigenous to Western Australia.	Fauna habitats in the project area are similar to adjacent areas, so clearing the vegetation will not result in the loss of significant habitat for indigenous fauna.
It includes, or is necessary for the continued existence or, rare flora.	N/A
It comprises the whole or a part of, or is necessary for the maintenance of, a threatened ecological community.	The area does not contain a threatened ecological fauna community.
It is significant as a remnant of native vegetation in an area that has been extensively cleared.	The area is not a remnant.
It is growing in, or in association with, an environment associated with a watercourses or wetland.	The area does not contain a natural wetland.
The clearing of the vegetation is likely to cause appreciable land degradation.	N/A
The clearing of the vegetation is likely to have an impact on the environmental values of any adjacent or nearby conservation area.	Clearing of vegetation is unlikely to impact the environmental values of the bioregion significantly.
The clearing of the vegetation is likely to cause deterioration in the quality of surface or underground water.	N/A
The clearing of the vegetation is likely to cause, or exacerbate the incidence of flooding.	N/A

7.2 IMPACTS ON SPECIES OF CONSERVATION SIGNIFICANCE

There is a single avifauna species near the project area that is potentially impacted by vegetation clearing and mining activities (i.e. Southern Whiteface). Potential impacts on this species are assessed below.

7.2.1 Critical habitat – Southern Whiteface

Department of Climate Change, Energy, the Environment and Water (2023) defined critical habitat for Southern Whiteface as:

- relatively undisturbed open woodlands and shrublands with an understorey of grasses or shrubs, or both;
- habitat with low tree densities and an herbaceous understorey litter cover which provides an essential foraging habitat; and
- living and dead trees with hollows and crevices which are essential for roosting and nesting.

The Regis project area includes Southern Whiteface critical habitat (i.e. open woodlands with an understorey of grasses and shrubs, low tree density, living and dead trees with hollows and crevices). This habitat is abundant across thousands of square kilometres in the Goldfields, Midwest, Murchison, and the semi-arid interior of southern Western Australia. There was no apparent difference between the project habitat and the surrounding areas.

7.2.2 Threats to Southern Whiteface

Department of Climate Change, Energy, the Environment and Water (2023) defined threats to Southern Whiteface as:

- habitat loss caused by clearing for agriculture;
- habitat degradation caused by domestic livestock grazing;
- increased frequency or length of droughts; and
- increased likelihood of extreme events (i.e., wildfire, drought, and heatwaves).

7.2.2.1 Habitat loss caused by clearing for agriculture

The proposed vegetation clearing is for an operational mine, and not broad-scale clearing for agriculture.

7.2.2.2 Habitat degradation caused by domestic livestock grazing

The proposed mining operations are on the Mt Weld Station, which has supported a low abundance of cattle grazing on native pasture for multiple decades, long before Granny Smith became active in this area.

7.2.2.3 Increased frequency or length of droughts and increased likelihood of extreme events

The mining operations are unlikely to significantly contribute to droughts or other extreme events any more than any other mining operations in the interior of Western Australia. So, based on the nominated major threats (Department of Climate Change Energy the Environment and Water 2023), the mining operations are unlikely to impact Southern Whiteface significantly.

Clearing vegetation in the project area will reduce foraging opportunities and breeding habitat for Southern Whiteface. However, the proposed total development envelope is minuscule in the context of the available

similar habitat in surrounding areas. Therefore, the loss of this habitat is unlikely to have a significant negative impact on the long-term survival of the Southern Whiteface.

It is acknowledged that the clearing of vegetation in the project area could result in the displacement of a small number of Southern Whiteface into surrounding areas at the time of vegetation clearing. The available data indicate that over a couple of months, these birds are mobile and can shift their foraging areas. Their abundance is also variable, so any impacts associated with forced displacement into the surrounding area, where the habitat is very similar, are unlikely to be significant. This shift in the foraging area is likely a natural process with minimal impact, unless pairs are displaced during breeding.

7.2.3 DCCEW MNES Significant Impact Guidelines

The Commonwealth Government's (Department of the Environment 2013) criteria for assessing potential impacts on a species of conservation significance are contained in Table 12 and the potential impact of Regis' proposed action is assessed against those criteria.

Table 12. Criteria for assessing the potential impacts on Southern Whiteface
(taken from: Department of the Environment 2013)

An action is likely to have a significant impact on a vulnerable species if there is a real chance or possibility that it will:	Southern Whiteface
1. lead to a long-term decrease in the size of an important population of a species	No
2. reduce the area of occupancy of an important population	No
3. fragment an existing important population into two or more populations	No
4. adversely affect habitat critical to the survival of a species	No
5. disrupt the breeding cycle of an important population	No
6. modify, destroy, remove or isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline	No
7. result in invasive species that are harmful to a vulnerable species becoming established in the vulnerable species' habitat	No
8. introduce disease that may cause the species to decline, or	No
9. interfere substantially with the recovery of the species.	No

An important population is defined (Department of the Environment 2013) as:

- key source populations either for breeding or dispersal;
- populations that are necessary for maintaining genetic diversity; and/or
- populations that are near the limit of the species range.

7.2.3.1 Southern Whiteface - important population

The project area is toward the centre of the Southern Whiteface geographical distribution in WA. A small population of Southern Whiteface may exist in or near the project area. There are recent records of this species from near the west coast in the Murchison, inland Murchison, southern Pilbara, Midwest, Goldfields and sandy desert regions (Plate 13), so any Southern Whiteface in or near the project area are no more important than those elsewhere in WA. The answer to Criteria 1 is 'No' for Southern Whiteface.

There are more than 100 records of Southern Whiteface within 100km of the project area, so the number of individuals that are periodically onsite does not constitute an 'important population'. In addition, any Southern Whiteface living in the project area immediately before it is cleared will readily move to surrounding areas. The answer to Criteria 1 is 'No'.

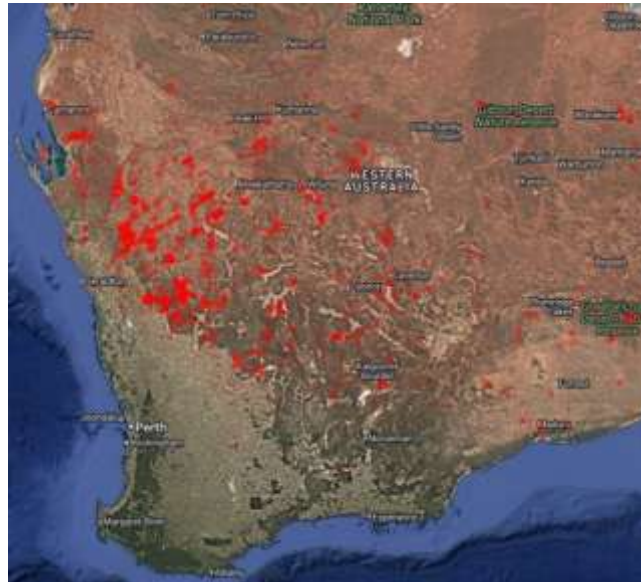


Plate 13. Southern Whiteface records in Terrestrial Ecosystems fauna survey database

7.2.3.2 Southern Whiteface - area of occupancy

Southern Whiteface records indicate this small bushbird is widespread in the bioregion (Plate 13). Had the Southern Whiteface occupancy area in Western Australia been randomly surveyed rather than at selected sites (i.e., mining locations and areas with vehicle access), it would have been evident that this bird is geographically widely distributed and relatively abundant in Western Australia. There is no evidence that the Southern Whiteface in and around the project area constitutes an important population. Therefore, the loss of a small quantity of vegetation in the project area will not reduce its area of occupancy or displace an important population. The answer to Criteria 2 is 'No'.

