



MIDDLEMOUNT COAL MINE

SOUTHERN EXTENSION PROJECT EPBC Act Preliminary Assessment Documentation (EPBC 2021/8920)

Attachment C Commonwealth Threatened Species and Communities Assessment Report



LEADING THE WAY
IN ENVIRONMENTAL
MANAGEMENT

**Middlemount Coal Mine Southern
Extension Project**

**Commonwealth Threatened Species
and Communities Assessment
Report**

July 2025

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Abbreviations

DAWE	Department of Agriculture, Water and the Environment
DCCEEW	Department of Climate Change, Energy, the Environment and Water
DES	Department of Environment and Science
DPIE	Department of Planning, Industry and Environment
DSEWPC	Department of Sustainability, Environment, Water, Population and Communities
DEWHA	Department of Environment, Water, Heritage and the Arts
DotE	Department of the Environment
E	Endangered
EHP	Ecology & Heritage Partners
EOP	Environment Offset Policy
EPBC Act	<i>Environment Protection and Biodiversity Conservation Act 1999</i>
GDE	Groundwater Dependent Ecosystems
GIS	Geographic Information System
ha	Hectares
IBRA	Interim biogeographic regionalisation of Australia
M	Migratory
MCPL	Middlemount Coal Pty Ltd
ML	Mining Lease
MNES	Matters of National Significance
MSES	Matters of State Significance
NT	Near Threatened
OMP	Offset Management Plan
OP	Offset Policy
Qld	Queensland
RE	Regional Ecosystem
REDD	Regional Ecosystem Description Database
TEC	Threatened Ecological Community
TSSC	Threatened Species Scientific Committee
V	Vulnerable



1. Introduction

1.1 Background

Biodiversity Australia were engaged by Middlemount Coal Pty Ltd (MCPL) to prepare an impact assessment report to support the provision of Preliminary Documentation to the Commonwealth Department of Climate Change, Energy, the Environment and Water (DCCEEW) (formally the Department of Agriculture, Water and the Environment [DAWE]) for the Middlemount Coal Mine Southern Extension Project (EPBC 2021/8920) (the Action).

The main activities associated with the Action include the:

- extension of the open cut pit to the south within the Mining Lease (ML) 70379 and 70417
- continued extraction of run-of-mine (RoM) coal up to approximately 5.7 million tonnes per annum using conventional open cut mining equipment
- realignment and extension of the approved (but not yet constructed) eastern diversion of Roper Creek (Roper Creek Diversion 2) within ML 70379
- realignment of Roper Creek within ML 70417
- minor extensions to the East Dump within MLs 70417 and 700027
- re-positioning of the approved southern flood levee and associated water management infrastructure within ML 70379
- extension of the southern flood levee and associated water management infrastructure within ML 70417
- continued development of sediment dams and other water management equipment and structures
- continued development of new haul roads and internal roads
- continued development of soil stockpiles, laydown areas and borrow areas
- a change to the final landform for the end of the mine life.

The Action also includes, but not limited to, the following key activities within the approved disturbance footprint of the Middlemount Coal Mine:

- placement of waste rock in existing emplacements and within the mined-out void
- use of existing and approved supporting mine infrastructure

In addition to the above, the Action includes an extension of the approved mine life by approximately seven years.

1.2 Purpose

This report assesses potential impacts of the Action on nationally listed species and ecological communities which constitute matters of national environmental significance (MNES) (MNES) (herein referred to as relevant MNES) under the Commonwealth *Environmental Protection and Biodiversity Conservation Act 1999* (EPBC Act).



The scope of work for this report comprised the following:

- detail and summarise all surveys for relevant MNES previously undertaken, with particular reference to the minimum survey guidelines (DEWHA 2010a, Department of Sustainability, Environment, Water, Population and Communities [DSEWPC] 2011a, DSEWPC 2011b)
- address the likelihood of occurrence and potential for impacts of each of the MNES identified in desktop assessments
- quantify any likely significant impacts to relevant MNES, supported by field data and mapping
- Identify suitable mitigation measures to address impacts to relevant MNES, particularly using the hierarchy of controls (noting that delivery of offsets are addressed in Attachment G of the *Middlemount Coal Mine Southern Extension Project - Preliminary Documentation*).

1.3 Action area

The Middlemount Coal Mine is an existing mine located approximately 90 kilometres (km) north-east of Emerald and approximately 4 km to the south-west of the Middlemount Township in Queensland (Figure 1).

The Action area is located immediately adjacent to the existing Middlemount Coal Mine and is approximately 250.22 hectares (ha) (Figure 2).

The Action area is comprised of multiple geographically isolated areas which are situated directly south and east of the existing Middlemount Coal Mine. The collective of these individual areas constitutes the Action area. The locality is defined as land within 10 km of the Action.

The Action would result in approximately 250.22 ha of additional surface disturbance area (Figure 2).

1.4 EPBC referral

On 20 May 2021, MCPL referred the Action to the Department of Agriculture Water and the Environment (DAWE) for assessment under the provisions of the Commonwealth EPBC Act. As of July 1, 2023, DCCEEW was formed replacing DAWE in administration of the EPBC Act.

In June 2021, a delegate for the Minister for the DAWE determined the Action to be a controlled action, due to the likelihood of significant impacts on MNES, and subject to the following controlling provisions:

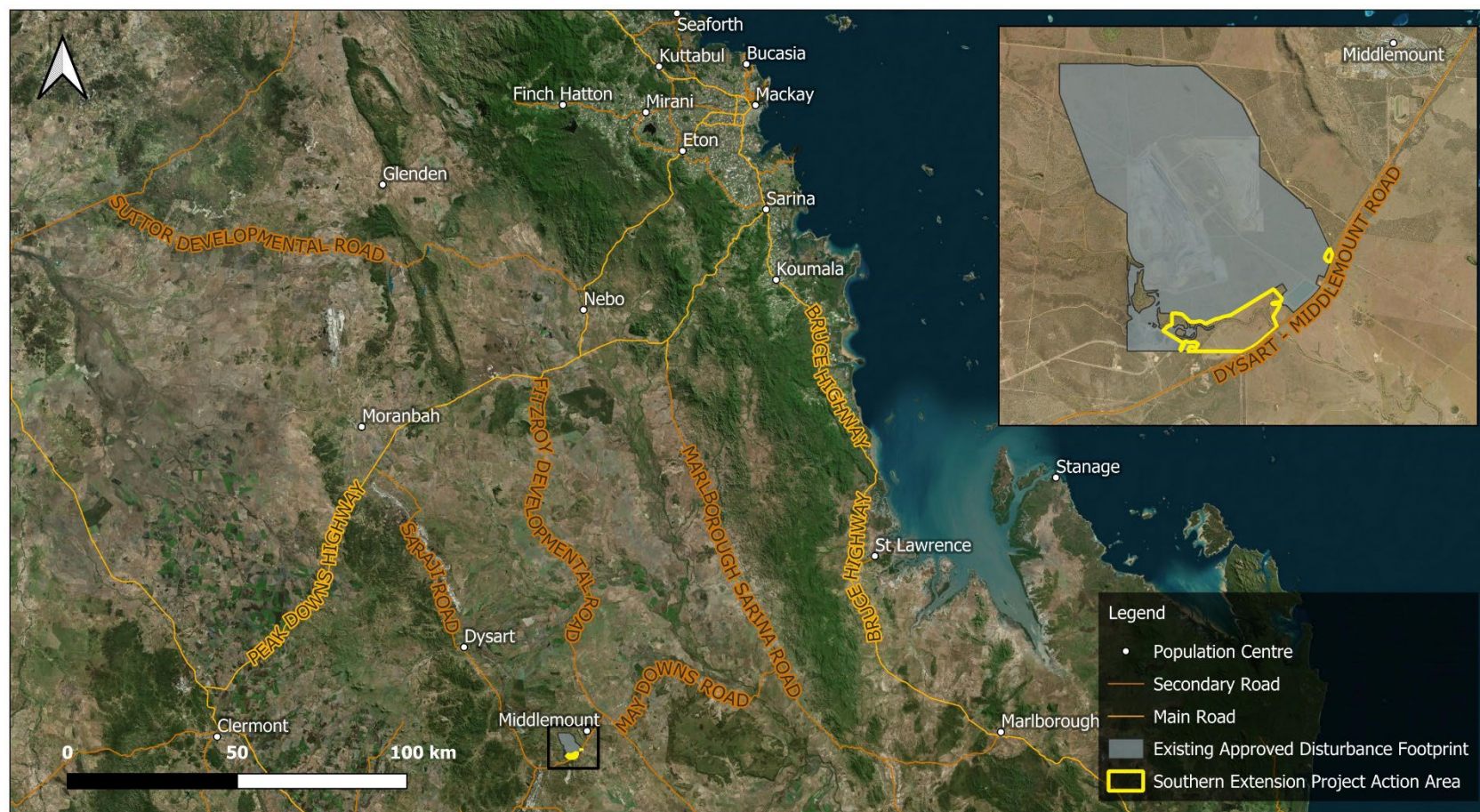
- nationally threatened species and ecological communities
- a water resource, in relation to coal seam gas development and large coal mining development.

DAWE determined that the Action must be assessed by provision of preliminary documentation which would among other things, assess the nature, scale and severity of likely impacts facilitated by the Action on MNES, and determine the adequacy of any proposed avoidance, mitigation and compensatory measures.

As part of a variation to the Action, MCPL reassessed impacts to the approved Roper Creek Diversion 2 corridor (approved under EPBC 2010/5394) and adjusted the referred Action to include the approved Roper Creek Diversion 2 corridor. Some other parts of the referred Action Area were also identified to either have been approved as part of previous extensions, or no longer required for development of the mine, therefore these areas were removed from the varied proposal.

The varied Action was accepted by DCCEEW in March 2025.





This mapping is to be considered indicative only and all derivations (e.g., vegetation communities) are best approximations and subject to errors including individual interpretation and reliance on information provided to Bio Aus where were not independently verified. All information is intended to be indicative only and no reliance for extrapolation, mapping etc. should be placed upon this map without independent validation of the information by the user. Bio Aus takes no responsibility for any subsequent error losses etc. that may arise from the use of this data without independent verification.

Project Manager:
DJ

Drawn by:
NE

Date:
July 2025

Figure Name:
Site Location

Location:
Middelmont Coal, Southern Extension

Client:
MCPL



Biodiversity
AUSTRALIA

Job Number:
ESQ5883

Spatial Reference: WGS 84 / Pseudo-Mercator

Scale: 1:1600000

Figure 1. Site Location





This mapping is to be considered indicative only and all derivations (e.g., vegetation communities) are best approximations and subject to errors including individual interpretation and reliance on information provided to Bio Aus where were not independently verified. All information is intended to be indicative only and no reliance for extrapolation, mapping etc. should be placed upon this map without independent validation of the information by the user. Bio Aus takes no responsibility for any subsequent error losses etc. that may arise from the use of this data without independent verification.

Project Manager:
DJ

Drawn by:
NE

Date:
July 2025

Figure Name:
Action Area

Location:
Middlemount Coal, Southern Extension

Client:
MCPL



Biodiversity
AUSTRALIA

Job Number:
ESQ5883

Spatial Reference: WGS 84 / Pseudo-Mercator

Scale: 1:60000

Figure 2. Location of the Action area



1.5 Regulatory framework

1.5.1 Environment Protection and Biodiversity Conservation Act 1999

The EPBC Act is intended to 'protect and manage nationally and internationally important flora, fauna, ecological communities and heritage places'. Under the EPBC Act, an action will require approval by the minister if it has, or will be likely to have, a significant impact on a MNES, including:

- world heritage properties
- national heritage places
- wetlands of international importance (i.e. Ramsar)
- nationally threatened species and ecological communities
- migratory species
- commonwealth marine areas
- the Great Barrier Reef Marine Park
- nuclear actions, and/or
- a water resource, in relation to coal seam gas development and large coal mining development.

Consistent with the controlled action decision, relevant to this report, are nationally threatened species and ecological communities protected under the EPBC Act

Under the EPBC Act *Significant Impact Guidelines 1.1 Matters of National Environmental Significance* (Department of the Environment, Water, Heritage and the Arts [DEWHA] 2013), an action is determined to have a significant impact to Critically Endangered and Endangered species if there is a real chance or possibility that the Action will:

- lead to a long-term decrease in the size of a population
- reduce the area of occupancy of the species
- fragment an existing population into two or more populations
- adversely affect habitat critical to the survival of a species
- disrupt the breeding cycle of a population
- modify, destroy, remove, isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline
- result in invasive species that are harmful to a critically endangered or endangered species becoming established in the endangered or critically endangered species' habitat
- introduce disease that may cause the species to decline, or
- interfere with the recovery of the species.

An action is determined to have a significant impact to Vulnerable species if there is a real chance or possibility that the Action will:

- lead to a long-term decrease in the size of an important population of a species
- reduce the area of occupancy of an important population
- fragment an existing important population into two or more populations
- adversely affect habitat critical to the survival of a species
- disrupt the breeding cycle of an important population



- modify, destroy, remove or isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline
- result in invasive species that are harmful to a vulnerable species becoming established in the vulnerable species' habitat
- introduce disease that may cause the species to decline, or
- interfere substantially with the recovery of the species.

An action is determined to have a significant impact to Critically Endangered and Endangered ecological communities there is a real chance or possibility that the Action will:

- reduce the extent of an ecological community
- fragment or increase fragmentation of an ecological community, for example by clearing vegetation for roads or transmission lines
- adversely affect habitat critical to the survival of an ecological community
- modify or destroy abiotic (non-living) factors (such as water, nutrients, or soil) necessary for an ecological community's survival, including reduction of groundwater levels, or substantial alteration of surface water drainage patterns
- cause a substantial change in the species composition of an occurrence of an ecological community, including causing a decline or loss of functionally important species, for example through regular burning or flora or fauna harvesting
- cause a substantial reduction in the quality or integrity of an occurrence of an ecological community, including, but not limited to:
 - assisting invasive species, that are harmful to the listed ecological community, to become established
 - causing regular mobilisation of fertilisers, herbicides or other chemicals or pollutants into the ecological community which kill or inhibit the growth of species in the ecological community, and/or
- interfere with the recovery of an ecological community.

1.5.2 EPBC Act Environmental Offsets Policy

The EPBC Act Environmental Offsets Policy (Department of Sustainability, Environment, Water, Population and Communities (DSEWPC 2012a) (EOP) defines offsets as 'measures that compensate for the residual adverse impacts of an action on the environment'.

In order to determine the extent and options available for environmental offsets according to the EOP, the Offsets Assessment Guide (DSEWPC 2012b) provides the tools to measure the impacts and determine the required offsets.

Environmental offsets allow compensation for the residual adverse impacts of an action on the environment, through counterbalancing the impacts that may remain after avoidance and mitigation measures have been undertaken. Avoidance and mitigation measures are the first-line strategies to be conducted to manage potential significant impacts of an action on the environment. In the case that residual impacts are likely, offsets may be deemed the most suitable approach to compensate.



Offsets may be determined to be necessary following a referral, and are assessed according to the following criteria:

- what is the nature of the likely impacts on protected matters?
- can impacts on protected matters be avoided?
- can impacts on protected matters be mitigated?
- are the residual impacts likely to be significant?
- are offsets a suitable approach?

If concluded that impacts are significant and unavoidable, an offset proposal will be provided by the proponent and evaluated by the DCCEE to determine if the proposed offset(s) are suitable to allow the Action to proceed. Following approval, the offset(s) must be delivered in accordance with the approved conditions, and will be monitored by the DCCEE.

The offset conditions are summarised in Figure 3 (DSWEPC 2012a).

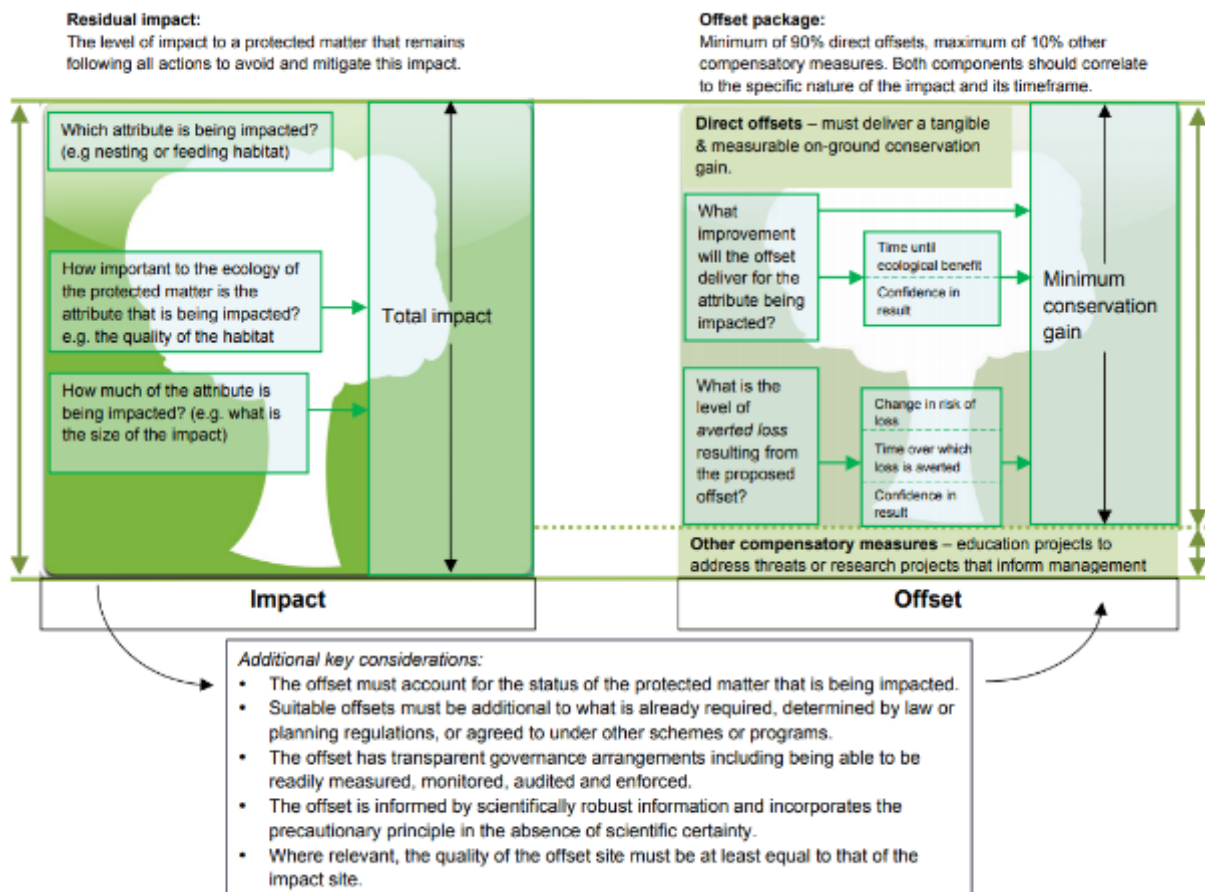


Figure 3. Determining suitable offsets in accordance with the EPBC Act (DSWEPC 2012a).



2. Ecological Assessment

2.1 Methodology

2.1.1 Desktop assessment and literature review

Biodiversity Australia completed a review of the following databases and documents:

- Atlas of Living Australia (2020)
- BirdLife Australia Atlas (2020)
- DAWE Protected Matters Database search for MNES listed under the EPBC Act for a radius of 10 km of the Action area (2020a) (Protected Matters Search Tool);
- Department of Environment and Science (DES) (2020d) Regional Ecosystems digital data layer (Version 11)
- DES (2018) Biodiversity Planning Assessment for the Brigalow Belt Bioregion - Version 2.1
- DES (2020b): Matters of State Environmental Significance (MSES) - Environmental Reports online
- Department of Natural Resources, Mines and Energy (2020b): Wildlife Online and Biomaps searches for Endangered, Vulnerable and Near Threatened species within a 10 km radius of the Action area
- Department of State Development, Infrastructure and Planning (2020) State Planning Policy interactive mapping system
- Department of Sustainability, Environment, Water, Population and Communities (2012b) Environment Protection and Biodiversity Conservation Act Offsets Assessment Guide
- Queensland Herbarium (2019a) BioCondition Benchmarks for Regional Ecosystem Condition Assessment: Brigalow Belt
- Queensland Herbarium (2019b) Regional Ecosystem Description Database (REDD).

In addition to the above, the following literature was reviewed for ecological information such as previous records of threatened flora and fauna, and survey techniques:

- Biodiversity Australia (2019). Ecological Monitoring for Middlemount Coal Offset Areas
- Biodiversity Australia (2018a). Ecological Monitoring for Middlemount Coal Offset Areas
- Biodiversity Australia (2018b). Ecological Impact Assessment: Western Extension Project, Middlemount Coal Mine.
- Biodiversity Australia (2018c). Western Extension Project Offset Area Baseline Report, Middlemount Coal Mine
- EHP (2013a). Vegetation Offsets for Middlemount Rail Spur and Loop
- EHP (2013b). Vegetation Offsets for Parrot Quarry
- EHP (2013c). Vegetation Offsets for Middlemount Coal Mine Thirteen
- EHP (2012). Ecological Investigations within the Offset Area for Stage 2 of the Middlemount Coal Mine, Queensland
- Eyre et al. (2015). BioCondition: A Condition Assessment Framework for Terrestrial Biodiversity in Queensland. Assessment Manual. Version 2.2
- Eyre et al. (2011). Method for the Establishment and Survey of Reference Sites for BioCondition. Version 2.0



- FRC Environmental (2010). Middlemount Coal Project EIS, Stage 2: Aquatic Ecology
- GHD (2012). Rail Spur Environmental Offset Package
- MCPL (2019). Middlemount Coal Mine Offset Management Plan/Vegetation Management Plan
- MCPL (2013a). Middlemount Coal Mine Offset Management Plan/Vegetation Management Plan
- MCPL (2013b). Middlemount Coal Mine Rail Loop and Spur Vegetation Offset Proposal
- MCPL (2013c). Parrot Quarry Vegetation Offset Proposal
- MCPL (2013d). Thirteen Mile Gully Diversion Vegetation Offset Proposal
- MCPL (2017b). Middlemount Coal Mine – Drainage Lines in Mining Leases 70379
- Naturecall (2014c). Ecological Assessment Report for Bingegang Pipeline Relocation
- Naturecall (2015b). Terrestrial Ecological Impact Assessment. – North East Extension
- Naturecall (2016b). Vegetation Validation and Terrestrial Habitat Assessment for North-east Extension Offset Area
- Naturecall (2017a). North-eastern Extension Offset Area Baseline Report
- Naturecall (2017b). Ecological Monitoring for Offset Area, Middlemount Coal Mine – BioCondition Monitoring Survey
- Naturecall (2016a). Ecological Monitoring for Offset Area, Middlemount Coal Mine – BioCondition Monitoring Survey
- Naturecall (2015a). Ecological Monitoring for Offset Area, Middlemount Coal Mine – BioCondition Monitoring Survey
- Naturecall (2014a). Ecological Monitoring for Offset Area, Middlemount Coal Mine – Fauna and Pest Species Survey
- Naturecall (2014b). Ecological Monitoring for Offset Area, Middlemount Coal Mine
- Owen Foley (2014). Residual Void Flora and Fauna Capability Study
- Parsons Brinckerhoff (2010a). Middlemount Coal Project, Stage 2: Terrestrial Ecological Impact Assessment. In MCPL (2011) Middlemount Coal Project Stage 2 Environmental Impact Statement
- Parsons Brinckerhoff (2010b). Middlemount Coal Project Stage 2 Aquatic Ecological Impact Assessment. In MCPL (2011) Middlemount Coal Project Stage 2 Environmental Impact Statement
- WRM Water and Environment (2018). Middlemount Coal Mine – Western Extension Project Surface Water Impact Assessment

The following resources were specifically reviewed to address the requirements of the EPBC Act.

- *Environment Protection and Biodiversity Conservation Act 1999* Environmental Offsets Policy;
- Significant Impact Guidelines 1.1 - Matters of National Environmental Significance
- Significant Impact Guidelines 1.2 – Actions on, or impacting upon, Commonwealth land and actions by Commonwealth agencies.



2.2 Field Surveys

2.2.1 Flora Sampling and Vegetation Mapping

Regional Ecosystems (REs) in the Study Area (Figure 4) were mapped and field verified as per the *Methodology for Surveying and Mapping Regional Ecosystems and Vegetation Communities in Queensland Version 5.1* (Neldner *et al.* 2020). This consisted of the quaternary flora survey methods, and terrestrial habitat quality assessments using methodology in line with that described in the *BioCondition Assessment Manual* (QLD Herbarium 2015) and *Guide to determining terrestrial habitat quality v1.3* (DES, 2020).

Three quaternary surveys and eighteen terrestrial habitat quality surveys were undertaken over the Study Area in areas considered representative of the general condition of the allocated Assessment Unit. Not all surveys occur within the Action area, as revisions to the Action area since survey have reduced the size of the Action area in accordance with the EOP (DSEWPC 2012a) mitigation hierarchy of Avoidance .

These quaternary surveys took place in vegetation representative of the general condition of the target RE, as such, the data collected in these areas has been utilised to inform habitat quality assessment of RE's within the Action area.

The location of each survey site is shown in Figure 4, the following information was collected at quaternary sites:

- Date
- Collector
- Coordinates
- Remnant or regrowth
- RE map unit
- Height and cover of each layer
- Land Zone
- Species present

REs were also verified during field traverses and through conducting Terrestrial Habitat Quality assessments.

Changes to RE mapping were made in the field using a tablet loaded with Field Maps (Esri Inc.). This allowed highly accurate mapping of vegetation boundaries live in the field. This was followed by desktop mapping using QGIS 3.28 for Windows and recent satellite imagery (June 2023) supplied by MCPL.

2.2.2 Targeted Searches for Threatened Species

Flora

A survey for MNES flora species was carried out during field surveys to provide certainty on presence/absence of threatened flora species. This was achieved via conducting three timed meander transect searches (DES 2019) which were undertaken in suitable habitats for the target MNES flora species.

These were undertaken in the southwest of the Action area in REs 11.7.2, 11.7.4 and 11.3.1 on 20 June 2020. The location of the threatened flora surveys is shown in Figure 4.

Fauna

A target survey for MNES fauna species (Table 1) was carried out during field surveys to identify and map the presence and habitat for target threatened fauna species.



