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Santos Limited
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Santos Roma West Ecology Report

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1.0 Introduction

1.1 Background

Santos Limited (Santos) are seeking to progress the Gladstone Liquefied Natural Gas (GLNG) Gas Field Development Project (GFD) and develop areas within the Roma gas field. To determine potential offset liabilities, Santos have engaged AECOM Australia Pty Ltd (AECOM) to undertake a terrestrial ecology survey for the western portion of the Roma gas field (the Survey Area). BioCondition and terrestrial habitat quality assessments were required within the Survey Area to determine habitat quality scores for Matters of National Environmental Significance (MNES) and Matters of State Environmental Significance (MSES).

1.2 Survey Area

The Roma gas field covers a total area of approximately 425,930 hectares (ha) and includes twenty-two (22) tenements: Authority to Prospect (ATP) 631; ATP 655; ATP708; ATP1187; ATP2017; ATP2053; Petroleum Lease (PL) 281; PL282; PL313; PL314; PL315; PL316; PL317; PL318; PL319; PL320; PL321; PL322; PL323; PL1019; PL1020; and PL1021.

The Survey Area occurs within the western portion of the Roma gas field and primarily includes the following tenements: PL314, PL315 and PL1020. The Survey Area is situated in the north Surat Basin, in the Darling Downs, Queensland. The township of Roma is located approximately 10 kilometres (km) to the south east of the Survey Area and Wallumbilla is approximately 3 km to the south. The Survey Area and Roma gas field is displayed on Figure 1.

The landscape within the Survey Area is highly fragmented, however small areas of remnant *Eucalyptus* or *Acacia* woodland are mapped along drainage lines with larger areas of remnant vegetation present within the Grafton Range in the far north west. Topography of the Survey Area includes undulating hills with a sedimentary geologic origin. The main watercourses that occur within the Survey Area include Myall Creek, Ferguson Creek, Sleepy Creek, Smith Creek, Wallumbilla Creek and Blyth Creek.

1.3 Scope and Objectives

Santos requires the following assessments as part of the scope of work:

- Conduct a desktop review of relevant databases and previous studies in the Survey Area to understand the ecological characteristics, including previous data collected for the area and potential presence of MNES and MSES values.
- Characterise and identify the ecological values within the Survey Area including:
  - Confirming the presence and extent of vegetation communities that are Regional Ecosystems (REs) and Threatened Ecological Communities (TECs);
  - Confirming the presence of and quality of habitat within the Study Area for threatened species;
  - Describing the diversity of terrestrial flora and fauna found in the Survey Area;
  - Identifying values which are considered MSES or MNES.
- Analyse field collected data and undertake spatial analysis to:
  - describe and map the location of TECs, REs, environmental values (EVs), and threatened fauna habitat;
  - determine terrestrial habitat quality scores for MNES and MSES values
- Prepare a technical report including figures that details survey methodology, results and conclusions.

For this assessment, terrestrial habitat quality scoring methodology as per the Queensland Government *Guide to determining terrestrial habitat quality* (Department of Environment and Science [DES], 2020) has been utilised to inform the Commonwealth offset habitat quality calculation requirements.

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LEGEND

- Roma West Survey Area
- Roma Gas Field Tenements
- Townships
- State Roads
- Other Roads and Tracks

ATP 708
PL 1019
PL 322
PL 314
PL 1021
PL 282
PL 1020
ATP 1187
PL 313
PL 315
PL 323
ROMA
WALLUMBILLA
ATP 2053
PL 281
YULEBA
PL 316
PL 317
PL 318
PL 319
PL 320
PL 321
ATP 2017
ATP 631

FIGURE 1
ROMA WEST SURVEY AREA

2.0 Legislative and Policy Context

2.1 Commonwealth

2.1.1 Environment Protection and Biodiversity Conservation Act 1999

The EPBC Act establishes a process for environmental assessment and approval of proposed actions that have, will have or are likely to have a significant impact on MNES or on Commonwealth land.

MNES are outlined in the EPBC Act to include:

- World Heritage Properties;
- National Heritage Places;
- Wetlands of International Importance (listed under the Ramsar Convention);
- Listed Threatened Species and Ecological Communities;
- Migratory Species (listed under international agreements);
- Commonwealth Marine Areas;
- Great Barrier Reef Marine Park; and
- A Water Resource, in relation to coal seam gas development and large coal mining development.

Under the EPBC Act, conservation significant species are assigned a conservation status of:

- Extinct;
- Extinct in the Wild;
- Critically Endangered;
- Endangered; and
- Vulnerable.

Threatened Ecological Communities (TECs) are assigned to one of three conservation categories:

- Critically Endangered;
- Endangered; and
- Vulnerable.

Australia is located within the East-Asian Australasian Flyway for migratory shorebirds. These species breed as far north as Siberia and Alaska during the northern hemisphere summer and migrate to non-breeding grounds in Australia and New Zealand to avoid the northern winter and take advantage of energy rich food sources in the southern hemisphere. Migrating shorebirds arrive in northern Australia between late August and early November.

The EPBC Act includes a list of bird species listed as Migratory, comprising:

- Migratory species which are native to Australia and are included in the appendices to the Bonn Convention;
- Migratory species included in annexes established under the Japan-Australia Migratory Bird Agreement (JAMBA) and the China-Australia Migratory Bird Agreement (CAMBA);
- Native, migratory species identified in a list established under an international agreement such as the Republic of Korea-Australia Migratory Bird Agreement (ROKAMBA).

MNES values within the Survey Area are detailed in Section 5.4.

2.2 Queensland

2.2.1 Nature Conservation Act 1992

The *Nature Conservation Act 1992* (NC Act) prohibits the taking or destruction, without authorisation, of protected flora and fauna species in the wild. All native plants and animals in Queensland are protected under Section 71 of the NC Act. This Act also provides for an integrated and comprehensive approach to conserve nature. The Act provides a legislative basis for research, community education, dedicating, declaring and managing protected areas, and protecting native wildlife and its habitat.

Threatened species are listed under the NC Act in the Nature Conservation (Animals) Regulation 2020 and the Nature Conservation (Plants) Regulation 2020 in the following categories:

- Near threatened;
- Vulnerable;
- Endangered;
- Critically endangered; and
- Extinct in the wild.

Additionally, Special Least Concern species are protected under the NC Act for their cultural significance or their inclusion within international migratory bird agreements, and include:

- Echidna (*Tachyglossus aculeatus*);
- Platypus (*Ornithorhynchus anatinus*); and

Migratory bird species listed under the Bonn Convention, JAMBA, and CAMBA.

Appropriate authorisations or permits under the NC Act are required prior for clearing of listed conservation significant plant species, interfering with an animal breeding place, or removing protected animals unless the activity is exempt. Habitat for threatened and Special Least Concern species is also considered an MSES. MSES within the Survey Area are detailed in Section 5.5.

2.2.1.1 Protected Plants Framework

Within the NC Act, provisions exist for the regulation or restriction taking or using of protected plants. Section 89 of the Act states that ‘a person, other than an authorised person, must not take a protected plant that is in the wild unless the plant is taken under:

- A conservation plan applicable to the plant; or
- A licence, permit or other authority issued or given under a regulation; or
- An exemption under a regulation’.

Activities that affect protected plants are regulated under the subordinate NC Regulation which requires a flora survey be carried out where areas of clearing are to occur within ‘High Risk Areas’ shown on the ‘Flora Survey Trigger Map’. High Risk Areas are known locations of endangered, vulnerable, or near threatened (EVNT) plants are buffered by 2 km. The flora survey method and format for the associated report required under the NC Act are defined by the Flora Survey Guideline (Department of Environment and Science, 2019).

No ‘High Risk Areas’ are mapped within the Survey Area.

2.2.2 Vegetation Management Act 1999

The *Vegetation Management Act 1999* (VM Act) regulates the clearing of native vegetation in Queensland and is administered by the Department of Natural Resources, Mines and Energy (DNRME). The purpose of the VM Act is to regulate the clearing of vegetation in a way that:

a. Conserves remnant vegetation;

b. Conserves vegetation in declared areas;

c. Ensures that clearing does not cause land degradation;

d. Prevents the loss of biodiversity;

e. Maintains ecological processes;

f. Manages the environmental effects of the clearing to achieve the matters mentioned in paragraphs (a) to (e);

g. Reduces greenhouse gas emissions; and

h. Allows for sustainable land use (refer s3(1) of the VM Act).

The VM Act categorises and defines native vegetation as remnant (category B), high value regrowth (HVR) (category C), reef regrowth watercourse vegetation (category R) and non-remnant (category X). Remnant vegetation is further classified into a RE based on bioregion, landform and dominant canopy species.

Under the VM Act all REs are assigned a Vegetation Management Status (VM status). This is based on the current extent remaining compared to its pre-clearing extent, as gazetted under the VM Act and listed in the Regional Ecosystem Description Database (REDD) maintained by the Queensland Herbarium, Department of Environment and Science (DES). An RE considered to have "VM status" is described as an:

- **Endangered** regional ecosystem:
  - Less than 10% of its pre-clearing extent remaining; or
  - 10% to 30% of its pre-clearing extent remaining and the remnant vegetation remaining is less than 10,000 ha.
- **Of Concern** regional ecosystem:
  - 10% to 30% of its pre-clearing extent remaining; or
  - More than 30% of its pre-clearing extent remaining and the remnant vegetation remaining is less than 10,000 ha.
- **Least Concern** regional ecosystem:
  - More than 30% of its pre-clearing extent remaining and the remnant vegetation remaining is more than 10,000 ha.

REs which are mapped within the Survey Area are discussed in Section 5.2.4.

2.2.2.1 Essential Habitat

Essential Habitat is also regulated under the VM Act. Remnant (category B) and HVR (category C) vegetation in which 'Endangered' and 'Vulnerable' species listed under the NC Act have been known to occur are classified as Essential Habitat. Specifically, section 20AC, sub section 2 states 'Essential Habitat, for protected wildlife, is a category A area, a category B area or category C area shown on the regulated vegetation management map -

a. That has at least 3 Essential Habitat factors for the protected wildlife that must include any Essential Habitat factors that are stated as mandatory for the protected wildlife in the Essential Habitat database; or

b. In which the protected wildlife, at any stage of its life cycle, is located'.

Essential Habitat is mapped within the Survey Area and is discussed in Sections 5.2.9 and 5.3.3.

2.2.3 Environmental Protection Act 1994

The objective of the *Environmental Protection Act 1994* (EP Act) is to protect Queensland's environment while allowing for development that improves the total quality of life, both now and in the future, in a way that maintains the ecological processes on which life depends (ecologically sustainable development).

The EP Act provides the key legislative framework for the protection of the environment in Queensland. Section 319 of the EP Act imposes a 'general environmental duty', which specifies that a

person must not undertake any activity that may harm the environment without taking reasonable and practical measures to prevent or minimise the harm.

2.2.4 Queensland Environmental Offsets Framework

The environmental offsets framework in Queensland includes the *Environmental Offsets Act 2014* (Qld) (EO Act), the Environmental Offsets Regulation 2014 (EO Regulation) and the Queensland Environmental Offsets Policy (EO Policy).

Matters of State Environmental Significance (MSES) are a component of the biodiversity state interest that is defined under the State Planning Policy (SPP) and defined under the EO Regulation. MSES are defined as:

- Regulated vegetation;
- Connectivity areas;
- Wetlands and watercourses;
- Designated precincts in Strategic Environmental Areas;
- Protected wildlife habitat;
- Protected areas (national parks, regional parks; and nature refuges);
- Declared fish habitat areas and highly protected zones of State Marine Parks;
- Waterways providing for fish passage;
- Marine plants;
- Legally secured offsets areas.

A self-assessment using the *Queensland Significant Residual Impact Guideline* is required to determine whether the Project will have a significant residual (SRI) impact on MSES. An environmental offset condition may be imposed under various State assessment frameworks (such as the *Planning Act 2016* and EP Act for an activity prescribed under the EO Act), if the Project will, or is likely to have a SRI on a prescribed environmental matter that is a MSES.

3.0 Commonwealth Offset Approach

There is no stipulated Commonwealth method for assessing the three components of habitat quality. However, for projects in Queensland the *Guide to determining terrestrial habitat quality* (Department of Environment and Science, 2020b) is commonly utilised for this process. This guide outlines the specific methodology for assessing habitat quality, which is usually determined by three indicators – site condition, site context and species habitat index. The linkages between the EPBC offsets assessment guide habitat quality components and the Queensland guide are outlined in Table 1.

This assessment has utilised the terrestrial habitat quality scoring methodology as per the Queensland Government *Guide to determining terrestrial habitat quality* (Department of Environment and Science, 2020b) to calculate the Commonwealth habitat quality inputs for MNES values.

Table 1 Commonwealth habitat quality components and associated Queensland habitat quality attributes

Commonwealth habitat quality components	Queensland habitat quality attributes
Site condition: This is the condition of a site in relation to the ecological requirements of a threatened species or ecological community. This includes considerations such as vegetation condition and structure, the diversity of habitat species present, and the number of relevant habitat features.	Site-based attributes: This is the general vegetation condition in the matter area when compared to an undisturbed reference site. It includes assessment of the following attributes: • Number of large native trees • Tree canopy height (emergent, canopy and sub-canopy) • Recruitment of woody perennial species (in the ecologically dominant layer) • Tree canopy cover (%) (emergent, canopy and sub-canopy) • Native shrub layer cover (%) • Coarse woody debris • Native plant species richness for trees, shrubs, grasses, and forbs/others • Non-native plant cover • Native perennial grass cover (%) • Organic litter cover
Site context: This is the relative importance of a site in terms of its position in the landscape, taking into account the connectivity needs of a threatened species or ecological community. This includes considerations such as movement patterns of the species, the proximity of the site in relation to other areas of suitable habitat, and the role of the site in relation to the overall population or extent of a species or community.	Landscape-scale attributes[1]: An analysis of the site in relation to the surrounding environment based on the following landscape attributes: • Size of patch (fragmented subregions) • Context (fragmented subregions) • Connectivity (fragmented subregions) • Ecological corridors (fragmented subregions) • Distance to permanent water (intact subregions)
Species stocking rate: This is the usage and/or density of a species at a particular site. The principle acknowledges that a particular site may have a high value for a particular threatened species, despite appearing to have poor condition and/or context. It includes considerations such as survey data for a site in regard to a particular species population or, in the case of a threatened ecological community this may be a number of different populations. It also includes consideration of the role of the site population in regard to the overall species population viability or community extent.	Species habitat attributes: The capacity of the site to support a species for all or part of its life cycle, permanently or from time to time, based on the following attributes: • Quality and availability of food and habitat required for foraging • Quality and availability of habitat required for shelter and breeding • Quality and availability of habitat required for mobility • Absence of threats

4.0 Assessment Methodology

4.1 Desktop Assessment

4.1.1 Database and literature review

A desktop assessment was undertaken to review publicly available and client supplied information (reports, database searches and spatial information) prior to the completion of field surveys. This identified threatened flora, fauna and vegetation communities previously recorded within the area, indicating the likelihood of these matters being present.

The following databases and reports were utilised to complete this assessment:

- DAWE EPBC Act Protected Matters Search Tool (PMST), to identify MNES within a search area extending at least 25 km from the approximate centre of the Survey Area (Department of Agriculture Water and the Environment, 2020) (Appendix A)
- The Queensland Department of Natural Resources, Mines and Energy (DNRME) Regulated Vegetation mapping
- The Queensland Department of Environment and Science (DES) Regional Ecosystem (RE) mapping version 11 to determine the nature and extent of vegetation within and surrounding the Survey Area
- DES Wildlife Online Extract (Appendix A)
- DNRME VM Act watercourse mapping
- DES VM Act wetland mapping (Department of Environment and Science, 2020)
- DES map of Queensland wetland environmental values to identify wetlands of high ecological significance (HES) and general ecological significance (GES) (DES, 2020b)
- Queensland wetland classification mapping (DES, 2020c)
- The Queensland Department of Agriculture and Fisheries (DAF) Queensland waterways for waterway barrier works mapping (DAF, 2020)
- DES Protected Plants Flora Survey Trigger Map to identify the high risk areas for protected plants (DES, 2020b)
- DES Essential Habitat mapping, to identify vegetation in which a threatened species has been known to occur
- Historical aerial imagery (Q Imagery, 2020)
- Predictive Habitat Mapping Rules for MNES and MSES Fauna Species within the Santos GFD Project Gas Fields (Boobook Ecological Consulting, 2020).

Aerial photographic interpretation was also undertaken across the Survey Area as an initial step to support the field survey. This allowed efforts to be focused to key areas within the Survey Area and ensured field data collection is spatially comprehensive, efficient and effective.

4.2 Field Surveys

Field surveys were conducted by up to three ecologists (Boobook Ecological Consultants or AECOM) within the Survey Area over the following dates during November to December 2020 and February 2021:

- 23 November to 26 November 2020
- 30 November to 4 December 2020
- 3 February to 5 February 2021
- 9 February to 12 February 2021

- 16 February 2021.

Given its large spatial extent, the Survey Area has been spilt into a total of six zones (Figure 4). Field survey locations are shown by zone in Figure 5 to Figure 10.

4.2.1 Survey conditions

The nearest Bureau of Meteorology weather station to the Survey Area is located at the Roma Airport (station 43091). Recorded daily observations include rainfall, minimum and maximum temperatures; these have been summarised below for each survey day (Table 2). It should be noted that the values detailed below may not be representative of conditions experienced during surveying. Daily observations across the survey months (November, December, January and February) are also shown in Figure 2.

Conditions during the field survey were hot and dry. Across the seventeen survey days, rainfall was recorded on two: 3 February 2021 with 1.0 millimetres (mm) recorded and 11 February 2021 with 1.6 mm. A review of recorded rainfall over summer 2020/2021 indicated that conditions were generally very dry; a total of 189.4 mm recorded which is well below the long-term average of 292.1 mm for the same period.

Daily minimum temperatures across the survey days ranged from 17.4 degrees Celsius (°C) (3 February 2021) to 26.3 °C (1 December 2020). Daily maximum temperatures across the survey days ranged from 30.9 °C (16 February 2021) to 44.7 °C (2 December 2020). Comparison of recorded daily temperatures to long-term averages indicate that survey conditions were hotter than average.

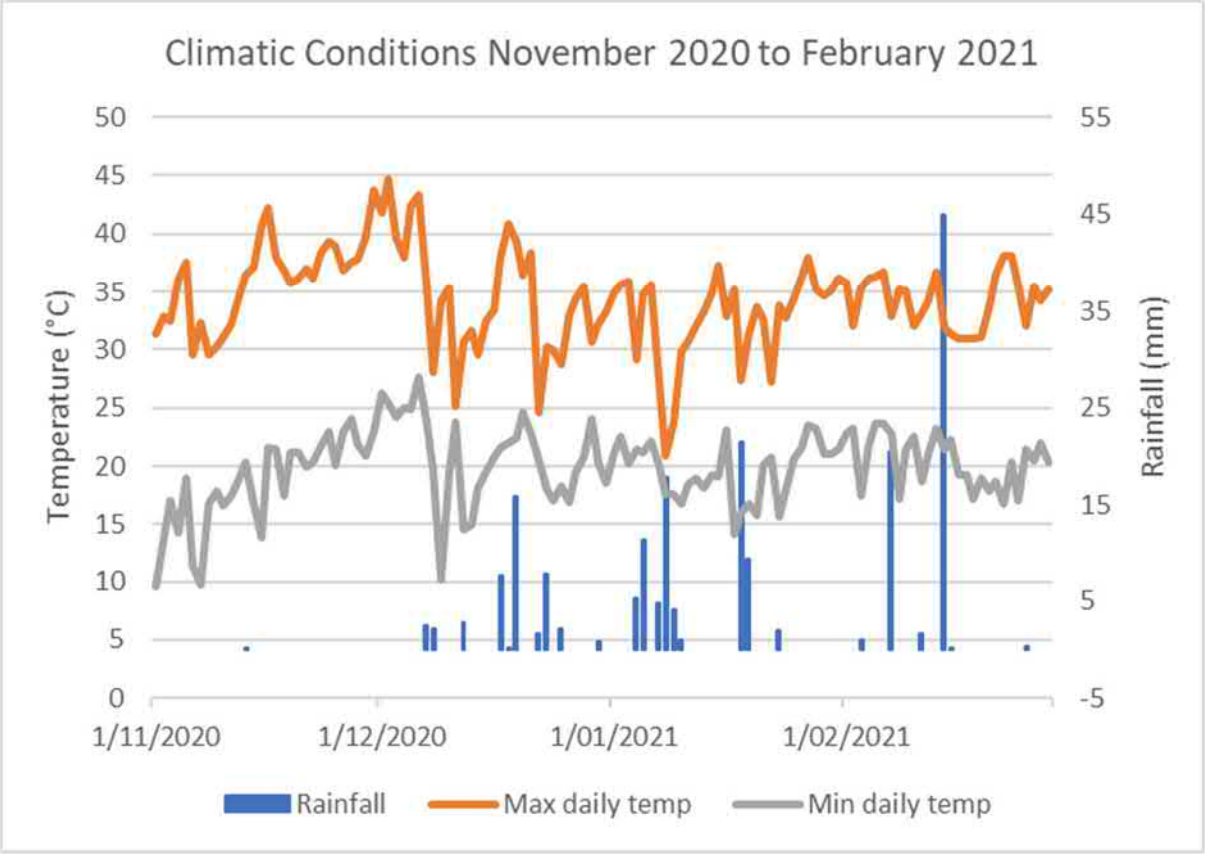


Figure 2 Climatic conditions during summer 2020/2021

Table 2 Roma Airport BoM station observations during field survey periods

Parameter	November 2020					December 2020				February 2021							
	23	24	25	26	30	01	02	03	04	03	04	05	09	10	11	12	16
Rainfall (mm)	0	0	0	0	0	0	0	0	0	1.0	0	0	0	0	1.6	0	0
Min temperature (°C)	21.7	23.0	20.1	23.0	23.0	26.3	25.5	24.2	25.0	17.4	21.8	23.6	21.4	22.5	18.7	21.0	19.2
Max temperature (°C)	38.4	39.3	39.0	36.9	43.7	41.8	44.7	39.6	37.9	35.4	36.2	36.3	35.1	32.1	33.2	34.3	30.9

4.2.2 Flora

4.2.2.1 Vegetation community assessment

The extent, classification and condition of ground-truthed vegetation communities within the Survey Area was validated in accordance with the Methodology for Surveying and Mapping Regional Ecosystem and Vegetation Communities in Queensland (Neldner, et al., 2019). This included traversing the Survey Area undertaking tertiary and quaternary level assessments.

As per the Queensland Herbarium methodology (Neldner, et al., 2019), tertiary level site assessments were undertaken within a 10 by 50 m quadrat, collecting the following information:

- vegetation structure, species composition and percentage cover for each structural layer
- aspect and slope
- soil type
- landform
- disturbance type and severity
- RE and remnant status.

Quaternary-level sites were utilised to verify vegetation units and confirm dominant characteristic species. Structural analysis included recording the height class and life form of the dominant species within the mid and canopy strata as per (Neldner, et al., 2019). Several time-encoded digital photographs were taken at each tertiary and quaternary site assessment as a reference.

RE classification was determined based on the vegetation, soil and landform characteristics identified in the field, geological mapping for the region and the Regional Ecosystem Description Database (REDD). Condition status for woody vegetation was evaluated utilising the definitions of remnant vegetation under the VM Act. For the purposes of this assessment, vegetation was mapped into three categories:

- Remnant: woody vegetation that has not been cleared or vegetation that has been cleared but where the dominant canopy has greater than 70% of the height and greater than 50% of the cover relative to the undisturbed height and cover of that stratum and is dominated by species characteristic of the vegetation's undisturbed canopy.
- High-value Regrowth (HVR): areas previously cleared or disturbed (e.g. by wildfire) over 15 years ago and containing woody vegetation floristically and structurally consistent with the RE but typically less than 70% of the height and less than 50% density of the RE.
- Regrowth or non-remnant: areas previously cleared or otherwise significantly disturbed.

4.2.2.2 Functionality assessment

Vegetation communities assessed to comprise remnant or HVR vegetation and analogous to an RE with an endangered biodiversity status (under the Queensland EP Act), were also assessed for functionality. Four condition attributes as per Table 3 below were assessed to determine if the patch was considered functional.

Table 3 Minimum ecosystem attributes for functional non-grassland ecosystems

Attribute	Cut-off
Patch size	>0.5 ha
Total non-native perennial vegetative cover	<50%
Recruitment to EDL	Yes
Minimum median canopy height	>1/3 of the median benchmark

4.2.2.3 TEC assessment

TEC assessments were undertaken across the Survey Area to confirm the presence of TECs identified during the desktop assessment, namely Brigalow (*Acacia harpophylla* dominated and co-

dominated) TEC (Brigalow TEC), Poplar Box Grassy Woodland on Alluvial Plains (Poplar box TEC), the semi-evergreen vine thickets of the Brigalow Belt (North and South) and Nandewar Bioregions (SEVT TEC) and the Weeping Myall Woodlands (Weeping myall TEC).

Brigalow, Poplar box, SEVT and Weeping myall TEC assessments were undertaken to identify vegetation communities meeting the key diagnostic and condition threshold criteria as described in the relevant Commonwealth Approved Conservation Advice, Policy Statement or Species Profile and Threat Database (SPRAT).

The assessment for Brigalow TEC consisted of collecting the following data at various sites within Brigalow vegetation:

- Dominance or co-dominance of Brigalow
- Brigalow listed RE
- Exotic perennial cover
- Age of community
- Patch size.

The assessment for Poplar box TEC consisted of collecting the following data at sites within vegetation dominated by *Eucalyptus populnea* (poplar box):

- Dominance of poplar box
- Soil type and or land zone
- Exotic perennial cover
- Patch size
- Evidence of recruitment.

The assessment for SEVT TEC consisted of collecting data to determine RE classification at various sites identified to comprise of semi-evergreen vine thicket species. REs that are identified to form the SEVT TEC are listed in Table 4.