7.2.3.3 Southern Whiteface - fragment an existing important population

The Southern Whiteface's geographic distribution includes the entire width of southern Western Australia (Plate 13), excluding the southwest, and it extends into South Australia and the Northern Territory. The Southern Whiteface is a mobile, semi-arid species that probably has a shifting activity area and will readily move if disturbed. Therefore, vegetation clearing in the project area will not fragment populations or isolate a small part of the population. There is no evidence that the small number of Southern Whiteface recorded in and around the project area represents an important population or is important for the maintenance of genetic diversity. The answer to Criteria 3 is 'No' for Southern Whiteface.

7.2.3.4 Southern Whiteface - habitat critical to the survival

Habitat that is critical to the survival of Southern Whiteface is described in the Commonwealth Conservation Advice as:

- relatively undisturbed open woodlands and shrublands with an understorey of grasses or shrubs, or both; habitat with low tree densities and an herbaceous understorey litter cover which provides an essential foraging habitat; and
- living and dead trees with hollows and crevices which are essential for roosting and nesting.

This critical habitat description is vague and applies to thousands of square kilometres of inland Western Australia in the Midwest, Murchison, Goldfields, and elsewhere. The loss of a very small part of these many thousands of square kilometres of similar habitat, particularly when the bird is mobile, probably has a shifting activity area, and will readily move if disturbed, will not adversely affect habitat critical to the survival of the species to the extent of adversely impacting the survival of the species. The answer to Criteria 4 is 'No'.

7.2.3.5 Southern Whiteface - disrupt the breeding cycle

Johnstone and Storr (2004) reported that the Southern Whiteface builds a dome-shaped nest with a side entrance mainly in a hollow branch, a tree trunk, a crevice between branches, a stump, a fence post, or a recumbent log entrance through a knot-hole or crack. Nests are made with grass, bark, rootlets, feathers and wool and lined with feathers, wool, fur and soft plant down (Johnstone and Storr 2004). Such habitats and materials are widely available in the Midwest, the Murchison, and the Goldfields of Western Australia. Based on geographic records, this small bushbird clearly breeds in thousands of locations across the semi-arid areas of Western Australia. There is no evidence that the very small number of Southern Whiteface in and around the project area represents an important population. The answer to Criteria 5 is 'No'.

7.2.3.6 Southern Whiteface - isolate or decrease the availability or quality of habitat

Quality habitat is not defined for the Southern Whiteface, but presumably, it is areas with a high abundance of this species concentrated in a particular area. Even the defined 'habitat critical to its survival' (Department of Climate Change Energy the Environment and Water 2023) is very widely available in the Goldfields, Murchison, and the Midwest of Western Australia. The project area represents a minuscule amount of the available suitable habitat for Southern Whiteface. There is no evidence to suggest or indicate that it is a 'quality habitat', and it does not differ appreciably from the habitat in the many square kilometres of surrounding habitat in which the Southern Whiteface has been recorded. The answer to Criteria 6 is 'No'.

7.2.3.7 Southern Whiteface – harmful invasive species

The proposed action will not result in invasive species harmful to the Southern Whiteface (e.g. cats) becoming established in the species' habitat, as these invasive species are already present in the area. Feral cat trapping is also proposed to keep cat numbers consistent with what was present before the mining areas were operational. The answer to Criteria 7 is 'No'.

7.2.3.8 Southern Whiteface - introduce disease

There is no suggestion or evidence to indicate that the proposed action will introduce disease into the Southern Whiteface habitats that would adversely impact this small bush bird. The answer to Criteria 8 is 'No'.

7.2.3.9 Southern Whiteface – recovery plan

There is no recovery plan for Southern Whiteface, and it is highly improbable that the proposed action will significantly and detrimentally impact the overall Southern Whiteface population or the bioregional Southern Whiteface population. The answer to Criteria 9 is 'No'.

Based on an assessment using criteria in the Commonwealth Government's (Department of the Environment 2013) significant impact assessment criteria, the proposed action will not significantly impact this species. The Department of Climate Change, Energy, the Environment and Water's (2023) conservation advice listed the issues shown in Table 13 as threats to the Southern Whiteface. Against each threat is a comment on whether the proposed action will significantly increase this threat.

Table 13. Threats to Southern Whiteface as described in the Conservation Advice to the Commonwealth Government Minister

Threat	Response
Habitat loss caused by clearing for agriculture	The proposed action is not clearing land for agriculture.
Habitat degradation caused by domestic livestock grazing	The cattle on the Mt Weld pastoral station were present long before the mining activity was undertaken.
Increased frequency or length of droughts	The mining operations have no capacity to influence the frequency or length of droughts in the Goldfields.
Increased likelihood of extreme events (i.e., wildfire, drought and heatwaves)	The mining company cannot influence the likelihood of extreme events in the Goldfields.

7.3 MITIGATION

The following mitigation measures will reduce the potential impact of vegetation clearing and mining operations on the Southern Whiteface:

- Where practical, clearing vegetation should be undertaken outside the breeding season of July to October, with fledglings leaving the nest by October (Johnstone and Storr 1998) for Southern Whiteface, noting that rain probably triggers breeding activity as early as April;
- If clearing is to occur in the Southern Whiteface breeding season, a zoologist familiar with the species should search the area for active nests. This will appreciably reduce the probability of an active Southern Whiteface nest being disturbed.
- If an active Southern Whiteface nest(s) is found, a 100m buffer is implemented around the nest site until all chicks have fledged; and
- Minimising vegetation clearing by redesigning the location of infrastructure (e.g. locating haul roads and mine roads along pre-existing roads and tracks).

7.3.1 Remaining uncertainty

Little is known about the movement behaviour and activity/foraging area of Southern Whiteface in the Goldfields, Murchison, and Midwest of Western Australia. The extent, distance, and frequency with which Southern Whiteface shifts its foraging areas would be useful for assessing potential impacts. If, for example, it moves its activity area every couple of months and is not range resident, then displacing Southern Whiteface during vegetation clearing into surrounding areas will have little consequence.

Knowledge of the Southern Whiteface activity area size around an active nest would be useful information in determining the buffer that should be implemented around a known active nest.

7.3.2 Is clearing vegetation in the project area likely to result in a significant impact on Southern Whiteface?

The conclusions drawn from the available data are that Southern Whiteface is geographically widespread in the Goldfields, Murchison, and Midwest of Western Australia. There is little or no evidence to indicate a significant recent decline in their abundance or geographical distribution in Western Australia, they are mobile with shifting activity/foraging areas, typically breed between April and September, and have a dome-shaped nest with a side entrance in a hollow branch, tree trunk, crevice between branches, a stump, and a fence post, etc.