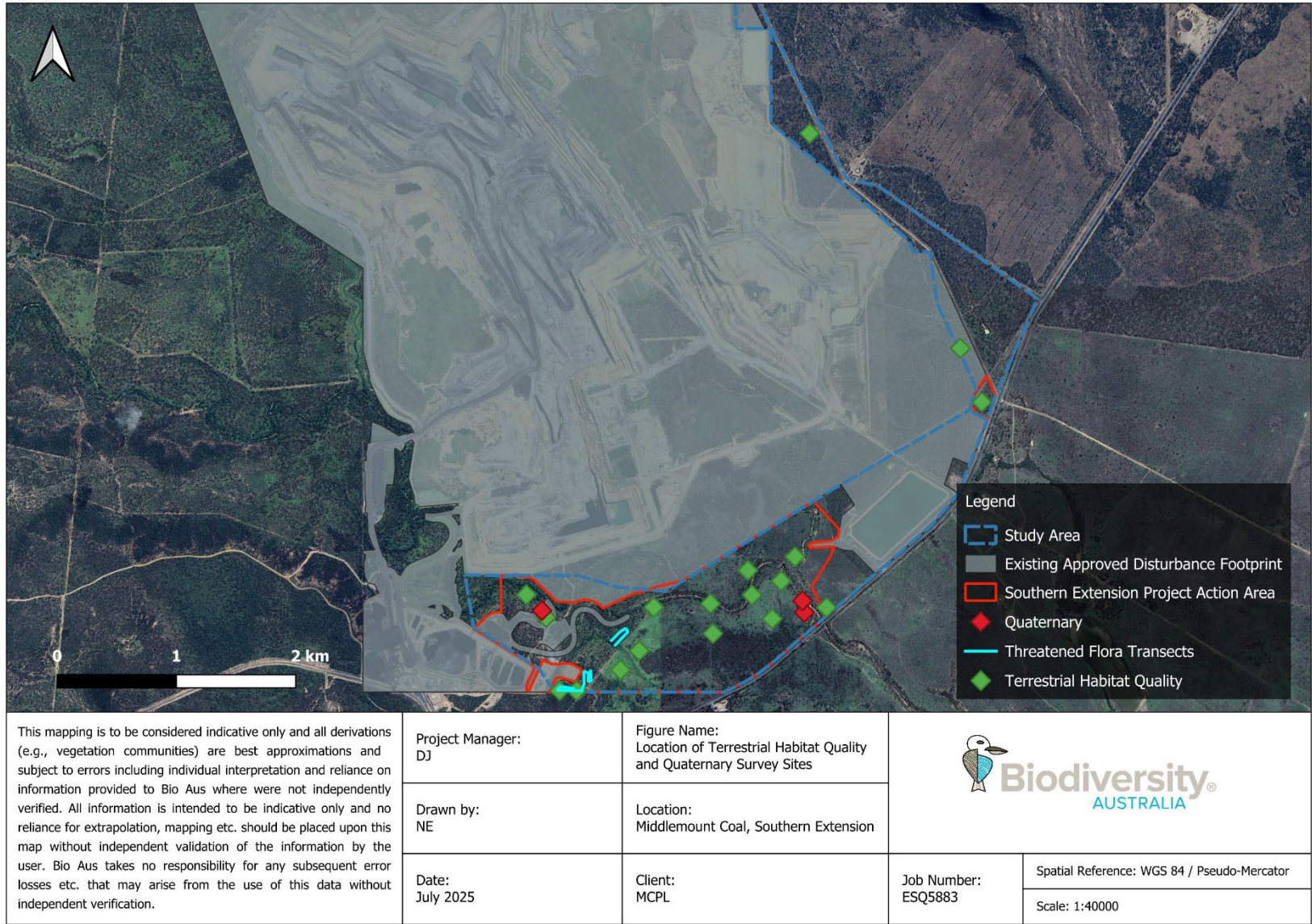


Figure 4. Location of terrestrial habitat quality and quaternary survey sites

Table 1. Target MNES Species.

Common Name	Scientific Name	EPBC Act*	Protected Matters Search Tool	Preferred Habitat	Likelihood of Occurrence	Justification
Ornamental snake	<i>Denisonia maculata</i>	V	✓	Restricted to the Brigalow Belt bioregion in Queensland, this cryptic snake prefers habitat within, or close to, suitable habitat for frogs. The species is known to prefer woodlands and open forests associated with moist areas, particularly gilgai (melon-hole) mounds and depressions but also lake margins and wetlands (DAWE 2021). Although described as preferring these habitat types on Land zone 4 (DAWE 2021), they are known to occur in vegetation mapped as RE 11.3.3, 11.4.3, 11.4.6, 11.4.8, 11.4.9, 11.5.16 or mapped as cleared but where the above REs formerly occurred (DSEWPC 2011a).	Known to occur	This snake species was recorded by Parsons Brinckerhoff (2010) on gilgai soils approximately 400 m north of the Action area near Roper Creek. It is considered that suitable habitat consists of Brigalow habitats (RE 11.3.1) with gilgai and drainage depressions that provide habitat for frogs which are their preferred prey species (Biodiversity Australia, 2020). Assessment of the distribution of suitable habitat in the expansion area shows a number of habitat fragments near Roper Creek in the southern expansion area however, they have been substantially modified as a result of clearing, weed invasion and cattle grazing. (Biodiversity Australia 2020). Suitable habitat covers 17.21 ha, comprising 3.48 ha of remnant vegetation and 13.73 ha of regrowth (Biodiversity Australia 2020).
Squatter pigeon (southern)	<i>Geophaps scripta scripta</i>	V	✓	Squatter Pigeons need to drink daily, and consequently prefer to nest within 1 km of water. Foraging areas extend out to 3 km from a suitable, permanent or seasonal waterbody, where they feed primarily on seeds of grasses, herbs and shrubs that have fallen to the ground (DAWE 2021). Foraging areas may include any areas of remnant or regrowth open-forest to sparse, open-woodland or scrub dominated by <i>Eucalyptus</i> , <i>Corymbia</i> , <i>Acacia</i> or <i>Callitris</i> species, preferably on sandy or gravelly soils with open and short grass cover that allows easier movement (DAWE 2021).	Known to occur	Squatter pigeons are known to occur on site, having been recorded during previous surveys (Parsons Brinckerhoff 2010, Naturecall 2014b, 2017, Biodiversity Australia 2018). The most recent sighting was one seen along the Bingegang Pipeline Road (Biodiversity Australia 2018b). Suitable foraging and breeding habitat occurs in most of the parcels for proposed additional disturbance, including RE11.3.1, RE 11.3.2/11.3.2b, RE 11.3.25, and RE 11.3.7, , but also in non-remnant including pasture grassland, regrowth woodland and roadside clearings (Parsons Brinckerhoff 2010, Naturecall 2013, 2014a). Distribution is dictated by water



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Common Name	Scientific Name	EPBC Act*	Protected Matters Search Tool	Preferred Habitat	Likelihood of Occurrence	Justification
						availability. There are a number of ephemeral water bodies within the Action area which would provide a suitable water source. Potential habitat areas total 250.22 ha, comprising 86.03 ha of remnant vegetation and 164.19 ha of regrowth (Biodiversity Australia 2020 & 2023).
Koala	<i>Phascolarctos cinereus</i>	E	✓	Although widespread in eastern Australia, suitable feed species and leaf moisture are the primary determinants of habitat suitability (DAWE 2021). Koalas prefer woodlands that are dominated by species of the <i>Corymbia</i> , <i>Melaleuca</i> , <i>Lophostemon</i> or <i>Eucalyptus</i> genera (Van Dyke and Strahan, 2008). They are known to prefer vegetation around creeks and waterways.	Known to occur	Koalas are known to occur on site, having been recorded during previous surveys (Biodiversity Australia 2018). Although the records are from a Reid River box (<i>Eucalyptus brownii</i>), suitable habitat also occur in woodland with Moreton Bay Ash (<i>Corymbia tessellaris</i>) and poplar box (<i>Eucalyptus populnea</i>), or in riparian vegetation with Queensland Blue Gum (<i>Eucalyptus tereticornis</i>). Suitable habitat includes RE 11.3.2/11.3.2b, RE 11.3.25, RE 11.3.7, and RE 11.7.4, and also in non-remnant areas including, regrowth woodland and agricultural paddocks, occurring in most of the parcels for proposed additional disturbance, equating to approximately 81.70 ha of remnant Koala habitat and 101.30 ha of regrowth across the proposed disturbance footprint (Biodiversity Australia, 2020 & 2023).
Greater glider (southern and central)	<i>Petauroides volans</i>	E	✓	The central greater glider is a recent separation from the greater glider <i>Petauroides volans</i> (McGregor <i>et al</i> 2020), and all previous reports and records of greater gliders in the Middlemount region relates to this species. Central greater gliders prefer old remnant woodlands that are dominated by species of <i>Corymbia</i> , <i>Melaleuca</i> , <i>Lophostemon</i> or <i>Eucalyptus</i> with large hollows. They are known to prefer vegetation around creeks and waterways (Van Dyke and Strahan, 2008).	Known to occur	Central greater gliders are known to occur on site, having been recorded during previous surveys (Naturecall 2013, 2014a, 2014b, 2017, Biodiversity Australia 2018). Approximately 81.70 ha of known and potential habitat for the Greater Glider occurs in the Action area represented by all Eucalypt forests and woodlands present as these contain trees with hollows suitable for denning. In the Middlemount area, this species prefers eucalypt woodlands and open



MIDDLEMOUNT SOUTHERN EXTENSION PROJECT MNES IMPACT ASSESSMENT REPORT | JULY 2025

Common Name	Scientific Name	EPBC Act*	Protected Matters Search Tool	Preferred Habitat	Likelihood of Occurrence	Justification
						forest associated with major creeks and drainage lines, equivalent to RE types 11.3.2, 11.3.25, 11.3.4 and 11.3.7, but has also been occasionally noted in Poplar Box woodland equivalent to RE 11.5.3. Based on these previous observations, preferred forage species appear to be Moreton Bay Ash (<i>Corymbia tessellaris</i>) and poplar box (<i>Eucalyptus populnea</i>) (Biodiversity Australia 2020). The largest numbers of individuals have been found in associated with vegetation fringing Roper Creek (RE 11.3.25 and 11.3.2) in the southern portion of the Action area.

*V= Vulnerable, E= Endangered, current as at July 2025

2.2.3 Threatened Ecological Community Identification

Vegetation communities identified during the surveys were assessed for their conservation status under:

- EPBC Act,
- *Vegetation Management Act 1999* (VM Act)
- Department of the Environment, Tourism, Science and Innovation (DETSI) (formally the Department of Environment and Science [DES]) Biodiversity Status.

Brigalow communities were assessed according to the *Approved Conservation Advice* for the Brigalow (*Acacia harpophylla* dominant and co-dominant) ecological community (Department of the Environment [DotE] 2013a) and Poplar Box Woodland on alluvial soils was assessed according to the *Conservation Advice (including listing advice) for the Poplar Box Grassy Woodland on Alluvial Plains* (Department of the Environment and Energy [DEE] 2019) as well as the *Species Profile and Threats Database* (DAWE 2020b).

2.2.4 Groundwater Dependent Ecosystem Identification

A groundwater dependent ecosystem is any ecosystem that relies on access to groundwater, either permanently or intermittently, to meet some or all of their water requirements so as to sustain resident flora and fauna compositions and ecological processes (Richardson *et al.* 2011).

An investigation of vegetation communities within the Action area that potentially use groundwater was conducted with consideration to the *Information Guidelines Explanatory Note: Assessing Groundwater-dependent Ecosystems* (Doody *et al.* 2019) and *Methods for the Identification of High Probability Groundwater Dependent Vegetation Ecosystems* (Department of Primary Industries - Water 2016).

The *Groundwater Dependent Ecosystems Atlas* (GDE Atlas) (BOM 2020) was consulted to identify potential GDEs within the Action area, which uses modelling to map and allocate any potential GDE with a value on a scale of Low to High potential.

The final determination of GDE presence within the Action area is based on the presence of flora species within the vegetation communities that have potential to be dependent on groundwater either permanently or intermittently, as well as consideration of groundwater information provided by Australasian Groundwater and Environment Consultants (AGE).

2.2.5 Habitat Quality Assessment

The survey methodology outlined in the *Guide to Determining Terrestrial Habitat Quality Version 1.3* (DES 2020a) was used to collect field attributes and determine terrestrial habitat quality scores for the Action area and known/potential threatened species. This methodology uses BioCondition plots to collect field data (Eyre *et al.* 2015).

A total of 18 site condition assessments (plots and transects) were undertaken in the Action area. The location of these plots is shown in Figure 4. Site selection was based on field verified RE mapping, allocation of Assessment Units (AU's) in accordance with Eyre *et al.* 2015 and analysis of high-resolution satellite imagery and aimed to sample a representative coverage of the site vegetation.

The following information was recorded at each of the field sampling sites:

- | | |
|---|-------------------------------|
| • Observer, location and date | • Number of large trees |
| • RE mapping unit | • Recruitment |
| • Photographic record of vegetation | • Course woody debris |
| • Habitat description | • Non-native plant cover |
| • Tree canopy and subcanopy height | • Percent cover of each layer |
| • Native plant species richness in each layer | |



The data collected was also used to determine terrestrial habitat quality scores for the Action area and known/potential threatened species, in accordance with the *Guide to Determining Terrestrial Habitat Quality Version 1.3* (DES 2020a) and to assist in determining offset requirements for the Action.

2.2.6 Fauna Surveys

Fauna surveys for target MNES species (Table 1) were undertaken over the Action area by two ecologists from 3-6 March 2020 and 20-21 June 2020.

Weather conditions for the survey periods are detailed in Section 3.2.3.

Fauna surveys were conducted in accordance with the following guidelines:

- *Survey Guidelines for Australia's Threatened Reptiles* (DSEWPC 2011a)
- *Survey Guidelines for Australia's Threatened Mammals* (DSEWPC 2011b)
- *Survey Guidelines for Australia's Threatened Birds* (Department of the Environment, Water, Heritage and the Arts [DEWHA] 2010a)
- *Survey Guidelines for Australia's Threatened Bats* (DEWHA 2010b)
- *EPBC Act referral guidelines for the vulnerable Koala (combined Qld, New South Wales [NSW] and the Australian Capital Territory)* (DotE 2014)
- *EPBC Act Draft Referral Guidelines for the nationally listed Brigalow Belt reptiles* (DSEWPC 2011c).
- *Species Profile and Threats Database* (DAWE 2020b)

Fauna surveys targeted threatened species listed under the NC Act and EPBC Act, as well as pest species, however common species were also surveyed. The following fauna surveys methods were utilised:

- Terrestrial and aquatic habitat assessments
- Spotlighting
- Microbat call recording and analysis
- Herpetofauna surveys
- Diurnal bird surveys
- PIR camera stations
- Koala surveys
- Scat, track and secondary evidence searches

These survey methods are described in detail in the following sections.

2.2.7 Terrestrial Habitat Assessment

Habitat assessments were undertaken across the Action area at the terrestrial habitat quality survey plots and during foot traverses over the Action area.

Habitats were defined according to parameters such as:

- Structural and floristic characteristics of the vegetation (e.g. understorey type and development, crown depth, groundcover density, etc.)
- Degree and extent of disturbance (e.g. fire, logging, weed invasion, modification to structure and diversity, etc.)
- Presence of water in any form (e.g. dams, creeks, drainage lines, soaks)
- Size and abundance of hollows and fallen timber
- Availability of shelter (e.g. rocks, logs, hollows, undergrowth)
- Wildlife corridors, refuges and proximate habitat types (i.e. connectivity between suitable habitats)
- Presence of resources (e.g. mistletoe, nectar, gum, seed, sap, etc.).



This information, along with information obtained from the desktop assessment was used to formulate a list of potentially occurring threatened fauna species for the Action area.

2.2.8 Spotlighting

Spotlighting was conducted for 2 hours per night for five nights across the Action area (Figure 5).

This involved driving transects from a vehicle moving at walking pace along roads and tracks as well as walking transects using hand-held spotlights through both vegetated areas and along tracks.

All habitat components (i.e. understorey/canopy trees for arboreal fauna), the ground, and terrestrial strata (e.g. logs, areas with good leaf litter accumulations, etc.) were searched for terrestrial fauna.

Spotlighting was conducted approximately one hour after dusk. Conditions varied between clear and overcast, and wind ranged from placid to light. Light rain was experienced on the second night of spotlighting.

2.2.9 Microbat Call Recording and Analysis

Microbat call detection was undertaken using two Anabat Express units (Titley Scientific). The units were deployed overnight at two locations, one facing a track near Roper Creek and the other on the edge of Poplar Box Woodland (Figure 5). Six-unit nights of recording was conducted in the Action area. This resulted in >60 hours of recording.

The recordings were forwarded to Greg Ford of Balance! Environmental, a bat call identification consultant, for identification of the bat species.

2.2.10 Herpetofauna Searches

Searches primarily targeting the ornamental snake, yakka skink (*Egernia rugosa*), Brigalow scaly-foot (*Paradelma orientalis*), Dunmall's snake (*Furina dunmali*) and golden-tailed gecko (*Strophurus taenicauda*) were undertaken within 50 m x 50 m quadrats. These were conducted at six locations within the Action area (Figure 5).

Herpetofauna searches involved active diurnal lifting up and rolling of timber and debris, inspection of dense vegetation and leaf litter and observation of likely basking sites for a total of 60-person minutes per site. Nocturnal herpetofauna torch searches were carried out in suitable habitat in conjunction with walking spotlight transects.

2.2.11 Diurnal Bird Surveys

Birds were surveyed by detecting calls and searching using binoculars at point positions or along a walking transect within two hours of dawn when peak activity usually occurs.

Specific bird censuses were undertaken each morning during the survey periods for 30 minutes with two observers. A total of eight bird surveys were carried out in the Action area (Figure 5).

Incidental observations of birds were also recorded during other survey activities. This provided short-term seasonal data on bird occurrences in the area for the particular seasons.



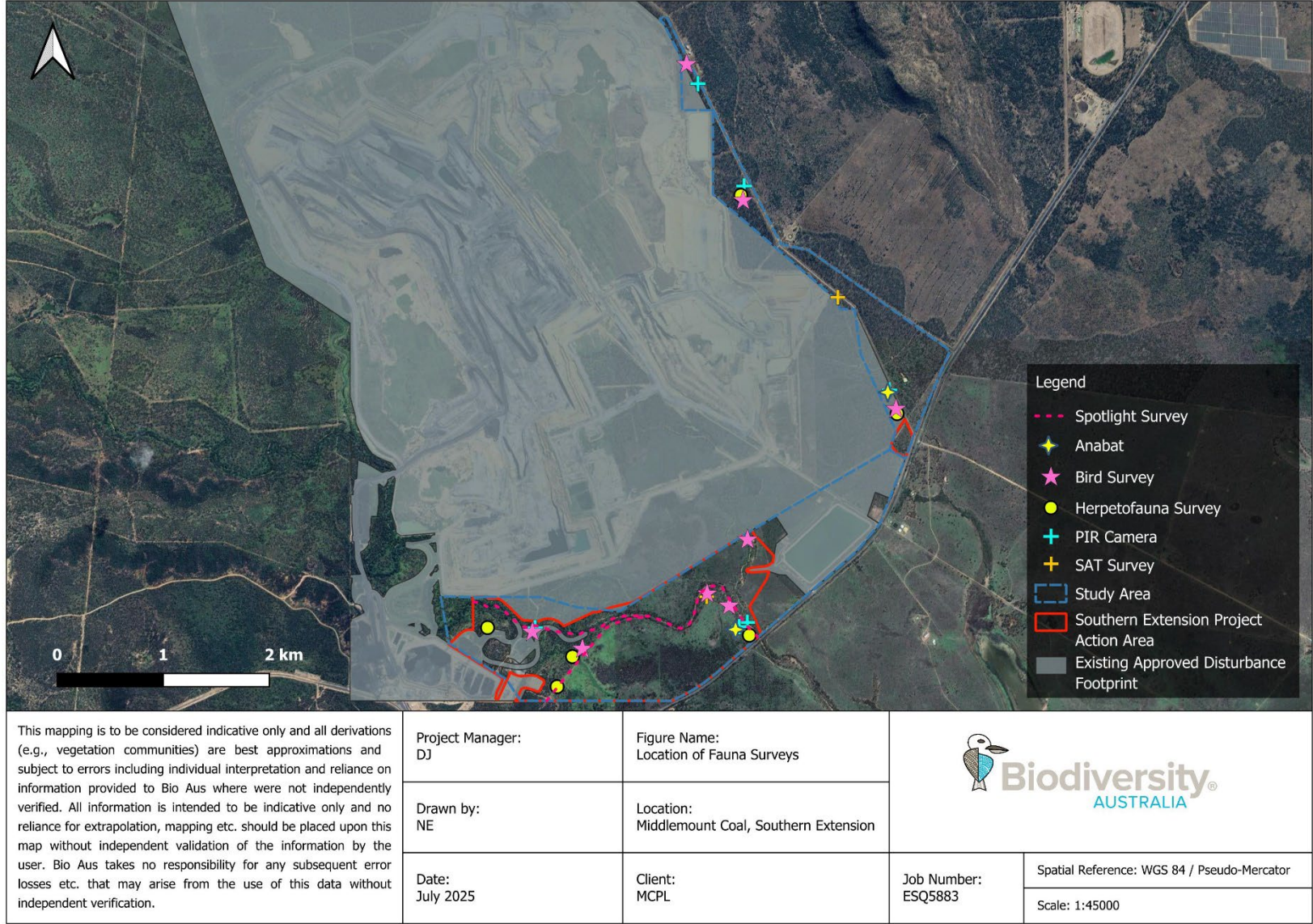


Figure 5. Location of fauna surveys within the Action area

2.2.12 Passive Infrared Camera Stations

Six infra-red cameras were deployed at various locations over the Action area. Cameras were set for three nights (Figure 5).

The cameras were set either in forested areas or facing a road/track and were baited with either a mixture of oats, peanut butter and apple, or a meat bait consisting of chicken necks and tinned cat food.

Target species were the northern quoll (*Dasyurus hallucatus*), arboreal mammals, raptors and feral species such as European red foxes (*Vulpes vulpes*), dogs/dingoes (*Canis spp.*), feral cats and pigs.

2.2.13 Koala Surveys

Two dedicated Koala Spot Assessment Technique (SAT) surveys were undertaken in the Action area on 21 June 2020. One was undertaken in the south of the Action area adjacent to Roper Creek and the second was undertaken in the east of the Study Area adjacent to the Bingegang Pipeline road. The location of SAT surveys is shown in Figure 5.

The SAT survey was undertaken as per the method described by Phillips and Callahan (2011). This consisted of identifying a centre tree which is either known to be frequented by the koala, known to contain faecal pellets of the koala, or is likely to be considered as a potentially important tree for the koala. In the event that a tree of this criteria was not located, a centre tree was randomly selected in an area of habitat most likely to support this species.

Once a centre tree was selected, active searches for koala scats were undertaken under this tree and under the twenty-nine nearest trees. Searches involved checking the ground and leaf litter within a one-metre radius of each tree, for a period of two minutes per tree or until a scat was found.

Opportunistic koala scat searches were also undertaken across the Action area under preferred food trees in areas of suitable habitat. Diurnal and nocturnal searches for koalas were undertaken along Roper Creek. This consisted of searching trees for koalas and searching for indicative koala scratch marks on trees.

2.2.14 Track, Scat and Sign Searches

Searches for scats, tracks, feeding signs and scratch marks on trees were undertaken opportunistically along roads/tracks and within forested areas at the herpetofauna survey sites.

The sandy roads within and around the Action area provided ideal locations for track searches, and any tracks found were photographed and identified using the methodology outlined in *Tracks, scats, and other traces: a field guide to Australian mammals* (Triggs 1996). Predator scats were targeted during surveys as remains can provide records of cryptic fauna.



2.3 Results

Surveys of the Action area were undertaken by two ecologists (as part of the Middlemount Coal Mine Southern Extension Project Environmental Values Assessment [EVA]) from the 3-6 March and 20-21 June 2020. The purpose of these surveys was to undertake the following tasks:

- conduct preliminary Regional Ecosystem verification over the Action area in accordance with the *Methodology for Survey and Mapping of Regional Ecosystems and Vegetation Communities in Queensland* (Neldner *et al.* 2020) and *Approved Conservation Advice for the Brigalow (Acacia harpophylla dominant and co-dominant) ecological community* (DSEWPC 2013)
- characterise the remnant and non-remnant vegetation over the Action area
- conduct preliminary field verification of pre-clearance Regional Ecosystems over the Action area
- verify and accurately map the extent of threatened ecological communities within the Action area
- identify potential habitat for relevant MNES.

A review of the surveys completed in 2020 as part of the Middlemount Coal Mine EVA has determined that they also satisfy the requirements for assessing MNES including TECs and threatened species under the EPBC Act. Accordingly, the data collected during these surveys is considered sufficient for assessing the impact of the proposed Southern Extension on the relevant MNES.

2.3.1 Regional Ecosystems

Seven Regional Ecosystems were identified and mapped within the Action Area, as displayed in Figure 7. These Regional Ecosystems included the following:

- RE 11.3.1 *Acacia harpophylla* and/or *Casuarina cristata* open forest on alluvial plains
- RE 11.3.2 *Eucalyptus populnea* woodland on alluvial plains
- RE 11.3.2b *Eucalyptus camaldulensis* (sometimes *E. populnea* and/or *E. tereticornis*) woodland in drainage depressions.
- RE 11.3.25 *Eucalyptus tereticornis* or *E. camaldulensis* woodland fringing drainage lines
- RE 11.3.7 *Corymbia* spp. open woodland on alluvial plains
- RE 11.7.2 *Acacia* spp. woodland on Cainozoic lateritic duricrust. Scarp retreat zone
- RE 11.7.4 *Eucalyptus decorticans* and/or *Eucalyptus* spp., *Corymbia* spp., *Acacia* spp., *Lysicarpus angustifolius* woodland on Cainozoic lateritic duricrust

2.3.2 Weather Conditions During the Survey

The 3-6 March surveys were conducted during a period of warm, but wet weather. The initial survey day comprised the only day where dry conditions were experienced, with light showers between 0.6 and 12.6 millimetres (mm) per day experienced throughout the remaining survey. According to Middlemount Mine rainfall data, the 3-6 March surveys were conducted at the end of a two-month long wet season of which three heavy rainfall events occurred (51.2 mm on 17/01/2020; 44.4 mm on 13/02/2020; 49.8 mm on 27/02/2020).

Temperatures during 3-6 March survey period ranged from a minimum of 21.5°C to a maximum of 34.5°C. These temperatures were typical of the slowly declining temperatures expected as the season progressed from summer to autumn.



