

## QUEENSLAND NORTHERN HUB

# SIGNIFICANT RESIDUAL IMPACT ASSESSMENTS – SONOMA EAST PIT EXTENSION MLA 70075



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Signed on behalf of Terrestria Pty Ltd



Dr Andrew Daniel  
Managing Director

Date: August 2023

# QUEENSLAND NORTHERN HUB

## SIGNIFICANT RESIDUAL IMPACT ASSESSMENTS – SONOMA EAST PIT EXTENSION MLA 70075

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## Abbreviations

- EA Environmental Authority
- EO Reg Environmental Offsets Regulation 2014
- ESA Environmentally Sensitive Area
- GIS Global Information System
- MNES Matters of National Environmental Significance
- RE Regional Ecosystems
- SRI Significant Residual Impact
- TEC Threatened Ecological Community
- VM Act Queensland’s Vegetation Management Act 1999

## 1.0 Introduction

### 1.1 Background and Purpose

Terrestria Pty Ltd has prepared this report for QCoal Pty Ltd for the purpose of providing an independent assessment of the Significant Residual (State) and Significant Impacts (federal) to ecological values arising from the Sonoma East MLA 700075 area near Collinsville in Central Queensland (Project areas) (**Figure 1.1**).

The aim of this report is to provide spatially explicit, field-verified estimations of the areas of State and federally important ecological values<sup>1</sup> that will be impacted by the proposed development activities. Then subsequently assess any significant residual impact that the proposed disturbance may have on matters of State and federal ecological significance.

### 1.2 Proposed Works

The proposed works consist of infrastructure to support the development of the Sonoma East Complex. The total area that will be cleared is referred to as the Construction Impact Area within this report. The layout of the Construction Impact Area is shown in **Figure 1.1**.

### 1.3 General Project Area Description

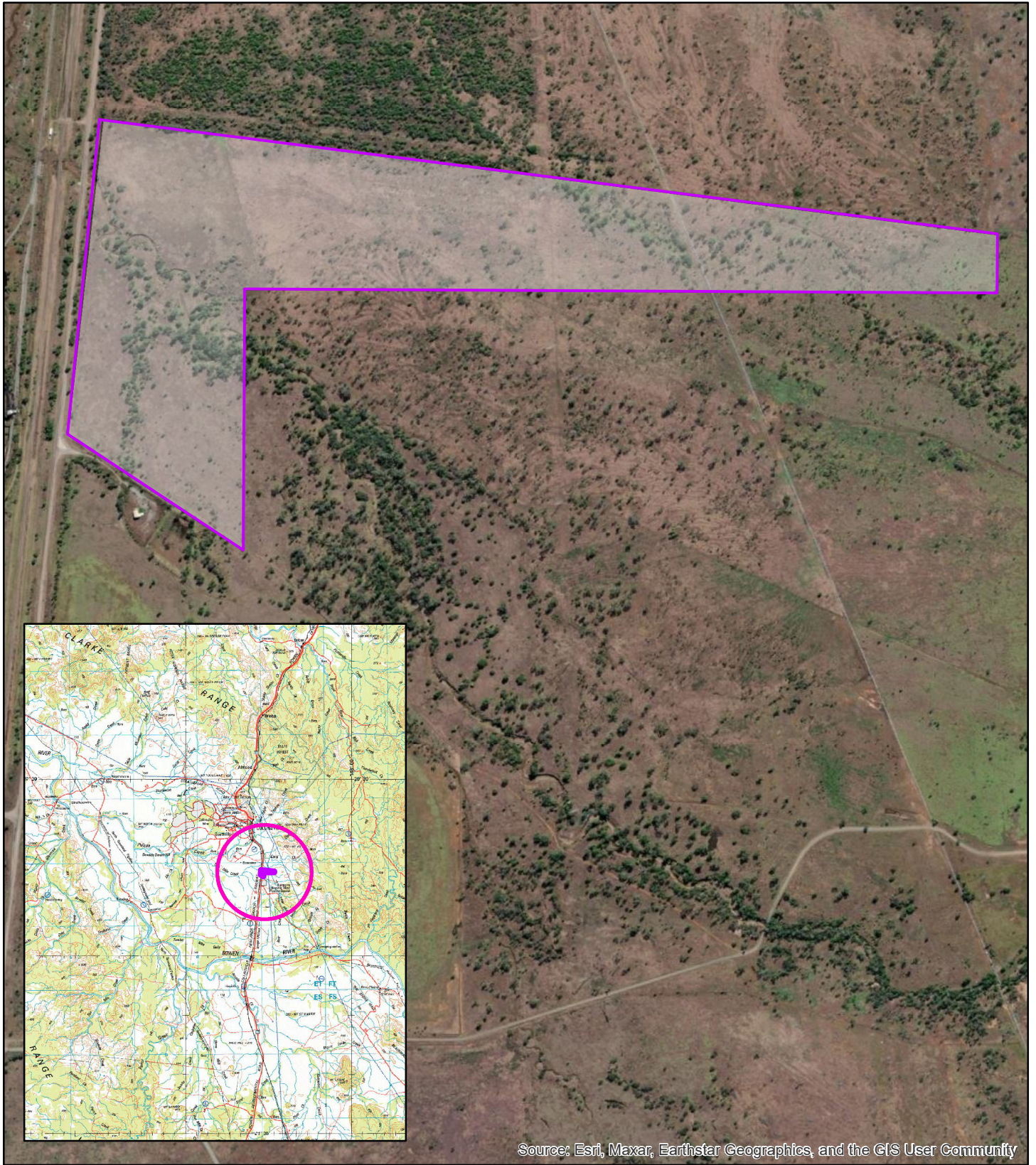
The Project area is located immediately north of the Bowen River approximately 10 km south of Collinsville in north central Queensland. The study area is within the Burdekin Basin and the Northern Bowen Basin sub-bioregion of the Brigalow Belt North bioregion. The region experiences sub-tropical climatic conditions with average temperatures between 21.4 C° and 33.5 C° in the summer months, and 9.1 C° to 27.6 C° in the winter months (BoM 2019). The mean average rainfall for the region is approximately 703 mm with a pronounced wet season. Approximately 75% of the annual rainfall is typically recorded between November and March. Agricultural pursuits, particularly cattle-grazing and cultivation are the predominate land uses in the region (**Figure 1.1**).

The Sonoma MLA700075 area is approximately 74 ha in size, bounded to the west by the Bowen Development Road and dissected by two minor watercourses. Most of the Project area is covered by low rolling hills of sandy clays supporting eucalyptus dominated woodlands that have been variously cleared for cattle grazing and support mostly exotic grass pastures.

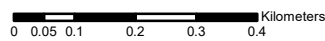
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<sup>1</sup> Impacts to these values may qualify as either a prescribed environmental matter (MSES) or a Matter of National Environmental Significance (MNES).





Source: Esri, Maxar, Earthstar Geographics, and the GIS User Community





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Aerial imagery courtesy of Bing Maps.

### LEGEND

-  ML700075
-  Sonoma MLA700075 CIA

### FIGURE 1.1

#### Site Location, Project Area Boundary and Construction Impact Area

Queensland Northern Hub  
 Significant Residual  
 Impact Assessments  
 Sonoma Pit Extension

AD 23/06/23  
 Job No. 0315





## 2.0 Background and Regulatory Context

### 2.1 State Regulation

#### 2.1.1 State Environmental Authority Conditions

QCoal Group is seeking to amend the Sonoma East Mine Environmental Authority (EA) to include an additional mining lease and associated disturbance not previously approved for the sites. This will be reflected in updated ABC mapping included as an attachment to the EA. To this end, a Significant Residual Impact (SRI) assessment has been undertaken based on identified Prescribed Environmental Matters (PEMs) in accordance with the Queensland Environmental Offsets Policy Significant Residual Impact Guidelines (DES, 2014).

#### 2.1.2 Relationship between Environmentally Sensitive Areas and Prescribed Environmental Matters

Environmental offsets compensate for unavoidable significant impacts on prescribed environmental matters, such as highly valuable species and ecosystems. Conditions for environmental offsets are applied under both the *Environmental Protection Act 1994*, and *Nature Conservation Act 1992*, which regulate whether an environmental offset is required as a condition of the EA

Whilst the EA prescribes what activities can occur within, and requirement to avoid impacts to, environmentally sensitive areas<sup>2</sup>, it is the Offsets Regulation that provides details of the prescribed environmental matters<sup>3</sup> to which the Offsets Act applies. If the prescribed activity is determined to have an impact on a 'prescribed environmental matter' and despite undertaking all reasonable avoidance and mitigation measures, that activity will have a 'significant residual impact' on the prescribed environmental matter, an environmental offset may be required under the EA.

The relevant prescribed environmental matters for the current activity are:

- Matters of State Environmental Significance (MSES) as defined in Schedule 2 of the Environmental Offsets Regulation 2014 (EO Regulation).

#### Determining the significance of an impact

Assessment of the extent, or potential maximum extent, of an impact associated with a prescribed activity on a prescribed environment matter forms part of the application assessment process. After all reasonable avoidance and mitigation has been taken into account, remaining impacts on each prescribed environmental matter are added to determine the extent of residual impact. Once the extent

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<sup>2</sup> Category A and category B environmentally sensitive areas (ESAs) as defined under Schedule 19 of the Environmental Protection Regulation 2019 (EP Regulation); Category C ESAs where defined in a relevant model conditions document<sup>1</sup> or ERA standard<sup>2</sup>;

<sup>3</sup> Prescribed Environmental Matters

Prescribed environmental matters are listed in section 10 of the Offsets Act, and in section 5 and Schedule 2 of the Offsets Regulation. Prescribed environmental matters may be:

- Matters of National Environmental Significance (MNES)
- Matters of State Environmental Significance (MSES)
- Matters of Local Environmental Significance (MLES).

of the residual impact on each prescribed environmental matter has been identified, an analysis can be undertaken to determine if that residual impact is, or is likely to be, 'significant'.

### Significant residual impacts

A significant residual impact is defined in Section 8 of the Offsets Act. A significant residual impact is generally an adverse impact, whether direct or indirect, of a prescribed activity on all or part of a prescribed environmental matter that:

- remains, or will or is likely to remain, (whether temporarily or permanently) despite on-site avoidance and mitigation measures for the prescribed activity; and
- is, or is likely to be, significant<sup>45</sup>.

The prescribed matters that are relevant to the current Project area include:

- Regulated Vegetation
- Wetlands and watercourses
- Protected Wildlife habitat
- Connectivity Area
- Protected Area
- Waterway providing for fish passage
- Legally secured offset areas

#### **2.1.3 Prescribed Environmental Matters – Regulated Vegetation**

Regulated vegetation is a 'prescribed regional ecosystem' that:

- is an endangered or of concern regional ecosystem, as defined under the *Vegetation Management Act 1999*; or
- intersects with an area shown on the vegetation management wetlands map, as defined under the *Vegetation Management Act 1999*, to remove doubt this refers to that component of a regional ecosystem that lies within a mapped wetland; or
- is located within the defined distance (5m<sup>6</sup>) from the defining banks of a watercourse identified on the vegetation management watercourse map, as defined under the *Vegetation Management Act 1999*.

The definition of prescribed regional ecosystem is in the Environmental Offsets Regulation 2014 and does not include regrowth vegetation.

Table 1 of the SRI Guidelines details the significant residual impact criteria for regulated vegetation.

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<sup>4</sup> Queensland Environmental Offsets Policy Significant Residual Impact Guideline Nature Conservation Act 1992 Environmental Protection Act 1994 Marine Parks Act 2004 December 2014 Section 1, p1.

<sup>5</sup> It is noted that the significant impact criteria provide a trigger for consideration of offsets. Once this trigger has been met or exceeded, then the total of the impact is included for consideration—not just the component of impact exceeding the criteria.

<sup>6</sup> SRI Guidelines S2.1 Table 1 row 3

For clearing for linear infrastructure:

- greater than 25m wide in a grassland (structural category) regional ecosystem; or
- greater than 20m wide in a sparse (structural category) regional ecosystem; or
- greater than 10m wide in a dense to mid-dense (structural category) regional ecosystem.

For clearing other than clearing for linear infrastructure:

- area greater than 5 ha where in a grassland (structural category) regional ecosystem; or
- area greater than 2 ha where in a sparse (structural category) regional ecosystem; or
- area greater than 0.5 ha where in a dense to mid-dense (structural category) regional ecosystem.

#### **2.1.4 Prescribed Environmental Matters – Wetlands and Watercourses**

An offset may be required for the following wetlands:

- wetland in a wetland protection area as shown on the Map of referable wetlands under schedule 12, part 2 of the Environmental Protection Regulation 2008;
- wetlands of high ecological significance as shown on the Map of referable wetlands under schedule 12, part 2 of the Environmental Protection Regulation 2008; and
- wetland or watercourse in a high ecological value waters as identified under the Environmental Protection (Water) Policy 2009, schedule 2.

An action is likely to have a significant residual impact on prescribed wetlands or watercourses if it is likely that the action will result in environmental values being affected in any of the following ways:

- areas of the wetland or watercourse being destroyed or artificially modified;
- a measurable change in water quality of the wetland or watercourse—for example a change in the level of the physical and/or chemical characteristics of the water, including salinity, pollutants, or nutrients in the wetland or watercourse, to a level that exceeds the water quality guidelines for the waters; or
- the habitat or lifecycle of native species, including invertebrate fauna and fish species, dependent upon the wetland being seriously affected; or
- a substantial and measurable change in the hydrological regime or recharge zones of the wetland, e.g. a substantial change to the volume, timing, duration and frequency of ground and surface water flows to and within the wetland; or
- an invasive species that is harmful to the environmental values of the wetland being established (or an existing invasive species being spread) in the wetland.

#### **2.1.5 Prescribed Environmental Matters – Protected Wildlife Habitat**

Clearing of native vegetation, regulated by the State has the potential to impact upon Prescribed Environmental Matters. Protected Wildlife habitat is one of the prescribed environmental matters and is defined below:

*Protected wildlife habitat*<sup>7</sup>

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<sup>7</sup> Section 5,p 10

This section applies to the following MSES prescribed in the Environmental Offsets Regulation 2014 (EO Reg):

- an area of essential habitat on the essential habitat map for an animal or plant that is endangered or vulnerable wildlife (section 2(3)(b), Schedule 2, EO Reg);
- an area that is shown as a high risk area on the flora survey trigger map and that contains plants that are endangered or vulnerable wildlife (section 6(1), Schedule 2, EO Reg)
- an area that is not shown as a high risk area on the flora survey trigger map, to the extent the area contains plants that are endangered or vulnerable wildlife (section 6(2), Schedule 2, EO Reg)
- an area of habitat (e.g. foraging, roosting, nesting or breeding habitat) for an animal that is endangered, vulnerable or a special least concern animal (section 6(4), EO Reg).

Significant residual impact criteria<sup>8</sup>: for Endangered and Vulnerable wildlife habitat (including essential habitat) & Special Least Concern Wildlife will occur if the impact on the habitat is likely to:

- lead to a long-term decrease in the size of a local population; or
- reduce the extent of occurrence of the species; or
- fragment an existing population; or
- result in genetically distinct populations forming as a result of habitat isolation; or
- result in invasive species that are harmful to an endangered or vulnerable species becoming established in the endangered or vulnerable species' habitat; or
- introduce disease that may cause the population to decline, or
- interfere with the recovery of the species; or
- cause disruption to ecologically significant locations (breeding, feeding, nesting, migration or resting sites) of a species.

Significant residual impact criteria<sup>9</sup> for *Special least concern (non-migratory) animal wildlife habitat* are:

An action is likely to have a significant impact on a special least concern (non-migratory) animal wildlife habitat will occur if it is likely that it will result in:

- a long-term decrease in the size of a local population; or
- a reduced extent of occurrence of the species; or
- fragmentation of an existing population; or
- result in genetically distinct populations forming as a result of habitat isolation; or
- disruption to ecologically significant locations (breeding, feeding or nesting sites) of a species.

#### 2.1.6 Prescribed Environmental Matters – Other

There are several other prescribed environmental matters that attract offset requirement. An assessment of the list of other potential matters has determined that none of them occur within the Project area and have not been considered in any more detail. These matters are:

- Connectivity Area
- Wetlands and Watercourses
- Koala habitat in South East Queensland

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<sup>8</sup> Section 5.1

<sup>9</sup> Section 5.1



- Protected Area
- Fish Habitat Area and Highly Protected Zones of State Marine Parks
- Waterway providing for fish passage
- Marine Plants
- Legally secured offset areas

## 2.2 Federal Regulation

### 2.2.1 Matters of National Environmental Significance

The proposed disturbance may require referral to the Commonwealth Department of Climate Change, the Environment, Energy and Water (DCCEEW) based on significant impacts to Matters of National Environmental Significance (MNES).

Matters of National Environmental Significance (MNES) are protected and regulated under the Commonwealth's *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act). MNES that are prescribed environmental matters are listed in section 10(3) of the Offsets Act and section 5 of the Offsets Regulation. Offset conditions for MNES cannot be imposed, delivered or legally secured under the Offsets Act because it has not been accredited by the Commonwealth.

Under the EPBC Act, an action will require approval from the minister if the action has, will have, or is likely to have, a significant impact on a matter of national environmental significance. The *Matters of National Environmental Significance; Significant Impact Guidelines 1.1* (2013) provide guidance on assessing whether or not the proposed action will have a significant impact.

To assist in assessing the possible impacts to matters of national environmental significance, the EPBC Act protected matters search tool allows you to search for matters of national environmental significance in an area where you propose to take an action. This search tool provides information on the proximity of the action to:

- Threatened species and ecological communities;
- Migratory species;
- Australia's Ramsar Wetlands;
- The Commonwealth marine environment;
- Australia's World Heritage properties;
- National Heritage places; and
- the Great Barrier Reef Marine Park.

In order to decide whether an action is likely to have a significant impact, it is necessary to take into account the nature and magnitude of potential impacts. In determining the nature and magnitude of an action's impacts, it is important to consider matters such as:

- the sensitivity of the environment which will be impacted;
- the timing, duration and frequency of the action and its impacts;
- all on-site and off-site impacts;
- all direct and indirect impacts;
- the total impact which can be attributed to the action over the entire geographic area affected, and over time;

- existing levels of impact from other sources, and
- the degree of confidence with which the impacts of the action are known and understood.

The 'significant impact criteria given within the Significant Impact Guidelines (1.1), for each MNES are intended to assist in determining whether the impacts of the proposed action on any MNES are likely to be significant.

The MNES relevant to the current Project area include:

- Threatened species and ecological communities;
- Migratory species.

## 2.2.2 Threatened species – Critically endangered and endangered species

### Significant impact criteria

An action is likely to have a significant impact on a critically endangered or endangered species if there is a real chance or possibility that it 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 likely to have a significant impact on a vulnerable species if there is a real chance or possibility that it 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.

### 2.2.3 Threatened Ecological Communities – Critically endangered and endangered ecological communities

#### Significant impact criteria

An action is likely to have a significant impact on a critically endangered or endangered ecological community if there is a real chance or possibility that it 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, 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

### 3.0 Methodology

Impacts to regulated vegetation and threatened ecological communities were evaluated using field-scale regional ecosystem mapping, the construction impact area footprint and Sate mapping layers for wetlands and watercourses.

The suite of threatened<sup>10</sup> fauna species that may occur, and would therefore be impacted by the proposed works, was developed through interrogation of the federal Protected Matters Search Tool and the State WildNet database for the Project area and surrounds. The likelihood that these species would occur and could persist within the Project area was then assessed using expert species knowledge and knowledge of the extent and type of habitats present. This list of species that have the potential to occur within the Project area was then subjected to impact assessment.

The general distribution of potential habitats for the target threatened fauna species were determined by assigning categories of essential, general and non-habitat to field mapped regional ecosystem polygons. The Construction Impact Area was superimposed over these maps to determine the extent of impact to these potential habitats. Species were short listed for significant impact assessment where their potential habitats were determined to be meaningfully impacted.

The degree potential habitat impacts were then further evaluated using the known presence of a suite of essential micro-habitat features for each species to map out and quantify the quality of habitats impacted. The known quality and quantity of the habitats impacted were then assessed against the criteria set out in the Guidelines<sup>11</sup>, together with expert knowledge of the species' ecology. Details of the methods employed in this methodology are detailed below.

#### 3.1 Potential Occurrence of Threatened Species

The potential occurrence of species listed as threatened under the EPBC act within the locality was investigated through a Protect Matters Search and a WildNet database search for the Project area with a 10 km buffer (**Appendix A & B**).

The likelihood of occurrence of these species within the immediate vicinity of the Construction Impact Areas were assessed using expert knowledge of the micro-habitat features required to sustain these species and detailed knowledge of the presence and distribution of these micro-habitat features within the Project area (**Appendix C**). Four (4) categories were used to classify the likelihood of threatened flora and fauna species being present within the Project area based on the desktop research and on-site observations. Categories were defined as:

- Present (confirmed during field assessments);
- Likely (suitable habitat observed during field assessments, within known distribution and records of the species occurring within or around the Project area);

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<sup>10</sup> Listed under the *Environment Protection and Biodiversity Conservation Act 1999* and/or the *Nature Conservation Act, 1992*.

<sup>11</sup> Significant Impact Guidelines, (2013). Matters of National Environmental Significance; Significant Impact Guidelines 1.1 Environment Protection and Biodiversity Conservation Act 1999. Australian Department of Environment.

Queensland Environmental Offsets Policy, Significant Residual Impact Guideline. Nature Conservation Act 1992 Environmental Protection Act 1994 Marine Parks Act 2004 December 2014

- Potential (possibility of suitable habitat, or limited records of the species within the local region); and
- Unlikely (no suitable habitat or not known to occur within the local region).

### 3.2 Distribution of Threatened Species Habitat

Field validated regional ecosystem mapping was produced by Terrestria for the Project area<sup>12</sup>. These maps provided the baseline information on which the delineation of habitat types was created. This information was supplemented by the addition of regrowth regional ecosystems using field data and current high quality aerial photography interpretation within ArcGIS10.7.

Maps of General, Essential and Non-habitat were then produced for all threatened species thought to occur by assigning each regional ecosystem to a habitat type (**Appendix D**). These habitat types were then assigned to all field-mapped polygons (including regrowth regional ecosystems) to produce maps showing the distribution of habitat types across the Project area. The Construction Impact Area was then overlain to gain a visual assessment of the likely impacts on habitats brought about by the mine expansion. These maps were used as a ‘first-cut’ to define which species may be significantly impacted.

Scores of ‘habitat quality’ for each habitat polygon (regional ecosystem x growth status) were then produced using the State’s ‘Species habitat attributes’ and ‘Absence of threats’ methods<sup>13</sup> applied to field data. These scores were then assigned to all similar polygons to produce maps of habitat quality across the Project area. This process was repeated for each species where initial evaluation had indicated a closer assessment was necessary.

A visual representation of habitat quality was then produced using colour ramps from within ArcGIS to provide spatially explicit distributions of habitat quality. These maps were overlain with the Construction Impact Area to delineate the areas and quality of habitat that will be impacted. These layers were then intersected, and the database exported into excel. These databases were then queried to produce tables showing the total area of each habitat quality score impacted. The quality of habitat was then categorised into three (3) classes depending upon the presence and abundance of micro-habitat features known to be required for the survival and proliferation of each species.

<b>Low quality habitat</b>	Habitat quality Scores 0 – 4.9	Most micro-habitat features that could support individuals of this species are largely absent. Scores are largely derived from presence of features that facilitate movement between other suitable patches of habitat (corridor values).
<b>Medium quality</b>	habitat quality Scores 5.0 – 6.5.	Many of the micro-habitat features known to support this species are present but may be sparsely distributed or the habitat is isolated from other habitat patches.
<b>High Quality</b>	habitat quality Sores 6.6 – 10.0	Most if not all micro-habitat features known to support this species are present and generally abundant. Habitat patches are also well connected to habitat within the broader landscape.

<sup>12</sup> Sonoma MLA 700075 Vegetation Community Mapping Technical Report (May 2023). Prepared for QCoal Pty Ltd by Terrestria Pty Ltd

<sup>13</sup> Guide to determining terrestrial habitat quality, Methods for assessing habitat quality under the Queensland Environmental Offsets Policy, Version 1.3 February 2020

### 3.2.1 Greater Glider Habitat Assessments

Given the issues of variability in the assessment of trees with hollows across multiple observers, and the demonstrated correlation between tree diameter size and the presence of hollows and other important greater glider habitat attribute, it is recommended that assessors use tree size rather than presence or absence of hollow-bearing trees to determine greater glider habitat<sup>14</sup>. Tree diameter is easy and reliable to measure. A large tree that provides habitat for the Greater glider in Queensland is considered to be 46 cm DBH or larger<sup>15</sup> with the benchmark density of large trees per hectare within the Brigalow belt being 14.9 +/- 5.1<sup>16</sup>.