Table 4 SEVT TEC listed REs

RE	Short description
11.2.3	Microphyll vine forest ("beach scrub") on sandy beach ridges
11.3.11	Semi-evergreen vine thicket on alluvial plains
11.4.1	Semi-evergreen vine thicket ± Casuarina cristata on Cainozoic clay plains
11.5.15	Semi-evergreen vine thicket on Cainozoic sand plains/remnant surface
11.7.1x	Semi-evergreen vine thicket on the slopes and scarps of rocky residual ranges with Cainozoic lateritic duricrust
11.8.3	Semi-evergreen vine thicket on Cainozoic igneous rocks
11.8.6	*Macropteranthes leichhardtii* thicket on Cainozoic igneous rocks
11.8.13	Semi-evergreen vine thicket and microphyll vine forest on Cainozoic igneous rocks
11.9.4	Semi-evergreen vine thicket on Cainozoic fine-grained sedimentary rocks
11.9.8	*Macropteranthes leichhardtii* thicket on Cainozoic fine-grained sedimentary rocks
11.11.18	Semi-evergreen vine thicket on old sedimentary rocks with varying degrees of metamorphism and folding

As per the Weeping Myall woodland EPBC Act Policy Statement 3.17 (Department of the Environment Water Heritage and the Arts, 2009), the assessment for Weeping myall TEC consisted of collecting the following data within vegetation dominated by weeping myall (*Acacia pendula*):

- Dominance of weeping myall in each vegetation layer
- Soil type and or land zone
- Ground layer species composition
- Patch size
- Evidence of recruitment.

4.2.2.4 Site condition assessment

Vegetation was delineated into Assessment Units and the condition quantified and assessed in accordance with the *Guide to determining terrestrial habitat quality* (Department of Environment and Science, 2020b). An Assessment Unit (AU) refers to vegetated areas with similar REs and vegetation status (remnant or regrowth) which can be grouped together reflecting a single vegetation community. Condition assessment focussed on AUs identified to be targeted for surveying to assist in determining terrestrial habitat quality (site condition component of Commonwealth Government habitat quality) for these values. Site condition assessments involved the collection of 13 site-based attributes as outlined in Table 5 within a 100 m x 50 m nested sampling plot (see Figure 3).

In total, 31 site condition assessments (Eyre et al., 2015) were completed across the Survey Area.

Table 5 Site condition attributes

Condition attributes	Assessment plot
Large trees	100 x 50 m plot
Tree canopy height	100 x 50 m plot
Recruitment of canopy species	100 x 50 m plot
Tree canopy cover (%)	100 m transect
Shrub layer cover (%)	100 m transect
Coarse woody debris	50 x 20 m plot
Native plant species richness for four life forms	100 x 50 m (trees) 50 x 10 m (shrubs, grasses and forbs)
Non-native plant cover	50 x 10 m plot
Native perennial grass cover (5)	1 x 1 m quadrat
Organic leaf litter	1 x 1 m quadrat

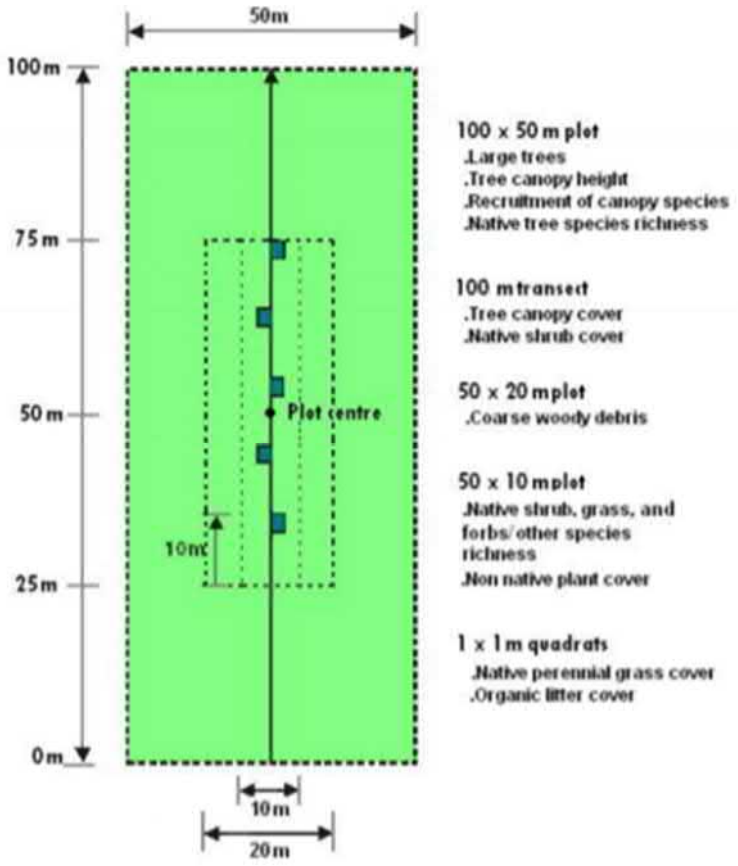


Figure 3 Sampling Plot Layout (taken from Eyre *et al.*, 2015)

4.2.3 Fauna

4.2.3.1 Habitat assessments

Habitat assessments were undertaken to characterise the fauna habitat values within the Survey Area. Habitat attributes recorded during the assessment include:

- Vegetation structure and dominant species, including a description of canopy, shrub and ground
- Presence and abundance of tree hollows and stags
- Presence and abundance of woody debris such as habitat logs and ground timber
- Rocky habitat such as surface rocks, boulders, crevices, overhangs and caves
- Proximity to water (both permanent and ephemeral)
- Disturbance from invasive weeds/pests
- Other disturbances such as grazing pressure, clearing, thinning or fire
- Any other significant habitat features or values present.

Included in the habitat assessments were searches for signs of animal activity, including tracks, scats, scratches, bones, fur, feathers, nests, foraging holes and diggings. At all fauna habitat assessment locations, active searches, incidental observations and visual and auditory survey of were conducted.

Habitat assessments were conducted to populate the fauna species habitat index as per the *Guide to Determining Terrestrial Habitat Quality* (Department of Environment and Science, 2020b). The fauna species habitat index examines the capacity of a site to support a species, which also contributes the Commonwealth species stocking rate component of the 'habitat quality'. This assessment represents an evaluation of the quality and availability of habitat for a target species, and the likelihood of continued survival of the target species within the site utilising the following attributes:

- Threats to species
- Quality and availability of food and foraging habitat
- Quality and availability of shelter
- Species mobility capacity
- Role of site location to species overall population in the state.

Fauna habitat assessments were completed in conjunction with the site condition assessments. Table 16 in Appendix B provides a breakdown of categorised attributes for potentially occurring threatened species that were collected during the fauna assessments and utilised to provide habitat quality scores.

AECOM

0 2.5 5 KMS

ZONE 1

ZONE 2

ZONE 3

ZONE 4

ZONE 5

ZONE 6

ROMA

WALLUMBILLA

LEGEND

- Survey
- Townships
- State Roads
- Other Roads and Tracks

FIGURE 4

SURVEY AREA & ZONES

AECOM

0 0.5 1 KMS

LEGEND

- Survey Area
- Roads and Tracks
- Habitat Quality Site
- Vegetation Assessment Site
- Observation Site
- Observation Site (Boobook)

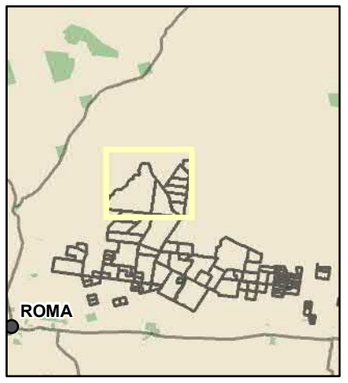


FIGURE 5 - ZONE 1 SURVEY SITES

AECOM

0 0.45 0.9 KMS

LEGEND

- Survey Area
- Roads and Tracks
- Habitat Quality Site
- Vegetation Assessment Site
- Observation Site
- Observation Site (Boobook)

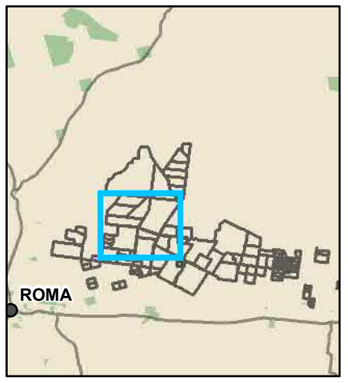


FIGURE 6 - ZONE 2 SURVEY SITES

AECOM

0 0.55 1.1 KMS

LEGEND

- Survey Area
- No Access
- Roads and Tracks
- Habitat Quality Site
- Vegetation Assessment Site
- Observation Site
- Observation Site (Boobook)

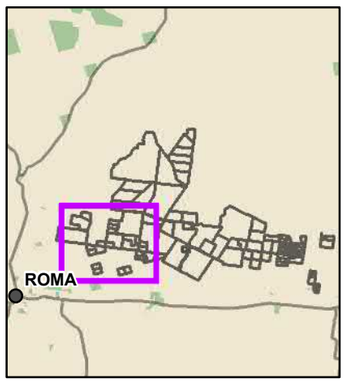


FIGURE 7 - ZONE 3 SURVEY SITES

AECOM

0 0.55 1.1 KMS

LEGEND

- Survey Area
- No Access
- Roads and Tracks
- Habitat Quality Site
- Vegetation Assessment Site
- Observation Site
- Observation Site (Boobook)

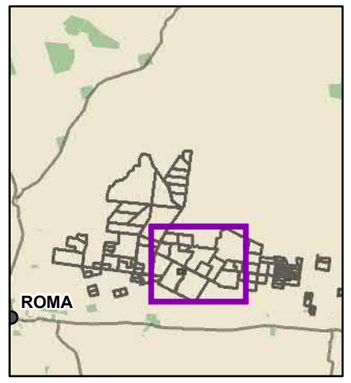


FIGURE 8 - ZONE 4 SURVEY SITES

AECOM

0 0.55 1.1 KMS

LEGEND

- Survey Area
- No Access
- Roads and Tracks
- Habitat Quality Site
- Observation Site (Boobook)

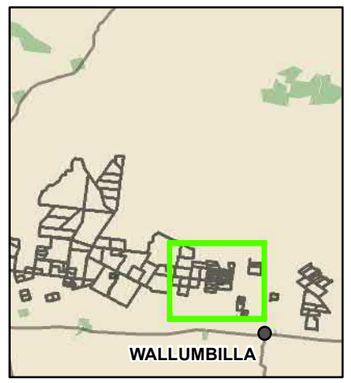
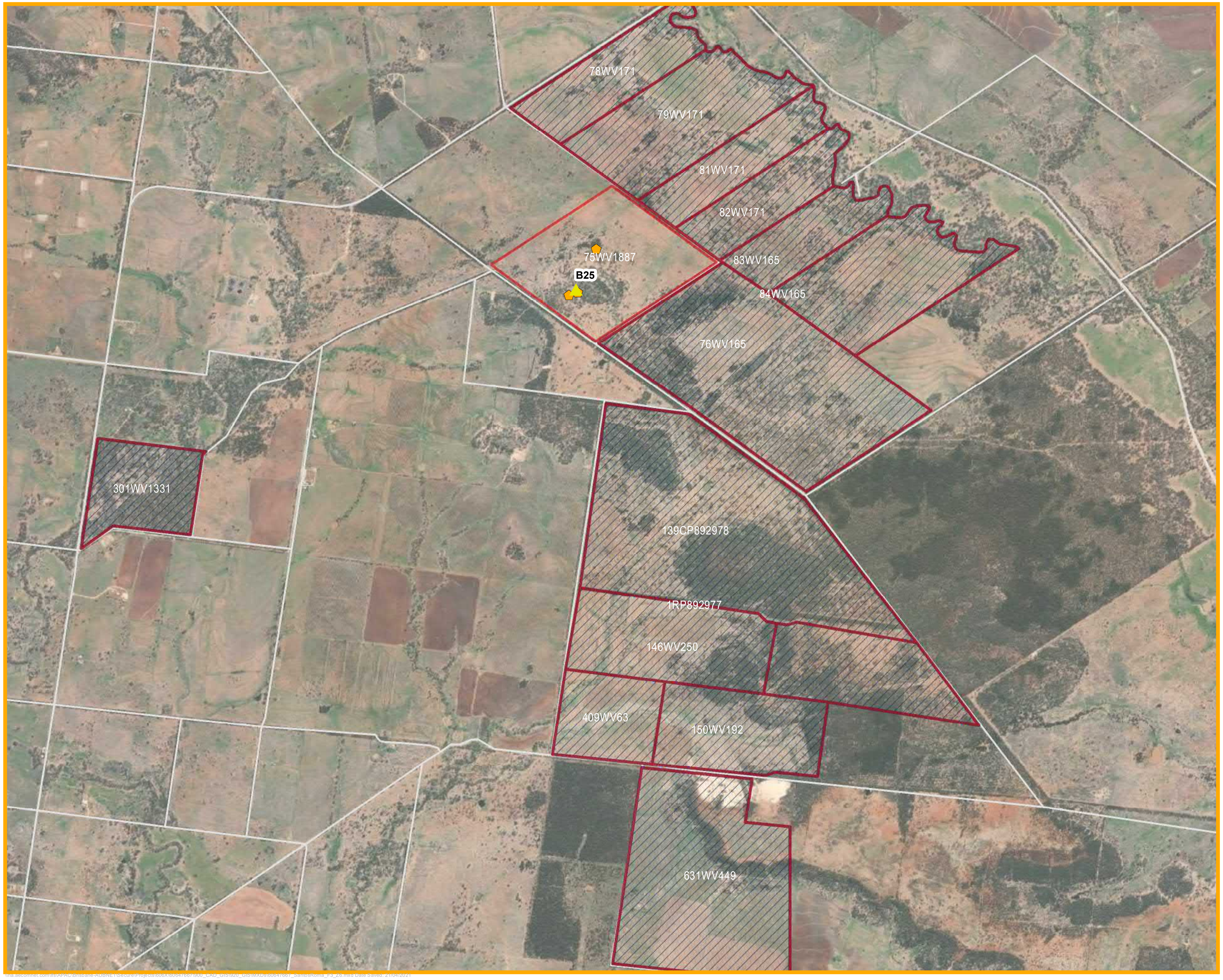


FIGURE 9 - ZONE 5 SURVEY SITES



AECOM

0 0.45 0.9 KMS

LEGEND

- Survey Area
- No Access
- Habitat Quality Site
- Observation Site (Boobook)
- Roads and Tracks

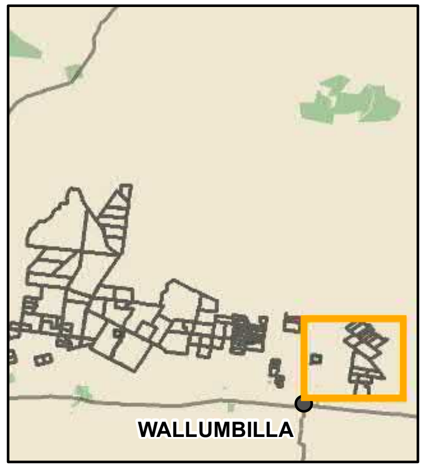


FIGURE 10 - ZONE 6 SURVEY SITES

4.3 Data analysis

4.3.1 GIS analysis

Spatial data collected during the field surveys was imported into ArcMap GIS to map vegetation community and habitat boundaries as well as calculate patch size. Target values identified during the field surveys were attributed to the appropriate vegetation communities and habitat types.

RE mapping completed as part of this assessment was used to undertake site context assessments. Site context assessments provide a quantitative assessment of the landscape values of the Survey Area and assist in determining the site context indicator of terrestrial habitat quality (site context component of Commonwealth Government habitat quality) for targeted values. Site context was analysed in accordance with the *Guide to determining terrestrial habitat quality* (Department of Environment and Science, 2020b). This involved calculating size of patch, connectivity and context following the methodology described in Eyre et al. (2015), while categorising ecological corridors as described in the guideline. The spatial layers used to assess the site context attributes were:

- AECOM RE mapping
- DES Regional Ecosystem Mapping (version 11) for surrounding areas outside of the Survey Area
- Biodiversity Planning Assessment for the Brigalow Belt mapping.

4.3.2 Terrestrial habitat quality scoring

Site-based attributes and species habitat attributes collected in the field as well as site context data analysed in GIS were evaluated to provide an overall terrestrial habitat quality score (Impact Site Commonwealth habitat quality score) for the associated MSES or MNES values. The terrestrial habitat quality scoring follows the methods described by (Department of Environment and Science, 2020b).

As per the method, site condition field data was compared against corresponding benchmark data (data from a representative vegetation community i.e. RE in an undisturbed state) and scored accordingly. Benchmark data was sourced from DES (2019a).

The following steps were undertaken to determine the terrestrial habitat quality score (Commonwealth habitat quality) for each field validated assessment unit identified to support an MSES or MNES value.

1. Determine the terrestrial habitat quality score (Measured) for each sampling site using the formula:

Site Condition (Measured) + Site Context (Measured) + Species Habitat Index (Measured) = Terrestrial Habitat Quality Score (Measured)

2. Determine the terrestrial habitat quality score (Maximum) by summing together the highest possible score attainable for each measured attribute and using the formula:

Site Condition (Maximum) + Site Context (Maximum) + Species Habitat Index (Maximum) = Terrestrial Habitat Quality Score (Maximum)

The maximum scores that can be obtained for each attribute are:

   a. Site Condition: 80
   b. Site Context: 26
   c. Species habitat index: 100

3. Determine the terrestrial habitat quality score using the formula:

[Terrestrial Habitat Quality Score (Measured)/Terrestrial Habitat Quality Score (Maximum)] x 10 = Terrestrial Habitat Quality Score

A Terrestrial Habitat Quality Score will give a total less than ten. Once a Terrestrial habitat Quality Score is derived for each site, scores are averaged for each AU if there is more than one site per AU. To provide an overall score for each MSES and MNES value, the scores of all applicable AU's (i.e. associated REs for each target value) were averaged.

4.4 Limitations

4.4.1 Species detectability

A flora field survey has inherent limitations associated with the variability of vegetation communities across a survey location, and changes to the detectability and presence of species over time. The seasonal conditions during which the survey was undertaken was conducive to a relatively high degree of detectable floral diversity. However, it is recognised that a single field study cannot always account for 100% of potential floral diversity present across a survey location.

The detection of fauna species during habitat assessments is limited, given the cryptic and nocturnal nature of many fauna. Further, seasonality and weather conditions influence the detectability of some taxa.

4.4.2 Weighting Assessment Units

Following the *Guide to determining terrestrial habitat quality* (Department of Environment and Heritage Protection, 2017) the final steps in determining the Habitat Quality Score for each MSES and MNES value include weighting the Assessment Units to determine how much each contributes to the weighted assessment unit Habitat Quality Score. Assessment Units are represented by a particular RE or a group of similar REs. Therefore, to determine how much area of an Assessment Unit needs to be considered for the weighted assessment, the area of each RE must be used. However, the location of infrastructure for the Project is yet to be finalised, therefore areas of RE to be impacted are currently under review. As an alternative, total scores were averaged across the AUs relevant to the target species.

4.4.3 Number of sampling sites

As per Section 1.4.2.1 of the *Guide to Determining Terrestrial Habitat Quality* (Department of Environment and Science, 2020b), a streamlined sampling approach was utilised that limited the number of condition assessments to a maximum of two per AU. Additionally, the extent of one AU (RE 11.3.39) within the Survey Area was of insufficient shape to appropriately fit a 100 m x 50 m transect, and therefore was excluded from the site condition assessment.

5.0 Ecological Values

5.1 Bioregional Context

The Survey Area occurs within the Brigalow Belt Bioregion, which covers the 500-759 mm rainfall area between the Queensland – New South Wales border in the south, to Townsville in the north. The Bioregion is characterised by the tree species *Acacia harpophylla* (brigalow) that forms forest and woodland on clay soils. Brigalow does not predominate across the entire region, with the bioregion including a range of ecosystems including eucalypt forest and woodland, grassland, dry rainforest, cypress pine woodland and riparian communities (Sattler & Williams, 1999).

Within the Brigalow Belt Bioregion, the Survey Area occurs within the Southern Downs sub-bioregion (Sattler & Williams, 1999).

5.2 Flora

5.2.1 Regulated Vegetation

A review of the DRNME Regulated Vegetation mapping identified the presence of regulated vegetation at various locations within the Survey Area. This includes the following regulated vegetation categories listed in Table 6. Areas of Category B and Category C vegetation are limited, primarily occurring in the north western extent of Lot and plan 2SP186211 (zone 1) and in association with the major watercourses Wallumbilla Creek and Blyth Creek.

Table 6 Regulated vegetation mapped within the Survey Area

VM Act vegetation category	Description
Category A	Compliance areas, environmental offset areas and voluntary declaration areas
Category B	Remnant vegetation
Category C	High-value regrowth vegetation
Category X	Non-remnant

Field assessments confirmed the presence of Category B remnant vegetation and Category C HVR vegetation within the Survey Area. Both Category B remnant vegetation and Category C HVR vegetation was confirmed in the areas shown in the Regulated Vegetation map as well as in multiple additional small scattered patches across the Survey Area. Additional areas of remnant and HVR vegetation occur in association with minor watercourses and along property boundaries or roads (windrows).

The remainder of the Survey Area is representative of Category X non-remnant vegetation, largely comprising cleared exotic grassland and low regrowth (generally brigalow).

5.2.2 Regulated Vegetation within a Defined Distance to a Watercourse

The DES 'MSES - Regulated vegetation intersecting a watercourse' mapping was reviewed as part of the desktop assessment. Regulated vegetation intersecting a watercourse is mapped at various locations across the Survey Area. During the field survey, regulated vegetation was confirmed within a defined distance of a watercourse at numerous locations across the Survey Area; the total area of regulated vegetation however is more than the extent represented in the State mapping.

5.2.3 Regulated Vegetation within 100 m of a Wetland

The DES 'MSES - Regulated vegetation - 100 m from wetland' mapping was also reviewed as part of the desktop assessment. No areas of regulated vegetation within 100 m of a wetland are mapped within the Survey Area.

AECOM

0 0.5 1 KMS

LEGEND

- Survey Area
- Roads and Tracks
- MSES - Regulated vegetation intersecting a watercourse

Regulated Vegetation Map

- Category A area
- Category B area
- Category C area
- Category X area

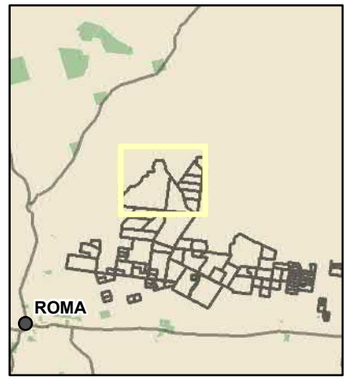
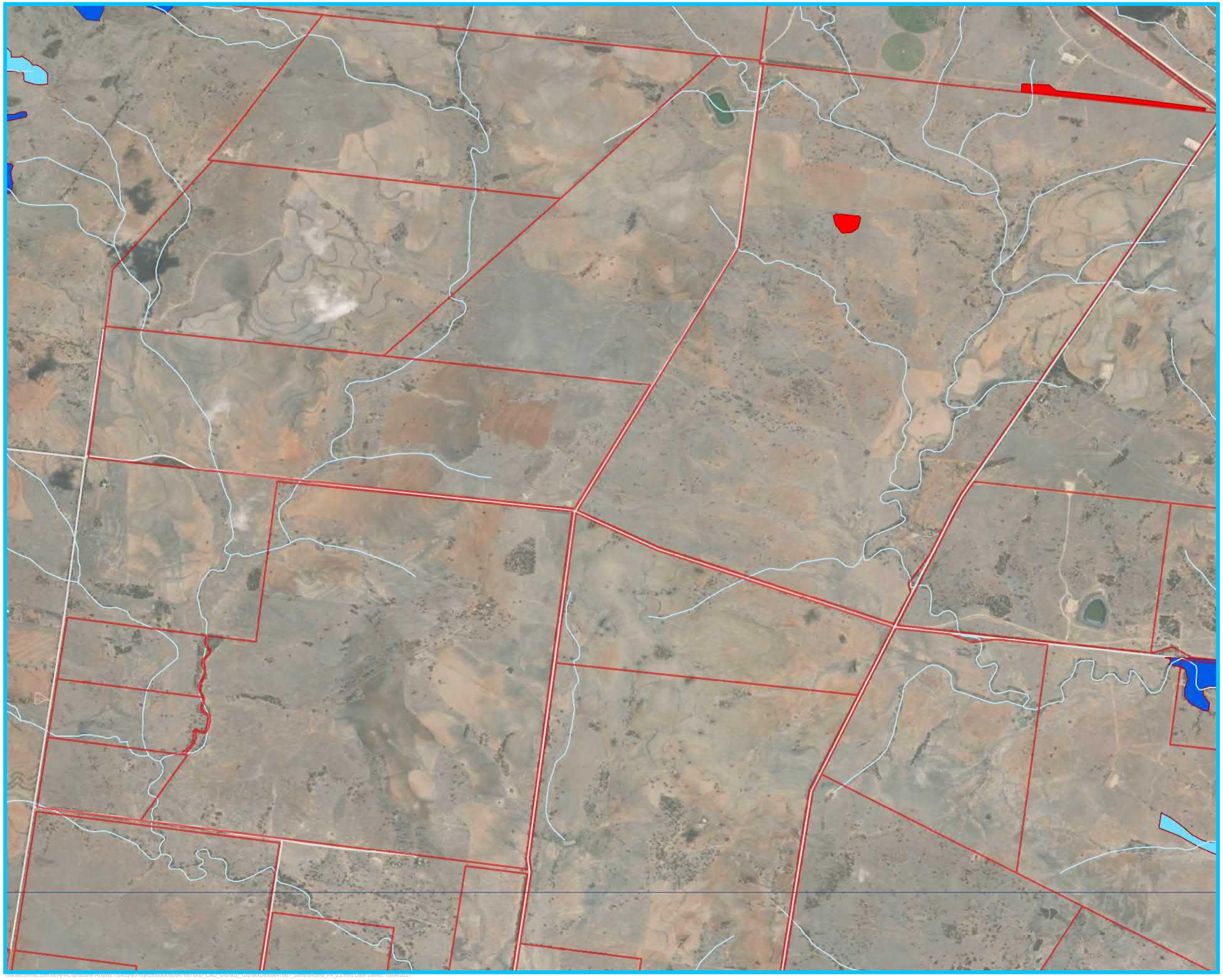