The 20-21 June surveys were conducted during a dry period with declining winter temperatures. This survey period fell over two survey days with temperatures ranging from a minimum of 12.6°C to a maximum of 24.4°C.

Middlemount rainfall and temperature data from the past year is graphed in relation to the survey period (Figure 6).

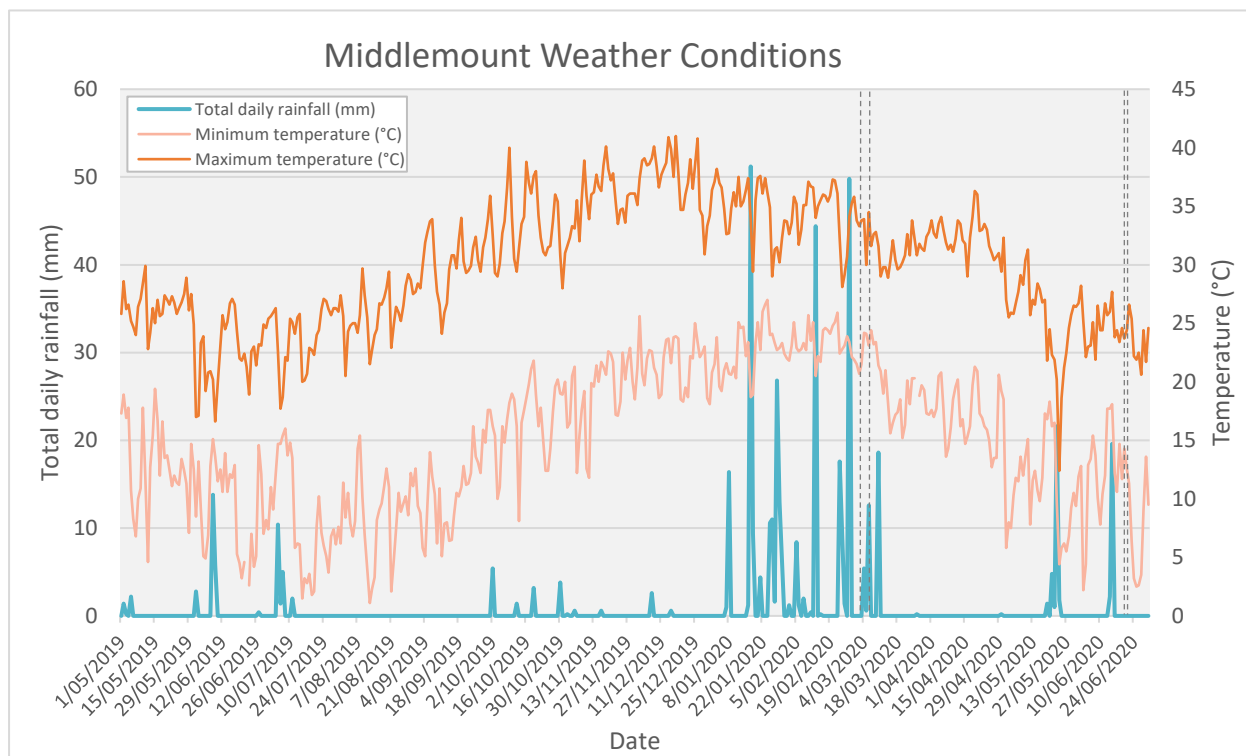


Figure 6. Precipitation/temperature recorded at Middlemount over the previous year (each survey period is marked by a dotted line)

2.3.3 Threatened Ecological Communities (TECs)

Three TECs were identified during the Desktop Assessment and determined to potentially occur within the Action area (Section 2.1.1). Field surveys identified two ground-truthed TECs within the Action area, primarily situated within the southern portion of the Action area. The extent of the ground-truthed TECs across the Action area are shown on Figure 8 and described below.

Brigalow Threatened Ecological Community

Brigalow communities within the Action area were assessed against the diagnostic and condition criteria listed in the *Approved Conservation Advice* (DoE 2013a) and the *Species Profile and Threats Database* (DAWE 2020b) to determine if they qualify as the Brigalow TEC. This assessment is provided in Table 2.

Brigalow TEC was identified within the Action area associated with the following Regional Ecosystems:

- RE 11.3.1 (*Acacia harpophylla* and/or *Casuarina cristata* open forest on alluvial plains)

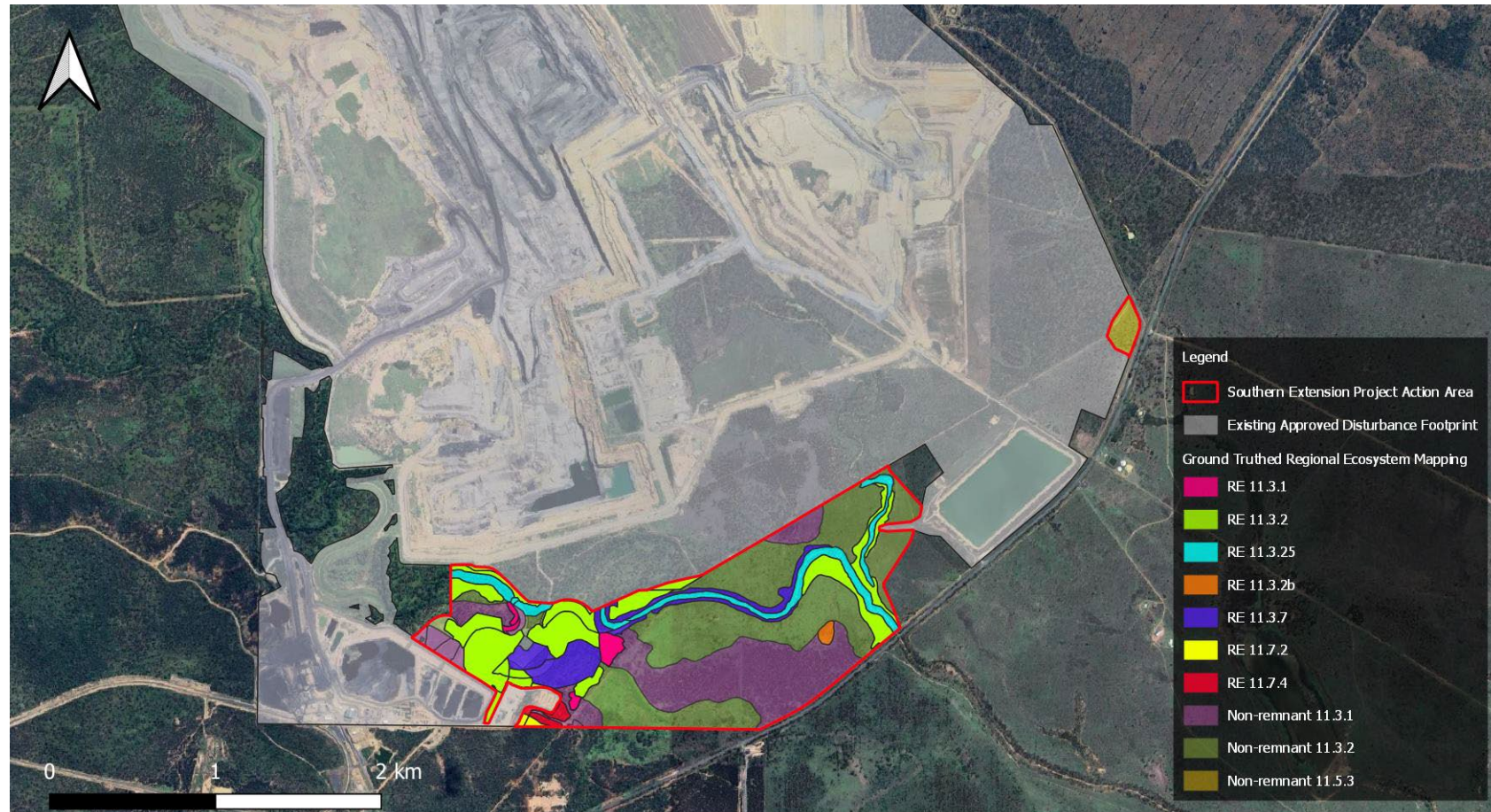


Table 2: Brigalow TEC assessment

Criteria	Result
1) The presence of <i>Acacia harpophylla</i> as one of the most abundant tree species in the patch. <i>A. harpophylla</i> is either dominant in the tree layer, or co-dominant with other species (notably <i>Casuarina cristata</i> , other species of <i>Acacia</i> , or species of <i>Eucalyptus</i>).	Yes – Brigalow (<i>Acacia harpophylla</i>) is dominant in the patches within the Action area (see vegetation descriptions in Section 3.2)
2a) In Qld - the patch is in one of the following Qld bioregions (including outliers) and it meets the description of one of 16 Qld REs determined at the time of the national listing of the Brigalow ecological community under the EPBC Act. The 16 REs are, as described by the Qld Herbarium (Wilson and Taylor 2012): In the Qld Brigalow Belt Bioregion – REs 11.3.1, 11.4.3, 11.4.7, 11.4.8, 11.4.9, 11.4.10, 11.5.16, 11.9.1, 11.9.5, 11.9.6, 11.11.14 and 11.12.21.	Yes – Patches of Brigalow within the Action area conform to 11.3.1.
2b) In NSW - the patch meets one of the following NSW Vegetation Classification and Assessment (VCA) community descriptions. The NSW VCA communities are: VCA IDs 29, 31 and 35; as described in Benson <i>et al.</i> (2006).	Not applicable.
2c) The vegetation in the patch is Brigalow regrowth with species composition and structural elements broadly typical of one of the identified Qld REs or NSW vegetation communities (although species density may be reduced). This can be assumed to be the case where it has been at least 15 years since it was last comprehensively cleared (not just thinned); unless direct evidence proves otherwise.	Yes – All of the remnant patches of Brigalow within the Action area meet this criterion. Regrowth patches which have been cleared within the last 15 years (determined through analysis of historic satellite imagery and communication with former landowner) and do not have typical structure and composition have been excluded.
3) The patch is 0.5 ha or more in size	Yes - All patches of Brigalow within the Action area are >0.5 ha in area.
4) Exotic perennial plants comprise less than 50% of the total vegetation cover of the patch, as assessed over a minimum sample area of 0.5 ha (100 m by 50 m), that is representative of the patch.	Yes – exotic perennial plants comprise <50% of vegetation cover in all remnant Brigalow patches within the Action area. Percentages of exotic species recorded at three individual remnant Brigalow patches were: – 28% (THQ7) – 20% (Q4) – 30% (Rapid plot 42)
Result	All remnant Brigalow communities in the Action area qualify as Brigalow TEC.

The assessment completed in Table 2 (above) confirms that the Brigalow communities identified during the field surveys (Section 2.2) within the Action area qualify as the Brigalow TEC. The location of the ground-truthed Brigalow TECs are shown on Figure 8.





This mapping is to be considered indicative only and all derivations (e.g., vegetation communities) are best approximations and subject to errors including individual interpretation and reliance on information provided to Bio Aus where were not independently verified. All information is intended to be indicative only and no reliance for extrapolation, mapping etc. should be placed upon this map without independent validation of the information by the user. Bio Aus takes no responsibility for any subsequent error losses etc. that may arise from the use of this data without independent verification.

Project Manager:
DJJ

Drawn by:
DB

Date:
July 2025

Figure Name:
Ground Truthed Regional Ecosystem Mapping

Location:
Southern Extension - Middlemount Coal Mine, Middlemount, QLD

Client:
MCPL



Biodiversity
AUSTRALIA

Job Number:
ESQ5883

Spatial Reference:

Scale: 1:30,000

Figure 7. Ground Truthed Regional Ecosystem Mapping - Action Area



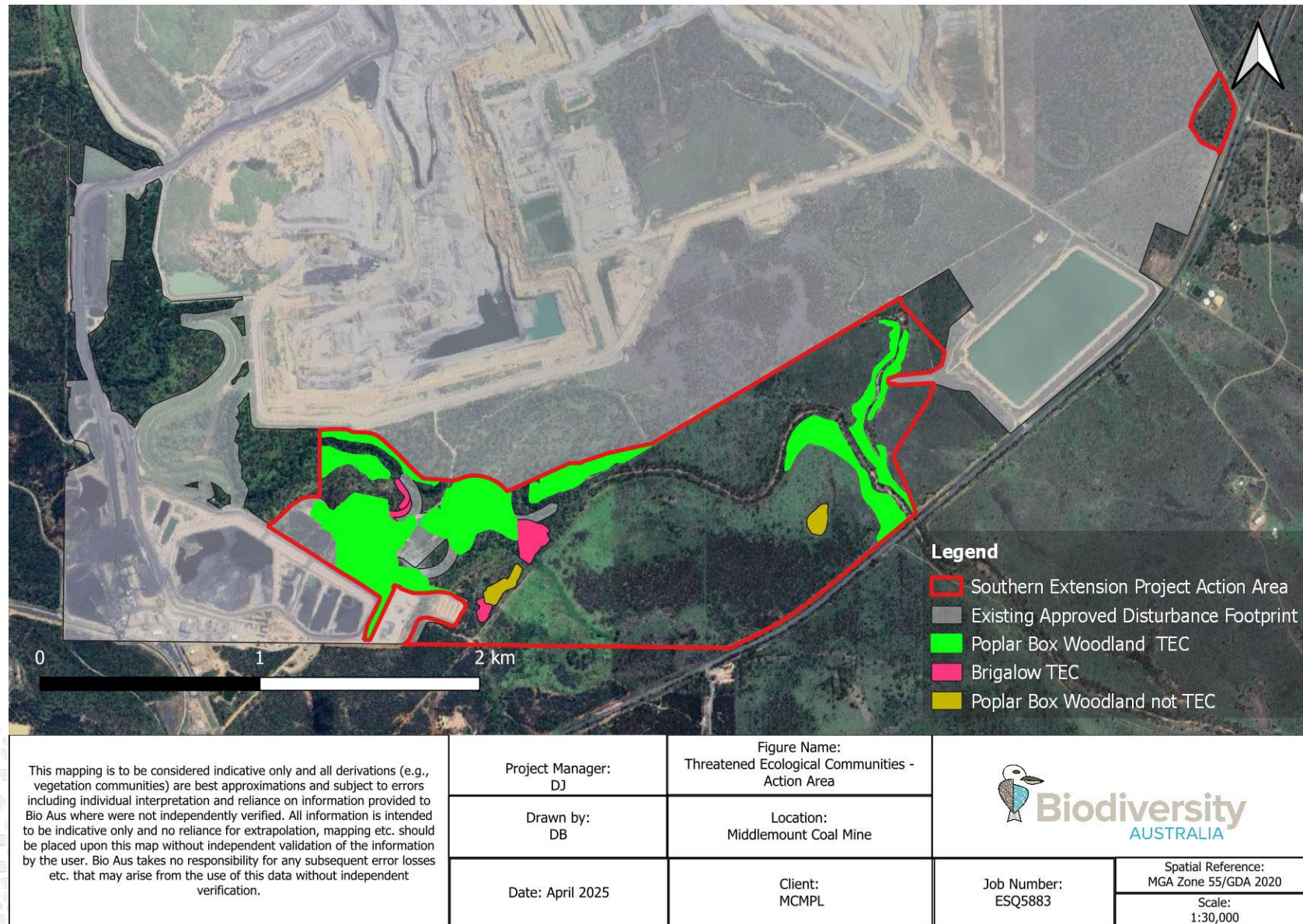


Figure 8. Location of TECs listed under the EPBC Act



Poplar Box Grassy Woodland Threatened Ecological Community

Poplar Box Grassy Woodland communities within the Action area were assessed against the diagnostic and condition criteria listed in the *Approved Conservation Advice* (DEE 2019) and the *Species Profile and Threats Database* (DAWE 2020b) to determine if the communities met the requirements to be classified as the Poplar Box Grassy Woodland TEC. This assessment is provided in Table 3 below.

Poplar Box Grassy Woodland TEC was identified within the Action area associated with the following Regional Ecosystems:

- RE 11.3.2 (*Eucalyptus populnea* woodland on alluvial plains)

Table 3: Poplar Box Woodland TEC assessment

Criteria	Result
Occurs in the Brigalow Belt North, Brigalow Belt South, Southeast Qld, Cobar Penepains, Darling Riverine Plains, NSW South-Western Slopes, Riverina and Murray Darling Depression IBRA Bioregions.	Yes – the Action area is located within the Brigalow Belt North Bioregion.
Associated with ancient and recent depositional alluvial plains with clay, clay-loam, loam and sandy loam, typically duplex soils or sodosols. This includes areas that may not be part of currently defined floodplains.	Yes – the identified communities are located on alluvial deposits associated with Roper Creek.
A grassy woodland to grassy open woodland with a tree crown cover of 10% or more at patch scale.	Yes – the identified communities have a open woodland structure with a canopy cover of >10%. Cover at individual surveyed patches is as follows: – 44.4% (THQ6) – 28% (THQ1) – 20% (Q2)
A tree canopy must be present that shows these features: • Canopy tree species are capable of reaching 10 m or more in height; • <i>Eucalyptus populnea</i> (Poplar Box) must be present in the canopy and is the dominant tree species; and • Where hybrids of Poplar Box with other <i>Eucalyptus</i> spp. are present, they should be counted as part of the <i>Eucalyptus populnea</i> component of the tree canopy when assessing the previous criterion.	The identified communities present within the Action area meet this criterion. The canopy height is approximately 15-18 m and is dominated by Poplar Box. Refer to vegetation description in Section 3.2.
Mid layer (1-10 m) crown cover of shrubs to small trees is low, about 30% or less.	Yes – identified communities have low shrub cover <30%. Shrub cover at individual patches surveyed is as follows: – 0.6% (THQ6) – 3.3% (THQ1) – 5% (Q2)
A ground layer (<1 m) mostly dominated across a patch by native grasses, other herbs and occasionally chenopods (during extended dry periods), ranging from sparse to thick (in response to canopy development, soil moisture, disturbance and/or management history).	The identified communities feature a ground layer which contains a mix of native and exotic grasses and herbs. Field observations noted a mosaic of native and exotic dominated groundcover patches across the community. Typical exotic species include: – Buffel Grass (<i>Cenchrus ciliaris</i>); – Sabi Grass (<i>Urochloa mosambicensis</i>); – Green Panic (<i>Megathyrsus maximus</i>); and – Red Natal Grass (<i>Melinis repens</i>). Patches of native grass included species such as: – Black Speargrass (<i>Heteropogon contortus</i>); – <i>Aristida</i> spp.; – Comet Grass (<i>Perotis rara</i>); and



Criteria	Result
	- Brown's Lovegrass (<i>Eragrostis brownii</i>). Percentage exotic cover at survey sites were: - 80% (THQ6) - 80% (THQ1) - 75% (Q2)
A list of diagnostic native plant species and some of the key native fauna that comprise the ecological community is given at Appendix A; although particular species may be abundant or rare, or not necessarily present, at every location.	The identified communities contain a range of diagnostic native plant species, including: - Poplar Box (<i>Eucalyptus populnea</i>); - Wilga (<i>Geijera parviflora</i>); - False Sandalwood (<i>Eremophila mitchellii</i>); - Whitewood (<i>Atalaya hemiglauca</i>); - Black Speargrass; - <i>Aristida</i> spp.; and - Australian Bluebell (<i>Wahlenbergia gracilis</i>).
Condition classes and minimum patch size thresholds: • Class A (Highest quality): >1 ha • Class B (Good quality): >5 ha • Class C (Moderate quality): >5 ha	Remnant patches of Poplar Box Grassy Woodland communities within the Action area fall within the Class C threshold category (i.e. moderate quality) due to the prevalence of exotic species in the ground layer. This class must have a minimum patch size of >5 ha. Most patches that occur along Roper Creek form part of a larger extent of the community that occurs beyond the Action area and are >5 ha. Two isolated patches occur further from Roper Creek and do not meet the minimum patch size. These have been excluded from forming the Poplar Box TEC (Figure 8). Regrowth areas of Poplar Box Grassy Woodland within the Action area do not meet the diagnostic criteria and minimum condition thresholds and would therefore do not qualify as the TEC.
Result	Most of the Poplar Box Woodland communities on alluvial plains identified within the Action area qualify as the Poplar Box Grassy Woodland TEC (Figure 7).



The assessment completed within the Table 3 (above) confirms that the Polar Box Woodland communities identified during the field surveys (Section 2.2) within the Action area (which occur on Land Zone 3) qualify as the Poplar Box TEC. The location of the ground-truthed Poplar Box TECs are shown in Figure 8.

2.3.4 Threatened Flora Species

Of the three threatened flora species identified in Section 2.2.2 as having the potential to occur within the Action area, none were detected during field surveys despite targeted survey efforts (Section 2.2.2).

2.3.5 Threatened Fauna Species

The following four species were considered likely to occur, or already present within the proposed action footprint (based on the outcomes of previous assessments) (see Table 1). Records of these target threatened species surveyed historically or in 2020 are depicted in Figure 9.

Ornamental Snake (*Denisonia maculata*)

The ornamental snake (vulnerable – EPBC Act) was not recorded in the Action area during the 2020 surveys. It has, however, been recorded by a previous contractor in 2010 on MCPL owned land on gilgai soils approximately 400 m north of the Action area near Roper Creek (Figure 9).

The southern portion of the Action area provides small patches of suitable habitat for the ornamental snake in the form of brigalow habitats (RE 11.3.1) with gilgai and drainage depressions which provide habitat for preferred prey species (i.e. frogs). The habitats in the Action area have, however, been substantially modified as a result of clearing, weed invasion and cattle grazing. This has reduced the quality of habitat available for the ornamental snake and has led to fragmentation and isolation of habitats.

Squatter Pigeon (southern) (*Geophaps scripta scripta*)

A single squatter pigeon (vulnerable – EPBC Act) was opportunistically recorded along the roadside north of the mine during the 2020 surveys (Figure 9). This species was not recorded within the Action area during the survey period.

Fauna surveys conducted by Biodiversity Australia in 2017 for the Western Extension Project identified the squatter pigeon along the Bingegang Pipeline Road (Biodiversity Australia 2018b). This species has also been previously recorded on MCPL owned land in 2010, 2013 and 2015 (Will Steggall pers obs., Naturecall 2013, Parsons Brinckerhoff 2010a).

A number of habitat attributes which would provide suitable habitat for the squatter pigeon are present. These include several native grass species, permanent water resources and a mosaic of open sandy areas. Within the Action area, suitable habitats are likely to comprise RE 11.3.1, RE 11.3.2/11.3.2b, RE 11.3.25, RE 11.3.7, RE 11.5.3 and RE 11.7.4. In addition to these remnant habitats, the squatter pigeon (southern) is regularly sighted foraging in non-remnant habitats including pasture grassland, regrowth woodland and roadside clearings (Parsons Brinckerhoff 2010a, Naturecall 2013, 2014a). There are a number of ephemeral water bodies within the Action area which could provide a suitable water source for the squatter pigeon.

Koala (*Phascolarctos cinereus*)

The koala (*Phascolarctos cinereus*) was listed as 'Vulnerable' under the EPBC Act and Nature Conservation Act 1992 [NC Act] at the time of the controlled action decision (17/06/2021) and is therefore assessed as 'Vulnerable' not 'Endangered'. The koala is an obligate folivore that predominantly feeds on leaves from *Eucalyptus*, *Corymbia*, *Lophostemon*, *Melaleuca*, *Angophora* and *Syncarpia* genus trees (DAWE 2021). Several REs with suitable food and shelter trees were recorded in the area. These included in RE 11.3.2/11.3.2b, RE 11.3.25, RE 11.3.7, and RE 11.7.4. Significant areas of agricultural paddock and regrowth woodland also occurred within the Action area, with sparse but suitable koala habitat species present as both mature trees and regrowth.



The remnant koala habitat identified occurs primarily along Roper Creek, which provides a wildlife corridor allowing transit through the Action area and surrounding habitat. Although koala food and shelter trees were common throughout the Eucalypt woodland/forest communities within the Action area, these communities were sparse and open, providing moderate foraging resources only.

A list of koala evidence recorded over multiple years is provided in Table 4.

Table 4. List of koala evidence recorded within or near the Action area

Year recorded	Source	Koala evidence	Approximate location	Notes
2020	Multiple (MCPL staff and contractors)	Observed koalas	Eastern side of MCPL land	Observed during fauna spotting Observed on dirt road
2020	Biodiversity Australia	Scat	Eastern side of MCPL land	Beneath Reid River box
2017	Biodiversity Australia	Scat	Eastern side of MCPL land	Beneath Reid River box. First known record of koalas within eastern portion of MCPL lands

Given the low evidence of the koalas recorded in the target areas during the 2020 surveys, and sparse previous records in the area (despite numerous past surveys and ongoing offset monitoring/management), it appears that a low-density koala population is present on MCPL lands and surrounding areas. Given the general low nutrient soils and scarcity of preferred foraging trees, koala home ranges are likely to be very large.

Areas of mapped vegetation within the Action area could provide potential habitat for the koala based on the occurrence of known and potential koala food and shelter. These areas could provide beneficial movement corridors (i.e. connectivity) for the koala throughout the landscape, particularly to areas of contiguous habitat.



Greater Glider (*Petauroides Volans*)

The greater glider (southern and central) (*Petauroides volans*) was listed as 'Endangered' under the EPBC Act on July 5 2022, prior to this, and at the time of the controlled action decision (17/06/2021) it was listed as 'Vulnerable' under the EPBC Act and NC Act and is therefore assessed as 'Vulnerable' not 'Endangered' in ensuing assessments. The greater glider occurs in forests and woodlands across eastern Australia where it forages on eucalypt leaves and occasionally flowers (Threatened Species Scientific Committee [TSSC] 2016). It requires large tracks of remnant forests which contain old growth trees containing hollows which it uses for denning.

Conservation advice (TSSC 2016) details that the greater glider is largely restricted to eucalypt forests and woodland, with its diet comprising mostly eucalypt leaves. Consistent with this, previous observations of this species on MCPL owned land have noted that it prefers eucalypt woodlands and open forest associated with major creeks and drainage lines, equivalent to RE types 11.3.2, 11.3.25, 11.3.4 and 11.3.7. It has also been occasionally noted in poplar box woodland equivalent to RE 11.5.3. Based on these previous observations, preferred forage species appear to be Moreton Bay ash, silver-leaved ironbark and poplar box.

The greater glider was detected during the 2020 survey period via spotlighting (Figure 8). This species was detected on four nights in vegetation fringing Roper Creek (RE 11.3.25 and 11.3.2) in the southern portion of the Action area. A total of four individuals, including a juvenile glider, were recorded in one night. Another individual was recorded on one night immediately north of the eastern portion of the Action area adjacent to the Bingegang Pipeline Road within RE 11.5.3. This individual would utilise vegetation within the Action area. Two gliders were also recorded on 20th June 2020 next to a track located 200m north of the Action area.