The presence and density of large trees with the potential to provide habitat for the greater glider was determined by measuring the DBH of all trees greater than 10 cm DBH in plots 100m x 50m located within representative areas of mapped Eucalypt dominated communities across the Survey area. The results of these assessments were used to assess habitat quality.

### 3.3 Calculating the Significant Residual Impact

#### 3.3.1 Prescribed Environmental Matters – Regulated Vegetation

Regulated vegetation are prescribed regional ecosystems that are an endangered or of concern regional ecosystem, as defined under the *Vegetation Management Act 1999*. The Construction Impact Area was intersected with the field-verified regional ecosystem and the areas of mapped regulated vegetation were exported into excel. Pivot tables were used to calculate the total area of clearing for each mapped regional ecosystem type.

The significant residual impact test<sup>17</sup> was applied to areas of clearing. In short, clearing that is greater than 10m wide represents a significant residual impact on endangered or of concern regional ecosystem. Once this threshold is reached all clearing within this regional ecosystem is considered to represent a significant residual impact.

#### 3.3.2 Prescribed Environmental Matters – Wetlands and Watercourses

Regulated Wetlands are mapped wetland areas shown on the vegetation management wetlands map, as defined under the *Vegetation Management Act 1999*<sup>18</sup>. Disturbance of remnant vegetation within 50m of a mapped wetland constitutes a significant residual impact.

Regulated watercourse vegetation is remnant vegetation that is located within the defined distance from the defining banks of a watercourse identified on the vegetation management watercourse map, as defined under the *Vegetation Management Act 1999*.

Clearing that occurs within 5m of the defining bank of a mapped watercourse and 50m of a wetland is determined to cause a significant residual impact. Vegetation that is within the defined distance from

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<sup>14</sup> Eyre TJ, Smith GC, Venz MF, Mathieson MT, Hogan LD, Starr, C, Winter, J and McDonald, K 2022, Guide to greater glider habitat in Queensland, report prepared for the Department of Agriculture, Water and the Environment, Canberra. Department of Environment and Science, Queensland Government, Brisbane page 29.

<sup>15</sup> Eyre et al; 2022, page 30.

<sup>16</sup> Eyre et al; 2022 Table 7.1 page 30

<sup>17</sup> Queensland Environmental Offsets Policy Significant Residual Impact Guideline Nature Conservation Act 1992 Section 2.1 Table 1

<sup>18</sup> to remove doubt this refers to that component of a regional ecosystem that lies within a mapped wetland

the defining banks of a watercourse and/or wetland was determined by using the vegetation management watercourse map shapefile extracted from QSpatial. The polylines were buffered by 5m to capture clearing that occurs within 5m of the defining bank. The significant residual impact test<sup>19</sup> was applied to areas of clearing within a defined distance of a mapped<sup>20</sup> watercourse.

### 3.3.3 Prescribed Environmental Matters – Protected Wildlife Habitat

The direct impacts to threatened fauna habitat were calculated according to requirements under Queensland’s Environmental Offsets Policy (v 1.8; February 2020) as set out in Queensland Environmental Offsets Policy, Significant Residual Impact Guideline<sup>21</sup>: The list of MSES species thought likely to occur and therefore possibly impacted was compiled using a WildNet database search with a radius of 20 km (**Appendix A**) and expert knowledge of threatened species that may occur within the local landscape. The resultant list of species known from the locality, that may possibly occur due to the presence of suitable habitat, was determined using the method described in **Section 3.1** above. The distribution of suitable habitat was mapped using the method described in **Section 3.2** above. The total area of each habitat type and quality that is potentially impacted by the Project was determined by intersecting the fauna habitat quality maps with the Construction Impact Area shapefile in ArcGIS 10.7. The resultant impacted areas were extracted into Excel and pivot tables were used to provide the area of each habitat quality impacted by the proposed activities.

#### Assessing Significant Residual Impacts

The likely impact of the proposed clearing on each individual threatened species was assessed according to the criteria set out in Section 5.1 of the Significant Residual Impact Guideline (2014). This assessment considered:

- The total quantum of potential habitat clearing;
- The size of individual patches of potential habitat to be cleared;
- The micro-habitat features of the habitat to be cleared (Habitat Quality);
- The known presence of the threatened species;
- The clearing width;
- Requirements for Rehabilitation; and
- The ecology of the threatened species.

An assessment was then made on whether the combination of these impacts on a particular species would result in a significant residual impact to its ecology if it were to occur within the Project Area.

### 3.3.4 Other Prescribed Environmental Matters

No other prescribed environmental matters were determined to be present within the Project area.

## 3.4 Matters of National Environmental Significance

### 3.4.1 Matters of National Environmental Significance - Threatened Ecological Communities

Field validated regional ecosystem and regrowth mapping was interrogated to identify regional ecosystems that are listed as an equivalent threatened ecological community (TEC), for any of the

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<sup>19</sup> Queensland Environmental Offsets Policy Significant Residual Impact Guideline Nature Conservation Act 1992 Section 2.1 Table 1

<sup>20</sup> Vegetation management watercourse and drainage feature map (1:100 000 and 1:250 000)

<sup>21</sup> Section 5.0 Queensland Environmental Offsets Policy, Significant Residual Impact Guideline: Nature Conservation Act 1992 Environmental Protection Act 1994 Marine Parks Act 2004, December 2014.

critically endangered or endangered ecological communities that may occur within the Project area, including regrowth. The extent and distribution of these regional ecosystems within the Construction Impact Area was then used to determine the total quantum of TECs that were impacted.

### **3.4.2 Matters of National Environmental Significance - Threatened Fauna Habitat**

A list of federally threatened fauna species thought likely to occur within the Project Area was compiled using a Protected Matters Search Tool (**Appendix B**). Expert habitat modelling, was used to assign regional ecosystems that potentially provide the micro-habitat features required to support these species (**Appendix D**) according to methods provided in **Sections 3.1** and **3.2**. The total area of each habitat type and quality that is potentially impacted by the Project was determined by intersecting the fauna habitat quality maps with the Construction Impact Area shapefile in ArcGIS 10.7. The resultant impacted areas were extracted into Excel and pivot tables were used to provide the area of each habitat quality impacted by the proposed activities. These data, together with an assessment of the species and local landscape ecology factors were then assessed against the significant impact criteria<sup>22</sup> to assess the likelihood that impacts, post-mitigation, would have a significant impact on these species in a manner similar to that described for impacts to MSES above.

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<sup>22</sup> Significant Impact Guidelines, (2013). Matters of National Environmental Significance; Significant Impact Guidelines 1.1 Environment Protection and Biodiversity Conservation Act 1999. Australian Department of Environment.



## 4.0 Results

### 4.1 Residual Impacts to MSES

#### 4.1.1 Prescribed Environmental Matters – Regulated Vegetation

Areas of remnant regional ecosystems impacted by the Construction Impact Area are shown in **Figure 4.1**. No areas of Regulated Vegetation (Of concern or Endangered regional ecosystems<sup>23</sup>) will be impacted by the project, are provided in **Table 4.1**.

**Table 4.1: Areas of Clearing within Regulated Vegetation – Remnant Regional Ecosystems**

Remnant Regional Ecosystem	Biodiversity status	Area (ha)	Significant Residual Impact
11.9.2	No concern at present	5.93	No
11.9.9	No concern at present	9.2	No

#### 4.1.2 Prescribed Environmental Matters – Wetlands and Watercourses

No wetlands shown on the vegetation management wetlands map, were identified as present within the Project area.

The area of clearing of remnant vegetation within the defined distance of a regulated watercourse is shown in **Figure 4.1**. The area of remnant vegetation that will be impacted by the Project is presented in **Table 4.2**. In total 0.82 ha of remnant vegetation intersecting a watercourse will be cleared.

**Table 4.2: Areas of Clearing within Regulated Vegetation – Remnant Regional Ecosystem within 5m of a Watercourse**

Regional Ecosystem	Area
11.9.9	0.82

#### 4.1.3 Prescribed Environmental Matters – Protected Wildlife Habitat

A review of the likely presence of all species predicted to occur within the locality is given in **Appendix C**. The threatened species determined to potentially occur within the Project area are given in **Appendix D**, along with regional ecosystem equivalents for General and Essential Habitat and limitations of their distribution and impact across the Project area. A total of 11 threatened fauna species were determined to potentially occur within the Project Area (**Table 4.3**).

Maps showing the distribution of potential habitat and the extent of impact (Construction Impact Area) are given in **Appendix E**. There was no utility in providing figures for general habitat for fork-tailed swift *Apus pacificus* and Echidna *Tachyglossus aculeatus* as they are predicted to occur across the entire Project area and so figures for these species have not been presented.

Maps showing the distribution of potential habitat have been used to short list the species whose habitat may possibly be significantly impacted by the Project (**Appendix E**). Review of the distribution of potential habitat against the Construction Impact Area shows that only minor areas of potential foraging

<sup>23</sup> Vegetation Management Act Class

habitat for oriental cuckoo *Cuculus optatus*, Satin flycatcher *Myiagra cyanoleuca*, and Spectacled monarch *Symposiachrus trivirgatus* will be disturbed and that significant residual impacts for these species are not expected. Review of the habitat maps reveal that habitat for six (6) species has the potential to be significantly impacted by the Project:

- Squatter Pigeon (southern) *Geophaps scripta scripta*;
- Ornamental snake *Denisonia maculate*;
- Yakka Skink *Egernia rugosa*;
- Greater Glider (northern) *Petauroides minor*;
- Greater Glider (central and southern) *Petauroides volans*; and
- Koala *Phascolarctos cinereus*.

It is unlikely that both glider species are present within the Project area and their habitat requirements are similar and so impacts to habitat for Greater Glider *senso latu* has been investigated.

The State's 'Species habitat attributes' and 'Absence of threats' methods were applied as a metric of 'habitat quality' to site data for each habitat type (regional ecosystem x growth status). The total quantum of habitat for each quality score has been determined and is shown in **Figures 4.2 – 4.6**, along with the Contraction Impact Area. Intersection of the area to be impacted with the distribution of habitat quality has been used to generate estimates of the amount and quality of habitat that will be disturbed (**Table 4.4**)

An assessment of the likelihood of a significant residual impact occurring on prescribed protected wildlife habitat using expert analysis of the micro-habitat values provided by the habitat to be disturbed, its role in the local landscape and the known ecology of the species is presented in **Appendix F**.

**Table 4.3: Threatened Fauna Species Predicted to Occur Based on Habitat Present**

Species	NC Act	EPBC Act	Habitat preference
<b>Birds</b>			
fork-tailed swift <i>Apus pacificus</i>	SL	NL	Feeds on the wing often along storm fronts and rarely lands
oriental cuckoo <i>Cuculus optatus</i>	SL	NL	Found in more humid habitats such as monsoon forest, wet eucalypt forest, river margins and near mangroves
Squatter Pigeon (southern) <i>Geophaps scripta scripta</i>	V	V	Dry grassy eucalypt woodlands and open forests, also Callitris and Acacia woodlands. Most birds live in sandy sites near permanent water. Often observed at cattle yards, dirt tracks and other disturbed areas.
Satin flycatcher <i>Myiagra cyanoleuca</i>	SL	NL	Found in tall forests, preferring wetter habitats such as heavily forested gullies, but not rainforests.
Spectacled monarch <i>Symposiachrus trivirgatus</i>	SL	NL	Found in thick understorey in rainforests, wet gullies and waterside vegetation, as well as mangroves
<b>Reptiles</b>			
ornamental snake <i>Denisonia maculata</i>	V	V	In Brigalow ( <i>Acacia harpophylla</i> ), Gidgee ( <i>Acacia cambagei</i> ), Blackwood ( <i>Acacia argyrodendron</i> ) or Coolibah ( <i>Eucalyptus coolabah</i> )-dominated vegetation communities, or pure grassland associated with gilgais
Yakka Skink <i>Egernia rugosa</i>	V	V	A wide variety of vegetation types including poplar box, ironbark, brigalow, white cypress pine, mulga, bendee and lancewood woodlands and open forests. Substrates include rock, sand, clay and loamy red earth. They can persist in clearings where shelter sites such as tunnel erosion, rabbit warrens and log piles exist.
<b>Mammals</b>			
Northern greater glider <i>Petauroides volans minor</i>	V	V	Wide range of habitats including tall open woodland, eucalypt forests and low woodlands. They do not occur in rainforests. They prefer habitats that are in older forests and have large number of hollows. typically found in highest abundance on high elevation, wetter sites in open woodland to open forests, containing relatively old trees and abundant hollows, with a particular preference for large hollows (diameter >10 cm) in large, old trees
Greater Glider (southern and central) <i>Petauroides volans</i>	E	E	Typically found in highest abundance in taller, montane, moist eucalypt forests on fertile soils, with relatively old trees and abundant hollows with a particular preference for large hollows (diameter >10 cm) in large, old trees
koala <i>Phascolarctos cinereus</i>	V	V	Koalas live over a range of open forest and woodland communities and feed primarily on eucalypts.
short-beaked echidna <i>Tachyglossus aculeatus</i>	SL	NL	Occupy a range of habitats, from snowy alpine to semi-arid areas, including meadows, heathlands, forests, woodlands, and Australian desert

**Table 4.4: Area and Quality of Threatened Fauna Habitat Impacted**

Habitat Quality	Squatter Pigeon	Ornamental Snake	Yakka skink	Greater Glider	Koala
2.4	0	0	0	0	0
2.7	0	0	0	0	0
3.4	0	0	0	0	0
3.9	0	0	0	0	0
4.3	0	0	0	0	0
4.4	0	15.1	0	0	0
4.9	0	0	15.1	0	0
5.4	0	0	0	0	0
5.5	0	0	0	0	0
5.7	0	0	0	0	0
5.9	0	0	0	15.1	0
6.4	15.1	0	0	0	0
6.5	0	0	0	0	0
6.9	0	0	0	0	0
7.0	0	0	0	0	0
7.2	0	0	0	0	0
7.4	0	0	0	0	15.1
7.5	0	0	0	0	0
8.4	0	0	0	0	0

Low Quality Habitat
Medium Quality Habitat
High Quality Habitat

#### 4.1.4 Greater Glider Habitat Quality

The density of “Large trees’ (> 46 cm DBH) was recorded within representative plots (100m X 50m) within Eucalypt woodland habitats across the Survey area (**Appendix G**). Site locations are shown in **Appendix Figure G**. Site data revealed Large trees were likely to exist within the eucalypt woodland habitats and few trees with diameters  $\geq$  35 cm DBH. These habitats are unlikely to support a population of Greater Gliders.

## 4.2 Residual Impacts to MNES

### 4.2.1 Matters of National Environmental Significance - Threatened Ecological Communities

Field validated regional ecosystem mapping did not identify the occurrence of remnant patches of regional ecosystem equivalents to federally Threatened Ecological Communities<sup>24</sup>.

### 4.2.2 Matters of National Environmental Significance - Threatened Fauna Habitat

The total area of threatened fauna (MNES) habitat impacted by the Construction Impact Area is presented in **Table 4.4** for each species predicted to occur within the Project area. The areas of general

<sup>24</sup> Sonoma MLA700075 Vegetation Community Mapping Technical Report. Prepared by Terrestrial Pty Ltd for QCoal Pty Ltd. May 2023

and essential habitat obtained by assigning regional ecosystem equivalents are given in **Appendix E**. Maps showing the distribution of habitats and their quality, together with the proposed disturbance area are given in **Figures 4.2 – 4.6**. Assessment of the likelihood that a significant impact will occur based on impacts to the area and quality of habitat for each species determined to potentially occur within the Project area are provided in **Appendix F**.

## 5.0 Discussion and Conclusions

Field regional ecosystem mapping<sup>25</sup>, together with the known extent and distribution of the Construction Impact area has allowed for the quantification of impacts to State Regulated remnant regional ecosystems, wetlands and watercourses. According to the State residual impact guidelines the proposal will result in significant residual impacts to 0.8 ha of remnant vegetation intersecting a watercourse.

There are no Threatened Ecological Communities within the MLA and therefore no impacts to federally protected vegetation communities will occur.

The use of field validated regional ecosystem communities as surrogates for threatened species habitats, together with field verified micro-habitat values was used to produce spatially explicit ‘general’ and ‘essential’ habitat maps for threatened species thought likely to occur within the locality. Expert interpretation of habitats present was used to generate a list of threatened fauna species that may possibly utilise the Project area based on the presence of suitable habitats. These species were determined to be:

- Fork-tailed swift *Apus pacificus* (Special Least Concern NC Act);
- Oriental cuckoo *Cuculus optatus* (Special Least Concern NC Act);
- Squatter Pigeon (southern) *Geophaps scripta scripta* (Vulnerable NC Act and EPBC Act);
- Satin flycatcher *Myiagra cyanoleuca* (Special Least Concern NC Act);
- Spectacled monarch *Symposiachrus trivirgatus* (Special Least Concern NC Act);
- Ornamental snake *Denisonia maculate* (Vulnerable NC Act and EPBC Act);
- Yakka Skink *Egernia rugosa* (Vulnerable NC Act and EPBC Act);
- Northern greater glider *Petauroides volans minor* (Vulnerable NC Act and EPBC Act);
- Greater Glider (southern and central) *Petauroides Volans* (Endangered NC Act and EPBC Act);
- koala *Phascolarctos cinereus* (Endangered NC Act and EPBC Act); and
- Short-beaked echidna *Tachyglossus aculeatus* (Special Least Concern NC Act).

The distribution of general and essential habitat patches for each of these threatened species, were overlain with the construction Impact area to determine if the proposed activities have potential to result in a significant residual (State) or significant (federal) impact.

Those species, whose potential habitats coincided with the Construction Impact Area in a meaningful way, were then subject to further analysis against the Significant residual impact guidelines for matters

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<sup>25</sup> Sonoma MLA700075 Vegetation Community Mapping Technical Report. Prepared by Terrestrial Pty Ltd for QCoal Pty Ltd. May 2023

of State Environmental significance – wildlife habitat under the Significant Residual Impact Guidelines and for significant impacts to Matters of National Environmental significance (Threatened species) under the federal Significant impact guidelines 1.1.

Habitat quality indices were generated for all field fauna habitat quality sites using the Species habitat attributes method provided within State’s Terrestrial Habitat Quality Guidelines<sup>26</sup> to generate scores of habitat quality for each mapped remnant and regrowth regional ecosystem. These values were then applied to all field mapped regional ecosystem polygons to provide spatially explicit habitat quality maps for all assessed species. Intersection of these habitat quality maps with the Construction Impact Area generated areas of habitat impacted and the habitat quality of those patches impacted.

The total of 15 ha of habitat impacted, together with the breakdown of the quality of the habitat impacted, was used in conjunction with expert knowledge of the threatened species ecology to determine if the proposed impacts would have a significant impact according to the Criteria set out in the State and federal guidelines. This assessment highlighted that the proposed disturbance to threatened fauna habitats within the Project area may have a significant impact on habitat for:

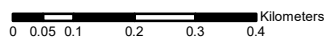
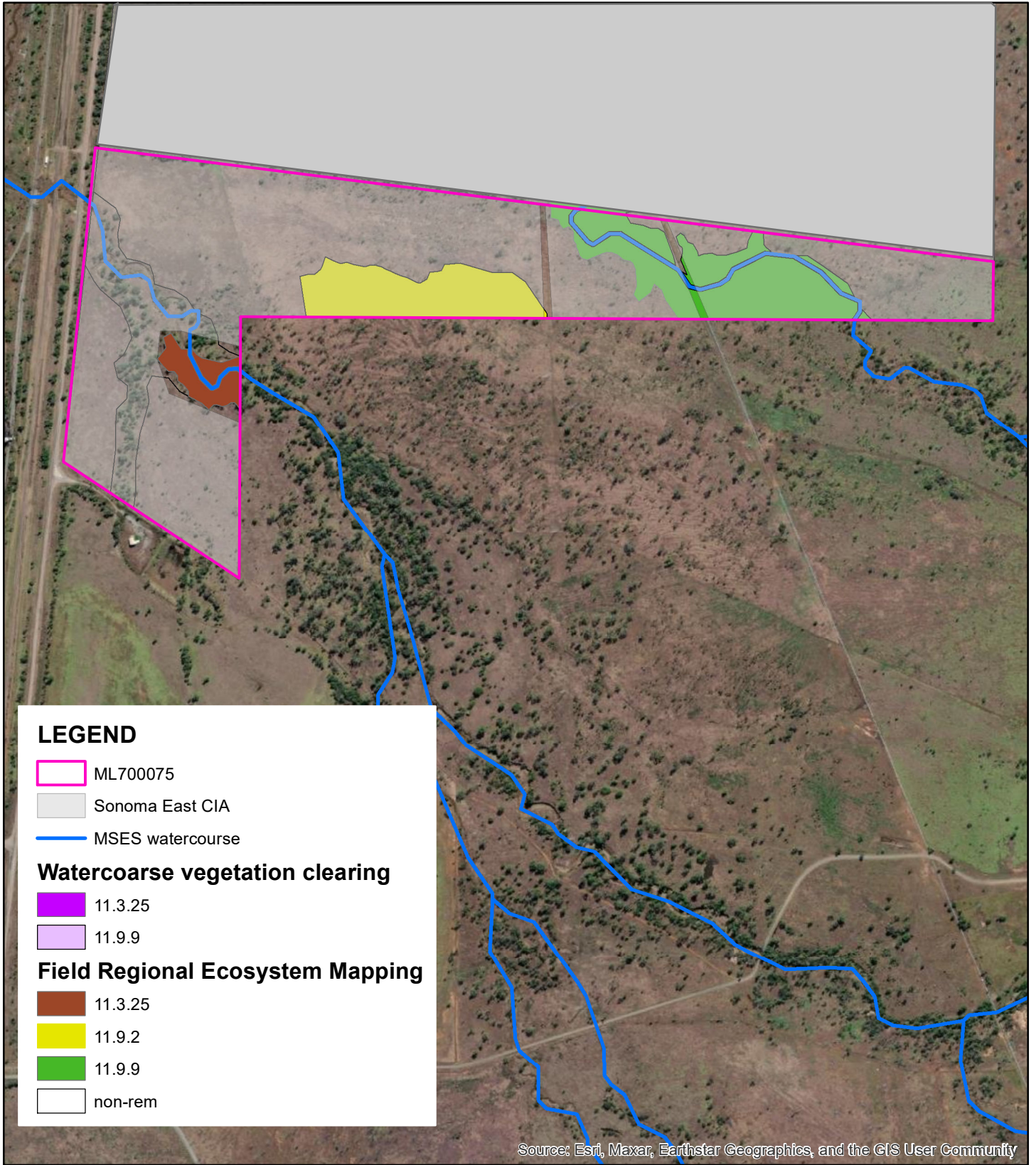
- Squatter pigeon; and
- Koala.

Although habitat quality scores generated for the Great Glider indicated some medium quality habitat for this species was associated with the MLA’s eucalypt woodland habitats, tree size surveys showed that these habitats are very unlikely to support a population of Greater gilders and therefore no significant residual impacts are likely for this species.