Clearing vegetation will remove habitat that has been and could in the future be used by Southern Whiteface, and any of these birds present during vegetation clearing will be displaced to surrounding areas. These factors are not considered to have a significant impact on this avian species.

7.3.3 Long-tailed Dunnart

The Long-tailed Dunnart is potentially present in the rocky outcrops and breakaways in the region. If present, they are also likely to be present in similar habitats in the uncleared neighbouring areas. The presence or absence of Long-tailed Dunnarts can only be determined by a trapping (i.e. camera, aluminium box trapping or pit-trapping) program. This is a boom-bust species that can be relatively abundant after heavy rains, which lead to flowering and seeding by native plants and an increase in foraging opportunities for all dunnarts.

This species is listed as Priority 4 with DBCA and is not currently on the Commonwealth or State Government's legislated conservation species lists. It is only likely to be impacted if the rocky outcrops and breakaways are to be disturbed, and that is unknown at present.

7.4 REFERRAL UNDER THE *EPBC ACT*

Although the Southern Whiteface is probably present in the project area in low abundance, this small bush bird is widespread and relatively abundant in this part of the Goldfields, Murchison and Midwest of WA and will readily move to adjacent areas if disturbed, so it is unlikely to be significantly impacted by vegetation clearing and mining operations. The proposed project is unlikely to significantly impact other fauna species of conservation significance, so a referral under the *EPBC Act 1999* is not recommended.

8. SUMMARY

Granny Smith Gold Mine is planning on expanding its operations and infrastructure footprint at its site 20km south of Laverton in Western Australia. The assessed project area is 348ha. A fauna habitat assessment was not undertaken in the project area, however, there are habitat data for adjacent areas, which indicate the fauna habitats potentially in the project area are:

- chenopod shrublands;
- mulga over shrubs;
- mulga woodlands over ironstone gravel and rocks;
- mulga over chenopod shrubs;
- open mulga woodland; and
- banded ironstone formations.

As in most areas of the Goldfields and Murchison, the density of trees and shrubs varies appreciably across the project area, with denser vegetation along drainage lines. Some of the project area is highly disturbed or cleared, primarily due to historical exploration activity and station roads.

The project area does not provide an important ecological linkage or fauna movement corridor. Clearing native vegetation is likely to result in the loss of a small number of vertebrate fauna that cannot move away during clearing. The few larger animals, such as goannas, and most of the birds will move into adjacent areas once clearing commences. The proposed vegetation clearing and mining operation may result in indirect impacts on the vertebrate fauna such as a reduction or loss of activity areas and closure of burrows, habitat fragmentation, increased presence of feral predators, road deaths and unnatural noises, vibrations, artificial light sources and vehicle and human movement in an area all of which may result in the death of animals or force some of them into adjacent areas. In the project area, impacts on vertebrate fauna associated with vegetation clearing and mining will be very low in a bioregional context.

The Southern Whiteface (listed as Vulnerable under the *EPBC Act* and *WA BC Act*) has been recorded in other fauna surveys in the adjacent areas, so it will likely be present in the project area. This small bushbird is widespread and relatively abundant in this part of the Goldfields and will readily move if disturbed; therefore, vegetation clearing and mining activity are unlikely to have a significant impact. The Peregrine Falcon may occasionally be recorded in the project area, but it has a large home range and will readily move if disturbed, so it is unlikely to be impacted by vegetation clearing and mining activity. The Long-tailed Dunnart was caught in adjacent areas in 2011, so it is likely present in the project area at low abundance. It is also likely to be in the surrounding area, as the habitat is very similar. The loss of a small number of Long-tailed Dunnarts during vegetation clearing is unlikely to be significant in a bioregional context.

There are no other vertebrate fauna of conservation significance likely to be significantly impacted by clearing vegetation and the development and operation of a mine in the project area. A referral under the *Environment Protection and Biodiversity Conservation Act* is not recommended; however, we would encourage the mine to implement the management recommendations to mitigate impacts on vertebrate fauna.

9. MANAGEMENT STRATEGIES

The purpose of this section is to identify generic management and mitigation strategies to address the potential impacts of development in the project area. Specific management and mitigation strategies to address potential impacts should be addressed in the recommended Vertebrate Fauna Management Plan and Construction Environmental Management Plan.

9.1 INDUCTION AND AWARENESS

All contractors and staff involved in vegetation clearing, development, and ongoing operations should be made aware of the potential presence and associated issues of terrestrial fauna in the area during induction.

Recommendation 1: An induction program that includes a component on managing vertebrate fauna is mandatory for staff working in the project area.

Recommendation 2: Information on protecting fauna and reporting deaths and sightings of fauna of conservation significance should be incorporated into the induction program.

9.2 DUST

Dust generated from vegetation clearing and development could potentially degrade surrounding vegetation, reducing its ability to absorb sunlight and influencing photosynthetic rates. Degradation of these areas will potentially render habitats unsuitable for fauna. Dust suppression and management programs are essential to minimising mining impacts on fauna.

Recommendation 3: The impact of dust on adjacent vegetation and fauna habitat is managed against appropriate KPIs and in accordance with the clients' dust management protocols.

9.3 MINIMISING HABITAT FRAGMENTATION

Loss of vegetation and habitat may contribute to declining fauna in and around the project area. Where practicable, access routes are aligned with existing tracks and other barriers, or follow the boundaries of broad-scale vegetation associations, to minimise impact on terrestrial fauna, which are often dependent on specific habitat types. Where practicable, clearing is minimised, and fragmentation of remnant vegetation is avoided. Once areas are no longer required, they are rehabilitated.

Recommendation 4: All areas disturbed during exploration are rehabilitated as soon as practical after they are no longer required.

Recommendation 5: Where possible, access routes are aligned to existing roads, tracks and other barriers or follow the boundaries of broad-scale vegetation associations in the area.

9.4 MINIMISING SECONDARY IMPACTS TO FAUNA AND FAUNA HABITAT

Pets and feral animals can affect native fauna. Pets should not be permitted on site, and feral and pest fauna should be monitored and controlled. To be effective, management of feral and pest species needs to be undertaken in collaboration with the landowner, pastoralist, and neighbouring tenement holders.

All rubbish likely to attract animals should be suitably contained and disposed of so as not to encourage the feeding of fauna around the site. The project area supports a population of feral cats. Reducing the impacts of

feral cats will reduce the stress on fauna and fauna assemblages in the area. Wild dogs are also common in the area and will impact the local and regional vertebrate fauna assemblage. Increased activity will lead to increased traffic and, consequently, more animal deaths on tracks and roads in the area. Limiting vehicle speed on access tracks can reduce collisions with fauna, particularly larger animals such as kangaroos and emus. Dead animals on the road also have the propensity to attract raptors, goannas and even cattle, which are then likely to be killed.

Recommendation 6: Pets are not permitted on the site.

Recommendation 7: All waste and rubbish to be contained in bins and regularly removed from the survey or placed in landfill, and suitably covered to exclude access to predator species.

Recommendation 8: Feeding of native fauna is prohibited.

Recommendation 9: A feral pest control program is implemented in the project area and its surroundings.