Greater gliders have small home ranges ranging between 1.3 and 4 ha (Comport *et al.* 1996, Pope *et al.* 2005, TSSC 2016). The Action area would likely encompass entire home ranges of the resident gliders, and they would also be expected to extend off site to the east of the eastern portion of the Action area.

The greater glider has been previously recorded on MCPL lands during fauna surveys and clearing supervision works. BioCondition monitoring surveys of the existing offset areas observed at least 16 greater gliders in 2017, which were primarily recorded along Roper Creek (Naturecall 2017).



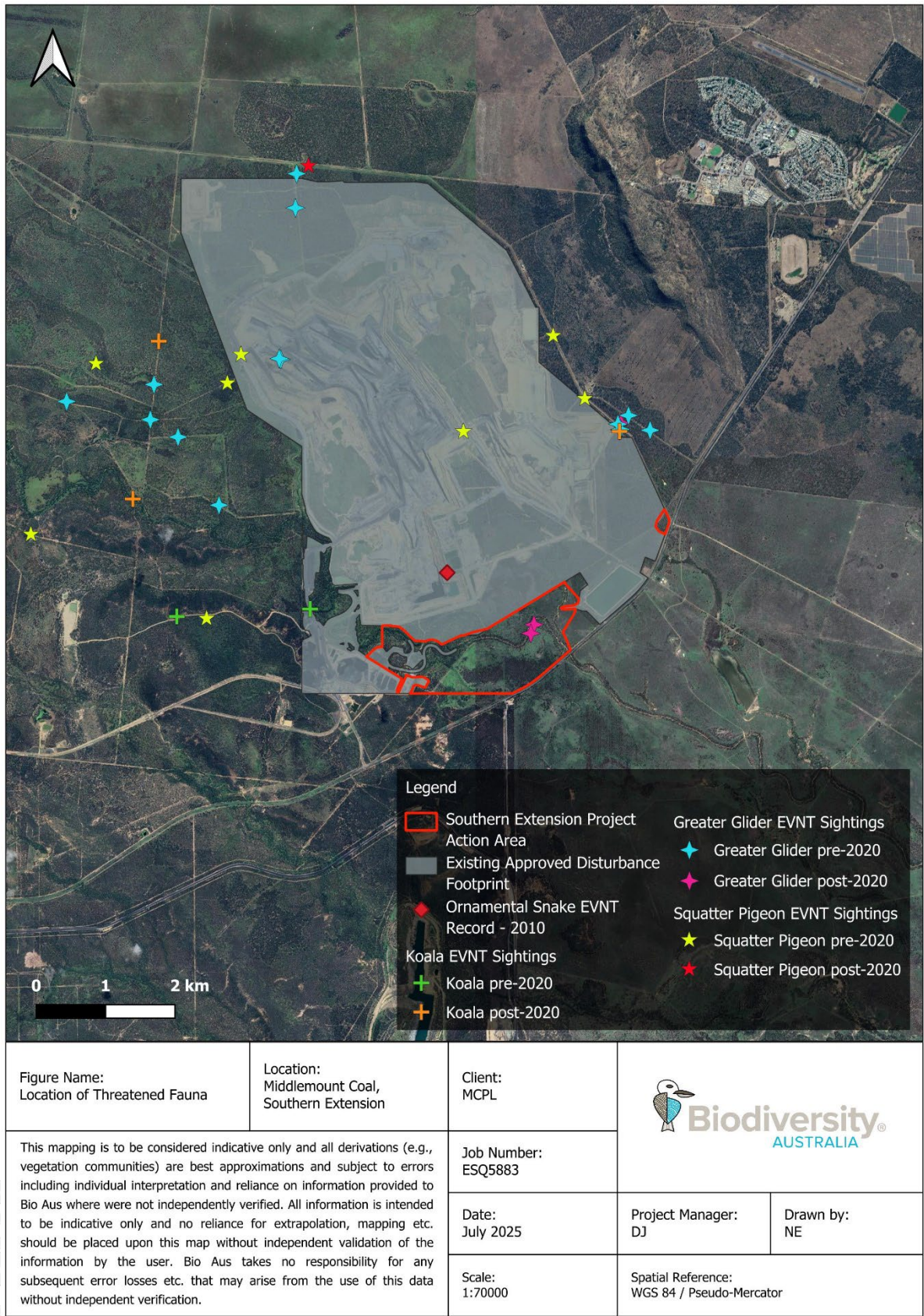


Figure 9. Records of threatened fauna species



3. MNES Impact Assessment

As a result of the field surveys (Sections 2.2 and 2.3), two TECs and habitat for four listed threatened species were ground-truthed within the Action area. The following sub-sections provide an assessment of significance for each of these relevant MNES to determine if a significant impact would be facilitated by the Action.

3.1 Assessment of significance – TECs

3.1.1 Brigalow TEC – EPBC Act Status: Endangered

Distribution

The Brigalow TEC occurs in three small patches located in the south-western corner of the Action area. These patches are isolated from each other by cleared areas and regrowth vegetation.

On a larger scale, this community is located within the Brigalow Belt (North and South), Darling Riverine Plains and South-east Qld Bioregions (DAWE, 2020b).

Threats

The DAWE (2020b) lists the largest threats to this TEC as clearing, plant and animal pests, fire, a lack of public knowledge, and overgrazing (promoted by high fragmentation levels).

Historically, large-scale clearing for development has occurred across the known southern to northern Brigalow extent, which has largely contributed to the decline of this community (DAWE, 2020b).

Significant Impact Criteria

Table 5: Significant impact assessment - Brigalow TEC

Significant Impact Criteria	Details
a) Reduce the extent of an ecological community	The Action would remove approximately 3.48 ha of Brigalow TEC (<i>Acacia harpophylla</i> and/or <i>Casuarina cristata</i> open forest on alluvial plains). This will marginally reduce its local extent.
b) Fragment or increase fragmentation of an ecological community, for example by clearing vegetation for roads or transmission lines	The Action would not result in fragmentation of Brigalow TEC as it will entirely remove small and already fragmented areas of the community. Three small patches of the TEC occur within the Action area, in an already highly fragmented landscape.
c) Adversely affect habitat critical to the survival of an ecological community	The Action would remove three small patches of the Brigalow TEC, however these areas, along with other areas of Brigalow regrowth, are unlikely to be critical to the survival of the community in the locality due to their small size and fragmentation, and the presence of larger more viable patches of brigalow within the broader region.
d) Modify or destroy abiotic (non-living) factors (such as water, nutrients, or soil) necessary for an ecological community's survival, including reduction of groundwater levels, or substantial alteration of surface water drainage patterns	The Action would remove three patches of Brigalow TEC and is unlikely to affect abiotic factors necessary for the survival of surrounding Brigalow communities. Surface water patterns and drainage lines would be altered due to the Action, however this would not affect nearby patches of Brigalow that occur on MCPL owned land or threaten the survival of the Brigalow TEC in the broader local area.
e) Cause a substantial change in the species composition of an occurrence of an ecological community, including causing a decline or loss of functionally important species, for example through regular burning or flora or fauna harvesting	The Action would result in the removal of non-critical patches of Brigalow community within the Action area, and surrounding Brigalow ecological communities not within the Action area would be unlikely to experience changes to species composition.



Significant Impact Criteria	Details
f) Cause a substantial reduction in the quality or integrity of an occurrence of an ecological community, including, but not limited to: • assisting invasive species, that are harmful to the listed ecological community, to become established, or • causing regular mobilisation of fertilisers, herbicides or other chemicals or pollutants into the ecological community which kill or inhibit the growth of species in the ecological community, or	The Action would not introduce an invasive species, however there is a possibility that invasive weed species may spread due to clearing activities. Weed control would continue to occur at the Middlemount Coal Mine (MCM) and within MCPL offset areas. The use of herbicides in existing MCPL offset areas would continue to target the control of invasive weeds, and would be applied in a manner that would be beneficial, rather than detrimental to native vegetation communities. The Action would not cause the regular mobilisation of harmful chemicals or pollutants into the ecological community.
g) Interfere with the recovery of an ecological community	The Action is likely to marginally interfere with the recovery of Brigalow TEC in the local area, as approximately 3.48 ha of Brigalow TEC would be entirely removed. There is an estimated 21,525 ha of remnant RE 11.3.1 (associated with Brigalow communities) remaining in the Isaac-Comet Downs IBRA subregion, and as such the Action would clear approximately 0.01% of the total potential extent of the community within the subregion.
Resulting Impact	No significant impact.

The above assessment concludes that the Action is not considered likely to have a significant impact on Brigalow TEC.

3.1.2 Poplar Box TEC – EPBC Act Status: Endangered

Distribution

The Poplar Box TEC occurs patchily in the southern portion of the Action area, largely fringing Roper Creek (Section 2.3.2).

On a broader scale, this TEC is known to occur in both Queensland (QLD) and New South Wales (NSW) with an estimated distribution of between Charters Towers (Qld) and Griffith (NSW). In both NSW and QLD, the Poplar Box TEC occurs in a highly fragmented state with estimates showing that more than 70% of the community has been currently lost (DEE 2017a and 2017b).

Threats

The DAWE (2020b) lists the largest threats to this TEC as tree clearing, exotic species infestations and intensive grazing pressure within the Brigalow Belt Bioregion in Qld (DAWE 2020b).



Significant Impact Criteria

Table 6: Significant impact assessment - Poplar Box TEC

Significant Impact Criteria	Details
a) Reduce the extent of an ecological community	The Action would remove approximately 43.88 ha of the Poplar Box TEC (<i>Eucalyptus populnea</i> woodland on alluvial plains) which would reduce its local extent.
b) Fragment or increase fragmentation of an ecological community, for example by clearing vegetation for roads or transmission lines	The Action would result in the removal of Poplar Box TEC, which would further increase the distances between the remaining Poplar Box TEC patches in the locality.
c) Adversely affect habitat critical to the survival of an ecological community	The Action would remove patches of the Poplar Box TEC, however these areas of TEC, along with other areas of Poplar Box regrowth, are unlikely to be critical to the survival of the community in the locality, due to the widespread fragmentation of this TEC already occurring, and the presence of other larger more viable patches within the broader region.
d) Modify or destroy abiotic (non-living) factors (such as water, nutrients, or soil) necessary for an ecological community's survival, including reduction of groundwater levels, or substantial alteration of surface water drainage patterns	The Action would entirely remove patches of Poplar Box TEC from within the Action area, and is unlikely to affect abiotic factors necessary for the survival of surrounding Poplar Box communities. Watercourses and drainage lines would be altered by the Action; however, this would not affect nearby patches of this TEC that occur on MCPL owned land, or threaten the survival of the Poplar Box TEC in the local area.
e) Cause a substantial change in the species composition of an occurrence of an ecological community, including causing a decline or loss of functionally important species, for example through regular burning or flora or fauna harvesting	The Action would cause a substantial change in species composition of the Poplar Box communities which occur within the Action area, as they would be completely removed. It would be unlikely that surrounding Poplar Box ecological communities, not within the Action area, would experience changes to species composition.
f) Cause a substantial reduction in the quality or integrity of an occurrence of an ecological community, including, but not limited to: - assisting invasive species, that are harmful to the listed ecological community, to become established, or - causing regular mobilisation of fertilisers, herbicides or other chemicals or pollutants into the ecological community which kill or inhibit the growth of species in the ecological community, or	The Action would not introduce an invasive species, however there is a possibility that invasive weed species may spread due to nearby clearing activities. Weed and pest control would continue to occur at the MCM and within MCPL offset areas. The use of herbicides in existing MCPL offset areas would continue to target the control of invasive weeds, and would be applied in a manner that would be beneficial, rather than detrimental to native vegetation communities. The Action would not cause the regular mobilisation of harmful chemicals or pollutants.
g) Interfere with the recovery of an ecological community	The Action is not likely to interfere with the recovery of the Poplar Box TEC in the local area, as approximately 43.88 ha of the Poplar Box TEC would be entirely removed. There is an estimated 34,440 ha of remnant RE 11.3.2 and 11.3.2b (associated with Poplar Box communities) remaining in the Isaac-Comet Downs IBRA subregion, and as such the Action would clear approximately 0.1% of the total extent of the community within the subregion.
Resulting Impact	No significant impact.

The above assessment concludes that the Action is not considered likely to have a significant impact on Poplar Box TEC.



3.2 Assessment of significance – Threatened Fauna

3.2.1 Greater glider (southern and central) (*Petauroides volans*) – EPBC Act Status: Endangered

Distribution

The greater glider occurs in forests and woodlands across eastern Australia where it forages on eucalypt leaves and occasionally flowers (TSSC, 2016). The species requires large tracks of remnant forests with old growth trees that contain hollows which greater gliders use for denning. Individual home ranges of the greater glider are small with an average size of approximately 1 to 3 ha. Greater gliders are known to be usually solitary within this home range and very loyal to their territory (Comport *et al.*, 1996, Pope *et al.*, 2005, TSSC, 2016).

Threats

A reduction in habitat area and quality, resulting from urban and rural-residential developments, is the key existing threat to this species (DAWE, 2021). The increasing level of development results in the following specific threats to the greater glider:

- removal and fragmentation of habitat from clearing and bushfire
- timber production
- loss of genetic viability from habitat fragmentation
- climate change
- injury from barbed wire fences

Relevance of the Action

The Action would remove approximately 81.70 ha of known and potential habitat for the Greater Glider, mainly along Roper Creek. It is relevant to note that there are existing and approved impacts on the riparian vegetation along Roper Creek associated with the approved Roper Creek Diversions. The Action would realign and extend the approved Roper Creek Diversion 2.

The Action would temporarily (until such time that reinstated vegetation reaches maturity) reduce the area of occupancy of the individuals recorded in the Action area, as riparian vegetation would be established along Roper Creek Diversion 2, having the effect of eventually reinstating and reconnecting the extensive Greater Glider habitat surrounding the Action area. For example, the existing Middlemount Coal Mine offsets (including three Commonwealth offset areas) cover an area of approximately 5,861 ha, and include extensive areas of Greater Glider habitat.

It is also relevant to note that the DES approved the Southern Extension Project (i.e. the Action) on 19 April 2021, with a requirement to offset impacts on the Greater Glider. MCPL will therefore expand the existing offset areas to include 975.1 ha of habitat for the Greater Glider as part of the approval process for impacts associated with the Action.

Survey Results

The greater glider was detected on three occasions during field surveys via spotlighting. There are also numerous historic records of the species occurring in nearby habitat. One such survey in 2017 observed at least 16 individuals, primarily along Roper Creek (Naturecall, 2017).



Important Population Assessment

Known suitable habitat occurs within the Action area, along Roper Creek, which was confirmed by the numerous records of individuals as explained above (Figure 10). The large number of recordings of this species in the surrounding area (including existing Middlemount Coal Mine offset areas) suggests this species is occupying habitat within the local context, and the individuals in the Action area are part of a larger population in the surrounding area that is not near the limit of the species known distribution. Given this, the local greater glider population utilising habitat within the Action area is not considered to represent an important population of this species as defined in the *Matters of National Environmental Significance Significant impact guidelines 1.1* (DoE, 2013).

Significant Impact Criteria

The Greater Glider (southern and central) (*Petauroides volans*) was listed as 'Vulnerable' under the EPBC Act and NC Act at the time of the controlled action decision (17/06/2021) and is therefore assessed as 'Vulnerable' and not 'Endangered' as it is currently listed.

Table 7: Significant impact assessment - Greater Glider

Significant Impact Criteria	Details
a) Lead to a long-term decrease in the size of an important population of a species	The greater glider has been recorded in within and adjacent to the Action area. Greater gliders have small home ranges ranging between 1.3 and 4 ha (Comport <i>et al.</i> 1996, Pope <i>et al.</i> 2005, TSSC 2016). The Action area could therefore encompass the entire home range of some individuals / family groups. The Action would remove approximately 81.70 ha of known habitat for the greater glider, comprising open woodlands. Greater glider habitat would be used for both foraging and denning/breeding within hollow-bearing trees within the Action area. Although greater glider records are widespread in the surrounding area, the removal of this smaller portion of habitat for the greater glider may lead to a long-term decrease in the size of a local population of this species, given that the local population is likely to be necessary for maintaining genetic diversity amongst the broader population. However, the local population is not considered to represent an important population of this species as defined in the <i>Matters of National Environmental Significance Significant impact guidelines 1.1</i> (DoE, 2013).
b) Reduce the area of occupancy of an important population	The Action would remove approximately 81.70 ha of known and potential habitat which is likely to reduce the area of occupancy of the local population.
c) Fragment an existing important population into two or more populations	The greater glider relies on canopy connection to move throughout its home range and would rarely come to the ground and cross clearings / open ground. Connective habitat along Roper Creek directly to the west of the Action area is approved for disturbance, and as such local populations of greater glider have already been fragmented. The removal of habitat from the Action area, in conjunction with approved mining activities, is likely to further fragment populations of the greater glider.
d) Adversely affect habitat critical to the survival of a species	No critical habitat for the greater glider and is present within the Action area according to any databases or registers, including the Register of Critical Habitat maintained by the minister under the EPBC Act.
e) Disrupt the breeding cycle of an important population	The habitat within the Action area represents known foraging and breeding habitat. The population within the Action area is however not considered to be an important population. Notwithstanding, removal of this habitat is likely to disrupt breeding by removing hollow-bearing trees which are used for denning, further isolation of populations which may reduce breeding success over time.
f) Modify, destroy, remove or isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline	The Action would remove known and potential habitat for the greater glider. In the eastern portion of the Action area, this will reduce the extent of available habitat for the greater glider, further isolating adjacent habitat. In the southern portion of the Action area, clearing will likely remove an entire area of known habitat along Roper Creek. Although the removal of the habitat within the Action area would have the potential to result in a short-term decline in the species in a local context, MCPL would continue to implement the pre-clearance management measures in accordance with the existing Environmental Management Plan, which includes the use of a fauna spotter catcher. These direct impacts have the potential to cause the decline of the local population.
g) Result in invasive species, that are harmful to a Vulnerable species	The Action area currently has a number of introduced and invasive species, including predators such as the feral cat and wild dog; and weeds such as red natal grass and buffel grass. No additional



Significant Impact Criteria	Details
becoming established in the Vulnerable species' habitat	weed or pest species would likely be introduced as a direct result of the Action. Weed and pest control would continue to occur at the MCM and within MCPL offset areas.
h) Introduce disease that may cause the species to decline	Due to the nature of the Action, the risk of a new disease being introduced to the locality would be unlikely.
i) Interfere substantially with the recovery of the species	The Action would lead to the loss of known greater glider habitat within the Action area, and contribute to threatening processes which would interfere with the recovery of the species. This includes directly reducing habitat for the local population, and temporarily reducing the amount of available potential habitat in the broader area. The Action would remove approximately 81.70 ha of known and potential habitat for the Greater Glider, mainly along Roper Creek (Biodiversity Australia, 2020). It is relevant to note that there are existing and approved impacts on the riparian vegetation along Roper Creek associated with the approved Roper Creek Diversions. The Action would realign and extend the approved Roper Creek Diversion 2. The Action would temporarily (until such time that reinstated vegetation matures) reduce the area of occupancy of the individuals recorded in the Action area, as riparian vegetation would be established along Roper Creek Diversion 2, having the effect of reinstating and reconnecting the extensive Greater Glider habitat surrounding the Action area. For example, the existing Middlemount Coal Mine offsets (including three Commonwealth offset areas) cover an area of approximately 5,861 ha, and include extensive areas of Greater Glider habitat. It is also relevant to note that the DES approved the Southern Extension Project (i.e. the Action) on 19 April 2021, with a requirement to offset impacts on the Greater Glider. MCPL will therefore expand the existing offset area to include 975.1 of habitat for the Greater Glider as part of the Commonwealth approval process for impacts associated with the Action. Greater glider habitat has been previously secured within MCPL offset areas to the west of the MCM. The greater glider has been recorded numerous times in these areas. As such, the Action is considered to only clear a small portion of habitat for the local population.
Resulting Impact	DAWE determination has considered that a significant impact to this species is likely.

As discussed in Section 1.4, DAWE considered that the Action is likely to have a significant impact on the greater glider. Habitat within the Action area is suitable for the species and if removed has the potential to cause the decline of an important population. Accordingly, DAWE's determination has considered that a significant impact to this species is likely.



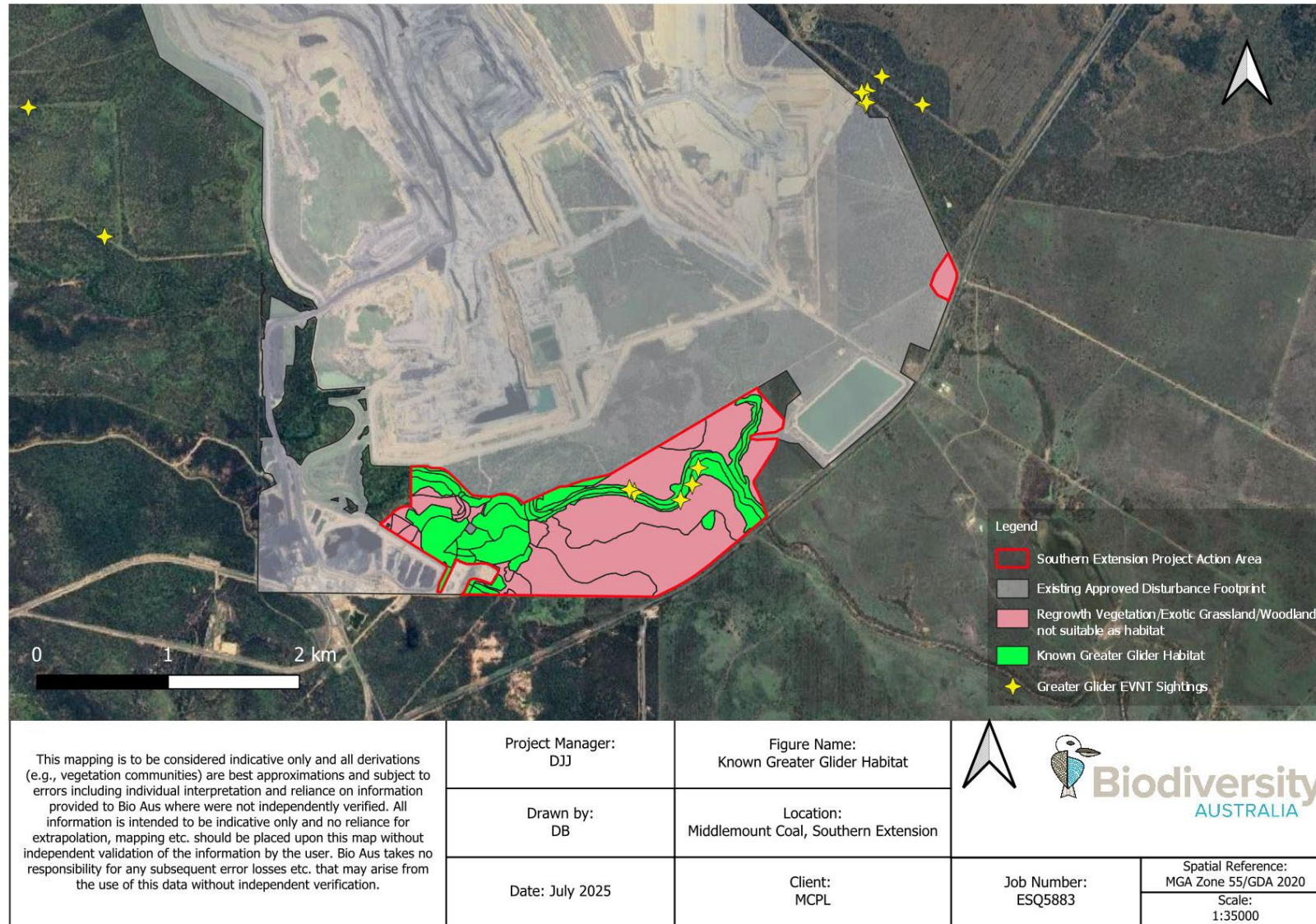


Figure 10. Location of known greater glider habitat within the Action area



3.2.2 Koala (*Phascolarctos cinereus*) – EPBC Act Status: Endangered

Distribution

The koala (combined populations of Queensland, New South Wales and the Australian Capital Territory) is listed as Endangered under the EPBC Act.

The listed species range for the koala is from north-eastern Qld to the Victorian border, however as a result of translocations, a number of populations can be found outside of this range (DAWE 2022).

In QLD, koala species distribution ends “inland from the east coast: from the Wet Tropics IBRA bioregion, into the Einasleigh Uplands bioregion in the north of the state; from the Central Mackay Coast bioregion, through the Brigalow Belt North bioregion to the Desert Uplands and Mitchell Grass Downs bioregions, and from the Southeast Qld bioregion, through the Brigalow Belt to the Mulga Lands and Channel Country bioregions in the southwest of the state” (DAWE 2022).

Koala distribution is highly dependent on altitude (<800 metres above sea level), temperature and in some instances, leaf moisture (DAWE 2022).

Threats

The key existing threats to the koala are ongoing habitat loss and fragmentation, vehicle strike and predation by the domestic/feral dog. The DAWE (2022) also recognises the significant threat of extreme environmental conditions (i.e. extreme heat, drought, fire) and disease (in particular, chlamydia infections and koala retrovirus) to the koala.

Relevance of the Action

The Action would remove approximately 183 ha of potential habitat for the Koala, mainly along Roper Creek. It is relevant to note that there are existing and approved impacts on the riparian vegetation along Roper Creek associated with the approved Roper Creek Diversions. The Action would realign and extend the approved Roper Creek Diversion 2.

The Action would temporarily (until reinstated vegetation reaches suitable maturity) reduce the area of potential Koala habitat in the Action area, as riparian vegetation would be established along Roper Creek Diversion 2, having the effect of reinstating and reconnecting the extensive Koala habitat surrounding the Action area. For example, the existing Middlemount Coal Mine offsets (including three Commonwealth offset areas) cover an area of approximately 5,861 ha, and include extensive areas of Koala habitat.

It is also relevant to note that the DES approved the Southern Extension Project (i.e. the Action) on 19 April 2021, with a requirement to offset impacts on the Koala. MCPL will therefore expand the existing offset areas to include 1178.29 ha of habitat for the Koala as part of the approval process for impacts associated with the Action.