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<sup>26</sup> Guide to determining terrestrial habitat quality Methods for assessing habitat quality under the Queensland Environmental Offsets Policy Version 1.3 February 2020





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**FIGURE 4.1**

**Potential Impacts to Prescribed Environmental Matters – Regulated Vegetation, Wetland and Watercourses**

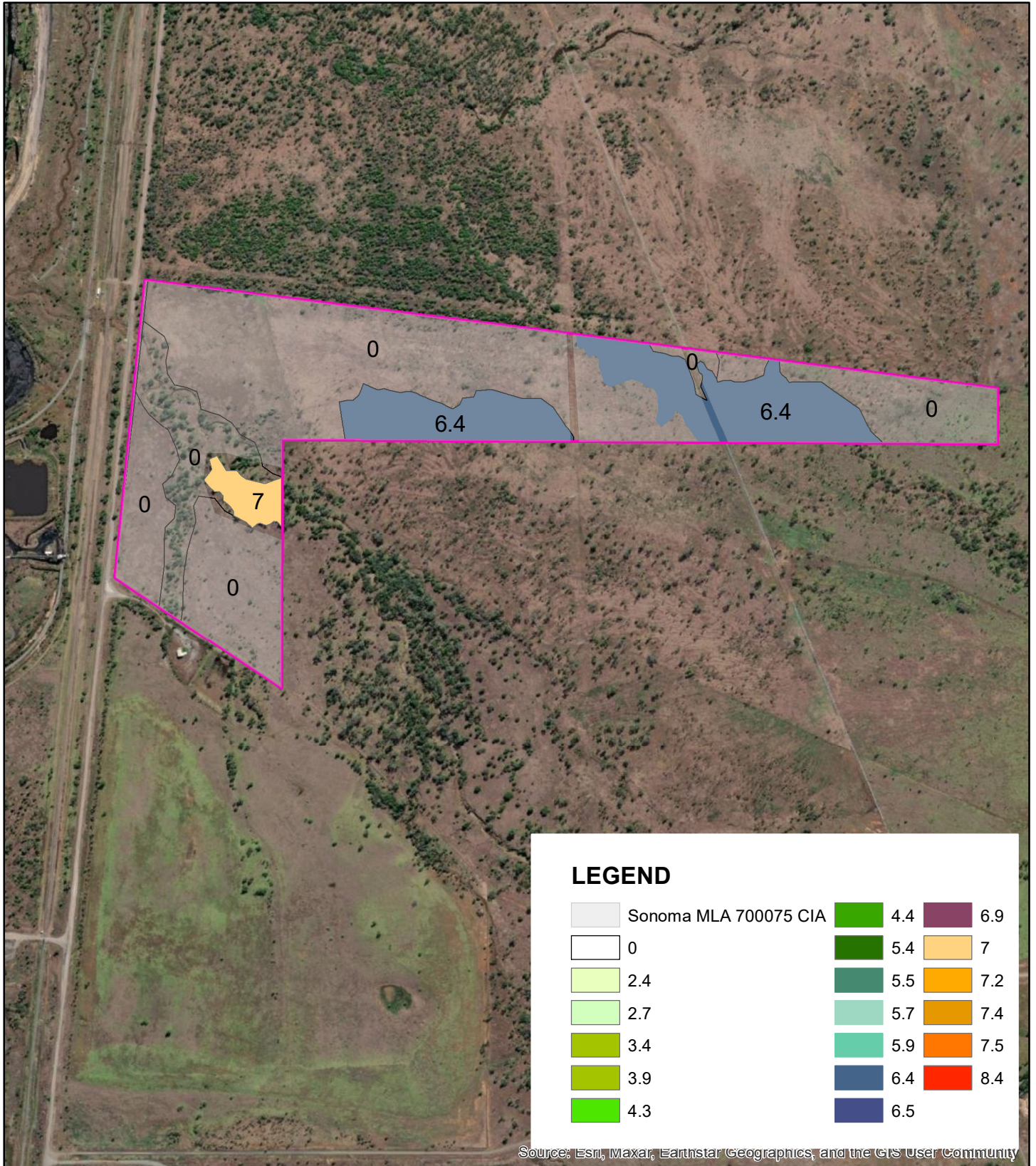
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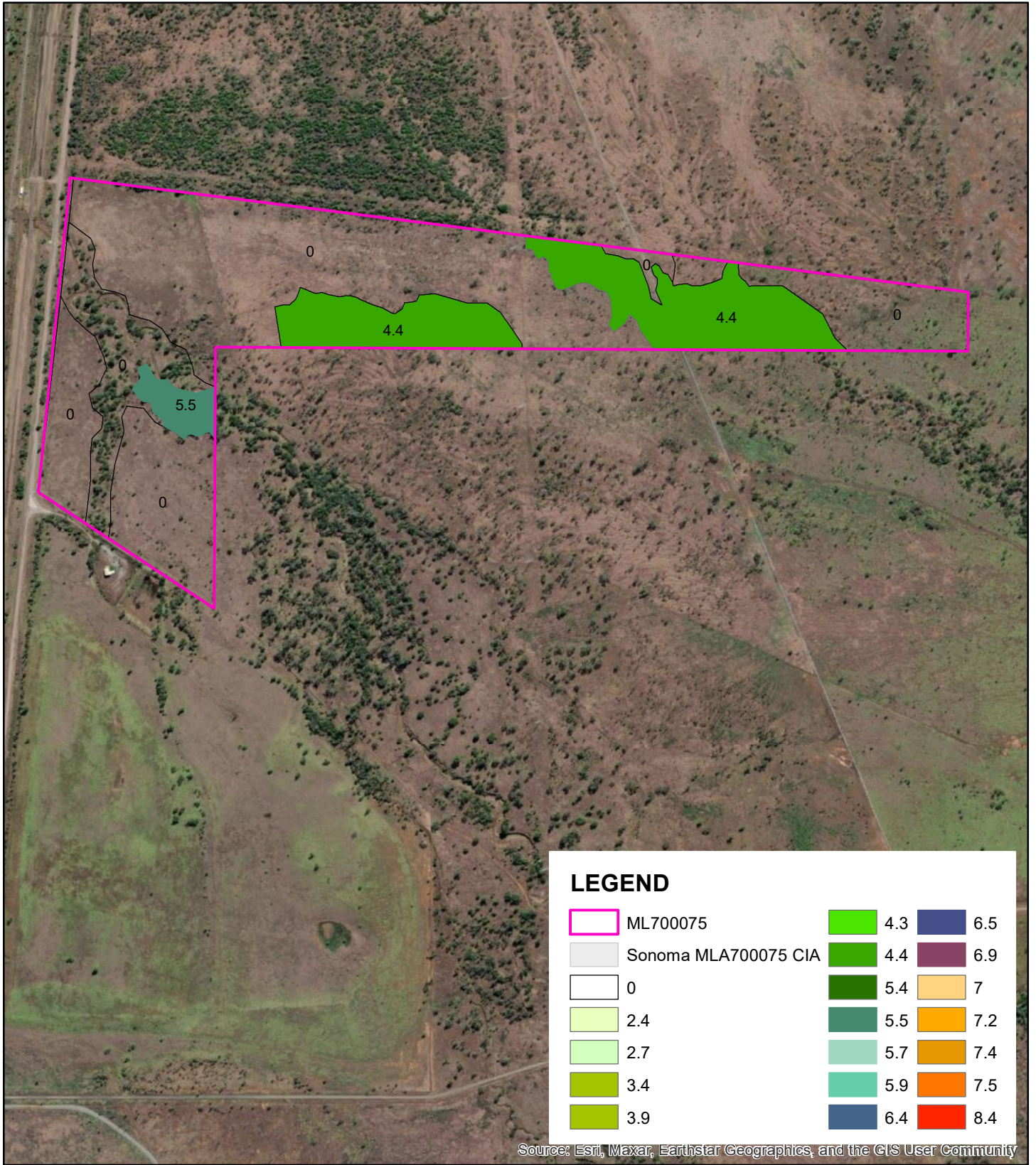
**Figure 4.2**  
**Habitat Quality for**  
**Squatter Pigeon (southern)**  
**Geophaps scripta scripta**

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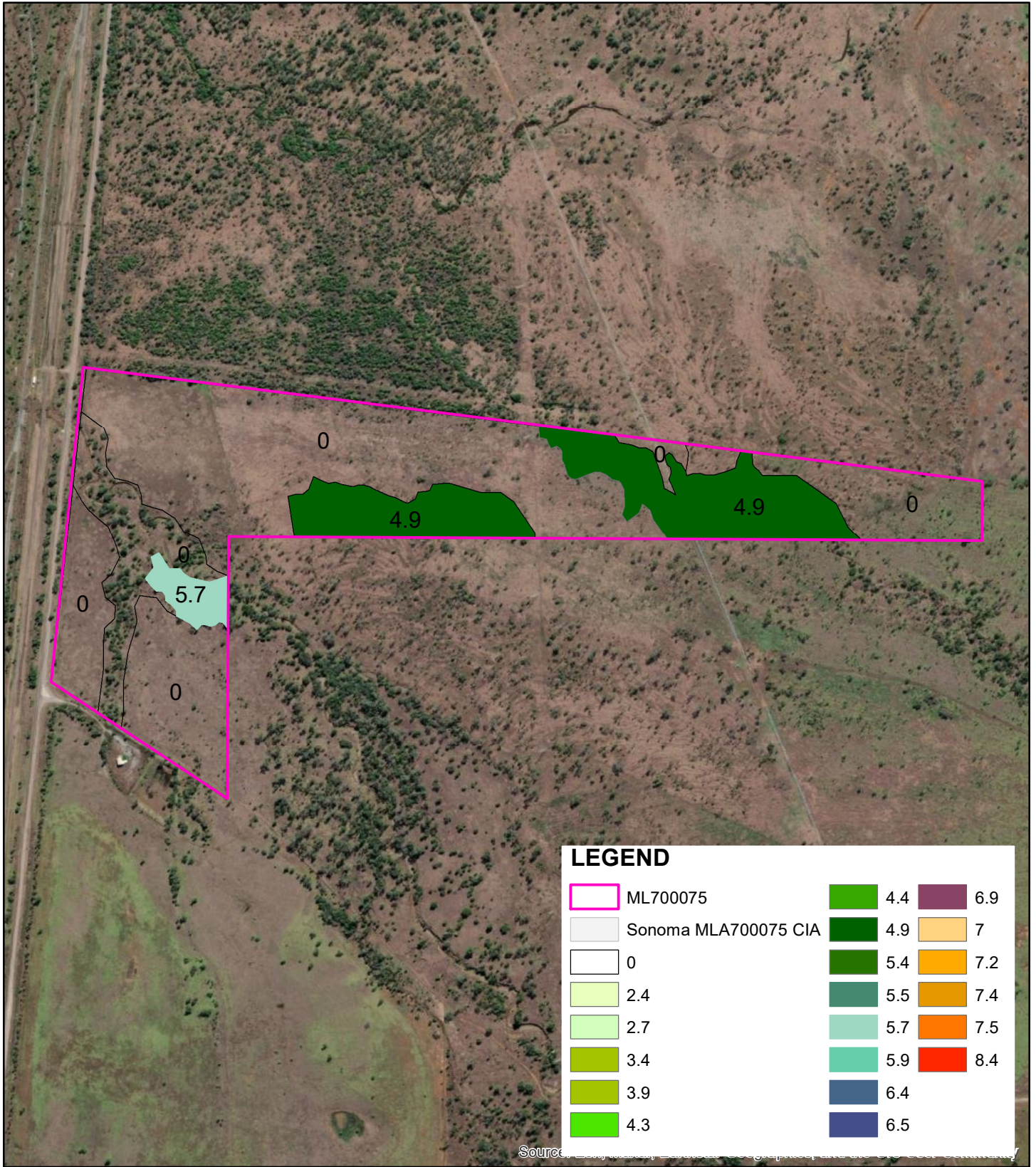
**Figure 4.3**  
**Habitat Quality for**  
**Ornamental snake**  
**Denisonia maculata**

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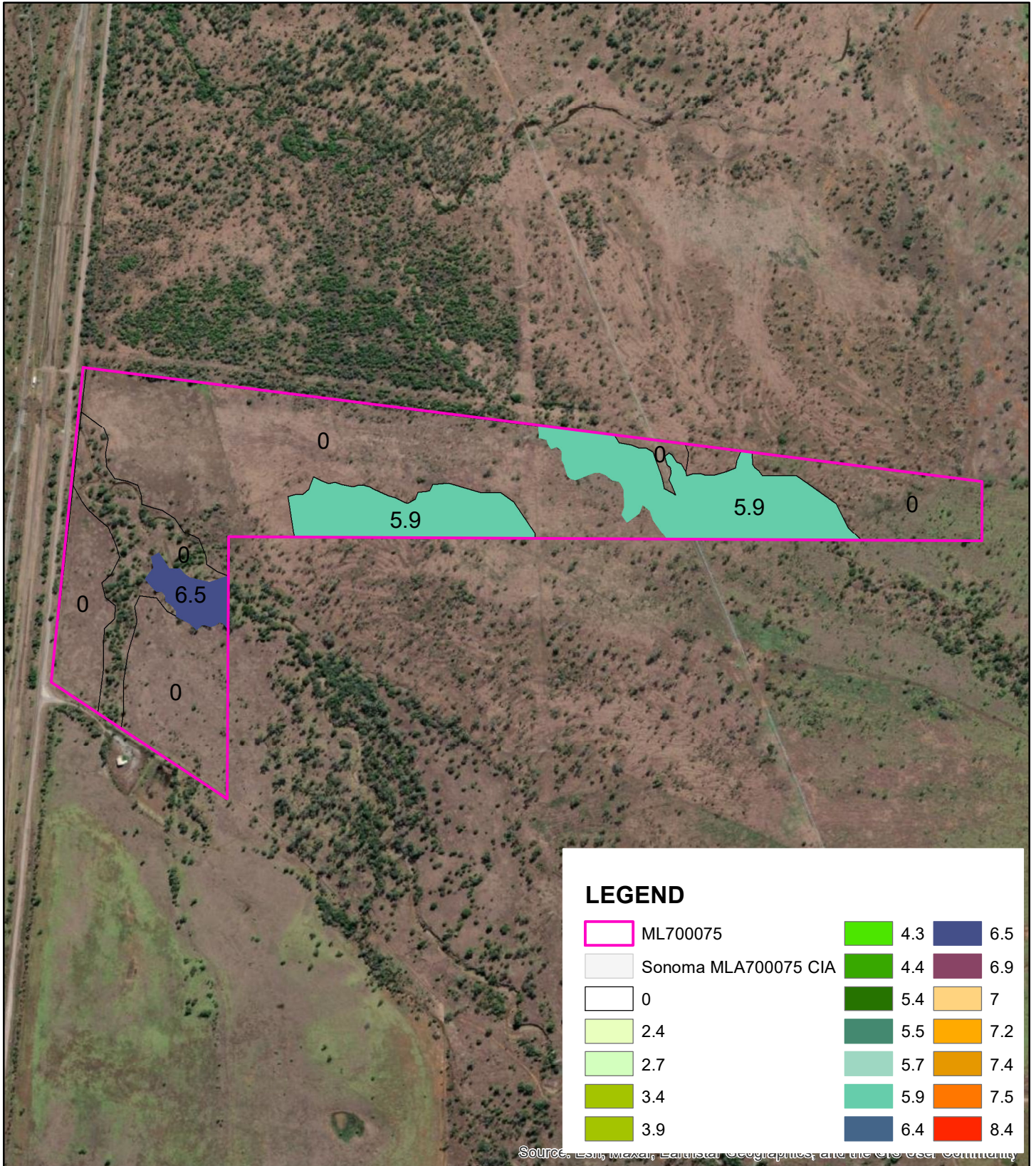
**Figure 4.4**  
**Habitat Quality for**  
**Yakka Skink**  
***Egernia rugosa***

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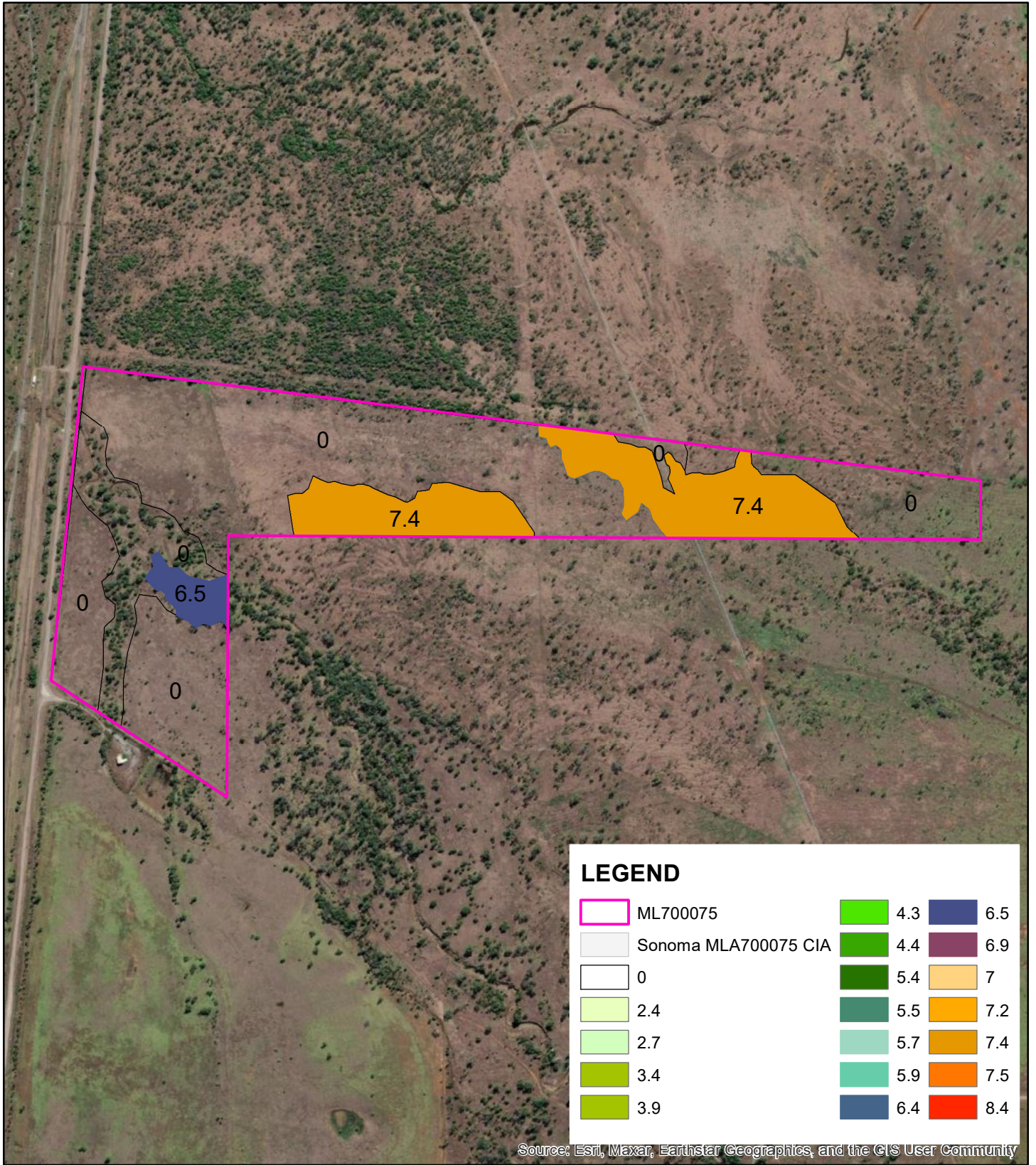
**Figure 4.5**  
**Habitat Quality for**  
**Greater Glider (Sensu lato)**  
**Petauroides volans**

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0 0.05 0.1 0.2 0.3 0.4 Kilometers



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Aerial imagery courtesy of Bing Maps.

**Figure 4.6**  
**Habitat Quality for**  
**Koala**  
**Phascolarctos cinereus**

Queensland Northern Hub  
Significant Residual  
Impact Assessments

AD 31/05/23  
Job No. 0298



# Appendix A

## WildNet Database Search



# Queensland Government

## WildNet species list

Search Criteria: Species List for a Specified Point

Species: All

Type: All

Queensland status: All

Records: All

Date: All

Latitude: -20.622

Longitude: 147.874

Distance: 15

Email: [adaniel@terrestria.com.au](mailto:adaniel@terrestria.com.au)

Date submitted: Sunday 22 Jan 2023 09:28:03

Date extracted: Sunday 22 Jan 2023 09:30:06

The number of records retrieved = 438

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Kingdom	Class	Family	Scientific Name	Common Name	I	Q	A	Records
animals	amphibians	Bufo	<i>Rhinella marina</i>	cane toad	Y			3
animals	amphibians	Hylidae	<i>Litoria bicolor</i>	northern sedgefrog		C		1
animals	amphibians	Hylidae	<i>Litoria caerulea</i>	common green treefrog		C		2
animals	amphibians	Hylidae	<i>Litoria nasuta</i>	striped rocketfrog		C		1/1
animals	amphibians	Limnodynastidae	<i>Limnodynastes tasmaniensis</i>	spotted grassfrog		C		2
animals	birds	Acanthizidae	<i>Gerygone olivacea</i>	white-throated gerygone		C		6
animals	birds	Acanthizidae	<i>Gerygone palpebrosa</i>	fairy gerygone		C		1
animals	birds	Acanthizidae	<i>Smicronis brevirostris</i>	weebill		C		3
animals	birds	Accipitridae	<i>Accipiter fasciatus</i>	brown goshawk		C		1
animals	birds	Accipitridae	<i>Aquila audax</i>	wedge-tailed eagle		C		3
animals	birds	Accipitridae	<i>Aviceda subcristata</i>	Pacific baza		C		1
animals	birds	Accipitridae	<i>Elanus axillaris</i>	black-shouldered kite		C		1
animals	birds	Accipitridae	<i>Haliaeetus leucogaster</i>	white-bellied sea-eagle		C		2
animals	birds	Accipitridae	<i>Haliastur sphenurus</i>	whistling kite		C		12
animals	birds	Accipitridae	<i>Milvus migrans</i>	black kite		C		7
animals	birds	Aegothelidae	<i>Aegotheles cristatus</i>	Australian owl-nightjar		C		2
animals	birds	Alaudidae	<i>Mirafra javanica</i>	Horsfield's bushlark		C		1
animals	birds	Alcedinidae	<i>Dacelo leachii</i>	blue-winged kookaburra		C		6
animals	birds	Alcedinidae	<i>Dacelo novaeguineae</i>	laughing kookaburra		C		11
animals	birds	Anatidae	<i>Anas superciliosa</i>	Pacific black duck		C		1
animals	birds	Anatidae	<i>Chenonetta jubata</i>	Australian wood duck		C		1
animals	birds	Anatidae	<i>Cygnus atratus</i>	black swan		C		1
animals	birds	Anatidae	<i>Nettapus coromandelianus</i>	cotton pygmy-goose		C		1
animals	birds	Ardeidae	<i>Ardea pacifica</i>	white-necked heron		C		2
animals	birds	Ardeidae	<i>Egretta novaehollandiae</i>	white-faced heron		C		2
animals	birds	Artamidae	<i>Artamus cinereus</i>	black-faced woodswallow		C		1
animals	birds	Artamidae	<i>Artamus leucorhynchus</i>	white-breasted woodswallow		C		1
animals	birds	Artamidae	<i>Artamus superciliosus</i>	white-browed woodswallow		C		1
animals	birds	Artamidae	<i>Cracticus nigrogularis</i>	piebald butcherbird		C		26
animals	birds	Artamidae	<i>Gymnorhina tibicen</i>	Australian magpie		C		30
animals	birds	Artamidae	<i>Strepera graculina</i>	piebald currawong		C		6
animals	birds	Cacatuidae	<i>Cacatua galerita</i>	sulphur-crested cockatoo		C		17
animals	birds	Cacatuidae	<i>Calyptorhynchus banksii</i>	red-tailed black-cockatoo		C		2
animals	birds	Cacatuidae	<i>Eolophus roseicapilla</i>	galah		C		5
animals	birds	Cacatuidae	<i>Nymphicus hollandicus</i>	cockatiel		C		3
animals	birds	Campephagidae	<i>Coracina maxima</i>	ground cuckoo-shrike		C		2
animals	birds	Campephagidae	<i>Coracina novaehollandiae</i>	black-faced cuckoo-shrike		C		16
animals	birds	Campephagidae	<i>Coracina papuensis</i>	white-bellied cuckoo-shrike		C		5
animals	birds	Caprimulgidae	<i>Caprimulgus macrurus</i>	large-tailed nightjar		C		1
animals	birds	Columbidae	<i>Geopelia cuneata</i>	diamond dove		C		1
animals	birds	Columbidae	<i>Geopelia placida</i>	peaceful dove		C		7
animals	birds	Columbidae	<i>Geophaps scripta scripta</i>	squatter pigeon (southern subspecies)		V	V	4
animals	birds	Columbidae	<i>Ocyphaps lophotes</i>	crested pigeon		C		13
animals	birds	Columbidae	<i>Phaps chalcoptera</i>	common bronzewing		C		1
animals	birds	Coraciidae	<i>Eurystomus orientalis</i>	dollarbird		C		6
animals	birds	Corcoracidae	<i>Struthidea cinerea</i>	apostlebird		C		6