FIGURE 11 - ZONE 1
REGULATED VEGETATION



AECOM

0 0.45 0.9
KMS

LEGEND

- Survey Area
- Roads and Tracks
- MSES - Regulated vegetation intersecting a watercourse

Regulated Vegetation Map

- Category A area
- Category B area
- Category C area
- Category X area

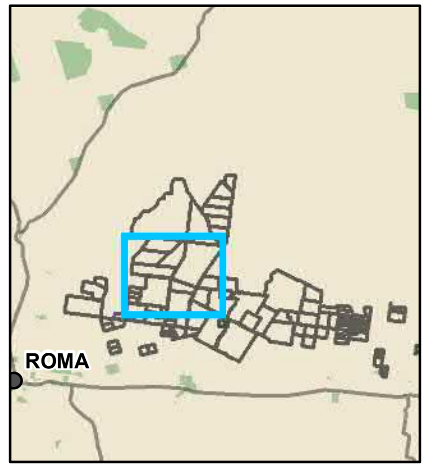


FIGURE 12 - ZONE 2 REGULATED VEGETATION

AECOM

0 0.55 1.1 KMS

LEGEND

- Survey Area
- Roads and Tracks
- MSES - Regulated vegetation intersecting a watercourse

Regulated Vegetation Map

- Category A area
- Category B area
- Category C area
- Category X area

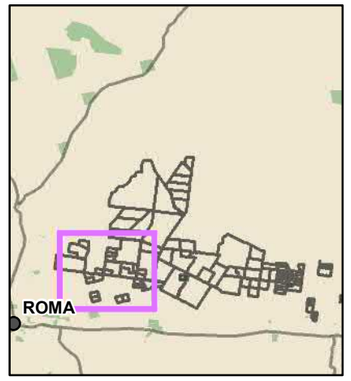


FIGURE 13 - ZONE 3
REGULATED VEGETATION

AECOM

0 0.55 1.1 KMS

LEGEND

- Survey Area
- Roads and Tracks
- MSES - Regulated vegetation intersecting a watercourse

Regulated Vegetation Map

- Category B area
- Category C area
- Category X area

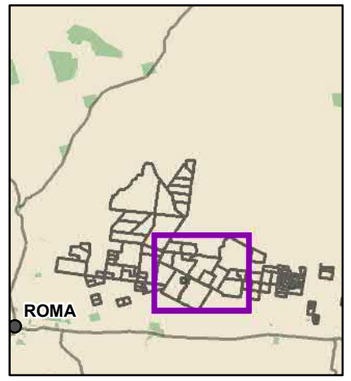
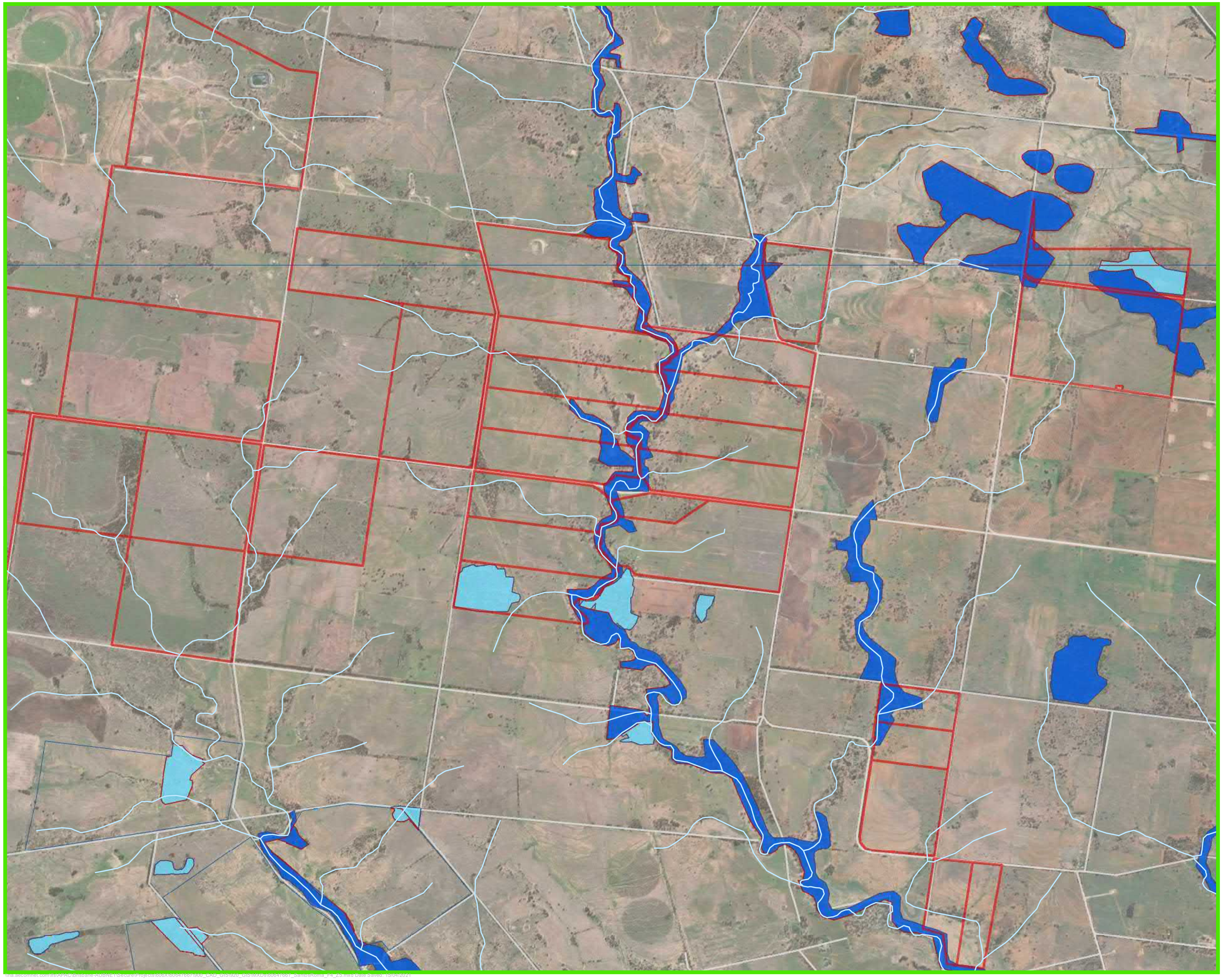


FIGURE 14 - ZONE 4
REGULATED VEGETATION



AECOM

0 0.55 1.1
KMS

LEGEND

Survey Area

Roads and Tracks

MSES - Regulated vegetation intersecting a watercourse

Regulated Vegetation Map

Category B area

Category C area

Category X area

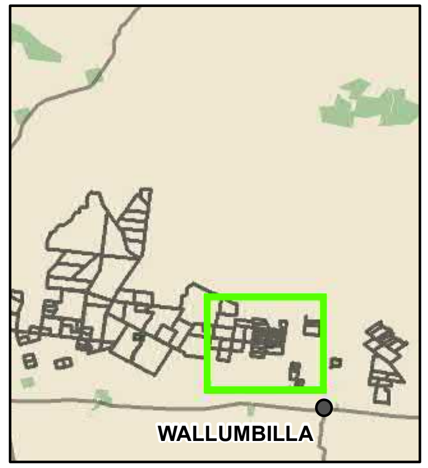
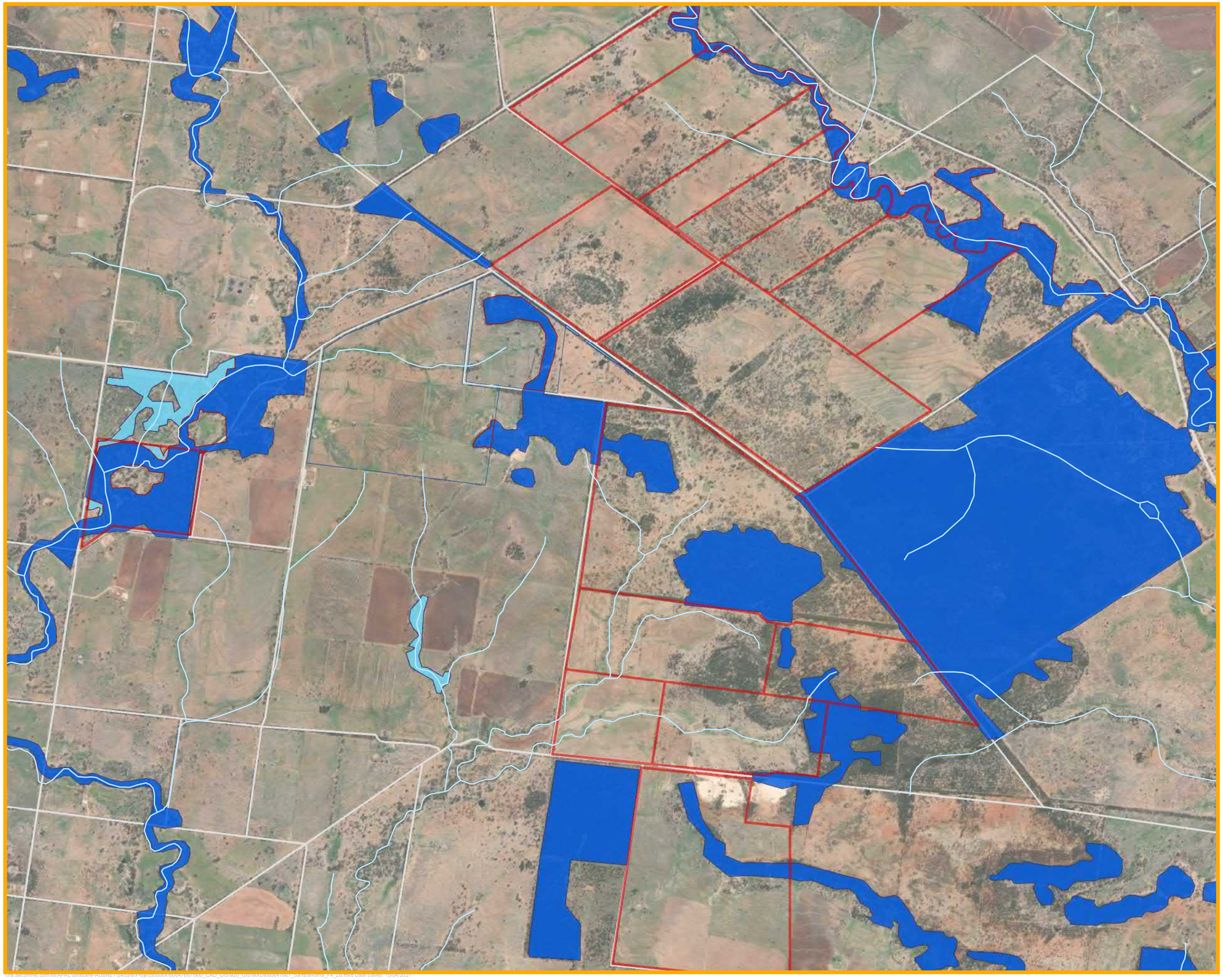


FIGURE 15 - ZONE 5 REGULATED VEGETATION



AECOM

0 0.45 0.9 KMS

LEGEND

Survey Area

Roads and Tracks

MSES - Regulated vegetation intersecting a watercourse

Regulated Vegetation Map

Category B area

Category C area

Category X area

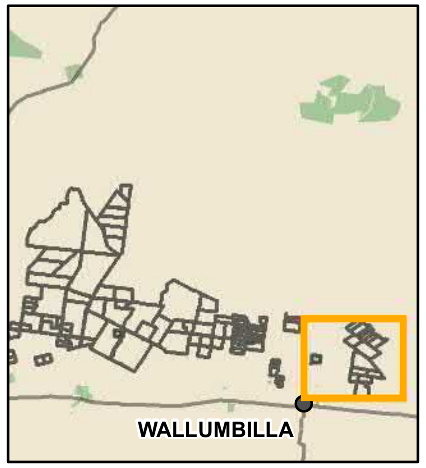


FIGURE 16 - ZONE 6 REGULATED VEGETATION

5.2.4 Vegetation communities and condition

Sixteen remnant and six regrowth vegetation communities were confirmed to occur within the Survey Area during field surveys (refer Table 7).

Vegetation condition was variable but typically in average to poor condition, with isolated regrowth areas exhibiting the greatest disturbance (edge effects and grazing). Vegetation surveys completed in the western extent of Lot and plan 2SP186211 (zone 1) found intact vegetation with limited weed invasion and other disturbances. Table 7 below describes the vegetation communities surveyed and provides the site condition score for each. Site condition assessment data per site is provided in Appendix C.

Table 7 Vegetation communities recorded within the Survey Area

RE (Site) AU	Site Condition	VM Act status	Site condition score	Image
Remnant 11.3.1 (B06, B28) AU1	*Acacia harpophylla* woodland to open forest to 12 m on alluvial flats, sometimes reduced to a narrow strip of vegetation adjacent narrow drainage lines. Other canopy species recorded include *Eucalyptus populnea*, *Casuarina cristata* and *Geijera parviflora*. A generally sparse sub-canopy to 10 m is present and contains *Eremophila mitchelli* and *G. parviflora*. A shrub layer is also present although very sparse and largely dominated by *Capparis lasiantha* with rare occurrences of *Apophyllum anomalum* and regrowth *E. mitchellii*, *A. harpophylla* and *G. parviflora*. The ground layer coverage is variable with some areas recording up to 50% bare ground, while other areas recorded a higher coverage due to the presence of exotic grasses *Cenchrus ciliaris** or *Urochloa mosambicensis** or clumps of native grass. Native grass species recorded include *Paspalidium sp.*, *Enteropogon acicularis*, *Chloris ventricosa*, *Enteropogon ramosus* and *Paspalidium caespitosum*. Infestations of other exotic species were largely absent. Evidence of erosion and recent grazing was recorded.	E	46.5/80	

RE (Site) AU	Site Condition	VM Act status	Site condition score	Image
Remnant 11.3.2 (B03, B30) AU2	*Eucalyptus populnea* woodland to open forest on alluvial plains. Median canopy height ranges from 13 m to 17 m. No other tree species were recorded in the ecologically dominant layer. The sub-canopy is generally sparse and populated by *Acacia salicina, Acacia excelsa* or *Acacia harpophylla*. *E. populnea* and *Alectryon oleifolius* subsp. *elongatus* were also occasionally recorded in the sub-canopy. A sparse lower tree layer dominated by *Eremophila mitchellii* is occasionally present. The shrub layer is sparse to very sparse with records of *Geijera parviflora*, *Citrus glauca*, *Alstonia constricta* and the exotic *Lycium ferocissimum**. The ground layer was generally dominated by a combination of native and exotic grasses. Native grass species diversity is variable but generally included *Aristida sp., Enteropogon ramosus, Heteropogon contortus and Themeda avenacea. Cenchrus ciliaris** and *Urochloa mosambicensis** were the most common exotic grasses. Light grazing and erosion is evident within most the of areas.	OC	59.5/80	
Remnant 11.3.2b (NA) -	*Eucalyptus camaldulensis* open forest up to 19 m on alluvial back plain depression. Occasional *Eucalyptus tereticornis* also occur within the canopy layer. The sub-canopy is sparse and also dominated by *E. camaldulensis* to 14 m with *Eucalyptus populnea* associated. No shrub layer is recorded. The ground layer is mid-dense to dense and dominated by native species including an unknown aquatic plant and *Leptochloa digitata*. This community occurs as a single patch within the Survey Area (zone 4, lot and plan 77WV975).	OC	-	-

RE (Site) AU	Site Condition	VM Act status	Site condition score	Image
HVR 11.3.2 (B02) AU3	*Eucalyptus populnea* low open woodland to 10 m. No other canopy species were recorded. A very sparse shrub layer was present and dominated by *Citrus glauca*. The ground layer was dominated by native grasses *Aristida sp.*, *Themeda avenacea* and *Enteropogon acicularis*. Ground cover primarily comprised organic litter, followed by native grasses and bare ground. Native forbs were scattered but reflective of species richness when compared to benchmark community. Forbs noted during surveys include *Sida hackettiana, Wahlenbergia sp., Lomandra sp.* and *Rumex brownii*. No weed cover was recorded.	OC	38.5/80	
Remnant 11.3.17 (B14) AU4	Open woodland dominated by *Eucalyptus populnea* up to 18 m along the banks and floodzone of stream. *Acacia harpophylla*, *Acacia excelsa*, and other *Eucalyptus sp.* were also recorded in the canopy layer. No sub-canopy was recorded. A low and sparse shrub layer is present, dominated by *Eremophila mitchellii* regrowth. Other shrub species present include *Capparis lasiantha*, *Capparis anomalum*, *Marsdenia viridiflora*, *Citrus glauca*, *Ehretia membranifolium*, *Jasminum didymum*, *Maireana microphylla*, *Geijera parviflora* and *Solanum parvifolium*. The ground layer comprised both native and exotic grasses (namely *Cenchrus ciliaris**). Native grass species recorded include *Aristida sp.*, *Enteropogon acicularis*, *Eragrostis sp.* and *Ancistrachne uncinulata*. Evidence of thinning and drought was recorded with canopy trees well-spaced and some experiencing dieback.	OC	46.5/80	

RE (Site) AU	Site Condition	VM Act status	Site condition score	Image
HVR 11.3.17 (B18) AU5	Low open forest of *Eucalyptus populnea* up to 10 m, with *Acacia harpophylla* along broad, shallow minor drainage lines. A sub-canopy to 6 m is present containing canopy species as well as *Eremophila mitchellii* and *Geijera parviflora*. A sparse shrub layer of *Acalypha eremorum*, *Alectryon diversifolia*, *Capparis mitchellii*, *Carissa ovata* and *Marsdenia viridiflora* is also present. The ground layer is variable but often dominated by exotic grass species (namely *Cenchrus ciliaris** and *Megathyrsus maxima**) with other exotic species also present (*Opuntia tomentosa** and *Lycium ferocissimum**). Consequentially, native grass and forb species diversity and cover is low.	OC	33/80	
Remnant 11.3.18 (B07, B27) AU6	Open forest to woodland of *Eucalyptus melanophloia*, *Eucalyptus populnea* and *Callitris glaucophylla* up to 18 m on alluvial flats. A lower tree layer up to 13 m is present and dominated by *C. glaucophylla* with occurrences of *Acacia excelsa*, *Allocasuarina luehmannii*, *Casuarina cristata*, *Eremophila mitchellii* and *Geijera parviflora*. A very sparse shrub layer was sometimes recorded, dominated by *Acacia excelsa* and *Grevillea striata* with occasional *Carissa ovata*.	LC	48.5/80	

RE (Site) AU	Site Condition	VM Act status	Site condition score	Image
Remnant 11.3.25 (B05, B31) AU7	*Eucalyptus camaldulensis* fringing riparian woodland to open forest to woodland up to 23 m. Other species recorded in the canopy include *Angophora floribunda* and occasional *Acacia harpophylla*, *Eucalyptus populnea*, *Eucalyptus melanophloia* and *Eremophila mitchellii*. A sparse sub-canopy of *Acacia excelsa, Acacia salicina* and eucalypt species is usually present. Similarly, a very sparse shrub layer sometimes occurs and contains *Sida hackettiana*, *Citrus glauca* and *Maireana microphylla.* The ground layer is generally dominated by the exotic grasses *Cenchrus ciliaris** or *Urochloa mosambicensis**, however scattered patches of native grass and forb species do also occur. Native grass species recorded include: *Ancistrachne uncinulata, Themeda avenacea, Bothriochloa bladhii, Enteropogon ramosus* and *Austrostipa verticillata*. Weed species outside of the ground layer were not recorded. Light grazing and some stream bank erosion was evident throughout these areas.	LC	42.75/80	-

RE (Site) AU	Site Condition	VM Act status	Site condition score	Image
Remnant 11.3.27 (B19) AU8	Freshwater wetland fringed by *Eucalyptus tereticornis* with an average height of 19 m. This community was only recorded in one location within the Survey Area (Lot and plan 111MV1566, zone 4). Canopy cover is sparse and dominated by *Eucalyptus tereticornis* but also included other canopy species such as *Acacia oswaldii*, *Acacia salicifolia* and *Geijera parviflora*. No sub-canopy was recorded. A very sparse shrub layer is present comprising *Acacia oswaldii* and *Sida sp.*. Organic litter and bare ground comprised over 80 % of the ground layer cover. Native grass and forb species diversity is moderate (5 and 8 species respectively) despite recorded cover being very low. Although recorded weed cover was low (6%), vegetation was disturbed by cattle grazing and edge effects due to the surrounding cleared pastures.	LC	55/80	
Remnant 11.3.39 (NA) -	*Eucalyptus melanophloia* and/or *E. chloroclada* woodland to open woodland. Other tree species may also occur, including *Angophora floribunda*, *Callitris glaucophylla*, *E. populnea*, *E. tereticornis* and Eucalypt hybrids. Shrub layers are not usually present in this association. The ground layer is dominated by perennial grasses, and is moderately dense to dense. This community occurs as a single patch within the north west Survey Area (zone 2, lot and plan 51WV1292). Due to the highly modified landscape surrounding, edge effects and grazing impacts were noted.	LC	-	-

RE (Site) AU	Site Condition	VM Act status	Site condition score	Image
Remnant 11.5.1 (B25) AU9	*Eucalyptus crebra* open woodland to 15 m on high plateaus. Occasional *Eucalyptus melanophloia* also occur in the canopy. The sub-canopy is dominated by *Callitris glaucophylla* up to 7 m. A very sparse shrub layer is also present, comprised of scattered *Sida corrugata*, *Hibiscus sturtii*, *Brachychiton rupestris*, *Eremophila mitchellii* in addition to regrowth canopy species. The ground layer is sparse and dominated by a variety of native grasses and forbs. Recorded native grass species included *Eragrostis lacunaria*, *Aristida sp. poss. jerichoensis*, *Aristida personata*, *Cymbopogon refractus*, *Sporobolus actinocladus* and *Enneapogon robustissimus*. Some areas of this community had notable weed incursion as well as moderate levels of grazing, erosion and historical thinning.	LC	66.5/80	
Remnant 11.8.x (B08, B10) AU10	*Acacia harpophylla* woodland to open forest up to 15 m. This community is restricted to the far western extent of the Survey Area on the hillslopes and plateaus, and due to the underlying basalt geology (land zone 8) is not analogous to an RE described in the REDD. A sub-canopy is present and comprises *Casuarina cristata*, *Geijera parviflora*, *Planchonella pubescens*, *Atalaya salicifolia* and *Ehretia membranifolia.* In some locations, patches also contained SEVT tree species such as *Alstonia constricta*, *Brachychiton australis* and *Brachychiton rupestris*. The shrub layer is very spare to sparse and highly variable in composition with up to 17 species recorded. Shrub species include low regrowth canopy species as well as *Capparis anomala*, *Croton phebalioides*, *Planchonella pubescens*, *Pittosporum spinescens*, *Psydrax odorata* and *Rhagodia parabolica*. The ground layer is dominated by leaf litter occasional patches of native grasses including	-	66.75/80	

RE (Site) AU	Site Condition	VM Act status	Site condition score	Image
	Paspalidium caespitosum, Paspalidium sp., Poaceae sp. and *Dinebra decipiens*. Native forb diversity was generally very high (up to 17 species recorded). No weed cover was recorded or signs of disturbance.			
Remnant 11.8.3 (B09, B11) AU11	Semi-evergreen vine thicket on hillslopes with igneous rock substrate. This community is also restricted to the far western extent of the Survey Area on the hillslopes. The canopy is 8 m tall, mid-dense to dense and variable in composition with up to 26 tree species recorded. Commonly recorded canopy species include *Acacia fasciculifera*, *Atalaya salicifolia*, *Brachychiton australis*, *Brachychiton rupestris*, *Geijera parvifolia*, *Ficus rubiginosa* and *Planchonella sp.*. The emergent layer is very sparse to sparse and primarily comprises *Brachychiton sp.* and *F. rubiginosa* up to 16.5 m. A sparse shrub layer is also present and highly diverse, including juvenile canopy species as well as occasional *Acalypha eremorum*, *Croton phebalioides*, *Diospyros humilis*, *Hovea longipes*, *Senna sophera subsp. 40 Mile Scrub*, *Turraea pubescens*, *Psydrax odorata*, *Phyllanthus gunnii*, *Teucrium juncea* and *Triflorensia ixoroides*. The ground layer is dominated by leaf litter or rocks, with very rare occurrences of native grasses including *Oplismenus aemulus, Aristida sp.* and *Ancistrachne uncinifolia*. Native forb diversity was generally very high (up to 17 species recorded). At some sites evidence of light grazing and weed invasion were recorded.	OC	49.25/80	