Recommendation 10: A Vertebrate Fauna Management Plan should be prepared and implemented for the life of the project.

9.5 SOUTHERN WHITEFACE

Clearing vegetation in the project area may remove habitat that the Southern Whiteface has used and could use in the future. These impacts are unlikely to be significant in a regional context, however, mitigation can further reduce potential impacts.

Recommendation 11: Clearing vegetation is undertaken outside the Southern Whiteface breeding and fledgling period of April to October, acknowledging that rainfall events can influence the breeding season.

Recommendation 12: If clearing is to occur in the Southern Whiteface breeding season, a zoologist familiar with the species will search the area for active nests before vegetation clearing is undertaken.

Recommendation 13: If an active Southern Whiteface nest(s) is found, a 250m buffer is implemented around the nest site until all chicks have fledged.

9.6 LONG-TAILED DUNNARTS

Long-tailed Dunnarts are potentially found in rocky outcrops and breakaways but it is unknown if these areas will be disturbed by development. If this were the case, it is likely that environmental regulators would be interested in how Granny Smith intends to mitigate potential impacts and monitoring the population.

If Granny Smith intends to impact the rocky outcrops and breakaways, then it is recommended that these areas be surveyed for the presence of Long-tailed Dunnarts. Should these dunnarts be present, then a management and mitigation plan should be prepared to accompany any environmental approval application.

Recommendation 14: If the larger rocky areas and breakaways are proposed for disturbance, then a survey of these areas is undertaken to determine the presence or absence of Long-tailed Dunnarts.

Recommendation 15: If Long-tailed Dunnarts are present in the proposed disturbance areas, then a management and mitigation plan is developed.

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Figures

**Desktop Vertebrate Fauna Assessment
Granny Smith Mine Expansion 2026**



Figure 1. Regional location

Figure 3. Historical survey sites

Figure 5. Historical survey sites

Figure 2. Fauna habitats in adjacent areas

Figure 4. Historical survey sites

Figure 6. Historical survey sites

Appendix A.

Results of the *EPBC Act* Protected Matters Search

Desktop Vertebrate Fauna Assessment
Granny Smith Mine Expansion 2026



Appendix B.

Vertebrate fauna in adjacent areas

**Desktop Vertebrate Fauna Assessment
Granny Smith Mine Expansion 2026**



B.1 VERTEBARTE FAUNA ASSESSMENTS

			Surveys										A	B	C										D	E									
			Unknown	Unknown	Site 9	Site 10	Site 2	Site 3	Site 12	Site 4	Site 5	Site 1	Site 8	Site 11	Site 13	Site 6	Site 7	Opportunistic	Bird survey			MME1	MME2	Opportunistic	MME3	MME5	MME7	MME8	MME9	MME6	MME4				
Family	Specie	Common name																																	
Amphibians																																			
Limnodynastidae	<i>Neobatrachus kunapalari</i>	Wheatbelt Frog	X		1																														
	<i>Neobatrachus sutor</i>	Shoemaker Frog	X		13	2	2	5	1	3	1	8	1									1	1												
	<i>Platyplectrum spenceri</i>	Spencer's Burrowing Frog	X																																
Myobatrachidae	<i>Pseudophryne occidentalis</i>	Western Toadlet	X																																
Pelodryadidae	<i>Cyclorana maini</i>	Main's Frog	X		11	5	1							1										1											
	<i>Cyclorana occidentalis</i>	Western Water-holding Frog	X		5	2	1	1	1						1																				
Reptiles																																			
Agamidae	<i>Ctenophorus caudicinctus</i>	Ring-tailed Dragon																																	
	<i>Ctenophorus clayi</i>	Black-collared Dragon	X																																
	<i>Ctenophorus fordi</i>	Mallee Dragon	X																																
	<i>Ctenophorus infans</i>	Ring-tailed Dragon	X																																
	<i>Ctenophorus isolepis</i>	Central Military Dragon	X																			1													
	<i>Ctenophorus nuchalis</i>	Central Netted Dragon	X																																
	<i>Ctenophorus reticulatus</i>	Western Netted Dragon	X																				1	1	1	1	3	1							
	<i>Ctenophorus salinarum</i>	Saltpan Dragon	X																																
	<i>Ctenophorus scutulatus</i>	Lozenge-marked Dragon	X																																
	<i>Diporiphora amphiboluroides</i>	Mulga Dragon	X							2	1					1																			
	<i>Moloch horridus</i>	Thorny Devil	X																																
	<i>Pogona minor</i>	Western Bearded Dragon	X																										1						
	<i>Tympanocryptis pseudopsephos</i>	Pebble Dragon	X							2	3		1			1																			
Carphodactylidae	<i>Nephurus laevis</i>	Smooth Knob-tail	X																																
	<i>Nephurus levis</i>	Three-lined Knob-tail	X																																
	<i>Nephurus vertebralis</i>	Midline Knob-tail	X																																
	<i>Underwoodisaurus milii</i>	Barking Gecko	X																										2						
Diplodactylidae	<i>Diplodactylus conspicillatus</i>	Fat-tailed Gecko	X																																
	<i>Diplodactylus granariensis</i>	Wheatbelt Stone Gecko				1																													
	<i>Diplodactylus pulcher</i>	Beautiful Gecko	X			2				1	4	2		1	1	3	1													1					
	<i>Lucasium bungabinna</i>	Southern Sandplain Gecko	X																																
	<i>Lucasium damaeum</i>	Beaded Gecko	X																																
	<i>Lucasium squarrosum</i>	Mottled Ground Gecko	X																																
	<i>Rhynchoedura ornata</i>	Beaked Gecko	X		1							3				2																			
	<i>Strophurus assimilis</i>	Goldfields Spiny-tailed Gecko	X																																
	<i>Strophurus elderi</i>	Jewelled Gecko	X																																
	<i>Strophurus spinigerus</i>	South-western Spiny-tailed Gecko	X																																