Kingdom	Class	Family	Scientific Name	Common Name	I	Q	A	Records
animals	birds	Corvidae	<i>Corvus orru</i>	Torresian crow		C		44
animals	birds	Corvidae	<i>Corvus sp.</i>			C		1
animals	birds	Cuculidae	<i>Cacomantis pallidus</i>	pallid cuckoo		C		1
animals	birds	Cuculidae	<i>Cacomantis variolosus</i>	brush cuckoo		C		3
animals	birds	Cuculidae	<i>Centropus phasianinus</i>	pheasant coucal		C		5
animals	birds	Cuculidae	<i>Chalcites basal</i>	Horsfield's bronze-cuckoo		C		1
animals	birds	Cuculidae	<i>Cuculus optatus</i>	oriental cuckoo		SL		1
animals	birds	Cuculidae	<i>Eudynamys orientalis</i>	eastern koel		C		3
animals	birds	Cuculidae	<i>Scythrops novaehollandiae</i>	channel-billed cuckoo		C		6
animals	birds	Dicaeidae	<i>Dicaeum hirundinaceum</i>	mistletoebird		C		6
animals	birds	Dicruridae	<i>Dicrurus bracteatus</i>	spangled drongo		C		3
animals	birds	Estrildidae	<i>Lonchura castaneothorax</i>	chestnut-breasted mannikin		C		1
animals	birds	Estrildidae	<i>Neochmia modesta</i>	plum-headed finch		C		1
animals	birds	Estrildidae	<i>Taeniopygia bichenovii</i>	double-barred finch		C		3
animals	birds	Falconidae	<i>Falco berigora</i>	brown falcon		C		2
animals	birds	Falconidae	<i>Falco cenchroides</i>	nankeen kestrel		C		3
animals	birds	Gruidae	<i>Antigone rubicunda</i>	broilga		C		1
animals	birds	Hirundinidae	<i>Petrochelidon ariel</i>	fairy martin		C		3
animals	birds	Locustellidae	<i>Cincloramphus mathewsi</i>	rufous songlark		C		1
animals	birds	Locustellidae	<i>Poodytes gramineus</i>	little grassbird		C		2
animals	birds	Maluridae	<i>Malurus melanocephalus</i>	red-backed fairy-wren		C		13
animals	birds	Meliphagidae	<i>Conopophila rufogularis</i>	rufous-throated honeyeater		C		1
animals	birds	Meliphagidae	<i>Entomyzon cyanotis</i>	blue-faced honeyeater		C		12
animals	birds	Meliphagidae	<i>Lichmera indistincta</i>	brown honeyeater		C		12
animals	birds	Meliphagidae	<i>Manorina flavigula</i>	yellow-throated miner		C		27
animals	birds	Meliphagidae	<i>Manorina melanocephala</i>	noisy miner		C		3
animals	birds	Meliphagidae	<i>Melithreptus albogularis</i>	white-throated honeyeater		C		9
animals	birds	Meliphagidae	<i>Melithreptus gularis</i>	black-chinned honeyeater		C		1
animals	birds	Meliphagidae	<i>Myzomela sanguinolenta</i>	scarlet honeyeater		C		2
animals	birds	Meliphagidae	<i>Philemon buceroides</i>	helmeted friarbird		C		11
animals	birds	Meliphagidae	<i>Philemon citreogularis</i>	little friarbird		C		8
animals	birds	Meliphagidae	<i>Philemon corniculatus</i>	noisy friarbird		C		5
animals	birds	Meliphagidae	<i>Stomiopera flava</i>	yellow honeyeater		C		4
animals	birds	Meropidae	<i>Merops ornatus</i>	rainbow bee-eater		C		5
animals	birds	Monarchidae	<i>Grallina cyanoleuca</i>	magpie-lark		C		24
animals	birds	Monarchidae	<i>Myiagra rubecula</i>	leaden flycatcher		C		2
animals	birds	Motacillidae	<i>Anthus novaeseelandiae</i>	Australasian pipit		C		2
animals	birds	Oriolidae	<i>Sphecotheres vieilloti</i>	Australasian figbird		C		4
animals	birds	Otididae	<i>Ardeotis australis</i>	Australian bustard		C		1
animals	birds	Pachycephalidae	<i>Colluricincla harmonica</i>	grey shrike-thrush		C		1
animals	birds	Pachycephalidae	<i>Colluricincla megarhyncha</i>	little shrike-thrush		C		1
animals	birds	Pachycephalidae	<i>Pachycephala rufiventris</i>	rufous whistler		C		4
animals	birds	Pardalotidae	<i>Pardalotus punctatus</i>	spotted pardalote		C		1
animals	birds	Pardalotidae	<i>Pardalotus rubricatus</i>	red-browed pardalote		C		1
animals	birds	Pardalotidae	<i>Pardalotus striatus</i>	striated pardalote		C		44
animals	birds	Pelecanidae	<i>Pelecanus conspicillatus</i>	Australian pelican		C		1



Kingdom	Class	Family	Scientific Name	Common Name	I	Q	A	Records
animals	birds	Petroicidae	<i>Microeca fascinans</i>	jacky winter		C		1
animals	birds	Phalacrocoracidae	<i>Microcarbo melanoleucos</i>	little pied cormorant		C		1
animals	birds	Phalacrocoracidae	<i>Phalacrocorax carbo</i>	great cormorant		C		1
animals	birds	Phasianidae	<i>Synoicus ypsilophorus</i>	brown quail		C		2
animals	birds	Podargidae	<i>Podargus strigoides</i>	tawny frogmouth		C		1
animals	birds	Pomatostomidae	<i>Pomatostomus temporalis</i>	grey-crowned babbler		C		5
animals	birds	Psittaculidae	<i>Aprosmictus erythropterus</i>	red-winged parrot		C		10
animals	birds	Psittaculidae	<i>Platycercus adscitus</i>	pale-headed rosella		C		25
animals	birds	Psittaculidae	<i>Trichoglossus chlorolepidotus</i>	scaly-breasted lorikeet		C		1
animals	birds	Psittaculidae	<i>Trichoglossus moluccanus</i>	rainbow lorikeet		C		28
animals	birds	Ptilonorhynchidae	<i>Chlamydera maculata</i>	spotted bowerbird		C		1
animals	birds	Ptilonorhynchidae	<i>Chlamydera nuchalis</i>	great bowerbird		C		4
animals	birds	Rallidae	<i>Amaurornis moluccana</i>	pale-vented bush-hen		C		1
animals	birds	Rallidae	<i>Gallinula tenebrosa</i>	dusky moorhen		C		1
animals	birds	Rhipiduridae	<i>Rhipidura albiscapa</i>	grey fantail		C		10
animals	birds	Rhipiduridae	<i>Rhipidura leucophrys</i>	willie wagtail		C		10
animals	birds	Strigidae	<i>Ninox boobook</i>	southern boobook		C		2
animals	birds	Tytonidae	<i>Tyto javanica</i>	eastern barn owl		C		2
animals	mammals	Dasyuridae	<i>Planigale maculata</i>	common planigale		C		1/1
animals	mammals	Dasyuridae	<i>Sminthopsis macroura</i>	stripe-faced dunnart		C		1/1
animals	mammals	Emballonuridae	<i>Saccolaimus flaviventris</i>	yellow-bellied sheath-tail bat		C		2
animals	mammals	Felidae	<i>Felis catus</i>	cat	Y			1
animals	mammals	Macropodidae	<i>Macropus giganteus</i>	eastern grey kangaroo		C		1
animals	mammals	Macropodidae	<i>Osphranter robustus</i>	common wallaroo		C		1
animals	mammals	Muridae	<i>Pseudomys delicatulus</i>	delicate mouse		C		2/2
animals	mammals	Muridae	<i>Pseudomys gracilicaudatus</i>	eastern chestnut mouse		C		1/1
animals	mammals	Phascolarctidae	<i>Phascolarctos cinereus</i>	koala		E	E	3
animals	mammals	Potoroidae	<i>Aepyprymnus rufescens</i>	rufous bettong		C		3
animals	mammals	Tachyglossidae	<i>Tachyglossus aculeatus</i>	short-beaked echidna		SL		1
animals	mammals	Vespertilionidae	<i>Scotorepens greyii</i>	little broad-nosed bat		C		1
animals	ray-finned fishes	Ambassidae	<i>Ambassis agassizii</i>	Agassiz's glassfish				1
animals	ray-finned fishes	Ambassidae	<i>Ambassis agrammus</i>	sailfin glassfish				2
animals	ray-finned fishes	Anguillidae	<i>Anguilla reinhardtii</i>	longfin eel				12
animals	ray-finned fishes	Apogonidae	<i>Glossamia aprion</i>	mouth almighty				1
animals	ray-finned fishes	Ariidae	<i>Neoarius graeffei</i>	blue catfish				31
animals	ray-finned fishes	Atherinidae	<i>Craterocephalus stercusmuscarum</i>	flyspecked hardyhead				12
animals	ray-finned fishes	Belonidae	<i>Strongylura krefftii</i>	freshwater longtom				2
animals	ray-finned fishes	Centropomidae	<i>Lates calcarifer</i>	barramundi				16
animals	ray-finned fishes	Cichlidae	<i>Oreochromis mossambica</i>	Mozambique mouthbrooder	Y			5
animals	ray-finned fishes	Clupeidae	<i>Nematalosa erebi</i>	bony bream				442
animals	ray-finned fishes	Eleotridae	<i>Hypseleotris sp.</i>					1
animals	ray-finned fishes	Eleotridae	<i>Mogurnda adspersa</i>	southern purplespotted gudgeon				1
animals	ray-finned fishes	Eleotridae	<i>Oxyeleotris lineolata</i>	sleepy cod				54
animals	ray-finned fishes	Melanotaeniidae	<i>Melanotaenia splendida splendida</i>	eastern rainbowfish				201
animals	ray-finned fishes	Plotosidae	<i>Neosilurus ater</i>	black catfish				11
animals	ray-finned fishes	Plotosidae	<i>Neosilurus hyrtlII</i>	Hyrtl's catfish				3/2

Kingdom	Class	Family	Scientific Name	Common Name	I	Q	A	Records
animals	ray-finned fishes	Plotosidae	<i>Neosilurus mollespiculum</i>	softspine catfish				1
animals	ray-finned fishes	Pseudomugilidae	<i>Pseudomugil signifer</i>	Pacific blue eye				1
animals	ray-finned fishes	Terapontidae	<i>Amniataba percoides</i>	barred grunter				16
animals	ray-finned fishes	Terapontidae	<i>Hephaestus fuliginosus</i>	sooty grunter				23
animals	ray-finned fishes	Terapontidae	<i>Leiopotherapon unicolor</i>	spangled perch				18
animals	ray-finned fishes	Toxotidae	<i>Toxotes chatareus</i>	sevenspot archerfish				2
animals	reptiles	Agamidae	<i>Pogona barbata</i>	bearded dragon			C	1
animals	reptiles	Boidae	<i>Aspidites melanocephalus</i>	black-headed python			C	2
animals	reptiles	Chelidae	<i>Emydura macquarii krefftii</i>	Krefftt's river turtle			C	15
animals	reptiles	Chelidae	<i>Wollumbinia latisternum</i>	saw-shelled turtle			C	1
animals	reptiles	Diplodactylidae	<i>Oedura castelnaui</i>	northern velvet gecko			C	2
animals	reptiles	Elapidae	<i>Denisonia devisi</i>	De Vis' banded snake			C	1
animals	reptiles	Gekkonidae	<i>Gehyra dubia</i>	dubious dtella			C	5
animals	reptiles	Scincidae	<i>Carlia jarnoldae</i>	lined rainbow-skink			C	1
animals	reptiles	Scincidae	<i>Carlia vivax</i>	tussock rainbow-skink			C	3
animals	reptiles	Scincidae	<i>Cryptoblepharus australis</i>	inland snake-eyed skink			C	1
animals	reptiles	Scincidae	<i>Liburnascincus mundivensis</i>	outcrop rainbow-skink			C	1
animals	uncertain	Indeterminate	<i>Indeterminate</i>	Unknown or Code Pending				3
plants	land plants	Acanthaceae	<i>Pseuderanthemum variabile</i>	pastel flower			C	1/1
plants	land plants	Acanthaceae	<i>Rostellularia adscendens var. adscendens</i>				C	2/2
plants	land plants	Acanthaceae	<i>Ruellia simplex</i>		Y			2/2
plants	land plants	Amaranthaceae	<i>Alternanthera ficoidea</i>		Y			2/2
plants	land plants	Amaranthaceae	<i>Alternanthera nodiflora</i>	joyweed			C	1/1
plants	land plants	Amaranthaceae	<i>Alternanthera pungens</i>	khaki weed	Y			1/1
plants	land plants	Amaranthaceae	<i>Amaranthus cochleitepalus</i>				C	1/1
plants	land plants	Amaranthaceae	<i>Amaranthus viridis</i>	green amaranth	Y			1/1
plants	land plants	Amaranthaceae	<i>Gomphrena celosioides</i>	gomphrena weed	Y			3/3
plants	land plants	Amaranthaceae	<i>Nyssanthes diffusa</i>	barbed-wire weed			C	1/1
plants	land plants	Amaranthaceae	<i>Ptilotus fusiformis</i>				C	1/1
plants	land plants	Amaryllidaceae	<i>Crinum arenarium</i>				SL	1/1
plants	land plants	Anacardiaceae	<i>Pleiogynium timorense</i>	Burdekin plum			C	1/1
plants	land plants	Anacardiaceae	<i>Schinus terebinthifolius</i>		Y			3/3
plants	land plants	Apocynaceae	<i>Alstonia scholaris</i>	white cheesewood			C	1/1
plants	land plants	Apocynaceae	<i>Asclepias curassavica</i>	red-head cottonbush	Y			1/1
plants	land plants	Apocynaceae	<i>Carissa ovata</i>	currantbush			C	1/1
plants	land plants	Apocynaceae	<i>Cascabela thevetia</i>	yellow oleander	Y			2/2
plants	land plants	Apocynaceae	<i>Catharanthus roseus</i>	pink periwinkle	Y			2/2
plants	land plants	Apocynaceae	<i>Gomphocarpus physocarpus</i>	balloon cottonbush	Y			1/1
plants	land plants	Apocynaceae	<i>Leichhardtia cymulosa</i>				C	1/1
plants	land plants	Apocynaceae	<i>Wrightia saligna</i>				C	1/1
plants	land plants	Araliaceae	<i>Heptapleurum actinophyllum</i>				C	1/1
plants	land plants	Asparagaceae	<i>Asparagus racemosus</i>	native asparagus			C	1/1
plants	land plants	Asteraceae	<i>Acanthospermum hispidum</i>	star burr	Y			2/2
plants	land plants	Asteraceae	<i>Ageratum conyzoides</i>	billygoat weed	Y			1/1
plants	land plants	Asteraceae	<i>Bidens bipinnata</i>	bipinnate beggar's ticks	Y			1/1
plants	land plants	Asteraceae	<i>Bidens biternata</i>		Y			1/1

Kingdom	Class	Family	Scientific Name	Common Name	I	Q	A	Records
plants	land plants	Asteraceae	<i>Calotis cuneifolia</i>	burr daisy		C		2/2
plants	land plants	Asteraceae	<i>Calyptocarpus vialis</i>	creeping cinderella weed	Y			2/2
plants	land plants	Asteraceae	<i>Camptacra robusta</i>			C		1/1
plants	land plants	Asteraceae	<i>Flaveria trinervia</i>		Y			1/1
plants	land plants	Asteraceae	<i>Parthenium hysterophorus</i>	parthenium weed	Y			3/3
plants	land plants	Asteraceae	<i>Pseudognaphalium luteoalbum</i>	Jersey cudweed		C		2/2
plants	land plants	Asteraceae	<i>Pterocaulon redolens</i>			C		1/1
plants	land plants	Asteraceae	<i>Sphaeromorphaea subintegra</i>			C		2/2
plants	land plants	Asteraceae	<i>Streptoglossa odora</i>			C		1/1
plants	land plants	Bignoniaceae	<i>Pandorea pandorana</i>	wonga vine		C		2/2
plants	land plants	Boraginaceae	<i>Heliotropium pauciflorum</i>			C		1/1
plants	land plants	Boraginaceae	<i>Trichodesma zeylanicum</i> var. <i>zeylanicum</i>			C		1/1
plants	land plants	Brassicaceae	<i>Lepidium africanum</i>	common peppergrass	Y			1/1
plants	land plants	Brassicaceae	<i>Lepidium bonariense</i>	Argentine peppergrass	Y			1/1
plants	land plants	Brassicaceae	<i>Lepidium didymum</i>		Y			1/1
plants	land plants	Byttneriaceae	<i>Melochia pyramidata</i>		Y			2/2
plants	land plants	Byttneriaceae	<i>Seringia hookeriana</i>			C		2/2
plants	land plants	Capparaceae	<i>Capparis lasiantha</i>	nipan		C		1/1
plants	land plants	Capparaceae	<i>Capparis ornans</i>			C		1/1
plants	land plants	Caryophyllaceae	<i>Polycarpaea corymbosa</i> var. <i>corymbosa</i>			C		1/1
plants	land plants	Caryophyllaceae	<i>Polycarpaea corymbosa</i> var. <i>minor</i>			C		1/1
plants	land plants	Caryophyllaceae	<i>Polycarpaea spirostylis</i> subsp. <i>spirostylis</i>			C		1/1
plants	land plants	Celastraceae	<i>Denhamia cunninghamii</i>			C		1/1
plants	land plants	Celastraceae	<i>Denhamia oleaster</i>			C		1/1
plants	land plants	Ceratophyllaceae	<i>Ceratophyllum demersum</i>	hornwort		C		1/1
plants	land plants	Chenopodiaceae	<i>Dysphania carinata</i>			C		1/1
plants	land plants	Chenopodiaceae	<i>Salsola australis</i>			C		3/3
plants	land plants	Cleomaceae	<i>Arivela viscosa</i>			C		1/1
plants	land plants	Cleomaceae	<i>Gynandropsis gynandra</i>		Y			1/1
plants	land plants	Convolvulaceae	<i>Bonamia media</i>			C		3/3
plants	land plants	Convolvulaceae	<i>Distimake dissectus</i>		Y			1/1
plants	land plants	Convolvulaceae	<i>Evolvulus alsinoides</i>			C		3/3
plants	land plants	Convolvulaceae	<i>Ipomoea brownii</i>			C		2/2
plants	land plants	Convolvulaceae	<i>Ipomoea gracilis</i>			C		1/1
plants	land plants	Convolvulaceae	<i>Ipomoea plebeia</i>	bellvine		C		3/3
plants	land plants	Convolvulaceae	<i>Ipomoea polymorpha</i>			C		1/1
plants	land plants	Convolvulaceae	<i>Ipomoea triloba</i>		Y			2/2
plants	land plants	Convolvulaceae	<i>Jacquemontia paniculata</i>			C		1/1
plants	land plants	Convolvulaceae	<i>Merremia hederacea</i>			C		1/1
plants	land plants	Convolvulaceae	<i>Xenostegia tridentata</i>			C		1/1
plants	land plants	Cucurbitaceae	<i>Cucumis anguria</i> var. <i>anguria</i>	West Indian gherkin	Y			2/2
plants	land plants	Cucurbitaceae	<i>Cucumis melo</i>			C		1/1
plants	land plants	Cucurbitaceae	<i>Diplocyclos palmatus</i> subsp. <i>palmatus</i>			C		1/1
plants	land plants	Cucurbitaceae	<i>Momordica charantia</i>	balsam pear	Y			1/1
plants	land plants	Cycadaceae	<i>Cycas media</i> subsp. <i>media</i>			SL		1/1
plants	land plants	Cyperaceae	<i>Abildgaardia ovata</i>			C		1/1

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plants	land plants	Cyperaceae	<i>Cyperus difformis</i>	rice sedge		C		1/1
plants	land plants	Cyperaceae	<i>Cyperus fulvus</i>			C		1/1
plants	land plants	Cyperaceae	<i>Cyperus involucratus</i>		Y			2/2
plants	land plants	Cyperaceae	<i>Cyperus javanicus</i>			C		1/1
plants	land plants	Cyperaceae	<i>Cyperus polystachyos</i> var. <i>polystachyos</i>			C		1/1
plants	land plants	Cyperaceae	<i>Eleocharis geniculata</i>			C		1/1
plants	land plants	Euphorbiaceae	<i>Euphorbia coghlanii</i>			C		1/1
plants	land plants	Euphorbiaceae	<i>Euphorbia cyathophora</i>	dwarf poinsettia	Y			1/1
plants	land plants	Euphorbiaceae	<i>Euphorbia heterophylla</i>		Y			1/1
plants	land plants	Euphorbiaceae	<i>Euphorbia hyssopifolia</i>		Y			1/1
plants	land plants	Euphorbiaceae	<i>Ricinus communis</i>	castor oil bush	Y			1/1
plants	land plants	Goodeniaceae	<i>Goodenia hirsuta</i>			C		1/1
plants	land plants	Haloragaceae	<i>Myriophyllum verrucosum</i>	water milfoil		C		1/1
plants	land plants	Hydrocharitaceae	<i>Vallisneria annua</i>			SL		2/2
plants	land plants	Hypericaceae	<i>Hypericum gramineum</i>			C		1/1
plants	land plants	Lamiaceae	<i>Coleus graveolens</i>			C		1/1
plants	land plants	Lamiaceae	<i>Leucas lavandulifolia</i>		Y			2/2
plants	land plants	Lamiaceae	<i>Mesosphaerum suaveolens</i>		Y			1/1
plants	land plants	Lamiaceae	<i>Ocimum americanum</i>		Y			1/1
plants	land plants	Lamiaceae	<i>Ocimum x africanum</i>		Y			1/1
plants	land plants	Lauraceae	<i>Cassytha filiformis</i>	dodder laurel		C		1/1
plants	land plants	Laxmanniaceae	<i>Eustrephus latifolius</i>	wombat berry		C		1/1
plants	land plants	Lecythidaceae	<i>Planchonia careya</i>	cockatoo apple		C		1/1
plants	land plants	Leguminosae	<i>Acacia crassa</i> subsp. <i>crassa</i>			C		1/1
plants	land plants	Leguminosae	<i>Acacia harpophylla</i>	brigalow		C		2/2
plants	land plants	Leguminosae	<i>Acacia holosericea</i>			C		1/1
plants	land plants	Leguminosae	<i>Acacia rhodoxylon</i>	ringy rosewood		C		2/2
plants	land plants	Leguminosae	<i>Acacia salicina</i>	doolan		C		2/2
plants	land plants	Leguminosae	<i>Albizia canescens</i>			C		1/1
plants	land plants	Leguminosae	<i>Albizia lebbek</i>	Indian siris		C		1/1
plants	land plants	Leguminosae	<i>Cajanus reticulatus</i> var. <i>reticulatus</i>			C		2/2
plants	land plants	Leguminosae	<i>Cajanus scarabaeoides</i> var. <i>scarabaeoides</i>			C		1/1
plants	land plants	Leguminosae	<i>Cassia brewsteri</i>			C		2/2
plants	land plants	Leguminosae	<i>Cassia fistula</i>	Indian laburnum	Y			1/1
plants	land plants	Leguminosae	<i>Chamaecrista absus</i> var. <i>absus</i>			C		3/3
plants	land plants	Leguminosae	<i>Chamaecrista concinna</i>			C		1/1
plants	land plants	Leguminosae	<i>Clitoria ternatea</i>	butterfly pea	Y			2/2
plants	land plants	Leguminosae	<i>Crotalaria incana</i> subsp. <i>incana</i>		Y			1/1
plants	land plants	Leguminosae	<i>Crotalaria juncea</i>	sunhemp	Y			1/1
plants	land plants	Leguminosae	<i>Crotalaria medicaginea</i> var. <i>neglecta</i>			C		1/1
plants	land plants	Leguminosae	<i>Desmodium filiforme</i>			C		1/1
plants	land plants	Leguminosae	<i>Galactia tenuiflora</i> var. <i>lucida</i>			C		1/1
plants	land plants	Leguminosae	<i>Indigofera australis</i>			C		1/1
plants	land plants	Leguminosae	<i>Indigofera colutea</i>	sticky indigo		C		1/1
plants	land plants	Leguminosae	<i>Leucaena leucocephala</i> subsp. <i>glabrata</i>		Y			1/1
plants	land plants	Leguminosae	<i>Lysiphyllum hookeri</i>	Queensland ebony		C		1/1