Survey Results

The koala was detected during field surveys within the Action area in 2020 via the identification of scats under a single Reid River box. The age of the scats from visual identifiers was estimated at six months old. Reports of a koala near the eastern portion of the disturbance footprint in 2020 were also provided by MCPL staff and contractors. Review of historic records also identified that koala scats were previously recorded in a similar location within the Action area during surveys for the Western Extension Project in 2017 (Biodiversity Australia 2018).

A number of additional historic records of the koala have also recorded near the Action area, located on MCPL owned land. In 2012, EHP recorded an individual koala in the south of the Stage 2 Offset Area (located to the west of the Action), and in 2014 Biodiversity Australia also recorded an individual adjacent to Parrot Quarry Road (Naturecall 2014a).



Preferred food trees for the koala were identified within the Action area, however the eucalypt woodland/forest communities containing these tree species were sparse and open, providing an overall scarcity of foraging resources (Figure 11).

Important Population Assessment

Given the sparse number of recordings of the Koala in the area surrounding the Action (including within existing Middlemount Coal Mine offset areas), any individuals in the Action area and surrounds are unlikely to represent an important population of this species as defined in the *Matters of National Environmental Significance Significant Impact Guidelines 1.1* (DoE, 2013).

Critical Habitat Assessment

The habitat on site has been assessed using the koala habitat assessment tool from the *EPBC Act Referral Guidelines* (DoE 2014). To qualify as critical habitat, it must score five or more. This is shown in the following table:

Table 8: Koala habitat assessment

Attribute	Score	Source/Reason	
Koala Occurrence	2	Desktop	There is a single record of the koala in the locality as identified in the Wildlife Online database search.
		On-ground	Koala scatts were recorded within the Action area during field surveys.
Vegetation structure and composition	2	Desktop	N/A
		On-ground	The Action area contains woodland habitat and preferred koala food trees including blue gum, Reid River box and Moreton Bay ash.
Habitat connectivity	2	The Action area is part a contiguous landscape which is >500 ha.	
Key existing threats	0	Desktop	N/A
		On-ground	Domestic dogs and roads in surrounding rural areas would be a likely threat to local koalas.
Recovery value	1	It is uncertain if the habitat within the Action area is contributing to the recovery of the koala due to the following factors: • Koala foraging resources are present, however are already fragmented. • Koala was recorded via scats. • Foraging habitat for the koala will remaining in surrounding lands and in the existing MCPL offset areas adjacent to the MCM (west of the Action area). • Risk of car strike and dog attack surrounding the Action area.	
Total	7	Site qualifies as critical habitat.	

As per the koala habitat assessment tool, the Action area qualifies as critical habitat. An assessment has been undertaken to determine if the Action will adversely affect this habitat critical to the survival and/or interfere substantially with the recovery of the koala (Table 10).



Table 9: Critical Habitat Assessment

Attribute	Response	Reason
Does impact area contain habitat critical to the survival of the Koala?	Yes	The Action area results in a habitat score of seven as per the koala habitat assessment tool, qualifying it as critical habitat.
Do the areas proposed to be cleared contain known Koala food trees?	Yes	Areas to be cleared due to the Action contain trees known to be used by koalas.
Are you proposing to clear ≤ 2 ha of habitat containing known Koala food trees in an area with a habitat score of ≤ 5 ?	No	The Action will require clearing of 183 ha of native habitat in an area with a habitat score of greater than five.
Are you proposing to clear ≥ 20 ha of habitat containing known koala food trees in an area with a habitat score of ≥ 8 ?	No	The Action will result in the clearing of 183 ha of native habitat in an area with a habitat score of seven.
Outcome	Impact uncertain, further assessment provided in Table 10 below.	

Significant Impact Criteria

The koala (*Phascolarctos cinereus*) was listed as 'Vulnerable' under the EPBC Act and NC Act at the time of the controlled action decision (17/06/2021) and is therefore assessed as 'Vulnerable' and not 'Endangered'.

Table 10: Significant impact assessment - Koala

Significant Impact Criteria	Details
a) Lead to a long-term decrease in the size of an important population of a species	The koala was not observed during field surveys of the Action area, and only a single occurrence of scats was recorded. Historic records of koalas are sparse in the local area with only a few records of this species occurring, despite the extensive surveys being conducted on MCPL lands. As such, the koala population within the area is likely to be of low-density, and poor local soil quality would mean koalas in the area would have large home ranges. The Action would remove approximately 183 ha of known and potential habitat for the koala which would further contribute to the loss of potential habitat. Due to limited abundance of preferred browse species and poor soils, the habitat to be removed is, however, considered lower quality habitat that would only form part of the marginal home range of a koala. The Action would reduce connectivity and habitat linkages for the local koala population; however, some connective habitat would be retained to the east of the Action area which would continue to provide a narrow corridor for the koala. No significant increase in threats to the koala such as roadkill or dog attack would result from the Action. The removal/modification of a portion of habitat for the koala is unlikely to lead to a long-term decrease in the size of a local population of koala given: - the koala has not been observed within the Action area (as only scats have been observed); - similar potential habitat for the koala is widespread in the landscape outside the Action area; and - koala records are widespread in the landscape outside the Action area.
b) Reduce the area of occupancy of an important population	The Action would remove an estimated 183 ha of habitat for the koala and given that known habitat is located within the Action area would be removed; the area of occupancy is likely to be reduced.
c) Fragment an existing important population into two or more populations	Koalas are relatively mobile, able to cross clearings and roads, although are highly susceptible to other threats such as dog attack and vehicle strike. The Action would reduce connectivity for the koala population, however connective habitat would still remain in some areas around the Action area. As such, while the Action would lead to further fragmentation of habitat and reduce connectivity, there is no potential for fragmentation of an existing population.
d) Adversely affect habitat critical to the survival of a species	The Action would remove habitat which meets the definition of 'Critical Habitat' for the koala as defined in the <i>EPBC Act referral guidelines for the Vulnerable koala (combined Qld, NSW and the Australian Capital Territory)</i> (DoE 2014) and as defined in <i>A review of koala habitat assessment criteria and methods</i> (Youngentob et al 2021) (Table 9).



Significant Impact Criteria	Details
e) Disrupt the breeding cycle of an important population	The habitat within the Action area is unlikely to support breeding given the low density of preferred food trees and existing habitat fragmentation.
f) Modify, destroy, remove or isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline	The Action would remove known and potential habitat. It would also reduce connectivity for this species until revegetation along the Roper Creek diversions establishes suitable browse trees. Indirect impacts associated with the mine also have the potential to affect koala habitat adjacent to the mine footprint and discourage use of this habitat. This includes noise, dust and light spillage from mining activities. These direct and indirect impacts, as well as impacts associated with approved mining activities, have the potential to cause the decline of populations of these species. Notwithstanding, the removal of the habitat within the Action area unlikely has the potential to result in a short term decline in the species in a local context, as MCPL would continue to implement the pre clearance management measures in accordance with the existing Environmental Management Plan, which includes the use of a fauna spotter catcher.
g) Result in invasive species, that are harmful to a Vulnerable species becoming established in the Vulnerable species' habitat	The Action area currently has a number of introduced and invasive species including predators such as the feral cat and wild dog; and weeds such as red natal grass and buffel grass that can potentially alter fire regimes. No new species that affects the koala would likely be introduced as a direct result of the Action. Weed and pest control would continue to occur at the MCM and within MCPL offset areas.
h) Introduce disease that may cause the species to decline	Due to the nature of the Action, the risk of a new disease being introduced to the locality would be unlikely. Koalas in the area could potentially carry chlamydia. Increased stress associated with fragmentation and loss of habitat have the potential to increase the effect of this disease on the local population.
i) Interfere substantially with the recovery of the species	The Action would remove approximately 183 ha of potential habitat for the Koala, mainly along Roper Creek (Biodiversity Australia, 2020). It is relevant to note that there are existing and approved impacts on the riparian vegetation along Roper Creek associated with the approved Roper Creek Diversions. The Action would realign and extend the approved Roper Creek Diversion 2. The Action would only temporarily reduce the area of potential Koala habitat in the Action area, as riparian vegetation would be established along Roper Creek Diversion 2, having the effect of reinstating and reconnecting the extensive Koala habitat surrounding the Action area. For example, the existing Middlemount Coal Mine offsets (including three Commonwealth offset areas) cover an area of approximately 5,861 ha, and include extensive areas of Koala habitat. It is also relevant to note that the DES approved the Southern Extension Project (i.e. the Action) on 19 April 2021, with a requirement to offset impacts on the Koala. MCPL will therefore expand the existing offset areas to include 1178.29 ha of habitat for the Koala as part of the approval process for impacts associated with the Action.
Resulting Impact	DAWE determination has considered that a significant impact to this species is likely

As discussed in Section 1.4, DAWE considered that the Action is likely to have a significant impact on the koala. Habitat within the Action area meets the definition of habitat critical to the survival of the koala. Accordingly, DAWE's determination has considered that a significant impact to this species is likely.



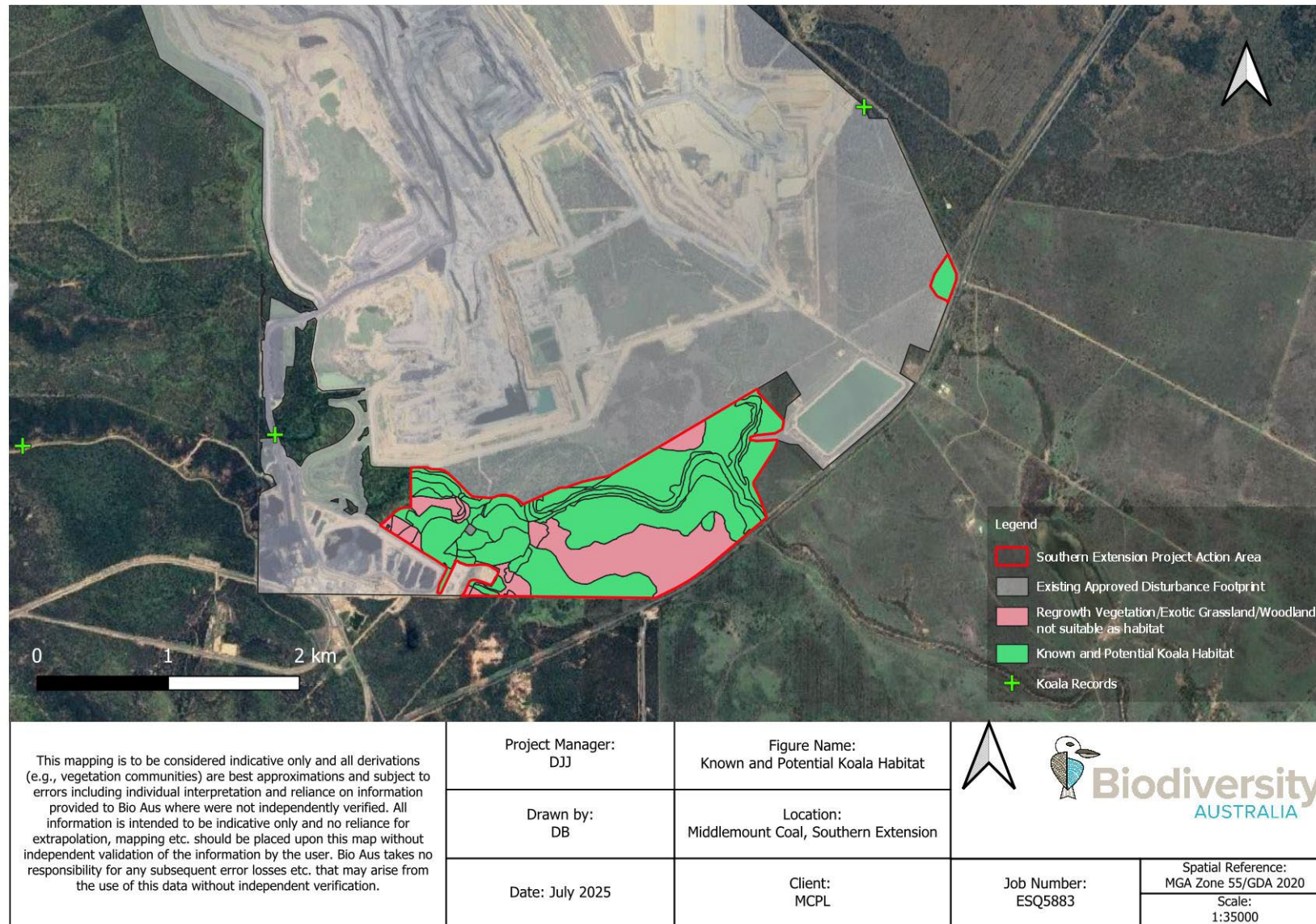


Figure 11. Location of known and potential habitat for the koala in the Action area



3.2.3 Squatter pigeon (southern) (*Geophaps scripta scripta*) – EPBC Act Status: Vulnerable

Distribution

The squatter pigeon is generally found in open-forest to sparse habitats that are largely dominated by *Acacias*, *Callitris* or *Eucalyptus* species; and within 3 km of a seasonal watercourse or waterbody. The species is known to occur “south from the Burdekin-Lynd divide in the southern region of Cape York Peninsula to the Border Rivers region of northern NSW, and from the east coast to Hughenden, Longreach and Charleville, Qld” (TSSC 2015).

Threats

The key threats to the squatter pigeon (southern) have been identified by the DAWE (2021b). These comprise:

- loss and fragmentation of habitat for agricultural purposes
- degradation of habitat by domestic herbivores (i.e. sheep, cattle)
- degradation of habitat by invasive weeds (i.e. buffel grass)
- predation from terrestrial and avian predators (i.e. dingo, fox, cat, raptors)

Survey Results

A single squatter pigeon was opportunistically recorded during the 2020 field surveys (Section 2.2), along the roadside north of the MCM. Squatter pigeon was not recorded within the Action area during field surveys.

Although not recorded within the Action area during the 2020 or 2023 field surveys (Section 2.2), the squatter pigeon has been recorded within the Action area historically. Fauna surveys conducted by Biodiversity Australia in 2017 for the MCM Western Extension Project identified the squatter pigeon along the Bingegang Pipeline Road (Biodiversity Australia 2018). This species has also been previously recorded on MCPL owned land in 2010, 2013 and 2015 (Parsons Brinckerhoff 2010a, Naturecall 2013, Will Steggall pers obs.).

Field surveys have identified the presence of suitable foraging, breeding and dispersal habitat for the squatter pigeon throughout the Action area, in the form of both remnant and non-remnant habitat (Figure 12). Squatter pigeons require waterbodies within 3km (for foraging) and 1km (for breeding), and typically sandy, gravelly or loamy soils, with an open shrubby understory. The presence of waterbodies, and the open woodland habitat type occurring on landzones 3, 5 and 7 (i.e. RE 11.3.1, 11.3.2, 11.7.2 and 11.7.4) within the Action area suggest the area is suitable habitat for foraging and breeding. Areas of remnant and non-cleared regrowth vegetation may be more suitable for breeding, when features including stony rises within 1km of water are present (DAWE 2021).

Important Population Assessment

The squatter pigeon population potentially utilising the Action area is likely to not represent a critical population, as the Action area is located within the centre of the range for their known suitable habitat (DAWE 2021), suggesting local populations likely occur beyond the Action area also. The population is also likely a part of a sub-population within a broader meta-population that extends far beyond the Action area, and as such would likely not represent a key population for breeding or dispersal. This is because individuals have been observed across many areas of the MCPL owned lands beyond the Action area (Biodiversity Australia pers obs.).



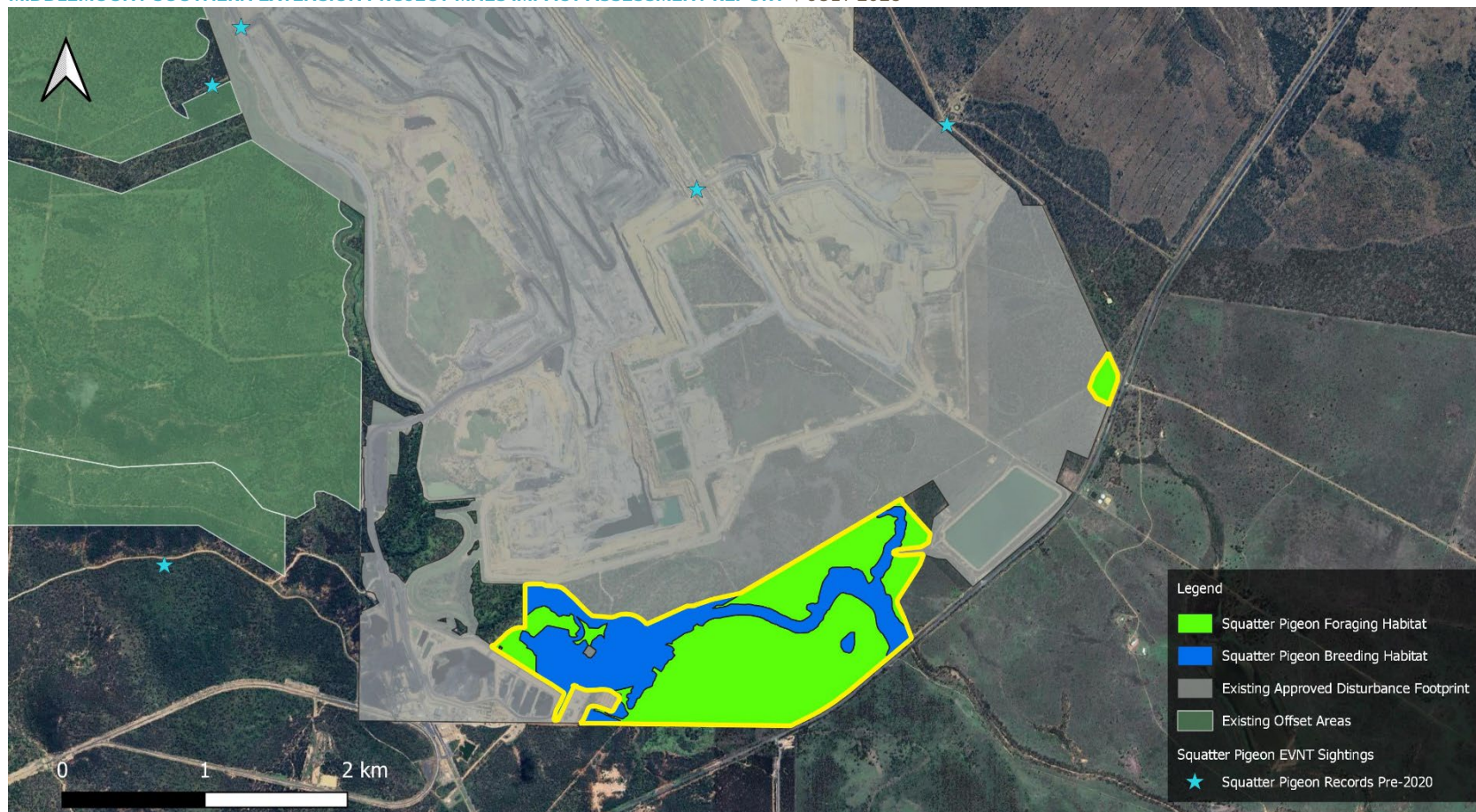
Significant Impact Criteria

Table 11: Significant impact assessment - Squatter Pigeon (southern)

Significant Impact Criteria	Details
a) Lead to a long-term decrease in the size of an important population of a species	The squatter pigeon was recorded north of the existing MCM, outside the Action area. Squatter pigeon has however previously been recorded in the Action area during previous studies (e.g. Biodiversity Australia, 2018). The Action area contains suitable habitat for the squatter pigeon in the form of woodland habitat as well as non-remnant woodland vegetation and disturbed areas located within 3 km of a seasonal water source or waterbody (DAWE 2021b). This species has large seasonally nomadic home ranges (TSSC 2015a) hence the local population would extend well beyond the Action area. The Action would see the removal of approximately 250.22 ha of potential habitat (consisting foraging, breeding and dispersal, as discussed above) for this species. Due to the large home range of the squatter pigeon, its high mobility, and the presence of extensive alternative habitat in the broader locality, the Action is unlikely to lead to a decrease in the important population.
b) Reduce the area of occupancy of an important population	While the Action would reduce the amount of potential habitat for the squatter pigeon on a local scale, the extent of higher quality habitat on adjacent land and in the broader locality and the large home range of these species, the removal of the identified habitat from the Action area would be unlikely to reduce the area of occupancy for the squatter pigeon.
c) Fragment an existing important population into two or more populations	The squatter pigeon is a highly mobile species and known to be capable of crossing human-modified habitat. The Action would therefore create no barriers to the species movement and would therefore not fragment the existing population.
d) Adversely affect habitat critical to the survival of a species	No critical habitat for the squatter pigeon is present within the Action area according to known databases or registers, including the Register of Critical Habitat maintained by the minister under the EPBC Act.
e) Disrupt the breeding cycle of an important population	The Action would be unlikely to disrupt the breeding cycle of an important population of the squatter pigeon given the presence of extensive alternative potential habitat in the broader locality and that breeding is likely to occur elsewhere outside of the Action area.
f) Modify, destroy, remove or isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline	The removal and modification of habitat facilitated by the Action would be unlikely to cause a decline of an important population, given the squatter pigeons high mobility and ability to relocate to suitable habitat which occurs nearby.
g) Result in invasive species, that are harmful to a Vulnerable species becoming established in the Vulnerable species' habitat	The Action area currently has several introduced and invasive species including predators such as the feral cat and wild dog; and weeds such as red natal grass and buffel grass that outcompete forage species and alter fire regimes. No new invasive species that is known to affect the squatter pigeon species would likely be introduced as a direct result of the Action. Weed and pest control would continue to occur at the MCM and within MCPL offset areas.
h) Introduce disease that may cause the species to decline	Due to the nature of the Action, the risk of a new disease being introduced to the locality would be unlikely.
i) Interfere substantially with the recovery of the species	The Action will reduce the amount of available potential habitat for this species; however this would likely comprise of a relatively small area of foraging and breeding habitat for the squatter pigeon that is not significant enough in size and quality to interfere with their recovery. Although the landzone, habitat types and presence of waterbodies suggests suitable habitat for the squatter pigeon, a large portion of the Action area is dominated by dense buffel grass which when present, may suggest the value for foraging or breeding for the squatter pigeon is of lesser quality, as their preference is for open understories with patchy, native tussock grasses and shrubs with areas of bare ground present (DAWE, 2021).
Resulting Impact	No significant impact

The above assessment concludes that the Action is not considered likely to have a significant impact on the squatter pigeon.





This mapping is to be considered indicative only and all derivations (e.g., vegetation communities) are best approximations and subject to errors including individual interpretation and reliance on information provided to Bio Aus where were not independently verified. All information is intended to be indicative only and no reliance for extrapolation, mapping etc. should be placed upon this map without independent validation of the information by the user. Bio Aus takes no responsibility for any subsequent error losses etc. that may arise from the use of this data without independent verification.

Project Manager:
DJJ

Drawn by:
DB

Date:
July 2025

Figure Name:
Breeding and Foraging Habitat -
Squatter Pigeon - Action Area

Location:
Middlemount Coal Mine, Southern
Extension Project Action Area

Client:
MCPL



Biodiversity
AUSTRALIA®

Job Number:
ESQ5883

Spatial Reference: GDA94 / MGA zone 55

Scale 1:35,000

Figure 12. Location of suitable habitat for the squatter pigeon (southern) within the Action area



3.2.4 Ornamental Snake (*Denisonia maculata*) – EPBC Act Status: Vulnerable

Distribution

The ornamental snake is largely found in open forests and woodlands with an association with moist areas. Their distribution is restricted to the Brigalow Belt North and Brigalow Belt South Bioregions of Qld, with the core population found within the drainage system of the Dawson River and Fitzroy River (DoE 2014a).

Threats

A number of key threats have been identified by the DAWE (2020b) as possible contributing factors to the ornamental snake population decline. These include:

- habitat loss as a result of clearing (i.e. mine-related activities, railways, roads)
- habitat degradation by cattle grazing
- habitat fragmentation
- predation by feral species
- invasive weeds
- alterations of landscape hydrology in/around gilgai environments
- alteration of water quality of wet areas (via chemical or sediment pollution)

Survey Results

Targeted surveys failed to detect the ornamental snake within the Action area. A single historic record of this species occurs north of the Action area, within the MCPL ML. This record occurs from surveys conducted by Parsons Brinckerhoff in 2010. Despite numerous intensive searches for this species since 2010, the ornamental snake has not been recorded since.

Important Population Assessment

The ornamental snake population potentially utilising habitat (Figure 13) within the Action area is not considered to represent an important population of this species. Sparse historic records occur in the locality and no records occur within the Action area. The Action area is also not located near the limit of the species range.

Significant Impact Criteria

Table 12: Significant impact assessment - ornamental snake

Significant Impact Criteria	Details
a) Lead to a long-term decrease in the size of an important population of a species	This species was not recorded in the Action area during the surveys despite targeted surveys. It has however been recorded to the north of the Action area by Parsons Brinckerhoff in 2010. The Action area provides suitable habitat for the ornamental snake in the form of Brigalow woodlands and gilgai nearby ephemeral drainage lines which provide habitat for preferred prey species. The Action would remove approximately 17.21 ha of potential habitat which comprises 3.48 ha of remnant and 13.73 ha of non-remnant Brigalow habitats. Given that a number of targeted surveys undertaken by Biodiversity Australia and other consultants since 2010 have not detected this species within the Action area, it is only considered to have a low likelihood of occurrence within the potential habitat in the Action area. As such, the removal of potential habitat in the Action area is unlikely to lead to a long-term decrease in the local population.
b) Reduce the area of occupancy of an important population	Given that a population of this species has not been detected in the Action area, no known habitat would be removed and the area of occupancy of this species would not be reduced as a result of the Action. The extent of potential habitat for this species would however be reduced, and this could impact the species recovery in the local area if a population still persists. Habitat to



Significant Impact Criteria	Details
	the north of the Action area where this species has been previously recorded is already approved for removal.
c) Fragment an existing important population into two or more populations	Removal of habitat for the Action would be unlikely to fragment a population of the ornamental snake given its low likelihood to occur on the site and that some connective habitat would remain around the Action area.
d) Adversely affect habitat critical to the survival of a species	No critical habitat for the ornamental snake is present within the Action area according to any databases or registers, including the Register of Critical Habitat maintained by the minister under the EPBC Act.
e) Disrupt the breeding cycle of an important population	Given that the ornamental snake has not been recorded within the Action area, and the only known location on MCPL land occurs off site to the north, the Project is unlikely to affect the breeding cycle of an important population.
f) Modify, destroy, remove or isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline	The Action would result in the direct removal of potential habitat. This would reduce the amount of habitat that is available to the ornamental snake on MCPL owned land, however it is unlikely that this would lead to a decline in the species given the lack of records in the Action area and limited records in the surrounding locality.
g) Result in invasive species, that are harmful to a Vulnerable species becoming established in the Vulnerable species' habitat	The Action area currently has a number of introduced and invasive species including predators such as the feral cat and wild dog; and weeds such as red natal grass and buffel grass. No new species that affects the subject species would likely be introduced as a direct result of the Action.
h) Introduce disease that may cause the species to decline	Due to the nature of the Action, the risk of a new disease being introduced to the locality would be unlikely.
i) Interferes substantially with the recovery of the species	The Action would lead to a loss of potential habitat for the ornamental snake. This is unlikely to interfere with the recovery of the ornamental snake as this species was not recorded within the Action area despite targeted survey and only sparse historic records of this species occur.
Resulting Impact	Significant impact unlikely

The above assessment concludes that the Action is not considered likely to have a significant impact on the ornamental snake.