			Surveys		A	B	C														D	E									
			Unknown	Unknown	Site 9	Site 10	Site 2	Site 3	Site 12	Site 4	Site 5	Site 1	Site 8	Site 11	Site 13	Site 6	Site 7	Opportunistic	Bird survey		MME1	MME2	Opportunistic	MME3	MME5	MME7	MME8	MME9	MME6	MME4	
Family	Specie	Common name																													
	<i>Strophurus strophurus</i>	Western Spiny-tailed Gecko	X																												
	<i>Strophurus wellingtonae</i>	Western Shield Spiny-tailed Gecko	X			2					4			1								1									
Elapidae	<i>Brachyuropis fasciolatus</i>	Narrow-banded Burrowing Snake	X																												
	<i>Furina ornata</i>	Orange-naped Snake	X																												
	<i>Suta monachus</i>	Hooded Snake	X									1			1								1								
	<i>Pseudechis australis</i>	Mulga Snake	X																												
	<i>Pseudechis butleri</i>	Spotted Mulga Snake	X																				1								
	<i>Pseudonaja mengdeni</i>	Western Brown Snake	X																												
	<i>Pseudonaja modesta</i>	Ringed Brown Snake	X																												
	<i>Simoeslaps bertholdi</i>	Jan's Banded Snake	X																												
	<i>Suta fasciata</i>	Rosen's Snake	X																												
Gekkonidae	<i>Christinus marmoratus</i>	Marbled Gecko	X																												
	<i>Gehyra purpurascens</i>	Purplish Dtella	X																												
	<i>Gehyra variegata</i>	Variegated Gehyra	X		2	3	2	2	4			3	1		1						3	9	1	3	3	2		3	9	10	
	<i>Heteronotia binoei</i>	Bynoe's Gecko	X		1			1		1	2		2	5								3	1							1	
Pygopodidae	<i>Delma butleri</i>	Unbanded Delma	X																												
	<i>Delma nasuta</i>	Sharp-snouted Delma	X																												
	<i>Lialis burtonis</i>	Burton's Legless Lizard	X																												
	<i>Pygopus nigriceps</i>	Western Hooded Scaly-foot	X																												
Scincidae	<i>Cryptoblepharus australis</i>	Inland Snake-eyed Skink	X																												
	<i>Cryptoblepharus buchananii</i>	Buchanan's Snake-eyed Skink	X																			2	1								
	<i>Ctenotus ariadnae</i>	Ariadna's Ctenotus	X																												
	<i>Ctenotus atlas</i>	Southern Mallee Ctenotus	X																												
	<i>Ctenotus calurus</i>	Blue-tailed Finesnout Ctenotus	X																												
	<i>Ctenotus colletti</i>	Buff-tailed Finesnout Ctenotus	X																												
	<i>Ctenotus dux</i>	Fine Side-lined Ctenotus	X																												
	<i>Ctenotus grandis</i>	Grand Ctenotus	X																												
	<i>Ctenotus greeri</i>	Spotted-necked Ctenotus	X																												
	<i>Ctenotus hanloni</i>	Nimble Ctenotus	X																												
	<i>Ctenotus helenae</i>	Clay-soil Ctenotus	X																												
	<i>Ctenotus leonhardii</i>	Leonhardi's Ctenotus	X		5	9	2		16			2		7	27		1							1							
	<i>Ctenotus nasutus</i>	Nasute Finsnout Ctenotus	X																												
	<i>Ctenotus pantherinus</i>	Leopard Ctenotus	X																												
	<i>Ctenotus piankai</i>	Coarse Sands Ctenotus	X																												
	<i>Ctenotus quattuordecimlineatus</i>	Fourteen-lined Ctenotus	X																												
	<i>Ctenotus schomburgkii</i>	Barred Wedgesnout Ctenotus	X																			1		1				2			
	<i>Ctenotus severus</i>	Stern Ctenotus	X																												
	<i>Ctenotus uber</i>	Spotted Ctenotus	X																												

			Surveys			A	B	C										D		E										
			Unknown	Unknown	Site 9	Site 10	Site 2	Site 3	Site 12	Site 4	Site 5	Site 1	Site 8	Site 11	Site 13	Site 6	Site 7	Opportunistic	Bird survey		MME1	MME2	Opportunistic	MME3	MME5	MME7	MME8	MME9	MME6	MME4
Family	Specie	Common name																												
	<i>Cyclodomorphus melanops</i>	Spiniflex Slender Blue-tongue	X																											
	<i>Egernia depressa</i>	Southern Pygmy Spiny-tailed Skink	X			1	1	1		2	2		6				3	9			1								1	
	<i>Egernia formosa</i>	Goldfields Crevice Skink	X																											
	<i>Eremiascincus richardsonii</i>	Broad-banded Sand-swimmer	X							2						1														
	<i>Lerista desertorum</i>	Central Desert Robust Slider	X												2								1				1	1		
	<i>Lerista distinguenda</i>	South-western Orange-tailed Slider													1															
	<i>Lerista kingi</i>	King's Slider	X																											
	<i>Lerista muelleri</i>	Wood Mulch-slider	X																											
	<i>Lerista timida</i>	Timid Slider	X																											
	<i>Liopholis inornata</i>	Desert Skink	X																											
	<i>Liopholis kintorei</i>	Great Desert Skink	X																											
	<i>Liopholis striata</i>	Nocturnal Desert Skink	X																											
	<i>Menetia greyii</i>	Common Dwarf Skink	X											1							4		1				1			
	<i>Morethia butleri</i>	Woodland Morethia Skink	X	6	1	1			3	1						2						2	1		2	1	1	1	3	4
	<i>Tiliqua multifasciata</i>	Central Blue-tongue	X									1																		
	<i>Tiliqua occipitalis</i>	Western Blue-tongued Lizard	X																											
Typhlopidae	<i>Anilius australis</i>	Austral Blind Snake	X	1									1																	
	<i>Anilius bicolor</i>	Dark-spined Blind Snake						1																						
Varanidae	<i>Varanus caudolineatus</i>	Stripe-tailed Monitor	X			1	2		2	1	3					1	1					1						1		
	<i>Varanus eremius</i>	Pygmy Desert Monitor	X																											
	<i>Varanus giganteus</i>	Perentie	X																											
	<i>Varanus gouldii</i>	Gould's Goanna	X																											
	<i>Varanus panoptes</i>	Yellow-spotted Monitor	X			4		7			3	4		2	6	2	2			4			1				1	1		
	<i>Varanus tristis</i>	Black-headed Monitor	X																											
Birds																														
Casuariidae	<i>Dromaius novaehollandiae</i>	Emu																3	1		1	1	1				1	1	1	
Anatidae	<i>Cygnus atratus</i>	Black Swan																					1							
	<i>Tadorna tadornoides</i>	Australian Shelduck																					1							
	<i>Chenonetta jubata</i>	Australian Wood Duck																77	2											
	<i>Anas superciliosa</i>	Pacific Black Duck																13					1							
	<i>Anas gracilis</i>	Grey Teal																74					1							
	<i>Malacorhynchus membranaceus</i>	Pink-eared Duck																5					1							
	<i>Aythya australis</i>	Hardhead																2												
	<i>Biziura lobata</i>	Musk Duck																2												
Megapodiidae	<i>Leipoa ocellata</i>	Malleefowl																					1							
Podicipedidae	<i>Poliocephalus poliocephalus</i>	Hoary-headed Grebe																30												
Columbidae	<i>Phaps chalcoptera</i>	Common Bronzewing																	5				1							
	<i>Ocyphaps lophotes</i>	Crested Pigeon																	12		2		1				3	2		