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plants	land plants	Leguminosae	<i>Macroptilium atropurpureum</i>	siratro	Y			1/1
plants	land plants	Leguminosae	<i>Neptunia gracilis</i>			C		1/1
plants	land plants	Leguminosae	<i>Senna alata</i>		Y			2/2
plants	land plants	Leguminosae	<i>Senna coronilloides</i>				C	1/1
plants	land plants	Leguminosae	<i>Senna gaudichaudii</i>				C	1/1
plants	land plants	Leguminosae	<i>Senna pendula</i> var. <i>glabrata</i>	Easter cassia	Y			1/1
plants	land plants	Leguminosae	<i>Sesbania cannabina</i> var. <i>cannabina</i>				C	1/1
plants	land plants	Leguminosae	<i>Stylosanthes hamata</i>		Y			1/1
plants	land plants	Leguminosae	<i>Tamarindus indica</i>		Y			1/1
plants	land plants	Leguminosae	<i>Tephrosia astragaloides</i>				C	1/1
plants	land plants	Leguminosae	<i>Tephrosia barbatala</i>				C	1/1
plants	land plants	Leguminosae	<i>Tephrosia filipes</i> var. ( <i>Mt Blackjack A.R.Bean+ 7332</i> )				C	1/1
plants	land plants	Leguminosae	<i>Tephrosia juncea</i>				C	1/1
plants	land plants	Leguminosae	<i>Tephrosia purpurea</i> var. <i>sericea</i>				C	1/1
plants	land plants	Leguminosae	<i>Vigna lanceolata</i> var. <i>lanceolata</i>				C	1/1
plants	land plants	Leguminosae	<i>Vigna</i> sp. ( <i>Greta Creek R.J.Lawn+ AQ532201</i> )				C	1/1
plants	land plants	Leguminosae	<i>Zornia muelleriana</i> subsp. <i>muelleriana</i>				C	1/1
plants	land plants	Linderniaceae	<i>Torenia crustacea</i>				C	1/1
plants	land plants	Loranthaceae	<i>Dendrophthoe glabrescens</i>				C	1/1
plants	land plants	Malvaceae	<i>Abutilon cunninghamii</i>				C	1/1
plants	land plants	Malvaceae	<i>Abutilon guineense</i>		Y			1/1
plants	land plants	Malvaceae	<i>Abutilon oxycarpum</i> var. <i>oxycarpum</i>				C	1/1
plants	land plants	Malvaceae	<i>Hibiscus</i>					2/2
plants	land plants	Malvaceae	<i>Hibiscus heterophyllus</i>				C	1/1
plants	land plants	Malvaceae	<i>Hibiscus meraukensis</i>	Merauke hibiscus			C	1/1
plants	land plants	Malvaceae	<i>Hibiscus sturtii</i>				C	1/1
plants	land plants	Malvaceae	<i>Hibiscus sturtii</i> var. <i>sturtii</i>				C	1/1
plants	land plants	Malvaceae	<i>Malvastrum coromandelianum</i> subsp. <i>coromandelianum</i>		Y			1/1
plants	land plants	Malvaceae	<i>Sida atherophora</i>				C	1/1
plants	land plants	Malvaceae	<i>Sida brachypoda</i>				C	2/2
plants	land plants	Malvaceae	<i>Sida cordifolia</i>		Y			3/3
plants	land plants	Malvaceae	<i>Sida rhombifolia</i>		Y			1/1
plants	land plants	Malvaceae	<i>Sida</i> sp. ( <i>Musselbrook M.B.Thomas+ MRS437</i> )				C	1/1
plants	land plants	Meliaceae	<i>Azadirachta indica</i>		Y			1/1
plants	land plants	Myrtaceae	<i>Corymbia erythrophloia</i>	variable-barked bloodwood			C	2/2
plants	land plants	Myrtaceae	<i>Eucalyptus brownii</i>	Reid River box			C	1/1
plants	land plants	Myrtaceae	<i>Eucalyptus camaldulensis</i> subsp. <i>acuta</i>				C	1/1
plants	land plants	Myrtaceae	<i>Eucalyptus orgadophila</i>	mountain coolibah			C	1/1
plants	land plants	Myrtaceae	<i>Eucalyptus persistens</i>				C	1/1
plants	land plants	Myrtaceae	<i>Eucalyptus raveretiana</i>	black ironbox			C	4/4
plants	land plants	Myrtaceae	<i>Lophostemon grandiflorus</i> subsp. <i>riparius</i>				C	2/2
plants	land plants	Myrtaceae	<i>Melaleuca bracteata</i>				C	2/2
plants	land plants	Myrtaceae	<i>Melaleuca fluviatilis</i>				C	1/1
plants	land plants	Myrtaceae	<i>Melaleuca nervosa</i>				C	1/1
plants	land plants	Nyctaginaceae	<i>Boerhavia dominii</i>				C	1/1



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plants	land plants	Nyctaginaceae	<i>Bougainvillea glabra</i>		Y			1/1
plants	land plants	Orobanchaceae	<i>Striga parviflora</i>			C		1/1
plants	land plants	Oxalidaceae	<i>Oxalis radicata</i>			C		1/1
plants	land plants	Papaveraceae	<i>Argemone ochroleuca subsp. ochroleuca</i>	Mexican poppy	Y			1/1
plants	land plants	Passifloraceae	<i>Passiflora foetida</i>		Y			1/1
plants	land plants	Passifloraceae	<i>Passiflora pallida</i>		Y			1/1
plants	land plants	Pentapetaceae	<i>Melhantha oblongifolia</i>				C	1/1
plants	land plants	Phyllanthaceae	<i>Phyllanthus amarus</i>		Y			1/1
plants	land plants	Phyllanthaceae	<i>Phyllanthus similis</i>				C	1/1
plants	land plants	Picrodendraceae	<i>Petalostigma pubescens</i>	quinine tree			C	1/1
plants	land plants	Plantaginaceae	<i>Scoparia dulcis</i>	scoparia	Y			2/2
plants	land plants	Poaceae	<i>Alloteropsis cimicina</i>				C	2/2
plants	land plants	Poaceae	<i>Aristida gracilipes</i>				C	1/1
plants	land plants	Poaceae	<i>Aristida holathera var. holathera</i>				C	3/3
plants	land plants	Poaceae	<i>Aristida hygrometrica</i>				C	1/1
plants	land plants	Poaceae	<i>Aristida ingrata</i>				C	1/1
plants	land plants	Poaceae	<i>Aristida queenslandica var. dissimilis</i>				C	2/2
plants	land plants	Poaceae	<i>Bothriochloa decipiens var. cloncurrans</i>				C	1/1
plants	land plants	Poaceae	<i>Bothriochloa ewartiana</i>	desert bluegrass			C	1/1
plants	land plants	Poaceae	<i>Bothriochloa pertusa</i>		Y			3/3
plants	land plants	Poaceae	<i>Cenchrus ciliaris</i>		Y			2/2
plants	land plants	Poaceae	<i>Chloris gayana</i>	rhodes grass	Y			1/1
plants	land plants	Poaceae	<i>Chloris inflata</i>	purpletop chloris	Y			1/1
plants	land plants	Poaceae	<i>Chloris ventricosa</i>	tall chloris			C	1/1
plants	land plants	Poaceae	<i>Chloris virgata</i>	feathertop rhodes grass	Y			3/3
plants	land plants	Poaceae	<i>Cleistochloa subjuncea</i>				C	1/1
plants	land plants	Poaceae	<i>Cynodon dactylon var. dactylon</i>		Y			1/1
plants	land plants	Poaceae	<i>Dichanthium aristatum</i>	angleton grass	Y			2/2
plants	land plants	Poaceae	<i>Dichanthium sericeum subsp. sericeum</i>				C	1/1
plants	land plants	Poaceae	<i>Digitaria ammophila</i>	silky umbrella grass			C	2/2
plants	land plants	Poaceae	<i>Digitaria longiflora</i>				C	1/1
plants	land plants	Poaceae	<i>Digitaria milaniana</i>		Y			1/1
plants	land plants	Poaceae	<i>Digitaria orbata</i>				C	2/2
plants	land plants	Poaceae	<i>Echinochloa colona</i>	awnless barnyard grass	Y			1/1
plants	land plants	Poaceae	<i>Eleusine indica</i>	crowsfoot grass	Y			1/1
plants	land plants	Poaceae	<i>Enneapogon polyphyllus</i>	leafy nineawn			C	1/1
plants	land plants	Poaceae	<i>Enneapogon virens</i>				C	1/1
plants	land plants	Poaceae	<i>Enteropogon unispiceus</i>				C	2/2
plants	land plants	Poaceae	<i>Eragrostis brownii</i>	Brown's lovegrass			C	1/1
plants	land plants	Poaceae	<i>Eragrostis cilianensis</i>		Y			2/2
plants	land plants	Poaceae	<i>Eragrostis pilosa</i>	soft lovegrass	Y			1/1
plants	land plants	Poaceae	<i>Eragrostis sororia</i>				C	3/3
plants	land plants	Poaceae	<i>Eriachne rara</i>				C	1/1
plants	land plants	Poaceae	<i>Eriochloa crebra</i>	spring grass			C	1/1
plants	land plants	Poaceae	<i>Eriochloa pseudoacrotricha</i>				C	2/2
plants	land plants	Poaceae	<i>Heteropogon contortus</i>	black speargrass			C	1/1

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plants	land plants	Poaceae	<i>Iseilema vaginiflorum</i>	red flinders grass		C		1/1
plants	land plants	Poaceae	<i>Megathyrsus maximus var. pubiglumis</i>		Y			1/1
plants	land plants	Poaceae	<i>Melinis repens</i>	red natal grass	Y			1/1
plants	land plants	Poaceae	<i>Ophiuros exaltatus</i>			C		1/1
plants	land plants	Poaceae	<i>Panicum effusum</i>			C		2/2
plants	land plants	Poaceae	<i>Panicum laevinode</i>	pepper grass		C		1/1
plants	land plants	Poaceae	<i>Paspalidium caespitosum</i>	brigalow grass		C		1/1
plants	land plants	Poaceae	<i>Paspalidium rarum</i>			C		3/3
plants	land plants	Poaceae	<i>Perotis rara</i>	comet grass		C		1/1
plants	land plants	Poaceae	<i>Sehima nervosum</i>			C		1/1
plants	land plants	Poaceae	<i>Setaria australiensis</i>	scrub pigeon grass		C		1/1
plants	land plants	Poaceae	<i>Setaria surgens</i>			C		2/2
plants	land plants	Poaceae	<i>Sorghum halepense</i>	Johnson grass	Y			1/1
plants	land plants	Poaceae	<i>Sorghum x almum</i>		Y			1/1
plants	land plants	Poaceae	<i>Sporobolus coromandelianus</i>		Y			1/1
plants	land plants	Poaceae	<i>Sporobolus creber</i>			C		1/1
plants	land plants	Poaceae	<i>Sporobolus jacquemontii</i>		Y			2/2
plants	land plants	Poaceae	<i>Themeda avenacea</i>			C		2/2
plants	land plants	Poaceae	<i>Themeda quadrivalvis</i>	grader grass	Y			1/1
plants	land plants	Poaceae	<i>Themeda triandra</i>	kangaroo grass		C		1/1
plants	land plants	Poaceae	<i>Urochloa mutica</i>		Y			2/2
plants	land plants	Poaceae	<i>Urochloa panicoides var. panicoides</i>		Y			1/1
plants	land plants	Poaceae	<i>Urochloa piligera</i>			C		1/1
plants	land plants	Poaceae	<i>Urochloa subquadripara</i>		Y			1/1
plants	land plants	Poaceae	<i>Whiteochloa airoides</i>			C		1/1
plants	land plants	Portulacaceae	<i>Portulaca filifolia</i>			C		1/1
plants	land plants	Portulacaceae	<i>Portulaca pilosa</i>		Y			3/3
plants	land plants	Proteaceae	<i>Grevillea parallela</i>			C		1/1
plants	land plants	Proteaceae	<i>Grevillea striata</i>	beefwood		C		2/2
plants	land plants	Proteaceae	<i>Hakea lorea subsp. lorea</i>			C		1/1
plants	land plants	Rhamnaceae	<i>Alphitonia excelsa</i>	soap tree		C		2/2
plants	land plants	Rhamnaceae	<i>Ziziphus mauritiana</i>	Indian jujube	Y			4/4
plants	land plants	Rubiaceae	<i>Coelospermum reticulatum</i>			C		1/1
plants	land plants	Rubiaceae	<i>Paranotis mitrasacmoides subsp. trachymenoides</i>			C		1/1
plants	land plants	Rubiaceae	<i>Psydrax odorata subsp. australiana</i>			C		1/1
plants	land plants	Rubiaceae	<i>Psydrax saligna forma saligna</i>			C		1/1
plants	land plants	Rubiaceae	<i>Richardia brasiliensis</i>	white eye	Y			1/1
plants	land plants	Rutaceae	<i>Micromelum minutum</i>	clusterberry		C		1/1
plants	land plants	Sapindaceae	<i>Alectryon diversifolius</i>	scrub boonaree		C		1/1
plants	land plants	Sapindaceae	<i>Atalaya hemiglauca</i>			C		1/1
plants	land plants	Sapindaceae	<i>Cardiospermum halicacabum var. halicacabum</i>		Y			1/1
plants	land plants	Sapindaceae	<i>Cardiospermum halicacabum var. microcarpum</i>		Y			1/1
plants	land plants	Sapindaceae	<i>Dodonaea viscosa subsp. burmanniana</i>			C		2/2
plants	land plants	Sapotaceae	<i>Amorphospermum antilogum</i>			C		1/1
plants	land plants	Scrophulariaceae	<i>Eremophila mitchellii</i>			C		1/1
plants	land plants	Solanaceae	<i>Capsicum frutescens</i>		Y			2/2

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plants	land plants	Solanaceae	<i>Physalis angulata</i>		Y			1/1
plants	land plants	Solanaceae	<i>Solanum ellipticum</i>	potato bush		C		1/1
plants	land plants	Solanaceae	<i>Solanum seafortianum</i>	Brazilian nightshade	Y			1/1
plants	land plants	Solanaceae	<i>Solanum torvum</i>	devil's fig	Y			1/1
plants	land plants	Sparrmanniaceae	<i>Corchorus olerius</i>	jute		C		1/1
plants	land plants	Sparrmanniaceae	<i>Corchorus trilocularis</i>			C		1/1
plants	land plants	Sparrmanniaceae	<i>Grewia asiatica</i>		Y			6/6
plants	land plants	Sparrmanniaceae	<i>Grewia savannicola</i>			C		2/2
plants	land plants	Sparrmanniaceae	<i>Grewia scabrella</i>			C		1/1
plants	land plants	Sparrmanniaceae	<i>Triumfetta pentandra</i>		Y			2/2
plants	land plants	Sparrmanniaceae	<i>Triumfetta rhomboidea</i>	chinese burr	Y			1/1
plants	land plants	Sterculiaceae	<i>Brachychiton australis</i>	broad-leaved bottle tree		SL		1/1
plants	land plants	Verbenaceae	<i>Lantana camara</i>	lantana	Y			4/4
plants	land plants	Verbenaceae	<i>Stachytarpheta jamaicensis</i>	Jamaica snakeweed	Y			1/1
plants	land plants	Verbenaceae	<i>Verbena litoralis</i> var. <i>litoralis</i>		Y			1/1
plants	land plants	Violaceae	<i>Pigea enneasperma</i>			C		1/1
plants	land plants	Violaceae	<i>Pigea stellarioides</i>			C		2/2
plants	land plants	Vitaceae	<i>Cissus cardiophylla</i>			C		1/1
plants	land plants	Vitaceae	<i>Clematicissus opaca</i>			C		1/1
plants	land plants	Zygophyllaceae	<i>Tribulus micrococcus</i>	yellow vine		C		1/1
plants		Mimosoid clade	<i>Neptunia heliophila</i>			C		1/1
plants		Papilionoideae	<i>Canavalia papuana</i>	wild jack bean		C		1/1
plants		Papilionoideae	<i>Crotalaria goreensis</i>	gambia pea	Y			1/1
plants		Papilionoideae	<i>Crotalaria pallida</i> var. <i>obovata</i>		Y			1/1
plants		Papilionoideae	<i>Indigofera hirsuta</i>	hairy indigo		C		2/2

#### 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.

## Appendix B

### Protected Matters Database Search





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: 22-Jan-2023

[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](#).

<a href="#">World Heritage Properties:</a>	None
<a href="#">National Heritage Places:</a>	None
<a href="#">Wetlands of International Importance (Ramsar)</a>	None
<a href="#">Great Barrier Reef Marine Park:</a>	None
<a href="#">Commonwealth Marine Area:</a>	None
<a href="#">Listed Threatened Ecological Communities:</a>	3
<a href="#">Listed Threatened Species:</a>	22
<a href="#">Listed Migratory Species:</a>	16

## 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.

<a href="#">Commonwealth Lands:</a>	None
<a href="#">Commonwealth Heritage Places:</a>	None
<a href="#">Listed Marine Species:</a>	21
<a href="#">Whales and Other Cetaceans:</a>	None
<a href="#">Critical Habitats:</a>	None
<a href="#">Commonwealth Reserves Terrestrial:</a>	None
<a href="#">Australian Marine Parks:</a>	None
<a href="#">Habitat Critical to the Survival of Marine Turtles:</a>	None

## Extra Information

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

<a href="#">State and Territory Reserves:</a>	1
<a href="#">Regional Forest Agreements:</a>	None
<a href="#">Nationally Important Wetlands:</a>	None
<a href="#">EPBC Act Referrals:</a>	20
<a href="#">Key Ecological Features (Marine):</a>	None
<a href="#">Biologically Important Areas:</a>	None
<a href="#">Bioregional Assessments:</a>	None
<a href="#">Geological and Bioregional Assessments:</a>	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
<a href="#">Brigalow (Acacia harpophylla dominant and co-dominant)</a>	Endangered	Community known to occur within area	In buffer area only
<a href="#">Natural Grasslands of the Queensland Central Highlands and northern Fitzroy Basin</a>	Endangered	Community likely to occur within area	In feature area
<a href="#">Poplar Box Grassy Woodland on Alluvial Plains</a>	Endangered	Community may 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
<b>BIRD</b>			
<a href="#">Calidris ferruginea</a> Curlew Sandpiper [856]	Critically Endangered	Species or species habitat may occur within area	In feature area
<a href="#">Erythrotriorchis radiatus</a> Red Goshawk [942]	Vulnerable	Species or species habitat likely to occur within area	In feature area
<a href="#">Falco hypoleucos</a> Grey Falcon [929]	Vulnerable	Species or species habitat may occur within area	In feature area
<a href="#">Geophaps scripta scripta</a> Squatter Pigeon (southern) [64440]	Vulnerable	Species or species habitat may occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
<a href="#">Hirundapus caudacutus</a> White-throated Needletail [682]	Vulnerable	Species or species habitat may occur within area	In buffer area only
<a href="#">Neochmia ruficauda ruficauda</a> Star Finch (eastern), Star Finch (southern) [26027]	Endangered	Species or species habitat likely to occur within area	In feature area
<a href="#">Numenius madagascariensis</a> Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat may occur within area	In feature area
<a href="#">Poephila cincta cincta</a> Southern Black-throated Finch [64447]	Endangered	Species or species habitat may occur within area	In feature area
<a href="#">Rostratula australis</a> Australian Painted Snipe [77037]	Endangered	Species or species habitat likely to occur within area	In feature area
<a href="#">Tyto novaehollandiae kimberli</a> Masked Owl (northern) [26048]	Vulnerable	Species or species habitat may occur within area	In feature area
<b>MAMMAL</b>			
<a href="#">Dasyurus hallucatus</a> Northern Quoll, Digul [Gogo-Yimidir], Wijingadda [Dambimangari], Wiminji [Martu] [331]	Endangered	Species or species habitat likely to occur within area	In feature area
<a href="#">Macroderma gigas</a> Ghost Bat [174]	Vulnerable	Species or species habitat likely to occur within area	In feature area
<a href="#">Petauroides minor</a> Greater Glider (northern), Greater Glider (north-eastern Queensland) [92008]	Vulnerable	Species or species habitat may occur within area	In feature area
<a href="#">Petauroides volans</a> Greater Glider (southern and central) [254]	Endangered	Species or species habitat likely to occur within area	In feature area
<a href="#">Phascolarctos cinereus (combined populations of Qld, NSW and the ACT)</a> 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



Scientific Name	Threatened Category	Presence Text	Buffer Status
<b>PLANT</b>			
<a href="#">Dichanthium queenslandicum</a> King Blue-grass [5481]	Endangered	Species or species habitat may occur within area	In buffer area only
<a href="#">Dichanthium setosum</a> bluegrass [14159]	Vulnerable	Species or species habitat likely to occur within area	In feature area
<a href="#">Eucalyptus raveretiana</a> Black Ironbox [16344]	Vulnerable	Species or species habitat known to occur within area	In feature area
<a href="#">Omphalea celata</a> [64586]	Vulnerable	Species or species habitat likely to occur within area	In feature area
<a href="#">Solanum graniticum</a> Granite Nightshade [84819]	Endangered	Species or species habitat may occur within area	In buffer area only

#### REPTILE

<a href="#">Denisonia maculata</a> Ornamental Snake [1193]	Vulnerable	Species or species habitat likely to occur within area	In feature area
<a href="#">Egernia rugosa</a> Yakka Skink [1420]	Vulnerable	Species or species habitat may occur within area	In feature area

#### Listed Migratory Species

[ [Resource Information](#) ]

Scientific Name	Threatened Category	Presence Text	Buffer Status
<b>Migratory Marine Birds</b>			
<a href="#">Apus pacificus</a> Fork-tailed Swift [678]		Species or species habitat likely to occur within area	In feature area

#### Migratory Marine Species

<a href="#">Crocodylus porosus</a> Salt-water Crocodile, Estuarine Crocodile [1774]		Species or species habitat likely to occur within area	In feature area
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#### Migratory Terrestrial Species

<a href="#">Cuculus optatus</a> Oriental Cuckoo, Horsfield's Cuckoo [86651]		Species or species habitat known to occur within area	In feature area
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Scientific Name	Threatened Category	Presence Text	Buffer Status
<a href="#">Hirundapus caudacutus</a> White-throated Needletail [682]	Vulnerable	Species or species habitat may occur within area	In buffer area only
<a href="#">Monarcha melanopsis</a> Black-faced Monarch [609]		Species or species habitat known to occur within area	In buffer area only
<a href="#">Motacilla flava</a> Yellow Wagtail [644]		Species or species habitat may occur within area	In feature area
<a href="#">Myiagra cyanoleuca</a> Satin Flycatcher [612]		Species or species habitat known to occur within area	In feature area
<a href="#">Rhipidura rufifrons</a> Rufous Fantail [592]		Species or species habitat likely to occur within area	In buffer area only
<a href="#">Symposiachrus trivirgatus as Monarcha trivirgatus</a> Spectacled Monarch [83946]		Species or species habitat may occur within area	In buffer area only
<b>Migratory Wetlands Species</b>			
<a href="#">Actitis hypoleucos</a> Common Sandpiper [59309]		Species or species habitat may occur within area	In feature area
<a href="#">Calidris acuminata</a> Sharp-tailed Sandpiper [874]		Species or species habitat may occur within area	In feature area
<a href="#">Calidris ferruginea</a> Curlew Sandpiper [856]	Critically Endangered	Species or species habitat may occur within area	In feature area
<a href="#">Calidris melanotos</a> Pectoral Sandpiper [858]		Species or species habitat may occur within area	In feature area
<a href="#">Gallinago hardwickii</a> Latham's Snipe, Japanese Snipe [863]		Species or species habitat may occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
<a href="#">Numenius madagascariensis</a> Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat may occur within area	In feature area
<a href="#">Pandion haliaetus</a> Osprey [952]		Species or species habitat likely to occur within area	In buffer area only

## Other Matters Protected by the EPBC Act

Listed Marine Species			[ Resource Information ]
Scientific Name	Threatened Category	Presence Text	Buffer Status
<b>Bird</b>			
<a href="#">Actitis hypoleucos</a> Common Sandpiper [59309]		Species or species habitat may occur within area	In feature area
<a href="#">Anseranas semipalmata</a> Magpie Goose [978]		Species or species habitat may occur within area overfly marine area	In feature area
<a href="#">Apus pacificus</a> Fork-tailed Swift [678]		Species or species habitat likely to occur within area overfly marine area	In feature area
<a href="#">Bubulcus ibis as Ardea ibis</a> Cattle Egret [66521]		Species or species habitat may occur within area overfly marine area	In feature area
<a href="#">Calidris acuminata</a> Sharp-tailed Sandpiper [874]		Species or species habitat may occur within area	In feature area
<a href="#">Calidris ferruginea</a> 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
<a href="#">Calidris melanotos</a> Pectoral Sandpiper [858]		Species or species habitat may occur within area overfly marine area	In feature area
<a href="#">Chalcites osculans as Chrysococcyx osculans</a> Black-eared Cuckoo [83425]		Species or species habitat may occur within area overfly marine area	In feature area
<a href="#">Gallinago hardwickii</a> Latham's Snipe, Japanese Snipe [863]		Species or species habitat may occur within area overfly marine area	In feature area
<a href="#">Haliaeetus leucogaster</a> White-bellied Sea-Eagle [943]		Species or species habitat likely to occur within area	In feature area
<a href="#">Hirundapus caudacutus</a> White-throated Needletail [682]	Vulnerable	Species or species habitat may occur within area overfly marine area	In buffer area only
<a href="#">Merops ornatus</a> Rainbow Bee-eater [670]		Species or species habitat may occur within area overfly marine area	In feature area
<a href="#">Monarcha melanopsis</a> Black-faced Monarch [609]		Species or species habitat known to occur within area overfly marine area	In buffer area only
<a href="#">Motacilla flava</a> Yellow Wagtail [644]		Species or species habitat may occur within area overfly marine area	In feature area
<a href="#">Myiagra cyanoleuca</a> Satin Flycatcher [612]		Species or species habitat known to occur within area overfly marine area	In feature area
<a href="#">Numenius madagascariensis</a> Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat may occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
<a href="#">Pandion haliaetus</a> Osprey [952]		Species or species habitat likely to occur within area	In buffer area only
<a href="#">Rhipidura rufifrons</a> Rufous Fantail [592]		Species or species habitat likely to occur within area overfly marine area	In buffer area only
<a href="#">Rostratula australis as Rostratula benghalensis (sensu lato)</a> Australian Painted Snipe [77037]	Endangered	Species or species habitat likely to occur within area overfly marine area	In feature area
<a href="#">Symposiachrus trivirgatus as Monarcha trivirgatus</a> Spectacled Monarch [83946]		Species or species habitat may occur within area overfly marine area	In buffer area only