RE (Site) AU	Site Condition	VM Act status	Site condition score	Image
Remnant 11.8.5 (B12) AU12	*Eucalyptus orgadophila* open woodland to 13 m on igneous rocks. A mid-dense sub-canopy is present and primarily comprises of *Acacia harpophylla*, *Casuarina cristata*, *E. orgadophila, Eremophila mitchellii* and *Geijera parviflora*. Other tree species occasionally recorded include *Alectryon diversifolius*, *Atalaya salicifolia*, *Brachychiton rupestris*, *Exocarpos latifolius*, *Diospyros humilis*, *Notelaea microcarpa*, *Planchonella pubescens*, *Pittosporum spinescens* and *Psydrax johnsonii*. The shrub layer is sparse and includes regrowth canopy species as well as *Carissa ovata*, *Cassinia laevis*, *Jasminum didymum* and *Capparis anomala*. The ground layer dominated by the exotic grass *Cenchrus ciliaris**, however rare occurrences of the native grass *Ancistrachne uncinulata* were also recorded. Evidence of recent grazing was noted.	LC	54.5/80	
HVR 11.9.4 (B15) AU13	Degraded regrowth semi-evergreen vine thicket on upper slopes of fine-grained sedimentary rock. A low mid-dense tree layer up to 8 m with a variable composition. Canopy species recorded include *Eucalyptus populnea*, *Brachychiton rupestris*, *Alectryon oleifolius*, *Ventilago viminalis*, *Citrus glauca*, *Denhamia cunninghamii*, *Geijera parviflora*, *Capparis anomalum*, *Psydrax odorata* and *Ehretia membranifolia*. An emergent layer of *Brachychiton sp.* up to 12 m with very sparse cover is also present. The shrub layer is also sparse and floristically diverse. Recorded shrub species include *Carissa ovata*, *Enchylaena tomentosa*, *Jasminum simplicifolium*, *Hovea longipes*, *Sclerolaena birchii*, *Marsdenia viridiflora*, *Parsonsia eucalyptophylla*, *Salsola australis, Atriplex muelleri* in addition to regrowth canopy species. The exotic grass *Cenchrus ciliaris** dominates the	OC	50.5/80	

RE (Site) AU	Site Condition	VM Act status	Site condition score	Image
	ground layer; other exotic species including *Lycium ferocissimum**, *Opuntia tomentosa** and *Malvastrum americanum** were also recorded. Areas of this community were generally highly disturbed due to grazing and weed incursion.			
Remnant 11.9.5 east (B04, B26) AU14	*Acacia harpophylla* and / or *Casuarina cristata* woodland to open forest up to 15.5 m. Other than non-remnant vegetation, this community is the most commonly recorded within the Survey Area often occurring as small linear windrow patches. The sub canopy is sparse and dominated by *A. harpophylla*, *C. cristata* and *Geijera parviflora* with scattered *Eremophila mitchellii* and *Atalaya hemiglauca* occasionally present. A very sparse, low shrub layer is sometimes present and contains *Carissa ovata*, *Citrus glauca*, *E. mitchellii* and *G. parviflora.* The ground layer was highly variable; some patches were dominated by exotic grasses (notably *Cenchrus ciliaris* and *Urochloa mosambicensis*) while others contained no exotic species in the ground layer at all. Several native grasses were recorded including *Paspalidium caespitosum, Chloris ventricosa, Sporobolus caroli, Enteropogon ramosus* and *Chloris divaricata*. Although scattered, the diversity of native forbs was moderate with up to 10 species recorded including *Abutilon oxycarpum, Enchylaena tomentosa, Brunoniella australis, Jasminum didymum, Maireana microphylla, Ptilotus 'lanatus'*. Vegetation was generally moderately disturbed due to cattle grazing and edge effects sometimes as a result of the relatively thin vegetation width.	E	54.25/80	

RE (Site) AU	Site Condition	VM Act status	Site condition score	Image
HVR 11.9.5 east (B16, B20, B23) AU15	*Acacia harpophylla* and / or *Casuarina cristata* low woodland to 10 m. This community is the most commonly recorded across the Survey Area, often occurring as small linear windrow patches. Other canopy species include *Eucalyptus populnea*, *Eremophila mitchellii, Geijera parviflora* and *Santalum lanceolatum*. The sub canopy is sparse to mid-dense and dominated by *A. harpophylla and E. mitchellii* to 5 m. If present, the shrub layer is very sparse and contains *Enchylaena tomentosa, Sida fibulifera, Geijera parviflora, Capparis lasiantha* and *Maireana decalvans* in addition to regrowth brigalow. The ground layer was often dominated by the exotic grass *Cenchrus ciliaris** with other exotic species also commonly recorded including *Lycium ferocissimum**, *Opuntia tomentosa**, and *Malvastrum Americanum**. However, some sites did record native grass cover comparable with the benchmark as well as a high diversity. Recorded native grass species include *Sporobolus caroli*, *Paspalidium caespitosum*, *Enteropogon acicularis*, *Paspalidium constrictum*, *Chloris truncata*, *Dinebra decipiens*, *Aristida sp. poss. calycina*. The presence of native forbs is variable across the areas of this community; recorded species include *Abutilon oxycarpum, Commelina diffusa, Portulaca filifolia, Centipeda minima, Nyssanthes erecta* and *Evolvulus alsinoides*. Disturbance from grazing, edge effects and drought was often moderate to severe.	E	42.66/80	
HVR 11.9.5a East (NA) -	Low woodland of *Casuarina cristata* up to 10 m with emergent *Eucalyptus populnea* and *Eucalyptus melanophloia*. Mixed softwood scrub species dominate the sparse shrub layer however regrowth *Acacia harpophylla* is also present. The ground layer is variable with bare ground common, but is generally dominated by the exotic *Cenchrus ciliaris**. A high level of disturbance due to edge	E	-	-

RE (Site) AU	Site Condition	VM Act status	Site condition score	Image
	effects and grazing was evident. This community occurs as a single patch within the north western Survey Area (zone 1, lot and plan 6WV435).			
Remnant 11.9.10 (B13, B17, B29) AU16	*Eucalyptus populnea* woodland with a distinct canopy to 17 m in height. A sparse emergent layer dominated by *E. populnea* up to 19 m is also present. *Acacia harpophylla, Casuarina cristata*, *Eremophila mitchellii* and *Geijera parviflora* were also recorded often forming a variable lower tree layer to 11 m. Other species recorded in this layer include regrowth *Atalaya hemiglauca, Citrus glauca, E. populnea* and *Owenia acidula*. A very sparse layer of shrubs is present and generally dominated by *Capparis lasiantha*. Other recorded shrub species include *Olearia canescens*, *Alectryon diversifolium*, *Carissa ovata*, *Acalypha eremorum*, *Croton phebalioides*, *Jasminum didymium* and *Maireana microphylla**. The ground layer is highly variable with some sites recording up to 45% bare ground. Cover is generally sparse and dominated by the exotic grass *Cenchrus ciliaris**. Consequentially, native ground cover is sparse, but the diversity of native grasses and forbs is mostly moderate with up to 7 species recorded respectively. Patches are subject to weed encroachment and edge effects due the relatively thin vegetation width and adjacent grazing pastures. Light grazing was evident throughout these areas.	OC	56.33/80	-
HVR 11.9.10 (B21, B24) AU17	Low open woodland of *Eucalyptus populnea* and *Acacia harpophylla* up to 15 m on undulating rises. A mid-dense sub-canopy up to 7 m is also present and contains *A. harpophylla*, *Brachychiton populneus*, *E. populnea* and *Geijera parviflora*. Other tree species occasionally recorded include *Acacia excelsa*, *Casuarina cristata*, *Eremophila mitchellii*, *Pittosporum angustifolius* and	OC	57.25/80	-

RE (Site) AU	Site Condition	VM Act status	Site condition score	Image
	Santalum lanceolatum. The shrub layer is sparse and diverse but generally dominated by regrowth *Acacia sp.*, *Sida sp.*, *Carissa ovata* and *Jasminum spp.*. The ground layer is highly variable with up to 50% bare ground recorded at some sites and others recording 20% exotic grass cover (*Cenchrus ciliaris**). Other exotic species were also recorded in the ground layer including *Opuntia tomentosa**, *O. stricta** and *Malvastrum americanum**. However, native grass and forb diversity is generally high despite cover being relatively low. Patches of this community are generally heavily disturbed due to repeated thinning events and ongoing grazing.			
Remnant 11.10.9 (B22) AU18	*Callitris glaucophylla* woodland up to 12 m with scattered emergent eucalypts up to 14 m. Recorded eucalypt species include *Eucalyptus melanophloia*, *Eucalyptus chloroclada* and *Corymbia clarksoniana*. A sub-canopy dominated by *Acacia salicina* and *C. glaucophylla* and to 8 m is also present. The shrub layer is very sparse and comprised of *Atalaya hemiglauca*, *Pittosporum angustifolium*, *Solanum spp.* and *Sida spp.*, in addition to regrowth canopy species. The ground layer is sparse and contains a high diversity of native grass and forb species. The exotic grasses *Cenchrus ciliaris** and *Megathyrsus maximus** however often dominate. Light grazing and weed incursion was recorded across all areas of this community.	LC	57.5/80	

RE (Site) AU	Site Condition	VM Act status	Site condition score	Image
Remnant 11.10.11 (B01) AU19	Woodland of *Eucalyptus populnea* and *E. melanophloia* with an average height of 13.5 m. The lower tree layer (6 m) is mid-dense and dominated by *Callitris glaucophylla* and *Eremophila* mitchellii. Regrowth *C. glaucophylla* and *E. mitchellii* form a very sparse shrub layer. The ground layer dominated by the exotic grass *Cenchrus ciliaris**, however rare scattered patches of native grass also occur. Recorded native grass species include *Paspalidium constrictum*, *Aristida sp.*, *Eragrostis sp.*, *Aristida caput-medusae* and *Enteropogon ramosus*. Recent grazing and selective thinning is evident across areas of this community.	LC	59.5/80	
Non remnant (NA) -	Non remnant *Cenchrus ciliaris** pasture and areas of low regrowth *Acacia harpophylla* to 2 - 4 m in very poor condition. The ground layer comprises bare ground or exotic grasses notably *Cenchrus ciliaris**. Evidence of cattle grazing severe in some areas.	Non-remnant	-	-

AECOM

0 0.5 1 KMS

LEGEND

- Survey Area
- Roads and Tracks

Ground-truthed Regional Ecosystem (RE)

- 11.10.9
- 11.3.1
- 11.3.17
- 11.3.18
- 11.3.2
- 11.3.25
- 11.8.3
- 11.8.5
- 11.8.x
- 11.9.10
- 11.9.4
- 11.9.5
- 11.9.5a

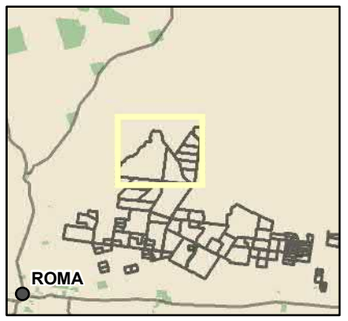
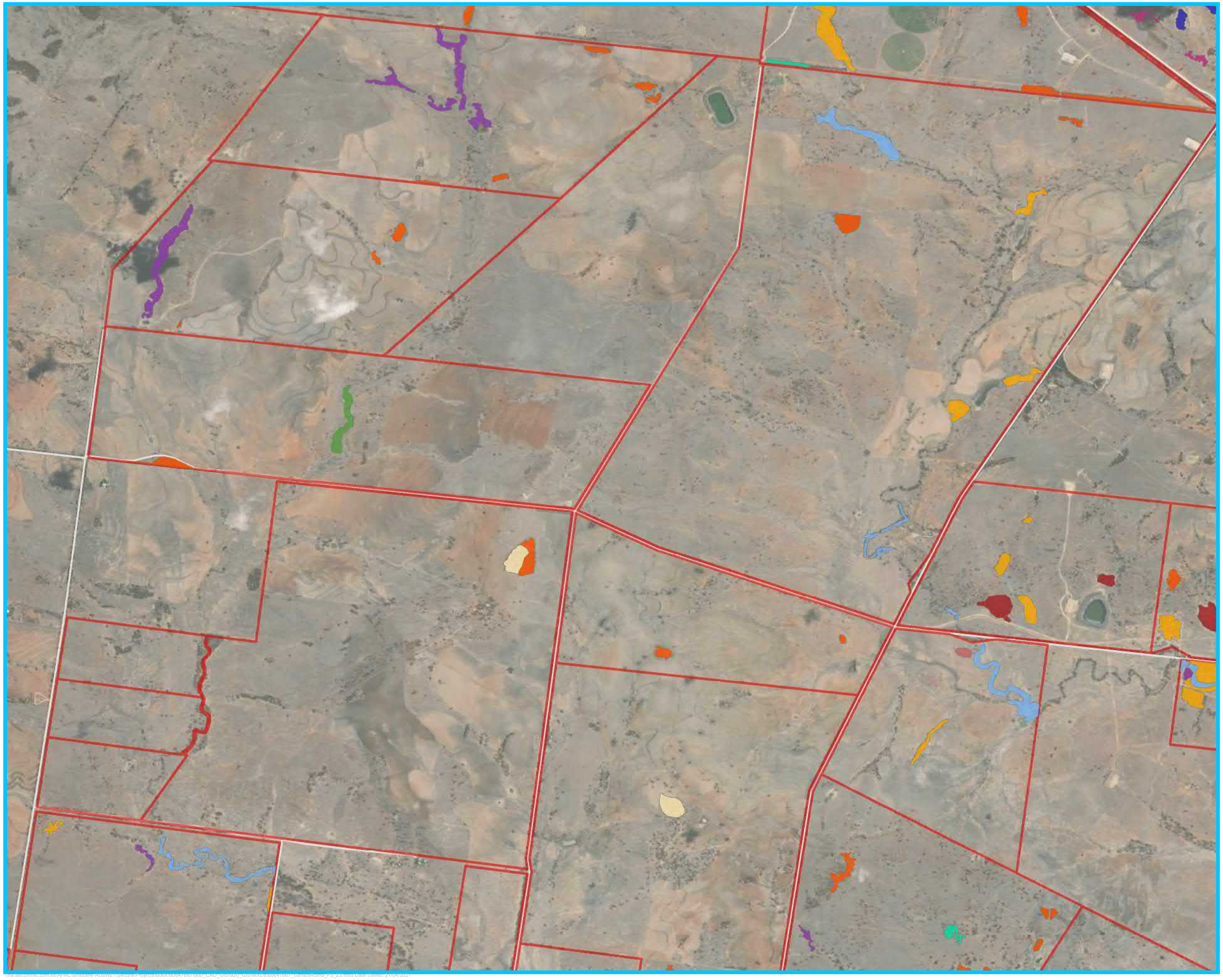
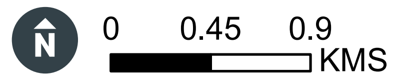


FIGURE 17 - ZONE 1
GROUND-TRUTHED VEGETATION





LEGEND

- Survey Area
- Roads and Tracks

Ground-truthed Regional Ecosystem (RE)

- 11.10.11
- 11.10.9
- 11.3.1
- 11.3.18
- 11.3.2
- 11.3.25
- 11.3.27
- 11.3.39
- 11.9.10
- 11.9.4
- 11.9.5

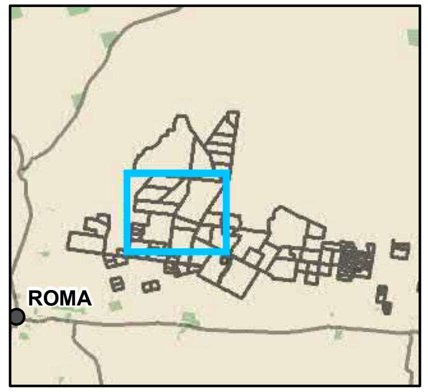


FIGURE 18 - ZONE 2
GROUND-TRUTHED VEGETATION

AECOM

0 0.55 1.1
KMS

LEGEND

- Survey Area
- No Access
- Roads and Tracks

Ground-truthed Regional Ecosystem (RE)

- 11.3.1
- 11.3.2
- 11.3.25
- 11.3.39
- 11.8.x
- 11.9.10
- 11.9.4
- 11.9.5

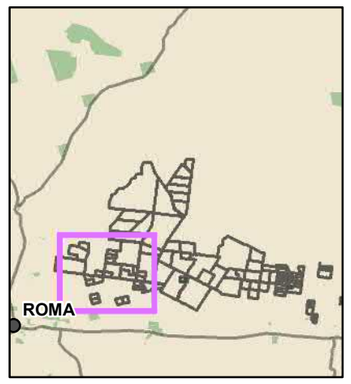


FIGURE 19 - ZONE 3 GROUND-TRUTHED REGIONAL ECOSYSTEM

AECOM

0 0.55 1.1 KMS

LEGEND

- Survey Area
- No Access
- Roads and Tracks

Ground-truthed Regional Ecosystem (RE)

- 11.10.11
- 11.10.9
- 11.3.1
- 11.3.18
- 11.3.2
- 11.3.25
- 11.3.27
- 11.3.2b
- 11.9.10
- 11.9.5

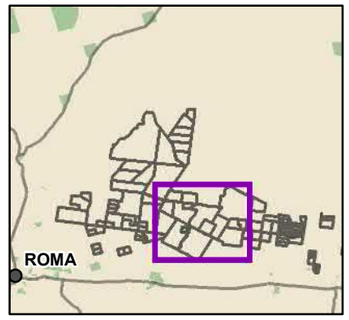


FIGURE 20 - ZONE 4 GROUND-TRUTHED VEGETATION

AECOM

0 0.55 1.1 KMS

LEGEND

- Survey Area
- No Access
- Roads and Tracks

Ground-truthed Regional Ecosystem (RE)

- 11.3.1
- 11.3.2
- 11.3.25
- 11.9.10
- 11.9.5

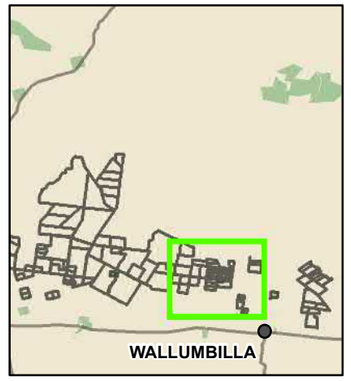
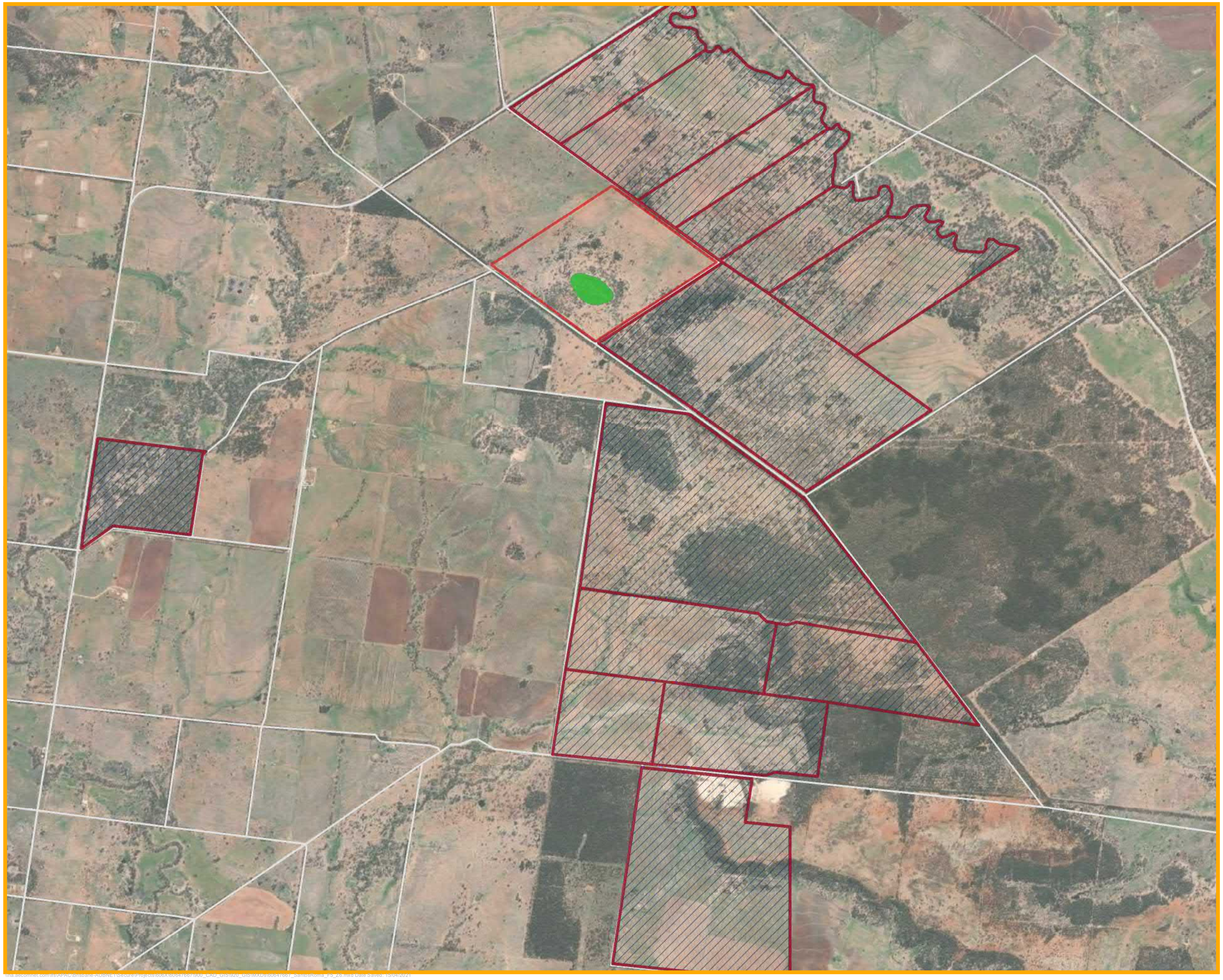


FIGURE 21 - ZONE 5
GROUND-TRUTHED VEGETATION



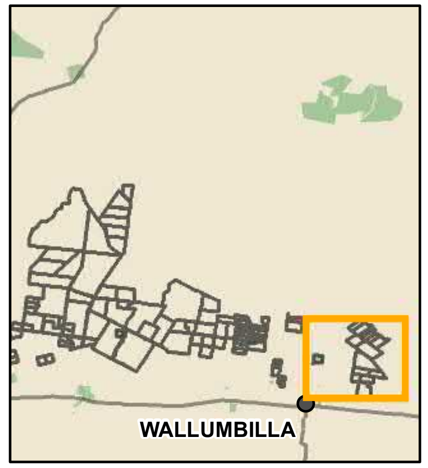


FIGURE 22 - ZONE 6

GROUND-TRUTHED VEGETATION

5.2.5 Threatened Ecological Communities

A review of the PMST report generated for the Survey Area determined that five EPBC Act listed TECs potentially occur within the Survey Area. Of these five communities, REs associated with four are considered present within the Survey Area (Table 8).

Table 8 EPBC listed TECs and associated REs

EPBC Act TEC	EPBC Act status	Analogous REs in BRB	Analogous REs mapped within Survey Area?
Brigalow *(Acacia harpophylla* dominant and co-dominant*)* (Brigalow)	Endangered	11.3.1, 11.4.3, 11.4.7, 11.4.8, 11.4.9, 11.4.10, 11.5.16, 11.9.1, 11.9.5, 11.9.6, 11.11.14, 11.12.21.	Yes: 11.3.1, 11.9.5
Coolibah – Black box woodlands of the Darling Riverine Plains and the Brigalow Belt south bioregions	Endangered	11.3.3, 11.3.15, 11.3.16, 11.3.28, 11.3.37	No
Poplar box grassy woodlands on alluvial plains (Poplar box)	Endangered	11.3.2, 11.3.17, 11.4.7, 11.4.12.	Yes: 11.3.2, 11.3.17
Semi-evergreen vine thickets of the Brigalow Belt (north and south) and Nandewar bioregions (SEVT)	Endangered	11.2.3, 11.3.11, 11.4.1, 11.5.15, 11.8.13, 11.8.3, 11.8.6, 11.9.4, 11.9.8, 11.11.18,	Yes: 11.8.3, 11.9.4
Weeping myall woodlands	Endangered	11.3.2, 11.3.28.	Yes: 11.3.2

5.2.5.1 Brigalow TEC

Within the Survey Area, the assessment of brigalow vegetation communities was completed in accordance with the Conservation Advice (Department of the Environment, 2013) and determination of each patch of vegetation was assessed against key diagnostic criteria and condition thresholds. A total of 243.19 ha of RE 11.3.1, 11.9.5 and 11.9.5a (HVR or remnant) was ground-truthed during the field survey, and of this total area only 53.0 ha was determined to be Brigalow TEC. Patches that were determined to not be TEC were generally either dominated by *Casuarina cristata* in the canopy (diagnostic criteria) or were found to have greater than 50% cover of exotic perennial weeds (namely buffel grass) in the ground layer (condition threshold).

Brigalow TEC within the Survey Area is shown in Figure 23 to Figure 27.

5.2.6 Poplar box TEC

Within the Survey Area, the assessment of poplar box vegetation communities was completed in accordance with the Conservation Advice (Department of the Environment and Energy, 2019) and determination of each patch of vegetation was assessed against key diagnostic criteria and condition thresholds. Due to the excessively dry conditions during surveying, a conservative approach was utilised when assessing native species richness in the ground layer. Where a patch met all other TEC criteria and weed incursion was minimal TEC status was given.

A total of 208.60 ha of RE 11.3.2 (HVR or remnant) was ground-truthed during the field survey, and of this total area 126.91 ha is considered Poplar box TEC. A total of 16.13 ha of RE 11.3.17 was also confirmed within the Survey Area during the field survey, however no areas of this community were found to meet TEC criteria.

Poplar box TEC within the Survey Area is shown in Figure 23 to Figure 27.

5.2.7 SEVT TEC

As described in Section 4.2.2.3, the assessment for SEVT TEC consisted of collecting data to determine RE classification at various sites identified to comprise of semi-evergreen vine thicket species. The SEVT REs 11.8.3 and 11.9.4 (HVR or remnant) were confirmed within low hills in the

western extent of the Survey Area during the field survey. Overall, the total area of SEVT TEC within the Survey Area is 258.40 ha.

SEVT TEC within the Survey Area is shown in Figure 23 to Figure 27.

5.2.8 Weeping myall TEC

Within the Survey Area, the assessment of vegetation patches dominated by weeping myall was completed in accordance with the Weeping Myall woodlands EPBC Act Policy Statement 3.17 (Department of the Environment Water Heritage and the Arts, 2009) and determination of each patch was assessed against key diagnostic criteria and condition thresholds. A total of 208.60 ha of RE 11.3.2 (HVR or remnant) was ground-truthed during the field survey, and of this total area 7.05 ha is considered Weeping myall TEC.