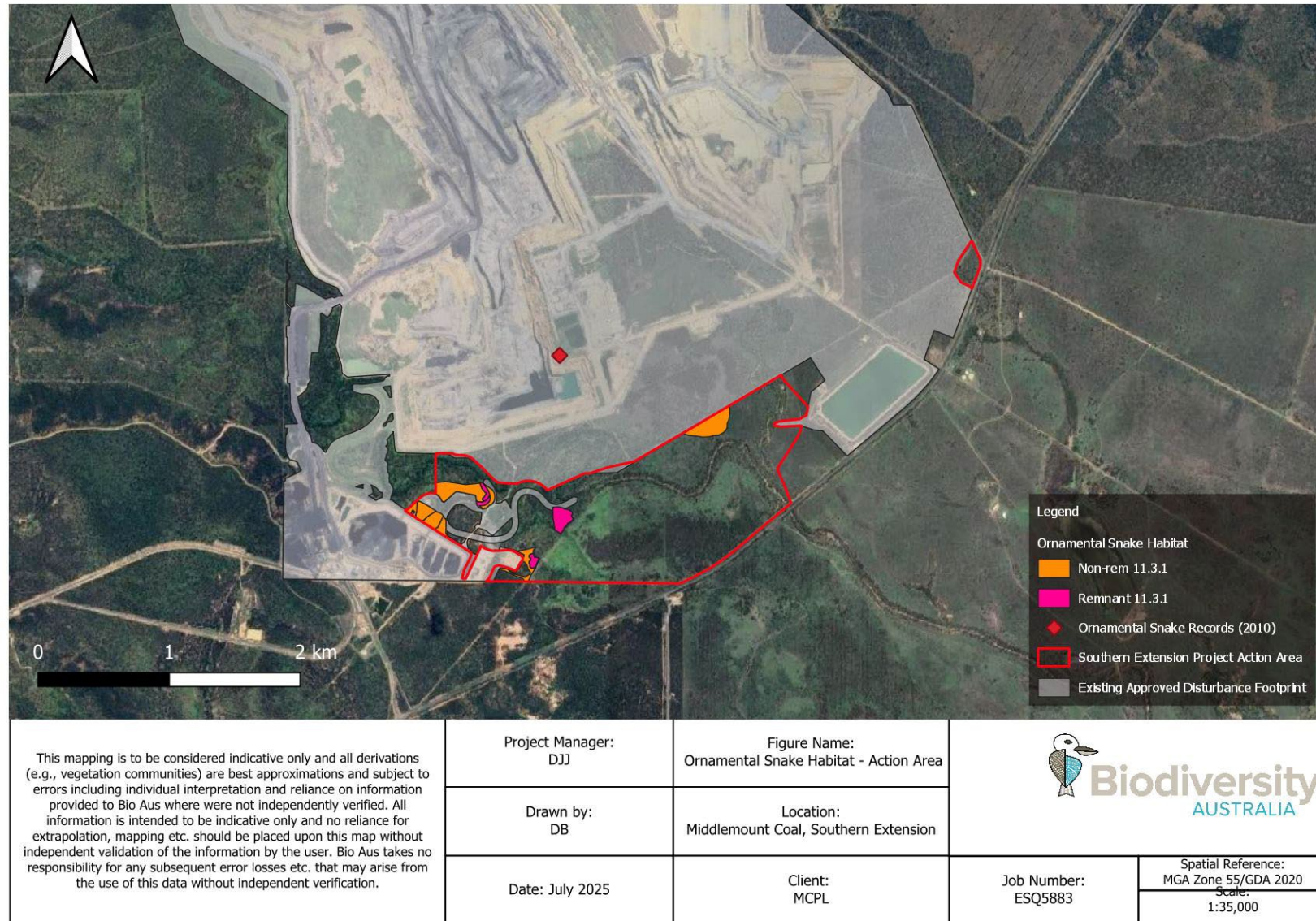


Figure 13. Potential habitat for the ornamental snake in the Action area



3.3 Potential Impacts

3.3.1 Native Vegetation and Habitat Clearance

The Action area is approximately 250.22 ha, of which the majority (i.e. 164.19 ha) is cleared or non-remnant vegetation. A total of approximately 86.03 ha of remnant vegetation would be cleared as a result of the Action (Table 13).

Table 13. Area of remnant vegetation impacted by the Action.

Field-verified Regional Ecosystem	Biodiversity Status	Vegetation Management Act Status	TEC Status under EPBC Act ¹	Habitat type	Area (ha)
11.3.1	Endangered	Endangered	Brigalow TEC	<i>Acacia harpophylla</i> Woodland/forest	3.48
11.3.2	Of Concern	Of Concern	Poplar Box Woodland TEC ²	Eucalypt woodland/forest	43.88

¹ All TECs within the Action area are listed as 'Endangered' under the EPBC Act

² Poplar box woodland TEC does not occur over the full extent of RE 11.3.2 within the project footprint, it excludes areas of non-rem 11.3.2 and areas of 11.3.2b

The vegetation to be impacted contains a number of fauna habitat components. These include potential nesting/denning/roosting habitat for hollow-obligate species in hollow-bearing trees, shelter provided by dense vegetation and fallen timber, foraging resources (e.g. nectar and sap sources), fruiting resources, seeds and grains along with prey habitat.

The vegetation proposed to be impacted by the Action includes known or potential habitat resources for the following listed threatened fauna species:

- Greater glider (81.70 ha, comprising only of remnant vegetation)
- Koala (183 ha, comprising 101.30 ha of regrowth and 81.70 ha of remnant vegetation)
- Squatter pigeon (southern) (250.22 ha, comprising 86.03 ha of remnant vegetation and 164.19 ha of regrowth)
- Ornamental snake (17.21 ha, comprising 3.48 ha of remnant vegetation and 13.73 ha of regrowth).

3.3.2 Individual fauna mortality and injury

The removal of native vegetation associated with the Action, particularly hollow bearing trees and logs, has the potential for direct mortality of fauna species. This potential risk is increased during the breeding seasons (generally spring to late autumn), and cooler seasons when mammals may enter torpor and reptiles are less active.

3.3.3 Habitat fragmentation and loss of connectivity

The vegetation communities in the disturbance footprint are largely patchy and fragmented, providing low connectivity for fauna in some parts. The vegetation within the north-eastern portion of the disturbance footprint is more contiguous and provides some degree of connectivity, however this area is fragmented by several roads and fence lines.

The Action is adjacent to the existing MCM, and clearance of vegetation within the Action area is not likely to isolate any external habitats (only increase the size of the existing footprint). The removal of vegetation from the Action area would, however, increase the level of local fragmentation and reduce connectivity between remaining habitats within the locality.



The Action would also increase the barrier already presented by the existing mine for terrestrial fauna species which would generally avoid crossing cleared land. This would have the greatest impact on less mobile species, including herpetofauna (e.g. snakes, lizards and frogs), arboreal mammals (e.g. sugar glider, squirrel glider and greater glider) and small mammals (e.g. rodents).

While fragmentation at the local scale would be high, the loss of habitat resulting from the Action in the wider area would only incrementally increase fragmentation of an already highly fragmented landscape. Many of the fauna groups represented in the area are highly mobile (e.g. birds, bats macropods), and would be accustomed to the level of fragmentation. Post-mine landforms are proposed to be progressively rehabilitated to include woodland habitat, except for residual voids.

3.3.4 Edge effects

Changes to the edges of vegetation communities have been attributed to a range of detrimental effects on different ecosystems. These changes have been linked to effects such as the alteration of environmental conditions, changes in species abundance and distributions and changes in species interactions (Murcia 1995).

Existing vegetation in the Action area and adjacent land is currently fragmented from pastoral areas, the existing mining works, roads and easements; hence any edge effects are likely to have already manifested. The Action would extend the range of edge effects to areas surrounding the Action area. Newly exposed edges created by clearing works may be subject to higher levels of weed invasion, noise, dust and vibration.

However, given the open nature of the adjacent woodland habitats, no alterations to microclimate or species assemblage are likely to occur as a result of the Action.

3.3.5 Vehicle strike

Studies have shown high road densities and vehicle speeds are associated with a significant increase in direct fauna mortality from vehicle strike incidents (Clevenger *et al.* 2002, Gurriga *et al.* 2012). The Action would involve new haul roads which would increase the risk of vehicle strike within the Action area, however all haul roads on the mine site are limited to 40 km/hour to further reduce this risk.

3.3.6 Surface water

The Action would result in changes to the natural flow regimes of the local drainage features, as a result of the following activities:

- the capture and re-use of drainage from operational disturbance areas
- the re-positioning of the approved southern flood levee and water management infrastructure
- the realignment and extension of the approved (but not yet constructed) eastern diversion of Roper Creek inside the ML.

3.3.7 Groundwater Dependent Ecosystems (GDEs)

As discussed in Section 2.2.4, some of the vegetation within the Action area is mapped as being a low potential GDE. The Action would involve further diversion of Roper Creek which may lead to reduced groundwater flows. Given that the vegetation along the existing path of Roper Creek would be removed and the creek would be diverted to the south, changes in groundwater would not affect the mapped potential GDEs in the Action area.

Potential impacts to downstream vegetation communities as a result of changes to the groundwater and surface water regime are unlikely to be significant and no adverse impacts have been noted as a result of existing operations.



3.3.8 Invasive weeds

The exposure of new vegetation edges and an increase in vehicle and foot traffic within the Action area has potential to introduce and increase the spread of weeds. The introduction of weeds can have a significant impact on native flora and fauna by altering natural features and ecological processes within ecosystems and outcompeting native flora for necessary sunlight, shade, nutrients and space (NSW Department of Planning, Industry and Environment [DPIE] 2019).

Newly exposed edges created by clearing works have the potential to be subject to higher levels of weed invasion, however the likelihood that weeds would spread into adjoining native woodland/forest vegetation as a result of the Action would be low as declared weeds would be controlled as per management measures outlined in the existing Offset Management Plan/Vegetation Management Plan (MCPL 2019). Further, construction areas and the post-mine landforms would be progressively rehabilitated with native vegetation (limiting opportunities for weeds to grow).

3.3.9 Feral animals

Mining, industrial and rural developments are often associated with the introduction of non-native fauna species (e.g. rodents, foxes and rabbits) by incidentally creating favourable conditions and habitat niches. Feral cats and foxes are significant predators of native fauna species and have severely reduced populations of birds (including the Squatter Pigeon [southern]) and small mammals (National Parks and Wildlife Service 2001, Dickman 1996, May and Norton 1996, Department of Agriculture and Fisheries 2016). Wild Dogs are significant threats to species such as the Koala (Wilkes and Snowden 1998, Connell Wagner 2000, Department of Agriculture and Fisheries 2016), while other feral animals, such as rabbits, are linked to severe land degradation and soil erosion, threatening habitats critical to many endangered native species (Department of Agriculture and Fisheries 2019).

These species are known to have a negative impact on native fauna by competing for food and shelter, destroying habitat, hyper-predation and by spreading disease (Department of Agriculture and Fisheries 2016). Additionally, the mere presence of these predators alone has been shown to affect fauna behaviour, e.g. avoidance of predator-inhabited areas that otherwise provide suitable habitat and range contraction. If unmitigated, the potential for an increase in feral animals surrounding the disturbance footprint would pose a substantial risk to native fauna in areas surrounding the Action.

Four feral species were detected during the 2020 surveys, including feral cats, wild dogs, European rabbits and cane toads. Feral pests that are already present in the Action area are likely to displace into adjoining areas during construction, however, the number of feral pests that would be displaced would be reduced by controlling feral pests. The control of feral pests is an existing measure that would be adopted for the Action.

3.3.10 Bushfire risk

Bushfire is an essential component of vegetation dynamics in Australia (particularly in eucalypt forests), but the frequency and intensity must be appropriate to each vegetation type, and most accidental wildfires are not likely to be beneficial.

An increase in mine activities and mine vehicles could potentially increase the risk of starting wildfires through hot exhausts, hot works or human error. The Action area is contiguous with areas of vegetated land that are largely dry and contain flora species that are flammable (e.g. eucalypts), and as such is both prone to wildfire incursion and a potential source of fire.

Bushfire prevention and management measures are described in Section 4.3.5.

3.3.11 Noise, dust and light pollution

The Action would result in the generation and distribution of dust from Action-related activities such as blasting, materials handling and vehicle movements (Katestone 2018). The Action would also result in the generation of noise from Action-related activities such as blasting, materials handling and vehicle



movements (Renzo Tonin 2018). The scale of dust and noise impacts would increase in comparison to the existing operations, as operational noise sources and the extent of blasting would be extended into the new mining areas (Renzo Tonin 2018).

Potential dust impacts on flora and/or fauna in surrounding habitats associated with the Action is likely to increase as a result of a larger extent of mining activities than existing operations.

Any potential noise-related impact on fauna residing in surrounding habitat would likely be localised and minor given fauna often readily habituate to continuous noise, and sudden noises from blasting would only occur in intervals. This has been evidenced during the current and previous survey work surrounding the existing operations through sightings of fauna using habitat adjacent to active mining areas. Some more sensitive fauna species are known to be discouraged by loud noise, however, and may avoid habitat areas surrounding the disturbance footprint.

The Action would result in an increase (relative to the existing operations) in the use of artificial lighting within the Action locality. Despite this, the incremental impact of this additional night lighting is expected to be minor given the lights would be operated in accordance with the relevant Australian Standard.

3.3.12 Erosion and sedimentation

The Action has the potential to increase the natural rate of erosion and sedimentation surrounding the Action and downstream of Roper Creek, due to the additional disturbance areas associated with the extension to the open cut pit. MCPL would revise the existing Erosion and Sediment Control Plan (WRM Water and Environment [WRM] 2012) to manage erosion and sedimentation in and around the disturbance footprint and downstream.

With the continuation of these management measures, it is unlikely that the Action would result in significant erosion or sedimentation impacts that would adversely impact native flora and/or fauna within or downstream of the Action area.

3.3.13 Cumulative impacts

Removal of vegetation and habitat facilitated by the Action would add to cumulative losses of vegetation from past land uses and significant clearing associated with the existing/approved MCM. The Action would also contribute to the cumulative impacts of vegetation clearance associated with a number of operational mines within the wider locality, these include:

- German Creek East – located approximately 5 km south of the Action area
- Foxleigh – located approximately 15 km south-east of the Action area
- Lake Lindsay – located approximately 15 km south south-east of the Action area
- Norwich Park – located approximately 20 km north-west of the Action area.

At a site level, the proposed clearance associated with the Action would increase native remnant vegetation clearance by approximately 10% when compared to the existing/approved MCM.

Approximately 630 ha of native remnant vegetation has been approved to be cleared for previous stages of the MCM, however, the loss of vegetation associated with the approved mining operations has already been offset in accordance with the relevant State and Commonwealth legislation.

On a larger scale, the native vegetation communities/regional ecosystems to be cleared during the life of the MCM all occur more widely in surrounding landscapes and subregions (after Accad *et al.* 2017). The Action would result in the loss of approximately 0.015% of the remnant vegetation remaining within the Isaac Comet Downs subregion, based on 2017 remnant vegetation cover estimates (Accad *et al.* 2017).

The offset areas proposed for the Action (Section 4.4) would significantly increase the area of protected habitat that would be managed for conservation. The existing MCM offset areas in conjunction with the proposed offset areas for the Action would provide habitat for a number of common and threatened



species as demonstrated from monitoring surveys (EHP 2012, Naturecall 2014-2017, Biodiversity Australia 2018-2019) and their continued regeneration would help offset biodiversity losses from the MCM. In addition, the progressive rehabilitation of mining areas over the life of the MCM would provide habitat in the medium to long term.

Given the above, the additional clearance associated with the Action is considered to represent only a minor increase in cumulative vegetation loss. Accordingly, the Action is not anticipated to have a significant cumulative impact on relevant MNES.



4. Proposed avoidance and mitigation measures

Avoidance and mitigation measures are proposed to minimise the likely impacts to each of the relevant MNES identified (Section 3.1, 3.2 and 3.3). These measures have been developed using the environmental management hierarchy, to firstly avoid (Section 4.1), minimise/reduce (Section 4.2) and then manage (Section 4.3) potential impacts.

4.1 Avoidance strategies

As a result of the Action facilitating impacts to relevant MNES, the following refinements have been made to the design of the Action to, where feasible, avoid unnecessary and additional land disturbance:

- use of existing infrastructure and facilities at the MCM, where possible, to avoid the need for additional clearance works
- locating the proposed waste emplacements to be continuous with the existing/approved waste emplacements to minimise the total disturbance footprint
- approved disturbance limits would be clearly marked (e.g. via pegging and/or flagging tape), before clearing, in order to avoid any unauthorised clearance
- site inductions are to specify that no clearing is to occur beyond the marked area, and any machinery or materials associated with the development are not to be parked or stored in adjacent retained vegetation;
- the scheduling of vegetation clearing in relevant habitat areas would avoid the breeding season for the greater glider (i.e. April to June).

4.2 Minimise and Reduce

Where impacts to MNES facilitated by the Action cannot be avoided, they will be minimised and/or reduced, where feasible, by restricting clearing and disturbance to the minimum area necessary to carry out the Action.

The Action would be subject to a number of mitigation measures in order to; minimise/reduce facilitated impacts. The following measures to minimise and reduce impacts would be implemented:

- use of existing infrastructure and facilities (where possible)
- optimising the backfilling of the open cut pit to minimise the overall mine footprint (i.e. reduce the size of the out-of-pit waste emplacement)
- preferentially clearing several areas that are immediately adjacent to the existing mine footprint already subject to significant noise and disturbance where threatened fauna species are less likely to occur
- preferentially impacting areas in the southern area next to the Dysart-Middlemount Road that are already cleared and mapped as non-remnant vegetation, and contiguous with broader areas of non-remnant vegetation to the south.



4.3 Management strategies

Impacts facilitated by the Action on relevant MNES will be managed in circumstances where avoidance and mitigation measures cannot be implemented by:

- undertaking vegetation clearing outside the known periods when greater gliders are breeding and rearing young (autumn-winter months)
- the sequence of vegetation clearing would be undertaken in a manner to ensure fauna is not isolated from adjacent habitat preventing their escape
- the area of clearing work is to be inspected for fauna by a fauna spotter immediately prior to commencement of any vegetation removal. Pre-clearing checks would include searches of habitat (e.g. lifting and destructive searches of logs) and searches for bird nests. Trapping surveys for capture of arboreal species is also recommended. If possible, any detected fauna is to be relocated to nearby suitable areas outside of the Action area (or other approved clearing areas) prior to clearing occurring
- during the pre-inspection, all hollow-bearing trees, stags and large hollow logs are to be clearly marked with flagging tape to allow easy identification during clearing
- a fauna spotter is to remain on site to supervise clearing to retrieve any fauna detected during works and undertake appropriate action (e.g. euthanize severely injured animals and/or relocate uninjured animals where possible)
- a release area for any fauna captured prior to or during clearing is to be identified prior to commencement of clearing works. Consideration should be given to the following factors when selecting release areas:
 - presence of suitable foraging and breeding habitat for the species
 - connectivity to other habitats and populations (e.g. do not select release areas that are isolated pockets of vegetation)
 - whether the habitat will be cleared or modified in the future
 - distance from disturbances associated with the mine e.g. noise, light, dust.
- if a koala is present in the proposed clearing area, it would be left to move away from the clearance area on its own accord
- vegetation loss from realignment and extension of the eastern diversion of Roper Creek inside the Action area will be managed by revegetation of the diversion
- weeds and pest animals will be subject to control measures (Section 4.3.1), particularly species declared under the *Biosecurity Act 2014*, in accordance with the '*Middlemount Coal Mine Environmental Management Plan*' (MCPL 2017a)
- fauna deaths via vehicle collision will be managed by reducing speed limits on haul roads to 40 km/h;
- measures described in the '*Middlemount Coal Mine Species Management Program*' would continue to be followed
- erosion and sediment on aquatic habitats will be managed through implementation of an '*Middlemount Coal Mine Erosion and Sediment Control Plan*' (MCPL 2021)
- expansion of the existing annual offset monitoring program to incorporate additional offset areas established for the Action (Section 4.4), to monitor and ensure progress towards the offset areas providing improved habitat values for threatened species and communities.



4.3.1 Weed Management

MCPL currently implements weed control measures at the MCM in accordance with the *Middlemount Coal Mine Environmental Management Plan* (MCPL, 2017a). These measures would be continued for the Action and include spot spraying of *Biosecurity Act 2014* listed weed species, as well as environmental weeds including buffel grass and red natal grass.

4.3.2 Feral Animal Management

MCPL currently implements feral animal control measures at the MCM in accordance with the *Middlemount Coal Mine Environmental Management Plan* (MCPL, 2017a). These measures would be continued for the Action and include wild dog and cat control.

4.3.3 Erosion and Sedimentation

MCPL currently implements standard erosion and sedimentation control measures at the MCM. These measures would be continued for the Action and would be applied as per an *Erosion and Sediment Control Plan* (WRM, 2012).

4.3.4 Artificial Lighting

Artificial lighting would be required during the operations within the Action area. Artificial light would not be directed into adjacent retained habitat to reduce impacts on nocturnal fauna potentially using this habitat.

4.3.5 Bushfire Prevention and Management

MCPL would aim to maintain vegetation structure and composition, protect mine assets and safeguard human life through the implementation of bushfire management techniques, including:

- physical protection through clean firebreaks
- active fire suppression of unplanned and potentially destructive fires (to vegetation and built assets)
- pro-active fuel and ecosystem management to sustain ecological fire regimes as much as possible.



4.4 Offset

Following implementation of the mitigation measures outlined above, residual impacts to MNES are expected to remain. A breakdown of these areas for all relevant MNES is presented in Table 14. Note, some overlap between habitat types for different listed threatened species habitat and TECs exist.

MCPL currently holds offsets located to the west of the MCM (i.e. associated with EPBC 2017/8130, 2010/5394 and 216/7717). With regard to providing a suitable offset for impacts facilitated by the Action (where impacts cannot be avoided, reduced/minimised or managed), MCPL would seek to secure a land-based offset, for impacts which cannot be avoided or mitigated (Section 4.1 and 4.2), in proximity to existing offset areas to the west of the MCM (Figure 14). With regard to securing additional offsets in this area, Biodiversity Australia (2020) states that,

“the best habitat for these [MNES] species is considered to be in the northwest...”. This mix of habitat types here would provide potential habitat for all the target species, and there have been records of the koala, greater glider and squatter pigeon nearby. Incorporating this area into MCPL’s offsets would also consolidate and protect habitat for these species and re-establish linkages over currently cleared/regenerating areas. If additional land is required, there is large areas of suitable habitat for the squatter pigeon, koala and greater glider to the south of the Western Extension Offset area”

Table 14: Residual impacts on MNES

MNES	Total Residual Impacts	Remnant Vs Non-rem Residual impact	Habitat Quality Score
Brigalow (<i>Acacia harpophylla</i> dominant and co-dominant) TEC	3.48 ha	3.48 ha (remnant)	5.94
Poplar box grassy woodland on alluvial plains TEC	43.88 ha	43.88 ha (remnant)	7.36
Ornamental snake (<i>Denisonia maculata</i>)	17.21 ha	3.48 ha (remnant)	5.23
		13.73 ha (regrowth)	4.17
Squatter pigeon (southern) (<i>Geophaps scripta scripta</i>)	250.22 ha	86.03 ha (remnant)	7.22
		164.19 ha (non-rem)	4.99
Koala (<i>Phascolarctos cinereus</i>)	183 ha	81.70 ha (remnant)	6.47
		101.30 ha (non-rem)	4.95
Greater glider (southern and central) (<i>Petauroides volans</i>)	81.70 ha	81.70 ha (remnant)	6.47



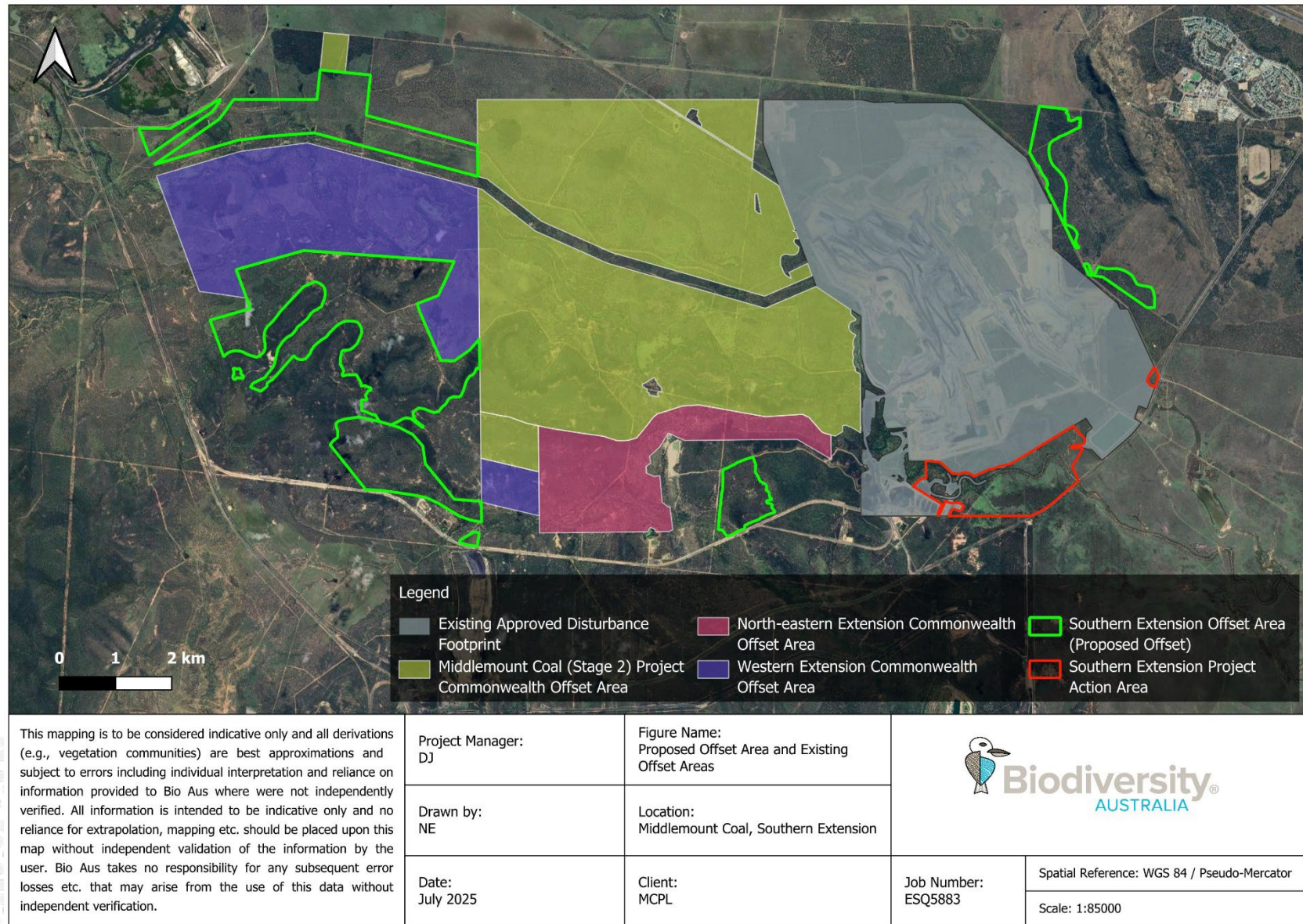


Figure 14. Proposed location of EPBC offsetting area, in context of existing offset areas



5. Conclusion

This report outlines the impacts of the proposed action on MNES listed TECs and fauna species. Significant impacts are likely for two federally listed species including the koala and greater glider. It is concluded that no significant impact will result for the listed TECs (Brigalow TEC and Poplar Box TEC) or the two other federally listed fauna species (squatter pigeon and ornamental snake). However, it is recommended that measures be implemented in order to avoid, mitigate and manage the impacts. This report should be considered in conjunction with Preliminary Documentation pertinent to the calculation of offset requirements for terrestrial habitat quality data, as well as the offset calculations for each MNES.