## Reptile

<a href="#">Crocodylus porosus</a> Salt-water Crocodile, Estuarine Crocodile [1774]		Species or species habitat likely to occur within area	In feature area
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## Extra Information

### State and Territory Reserves [\[ Resource Information \]](#)

Protected Area Name	Reserve Type	State	Buffer Status
Flagstone	Nature Refuge	QLD	In buffer area only

### EPBC Act Referrals [\[ Resource Information \]](#)

Title of referral	Reference	Referral Outcome	Assessment Status	Buffer Status
<a href="#">Controlled action</a>				
<a href="#">Alpha Coal Project - Mine and Rail Development</a>	2008/4648	Controlled Action	Post-Approval	In feature area
<a href="#">BHP Billiton Goonyella to Abbot Point rail project</a>	2011/6082	Controlled Action	Completed	In buffer area only
<a href="#">Central Queensland Integrated Rail Project</a>	2012/6321	Controlled Action	Completed	In feature area
<a href="#">CopperString Project</a>	2010/5581	Controlled Action	Completed	In buffer area only
<a href="#">Diversion of a stretch of Coral Creek to expand the northern reach of the open-cut pit mine</a>	2011/5800	Controlled Action	Post-Approval	In feature area



Title of referral	Reference	Referral Outcome	Assessment Status	Buffer Status
<b>Controlled action</b>				
<a href="#">Drake Open Cut Coal Mine</a>	2010/5457	Controlled Action	Post-Approval	In buffer area only
<a href="#">Establishment of Galilee Coal Mine and Associated Infrastructure</a>	2009/4737	Controlled Action	Post-Approval	In feature area
<a href="#">North Galilee Basin Rail Project, Qld</a>	2013/6885	Controlled Action	Post-Approval	In buffer area only
<a href="#">Sarum Coal Project</a>	2011/5906	Controlled Action	Completed	In feature area
<a href="#">Sarum Open Cut &amp; Underground Coal Mining Operation &amp; Associated Infrastructure</a>	2010/5308	Controlled Action	Completed	In buffer area only
<b>Not controlled action</b>				
<a href="#">Construction of Burdekin Pipeline</a>	2005/2209	Not Controlled Action	Completed	In buffer area only
<a href="#">Cows Coal Project, Open-Cut Coal Mine</a>	2009/5216	Not Controlled Action	Completed	In buffer area only
<a href="#">Improving rabbit biocontrol: releasing another strain of RHDV, sthrn two thirds of Australia</a>	2015/7522	Not Controlled Action	Completed	In feature area
<a href="#">Jax Coal Project, Open-Cut Mine Development</a>	2009/5215	Not Controlled Action	Completed	In buffer area only
<a href="#">Nebo to Strathmore 275kV Transmission Line</a>	2006/2997	Not Controlled Action	Completed	In feature area
<a href="#">Sarum Deposit Seismic Exploration Program</a>	2007/3673	Not Controlled Action	Completed	In buffer area only
<a href="#">Sonoma Coal Project, comprising Sonoma-1, Sonoma-2, and Belmore-1</a>	2005/2080	Not Controlled Action	Completed	In feature area
<a href="#">Stage 2 Solar Farm Development, north-west of Collinsville, Queensland</a>	2017/7904	Not Controlled Action	Completed	In buffer area only
<b>Not controlled action (particular manner)</b>				
<a href="#">275kV Transmission Line from Ross substation to Strathmore Substation (approx 180km)</a>	2008/4390	Not Controlled Action (Particular Manner)	Post-Approval	In buffer area only
<a href="#">Solar Farm development, north-west of Collinsville, Qld</a>	2016/7824	Not Controlled Action (Particular Manner)	Post-Approval	In buffer area only

# 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 are 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

## 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

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

## 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
- 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.

# Appendix C

## Potential Threatened Fauna Review

Species	Common Name	NC Act	EPBC Act	Data base	Habitat preference	Likelihood of occurrence
<b>Amphibians</b>						
None						
<b>Birds</b>						
<i>Rostratula australis</i>	Australian painted snipe	V	E	W	Terrestrial shallow wetlands, ephemeral and permanent, usually freshwater but occasionally brackish. They also use inundated grasslands, saltmarsh, dams, rice crops, sewage farms and bore drains. Most likely in alluvial areas but could also occur in gilgaied areas.	<b>Unlikely</b> Although low quality habitat for this species occurs in association with wet habitats near the farm dams these are low quality habitats.  No database records (predicted to occur on EPBC search tool).
<i>Poephila cincta</i>	Southern Black-throated Finch	E	E	P	Grassy, open woodlands and forests, typically dominated by Eucalyptus, Corymbia and Melaleuca, and occasionally in tussock grasslands or other habitats (for example freshwater wetlands), often along or near watercourses, or in the vicinity of water	<b>Potentially occurs / unlikely</b> Habitat for this species occurs across the Project area however this species has not been recorded within the locality and it is unlikely to be present in the local landscape.  No database records (predicted to occur on EPBC search tool).  This is an extremely uncommon species.
<i>Calidris ferruginea</i>	curlew sandpiper	E	CE	P	Mainly occur on intertidal mudflats in sheltered coastal areas, such as estuaries, bays, inlets and lagoons, and also around non-tidal swamps, lakes and lagoons near the coast, and ponds in saltworks and sewage farms. They are also recorded inland, though less often, including around ephemeral and permanent lakes, dams, waterholes and	<b>Potentially occurs / unlikely</b> There is limited habitat for this species associated with the Bowen River, larger creeks and farm dams. The inland sub-



Species	Common Name	NC Act	EPBC Act	Data base	Habitat preference	Likelihood of occurrence
					bore drains, usually with bare edges of mud or sand. They occur in both fresh and brackish waters. Occasionally they are recorded around floodwaters	coastal location does not favour the occurrence of this species. No database records (predicted to occur on EPBC search tool). This is an extremely uncommon species.
<i>Numenius madagascariensis</i>	Eastern Curlew	E	CE	P	Intertidal mudflats and sandflats often with beds of seagrass, on sheltered coasts, especially estuaries, mangrove swamps, bays, harbours and lagoons. Very occasionally found further inland associated with lakes and lagoons	<b>Unlikely</b> No suitable habitat for this species occurs within the Project area. No database records (predicted to occur on EPBC search tool).
<i>Apus pacificus</i>	fork-tailed swift	SL	NL	W	Feeds on the wing often along storm fronts and rarely lands	<b>Potentially occurs – Fly over</b> The extant habitats hold little direct relevance to this species. It is expected to occur across the Project area during seasonal movements.
<i>Plegadis falcinellus</i>	glossy ibis	SL	NL	W	Feeds in very shallow water and nest in freshwater or brackish wetlands with tall dense stands of emergent vegetation such as reeds, papyrus or rushes) and low trees or bushes	<b>Potentially occurs / unlikely</b> Low quality habitat for this species occurs along the margins of the Bowen River and major creek systems. Maybe infrequent visitor during wet periods when paddocks becomes inundated.
<i>Cuculus optatus</i>	oriental cuckoo	SL	NL	W	Found in more humid habitats such as monsoon forest, wet eucalypt forest, river margins and near mangroves	<b>Potentially occurs</b>

Species	Common Name	NC Act	EPBC Act	Data base	Habitat preference	Likelihood of occurrence
						Habitat for this specie is limited to the narrow riparian forest fringing the Bowen River (Drake), Jack Creek (Jax) and Coral Creek (Sonoma).
<i>Tyto novaehollandiae kimberli</i>	Masked Owl (northern)	V	V	P	Riparian forest, rainforest, open forest, Melaleuca swamps and the edges of mangroves, as well as along the margins of sugar cane fields	<p><b>Potentially occurs / unlikely</b></p> <p>Habitat for this specie is limited to the narrow riparian forest fringing the Bowen River (Drake), Jack Creek (Jax) and Coral Creek (Sonoma).</p> <p>No database records (predicted to occur on EPBC search tool).</p>
<i>Erythrotriorchis radiatus</i>	red goshawk	E	V	P	Endemic to northern and eastern Australia in coastal and subcoastal areas with large home ranges of up to 200 km <sup>2</sup> . Occurs in woodlands and forests and prefers mosaic habitats that hold a large population of birds and permanent water. Riparian areas are heavily favoured.	<p><b>Potential visitor / unlikely</b></p> <p>Good quality foraging habitat for this species occurs within the narrow riparian forest fringing the Bowen River. The Project area offers a mosaic of woodlands and forest of lesser habitat value.</p> <p>This is an extremely rare species that is unlikely to be present within the local landscape.</p> <p>No database records (predicted to occur on EPBC search tool).</p> <p>This is an extremely uncommon species.</p>
<i>Geophaps scripta scripta</i>	Squatter Pigeon (southern)	NL	V	W/P	Dry grassy eucalypt woodlands and open forests, also Callitris and Acacia woodlands. Most birds live in sandy	<b>Present</b>

Species	Common Name	NC Act	EPBC Act	Data base	Habitat preference	Likelihood of occurrence
					sites near permanent water. Often observed at cattle yards, dirt tracks and other disturbed areas.	This species was observed in good numbers in multiple places across the Project area
<i>Myiagra cyanoleuca</i>	Satin flycatcher	SL	NL	W	Found in tall forests, preferring wetter habitats such as heavily forested gullies, but not rainforests.	<b>Potentially occurs</b> Habitat for this specie is limited to the narrow riparian forest fringing the Bowen River (Drake), Jack Creek (Jax) and Coral Creek (Sonoma).
<i>Symposiachrus trivirgatus</i>	Spectacled monarch	SL	NL	W	Found in thick understorey in rainforests, wet gullies and waterside vegetation, as well as mangroves	<b>Potentially occurs</b> Habitat for this specie is limited to the narrow riparian forest fringing the Bowen River (Drake), Jack Creek (Jax) and Coral Creek (Sonoma).
<i>Neochmia ruficauda ruficauda</i>	Star Finch (eastern), Star Finch (southern)	LC	E	P	Mainly in grasslands and grassy woodlands that are located close to bodies of fresh water. also occurs in cleared or suburban areas such as along roadsides and in towns	<b>Potentially occurs / unlikely</b> Low quality habitat for this species occurs across the Project area. No database records (predicted to occur on EPBC search tool).
<i>Falco hypoleucos</i>	Grey Falcon	X	X	X	Usually restricted to shrubland, grassland and wooded watercourses of arid and semi-arid regions, although it is occasionally found in open woodlands near the coast. Also occurs near wetlands where surface water attracts prey.	<b>Potentially occurs / unlikely</b> Habitat for this species occurs in association with all woodland and open forest communities across the Project area No database records (predicted to occur on EPBC search tool).

Species	Common Name	NC Act	EPBC Act	Data base	Habitat preference	Likelihood of occurrence
<b>Reptiles</b>						
<i>Denisonia maculata</i>	ornamental snake	V	V	W/P	In Brigalow ( <i>Acacia harpophylla</i> ), Gidgee ( <i>Acacia cambagei</i> ), Blackwood ( <i>Acacia argyrodendron</i> ) or Coolibah ( <i>Eucalyptus coolabah</i> )-dominated vegetation communities, or pure grassland associated with gilgais	<b>Potentially occurs</b> There are some large patch of deep cracking clay soils across the Project area.
<i>Egernia rugosa</i>	Yakka Skink	V	V	P	A wide variety of vegetation types including poplar box, ironbark, brigalow, white cypress pine, mulga, bendee and lancewood woodlands and open forests. Substrates include rock, sand, clay and loamy red earth. They can persist in clearings where shelter sites such as tunnel erosion, rabbit warrens and log piles exist.	<b>Potentially occurs</b> There is habitat for this species associated with the large expanses of Eucalypt woodland with high levels of fallen woody material on lands zone 9 within the Project area
<i>Lerista vittata</i>	Mount Cooper Striped Skink	V	V	P	Ironbark ( <i>Eucalyptus crebra</i> and <i>E. melanophloia</i> ) and bloodwood ( <i>Corymbia clarksonia</i> and <i>C. intermedia</i> ) dominated woodland with shrub and/or grassy ground layers on deep red earths (QLD RE 11.5.9), undulating plains and steep hills on granitic rocks (QLD RE 9.12.1a). Semi-Evergreen Vine Thicket (QLD RE 11.5.15), which extends onto areas of ironstone (duricrust) and Spinifex communities. Restricted to the Mount Cooper area	<b>Unlikely</b> There are no areas of deep red earths within the Project area  There are no database records for this species(predicted to occur on EPBC search tool).  This species is restricted to the Mount Cooper area
<b>Mammals</b>						
<i>Petauroides volans minor</i>	Northern greater glider	V	V	W/P	Wide range of habitats including tall open woodland, eucalypt forests and low woodlands. They do not occur in rainforests. They prefer habitats that are in older forests and have large number of hollows. typically found in highest abundance on high elevation, wetter sites in open woodland to open forests, containing relatively old trees	<b>Potentially occurs.</b> Large eucalypts provide habitat for this species. There is good quality habitat for this species in many parts of the Project area. The riparian woodlands close to

Species	Common Name	NC Act	EPBC Act	Data base	Habitat preference	Likelihood of occurrence
					and abundant hollows, with a particular preference for large hollows (diameter >10 cm) in large, old trees	the Bowen River offer particularly good habitat.
<i>Petauroides volans</i>	Greater Glider (southern and central)	X	E		Typically found in highest abundance in taller, montane, moist eucalypt forests on fertile soils, with relatively old trees and abundant hollows typically found in highest abundance in taller, montane, moist eucalypt forests on fertile soils, with relatively old trees and abundant hollows with a particular preference for large hollows (diameter >10 cm) in large, old trees	<b>Potentially occurs</b> Large eucalypts provide habitat for this species. There is good quality habitat for this species in many parts of the Project area. The riparian woodlands close to the Bowen River offer particularly good habitat.
<i>Phascolarctos cinereus</i>	koala	V	V	W/P	No evidence of this species (scats and tree scratches) was detected throughout the site during the site survey. Koalas live over a range of open forest and woodland communities. Within the Site, some of the canopy eucalypts are suitable habitat for this species. The presence of main roads and low bushland density within the area makes it unlikely that the koala persists in this landscape	<b>Potentially occurs.</b> Habitat for this species includes all woodlands and open forests dominated by eucalypts within the Project area. Particularly good habitat or this species is associated with the fringing riparian open forest of the Bowen River and larger Creek systems
<i>Tachyglossus aculeatus</i>	short-beaked echidna	SL	NL	W	Occupy a range of habitats, from snowy alpine to semi-arid areas, including meadows, heathlands, forests, woodlands, and Australian desert	<b>Present</b> Scats and diggings associated with this species were identified in several locations across the Project area.
<i>Dasyurus hallucatus</i>	Northern Quoll	LC	E	P	Occupies a diversity of habitats across its range which includes rocky areas, eucalypt forest and woodlands, rainforests, sandy lowlands and beaches, shrubland, grasslands and desert. Habitat generally encompasses some form of rocky area for denning purposes with surrounding vegetated habitats used for foraging and	<b>Potentially occurs / unlikely</b> Low quality habitat for this species occurs along the banks of the Bowen River and larger creek systems as well as the two



Species	Common Name	NC Act	EPBC Act	Data base	Habitat preference	Likelihood of occurrence
					dispersal. Rocky habitats are usually of high relief, often rugged and dissected but can also include tor fields or caves in low lying areas. Quolls are more likely to be present in high relief areas that have shallower soils, greater cover of boulders, less fire impact and were closer to permanent water	isolated volcanic plugs in the SE of the Project area
<i>Macroderma gigas</i>	Ghost Bat	E	V	P	Ghost bat selects daytime roosts in caves, sheltered rock crevices, boulder piles or disused mines. A preference is given to sites with a complex of shafts or cavities and several openings to the outside	<b>Unlikely</b> No suitable roost sites occur on or near the site
<b>Fish</b>						
None						
<b>Invertebrates</b>						
None						

Abbreviations: *Status*

NC Act: E=Endangered; V=Vulnerable; NT=Near Threatened; S+ Special Least Concern; LC=Least Concern.

EPBC Act: CE=Critically Endangered; E=Endangered; V=Vulnerable; M=Migratory.

*Data source*

WN= DEHP Wildlife Online database; EPBC=Protected Matters Search Tool.

M = migratory, NL = not listed

Appendix D  
Regional Ecosystem Equivalents for Threatened  
Fauna

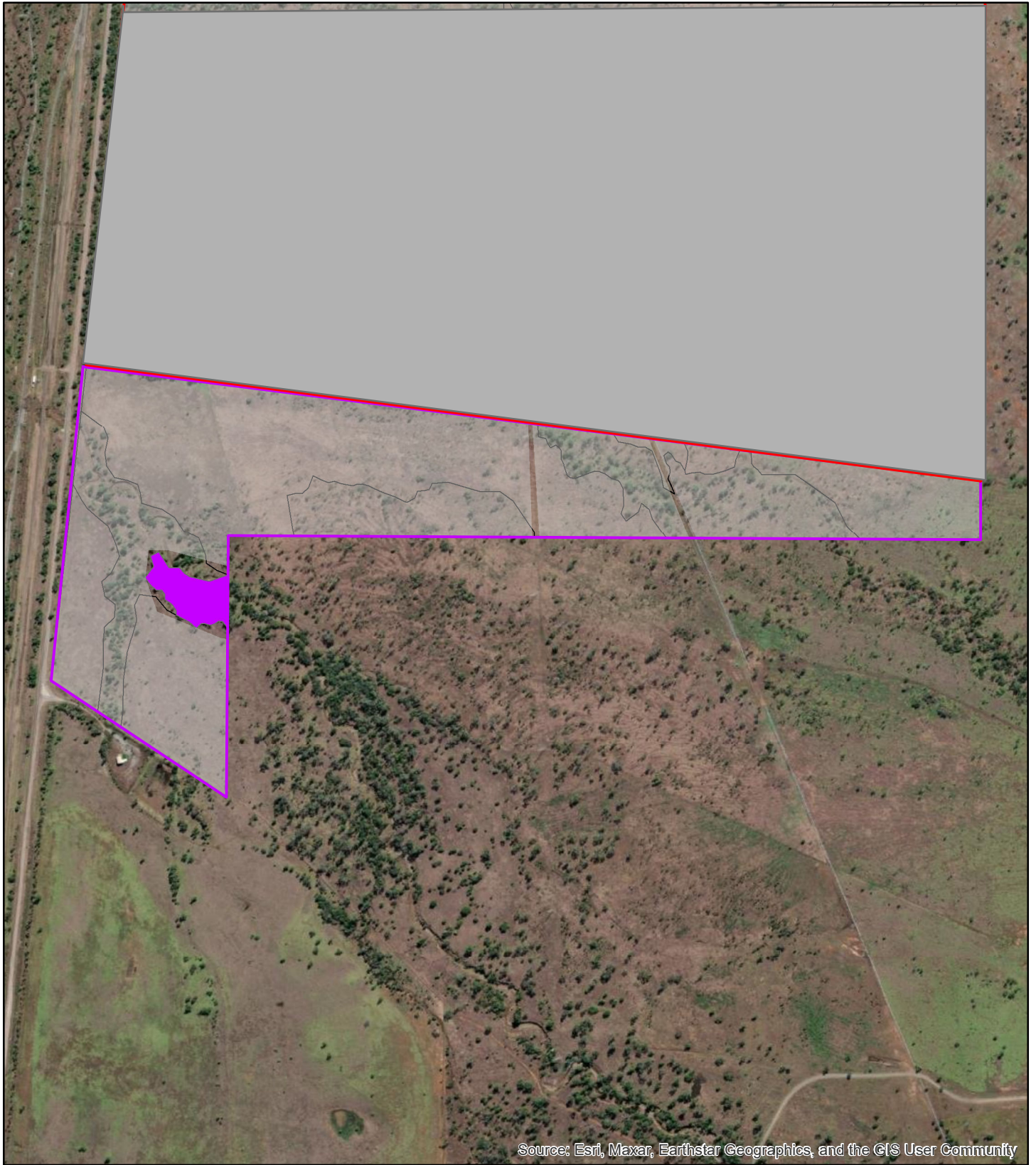
**Table 4.1: Threatened Species that may possibly occur within the Project Area**

Species	NC Act	EPBC Act	Regional Ecosystem Equivalents General habitat	Limitations within Project Area
<b>Amphibians</b>				
None				
<b>Birds</b>				
fork-tailed swift <i>Apus pacificus</i>	SL	NL	All remnant and regrowth regional ecosystems within the Project area	This species is unlikely to land within the Project area and no significant residual impact is expected.
oriental cuckoo <i>Cuculus optatus</i>	SL	NL	REs 11.3.1, 11.3.37.	Limited to riparian forest fringing the Bowen River (Drake), Jack Creek (Jax) and Coral Creek (Sonoma).  Regrowth habitats within the Project area are not dense enough to provide refuge for this species.
Squatter Pigeon (southern) <i>Geophaps scripta scripta</i>	NL	V	REs 11.3.4, 11.3.7, 11.3.9, 11.3.10, 11.3.30, 11.9.2 and 11.9.9	Limited by lack of native grasses within the understorey limits the quality of habitat for this species.  Breeding habitat limited to within 1 km of permanent water
Satin flycatcher <i>Myiagra cyanoleuca</i>	SL	NL	REs 11.3.1, 11.3.37.	Limited to moist gullies and riparian forest fringing the Bowen River (Drake), Jack Creek (Jax) and Coral Creek (Sonoma).  Regrowth habitats within the Project area are not dense enough to provide refuge for this species.
Spectacled monarch <i>Symposiachrus trivirgatus</i>	SL	NL	REs 11.3.1, 11.3.37.	Limited to riparian forest fringing the Bowen River (Drake), Jack Creek (Jax) and Coral Creek (Sonoma).  Regrowth habitats within the Project area are not dense enough to provide refuge for this species.
<b>Reptiles</b>				
Ornamental snake <i>Denisonia maculata</i>	V	V	11.3.1, 11.3.4, 11.3.7, 11.3.9, 11.3.10, 11.3.30, 11.3.37	Limited to areas close to permanent and semi-permanent water. Regrowth habitats within the Project area do not support sufficient fallen woody material of dense lower shrub layer to provide refuge for this species.

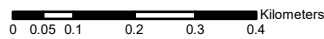
Species	NC Act	EPBC Act	Regional Ecosystem Equivalents General habitat	Limitations within Project Area
Yakka Skink <i>Egernia rugosa</i>	V	V	11.3.37, 11.9.10, Essential habitat 11.3.4, 11.3.7, 11.3.9, 11.3.10, 11.3.30 11.9.2, 11.9.9	Large areas within the Project area have been “cleaned” to promote grass growth for grazing purposes and do not support low shrub or fallen woody material shelter micro-habitats for this species
<b>Mammals</b>				
Greater Glider (northern) <i>Petauroides minor</i>	V	V	11.3.4, 11.3.7, 11.3.9, 11.3.10, 11.3.30, 11.3.37, 11.9.2, 11.9.9	Limited to old growth habitats that support sufficient densities of large hollows
Greater Glider (central and southern) <i>Petauroides volans</i>	X	E	11.3.4, 11.3.7, 11.3.9, 11.3.10, 11.3.30, 11.3.37, 11.9.2, 11.9.9	Limited to old growth habitats that support sufficient densities of large hollows
Koala <i>Phascolarctos cinereus</i>	V	V	11.9.2, 11.9.9, 11.9.10 Essential Habitat 11.3.4, 11.3.7, 11.3.9, 11.3.10, 11.3.30, 11.3.37	
Echidna <i>Tachyglossus aculeatus</i>	SL	NL	11.3.1, 11.3.4, 11.3.7, 11.3.9, 11.3.10, 11.3.30, 11.3.37, 11.9.2, 11.9.9, 11.9.10	
<b>Fish</b>				
None				
<b>Invertebrates</b>				
None				

Appendix E  
General and Essential Habitat Maps for Threatened  
Fauna





Source: Esri, Maxar, Earthstar Geographics, and the GIS User Community



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Aerial imagery courtesy of Bing Maps.