			Surveys		A	B	C													D	E																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																		
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			Surveys		A	B	C																D	E							
			Unknown	Unknown	Site 9	Site 10	Site 2	Site 3	Site 12	Site 4	Site 5	Site 1	Site 8	Site 11	Site 13	Site 6	Site 7	Opportunistic	Bird survey		MME1	MME2	Opportunistic	MME3	MME5	MME7	MME8	MME9	MME6	MME4	
Family	Specie	Common name																													
Locustellidae	<i>Cincloramphus cruralis</i>	Brown Songlark	X																												
	<i>Cincloramphus mathewsi</i>	Rufous Songlark	X																												
Hirundinidae	<i>Hirundo rustica</i>	Barn Swallow																											5		
	<i>Hirundo neoxena</i>	Welcome Swallow	X															2	4												
	<i>Petrochelidon nigricans</i>	Tree Martin	X															1	2												
	<i>Cheramoeca leucosterna</i>	White-backed Swallow	X															4	1				1	2							
Dicaeidae	<i>Dicaeum hirundinaceum</i>	Mistletoebird	X															2	2												
Estrildidae	<i>Taeniopygia guttata</i>	Zebra Finch	X															2					1								
Motacillidae	<i>Anthus novaeseelandiae</i>	Australasian Pipit	X															6	1				1	4							
Mammals																															
Tachyglossidae	<i>Tachyglossus aculeatus</i>	Short-beaked Echidna																				1	1								
Bovidae	<i>Capra hircus</i>	Goat																					1								
Canidae	<i>Canis lupus</i>	Dingo																					1								
	<i>Vulpes vulpes</i>	Red Fox																					1								
Vespertilionidae	<i>Chalinolobus gouldii</i>	Gould's Wattled Bat	X																												
	<i>Nyctophilus geoffroyi</i>	Lesser Long-eared Bat	X																												
	<i>Scotorepens balstoni</i>	Inland Broad-nosed Bat	X																												
Dasyuridae	<i>Antechinomys laniger</i>	Kultarr			2	1					3	2	2		1	3	3			1											
	<i>Ningauai ridei</i>	Wongai Ningauai	X																												
	<i>Ningauai yvonneae</i>	Mallee Ningauai	X																												
	<i>Pseudantechinus woolleyae</i>	Woolley's False Antechinus	X																												
	<i>Sminthopsis crassicaudata</i>	Fat-tailed Dunnart	X																		1			1							
	<i>Sminthopsis dolichura</i>	Little Long-tailed Dunnart	X		5	3	1	3	1	7	5	1	3		1	4	13														
	<i>Sminthopsis hirtipes</i>	Hairy-footed Dunnart	X							1																					
	<i>Antechinomys longicaudatus</i>	Long-tailed Dunnart		17							1				1	1				1											
	<i>Sminthopsis macroura</i>	Stripe-faced Dunnart			1	5	3		3	2	1	2	1	5	2	1	1			19											
	<i>Sminthopsis murina</i>	Slender-tailed Dunnart	X																												
	<i>Sminthopsis ooldea</i>	Ooldea Dunnart	X																												
Macropodidae	<i>Osphranter robustus</i>	Euro	X																				1						1		
	<i>Osphranter rufus</i>	Red Kangaroo																					1	5			6				
Leporidae	<i>Oryctolagus cuniculus</i>	Rabbit	X																				1						1		
Equidae	<i>Equus asinus</i>	Donkey																					1								
	<i>Equus caballus</i>	Horse	X																												
Muridae	<i>Mus musculus</i>	House Mouse	X											5		1				4	1	2		2	2			2	1		
	<i>Notomys alexis</i>	Spinifex Hopping Mouse	X									3								7						2					
	<i>Pseudomys hermannsburgensis</i>	Sandy Inland Mouse	X		1	2	1	1	5	3		1		2	6					6							4	1			

A Atlas of Living Australia

B DBCA's threatened species database

C Terrestrial Ecosystems (2011a) Level 2 Fauna Risk Assessment for the Granny Deeps Project Area, Unpublished report for Barrick Gold Corporation, Perth.



- D Terrestrial Ecosystems (2011b) Targeted Survey for Long-tailed Dunnarts for the Granny Deeps Project Area, Unpublished report for Barrick Gold Corporation , Perth.
- E Ninox Wildlife Consulting (1998) A Vertebrate Fauna Survey of the Murrin Murrin Expansion Project. Unpublished report for Anaconda Nickel Ltd, Perth.

			Surveys																A										B										C	D
			TM1	JS2	WM2	WS2	WM1	WS1	JS3	JS1	JS4	HB1	Site 14a	Site 5a	Site 1a	Site 17a	Site 14	Site 20a	Site 11	Site 11a	Site 8	Site 19	Site 14b	Jump Up	Unknown															
Family	Species	Common name																																						
Amphibians																																								
Limnodynastidae	<i>Neobatrachus wilsmorei</i>	Plonking Frog	3	1																																				
	<i>Platyplectrum spenceri</i>	Spencer's Burrowing Frog											8																											
Myobatrachidae	<i>Pseudophryne occidentalis</i>	Western Toadlet												2																										
Reptiles																																								
Agamidae	<i>Ctenophorus caudicinctus</i>	Ring-tailed Dragon													12																									
	<i>Ctenophorus inermis</i>	Military Dragon			1											1																								
	<i>Ctenophorus maculatus</i>	Spotted Dragon				2																																		
	<i>Ctenophorus reticulatus</i>	Western Netted Dragon					1						1	13		2	2	4						1																
	<i>Ctenophorus salinarum</i>	Saltpan Dragon				2		1						1					5	1	2																			
	<i>Diporiphora amphiboluroides</i>	Mulga Dragon																						1																
	<i>Pogona minor</i>	Western Bearded Dragon	1		2				2	1	1						1		2	1	2	2																		
	<i>Tympanocryptis pseudopsephos</i>	Pebble Dragon																		1																				
Carphodactylidae	<i>Nephurus vertebralis</i>	Midline Knob-tail					1		1										1		2																			
	<i>Underwoodisaurus milii</i>	Barking Gecko												2		9								1																
Diplodactylidae	<i>Diplodactylus pulcher</i>	Beautiful Gecko											4	3		3							1																	
	<i>Lucasium squarrosum</i>	Mottled Ground Gecko	2	1	5	2	1					2	1			3		2	1	3																				
	<i>Rhynchoedura ornata</i>	Beaked Gecko																			2			1																
	<i>Strophurus ciliaris</i>	Spiny-tailed Gecko											2	2		1		1																						
	<i>Strophurus elderi</i>	Jewelled Gecko		1					1	2																														
	<i>Strophurus strophurus</i>	Western Spiny-tailed Gecko																			7																			
Elapidae	<i>Brachyuropsis fasciolatus</i>	Narrow-banded Burrowing Snake																1																						
	<i>Brachyuropsis semifasciata</i>	Half-girdled Snake																						1																
	<i>Suta monachus</i>	Hooded Snake											1			3																								
	<i>Simoselaps bertholdi</i>	Jan's Banded Snake	1																			1																		
	<i>Suta fasciata</i>	Rosen's Snake												2																										
Gekkonidae	<i>Gehyra purpurascens</i>	Purplish Dtella																																						
	<i>Gehyra variegata</i>	Variegated Gehyra												15	1	15		1			1	1		1																
	<i>Heteronotia binoei</i>	Bynoe's Gecko	1				2				2	3		7		34								1																
	<i>Gehyra xenopus</i>	Crocodile-faced Dtella		1			1			1	1																													
Pygopodidae	<i>Delma nasuta</i>	Sharp-snouted Delma									1																													
	<i>Lialis burtonis</i>	Burton's Legless Lizard									1																													
	<i>Pygopus nigriceps</i>	Western Hooded Scaly-foot									1					1		1																						
Scincidae	<i>Cryptoblepharus buechananii</i>	Buchanan's Snake-eyed Skink											1																											
	<i>Ctenotus calurus</i>	Blue-tailed Finesnout Ctenotus																				1																		