Weeping myall TEC within the Survey Area is shown in Figure 23 to Figure 27.

5.2.9 Threatened flora species

The PMST report and Wildlife Online report (Appendix A) generated for the Survey Area identified seven potentially occurring threatened flora species listed under the EPBC Act or the NC Act (Table 9).

Table 9 Desktop identified threatened flora species

Scientific name	Common name	EPBC Act status	NC Act status
Arthraxon hispidus	Hairy-joint grass	Vulnerable	Vulnerable
Cadellia pentastylis	Ooline	Vulnerable	Vulnerable
Dichanthium setosum	Bluegrass	Vulnerable	Least Concern
Homopholis belsonii	Belson's panic	Vulnerable	Endangered
Picris barbarorum	-	-	Vulnerable
Swainsona murrayana	Slender darling-pea	Vulnerable	Vulnerable
Tylophora linearis	-	Endangered	Endangered

No threatened flora species were recorded during the field survey.

The DNRME Essential Habitat mapping was reviewed as part of the desktop assessment. No areas of Essential Habitat for threatened flora species occur within the Survey Area.

AECOM

0 0.5 1 KMS

LEGEND

- Survey Area
- Roads and Tracks

Ground-truthed Threatened Ecological Community (TEC)

- Brigalow
- Poplar box
- SEVT

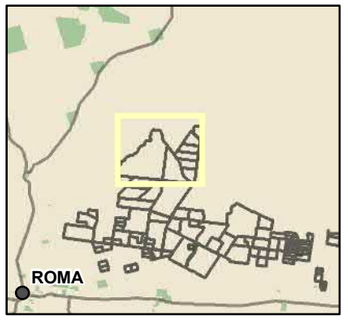


FIGURE 23 - ZONE 1
THREATENED ECOLOGICAL COMMUNITIES

AECOM

0 0.45 0.9
KMS

LEGEND

- Survey Area
- Roads and Tracks

Ground-truthed Threatened Ecological Community (TEC)

- Brigalow
- Poplar box
- SEVT
- Weeping myall

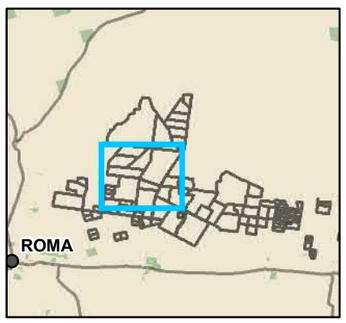


FIGURE 24 - ZONE 2 THREATENED ECOLOGICAL COMMUNITIES

AECOM

0 0.55 1.1 KMS

LEGEND

- Survey Area
- No Access
- Roads and Tracks

Ground-truthed Threatened Ecological Community (TEC)

- Brigalow
- SEVT
- Weeping myall

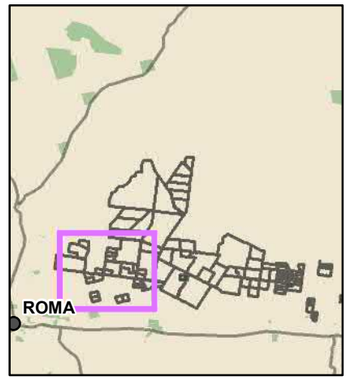
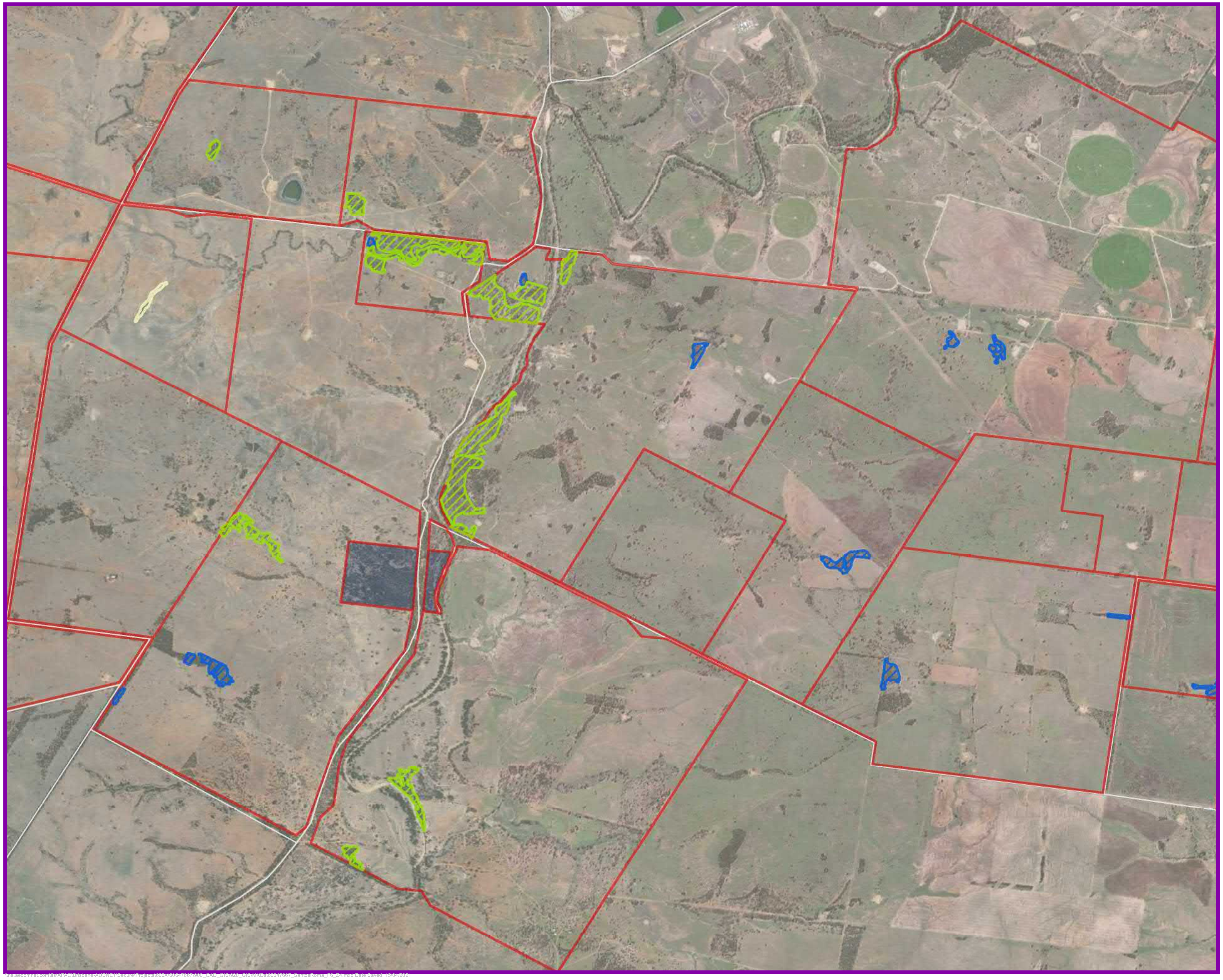


FIGURE 25 - ZONE 3 THREATENED ECOLOGICAL COMMUNITIES



AECOM

LEGEND

- Survey Area
- No Access
- Roads and Tracks

Ground-truthed Threatened Ecological Community (TEC)

- Brigalow
- Poplar box
- Weeping myall

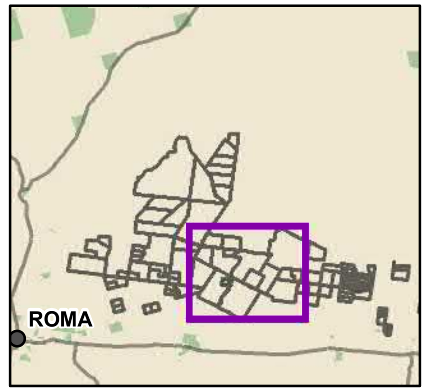


FIGURE 26 - ZONE 4 THREATENED ECOLOGICAL COMMUNITIES

AECOM

0 0.55 1.1 KMS

LEGEND

- Survey Area
- No Access
- Roads and Tracks

Ground-truthed Threatened Ecological Community (TEC)

- Brigalow
- Poplar box

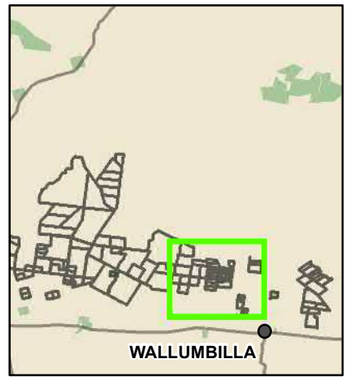


FIGURE 27 - ZONE 5
THREATENED ECOLOGICAL COMMUNITIES

5.3 Fauna

5.3.1 Habitat types

Habitat occurring within the Survey Area can be classified into four distinct habitat types based on the vegetation composition, underlying geology and availability of habitat resources. These are:

- Brigalow community
- SEVT
- Woodland and open forest on alluvial soils
- Woodland and open forest on non-alluvial soils.

Brigalow community

This habitat within the Survey Area largely occurs in small disjunct linear patches along narrow drainage lines, roadsides and property boundaries with underlying geologies including alluvial uplands, fine-grained and medium to coarse-grained sedimentary rocks. It is associated with remnant and regrowth areas of RE 11.3.1, 11.9.5 and 11.9.5a (sites B1, B6, B04, B16, B20, B23 and B28).

This habitat has variable structural complexity. Both the canopy and sub-canopy layers are generally classified as sparse to mid-dense. However, canopy cover is generally greater, ranging from 23.1% to 65% while sub-canopy cover ranged from 0.8% to 33%. A very sparse shrub layer is sometimes present (up to 4.4% cover). The ground layer is generally mid-dense and primarily dominated by buffel grass. However native grass is often present (up to 8 species) and at one location comprised 13% of the ground cover (site B23). Abundance of microhabitat features within the ground layer also varied but was generally lower in the regrowth vegetation with 19.4% leaf litter cover and 8.1 m per ha of coarse woody debris (>0.5m long and >10cm diameter) recorded at site B16. Elsewhere, coarse woody debris was moderate (up to 798 m per ha) and organic litter cover consistent with benchmark values, ranging from 29% to 57%. The soil type is dominated by clay however only very shallow cracking was observed and at most locations erosion due to cattle activity was high. In some locations small to medium stones were present.

The complex ground-layer provides a number of habitat opportunities for common reptile species such as the Bynoe's gecko (*Heteronotia binoei*), dubious dtella (*Gehyra dubia*) and eastern bearded dragon (*Pogona barbata*). The moderate structural complexity and grassy understory provides suitable foraging and nesting habitat for numerous woodland birds and ground-dwelling mammals. A number of shallow drainage lines occur within or adjacent to this habitat, which provide narrow flyways potentially suitable for the foraging and dispersal of microbats. Standing water was not recorded, however this was possibly due to the unseasonable conditions. Unnamed drainage lines are considered to be highly ephemeral but would periodically flow during extended high and extreme rainfall events. During this time aquatic habitat would be provided for a variety of common frog species.

Hollow-bearing trees and stags were primarily only present in areas of RE 11.3.1, often as a result of the presence of *Eucalyptus populnea*. Where hollows were recorded abundance was low and hollows were generally small. Deep furrowing and decorticating bark was present but in low abundance (1-5 trees per ha), however koala food tree species were largely absent with areas of RE 11.3.1 the exception. Although limited sheltering, nesting and breeding habitat for hollow dependent birds and arboreal mammals is available in these areas, habitat is suitable for microbats. Mistletoe was occasionally present although generally in low abundance; this species provides dense foliage suitable for insects, nectar and fruit as well and nesting opportunities for woodland birds.

This habitat type mainly occurs as small disconnected patches in a degraded form due to historical clearing, edge effects from historical clearing in adjacent areas as well as cattle grazing. Due to this and the lack of connectivity, these areas are generally only suitable to highly mobile or common fauna species. The extent and severity of threatening processes is higher in these areas due to the degraded nature and include disturbance, stock grazing and fragmentation.

SEVT

This habitat is primarily found in the hillslopes in the north western extent of the Survey Area, in association with the Grafton Range. It is associated with remnant and HVR areas of RE 11.8.3 and 11.9.4 (sites B09, B11 and B15).

This habitat is characterised by a low (up to 8 m) but highly diverse canopy, with up to 26 tree species recorded (site B09). Recorded canopy cover was predominantly mid-dense, although at one site was dense (75.1%). A sparse sub-canopy to 4 m was often present. The shrub layer is consistently sparse (cover ranging from 5.2% - 6.4%) and also highly diverse, containing up to 13 native species. The ground layer is generally complex, but not to the level usually recorded in SEVT communities with bare ground commonly recorded. A moderate level of native forb diversity was recorded however native grass species were only recorded at one site (analogous to HVR 11.9.4). Organic litter cover varied from 18.8% to 60% and levels of woody debris were very low (up to 269 m per ha recorded). Areas of thick leaf litter and rock piles are expected to be common especially in the lower gullies. The soil type is dominated by clay (basaltic), derived from Cainozoic igneous rocks. The ground was commonly found to have embedded and loose rocks.

The primary habitat feature recorded was occasional to common trees with loose bark; this may be utilised by reptiles such as geckos and roosting microbats. *Eucalyptus populnea* is the only koala food tree that was recorded but was uncommon and limited to areas of HVR 11.9.4. Due to the presence of *E. populnea*, these areas of SEVT habitat also contained rare hollow-bearing trees and fallen logs with hollows. Opportunities for arboreal mammals are considered limited, however ground dwelling mammals may utilise the habitat for refuge and foraging. A variety of bird species are likely to utilise the structurally complex vegetation of this habitat for refuge, and forage on the high diversity of flowering and fruiting plants.

As this habitat occurs primarily as larger connected patches, evidence of disturbance was generally low. Where this habitat occurs as a regrowth community (RE 11.9.4), disturbance due to weeds and grazing was high.

Woodland and open forest on alluvial soils

This habitat occurs along and adjacent to Blyth Creek, Myall Creek, Sleepy Creek and Ferguson Creek as well in association with unnamed watercourses and surrounding alluvial plains. It is associated with remnant and HVR areas of RE 11.3.2, 11.3.17, 11.3.18, 11.3.25 and 11.3.27 (sites B2, B3, B5, B14, B18, B19, B27, B30 & B31).

This habitat is characterised by a tall (up to 23 m) but structurally variable canopy, ranging from 3.4% (site B02) to 56.4% (site B05) cover. The presence of a sub-canopy and shrub layer is not consistent; where it is recorded, the sub-canopy is generally sparse to mid-dense (up to 41.9%) and shrub layer sparse to very sparse. The ground layer was variable in complexity, with areas associated with regrowth vegetation generally having lower abundances of microhabitat features and bare ground common. Elsewhere, this habitat generally had moderate levels of coarse woody debris coverage (up to 448 m per ha) and high leaf litter cover (cover ranging from 29.8% to 58.6%). Native forb and grass diversity are mostly lower than recorded in the relevant benchmark communities, which is likely a result of weeds, which at two sites contributed to 70% of the ground cover. The soil type is alluvial in origin, predominately clay and contains very shallow soil cracks.

Creeks and connecting drainage lines are ephemeral, so were only rarely observed to be holding pools of water (no flow evident). When large rainfall events occur in the area and water availability is greater, these creeks may provide suitable habitat to common aquatic fauna such as amphibians and some macroinvertebrates. These landscape features provide a foraging resource for various types of fauna including microbats, who also use creek lines as flyways. Where habitat is analogous to RE 11.3.27, suitable wet condition may also provide temporary foraging resources to waterbirds.

The canopy is dominated koala food trees including, *Eucalyptus tereticornis, Eucalyptus camaldulensis, Eucalyptus chloroclada, Eucalyptus crebra, Eucalyptus melanophloia* and *Eucalyptus populnea*. A juvenile koala was recorded utilising this habitat type during the field survey (zone 4, lot and plan 77WV975). Occasional trees had decorticating or peeling bark. Almost all sites recorded hollow-bearing trees although abundance was always low (1-5 trees per ha). These habitat features

are especially important as they support hollow-depend birds, some arboreal mammals and microbats, potentially including the conservation significant south-eastern long-eared bat.

Opportunities for birds within this habitat type include some foraging habitat for canopy gleaners and nectar-feeders as well as hollows for species such as parrots and owls. Mistletoe was not recorded. Trees greater than 18 m tall were sometimes present, and may be suitable for the nesting of some raptor species. The grassy ground layer and occasional tree with decorticating bark provides foraging and refuge habitat for bandicoots, macropods and reptiles.

This habitat largely occurs as linear patches which are moderately connected to adjacent patches of vegetation. Connectivity is highest in the southern central Survey Area where habitat is associated with Blyth Creek (site B05). Threatening processes identified in this habitat include historical clearing, weed invasion, pest animal damage and stock grazing. In most areas this habitat type occurs in a degraded form as a result of edge effects from historical clearing in adjacent areas, and ongoing maintenance that is undertaken for property management and cattle grazing purposes.

Woodland and open forest on non-alluvial soils

This habitat occurs on the hillslopes and undulating plains of the Survey Area, with underlying geology including fine-grained and coarse-grained sedimentary as well as cainozoic sand plains and igneous rocks. It is associated with remnant and HVR areas of RE 11.5.1, 11.8.5, 11.9.10, 11.10.9 and 11.10.11 (sites B01, B12, B13, B17, B21, B22, B24, B25 & B29).

This habitat is characterised by a tall (up to 17 m) and mid-dense canopy (ranging from 21.7% to 47.5% cover), except where vegetation is in regrowth form or associated with RE 11.5.1 (cover ranging from 1.6% – 12.5%). This habitat has a sparse to mid-dense sub-canopy (23.4% to 63.3% cover) sub-canopy, and if present a very sparse or sparse shrub layer. The ground layer has a moderate diversity of native grasses and forb species. Due to the presence of exotic grasses however, native grass cover is generally low with site B12 recording 0% cover. Coarse woody debris (up to 600 m per ha) and organic leaf litter (up to 79%) are generally common except in regrowth communities. Fallen logs were also recorded although in low abundance. These understorey features provide refuge and dispersal opportunities for reptiles, as well as foraging opportunities for small mammals.

The canopy of this habitat type is mostly dominated koala food trees including *Eucalyptus orgadophila*, *Eucalyptus populnea*, *Eucalyptus chloroclada* and *Eucalyptus melanophloia*. Hollow-bearing trees and stags were not recorded at all sites and where present abundance varied from 1-5 per ha to 6-20 per ha. Trees that had decorticating or peeling bark were also only occasionally present. These habitat features are especially important as they support hollow-dependent birds, arboreal mammals and microbats, potentially including the conservation significant south-eastern long-eared bat.

Opportunities for birds within this habitat type include foraging habitat for canopy gleaners and nectar-feeders as well as occasional hollows for species such as parrots and owls. Mistletoes were very rarely recorded. The grassy ground layer and occasional tree with decorticating bark provides foraging and refuge habitat for bandicoots, macropods and reptiles.

This habitat generally exhibits poor connectivity, largely occurring as small fragmented patches in the landscape. As a result of the fragmentation and adjacent land uses, habitat is generally moderately disturbed and subject to multiple threatening processes including edge effects, fragmentation, weed invasion, pest animal damage and stock grazing.

5.3.2 Essential Habitat

The DNRME Essential Habitat mapping was reviewed as part of the desktop assessment. Areas of essential habitat for koala are mapped within the eastern Survey Area (Zone 5, lot and plans 168WAL53443, 382WAL53443, 320WAL53440 and 335WAL53460).

The essential habitat factors for the koala and their occurrence within the Survey Area are presented in Table 10. The assessment determines that habitat within the Survey Area does meet the definition of essential habitat for the koala.

Table 10 Essential habitat factors for koala

Habitat Factors	Occurrence within Project site
REs in bioregion 11 outside SEQ (mandatory for this species) 11.2.1, 11.2.5, **11.3.1**, **11.3.2**, 11.3.3, 11.3.4, 11.3.5, 11.3.6, 11.3.7, 11.3.9, 11.3.10, 11.3.12, 11.3.13, 11.3.14, 11.3.15, 11.3.16, **11.3.17**, **11.3.18**, 11.3.19, 11.3.21, 11.3.23, **11.3.25**, 11.3.26, **11.3.27**, 11.3.28, 11.3.29, 11.3.30, 11.3.32, 11.3.33, 11.3.35, 11.3.36, 11.3.37, 11.3.38, 11.3.39, 11.4.2, 11.4.3, 11.4.7, 11.4.8, 11.4.9, 11.4.10, 11.4.12, 11.4.13, **11.5.1**, 11.5.2, 11.5.3, 11.5.4, 11.5.5, 11.5.7, 11.5.8, 11.5.9, 11.5.12, 11.5.13, 11.5.14, 11.5.17, 11.5.18, 11.5.20, 11.5.21, 11.7.1, 11.7.2, 11.7.3, 11.7.4, 11.7.6, 11.7.7, 11.8.1, 11.8.2, 11.8.4, **11.8.5**, 11.8.8, 11.8.11, 11.8.12, 11.8.14, 11.8.15, 11.9.1, 11.9.2, 11.9.3, **11.9.5**, 11.9.6, 11.9.7, 11.9.9, **11.9.10**, 11.9.11, 11.9.13, 11.9.14, 11.10.1, 11.10.2, 11.10.3, 11.10.4, 11.10.5, 11.10.6, 11.10.7, **11.10.9**, **11.10.11**, 11.10.12, 11.10.13, 11.11.1, 11.11.2, 11.11.3, 11.11.4, 11.11.6, 11.11.7, 11.11.8, 11.11.9, 11.11.10, 11.11.11, 11.11.12, 11.11.13, 11.11.14, 11.11.15, 11.11.16, 11.11.17, 11.11.19, 11.11.20, 11.12.1, 11.12.2, 11.12.3, 11.12.5, 11.12.6, 11.12.7, 11.12.8, 11.12.9, 11.12.10, 11.12.13, 11.12.14, 11.12.15, 11.12.16, 11.12.17, 11.12.19, 11.12.20,	**Yes** Twelve mandatory REs (bolded) have been field-validated to occur within the Survey Area: REs 11.3.1, 11.3.2, 11.3.17, 11.3.18, 11.3.25, 11.3.27, 11.5.1, 11.8.5, 11.9.5, 11.9.10, 11.10.9 and 11.10.11.
Vegetation community Open eucalypt forest and woodland that has: a) multiple strata layers containing Eucalyptus, Corymbia, Angophora, Lophostemon or Melaleuca trees that-at 1.3 metres above the ground-have a diameter both greater and less than 30 centimetres; and b) at least 1 of the following species: *Eucalyptus tereticornis, E. fibrosa, E. propinqua; E. umbra, E. grandis, E. microcorys, E. tindaliae, E. resinifera, E. populnea, E. robusta, E. nigra, E. racemosa, E. crebra, E. exserta, E. seeana, Lophostemon confertus, L. suaveolens, Melaleuca quinquenervia*.	**Yes** The Survey Area does contain the identified vegetation communities.
Altitude Sea level to 1000 metres.	**Yes** The Survey Area occurs at elevations 350 – 550 m AHD.
Position in the landscape Riparian areas, plains and hill/escarpment slopes	**Yes** Vegetation communities occur in riparian areas or in low-lying plains.

5.3.3 Threatened fauna species

A review of the 'Predictive Habitat Mapping Rules for MNES and MSES Fauna Species within the Santos GFD Project Gas Fields' (Boobook Ecological Consulting, 2020) was conducted in the desktop assessment to determine the potential occurrence of threatened fauna species within the Survey Area. Species that were reported to be potentially present in the Roma gas field are considered potential occurrences within the Survey Area where potentially suitable REs also occur. This includes three mammals, six birds, six reptiles, one fish and one insect species listed in Table 11 below.

A single koala was recorded during field surveying within RE 11.3.25 on Lot and plan 77WV975.

Habitat for potentially occurring threatened fauna species within the Survey Area has been mapped based on the mapping rules detailed by Boobook Ecological Consulting (2020). Threatened fauna habitat is shown in Figure 28 to Figure 50.