### LEGEND

- ML\_10327
- ML700075
- Sonoma East Construction Impact Area
- General habitat
- No habitat

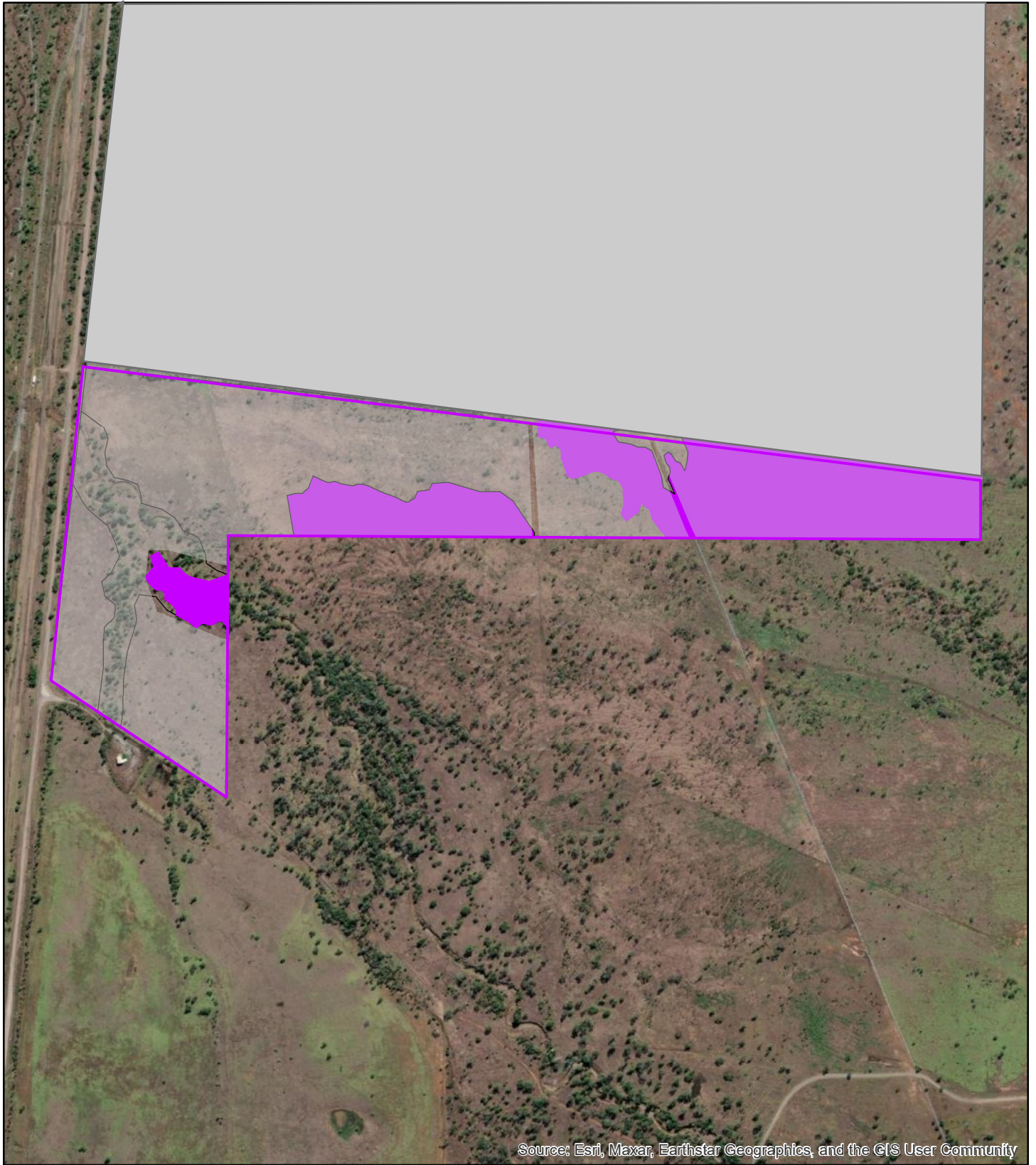
### Appendix Figure A Potential Habitat for Oriental cuckoo Cuculus optatus

Queensland Northern Hub  
 Significant Residual  
 Impact Assessments  
 Sonoma East Pit Extension

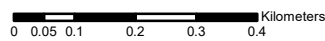
AD 31/05/23  
 Job No. 0298







Source: Esri, Maxar, Earthstar Geographics, and the GIS User Community







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Aerial imagery courtesy of Bing Maps.

### LEGEND

-  ML700075
-  Sonoma East Construction Impact Area
-  General habitat
-  No habitat

### Appendix Figure B

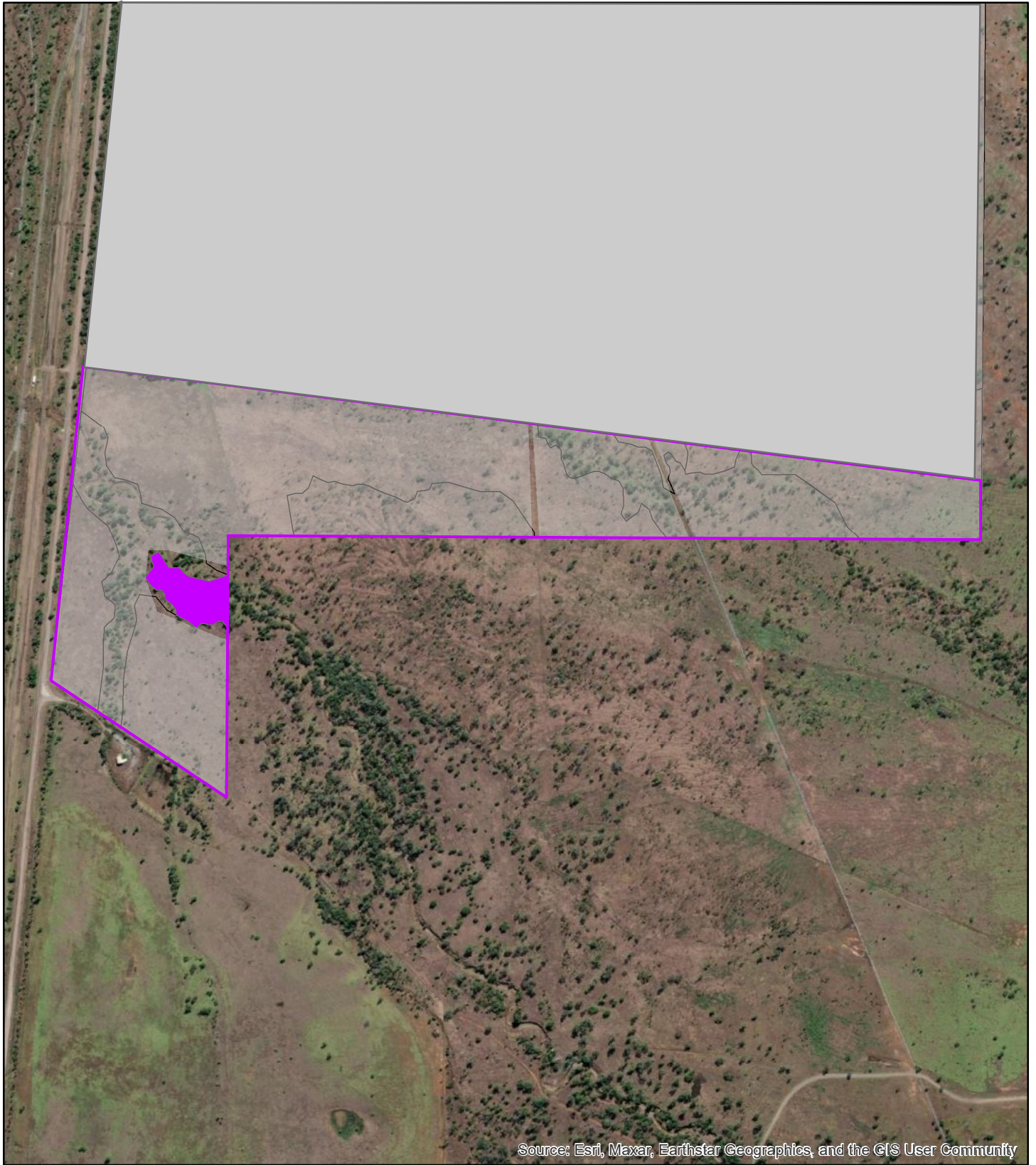
#### Potential Habitat for Squatter Pigeon *Geophaps scripta scripta*

Queensland Northern Hub Significant Residual Impact Assessments Sonoma East Pit Extension

AD 31/05/23  
 Job No. 0298







Source: Esri, Maxar, Earthstar Geographics, and the GIS User Community

0 0.05 0.1 0.2 0.3 0.4 Kilometers







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Aerial imagery courtesy of Bing Maps.

### LEGEND

-  ML700075
-  Sonoma East Construction Impact Area
-  General habitat
-  No habitat

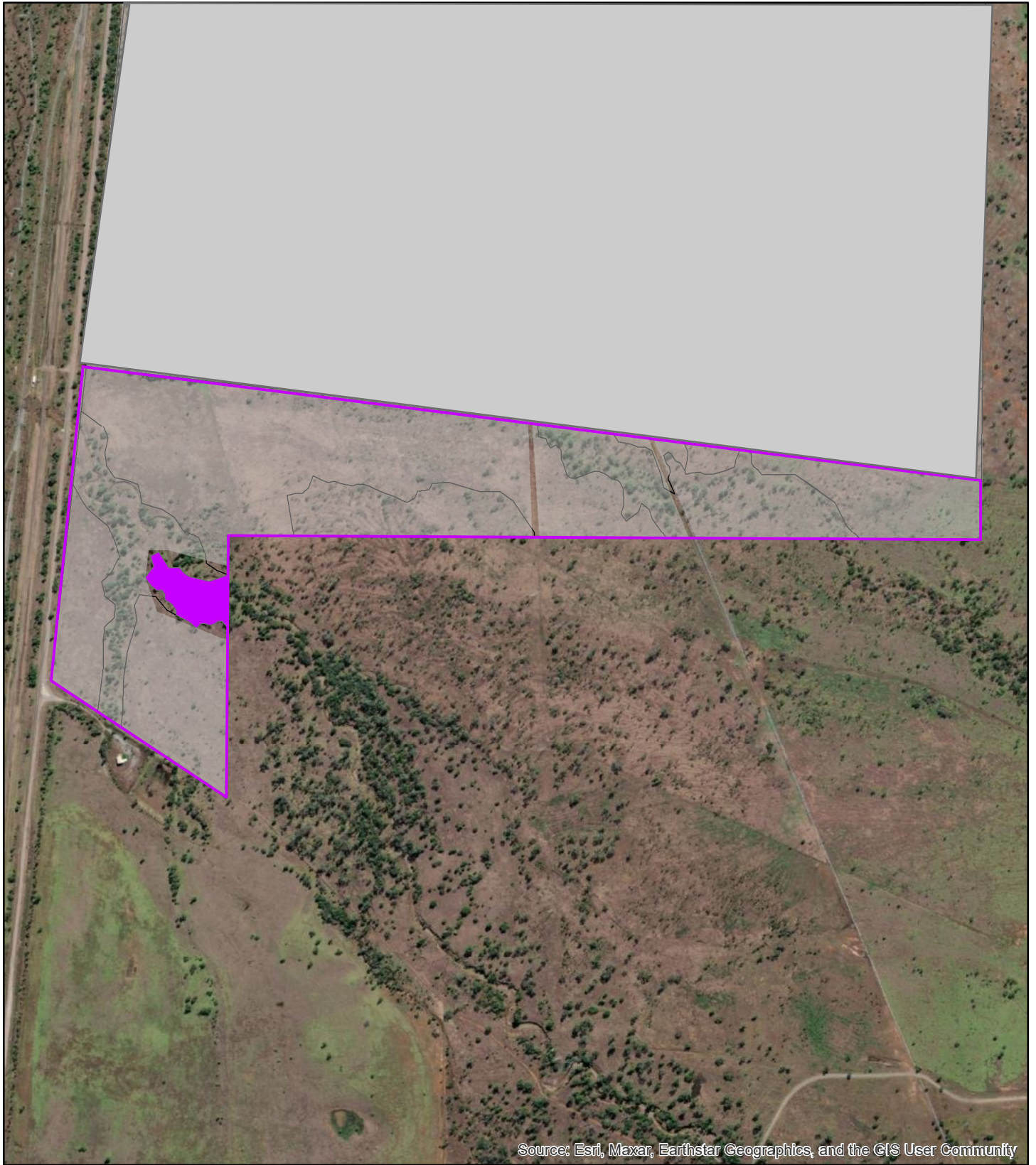
### Appendix Figure C Potential Habitat for Satin flycatcher Myiagra cyanoleuca

Queensland Northern Hub  
 Significant Residual  
 Impact Assessments  
 Sonoma East Pit Extension

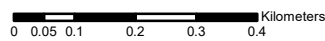
AD 31/05/23  
 Job No. 0298







Source: Esri, Maxar, Earthstar Geographics, and the GIS User Community







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Aerial imagery courtesy of Bing Maps.

### LEGEND

-  ML700075
-  Sonoma East Construction Impact Area
-  General habitat
-  No habitat

## Appendix Figure D Potential Habitat for Spectacled monarch *Sympsiachrus trivirgatus*

Queensland Northern Hub  
 Significant Residual  
 Impact Assessments  
 Sonoma East Pit Extension

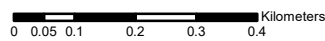
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Source: Esri, Maxar, Earthstar Geographics, and the GIS User Community







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### LEGEND

-  ML700075
-  Sonoma East Construction Impact Area
-  Essential habitat
-  No habitat

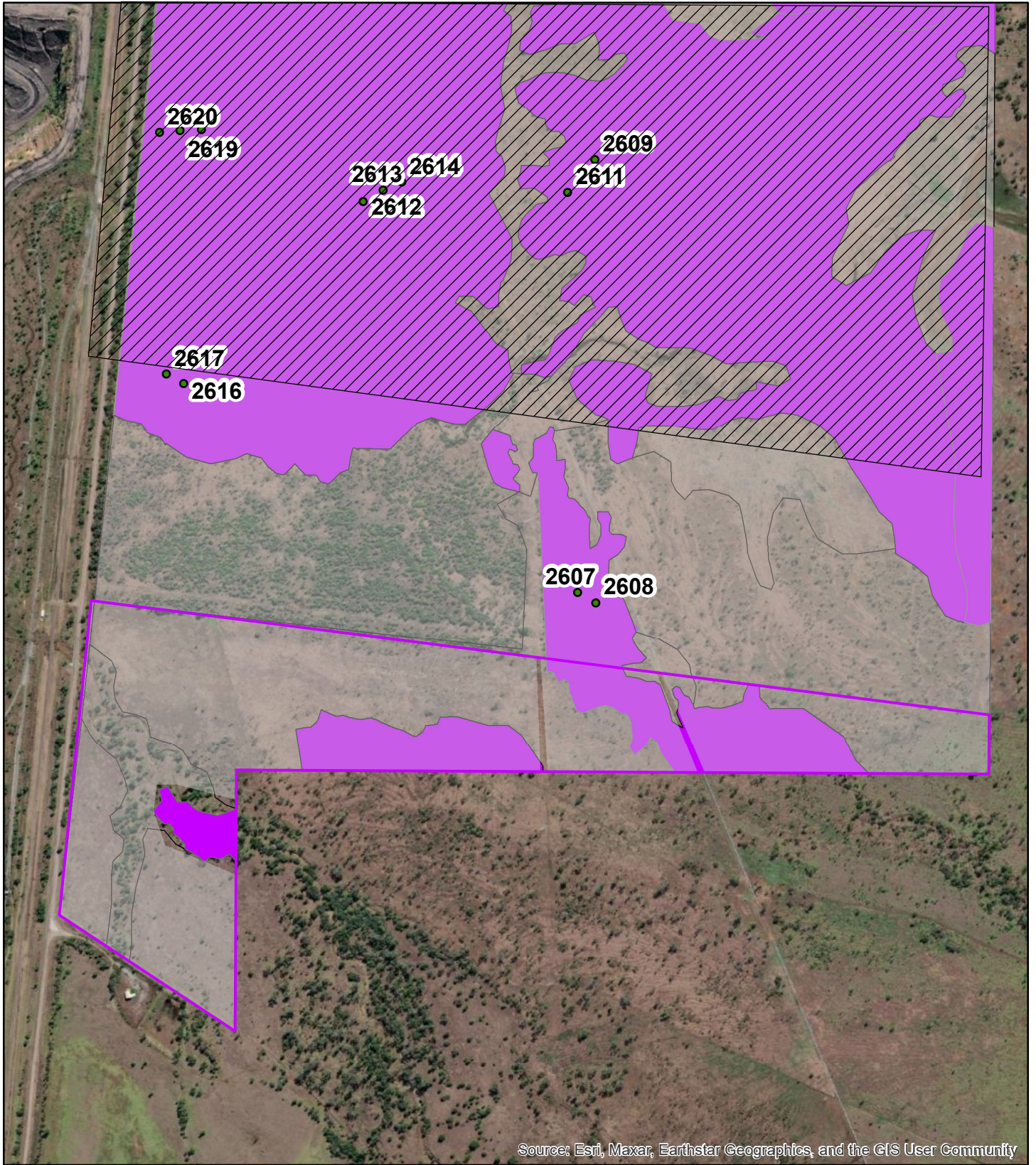
### Appendix Figure E Potential Habitat for Yakka Skink Egernia rugosa

Queensland Northern Hub  
 Significant Residual  
 Impact Assessments  
 Sonoma East Pit Extension

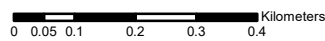
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**LEGEND**

- Tree survey data
- ML700075
- ▨ Sonoma East Construction Impact Area
- General habitat
- No habitat

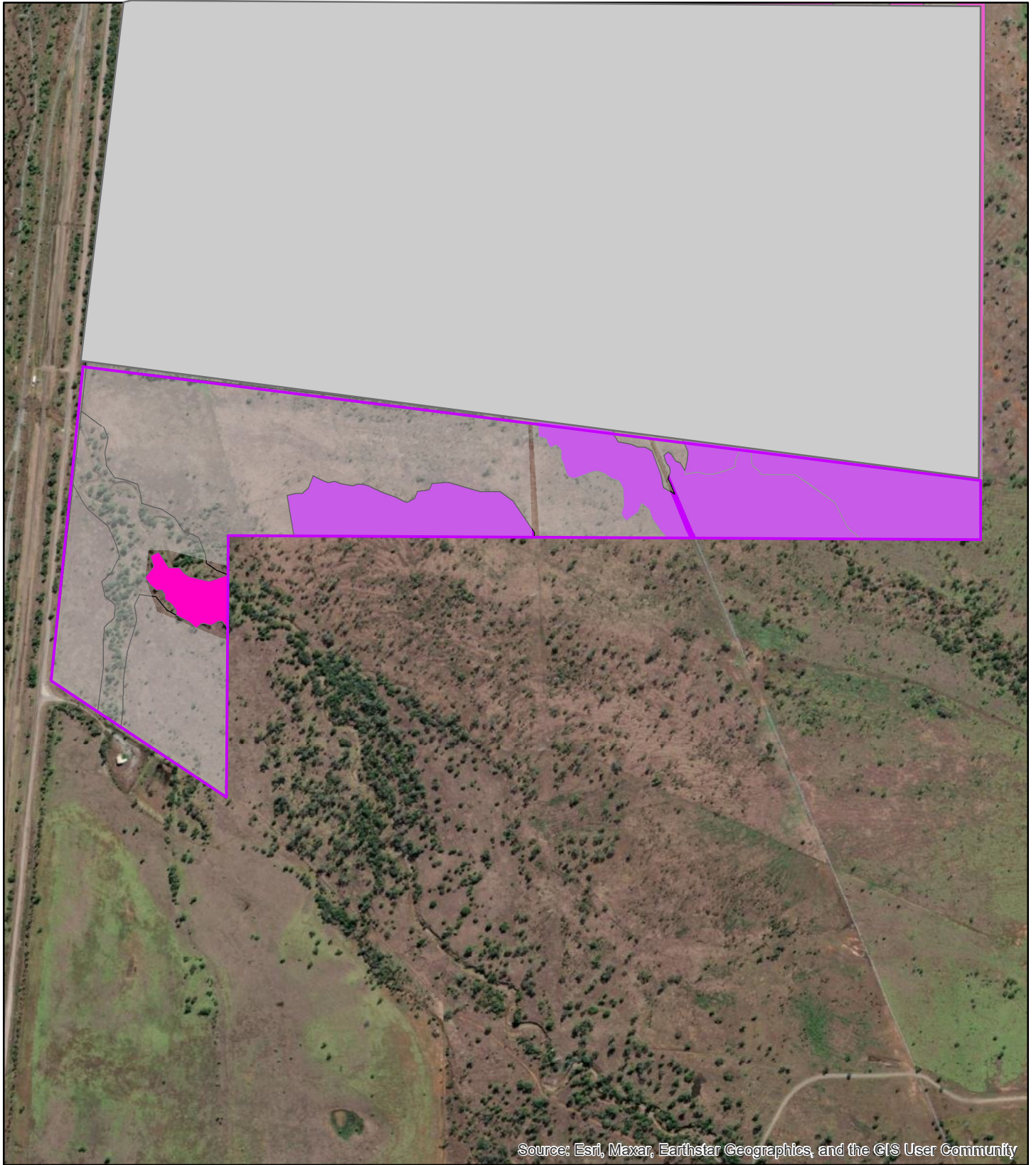
**Appendix Figure G  
 Potential Habitat for  
 Greater Glider  
 Petauroides volans**

Queensland Northern Hub  
 Significant Residual  
 Impact Assessments  
 Sonoma East Pit Extension

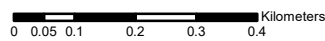
AD 31/05/23  
 Job No. 0298







Source: Esri, Maxar, Earthstar Geographics, and the GIS User Community








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Aerial imagery courtesy of Bing Maps.

### LEGEND

-  ML700075
-  Sonoma East Construction Impact Area
-  Essential habitat
-  General habitat
-  No habitat

### Appendix Figure H Potential Habitat for Koala Phascolarctos cinereus

Queensland Northern Hub  
 Significant Residual  
 Impact Assessments  
 Sonoma East Pit Extension

AD 31/05/23  
 Job No. 0298



Appendix F  
Significant Residual Impact Assessment for  
Threatened Fauna

Significant residual impact assessment for Fork-tailed swift <i>Apus pacificus</i>	
MSES Significant Residual Impact Guideline Criteria.	Response
a long-term decrease in the size of a local population	<p><b>Significant impact unlikely</b></p> <p>This species is a large widely distributed swift that is mostly aerial, very occasionally observed roosting in trees amongst dense foliage in the canopy or in hollows.</p> <p>There are no areas with high micro-habitat values for this species within the Construction Impact Area. No feeding, nesting or resting habitat for this species will be directly impacted and no barriers to its movement created.</p> <p>The proposed clearing will not result in a significant residual impact to this species.</p>
Reduce the extent of occurrence of the species	<p><b>No significant Impact</b></p> <p>This is a very widely distributed and highly mobile species. The proposed clearing will not reduce the extent of occurrence of this species.</p>
Fragment an existing population	<p><b>No significant Impact</b></p> <p>This is a large widely distributed highly mobile species. The proposed clearing will not fragment the existing populations of this species.</p>
Result in genetically distinct populations forming as a result of habitat isolation	<p><b>No significant Impact</b></p> <p>This is a widely distribute and highly mobile species. The proposed clearing will not isolate populations of this species causing distinct sub-populations forming.</p>
Cause disruption to ecologically significant locations (breeding, feeding, nesting, migration or resting sites) of a species.	<p><b>No significant Impact</b></p> <p>There are no ecologically significant locations for breeding, feeding nesting or resting for this species identified within the proposed Construction Impact Area.</p>

<b>Significant residual impact assessment for Oriental cuckoo</b> <i>Cuculus optatus</i>	
<b>For habitat impacts see Appendix E Figure A</b>	
<b>MSES Significant Residual Impact Guideline Criteria.</b>	<b>Response</b>
a long-term decrease in the size of a local population	<p><b>Significant impact unlikely</b></p> <p>This species is restricted to the densely vegetated gullies associated with major creek lines within and bordering the Project area. These habitats are marginal and the species would only be expected to occur as a vagrant.</p> <p>The proposed removal of native vegetation from within the Construction Impact area will not lead to a long-term decrease in the size of a local population of this species.</p>
a reduced extent of occurrence of the species	<p><b>No significant Impact</b></p> <p>This species is restricted to the densely vegetated gullies associated with major creek lines within and bordering the Project area. These habitats are marginal and the species would only be expected to occur as a vagrant.</p> <p>This is a highly mobile migratory species, the proposed removal of native vegetation from within the Construction Impact area will not reduce its extent of occurrence.</p>
fragmentation of an existing population	<p><b>No significant Impact</b></p> <p>This is a highly mobile migratory species, the proposed removal of native vegetation from within the Construction Impact area will not Fragment an existing population.</p>
result in genetically distinct populations forming as a result of habitat isolation	<p><b>No significant Impact</b></p> <p>This is a highly mobile migratory species, the proposed removal of native vegetation from within the Construction Impact area will not result in genetically distinct populations through habitat isolation.</p>
disruption to ecologically significant locations (breeding, feeding or nesting sites) of a species	<p><b>No significant Impact</b></p> <p>This species is restricted to the densely vegetated gullies associated with major creek lines within Project area. These habitats are marginal and the species would only be expected to occur as a vagrant.</p> <p>The clearing within the Construction Impact Area will not impact on any ecologically significant locations for this species.</p>