			Surveys		A										B										C	D
			TM1	JS2	WM2	WS2	WM1	WS1	JS3	JS1	JS4	HB1	Site 14a	Site 5a	Site 1a	Site 17a	Site 14	Site 20a	Site 11	Site 11a	Site 8	Site 19	Site 14b	Jump Up	Unknown	
Family	Species	Common name																								
	<i>Ctenotus greeri</i>	Spotted-necked Ctenotus																				12				
	<i>Ctenotus helenae</i>	Clay-soil Ctenotus		2					2	1											1					
	<i>Ctenotus leonhardii</i>	Leonhardi's Ctenotus	6	3	3	6	7				2	4							5	4	2					
	<i>Ctenotus pantherinus</i>	Leopard Ctenotus																				4				
	<i>Ctenotus quattuordecimlineatus</i>	Fourteen-lined Ctenotus																				11				
	<i>Ctenotus schomburgkii</i>	Barred Wedgesnout Ctenotus																2	3		15	11				
	<i>Ctenotus severus</i>	Stern Ctenotus													1	6										
	<i>Ctenotus uber</i>	Spotted Ctenotus											3			2		6								
	<i>Egernia depressa</i>	Southern Pygmy Spiny-tailed Skink																4						1		
	<i>Egernia formosa</i>	Goldfields Crevice Skink												3										1		
	<i>Eremiascincus richardsonii</i>	Broad-banded Sand-swimmer											1			1										
	<i>Lerista desertorum</i>	Central Desert Robust Slider	4	1	1				1	2	1					6		2				6				
	<i>Lerista distinguenda</i>	South-western Orange-tailed Slider																								
	<i>Lerista kingi</i>	King's Slider					1																			
	<i>Lerista macropisthopus</i>	Unpatterned Robust Slider												2												
	<i>Lerista picturata</i>	Southern Robust Slider												2												
	<i>Lerista</i> sp.															9					5	1				
	<i>Liopholis striata</i>	Nocturnal Desert Skink																2								
	<i>Menetia greyii</i>	Common Dwarf Skink				1	1							4												
	<i>Morethia butleri</i>	Woodland Morethia Skink												4		6	2									
Typhlopidae	<i>Anilius hamatus</i>	Pale-headed Blind Snake					1				1		1								1					
	<i>Anilius waitii</i>	Waite's Blind Snake											2								1					
Varanidae	<i>Varanus caudolineatus</i>	Stripe-tailed Monitor			1								1	2				6								
	<i>Varanus giganteus</i>	Perentie												1												
	<i>Varanus gouldii</i>	Gould's Goanna					1		1					1		1										
	<i>Varanus panoptes</i>	Yellow-spotted Monitor											2					1	1					1		
	<i>Varanus tristis</i>	Black-headed Monitor											1													
Birds																										
Casuariidae	<i>Dromaius novaehollandiae</i>	Emu											1	2						2		2	5	1		
Megapodiidae	<i>Leipoa ocellata</i>	Malleefowl																						1	X	
Phasianidae	<i>Coturnix pectoralis</i>	Stubble Quail																					1			
Columbidae	<i>Phaps chalcoptera</i>	Common Bronzewing																			1			1		
	<i>Ocyphaps lophotes</i>	Crested Pigeon											5	6		11	1	7			9		2	1		
Otididae	<i>Ardeotis australis</i>	Australian Bustard											4							1				1	X	
Cuculidae	<i>Chrysococcyx basalis</i>	Horsfield's Bronze-Cuckoo																		3	1	3		1		
	<i>Chrysococcyx osculans</i>	Black-eared Cuckoo																2				1		1		
Aegothelidae	<i>Aegotheles cristatus</i>	Australian Owlet-nightjar											3				3				1		2	1		
Podaridae	<i>Podargus strigoides</i>	Tawny Frogmouth																1								

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A Dunlop, J.N and Paynes, W. (1999) A vertebrate fauna survey of the North Lake Carey region. Unpublished report for Placer (Granny Smith) and Homestake, Perth.

B Dell, J and How, R.A. (1988) Vertebrate fauna. In: The biological Survey of the Eastern Goldfields of Western Australia, Part 5, Edjudina - Menzies Study Area. Records of the Western Australian Museum, Supplement No 31., pp. 38-77.

C Ecologia Environment (2007) Jump Up Dam Fauna Assessment. Unpublished report for Heron Resources, Perth.

D Kingfisher Environmental Consulting (2014) Sunrise Dam - Tropicana Infrastructure Corridor Fauna Survey, Unpublished report for AngloGold Ashanti Australia, Perth.

Appendix C.

Definitions of Significant Fauna under the WA *Biodiversity Conservation Act 2016* and Priority Species

Desktop Vertebrate Fauna Assessment
Granny Smith Mine Expansion 2026



C.1 DEFINITIONS OF SIGNIFICANT FAUNA UNDER THE WA *BIODIVERSITY CONSERVATION ACT 2016* AND PRIORITY SPECIES

Threatened, Extinct and Specially Protected fauna or flora¹ are species² which have been adequately searched for and are deemed to be, in the wild, threatened, extinct or in need of special protection, and have been gazetted as such. The *Wildlife Conservation (Specially Protected Fauna) Notice 2018* and the *Wildlife Conservation (Rare Flora) Notice 2018* have been transitioned under regulations 170, 171 and 172 of the *Biodiversity Conservation Regulations 2018* to be the lists of Threatened, Extinct and Specially Protected species under Part 2 of the *Biodiversity Conservation Act 2016*. Categories of Threatened, Extinct and Specially Protected fauna and flora are:

T Threatened Species

Listed by order of the Minister as Threatened in the category of critically endangered, endangered or vulnerable under section 19(1), or is a rediscovered species to be regarded as threatened species under section 26(2) of the *Biodiversity Conservation Act 2016* (BC Act).

Threatened fauna is that subset of 'Specially Protected Fauna' listed under schedules 1 to 3 of the *Wildlife Conservation (Specially Protected Fauna) Notice 2018* for Threatened Fauna.

Threatened flora is that subset of 'Rare Flora' listed under schedules 1 to 3 of the *Wildlife Conservation (Rare Flora) Notice 2018* for Threatened Flora.

The assessment of the conservation status of these species is based on their national extent and ranked according to their level of threat using IUCN Red List categories and criteria as detailed below.

CR Critically endangered species

Threatened species considered to be "*facing an extremely high risk of extinction in the wild in the immediate future, as determined in accordance with criteria set out in the ministerial guidelines*".

Listed as critically endangered under section 19(1)(a) of the BC Act in accordance with the criteria set out in section 20 and the ministerial guidelines. Published under schedule 1 of the *Wildlife Conservation (Specially Protected Fauna) Notice 2018* for critically endangered fauna or the *Wildlife Conservation (Rare Flora) Notice 2018* for critically endangered flora.

¹ The definition of flora includes algae, fungi and lichens

² Species includes all taxa (plural of taxon - a classificatory group of any taxonomic rank, e.g. a family, genus, species or any infraspecific category i.e. subspecies or variety, or a distinct population).