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7. Appendices

A1- Potential Occurrence Assessments

The following tables are used as a summary to address threatened species in terms of potential occurrence and requirement for formal assessment. A threatened species has been assessed if it is:

- 1) Recorded on-site; or
- 2) Not recorded on site, but recorded within a 10 km radius (the locality), and may occur to some degree on-site due to potential habitat, key habitat component, etc.;
- 3) Not recorded in the locality as yet, but recorded in the bioregion, and thus may occur in the locality, and possibly to some extent, may occur on the site, due to potential habitat.

Likelihood of occurrence is based on the probability of occurrence in terms of:

- Habitat extent (e.g. sufficient to support an individual or the local population; comprises all of home range; forms part of larger territory, etc.); quality (i.e. condition, including an assessment of threats, historical land uses on and off-site, and future pressures); interconnectivity to other habitat; and ability to provide all the species life-cycle requirements (either the site alone, or other habitat within its range);
- Occurrence frequency (i.e. on-site resident; portion of larger territory or seasonal migrant); and
- Usage i.e. breeding or non-breeding; opportunistic foraging (e.g. seasonal, migratory or opportunistic); marginal fringe of core range; refuge; roosts; etc.

An indicative 1-5 scale used by the author to indicate the likelihood of the species to potentially occur in the habitat on the study sites (if they have not been recorded in the locality) is as follows:

- 0: *Unlikely* (<1% probability) - no potentially suitable habitat; too disturbed; or habitat is very poor. No or few records in region or records/site very isolated e.g. by pastoral land, urbanisation, etc.
- 1: *Low* (1-25%) - few minor areas of potential habitat; highly modified site/habitat; or few habitat parameters present, but others absent or relatively insignificant (sub-optimum habitat). Usually very few records in locality.
- 2: *Fair* (25-50%) - some significant areas of potential habitat, but some habitat parameters limited. Potential for occasional foraging e.g. from nearby more optimal areas or known habitat. Records at least within 10-15 km radius of site.
- 3: *Moderate* (50-75%) - quite good potentially suitable habitat on and adjacent to the site, and/or good quality and abundance of some vital habitat parameters. Records within <10km, or adjacent to site, or adjacent to high quality habitat where species likely to occur.
- 4: *High* (>75%) - very good to optimum habitat occurring on or adjacent to the site (support breeding pair or population). Recorded within 5-10 km of site in same or similar habitat.

A1-1 Flora

Searches of relevant literature and databases (DES 2020b) only found records of a single flora species in the locality. A number of other species have the potential to occur within the locality based on regional records and presence of suitable habitat. In the table below, these species are evaluated for their potential to occur on the site.



Table 15 Potential occurrence assessment - flora

Species	No. of Records	NC Act	EPBC Act	Link to Profile	Likelihood of Occurrence
<i>Cerbera dumicola</i>	1	NT	-	http://wetlandinfo.ehp.qld.gov.au/wetlands/ecology/components/species/?cerbera-dumicola	Recorded in the locality and in the Stage 2 Project to the west of the site (Parsons Brinckerhoff 2010a). The southwest corner of the study area contains a small extent of suitable habitat for this species, however it was not found during surveys. Expected to be readily detected if present. Unlikely to occur.
<i>Cycas megacarpa</i>	0	E	E	https://www.environment.gov.au/cgi-bin/sprat/public/publicspecies.pl?taxon_id=55794	No preferred habitat on site and not recorded locally. This distinctive species would be expected to be readily detected if present. Unlikely to occur.
<i>Dichanthium queenslandicum</i>	0	V	E	https://www.environment.gov.au/cgi-bin/sprat/public/publicspecies.pl?taxon_id=5481	Only small areas of preferred habitat on site and not recorded locally or on MCPL lands during previous surveys. Site disturbance history would also reduce potential to occur. Unlikely to occur.
<i>Dichanthium setosum</i>	0	-	V	http://www.environment.gov.au/cgi-bin/sprat/public/publicspecies.pl?taxon_id=14159	Woodland areas on site may broadly qualify as suitable habitat, however there are no local records and no known populations in the region. Unlikely to occur.
<i>Digitaria porrecta</i>	0	NT	-	http://www.environment.gov.au/cgi-bin/sprat/public/publicspecies.pl?taxon_id=12768	Only small areas of preferred habitat on site and not recorded locally or on MCPL lands during previous surveys. Site disturbance history would also reduce potential to occur. Unlikely to occur.
<i>Picris evae</i>	0	V	V	https://www.environment.gov.au/cgi-bin/sprat/public/publicspecies.pl?taxon_id=10839	Site may broadly qualify as potential habitat; however, no local records and site occurs beyond known population extent. Unlikely to occur.
<i>Cadellia pentastylis</i>	0	V	V	https://www.environment.gov.au/cgi-bin/sprat/public/publicspecies.pl?taxon_id=9828	No suitable habitat on site and no local records. Expected to be readily detected if present. Unlikely to occur.

Key: Endangered (E), Vulnerable (V), Near Threatened (NT).



A1-2 Fauna Species Eligibility for Test of Significance and MNES Assessment

As previously noted, a number of threatened and migratory fauna have been recorded in the locality, and a number of others are considered to have the potential to occur. In the table below, these species not known to occur are evaluated for their potential to occur on the site.

Table 16 Potential of occurrence - fauna

Species	No. of Records	NC Act	EPBC Act	Link to Profile	Likelihood of Occurrence
Aves					
South-eastern Glossy Black-Cockatoo (<i>Calyptorhynchus lathami lathami</i>)	0	V	V	http://www.birdsinbackyards.net/species/Calyptorhynchus-lathami	No suitable foraging habitat is present in the study area. Not recorded locally or on MCPL lands during previous surveys. Unlikely to occurrence.
Red Goshawk (<i>Erythrotriorchis radiatus</i>)	0	E	V	http://www.environment.gov.au/cgi-bin/sprat/public/publicspecies.pl?taxon_id=942	Site, and general area, comprises low quality foraging habitat due to lack of permanent waterways. No local or regional records. Unlikely to occur.
Powerful Owl (<i>Ninox strenua</i>)	0	V	-	http://www.birdlife.org.au/bird-profile/powerful-owl	Site contains potential foraging and nesting habitat as part of a wider area. No local records and not recorded on MCPL lands during this or previous surveys. Very low to unlikely to occur.
Australian Painted Snipe (<i>Rostratula australis</i>)	0	E	E	http://www.environment.gov.au/cgi-bin/sprat/public/publicspecies.pl?taxon_id=77037	No large permanent wetlands occur on site, and no local records. Unlikely to occur.
Black-throated Finch (<i>Poephila cincta cincta</i>)	0	E	E	http://www.environment.gov.au/cgi-bin/sprat/public/publicspecies.pl?taxon_id=64447	Site represents poor potential habitat for this species. No local records; and site occurs beyond known distribution. Unlikely to occur.
Star Finch (eastern subspecies) (<i>Neochimia ruficauda ruficauda</i>)	0	E	E	http://www.environment.gov.au/cgi-bin/sprat/public/publicspecies.pl?taxon_id=26027	Site represents poor potential habitat for this species due to lack of permanent water and disturbance history. No local records. Unlikely to occur.
Painted Honeyeater (<i>Grantiella picta</i>)	0	V	V	http://www.birdlife.org.au/bird-profile/painted-honeyeater	Site provides generic foraging habitat for this species. Lack of local and regional records, disturbance history or site and locality would however reduce potential to occur. Unlikely to occur.
Eastern Osprey (<i>Pandion cristatus</i>)	0	-	M	http://www.environment.gov.au/cgi-bin/sprat/public/publicspecies.pl?taxon_id=952	No suitable foraging habitat occurs on site. Unlikely to occur.

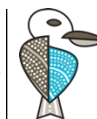


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Species	No. of Records	NC Act	EPBC Act	Link to Profile	Likelihood of Occurrence
Latham's Snipe (<i>Gallinago hardwickii</i>)	1	-	M	http://birdlife.org.au/bird-profile/lathams-snipe	No large permanent wetlands or waterways occur on site, and no local records. Unlikely to occur.
Glossy Ibis (<i>Plegadis falcinellus</i>)	1	-	M	http://www.environment.gov.au/cgi-bin/sprat/public/publicspecies.pl?taxon_id=991	Some potential habitat occurs on site. Moderate likelihood of occurrence.
Fork-tailed Swift (<i>Apus pacificus</i>)	0	-	M	https://www.environment.gov.au/cgi-bin/sprat/public/publicspecies.pl?taxon_id=678	Fair potential, as transient, between Oct-April
White-throated Needletail (<i>Hirundapus caudacutus</i>)	0	V	V, M	http://www.environment.gov.au/cgi-bin/sprat/public/publicspecies.pl?taxon_id=682	No local records, however site contains broadly suitable habitat. Low likelihood of occurrence.
Rufous Fantail (<i>Rhipidura rufifrons</i>)	0	-	M	http://birdlife.org.au/bird-profile/Rufous-Fantail	No suitable habitat on site. Unlikely to occur.
Satin Flycatcher (<i>Myiagra cyanoleuca</i>)	0	-	M	http://birdlife.org.au/bird-profile/Satin-Flycatcher	Broadly suitable habitat occurs on site. Low likelihood of occurrence.
Black-faced Monarch (<i>Monarcha melanopsis</i>)	1	-	M	http://www.birdlife.org.au/bird-profile/black-faced-monarch	Broadly suitable habitat occurs on site. Low likelihood of occurrence.
Yellow Wagtail (<i>Motacilla flava</i>)	0	-	M	http://www.birdlife.org/datazone/speciesfactsheet.php?id=8411	No suitable habitat on site. Unlikely to occur.
Oriental Cuckoo (<i>Cuculus optatus</i>)	0	-	M	https://www.environment.gov.au/cgi-bin/sprat/public/publicspecies.pl?taxon_id=710	Broadly suitable habitat on site. Low likelihood of occurrence.
Mammalia					
Northern Quoll (<i>Dasyurus hallucatus</i>)	0	-	E	http://www.wildlife.org.au/wildlife/speciesprofile/mammals/northern_quoll.html	Site may provide generic foraging and denning habitat, however disturbance history of site and general area, presence of feral predators, coupled with lack of records would significantly reduce potential. Unlikely to occur.



Species	No. of Records	NC Act	EPBC Act	Link to Profile	Likelihood of Occurrence
Bridled Nail-tail Wallaby (<i>Onychogalea fraenata</i>)	0	E	E	http://www.environment.gov.au/cgi-bin/sprat/public/publicspecies.pl?taxon_id=239	Site habitat generally unsuitable and beyond known distribution. Unlikely to occur.
Grey-headed Flying Fox (<i>Pteropus poliocephalus</i>)	0	-	V	http://www.environment.gov.au/cgi-bin/sprat/public/publicspecies.pl?taxon_id=186	Site contains a generic nectar foraging resource; however, no potential roosting habitat occurs in the study site or adjacent. There are no local records of this species and it has not been recorded on MCPL lands to date. The nearest database record for this species is located approximately 200 km east of the study site in Rockhampton (ALA 2020). Unlikely to occur.
South-eastern Long-eared Bat (<i>Nyctophilus corbeni</i>)	0	V	V	http://www.environment.gov.au/cgi-bin/sprat/public/publicspecies.pl?taxon_id=83395	Site contains generic potential foraging habitat for this species, however no preferred foraging habitats are present. Not detected on site during targeted surveys, or during previous surveys on MCPL land. Expert advice suggests that the site is beyond the known distribution of this species (Greg Ford pers comm.). Unlikely to occur.
Large-eared Pied Bat (<i>Chalinolobus dwyeri</i>)	0	V	V	http://www.environment.gov.au/cgi-bin/sprat/public/publicspecies.pl?taxon_id=183	Site contains generic potential foraging habitat for this species, however the study area is beyond the known range of the species. Unlikely to occur.
Ghost Bat (<i>Macroderma gigas</i>)	0	E	V	http://www.environment.gov.au/cgi-bin/sprat/public/publicspecies.pl?taxon_id=174	Site unlikely to comprise suitable and no caves or mine tunnels which offer roosting habitat are known to occur in the study area. Unlikely to occur.
Reptilia					
Ornamental Snake (<i>Denisonia maculata</i>)	1	V	V	http://www.environment.gov.au/cgi-bin/sprat/public/publicspecies.pl?taxon_id=1193	Recorded 600 m to the north of the study in 2010. Not found in the study area or during this or previous surveys by Biodiversity Australia despite targeted searches. The site contains some preferred Brigalow and gilgai habitats. However, these habitats have been disturbed as a result of cattle grazing and weed invasion. Low to fair likelihood of occurrence.
Yakka Skink (<i>Egernia rugosa</i>)	0	V	V	http://www.environment.gov.au/cgi-bin/sprat/public/publicspecies.pl?taxon_id=1420	Site contains broadly suitable vegetation associations and habitat components for this species however it has not been recorded on site despite targeted surveys or on MCPL lands during previous surveys. Unlikely to occur.



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Species	No. of Records	NC Act	EPBC Act	Link to Profile	Likelihood of Occurrence
Golden-tailed Gecko (<i>Strophurus taenicauda</i>)	0	NT	-	https://www.ehp.qld.gov.au/wildlife/threatened-species/near-threatened/goldentailed_gecko.html	Site contains broadly suitable vegetation associations and habitat components for this species however it has not been recorded on MCPL lands during previous surveys. Disturbance history of the locality and presence of feral predators would also reduce potential to occur. Unlikely to occur.
Dunmall's Snake (<i>Furina dunmalli</i>)	0	V	V	http://www.environment.gov.au/cgi-bin/sprat/public/publicspecies.pl?taxon_id=59254	Some potential habitat occurs on site however no local records and not recorded on MCPL lands to date. Disturbance history, local fragmentation and modification of surrounding habitats would also reduce potential to occur. Unlikely to occur.
Collared Delma (<i>Delma torquata</i>)	0	V	V	http://www.environment.gov.au/cgi-bin/sprat/public/publicspecies.pl?taxon_id=1656	As for Dunmall's Snake. Unlikely to occur.
Common Death Adder (<i>Acanthophis antarcticus</i>)	0	V	-	https://www.ehp.qld.gov.au/wildlife/animals-az/common_death_adder.html	No typical or preferred habitat for this species is present on site and no local records. Unlikely to occur.
Southern Snapping Turtle (<i>Elseya albagula</i>)	0	E	CE	https://www.ehp.qld.gov.au/wildlife/animals-az/whitethroated_snapping_turtle.html	No suitable habitat occurs on the site or adjacent. Unlikely to occur.
Retro Slider (<i>Lerista allanae</i>)	0	E	E	https://www.ehp.qld.gov.au/wildlife/animals-az/allans_lerista.html	No suitable habitat occurs on the site or adjacent. Unlikely to occur.
Fitzroy River Turtle (<i>Rheodytes leukops</i>)	0	V	V	https://www.ehp.qld.gov.au/wildlife/animals-az/fitzroy_river_turtle.html	No suitable habitat occurs on the site or adjacent. Unlikely to occur.

Key: Critically Endangered (CE), Endangered (E), Vulnerable (V), Near Threatened (NT), Migratory (M).



A-2 Site Flora Species List

Table 17 Site Flora Species List

Common Name	Scientific Name	Frequency
Canopy Trees		
Brigalow	<i>Acacia harpophylla</i>	U
Clarkson's Bloodwood	<i>Corymbia clarksoniana</i>	O
Ghost Gum	<i>Corymbia dallachiana</i>	R
Moreton Bay Ash	<i>Corymbia tessellaris</i>	C
Brown Bloodwood	<i>Corymbia trachyphloia</i>	R
Reid River Box	<i>Eucalyptus brownii</i>	R
Dawson's Gum	<i>Eucalyptus cambageana</i>	U
Narrow-leaved Ironbark	<i>Eucalyptus crebra</i>	U
Poplar Box	<i>Eucalyptus populnea</i>	D
Queensland Blue Gum	<i>Eucalyptus tereticornis</i>	C
Weeping Paperbark	<i>Melaleuca leucadendra</i>	R
Small Trees and Shrubs		
Chalky Wattle	<i>Acacia cretata</i>	R
Ironwood	<i>Acacia excelsa</i>	U
Mimosa Bush	<i>Acacia farnesiana</i> *	U
Native Willow	<i>Acacia salicina</i>	O
Lancewood	<i>Acacia shirleyi</i>	O
Red Ash	<i>Alphitonia excelsa</i>	U
Bitter Bark	<i>Alstonia constricta</i>	U
Dead Finish	<i>Archidendropsis basaltica</i>	U
Whitewood	<i>Atalaya hemiglauca</i>	O
Coffee Bush	<i>Breynia oblongifolia</i>	O
Wild Orange	<i>Capparis canescens</i>	O
Nepine	<i>Capparis lasiantha</i>	C
-	<i>Capparis loranthifolia</i>	C
Wild Orange	<i>Capparis mitchellii</i>	U
Currant Bush	<i>Carissa ovata</i>	C
Leichardt Bean	<i>Cassia brewsteri</i>	C
River Oak	<i>Casuarina cunninghamiana</i>	U
Limebush	<i>Citrus glauca</i>	R
Lollybush	<i>Clerodendrum floribundum</i>	O
Medicine Bush	<i>Coelospermum reticulatum</i>	R
-	<i>Denhamia cunninghamii</i>	R
Sticky Hop Bush	<i>Dodonaea viscosa</i>	O
Ellangowan Poison Bush	<i>Eremophila deserti</i>	O



Common Name	Scientific Name	Frequency
False Sandalwood	<i>Eremophila mitchellii</i>	O
Turkey Bush	<i>Erythroxylum australe</i>	U
Scrub Leopardwood	<i>Flindersia dissosperma</i>	U
Sandpaper Fig	<i>Ficus opposita</i>	U
Wilga	<i>Geijera parviflora</i>	O
Silver Oak	<i>Grevillea parallela</i>	U
Beefwood	<i>Grevillea striata</i>	U
Dysentery Bush	<i>Grewia latifolia</i>	C
Bootlace Oak	<i>Hakea lorea</i>	O
Harrisia Cactus	<i>Harrisia martini*</i>	R
Queensland Ebony	<i>Lysiphyllum carronii</i>	R
Black Tea Tree	<i>Melaleuca bracteata</i>	R
White Cedar	<i>Melia azaderach</i>	R
Western Boobialla	<i>Myoporum montanum</i>	
Prickly Pear	<i>Opuntia stricta*</i>	U
Velvet Tree Pear	<i>Opuntia tomentosa*</i>	U
Emu Apple	<i>Owenia acidula</i>	R
Quinine Tree	<i>Petalostigma pubescens</i>	U
-	<i>Psyrax attenuata</i>	U
Castor Oil Plant	<i>Ricinus communis*</i>	U
Sandalwood	<i>Santalum lanceolatum</i>	U
Potato Bush	<i>Solanum ellipticum</i>	U
Bead Bush	<i>Spartothamnella juncea</i>	R
Yellow-wood	<i>Terminalia oblongata</i>	R
Vine Tree	<i>Ventilago viminalis</i>	U
Grasses		
Cockatoo Grass	<i>Alloteropsis semialata</i>	U
Hooky Grass	<i>Ancistrachne uncinulata</i>	
Dark Wiregrass	<i>Aristida calycina</i>	O
Bunched Kerosene Grass	<i>Aristida contorta</i>	U
Jericho Wiregrass	<i>Aristida jerichoensis</i>	O
Purple Wire-grass	<i>Aristida personata</i>	U
Forest Blue Grass	<i>Bothriochloa bladhii</i>	U
Pitted Bluegrass	<i>Bothriochloa decipiens</i>	U
Tableland Couch	<i>Calyptochloa gracillima</i>	U
Buffel Grass	<i>Cenchrus ciliaris*</i>	D
Slender Chloris	<i>Chloris divaricata</i>	O
Rhodes Grass	<i>Chloris gayana*</i>	U
Windmill Grass	<i>Chloris truncata</i>	C



Common Name	Scientific Name	Frequency
Golden Beard Grass	<i>Chrysopogon fallax</i>	U
Barbed Wire Grass	<i>Cymbopogon refractus</i>	U
Couch Grass	<i>Cynodon dactylon</i>	O
Queensland Bluegrass	<i>Dichanthium sericeum</i>	C
Umbrella Grass	<i>Digitaria divaricatissima</i>	U
-	<i>Enteropogon acicularis</i>	U
Wiry Panic	<i>Entolasia stricta</i>	R
Brown's Lovegrass	<i>Eragrostis brownii</i>	U
Clustered Lovegrass	<i>Eragrostis elongata</i>	U
Purple Lovegrass	<i>Eragrostis lacunaria</i>	U
Silky Browntop	<i>Eulalia aurea</i>	U
Black Speargrass	<i>Heteropogon contortus</i>	O
Swamp Ricegrass	<i>Leersia hexandra</i>	U
Green Panic	<i>Megathyrsus maximus*</i>	C
Red Natal Grass	<i>Melinis repens*</i>	C
Native Millet	<i>Panicum decompositum</i>	O
Hairy Panic	<i>Panicum effusum</i>	O
Yabila Grass	<i>Panicum queenslandicum</i>	U
Brigalow Grass	<i>Paspalidium caespitosum</i>	U
-	<i>Paspalidium distans</i>	U
Freshwater Couch	<i>Paspalum distichum</i>	R
Vasey Grass	<i>Paspalum urvillei</i>	O
Comet Grass	<i>Perotis rara</i>	U
Fairy Grass	<i>Sporobolus caroli</i>	R
Kangaroo Grass	<i>Themeda triandra</i>	R
Sabi Grass	<i>Urochloa mosambicensis*</i>	D
Groundcovers		
Chaff Flower	<i>Achyranthes aspera</i>	U
Khaki Weed	<i>Alternanthera pungens*</i>	U
-	<i>Alternanthera sp.</i>	R
Prickly Poppy	<i>Argemone ochroleuca</i>	U
Cobbler's Pegs	<i>Bidens pilosa*</i>	O
Blue Trumpet	<i>Brunoniella australis</i>	C
Mother of Millions	<i>Bryophyllum delagoense*</i>	U
-	<i>Calotis sp.</i>	U
Yellow Buttons	<i>Chrysocephalum apiculatum</i>	C
-	<i>Commelina cyanea</i>	O
Native Wandering Jew	<i>Commelina diffusa</i>	O



Common Name	Scientific Name	Frequency
Scurvy Grass	<i>Commelina ensifolia</i>	U
Darling Lily	<i>Crinum flaccidum</i>	U
Gambia Pea	<i>Crotalaria goreensis*</i>	O
Yellow Rattlepod	<i>Crotalaria mitchellii</i>	O
Ruby Saltbush	<i>Enchylaena tomentosa</i>	U
Winter Apple	<i>Eremophila debilis</i>	O
Tropical Speedwell	<i>Evolvulus alsinoides</i>	C
Gomphrena Weed	<i>Gomphrena celosioides</i>	O
-	<i>Goodenia rotundifolia</i>	U
Slender Violet-bush	<i>Hybanthus monopetalus</i>	U
Narrow-leaved Indigo	<i>Indigofera linifolia</i>	U
Spiny Matrush	<i>Lomandra longifolia</i>	O
Wattle Matrush	<i>Lomandra filiformis</i>	U
Phasey Bean	<i>Macroptilium lathryodes</i>	C
-	<i>Oxalis perennans</i>	U
Hairy Pigweed	<i>Portulaca pilosa</i>	O
Pigweed	<i>Portulaca oleracea</i>	C
-	<i>Rostellularia adscendens</i>	O
Soft Roly-poly	<i>Salsola australis</i>	O
-	<i>Sauropus hirtellus</i>	U
Sesbania Pea	<i>Sesbania cannabina</i>	O
-	<i>Sida cordifolia</i>	O
Fine Sida	<i>Sida filiformis</i>	O
Flannel Weed	<i>Sida hackettiana*</i>	C
Paddy's Lucerne	<i>Sida rhombifolia*</i>	U
Spiked Sida	<i>Sida subspicata</i>	C
Grass Trigger Plant	<i>Stylidium graminifolium</i>	U
Stylo	<i>Stylosanthes scabra*</i>	D
Caltrop	<i>Tribulus terrestris</i>	O
Australian Bluebell	<i>Wahlenbergia gracilis</i>	U
Climbers and Orchids		
Headache Vine	<i>Clematis glycinoides</i>	U
Pepper Vine	<i>Clematicissus opaca</i>	U
Tiger Orchid	<i>Cymbidium canaliculatum</i>	U
Caustic Vine	<i>Cynanchum viminalis</i>	U
Siratro	<i>Macroptilium atropurpureum*</i>	O
Bush Banana	<i>Marsdenia viridiflora</i>	U
Morning Glory	<i>Ipomoea indica</i>	O



Common Name	Scientific Name	Frequency
Red Passionflower	<i>Passiflora aurantia</i>	U
Native Tick Trefoil	<i>Rhynchosia australis</i>	U
Aquatics		
Giant Sedge	<i>Cyperus exaltatus</i>	U
-	<i>Cyperus sp.</i>	U
-	<i>Cyperus gracilis</i>	
Common Fringe-Rush	<i>Fimbristylis dichotoma</i>	C
-	<i>Juncus usitatus</i>	U
Water Primrose	<i>Ludwigia peploides</i>	O
Bog Hyacinth	<i>Monochoria cyanea</i>	U
Water Snowflake	<i>Nymphoides indica</i>	R
Swamp Lily	<i>Ottelia ovalifolia</i>	U
Key: Dominant (D), Common (C), Occasional (O), Uncommon (U), Rare (R), Exotic Species (*).		