<b>Significant residual impact assessment for Squatter Pigeon (southern) <i>Geophaps scripta scripta</i></b>	
<b>For habitat impacts see Appendix E Figure B</b>	
<b>MNES Significant Impact and MSES Significant Residual Impact Guideline Criteria.</b>	<b>Response</b>
<p>MSES – a long-term decrease in the size of a local population.</p> <p>MNES – lead to a long-term decrease in the size of an important population of a species</p>	<p><b>Potential Significant Impact</b></p> <p>The construction impact area will result in the loss of areas of medium quality habitat for this species.</p> <p>There are large areas of grassy woodlands across the Project area. Combined with nearby permanent or semi-permanent water within Two-mile Creek and a farm dam these communities provide habitat for this species. The quality of these habitats is somewhat diminished by the overwhelming dominance of exotic grass species.</p> <p>This species has been observed within the very south of the Project area in woodlands on the alluvial soils that flank the Bowen River. It has not been observed within the northern section of the Project area.</p>
<p>MSES – a reduced extent of occurrence of the species</p> <p>MNES – reduce the area of occupancy of an important population</p>	<p><b>No Significant Impact</b></p> <p>This species is known to occur within the Project area and the removal of 23.7 ha of habitat for this species may reduce the extent of its occurrence within the locality. However, this species is a relatively large, highly mobile, bird species and the project area is centrally located within the species range. It is unlikely that the Project will reduce the extent of occurrence of this species</p>
<p>MSES – fragmentation of an existing population</p> <p>MNES – fragment an existing important population into two or more populations</p>	<p><b>No Significant Impact</b></p> <p>This is a highly mobile bird species known to move through non-timbered habitats. The proposed action will not result in fragmentation of local habitats for this species.</p>
<p>MSES – Result in genetically distinct populations forming as a result of habitat isolation</p>	<p><b>No Significant Impact</b></p> <p>This is a highly mobile bird species known to move through non-timbered habitats facilitating the movement of genetic material. The proposed action will not result in the formation of genetically distinct population.</p>
<p>MSES – Result in invasive species that are harmful to an endangered or vulnerable species becoming established in the</p>	<p><b>No Significant Impact</b></p> <p>Cats, dogs and foxes are all known from the Project area and the proposed activities will not result in the introduction of any other invasive species that are harmful to this bird species.</p>

Significant residual impact assessment for Squatter Pigeon (southern) <i>Geophaps scripta scripta</i>	
For habitat impacts see Appendix E Figure B	
MNES Significant Impact and MSES Significant Residual Impact Guideline Criteria.	Response
<p>endangered or vulnerable species' habitat.</p> <p>MNES – result in invasive species that are harmful to a vulnerable species becoming established in the vulnerable species' habitat</p>	
<p>MSES – Introduce disease that may cause the population to decline</p> <p>MNES – introduce disease that may cause the species to decline</p>	<p><b>No significant Impact</b></p> <p>The proposed activities will not result in the introduction of a disease that may cause the population to decline.</p>
<p>MSES – Interfere with the recovery of the species.</p> <p>MNES – interfere substantially with the recovery of the species</p>	<p><b>No Significant Impact</b></p> <p>This is a highly mobile and widely distributed species. The habitat values for this species are moderate and the removal of these habitats will not meaningfully interfere with the recovery of this species.</p> <p>The main threats to this species recovery are overgrazing during drought, overgrazing of habitat by livestock and feral herbivores such as rabbits (<i>Oryctolagus cuniculus</i>), introduction of weeds, inappropriate fire regimes, thickening of understorey vegetation, predation by feral cats (<i>Felis catus</i>) and foxes (<i>Vulpes vulpes</i>), trampling of nests by domestic stock and illegal shooting</p>
<p>MSES – disruption to ecologically significant locations (breeding, feeding or nesting sites) of a species</p> <p>MNES – Disrupt the breeding cycle of an important population.</p>	<p><b>Potential Significant Impact</b></p> <p>The species is known from the Project area and is likely to breed in timbered habitats close to Two-mile Creek and a farm dam</p>
<p>MNES – adversely affect habitat critical to the survival of a species</p>	<p><b>No Significant Impact</b></p> <p>Whilst some breeding habitats are present the quality of these habitats are significantly diminished by the dominance of exotic grasses within the ground layer. This species is widely distributed at low densities and it is unlikely that the amount of habitat removal proposed would meaningfully impact habitat through critical to the survival of this species.</p>



<b>Significant residual impact assessment for Satin flycatcher</b> <i>Myiagra cyanoleuca</i>	
<b>For habitat impacts see Appendix E Figure C</b>	
<b>MSES Significant Residual Impact Guideline Criteria.</b>	<b>Response</b>
a long-term decrease in the size of a local population	<p><b>Significant impact unlikely</b></p> <p>This species is restricted to the densely vegetated gullies associated with major creek lines within and bordering the Project area. These habitats are marginal and the species would only be expected to occur as a vagrant.</p> <p>The proposed removal of native vegetation from within the Construction Impact area will not lead to a long-term decrease in the size of a local population of this species.</p>
a reduced extent of occurrence of the species	<p><b>No significant Impact</b></p> <p>This species is restricted to the densely vegetated gullies associated with major creek lines within and bordering the Project area. These habitats are marginal and the species would only be expected to occur as a vagrant.</p> <p>This is a highly mobile migratory species, the proposed removal of native vegetation from within the Construction Impact area will not reduce its extent of occurrence.</p>
fragmentation of an existing population	<p><b>No significant Impact</b></p> <p>This is a highly mobile migratory species, the proposed removal of native vegetation from within the Construction Impact area will not Fragment an existing population.</p>
result in genetically distinct populations forming as a result of habitat isolation	<p><b>No significant Impact</b></p> <p>This is a highly mobile migratory species, the proposed removal of native vegetation from within the Construction Impact area will not result in genetically distinct populations through habitat isolation.</p>
disruption to ecologically significant locations (breeding, feeding or nesting sites) of a species	<p><b>No significant Impact</b></p> <p>This species is restricted to the densely vegetated gullies associated with major creek lines within Project area. These habitats are marginal and the species would only be expected to occur as a vagrant.</p> <p>The clearing within the Construction Impact Area will not impact on any ecologically significant locations for this species.</p>

**Significant residual impact assessment for Spectacled monarch  
*Symposiachrus trivirgatus***

**For habitat impacts see Appendix E Figure D**

<b>MSES Significant Residual Impact Guideline Criteria.</b>	<b>Response</b>
a long-term decrease in the size of a local population	<p><b>Significant impact unlikely</b> This species is restricted to the densely vegetated gullies associated with major creek lines within and bordering the Project area. These habitats are marginal and the species would only be expected to occur as a vagrant.</p> <p>The proposed removal of native vegetation from within the Construction Impact area will not lead to a long-term decrease in the size of a local population of this species.</p>
a reduced extent of occurrence of the species	<p><b>No significant Impact</b> This species is restricted to the densely vegetated gullies associated with major creek lines within and bordering the Project area. These habitats are marginal and the species would only be expected to occur as a vagrant.</p> <p>This is a highly mobile migratory species, the proposed removal of native vegetation from within the Construction Impact area will not reduce its extent of occurrence.</p>
fragmentation of an existing population	<p><b>No significant Impact</b> This is a highly mobile migratory species, the proposed removal of native vegetation from within the Construction Impact area will not Fragment an existing population.</p>
result in genetically distinct populations forming as a result of habitat isolation	<p><b>No significant Impact</b> This is a highly mobile migratory species, the proposed removal of native vegetation from within the Construction Impact area will not result in genetically distinct populations through habitat isolation.</p>
disruption to ecologically significant locations (breeding, feeding or nesting sites) of a species	<p><b>No significant Impact</b> This species is restricted to the densely vegetated gullies associated with major creek lines within Project area. These habitats are marginal and the species would only be expected to occur as a vagrant.</p> <p>The clearing within the Construction Impact Area will not impact on any ecologically significant locations for this species.</p>

**Significant residual impact assessment for Ornamental snake  
*Denisonia maculata***

**For habitat impacts see Appendix E Figure E**

<b>MNES Significant Impact and MSES Significant Residual Impact Guideline Criteria.</b>	<b>Response</b>
<p>MSES – a long-term decrease in the size of a local population.</p> <p>MNES – lead to a long-term decrease in the size of an important population of a species</p>	<p><b>SRI unlikely</b></p> <p>The quality of habitats is limited by the absence of frog habitats over much of the Project area.</p> <p>Most of the potential habitat that will be cleared is rated as medium to low quality. The habitat values that existing are mainly limited to use as connectivity. There are no good quality habitats close to the Project area and it is unlikely that this species would need to traverse the site.</p> <p>This species is unlikely to occur within the Project area and is unlikely to be impacted by clearing within the Construction Impact Area.</p>
<p>MSES – a reduced extent of occurrence of the species</p> <p>MNES – reduce the area of occupancy of an important population</p>	<p><b>No significant Impact</b></p> <p>The species is not known from the Project area and is thought unlikely to occur due to the lack of frog habitats. This species is widely distributed and the Project area is located within the middle of its known range.</p>
<p>MSES – fragmentation of an existing population</p> <p>MNES – fragment an existing important population into two or more populations</p>	<p><b>No significant Impact</b></p> <p>The species is not known from the Project area and is thought unlikely to occur due to the lack of frog habitats. There are no likely habitats for this species surrounding the Construction Impact area and the removal of sub-optimal habitat for this species will not prevent dispersal of this species across the broader landscape particularly along Cora and Two-mile Creek corridors. The proposed disturbance will not result in the fragmentation of a known population.</p>
<p>MSES – Result in genetically distinct populations forming as a result of habitat isolation</p>	<p><b>No significant Impact</b></p> <p>The species is not known from the Project area and is thought unlikely to occur due to the lack of frog habitats. There are no likely habitats for this species surrounding the Construction Impact area and the removal of sub-optimal habitat for this species will not prevent dispersal of this species and will not result in the fragmentation of a known population and will not result in the formation of genetically distinct populations.</p>
<p>MSES – Result in invasive species that are harmful to</p>	<p><b>No significant Impact</b></p>

**Significant residual impact assessment for Ornamental snake  
*Denisonia maculata***

**For habitat impacts see Appendix E Figure E**

<b>MNES Significant Impact and MSES Significant Residual Impact Guideline Criteria.</b>	<b>Response</b>
<p>an endangered or vulnerable species becoming established in the endangered or vulnerable species' habitat.</p> <p>MNES – result in invasive species that are harmful to a vulnerable species becoming established in the vulnerable species' habitat</p>	<p>Pigs are known from the Project area and the proposed activities will not result in the introduction of or an increase in any invasive species known to be harmful to this species.</p>
<p>MSES – Introduce disease that may cause the population to decline</p> <p>MNES – introduce disease that may cause the species to decline</p>	<p><b>No significant Impact</b></p> <p>The proposed activities will not result in the introduction of any diseases known to impact this species.</p>
<p>MSES – Interfere with the recovery of the species.</p> <p>MNES – interfere substantially with the recovery of the species</p>	<p><b>No significant Impact</b></p> <p>The species is not known from the Project area and is thought unlikely to occur due to the lack of frog habitats. The removal of sub-optimal habitat for this species will not interfere with the recovery of the species.</p>
<p>MSES – disruption to ecologically significant locations (breeding, feeding or nesting sites) of a species</p> <p>MNES – Disrupt the breeding cycle of an important population.</p>	<p><b>No significant Impact</b></p> <p>The species is not known from the Project area and is thought unlikely to occur due to the lack of frog habitats. This species is restricted by the presence of frog species and therefore the habitats within the Project area do not provide breeding and nesting sites for this species. The proposed activities will not result in disruption to ecologically significant locations (breeding, feeding or nesting sites) of a species.</p>
<p>MNES – adversely affect habitat critical to the survival of a species</p>	<p><b>No Significant Impact</b></p> <p>The species is not known from the Project area and is thought unlikely to occur due to the lack of frog habitats. The removal of sub-optimal habitat for this species will not adversely affect habitat critical to the survival of a species</p>

**Significant residual impact assessment for Yakka Skink  
*Egernia rugosa***

For habitat impacts see Appendix E Figure F

MNES Significant Impact and MSES Significant Residual Impact Guideline Criteria.	Response
<p>MSES – a long-term decrease in the size of a local population.</p> <p>MNES – lead to a long-term decrease in the size of an important population of a species</p>	<p><b>No significant Impact</b></p> <p>Although several regional ecosystems were determined to provide essential habitat for this species, the habitats within the Project area were determined to be medium to low quality due to the lack of fallen woody material and native ground layers. Habitat quality scores for this species are mainly comprised of scores for connectivity.</p> <p>This species can effectively move between better quality habitats through the Two-mile Creek vegetated corridor and the proposed clearing of these woodland communities are unlikely to result in a significant residual / significant impact to this species.</p>
<p>MSES – a reduced extent of occurrence of the species</p> <p>MNES – reduce the area of occupancy of an important population</p>	<p><b>No significant Impact</b></p> <p>The species is not known from the Project area and is thought unlikely to occur due to the lack of good quality habitats. This species is widely distributed and the Project area is located within the middle of its known range.</p>
<p>MSES – fragmentation of an existing population</p> <p>MNES – fragment an existing important population into two or more populations</p>	<p><b>No significant Impact</b></p> <p>The species is not known from the Project area and is thought unlikely to occur due to the lack of good quality habitats. This species can move freely through the broader landscape through the Two-mile Creek vegetated corridor and the removal of sub-optimal habitat for this species will not result in the fragmentation of a known population.</p>
<p>MSES – Result in genetically distinct populations forming as a result of habitat isolation</p>	<p><b>No significant Impact</b></p> <p>The species is not known from the Project area and is thought unlikely to occur due to the lack of good quality habitats. This species can move freely through the broader landscape through the Two-mile Creek vegetated corridor and the removal of sub-optimal habitat for this species will not result in the fragmentation of a known population and will not result in the formation of genetically distinct populations.</p>
<p>MSES – Result in invasive species that are harmful to</p>	<p><b>No significant Impact</b></p>

**Significant residual impact assessment for Yakka Skink**  
*Egernia rugosa*

**For habitat impacts see Appendix E Figure F**

<b>MNES Significant Impact and MSES Significant Residual Impact Guideline Criteria.</b>	<b>Response</b>
<p>an endangered or vulnerable species becoming established in the endangered or vulnerable species' habitat.</p> <p>MNES – result in invasive species that are harmful to a vulnerable species becoming established in the vulnerable species' habitat</p>	<p>The proposed activities will not result in the introduction of, or an increase in, any invasive species known to be harmful to this species.</p>
<p>MSES – Introduce disease that may cause the population to decline</p> <p>MNES – introduce disease that may cause the species to decline</p>	<p><b>No significant Impact</b></p> <p>The proposed activities will not result in the introduction of any diseases known to impact this species.</p>
<p>MSES – Interfere with the recovery of the species.</p> <p>MNES – interfere substantially with the recovery of the species</p>	<p><b>No significant Impact</b></p> <p>The species is not known from the Project area and is thought unlikely to occur due to the lack of good quality habitats. The removal of sub-optimal habitat for this species will not interfere with the recovery of the species</p>
<p>MSES – disruption to ecologically significant locations (breeding, feeding or nesting sites) of a species</p> <p>MNES – Disrupt the breeding cycle of an important population.</p>	<p><b>No significant Impact</b></p> <p>The species is not known from the Project area and is thought unlikely to occur due to the lack of good quality habitats. The proposed activities will not result in disruption to ecologically significant locations (breeding, feeding or nesting sites) of a species.</p>
<p>MNES – adversely affect habitat critical to the survival of a species</p>	<p><b>No significant Impact</b></p> <p>The species is not known from the Project area and is thought unlikely to occur due to the lack of good quality habitats. The removal of sub-optimal habitat for this species will not adversely affect habitat critical to the survival of a species</p>



<b>Significant residual impact assessment for Greater Glider (<i>Sensu lato</i>) <i>Petauroides volans</i></b>	
<b>For habitat impacts see Appendix E Figure G</b>	
<b>MNES Significant Impact and MSES Significant Residual Impact Guideline Criteria.</b>	<b>Response</b>
<p>MSES – a long-term decrease in the size of a local population.</p> <p>MNES – lead to a long-term decrease in the size of an important population of a species</p>	<p><b>No significant Impact</b></p> <p>Tree size surveys showed that these habitats are very unlikely to support a population of Greater gliders and therefore no significant residual impacts are likely for this species.</p>
<p>MSES – a reduced extent of occurrence of the species</p> <p>MNES – reduce the area of occupancy of an important population</p>	<p><b>No significant Impact</b></p> <p>The Two-mile Creek riparian woodlands provide a continuous timbered habitat link for this species. The removal of habitat from within the Construction Impact Area will not prevent the movement of this species within the broader landscape.</p>
<p>MSES – fragmentation of an existing population</p> <p>MNES – fragment an existing important population into two or more populations</p>	<p><b>No significant Impact</b></p> <p>The Two-mile Creek riparian woodlands provide a continuous timbered habitat link for this species. The removal of habitat from within the Construction Impact Area will not prevent the movement of t this species within the broader landscape and the subsequent movement of genetic material.</p>
<p>MSES – Result in genetically distinct populations forming as a result of habitat isolation</p>	<p><b>No significant Impact</b></p> <p>Cats are known to occur within the Project area and the proposed activities will not lead to the introduction of any other invasive species known to be harmful to this species.</p>
<p>MSES – Result in invasive species that are harmful to an endangered or vulnerable species becoming established in the endangered or vulnerable species’ habitat.</p> <p>MNES – result in invasive species that are harmful to a vulnerable species becoming established in the vulnerable species’ habitat</p>	<p><b>No significant Impact</b></p> <p>The proposed activities will not lead to the introduction of any disease that may cause the population to decline</p>

Significant residual impact assessment for Greater Glider ( <i>Sensu lato</i> ) <i>Petauroides volans</i>	
For habitat impacts see Appendix E Figure G	
MNES Significant Impact and MSES Significant Residual Impact Guideline Criteria.	Response
<p>MSES – Introduce disease that may cause the population to decline</p> <p>MNES – introduce disease that may cause the species to decline</p>	<p><b>No significant Impact</b></p> <p>The project is unlikely to introduce any diseases known to significantly affect the health and survival of this species such that a population decline will occur.</p>
<p>MSES – Interfere with the recovery of the species.</p> <p>MNES – interfere substantially with the recovery of the species</p>	<p><b>No significant Impact</b></p> <p>Tree size surveys showed that these habitats are very unlikely to support a population of Greater gilders and therefore no significant residual impacts are likely for this species.</p>
<p>MSES – disruption to ecologically significant locations (breeding, feeding or nesting sites) of a species</p> <p>MNES – Disrupt the breeding cycle of an important population.</p>	<p><b>No significant Impact</b></p> <p>Tree size surveys showed that these habitats are very unlikely to support a population of Greater gilders and therefore no significant residual impacts are likely for this species.</p>
<p>MNES – adversely affect habitat critical to the survival of a species</p>	<p><b>No significant Impact</b></p> <p>Tree size surveys showed that these habitats are very unlikely to support a population of Greater gilders and therefore no significant residual impacts are likely for this species.</p>

TPSP (2016) – Threatened Species Scientific Committee, *Petauroides volans* (greater glider) Conservation Advice; effective from 05/05/2016.

<b>Significant residual impact assessment for Koala</b> <i>Phascolarctos cinereus</i>	
<b>For habitat impacts see Appendix E Figure H</b>	
<b>MNES Significant Impact and MSES Significant Residual Impact Guideline Criteria.</b>	<b>Response</b>
<p>MSES – a long-term decrease in the size of a local population.</p> <p>MNES – lead to a long-term decrease in the size of an important population of a species</p>	<p><b>Possible Significant Impact</b></p> <p>Approximately 32.7 ha of woodland habitat dominated by eucalypt and Corymbia species will be cleared from within the Construction Impact Area. This tall woodland canopy provides potential feeding and breeding habitats for this species and is well connected to the broader landscape.</p> <p>The Project area’s woodland communities associated with alluvial systems provide higher quality habitats for this species and some meaningful amounts of these alluvial communities will be cleared.</p>
<p>MSES – a reduced extent of occurrence of the species</p> <p>MNES – reduce the area of occupancy of an important population</p>	<p><b>No significant impact</b></p> <p>The koala is a widely distributed species, and the project area is not located on the margins its habitat range. The loss of habitats within the Construction Impact Area may reduce the occupancy of the local populations by no more than one to two animals.</p>
<p>MSES – fragmentation of an existing population</p> <p>MNES – fragment an existing important population into two or more populations</p>	<p><b>No significant impact</b></p> <p>The Project areas woodland habitats are well connected to the broader landscape particularly through riparian communities associated with Two-mile Creek. These connections will be retained after clearing has occurred within the Construction Impact Area.</p>
<p>MSES – Result in genetically distinct populations forming as a result of habitat isolation</p>	<p><b>No significant Impact</b></p> <p>The Project areas woodland habitats are well connected to the broader landscape particularly through riparian communities associated with Two-mile Creek. These connections will be retained after clearing has occurred within the Construction Impact Area.</p> <p>Local koalas will be able to move freely through these retained habitats. This movement of individuals throughout the broader landscape will prevent genetic isolation from occurring.</p>
<p>MSES – Result in invasive species that are harmful to an endangered or vulnerable species becoming established in</p>	<p><b>No significant impact</b></p>

<b>Significant residual impact assessment for Koala</b> <i>Phascolarctos cinereus</i>	
<b>For habitat impacts see Appendix E Figure H</b>	
<b>MNES Significant Impact and MSES Significant Residual Impact Guideline Criteria.</b>	<b>Response</b>
<p>the endangered or vulnerable species' habitat.</p> <p>MNES – result in invasive species that are harmful to a vulnerable species becoming established in the vulnerable species' habitat</p>	<p>Clearing will not result in introduction of any invasive species known to predate the koala not already present in the local environment.</p>
<p>MSES – Introduce disease that may cause the population to decline</p> <p>MNES – introduce disease that may cause the species to decline</p>	<p><b>No significant impact</b>  <i>Chlamydia pneumoniae</i> and <i>Chlamydia pecorum</i> are endemic in wild koala populations and will not be introduced from pipeline construction activities.</p>
<p>MSES – Interfere with the recovery of the species.</p> <p>MNES – interfere substantially with the recovery of the species</p>	<p><b>No significant impact</b>            Whilst in danger from habitat clearing, dog and vehicle strike in urban and peri-urban areas rural koalas are more likely to be affected by drought and inappropriate fire regimes. Drought and fire frequency will be significantly increased by the proposed activities and is not likely to substantially interfere with the recovery of this species..</p>
<p>MSES – disruption to ecologically significant locations (breeding, feeding or nesting sites) of a species</p> <p>MNES – Disrupt the breeding cycle of an important population.</p>	<p><b>Potential significant impact</b>            The loss of 32.7 ha of woodland habitat that contains breeding, feeding and refuge habitat for this species represents the loss notable amount of feeding breeding and resting resource for a few individuals of this species. The essential habitat areas associated with the woodland communities on alluvial soils are especially important to the ecology of this species.</p>
<p>MNES – adversely affect habitat critical to the survival of a species</p>	<p><b>No significant impact</b>            Whilst habitat for this species will be cleared from within the construction Impact Area, the area that will be cleared is likely to support one or two individuals at the most.</p> <p>Whilst in danger from habitat clearing, dog and vehicle strike in urban and peri-urban areas rural koalas are more likely to be affected by drought and inappropriate fire regimes. The mainly non-remnant woodland communities of the site have a biodiversity status of 'no concern at present' and a least concern vegetation management act status and are not</p>

Significant residual impact assessment for Koala <i>Phascolarctos cinereus</i>	
For habitat impacts see Appendix E Figure H	
MNES Significant Impact and MSES Significant Residual Impact Guideline Criteria.	Response
	generally subject to broad scale clearing and are not considered habitat critical to the survival of this species.

Significant residual impact assessment for Echidna <i>Tachyglossus aculeatus</i>	
MSES Significant Residual Impact Guideline Criteria.	Response
a long-term decrease in the size of a local population	<b>No significant impact</b> This species is widely distributed and has no particular habitat preferences, except for the supply of ants and termites. The home range of this species in the locality is large. The proposed clearing will result in the loss of habitat for a limited number of individuals of a species that is not under threat from habitat loss.
a reduced extent of occurrence of the species	<b>No significant Impact</b> This species is widely distributed and has no particular habitat preferences, except for the supply of ants and termites. The proposed clearing will result in minimal impacts on this species and will not reduce its extent of occurrence.
fragmentation of an existing population	<b>No significant Impact</b> This species will move freely through open ground. The development will not result in the fragmentation of the existing population.
result in genetically distinct populations forming as a result of habitat isolation	<b>No significant Impact</b> his species will move freely through open ground. The development will not result in the formation of genetically distinct populations through habitat isolation.
disruption to ecologically significant locations (breeding, feeding or nesting sites) of a species	<b>No significant Impact</b> Whilst there is a potential impact on breeding, feeding and nesting sites for this species there are no particular habitat values such as high densities of ants or termites present that make this an ecological significant location for this species.