EN Endangered species

Threatened species considered to be *"facing a very high risk of extinction in the wild in the near future, as determined in accordance with criteria set out in the ministerial guidelines"*.

Listed as endangered under section 19(1)(b) of the BC Act in accordance with the criteria set out in section 21 and the ministerial guidelines. Published under schedule 2 of the *Wildlife Conservation (Specially Protected Fauna) Notice 2018* for endangered fauna or the *Wildlife Conservation (Rare Flora) Notice 2018* for endangered flora.

VU Vulnerable species

Threatened species considered to be *"facing a high risk of extinction in the wild in the medium-term future, as determined in accordance with criteria set out in the ministerial guidelines"*.

Listed as vulnerable under section 19(1)(c) of the BC Act in accordance with the criteria set out in section 22 and the ministerial guidelines. Published under schedule 3 of the *Wildlife Conservation (Specially Protected Fauna) Notice 2018* for vulnerable fauna or the *Wildlife Conservation (Rare Flora) Notice 2018* for vulnerable flora.

Extinct Species

Listed by order of the Minister as extinct under section 23(1) of the BC Act as extinct or extinct in the wild.

EX Extinct species

Species where *"there is no reasonable doubt that the last member of the species has died"*, and listing is otherwise in accordance with the ministerial guidelines (section 24 of the BC Act).

Published as presumed extinct under schedule 4 of the *Wildlife Conservation (Specially Protected Fauna) Notice 2018* for extinct fauna or the *Wildlife Conservation (Rare Flora) Notice 2018* for extinct flora.

EW Extinct in the wild species

Species that *"is known only to survive in cultivation, in captivity or as a naturalised population well outside its past range; and it has not been recorded in its known habitat or expected habitat, at appropriate seasons, anywhere in its past range, despite surveys over a time frame appropriate to its life cycle and form"*, and listing is otherwise in accordance with the ministerial guidelines (section 25 of the BC Act).

Currently there are no threatened fauna or threatened flora species listed as extinct in the pwild. If listing of a species as extinct in the wild occurs, then a schedule will be added to the applicable notice.

Specially Protected Species

Listed by order of the Minister as specially protected under section 13(1) of the BC Act. Meeting one or more of the following categories: species of special conservation interest; migratory species; cetaceans; species subject to international agreement; or species otherwise in need of special protection.

Species that are listed as threatened species (critically endangered, endangered or vulnerable) or extinct species under the BC Act cannot also be listed as Specially Protected species.

MI Migratory birds protected under an international agreement

Fauna that periodically or occasionally visit Australia or an external Territory or the exclusive economic zone; or the species is subject of an international agreement that relates to the protection of migratory species and that binds the Commonwealth; and listing is otherwise in accordance with the ministerial guidelines (section 15 of the BC Act).

Includes birds that are subject to an agreement between the government of Australia and the governments of Japan (JAMBA), China (CAMBA) and The Republic of Korea (ROKAMBA), and fauna subject to the *Convention on the Conservation of Migratory Species of Wild Animals* (Bonn Convention), an environmental treaty under the United Nations Environment Program. Migratory species listed under the BC Act are a subset of the migratory animals, that are known to visit Western Australia, protected under the international agreements or treaties, excluding species that are listed as Threatened species.

Published as migratory birds protected under an international agreement under schedule 5 of the *Wildlife Conservation (Specially Protected Fauna) Notice 2018*.

CD Species of special conservation interest (conservation dependant fauna)

Fauna of special conservation need being species dependent on ongoing conservation intervention to prevent it becoming eligible for listing as threatened, and listing is otherwise in accordance with the ministerial guidelines (section 14 of the BC Act).

Published as conservation dependent fauna under schedule 6 of the *Wildlife Conservation (Specially Protected Fauna) Notice 2018*.

OS Other specially protected species

Fauna otherwise in need of special protection to ensure their conservation, and listing is otherwise in accordance with the ministerial guidelines (section 18 of the BC Act).

Published as other specially protected fauna under schedule 7 of the *Wildlife Conservation (Specially Protected Fauna) Notice 2018*.

P Priority species

Possibly threatened species that do not meet survey criteria, or are otherwise data deficient, are added to the Priority Fauna or Priority Flora Lists under Priorities 1, 2 or 3. These three categories are ranked in order of priority for survey and evaluation of conservation status so that consideration can be given to their declaration as threatened fauna or flora.

Species that are adequately known, are rare but not threatened, or meet criteria for near threatened, or that have been recently removed from the threatened species or other specially protected fauna lists for other than taxonomic reasons, are placed in Priority 4. These species require regular monitoring.

Assessment of Priority codes is based on the Western Australian distribution of the species, unless the distribution in WA is part of a contiguous population extending into adjacent States, as defined by the known spread of locations

P1 Priority 1: Poorly-known species

Species that are known from one or a few locations (generally five or less) which are potentially at risk. All occurrences are either: very small; or on lands not managed for conservation, e.g. agricultural or pastoral lands, urban areas, road and rail reserves, gravel reserves and active mineral leases; or otherwise under threat of habitat destruction or degradation. Species may be included if they are comparatively well known from one or more locations but do not meet adequacy of survey requirements and appear to be under immediate threat from known threatening processes. Such species are in urgent need of further survey.

P2 Priority 2: Poorly-known species

Species that are known from one or a few locations (generally five or less), some of which are on lands managed primarily for nature conservation, e.g. national parks, conservation parks, nature reserves and other lands with secure tenure being managed for conservation. Species may be included if they are comparatively well known from one or more locations but do not meet adequacy of survey requirements and appear to be under threat from known threatening processes. Such species are in urgent need of further survey.

P3 Priority 3: Poorly-known species

Species that are known from several locations, and the species does not appear to be under imminent threat, or from few but widespread locations with either large population size or significant remaining areas of apparently suitable habitat, much of it not under imminent threat. Species may be included if they are comparatively well known from several locations but do not meet adequacy of survey requirements and known threatening processes exist that could affect them. Such species are in need of further survey.

P4 Priority 4: Rare, Near Threatened and other species in need of monitoring

(a) Rare. Species that are considered to have been adequately surveyed, or for which sufficient knowledge is available, and that are considered not currently threatened or in need of special protection but could be if present circumstances change. These species are usually represented on conservation lands.

(b) Near Threatened. Species that are considered to have been adequately surveyed and that are close to qualifying for vulnerable but are not listed as Conservation Dependent.

(c) Species that have been removed from the list of threatened species during the past five years for reasons other than taxonomy.

Appendix D.

Descriptions of vertebrate fauna of conservation significance

**Desktop Vertebrate Fauna Assessment
Granny Smith Mine Expansion 2026**



D.1 NIGHT PARROT

D.2 MALLEEFOWL

D.3 GREY FALCON

D.4 PRINCESS PARROT

D.5 SOUTHERN WHITEFACE

D.6 FORK-TAILED SWIFT

D.7 GREY WAGTAIL

D.8 PEREGRINE FALCON

D.9 WOMA

D.10 LONG-TAILED DUNNART

D.11 MULGARA

D.12 CENTRAL LONG-EARED BAT