A-3 Site Fauna Species List

Table 18 Site Fauna Species List

Common Name	Scientific Name	Detection Method
Amphibia		
Rough-collared Frog	<i>Cyclorana verrucosa</i>	OBS
Desert Tree Frog	<i>Litoria rubella</i>	HC
Cane Toad*	<i>Rhinella marina</i> *	OBS
Aves		
Indian Mynah	<i>Acridotheres tristis</i>	OBS
Pacific Black Duck	<i>Anas superciliosa</i>	OBS
Red-winged Parrot	<i>Aprosmictus erythropterus</i>	OBS, HC
Wedge-tailed Eagle	<i>Aquila audax</i>	OBS
Sulphur-crested Cockatoo	<i>Cacatua galerita</i>	OBS, HC
Pheasant Coucal	<i>Centropus phasianinus</i>	OBS, HC
Wood Duck	<i>Chenonetta jubata</i>	OBS
Golden-headed Cisticola	<i>Cisticola exilis</i>	HC
Grey Strike-thrush	<i>Colluricincla harmonica</i>	OBS, HC
Black-faced Cuckoo-shrike	<i>Coracina novaehollandiae</i>	OBS, HC
Torresian Crow	<i>Corvus orru</i> *	HC
Pied Butcherbird	<i>Cracticus nigrogularis</i>	OBS, HC
Black Swan	<i>Cygnus atratus</i>	OBS
Blue-winged Kookaburra	<i>Dacelo leachii</i>	HC
Laughing Kookaburra	<i>Dacelo novaeguineae</i>	OBS
Blue-faced Honeyeater	<i>Entomyzon cyanotis</i>	OBS, HC
Eastern Koel	<i>Eudynamys orientalis</i>	HC
Dollar Bird	<i>Eurystomus orientalis</i>	OBS, HC
Nankeen Kestrel	<i>Falco cenchroides</i>	OBS
Australian Hobby	<i>Falco longipennis</i>	OBS
Squatter Pigeon (southern subspecies)	<i>Geophaps scripta scripta</i>	OBS
Bar-shouldered Dove	<i>Geopelia humeralis</i>	OBS
Peaceful Dove	<i>Geopelia placida</i>	OBS
White-throated Gerygone	<i>Gerygone albogularis</i>	HC
Magpie Lark	<i>Grallina cyanoleuca</i>	OBS
Australian Magpie	<i>Gymnorhina tibicen</i>	HC
Whistling Kite	<i>Haliastur sphenurus</i>	OBS
Singing Honeyeater	<i>Lichenostomus virescens</i>	OBS
Chestnut-breasted Mannikin	<i>Lonchura castaneothorax</i>	OBS
Superb Fairy Wren	<i>Malurus cyaneus</i>	OBS
Variegated Fairy Wren	<i>Malurus lamberti</i>	OBS



Common Name	Scientific Name	Detection Method
Red-backed Fairy-wren	<i>Malurus melanocephalus</i>	OBS
Noisy Miner	<i>Manorina melanocephala</i>	OBS, HC
Rainbow Bee-eater	<i>Merops ornatus</i>	HC
White-naped Honeyeater	<i>Melithreptus lunatus</i>	HC
Black Kite	<i>Milvus migrans</i>	OBS
Southern Boobook	<i>Ninox boobook</i>	OBS
Crested Pigeon	<i>Ocyphaps lophotes</i>	OBS
Rufous Whistler	<i>Pachycephala rufiventris</i>	OBS
Striated Pardalote	<i>Pardalotus striatus</i>	OBS, HC
Little Friarbird	<i>Philemon citreogularis</i>	OBS, HC
Noisy Friarbird	<i>Philemon corniculatus</i>	OBS
Pale-headed Rosella	<i>Platycercus adscitus</i>	OBS
Tawny Frogmouth	<i>Podargus strigoides</i>	OBS
Grey-crowned Babbler	<i>Pomatostomus temporalis</i>	HC
Willie Wagtail	<i>Rhipidura leucophrys</i>	OBS
Weebill	<i>Smicromis brevirostris</i>	HC
Double-barred Finch	<i>Taeniopygia bichenovii</i>	OBS
Crested Tern ¹	<i>Thalasseus bergii</i>	OBS
Scaly-breasted Lorikeet	<i>Trichoglossus chlorolepidotus</i>	OBS
Rainbow Lorikeet	<i>Trichoglossus haematodus</i>	OBS, HC
Masked lapwing	<i>Vanellus miles</i>	OBS
Mammalia		
Rufous Bettong	<i>Aepyprymnus rufescens</i>	OBS, CAM
Wild Dog*	<i>Canis lupus familiaris</i> *	TR
Northern Freetail Bat	<i>Chaerephon jobensis</i>	ANA
Gould's Wattled Bat	<i>Chalinolobus gouldii</i>	ANA
Chocolate Wattled Bat	<i>Chalinolobus morio</i>	ANA
Little Pied Bat	<i>Chalinolobus picatus</i>	ANA
Feral Cat*	<i>Felis catus</i> *	TR
Eastern Grey Kangaroo	<i>Macropus giganteus</i>	OBS
Little Bent-wing Bat	<i>Miniopterus australis</i>	ANA
Long-eared Bat	<i>Nyctophilus sp.</i>	ANA
European Rabbit*	<i>Oryctolagus cuniculus</i> *	OBS
Northern Free-tailed Bat	<i>Ozimops lumsdenae</i>	ANA
Eastern Free-tailed Bat	<i>Ozimops ridei</i>	ANA
Greater Glider (southern and central)	<i>Petauroides volans</i>	OBS
Sugar Glider	<i>Petaurus breviceps</i>	OBS
Squirrel Glider	<i>Petaurus norfolcensis</i>	OBS



Common Name	Scientific Name	Detection Method
Koala	<i>Phascolarctos cinereus</i>	SC
Yellow-bellied Sheath-tailed Bat	<i>Saccolaimus flaviventris</i>	ANA
Inland Broad-nosed Bat	<i>Scotorepens balstoni</i>	ANA
Little Broad-nosed Bat	<i>Scotorepens greyii</i>	ANA
Short-beaked Echidna	<i>Tachyglossus aculeatus</i>	OBS
Common Brushtail Possum	<i>Trichosurus vulpecula</i>	OBS
Inland Forest Bat	<i>Vespadelus baverstocki</i>	ANA
Eastern Cave Bat	<i>Vespadelus troughtoni</i>	ANA
Reptilia		
Lined Rainbow Skink	<i>Carlia jarnoldae</i>	OBS
Fence Skink	<i>Cryptoblepharus virgatus</i>	OBS
Copper-tailed Skink	<i>Ctenotus taeniolatus</i>	OBS
Chain-backed Dterra	<i>Gehyra catenata</i>	OBS
Bynoe's Gecko	<i>Heteronotia binoei</i>	OBS
Ocellated Velvet Gecko	<i>Oedura monilis</i>	OBS
Eastern Brown Snake	<i>Pseudonaja textilis</i>	OBS
Key: Observed (OBS), Heard Call (HC), PIR Camera (CAM), Scat (SC), Anabat Recording (ANA), Tracks (TR), Introduced Species (*), Threatened Species under EPBC Act and/or NC Act (bold), Migratory Species (¹).		



A-4 – Database Search Results

A-4-1 Protected Matters Search Tool





Australian Government

Department of Climate Change, Energy,
the Environment and Water

EPBC Act Protected Matters Report

This report provides general guidance on matters of national environmental significance and other matters protected by the EPBC Act in the area you have selected. Please see the caveat for interpretation of information provided here.

Report created: 01-May-2025

[Summary](#)

[Details](#)

[Matters of NES](#)

[Other Matters Protected by the EPBC Act](#)

[Extra Information](#)

[Caveat](#)

[Acknowledgements](#)

Summary

Matters of National Environment Significance

This part of the report summarises the matters of national environmental significance that may occur in, or may relate to, the area you nominated. Further information is available in the detail part of the report, which can be accessed by scrolling or following the links below. If you are proposing to undertake an activity that may have a significant impact on one or more matters of national environmental significance then you should consider the [Administrative Guidelines on Significance](#).

World Heritage Properties:	None
National Heritage Places:	None
Wetlands of International Importance (Ramsar	None
Great Barrier Reef Marine Park:	None
Commonwealth Marine Area:	None
Listed Threatened Ecological Communities:	3
Listed Threatened Species:	30
Listed Migratory Species:	8

Other Matters Protected by the EPBC Act

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

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

A [permit](#) may be required for activities in or on a Commonwealth area that may affect a member of a listed threatened species or ecological community, a member of a listed migratory species, whales and other cetaceans, or a member of a listed marine species.

Commonwealth Lands:	None
Commonwealth Heritage Places:	None
Listed Marine Species:	15
Whales and Other Cetaceans:	None
Critical Habitats:	None
Commonwealth Reserves Terrestrial:	None
Australian Marine Parks:	None
Habitat Critical to the Survival of Marine Turtles:	None

Extra Information

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

State and Territory Reserves:	None
Regional Forest Agreements:	None
Nationally Important Wetlands:	None
EPBC Act Referrals:	9
Key Ecological Features (Marine):	None
Biologically Important Areas:	None
Bioregional Assessments:	None
Geological and Bioregional Assessments:	None

Details

Matters of National Environmental Significance

Listed Threatened Ecological Communities

[Resource Information]

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

Status of Vulnerable, Disallowed and Ineligible are not MNES under the EPBC Act.

Community Name	Threatened Category	Presence Text	Buffer Status
Brigalow (Acacia harpophylla dominant and co-dominant)	Endangered	Community known to occur within area	In feature area
Natural Grasslands of the Queensland Central Highlands and northern Fitzroy Basin	Endangered	Community likely to occur within area	In feature area
Poplar Box Grassy Woodland on Alluvial Plains	Endangered	Community likely to occur within area	In feature area

Listed Threatened Species

[Resource Information]

Status of Conservation Dependent and Extinct are not MNES under the EPBC Act.

Number is the current name ID.

Scientific Name	Threatened Category	Presence Text	Buffer Status
BIRD			
Calidris acuminata Sharp-tailed Sandpiper [874]	Vulnerable	Species or species habitat may occur within area	In feature area
Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	Species or species habitat may occur within area	In feature area
Erythroriorchis radiatus Red Goshawk [942]	Endangered	Species or species habitat may occur within area	In feature area
Falco hypoleucos Grey Falcon [929]	Vulnerable	Species or species habitat may occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Gallinago hardwickii Latham's Snipe, Japanese Snipe [863]	Vulnerable	Species or species habitat may occur within area	In feature area
Geophaps scripta scripta Squatter Pigeon (southern) [64440]	Vulnerable	Species or species habitat known to occur within area	In feature area
Grantiella picta Painted Honeyeater [470]	Vulnerable	Species or species habitat may occur within area	In feature area
Neochmia ruficauda ruficauda Star Finch (eastern), Star Finch (southern) [26027]	Endangered	Species or species habitat likely to occur within area	In feature area
Poephila cincta cincta Southern Black-throated Finch [64447]	Endangered	Species or species habitat may occur within area	In feature area
Rostratula australis Australian Painted Snipe [77037]	Endangered	Species or species habitat may occur within area	In feature area
Stagonopleura guttata Diamond Firetail [59398]	Vulnerable	Species or species habitat may occur within area	In feature area
MAMMAL			
Dasyurus hallucatus Northern Quoll, Digul [Gogo-Yimidir], Wijingadda [Dambimangari], Wiminji [Martu] [331]	Endangered	Species or species habitat may occur within area	In feature area
Macroderma gigas Ghost Bat [174]	Vulnerable	Species or species habitat may occur within area	In feature area
Nyctophilus corbeni Corben's Long-eared Bat, South-eastern Long-eared Bat [83395]	Vulnerable	Species or species habitat may occur within area	In feature area
Petauroides volans Greater Glider (southern and central) [254]	Endangered	Species or species habitat known to occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Phascolarctos cinereus (combined populations of Qld, NSW and the ACT)			
Koala (combined populations of Queensland, New South Wales and the Australian Capital Territory) [85104]	Endangered	Species or species habitat known to occur within area	In feature area
Pteropus poliocephalus			
Grey-headed Flying-fox [186]	Vulnerable	Roosting known to occur within area	In feature area
PLANT			
Cadellia pentastylis			
Ooline [9828]	Vulnerable	Species or species habitat likely to occur within area	In feature area
Dichanthium queenslandicum			
King Blue-grass [5481]	Endangered	Species or species habitat may occur within area	In buffer area only
Dichanthium setosum			
bluegrass [14159]	Vulnerable	Species or species habitat likely to occur within area	In feature area
Eucalyptus raveretiana			
Black Ironbox [16344]	Vulnerable	Species or species habitat may occur within area	In feature area
Polianthion minutiflorum			
[82772]	Vulnerable	Species or species habitat may occur within area	In feature area
REPTILE			
Delma torquata			
Adorned Delma, Collared Delma [1656]	Vulnerable	Species or species habitat may occur within area	In feature area
Denisonia maculata			
Ornamental Snake [1193]	Vulnerable	Species or species habitat likely to occur within area	In feature area
Egernia rugosa			
Yakka Skink [1420]	Vulnerable	Species or species habitat may occur within area	In feature area
Elseya albagula			
Southern Snapping Turtle, White-throated Snapping Turtle [81648]	Critically Endangered	Species or species habitat may occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Furina dunmalli Dunmall's Snake [59254]	Vulnerable	Species or species habitat may occur within area	In feature area
Hemiaspis damelii Grey Snake [1179]	Endangered	Species or species habitat may occur within area	In feature area
Lerista allanae Allan's Lerista, Retro Slider [1378]	Endangered	Species or species habitat may occur within area	In buffer area only
Rheodytes leukops Fitzroy River Turtle, Fitzroy Tortoise, Fitzroy Turtle, White-eyed River Diver [1761]	Endangered	Species or species habitat likely to occur within area	In feature area

Listed Migratory Species	[Resource Information]		
Scientific Name	Threatened Category	Presence Text	Buffer Status
Migratory Marine Birds			
Apus pacificus Fork-tailed Swift [678]		Species or species habitat likely to occur within area	In feature area

Migratory Terrestrial Species			
Cuculus optatus Oriental Cuckoo, Horsfield's Cuckoo [86651]		Species or species habitat may occur within area	In feature area
Motacilla flava Yellow Wagtail [644]		Species or species habitat may occur within area	In feature area

Migratory Wetlands Species			
Actitis hypoleucos Common Sandpiper [59309]		Species or species habitat may occur within area	In feature area
Calidris acuminata Sharp-tailed Sandpiper [874]	Vulnerable	Species or species habitat may occur within area	In feature area
Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	Species or species habitat may occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Calidris melanotos Pectoral Sandpiper [858]		Species or species habitat may occur within area	In feature area
Gallinago hardwickii Latham's Snipe, Japanese Snipe [863]	Vulnerable	Species or species habitat may occur within area	In feature area

Other Matters Protected by the EPBC Act

Listed Marine Species	[Resource Information]		
Scientific Name	Threatened Category	Presence Text	Buffer Status
Bird			
Actitis hypoleucos Common Sandpiper [59309]		Species or species habitat may occur within area	In feature area
Anseranas semipalmata Magpie Goose [978]		Species or species habitat may occur within area overfly marine area	In feature area
Apus pacificus Fork-tailed Swift [678]		Species or species habitat likely to occur within area overfly marine area	In feature area
Bubulcus ibis as Ardea ibis Cattle Egret [66521]		Species or species habitat may occur within area overfly marine area	In feature area
Calidris acuminata Sharp-tailed Sandpiper [874]	Vulnerable	Species or species habitat may occur within area	In feature area
Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	Species or species habitat may occur within area overfly marine area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Calidris melanotos Pectoral Sandpiper [858]		Species or species habitat may occur within area overfly marine area	In feature area
Chalcites osculans as Chrysococcyx osculans Black-eared Cuckoo [83425]		Species or species habitat may occur within area overfly marine area	In feature area
Gallinago hardwickii Latham's Snipe, Japanese Snipe [863]	Vulnerable	Species or species habitat may occur within area overfly marine area	In feature area
Haliaeetus leucogaster White-bellied Sea-Eagle [943]		Species or species habitat likely to occur within area	In feature area
Merops ornatus Rainbow Bee-eater [670]		Species or species habitat may occur within area overfly marine area	In feature area
Motacilla flava Yellow Wagtail [644]		Species or species habitat may occur within area overfly marine area	In feature area
Myiagra cyanoleuca Satin Flycatcher [612]		Species or species habitat may occur within area overfly marine area	In feature area
Rhipidura rufifrons Rufous Fantail [592]		Species or species habitat may occur within area overfly marine area	In buffer area only
Rostratula australis as Rostratula benghalensis (sensu lato) Australian Painted Snipe [77037]	Endangered	Species or species habitat may occur within area overfly marine area	In feature area

Extra Information

EPBC Act Referrals			[Resource Information]	
Title of referral	Reference	Referral Outcome	Assessment Status	Buffer Status
Controlled action				
Bowen Gas Project	2012/6377	Controlled Action	Post-Approval	In feature area
Foxleigh Coal Mine Extension	2010/5421	Controlled Action	Post-Approval	In buffer area only
install & operate gas pipeline	2005/2059	Controlled Action	Post-Approval	In feature area
Middlemount Coal Mine, North-eastern Extension, Bowen Basin, Qld	2016/7717	Controlled Action	Post-Approval	In feature area
Middlemount Coal Mine - Southern Open Cut Extension Project, QLD	2021/8920	Controlled Action	Assessment Approach	In feature area
Middlemount Coal Mine Western Extension Project, Qld	2017/8130	Controlled Action	Post-Approval	In feature area
Middlemount Coal Project Stage 2	2010/5394	Controlled Action	Post-Approval	In feature area
Not controlled action				
extention to the existing underground mine and additional surface areas to gain	2004/1547	Not Controlled Action	Completed	In feature area
Improving rabbit biocontrol: releasing another strain of RHDV, sthrn two thirds of Australia	2015/7522	Not Controlled Action	Completed	In feature area

Caveat

1 PURPOSE

This report is designed to assist in identifying the location of matters of national environmental significance (MNES) and other matters protected by the Environment Protection and Biodiversity Conservation Act 1999 (Cth) (EPBC Act) which may be relevant in determining obligations and requirements under the EPBC Act.

The report contains the mapped locations of:

- World and National Heritage properties;
- Wetlands of International and National Importance;
- Commonwealth and State/Territory reserves;
- distribution of listed threatened, migratory and marine species;
- listed threatened ecological communities; and
- other information that may be useful as an indicator of potential habitat value.

2 DISCLAIMER

This report is not intended to be exhaustive and should only be relied upon as a general guide as mapped data is not available for all species or ecological communities listed under the EPBC Act (see below). Persons seeking to use the information contained in this report to inform the referral of a proposed action under the EPBC Act should consider the limitations noted below and whether additional information is required to determine the existence and location of MNES and other protected matters.

Where data is available to inform the mapping of protected species, the presence type (e.g. known, likely or may occur) that can be determined from the data is indicated in general terms. It is the responsibility of any person using or relying on the information in this report to ensure that it is suitable for the circumstances of any proposed use. The Commonwealth cannot accept responsibility for the consequences of any use of the report or any part thereof. To the maximum extent allowed under governing law, the Commonwealth will not be liable for any loss or damage that may be occasioned directly or indirectly through the use of, or reliance on the contents of this report.

3 DATA SOURCES

Threatened ecological communities

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

Threatened, migratory and marine species

Threatened, migratory and marine species distributions have been discerned through a variety of methods. Where distributions are well known and if time permits, distributions are inferred from either thematic spatial data (i.e. vegetation, soils, geology, elevation, aspect, terrain, etc.) together with point locations and described habitat; or modelled (MAXENT or BIOCLIM habitat modelling) using point locations and environmental data layers.

Where little information is available for a species or large number of maps are required in a short time-frame, maps are derived either from 0.04 or 0.02 decimal degree cells; by an automated process using polygon capture techniques (static two kilometre grid cells, alpha-hull and convex hull); or captured manually or by using topographic features (national park boundaries, islands, etc.).

In the early stages of the distribution mapping process (1999-early 2000s) distributions were defined by degree blocks, 100K or 250K map sheets to rapidly create distribution maps. More detailed distribution mapping methods are used to update these distributions when time permits.

4 LIMITATIONS

The following species and ecological communities have not been mapped and do not appear in this report:

- threatened species listed as extinct or considered vagrants;
- some recently listed species and ecological communities;
- some listed migratory and listed marine species, which are not listed as threatened species; and
- migratory species that are very widespread, vagrant, or only occur in Australia in small numbers.

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

- listed migratory and/or listed marine seabirds, which are not listed as threatened, have only been mapped for recorded breeding sites; and
- seals which have only been mapped for breeding sites near the Australian continent

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

Refer to the metadata for the feature group (using the Resource Information link) for the currency of the information.

Acknowledgements

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

- [-Office of Environment and Heritage, New South Wales](#)
- [-Department of Environment and Primary Industries, Victoria](#)
- [-Department of Primary Industries, Parks, Water and Environment, Tasmania](#)
- [-Department of Environment, Water and Natural Resources, South Australia](#)
- [-Department of Land and Resource Management, Northern Territory](#)
- [-Department of Environmental and Heritage Protection, Queensland](#)
- [-Department of Parks and Wildlife, Western Australia](#)
- [-Environment and Planning Directorate, ACT](#)
- [-Birdlife Australia](#)
- [-Australian Bird and Bat Banding Scheme](#)
- [-Australian National Wildlife Collection](#)
- [-Natural history museums of Australia](#)
- [-Museum Victoria](#)
- [-Australian Museum](#)
- [-South Australian Museum](#)
- [-Queensland Museum](#)
- [-Online Zoological Collections of Australian Museums](#)
- [-Queensland Herbarium](#)
- [-National Herbarium of NSW](#)
- [-Royal Botanic Gardens and National Herbarium of Victoria](#)
- [-Tasmanian Herbarium](#)
- [-State Herbarium of South Australia](#)
- [-Northern Territory Herbarium](#)
- [-Western Australian Herbarium](#)
- [-Australian National Herbarium, Canberra](#)
- [-University of New England](#)
- [-Ocean Biogeographic Information System](#)
- [-Australian Government, Department of Defence](#)
- [Forestry Corporation, NSW](#)
- [-Geoscience Australia](#)
- [-CSIRO](#)
- [-Australian Tropical Herbarium, Cairns](#)
- [-eBird Australia](#)
- [-Australian Government – Australian Antarctic Data Centre](#)
- [-Museum and Art Gallery of the Northern Territory](#)
- [-Australian Government National Environmental Science Program](#)
- [-Australian Institute of Marine Science](#)
- [-Reef Life Survey Australia](#)
- [-American Museum of Natural History](#)
- [-Queen Victoria Museum and Art Gallery, Inveresk, Tasmania](#)
- [-Tasmanian Museum and Art Gallery, Hobart, Tasmania](#)
- [-Other groups and individuals](#)

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

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

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A-4-2 WildNet Species List Search





Queensland Government

WildNet species list

Search Criteria: Species List for a Specified Point
Species: All
Type: Native
Queensland status: Rare and threatened species
Records: All
Date: All
Latitude: -22.8703
Longitude: 148.6695
Distance: 5
Email: dominic.barbagallo@biodiversityaust.com.au
Date submitted: Thursday 01 May 2025 09:38:22
Date extracted: Thursday 01 May 2025 09:40:07

The number of records retrieved = 1

Disclaimer

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Information about your Species lists request is logged for quality assurance, user support and product enhancement purposes only.

The information provided should be appropriately acknowledged as being derived from WildNet database when it is used. As the WildNet Program is still in a process of collating and vetting data, it is possible the information given is not complete. Go to the WildNet database webpage (<https://www.qld.gov.au/environment/plants-animals/species-information/wildnet>) to find out more about WildNet and where to access other WildNet information products approved for publication. Feedback about WildNet species lists should be emailed to wildlife.online@des.qld.gov.au.

Kingdom	Class	Family	Scientific Name	Common Name	I	Q	A	Records
animals	mammals	Pseudocheiridae	<i>Petauroides volans volans</i>	southern greater glider		E	E	3

CODES

- I - Y indicates that the taxon is introduced to Queensland and has naturalised.
- Q - Indicates the Queensland conservation status of each taxon under the *Nature Conservation Act 1992*.
The codes are Extinct (EX), Extinct in the Wild (PE), Critically Endangered (CR), Endangered (E), Vulnerable (V), Near Threatened (NT), Special Least Concern (SL) and Least Concern (C).
- A - Indicates the Australian conservation status of each taxon under the *Environment Protection and Biodiversity Conservation Act 1999*.
The values of EPBC are Extinct (EX), Extinct in the Wild (XW), Critically Endangered (CE), Endangered (E), Vulnerable (V) and Conservation Dependent (CD).
- Records - The first number indicates the total number of records of the taxon (wildlife records and species listings for selected areas).
This number is output as 99999 if it equals or exceeds this value. A second number located after a / indicates the number of specimen records for the taxon.
This number is output as 999 if it equals or exceeds this value.