Table 11 Potential threatened fauna species within the Survey Area

Scientific name	Common name	EPBC Act status	NC Act status	Total area of habitat (ha)
Mammals				
Nyctophilus corbeni	South-eastern long-eared bat	Vulnerable	Vulnerable	1, 064,15
Petauroides volans	Greater glider	Vulnerable	Vulnerable	540.01
Phascolarctos cinereus	Koala	Vulnerable	Vulnerable	
Birds				
Botaurus poiciloptilus	Australasia bittern	Endangered	Endangered	3.40
Calidris ferruginea	Curlew sandpiper	Critically Endangered	Critically Endangered	
Calyptorhynchus lathami	Glossy black cockatoo	-	Vulnerable	598.36
Grantiella picta	Painted honeyeater	Vulnerable	Vulnerable	1,064.15
Hirundapus caudacutus	White-throated needletail	Vulnerable	Vulnerable	
Rostratula australis	Australian painted snipe	Endangered	Endangered	0.91
Reptiles				
Aspidites ramsayi	Woma	-	Near Threatened	718.90
Delma torquata	Collared delma	Vulnerable	Vulnerable	736.04
Egernia rugosa	Yakka skink	Vulnerable	Vulnerable	674.47
Furina dunmalli	Dunmall's snake	Vulnerable	Vulnerable	718.90
Hemiaspis damelii	Grey snake	-	Endangered	346.68
Strophurus taenicauda	Golden-tailed gecko	-	Near Threatened	718.90
Fish				
Maccullochella peelii	Murray cod	Vulnerable	-	74.26
Insect				
Jalmenus eubulus	Pale imperial hairstreak butterfly	-	Vulnerable	298.80

AECOM

0 0.5 1 KMS

LEGEND

- Survey Area
- Roads and Tracks

Potential Threatened Fauna Habitat

- Koala & greater glider
- Murray cod

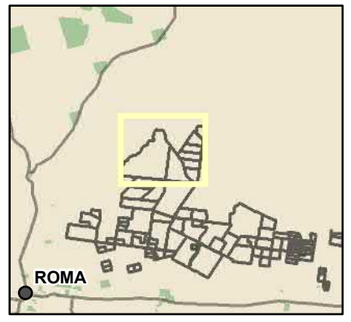


FIGURE 28 - ZONE 1
THREATENED FAUNA HABITAT - ARBOREAL MAMMALS & FISH

AECOM

0 0.45 0.9
KMS

LEGEND

- Survey Area
- Roads and Tracks

Potential Threatened Fauna Habitat

- Koala & greater glider
- Threatened waterbirds
- Murray cod

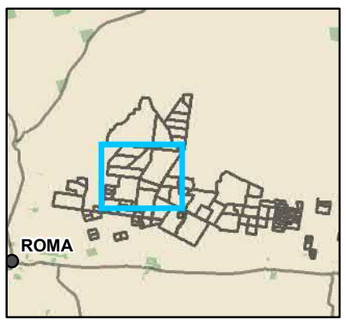
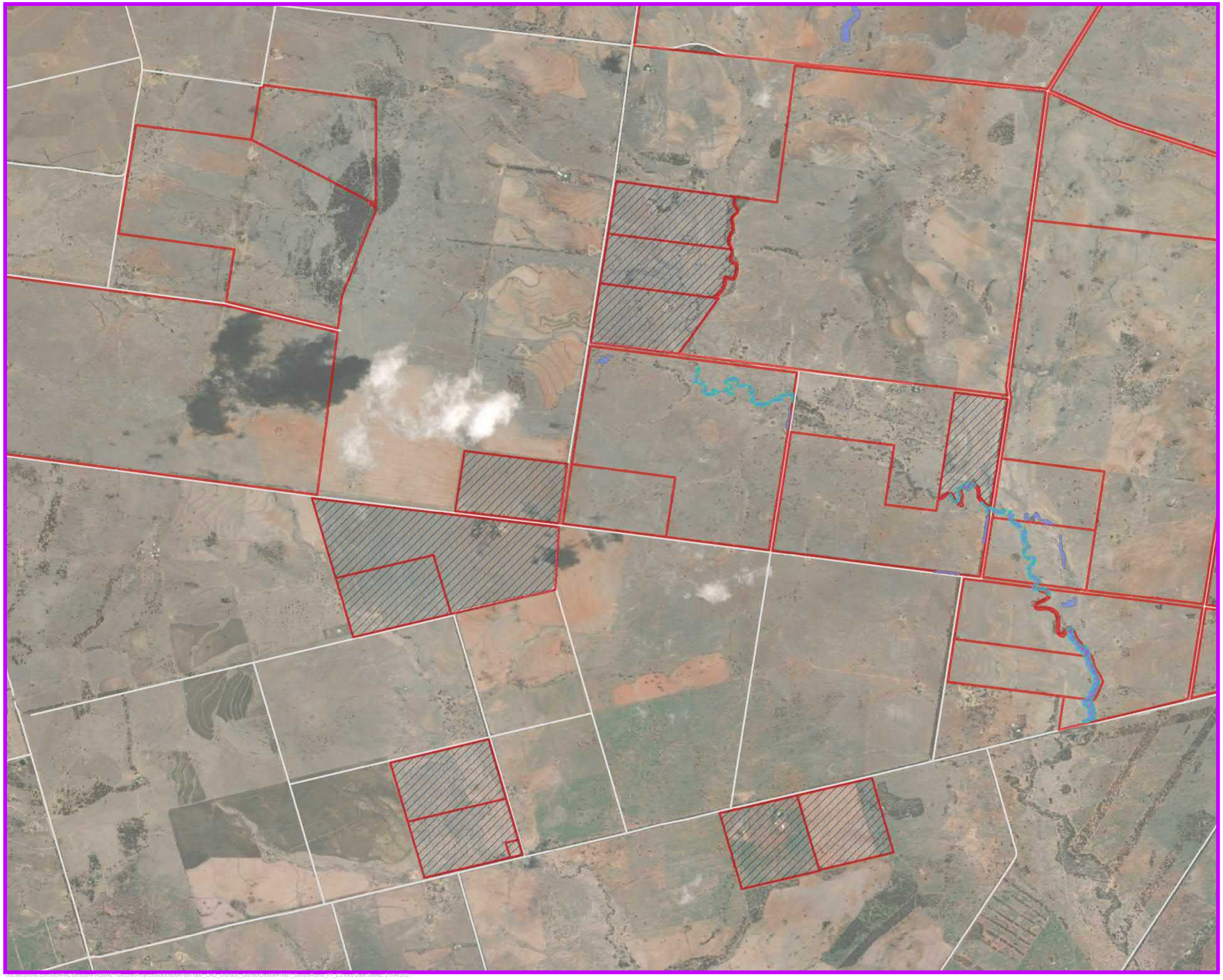
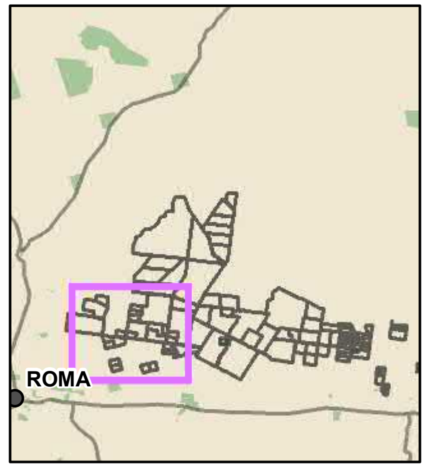


FIGURE 29 - ZONE 2 THREATENED FAUNA HABITAT - ARBOREAL MAMMALS, WATER BIRDS & FISH





AECOM

0 0.55 1.1 KMS

LEGEND

- Survey Area
- No Access
- Roads and Tracks

Potential Threatened Fauna Habitat

- Koala & greater glider
- Murray cod

FIGURE 30 - ZONE 3 THREATENED FAUNA HABITAT - ARBOREAL MAMMALS & FISH

AECOM

0 0.55 1.1
KMS

LEGEND

- Survey Area
- No Access
- Roads and Tracks
- AECOM Record - Koala

Potential Threatened Fauna Habitat

- Koala & greater glider
- Threatened waterbird species
- Murray cod

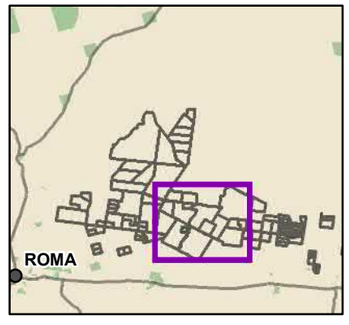
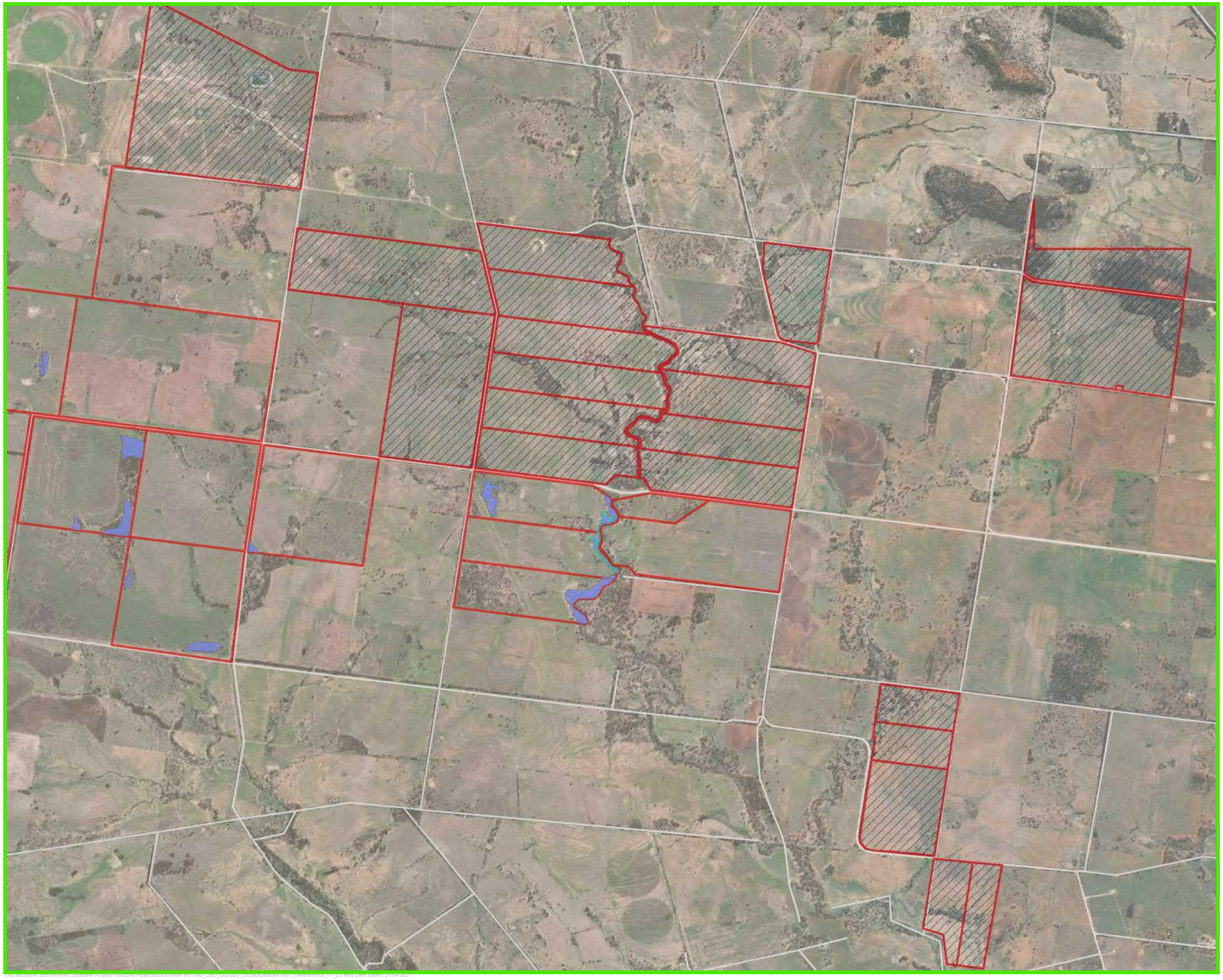


FIGURE 31 - ZONE 4 THREATENED FAUNA HABITAT - ARBOREAL MAMMALS, WATER BIRDS & FISH



LEGEND

- Survey Area
- No Access
- Roads and Tracks

Potential Threatened Fauna Habitat

- Koala & greater glider
- Murray cod

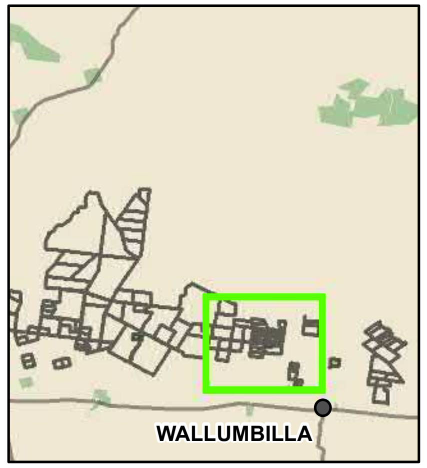
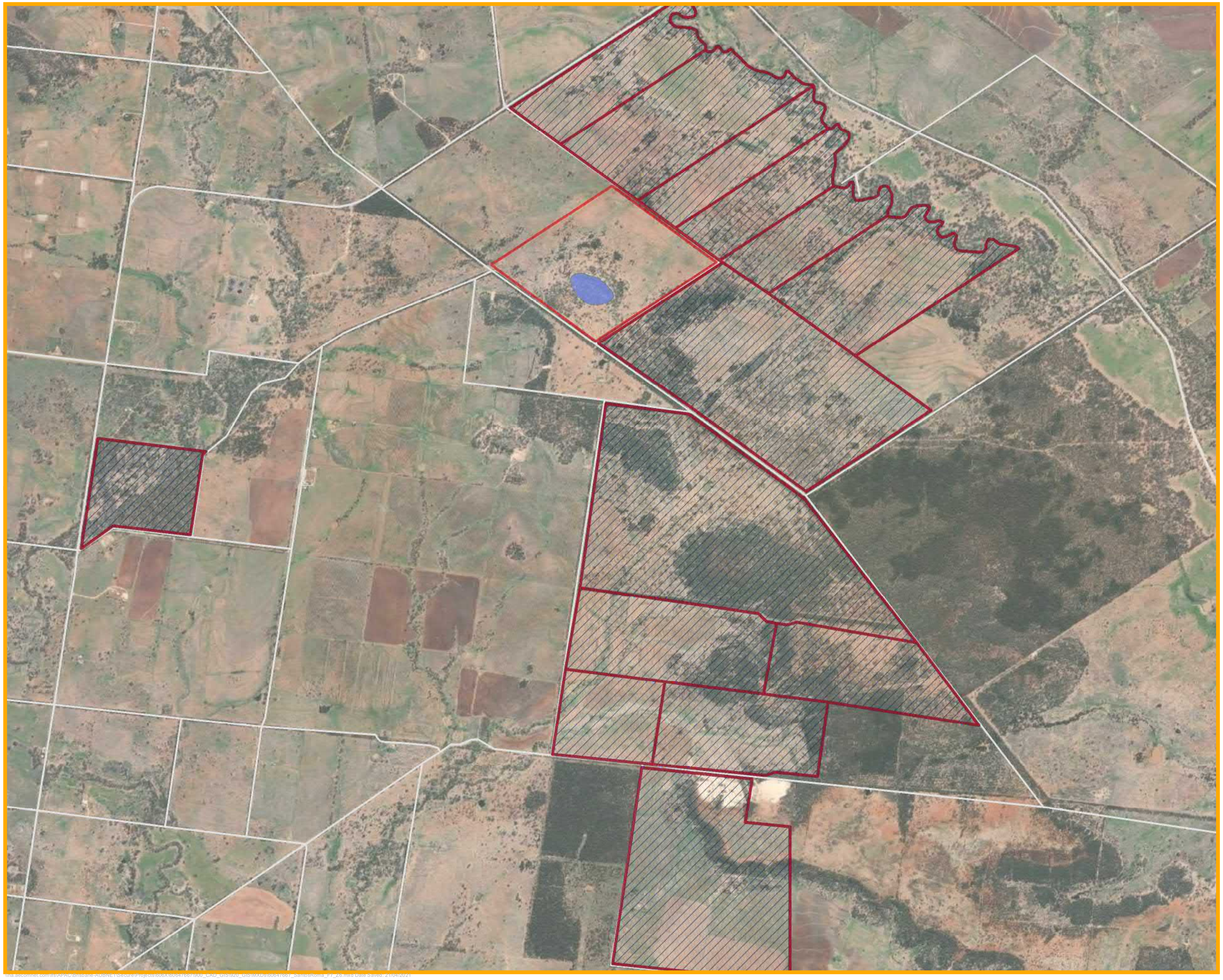


FIGURE 32 - ZONE 5

THREATENED FAUNA HABITAT - ARBOREAL MAMMALS & FISH

AECOM



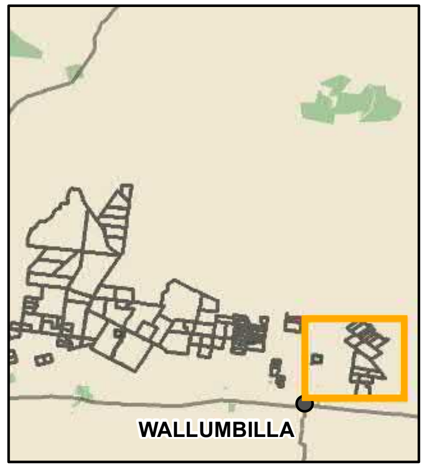
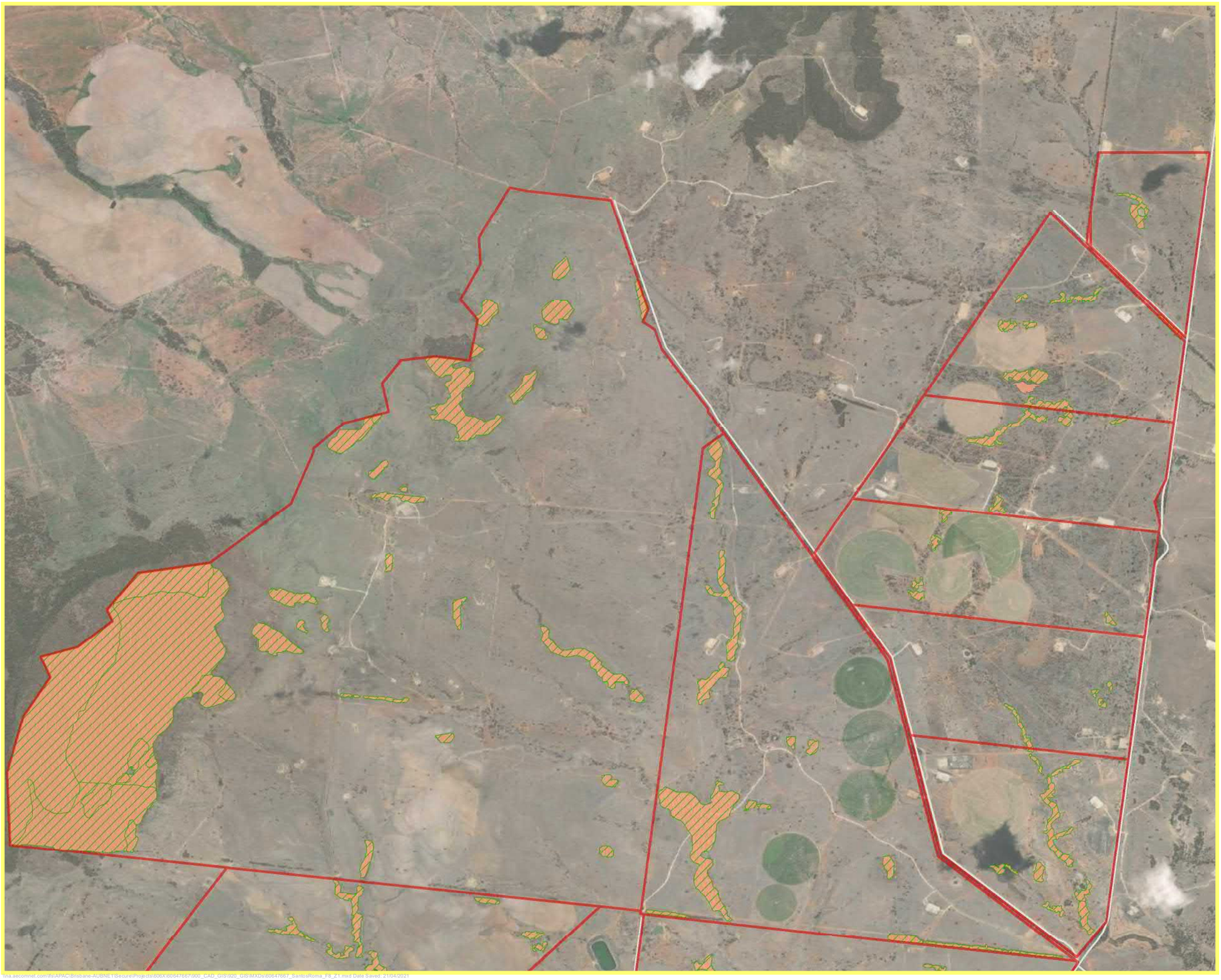


FIGURE 33 - ZONE 6

THREATENED FAUNA HABITAT - ARBOREAL MAMMALS & FISH



AECOM

0 0.5 1 KMS

LEGEND

- Survey Area
- Roads and Tracks

Potential Threatened Fauna Habitat

- South-eastern long-eared bat, white-throated needletail & painted honeyeater
- Glossy black cockatoo

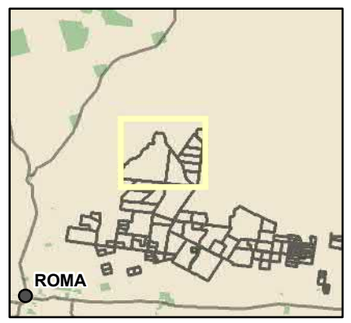


FIGURE 34 - ZONE 1
THREATENED FAUNA HABITAT - BIRDS & BATS

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AECOM

0 0.45 0.9 KMS

LEGEND

- Survey Area
- Roads and Tracks

Potential Threatened Fauna Habitat

- South-eastern long-eared bat, white-throated needletail & painted honeyeater
- Glossy black cockatoo

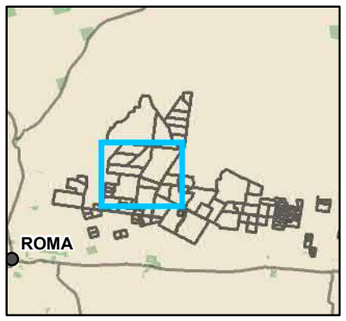
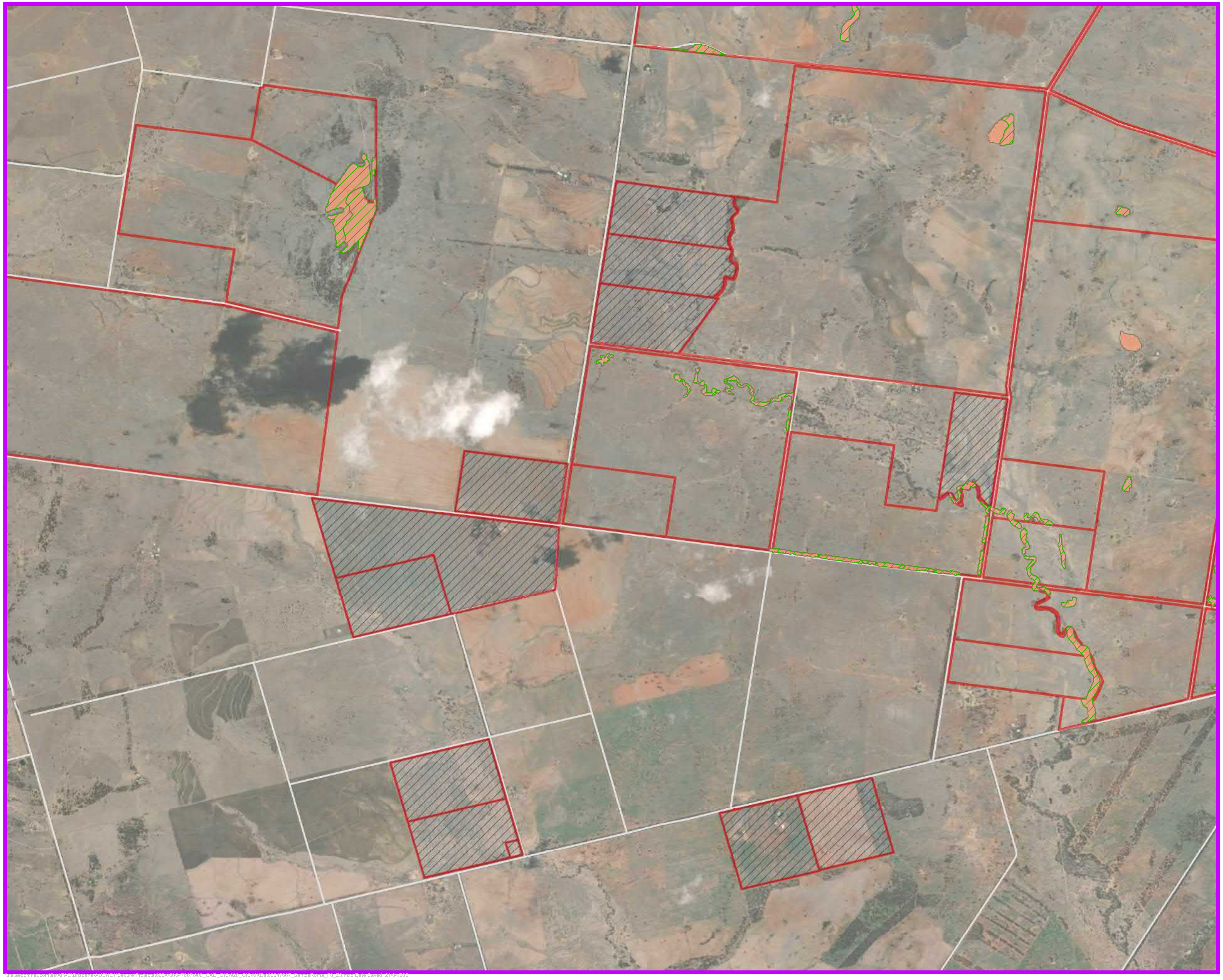
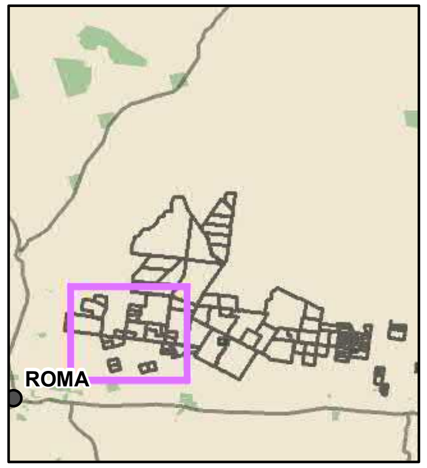


FIGURE 35 - ZONE 2 THREATENED FAUNA HABITAT - BIRDS & BATS





0 0.55 1.1 KMS

LEGEND

- Survey Area
- No Access
- Roads and Tracks

Potential Threatened Fauna Habitat

- South-eastern long-eared bat, white-throated needletail & painted honeyeater
- Glossy black cockatoo

FIGURE 36 - ZONE 3
THREATENED FAUNA HABITAT - BIRDS & BATS

AECOM

0 0.55 1.1 KMS

LEGEND

- Survey Area
- No Access
- Roads and Tracks

Potential Threatened Fauna Habitat

- South-eastern long-eared bat, white-throated needletail & painted honeyeater
- Glossy black cockatoo

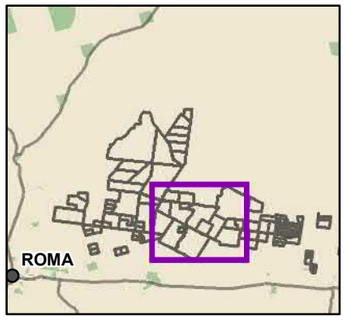
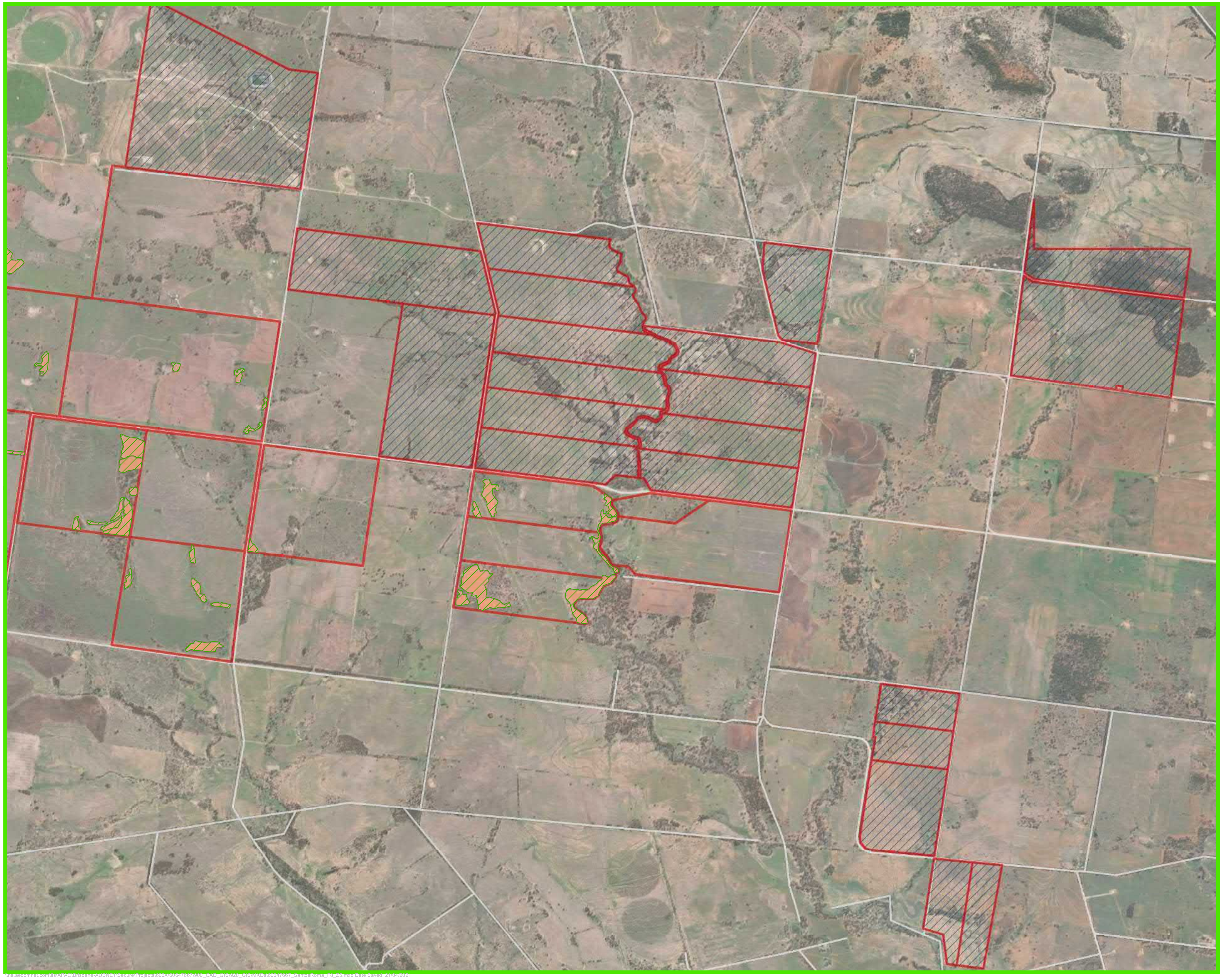


FIGURE 37 - ZONE 4 THREATENED FAUNA HABITAT - BIRDS & BATS



AECOM

0 0.55 1.1 KMS

LEGEND

- Survey Area
- No Access
- Roads and Tracks

Potential Threatened Fauna Habitat

- South-eastern long-eared bat, white-throated needletail & painted honeyeater
- Glossy black cockatoo

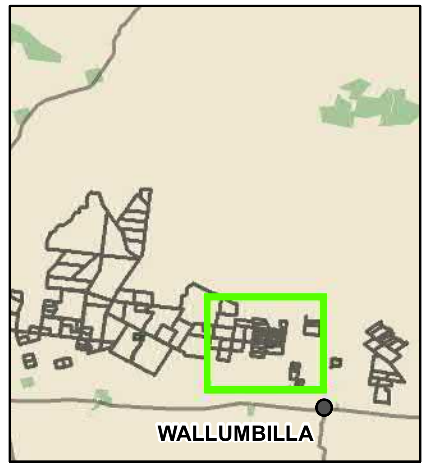
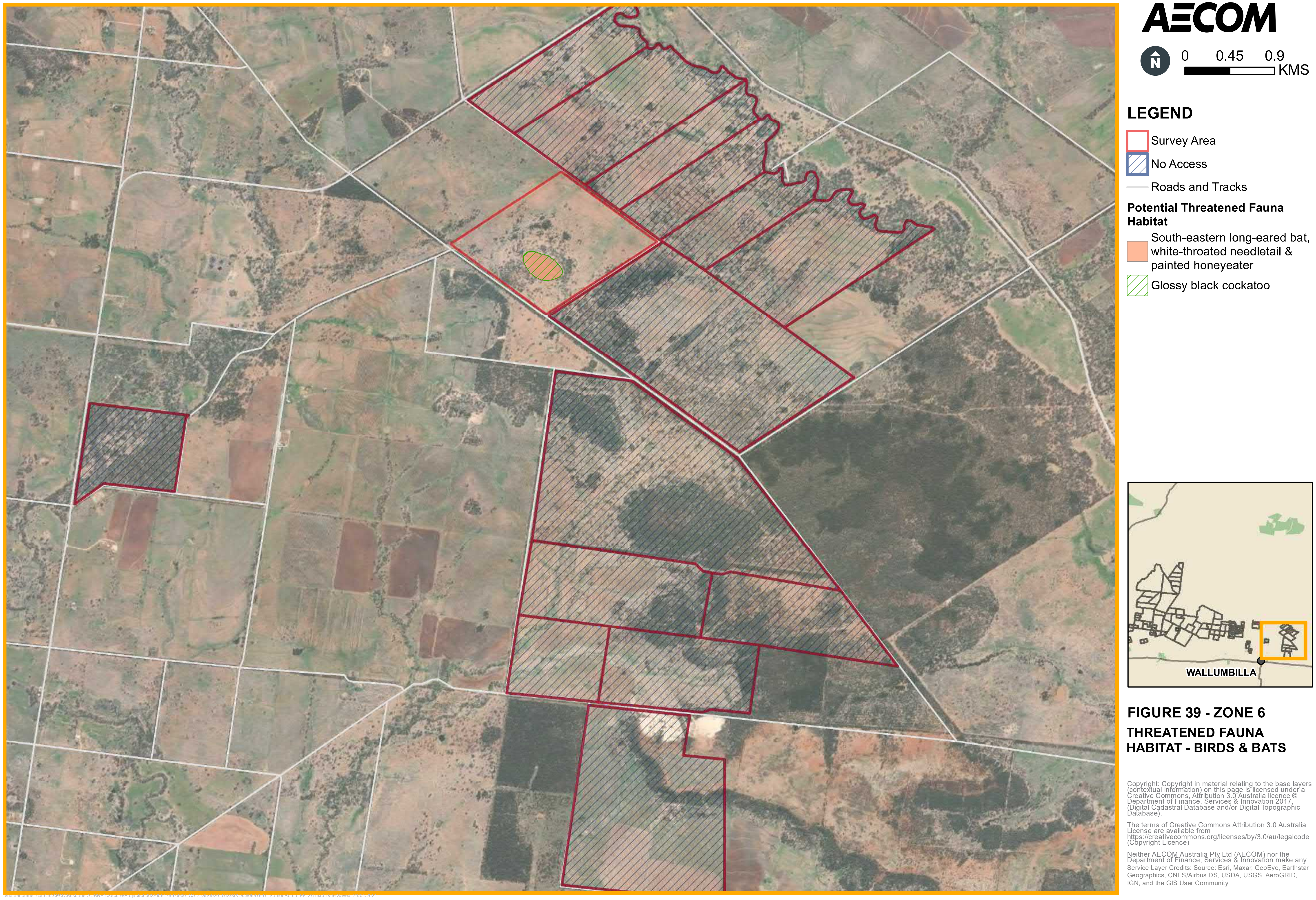


FIGURE 38 - ZONE 5

THREATENED FAUNA HABITAT - BIRDS & BATS



AECOM

LEGEND

- Survey Area
- No Access
- Roads and Tracks

Potential Threatened Fauna Habitat

- South-eastern long-eared bat, white-throated needletail & painted honeyeater
- Glossy black cockatoo

FIGURE 39 - ZONE 6

THREATENED FAUNA HABITAT - BIRDS & BATS

Service Layer Credits: Source: Esri, Maxar, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

AECOM

0 0.5 1 KMS

LEGEND

- Survey Area

Potential Threatened Fauna Habitat

- Yakka skink
- Dunmall's snake, golden-tailed gecko & woma
- Collared delma
- Roads and Tracks

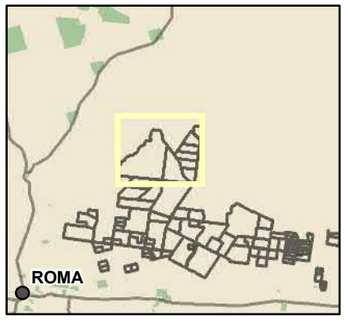


FIGURE 40 - ZONE 1
THREATENED FAUNA HABITAT - REPTILES

AECOM

0 0.45 0.9
KMS

LEGEND

- Survey Area
- Roads and Tracks

Potential Threatened Fauna Habitat

- Yakka skink
- Collared delma
- Dunmall's snake, golden-tailed gecko & woma

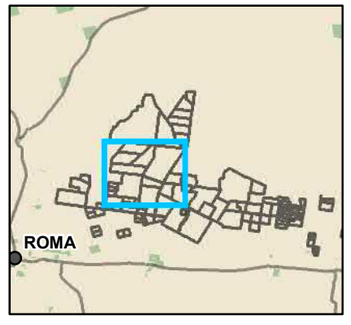


FIGURE 41 - ZONE 2 THREATENED FAUNA HABITAT - REPTILES

AECOM

0 0.55 1.1 KMS

LEGEND

- Survey Area
- No Access
- Roads and Tracks

Potential Threatened Fauna Habitat

- Yakka skink
- Dunmall's snake, golden-tailed gecko & woma
- Collared delma

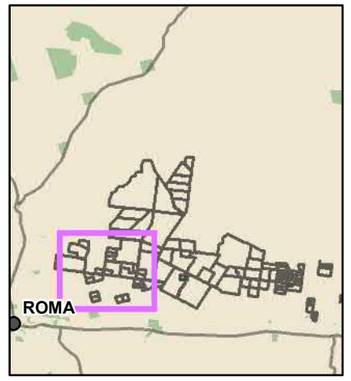


FIGURE 42 - ZONE 3
THREATENED FAUNA HABITAT - REPTILES

AECOM

0 0.55 1.1
KMS

LEGEND

- Survey Area
- No Access
- Roads and Tracks

Potential Threatened Fauna Habitat

- Yakka skink
- Dunmall's snake, golden-tailed gecko & woma
- Collared delma

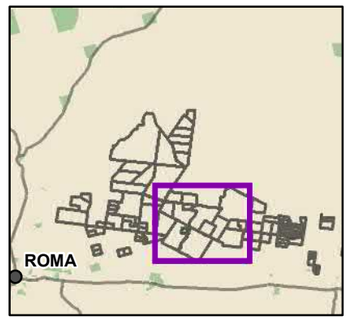
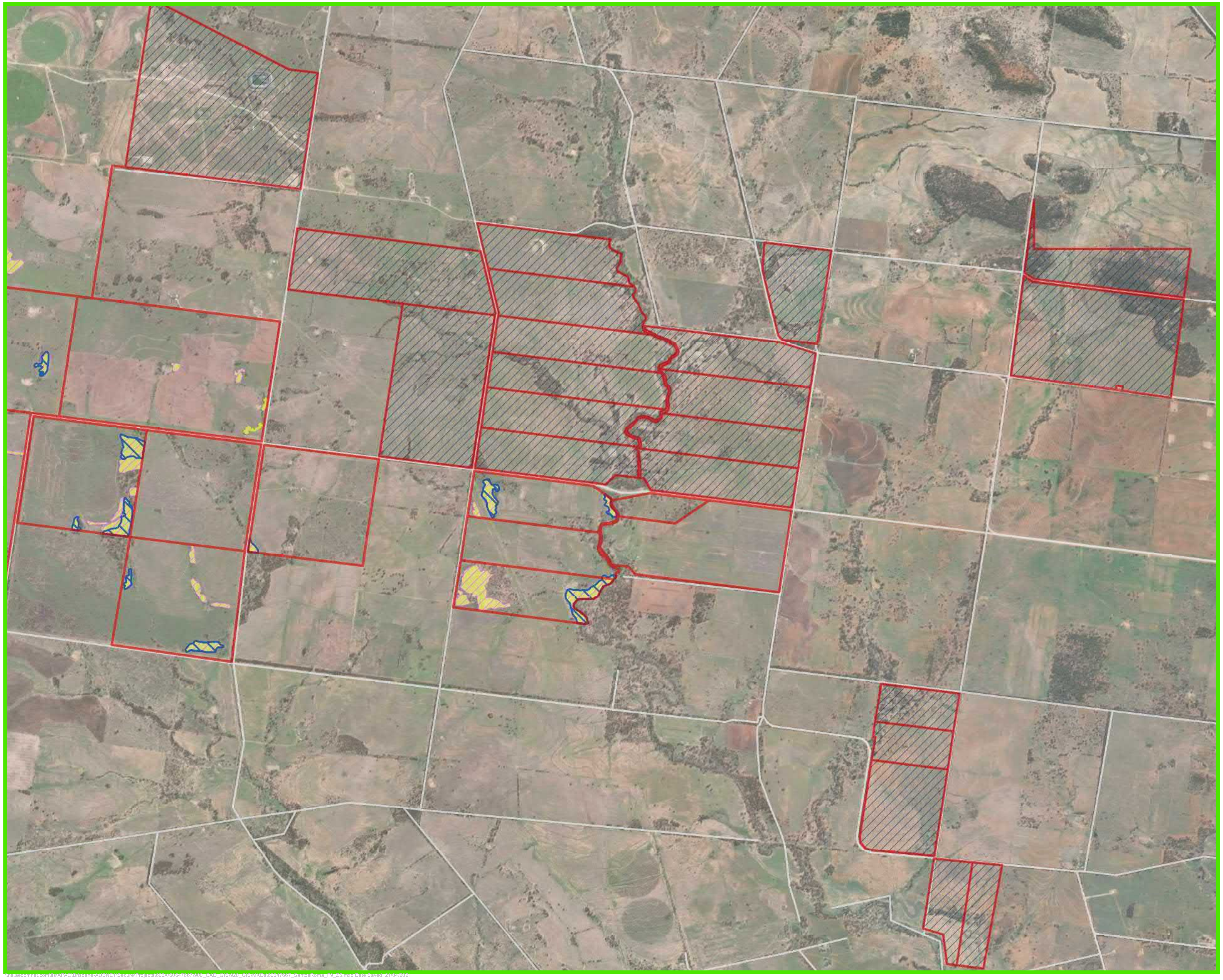


FIGURE 43 - ZONE 4 THREATENED FAUNA HABITAT - REPTILES



AECOM

0 0.55 1.1 KMS

LEGEND

Survey Area
No Access
Roads and Tracks

Potential Threatened Fauna Habitat

Yakka skink
Dunmall's snake, golden-tailed gecko & woma
Collared delma

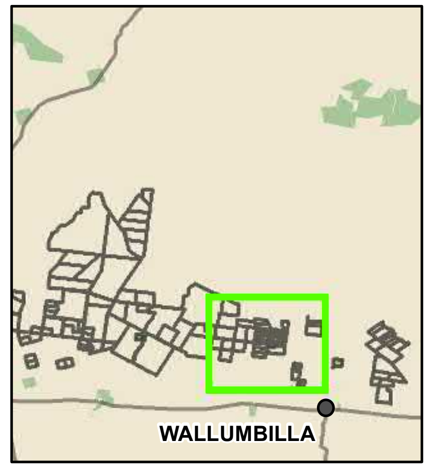
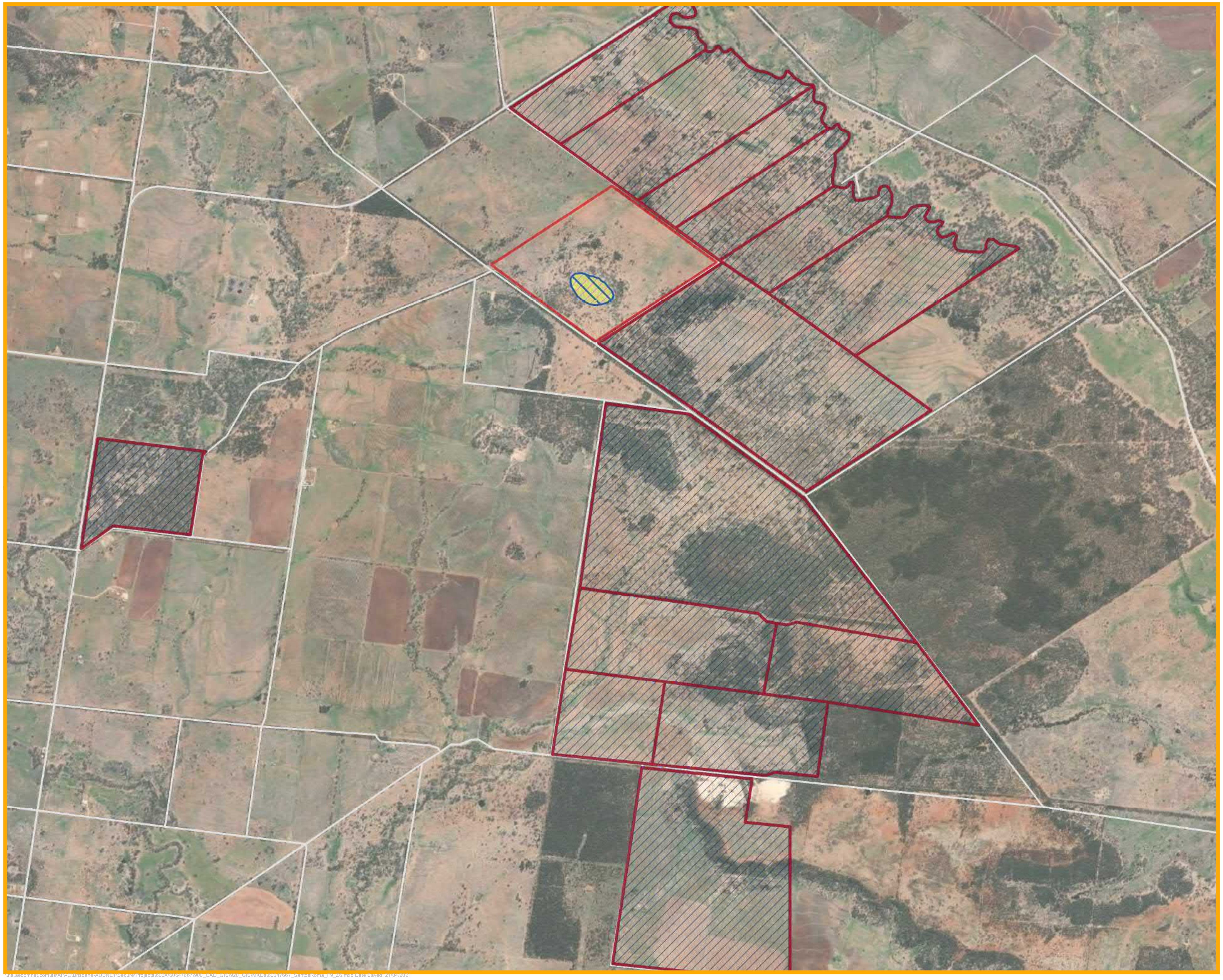


FIGURE 44 - ZONE 5
THREATENED FAUNA HABITAT - REPTILES

\\na.aecomnet.com\lfs\APAC\Brisbane-AUBNE1\Secure\Projects\606X\60647667\900_CAD_GIS\920_GIS\MXDs\60647667_SantosRoma_F9_Z5.mxd Date Saved: 21/04/2021



LEGEND

Survey Area

No Access

Roads and Tracks

Potential Threatened Fauna Habitat

Yakka skink

Dunmall's snake, golden-tailed gecko & woma

Collared delma

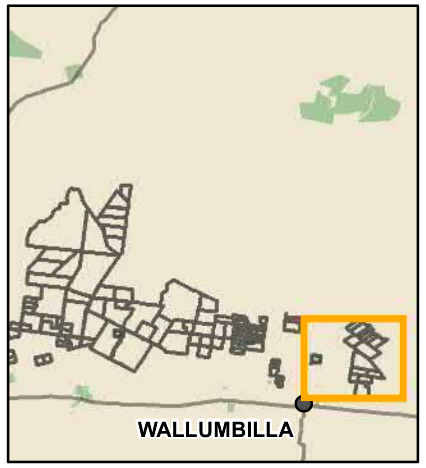


FIGURE 45 - ZONE 6
THREATENED FAUNA HABITAT - REPTILES

AECOM

0 0.5 1 KMS

LEGEND

- Survey Area
- Roads and Tracks

Potential Threatened Fauna Habitat

- Grey snake
- Pale imperial hairstreak butterfly

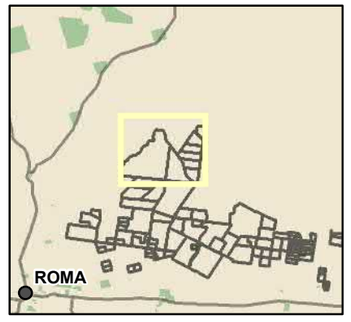
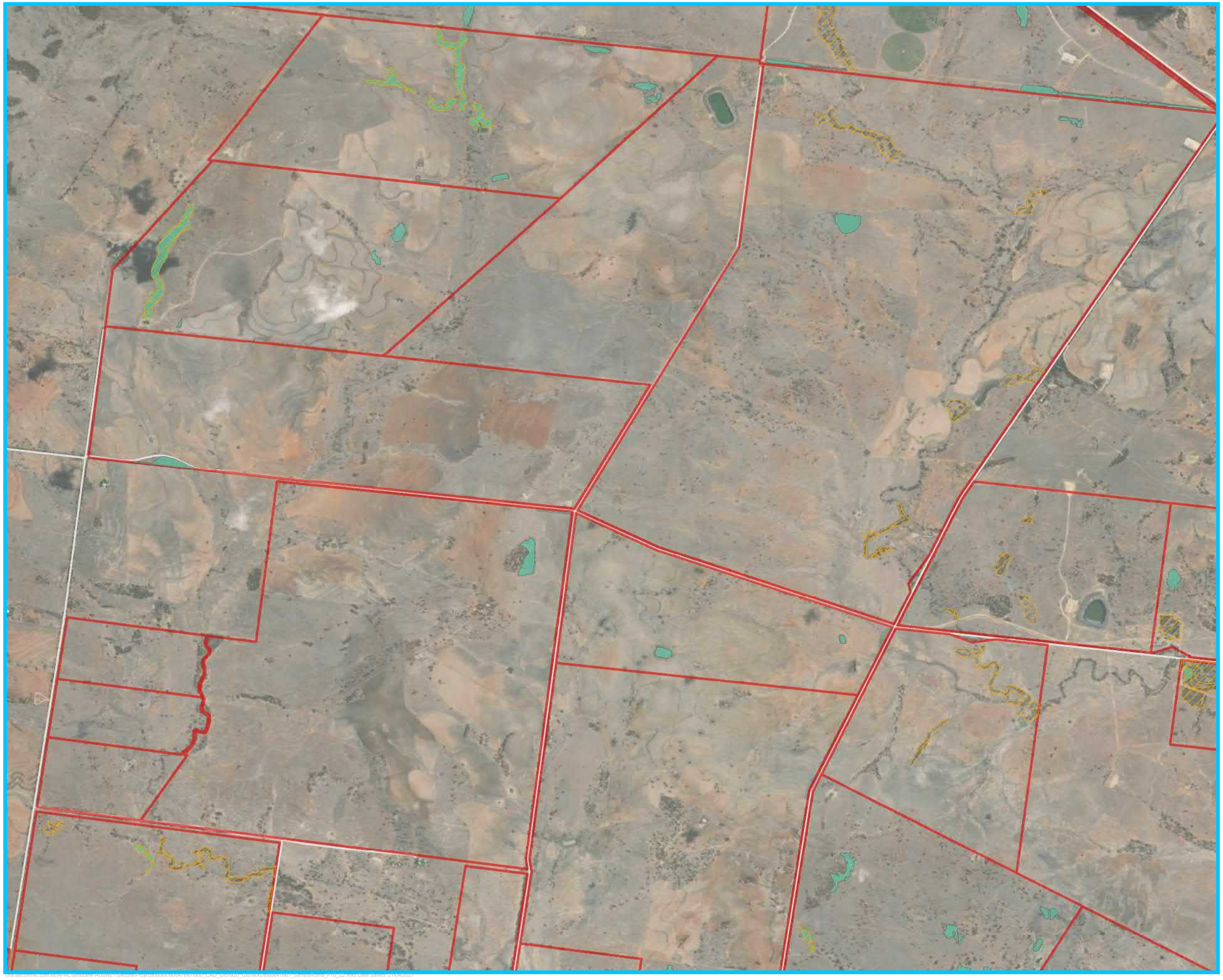


FIGURE 46 - ZONE 1

THREATENED FAUNA HABITAT - GREY SNAKE & PALE IMPERIAL HAIRSTREAK

\\na.aecomnet.com\fs\APAC\Brisbane-AUBNE1\Secure\Projects\606X\60647667\900_CAD_GIS\920_GIS\MXDs\60647667_SantosRoma_F10_Z1.mxd Date Saved: 21/04/2021



LEGEND

- Survey Area
- Roads and Tracks

Potential Threatened Fauna Habitat

- Grey snake
- Pale imperial hairstreak butterfly

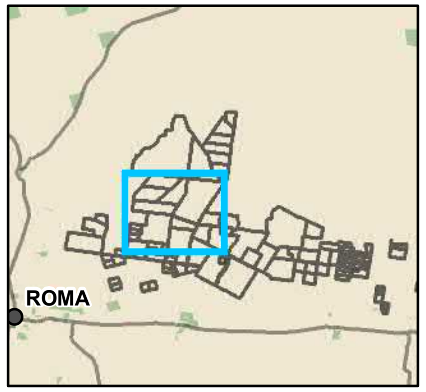


FIGURE 47 - ZONE 2 THREATENED FAUNA HABITAT - GREY SNAKE & PALE IMPERIAL HAIRSTREAK

AECOM

0 0.55 1.1 KMS

LEGEND

- Survey Area
- No Access
- Roads and Tracks

Potential Threatened Fauna Habitat

- Grey snake
- Pale imperial hairstreak butterfly

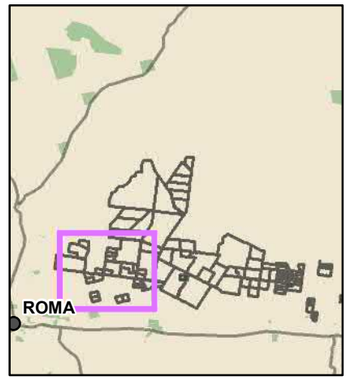


FIGURE 48 - ZONE 3 THREATENED FAUNA HABITAT - GREY SNAKE & PALE IMPERIAL HAIRSTREAK

AECOM

0 0.55 1.1 KMS

LEGEND

- Survey Area
- No Access
- Roads and Tracks

Potential Threatened Fauna Habitat

- Grey snake
- Pale imperial hairstreak butterfly

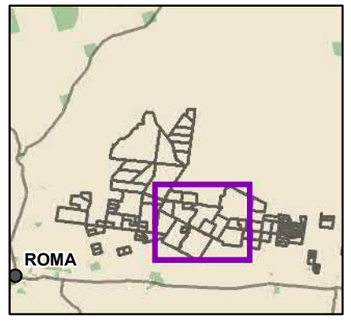
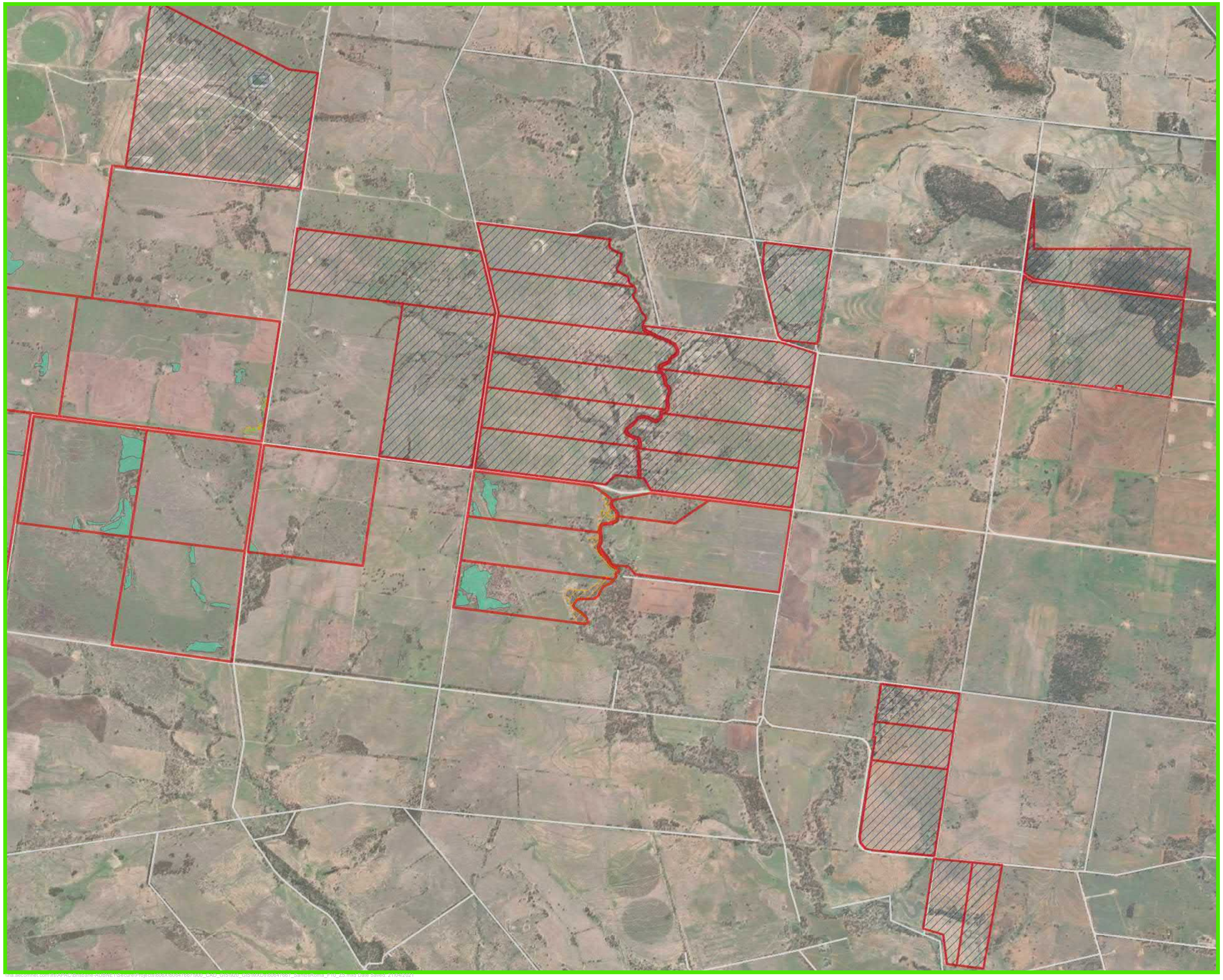


FIGURE 49 - ZONE 4 THREATENED FAUNA HABITAT - GREY SNAKE & PALE IMPERIAL HAIRSTREAK



AECOM

0 0.55 1.1 KMS

LEGEND

Survey Area

No Access

Roads and Tracks

Potential Threatened Fauna Habitat

Grey snake

Pale imperial hairstreak butterfly

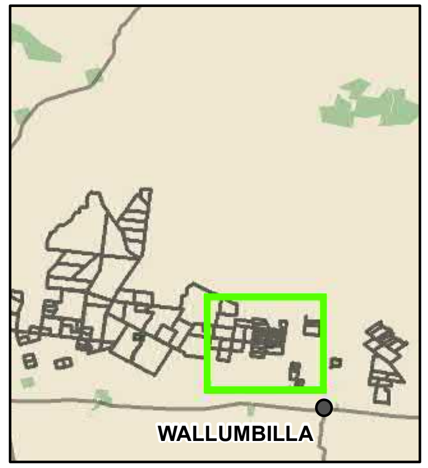


FIGURE 50 - ZONE 5

THREATENED FAUNA HABITAT - GREY SNAKE & PALE IMPERIAL HAIRSTREAK

5.4 Matters of National Environmental Significance

5.4.1 TECs

Four TECs were confirmed within the Survey Area including:

- Brigalow (53.0 ha)
- Poplar box (126.91 ha)
- SEVT (258.40 ha)
- Weeping myall (7.05 ha).

Impacts to areas of TEC may require offsets under the EPBC Act.

5.4.2 Threatened fauna

Including koala which was recorded in the Survey Area during the field survey, a total of twelve species protected under the EPBC Act are potential occurrences within the Survey Area. This includes the following:

- South-eastern long-eared bat (*Nyctophilus corbeni*); Vulnerable
- Koala (*Phascolarctos cinereus*); Vulnerable
- Greater glider (*Petauroides volans*); Vulnerable
- Australasian bittern (*Botaurus poiciloptilus*); Endangered and Migratory
- Curlew sandpiper (*Calidris ferruginea*); Critically Endangered and Migratory
- Painted honeyeater (*Grantiella picta*); Vulnerable
- White-throated needletail (*Hirundapus caudacutus*); Vulnerable, Migratory and exclusively aerial
- Australian painted snipe (*Rostratula australis*); Endangered
- Collared delma (*Delma torquata*); Vulnerable
- Yakka skink (*Egernia rugosa*); Vulnerable
- Dunmall's snake (*Furina dunmalli*); Vulnerable
- Murray cod (*Maccullochella peelii*); Vulnerable

Impacts to areas of potential habitat for these species may require offsets under the EPBC Act.

5.5 Matters of State Environmental Significance

MSES include certain environmental values that are protected under Queensland legislation including:

- NC Act
- *Marine Parks Act 2004*
- *Fisheries Act 1994*
- EP Act
- *Regional Interests Planning Act 2014*
- VM Act
- EO Act.

A summary of MSES values identified within the Survey Area are presented in Table 12.

Table 12 MSES values within the Survey Area

MSES	Description	Present in the Survey Area
Regulated vegetation (Endangered / Of Concern REs)	Regional ecosystems which: • are listed in schedule 1 of the Vegetation Management Regulation 2012 • occur within a Category B area on the regulated vegetation management map • fit the description for the regional ecosystem contained in the Regional Ecosystem Description Database.	**Yes** Regulated vegetation (Endangered and Of Concern REs) as per the MSES description occurs within the Survey Area (346.05 ha).
Regulated vegetation (within the defined distance of a watercourse)	Regional ecosystems which: • occur within a Category B area on the regulated vegetation management map; and • intersect or occur within a wetland area as identified on the vegetation management wetlands map. • are located within the defined distance from the defining banks of a relevant watercourse or relevant drainage feature (being those that are identified on the vegetation management watercourse and drainage feature map).	**Yes** Regulated vegetation (intersecting a watercourse) as per the MSES description occurs within the Project Area (62.36 ha).
Regulated Vegetation (within a Vegetation Management Wetland Area)	Regional ecosystems which: • are mapped as a Category B area on the regulated vegetation management map; and • identified as a wetland on the vegetation management wetlands map.	**No** No wetlands as per the MSES description are mapped in the Survey Area.
Wetland and Watercourses	Means an area shown as a wetland: • in a wetland protection area; or • of high ecological significance on the Map of Referrable Wetlands • or watercourse in high ecological value waters (as defined under the Environmental Protection (Water) Policy 2009, schedule 2.	**No** No wetland or watercourse protection areas occur within the Survey Area.

MSES	Description	Present in the Survey Area
Connectivity areas	Areas which consist of vegetation mapped as prescribed regional ecosystem that: • are of sufficient size or configured in a way that maintains ecosystem functioning; and • will remain despite a threatening process within the meaning of the NC Act.	**Yes** Connectivity areas occur within the Project Area as per the MSES description.
Protected wildlife habitat	Protected wildlife habitat includes: • an area of Essential Habitat on the Essential Habitat map for an animal or plant that is endangered or vulnerable wildlife • a high-risk area on the flora survey trigger map which also contains endangered, vulnerable or near threatened (EVNT) plant species • an area which contains EVNT plants and is not shown on the flora survey trigger map • 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 (non-migratory).	**Yes** Potential habitat for state listed species occurs within the Survey Area, including: One critically endangered, three endangered, ten vulnerable and two near threatened fauna species: • Australasian bittern (*Botaurus poiciloptilus*) • Curlew sandpiper (*Calidris ferruginea*) • Collared delma (*Delma torquata*) • Yakka skink (*Egernia rugosa*) • Dunmall's snake (*Furina dunmalli*) • Woma (*Aspidites ramsayi*) • Painted honeyeater (*Grantiella picta*) • White-throated needletail (*Hirundapus caudacutus*) • Glossy black cockatoo (*Calyptorhynchus lathami*) • Australian painted snipe (*Rostratula australis*) • South-eastern long-eared bat (*Nyctophilus corbeni*) • Greater glider (*Petauroides volans*) • Koala (*Phascolarctos cinereus*) • Golden-tailed gecko (*Strophurus taenicauda*) • Pale imperial hairstreak butterfly (*Jalmenus eubulus*). Essential Habitat is mapped for koala.
Protected areas	This relates to protected areas as declared under the NC Act, including: • National parks • National parks (Aboriginal land) • National parks (Torres Strait Islander land) • National parks (Cape York Peninsula Aboriginal land) • Regional parks • Nature refuges.	**No** No protected areas as per the MSES definition are present within the Survey Area.
Fish Habitat Areas and Highly	An area declared under the *Fisheries Act 1994* to be a fish habitat area.	**No**

MSES	Description	Present in the Survey Area
Protected Zones of State marine parks		No state marine parks or fish habitat areas occur within the Survey Area.
Waterway providing for fish passage	Any part of a waterway providing for passage of fish if the construction, installation or modification of waterway barrier works carried out under an authority will limit the passage of fish along the waterway.	**Yes** Waterways which provide for fish passage are present within the Survey Area. The detailed design of the Project will determine if construction, installation or modification of waterway barrier works within these waterways will limit the passage of fish.
Marine plants	A marine plant within the meaning of the *Fisheries Act 1994.*	**No** Marine plants do not occur within the Survey Area.
Legally secured offset area under State legislation	An offset area approved by the administering authority associated with a legislative or policy requirement for the provision of an offset.	**Yes** Legally secured offset areas (Category A regulated vegetation) occur within the Survey Area.

6.0 Habitat Quality Assessment

6.1 Site-based attributes

Based on the vegetation communities encountered a total of nineteen AUs were assessed as per the Guide to determining terrestrial habitat guideline. Table 13 below displays the results of site-based attribute scoring for each AU, while Appendix C displays the raw data used to derive the site-based attribute scores.

Relative to the appropriate benchmarks, vegetation communities within the Survey Area were generally found to be in moderate condition. Communities generally had lower native species diversity, weed incursion which resulted in low levels of native grass cover and reduced microhabitat features as a result of ongoing disturbance from cattle grazing. Regrowth vegetation communities generally scored lower than remnant communities.

Table 13 Site-based attribute scores for AUs within the Survey Area

RE	AU	Number of sites	Average site condition score (maximum 80)
11.3.1	1	2	46.5
11.3.2	2	2	59.5
11.3.2 (HVR)	3	1	38.5
11.3.17	4	1	46.5
11.3.17 (HVR)	5	1	33
11.3.18	6	2	48.5
11.3.25	7	2	42.75
11.3.27	8	1	55
11.5.1	9	1	66.5
11.8.x	10	2	66.75
11.8.3	11	2	47
11.8.5	12	1	54.5
11.9.4 (HVR)	13	1	50.5
11.9.5	14	2	54.25
11.9.5 (HVR)	15	3	42.66
11.9.10	16	3	56.33
11.9.10 (HVR)	17	2	57.25
11.10.9	18	1	57.5
11.10.11	19	1	59.5

6.2 Landscape-scale attributes

The Survey Area lies within a landscape which has been highly modified for agriculture (cattle grazing and irrigated cropping) with CSG activities also present. Historical land use practices have resulted in a largely cleared landscape, with fragmented patches of remnant or regrowth vegetation remaining primarily in association with riparian zones and the Grafton Range in the far west.

Vegetation within the Survey Area was found to have variable but mostly low landscape connectivity and context value. The north western extent (zone 1) followed by the central area of the Survey Area (zone 4) contain the largest areas of vegetation in close proximity to each other and as such these

areas are of higher value contextually. Habitat patches in the north west associated with the Grafton Range have a moderate to high level of connectivity (sites B08 and B10). Riparian habitat (RE 11.3.25) associated with Ferguson Creek and Blyth Creek is also moderately connected (site B05 especially). These creek-line areas also contain large, tall and spreading canopy species (i.e. *Eucalyptus tereticornis* and *Eucalyptus camaldulensis*) providing dispersal opportunities for a diverse array of species including threatened arboreal mammals.

Across the south-western and south-eastern extents of the Survey Area large areas of cleared grazing surround isolated and small habitat fragments generally associated with property boundaries or narrow drainage lines. Of the nineteen AUs, a total of ten had low connectivity and context (a score of zero), including AU3 (HVR 11.3.2), AU4 (RE11.3.17), AU5 (HVR11.3.17), AU8 (RE 11.3.27), AU9 (RE 11.5.1), AU12 (RE11.8.5), AU 13 (HVR 11.9.4), AU 14 (RE 11.9.5), AU 16 (RE11.9.10) and AU 19 (RE11.10.11).

Site context assessment data for each vegetation community is provided in Appendix C.

6.3 Species habitat attributes

A summary of the species habitat attributes score is provided in Table 14 below. The raw species habitat attribute scores for each vegetation community are provided in Appendix B.

Table 14 Species habitat attribute score summary

Species name	Suitable REs within Survey Area	Associated AUs	Average score (100 max)
Mammals			
South-eastern long-eared bat (*Nyctophilus corbeni*)	11.3.1, 11.3.2, 11.3.2b, 11.3.17, 11.3.18, 11.3.25, 11.3.27, 11.3.39, 11.5.1, 11.8.3, 11.8.5, 11.9.4, 11.9.5, 11.9.5a, 11.9.10, 11.10.9 & 11.10.11	All	50
Greater glider (*Petauroides volans*)	11.3.2, 11.3.2b[1], 11.3.17, 11.3.18, 11.3.25, 11.3.27, 11.3.39, 11.5.1, 11.8.5, 11.9.10 & 11.10.11	2, 3, 4, 5, 6, 7, 8, 9, 12, 16, 17 & 19	38
Koala (*Phascolarctos cinereus*)			51
Birds			
Australasian bittern (*Botaurus poiciloptilus*)	11.3.2b, 11.3.27	8	16
Curlew sandpiper (*Calidris ferruginea*)			
Glossy black cockatoo (*Calyptorhynchus lathami*)	11.3.1, 11.3.2, 11.3.2b, 11.3.17, 11.3.18, 11.3.25, 11.3.27, 11.3.39, 11.5.1, 11.8.5, 11.9.10, 11.10.9 & 11.10.11	1, 2, 3, 4, 5, 6, 7, 8, 9, 12, 16, 17, 18 & 19	34
Painted honeyeater (*Grantiella picta*)	11.3.1, 11.3.2, 11.3.2b, 11.3.17, 11.3.18, 11.3.25, 11.3.27, 11.3.39, 11.5.1, 11.8.3, 11.8.5, 11.9.4, 11.9.5, 11.9.5a, 11.9.10, 11.10.9 & 11.10.11	All	31
White-throated needletail (*Hirundapus caudacutus*)	11.3.1, 11.3.2, 11.3.2b, 11.3.17, 11.3.18, 11.3.25, 11.3.27, 11.3.39, 11.5.1, 11.8.3, 11.8.5, 11.9.4, 11.9.5, 11.9.5a, 11.9.10, 11.10.9 & 11.10.11		65
Australian painted snipe	11.3.27	8	16

Species name	Suitable REs within Survey Area	Associated AUs	Average score (100 max)
(*Rostratula australis*)			
Reptiles			
Woma *(Aspidites ramsayi)*	11.3.1, 11.3.2, 11.3.17, 11.3.18, 11.3.39, 11.5.1, 11.8.5, 11.9.5, 11.9.5a, 11.9.10, 11.10.9 & 11.10.11	1, 2, 3, 4, 5	29
Collared delma (*Delma torquate*)	11.3.2, 11.3.17, 11.3.18, 11.3.39, 11.5.1, 11.8.3, 11.8.5, 11.9.10, 11.10.9 & 11.10.11	2, 3, 4, 5, 6, 9, 12, 16, 17, 18 & 19	37
Yakka skink (*Egernia rugosa*)	11.3.2, 11.3.17, 11.3.18, 11.3.39, 11.5.1, 11.8.5, 11.9.5, 11.9.5a, 11.9.10, 11.10.9 & 11.10.11	2, 3, 4, 5, 6, 9, 10, 12, 14, 15, 16, 17, 18 & 19	29
Dunmall's snake (*Furina dunmalli*)	11.3.1, 11.3.2, 11.3.17, 11.3.18, 11.3.39, 11.5.1, 11.8.5, 11.9.5, 11.9.5a, 11.9.10, 11.10.9 & 11.10.11	1, 2, 3, 4, 5, 6, 9, 10, 12, 14, 15, 16, 17, 18 & 19	34
Grey snake (*Hemiaspis damelii*)	11.3.1, 11.3.2, 11.3.2b, 11.3.17, 11.3.25 & 11.3.27	1, 2, 3, 4, 5, 7 & 8	41
Golden-tailed gecko (*Strophurus taenicauda*)	11.3.1, 11.3.2, 11.3.17, 11.3.18, 11.3.39, 11.5.1, 11.8.5, 11.9.5, 11.9.5a, 11.9.10, 11.10.9 & 11.10.11	1, 2, 3, 4, 5, 6, 9, 10, 12, 14, 15, 16, 17, 18 & 19	34
Fish			
Murray cod (*Maccullochella peelii*)	11.3.25	7	1
Insect			
Pale imperial hairstreak butterfly (*Jalmenus eubulus*)	11.3.1, 11.3.17, 11.9.5, 11.9.5a & 11.9.10	1, 4, 5, 10, 14, 15, 16 & 17	44

[1] This RE was not listed for koala in Boobook Ecological Consulting (2020) but was determined to be suitable due to the dominant canopy species.

6.4 Overall habitat quality score

A summary of habitat quality scores for each potential MNES or MSES values in the Survey Area is provided in Table 15 below. Scores could not be weighted as infrastructure placement is yet to be finalised, therefore total scores were averaged across the AUs relevant to the target species.

The predominately aerial white-throated needletail is the only species to receive a habitat quality score of 6; in contrast, the lowest score of 3 is attributed to the Murray cod fish and the three waterbird species (Australasian bittern, curlew sandpiper and Australian painted snipe). A score of 5 is attributed to koala, south-eastern long-eared bat, collared delma and the pale imperial hairstreak butterfly, while habitat quality scores for remaining species are a 4.

Species habitat index scoring per survey site are detailed in Appendix B. Site condition and context scores per survey site and AU are detailed in Appendix C.

Table 15 Impact scores for MNES and MSES values

Environmental value	Average Site condition	Maximum Site Condition	Average Site Context	Maximum Site Context	Average Species Habitat Index	Maximum Habitat Index	Overall habitat quality score
Koala	51.3	**80**	2.6	**26**	51	**100**	**5**
Greater glider					35		**4**
South-eastern long-eared bat	51.9		4.2		50		**5**
Australasian bittern	55		0		16		**3**
Curlew sandpiper							
Glossy black cockatoo	51.6		3.5		34		**4**
Painted honeyeater	51.9		4.2		31		**4**
White-throated needletail					65		**6**
Australian painted snipe	55		0		16		**3**
Collared delma	52.5		2.6		37		**5**
Golden-tailed gecko	52.5		3.8		34		**4**
Yakka skink	52.9		3.6		29		**4**
Woma	44.8		2.9		29		**4**
Dunmall's snake	52.5		3.8		34		**4**
Grey snake	46		3.8		41		**4**
Murray cod	43		12		1		**3**
Pale imperial hairstreak butterfly	50.4		4.1		44		**5**

7.0 Summary and Conclusion

AECOM were engaged by Santos to collect supplementary data on the baseline ecological values and condition of the Survey Area relevant to potentially occurring MNES and MSES values. Field surveys were completed to document condition and extent of vegetation communities, habitat types and other ecological values across the Survey Area in accordance with the Queensland *Guide to Determining Terrestrial Habitat Quality* (Department of Environment and Science, 2020b).

Sixteen remnant and six regrowth vegetation communities were confirmed to occur within the Survey Area during field surveys (refer Table 7). Four TECs were confirmed including Brigalow, Poplar box, SEVT and Weeping myall. Field surveys did not record any threatened flora species. One threatened fauna species (koala) was recorded within RE 11.3.25 on lot and plan 77WV975.

Nineteen assessment units represented by fourteen remnant and five HVR communities were assessed across thirty-one sites. Vegetation condition was variable but typically in average to poor condition, with isolated regrowth areas exhibiting the greatest disturbance (edge effects and grazing). Habitat within the Survey Area was classified into four distinct habitat types based on the vegetation composition, underlying geology and availability of habitat resources:

- Brigalow community; associated with remnant and regrowth areas of RE 11.3.1, 11.9.5 and 11.9.5a (sites B1, B6, B04, B16, B20, B23 and B28)
- SEVT; associated with remnant and HVR areas of RE 11.8.3 and 11.9.4 (sites B09, B11 and B15).
- Woodland and open forest on alluvial soils; associated with remnant and HVR areas of RE 11.3.2, 11.3.17, 11.3.18, 11.3.25 and 11.3.27 (sites B2, B3, B5, B14, B18, B19, B27, B30 & B31).
- Woodland and open forest on non-alluvial soils; associated with remnant and HVR areas of RE 11.5.1, 11.8.5, 11.9.10, 11.10.9 and 11.10.11 (sites B01, B12, B13, B17, B21, B22, B24, B25 & B29).

Habitat quality scores for each potentially occurring MNES or MSES value in the Survey Area were determined (Table 15). Scores could not be weighted as infrastructure placement is yet to be finalised, therefore total scores were averaged across the AUs relevant to the target species.

8.0 References

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Appendix A

Desktop Assessment

Australian Government

Department of Agriculture, Water and the Environment

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.

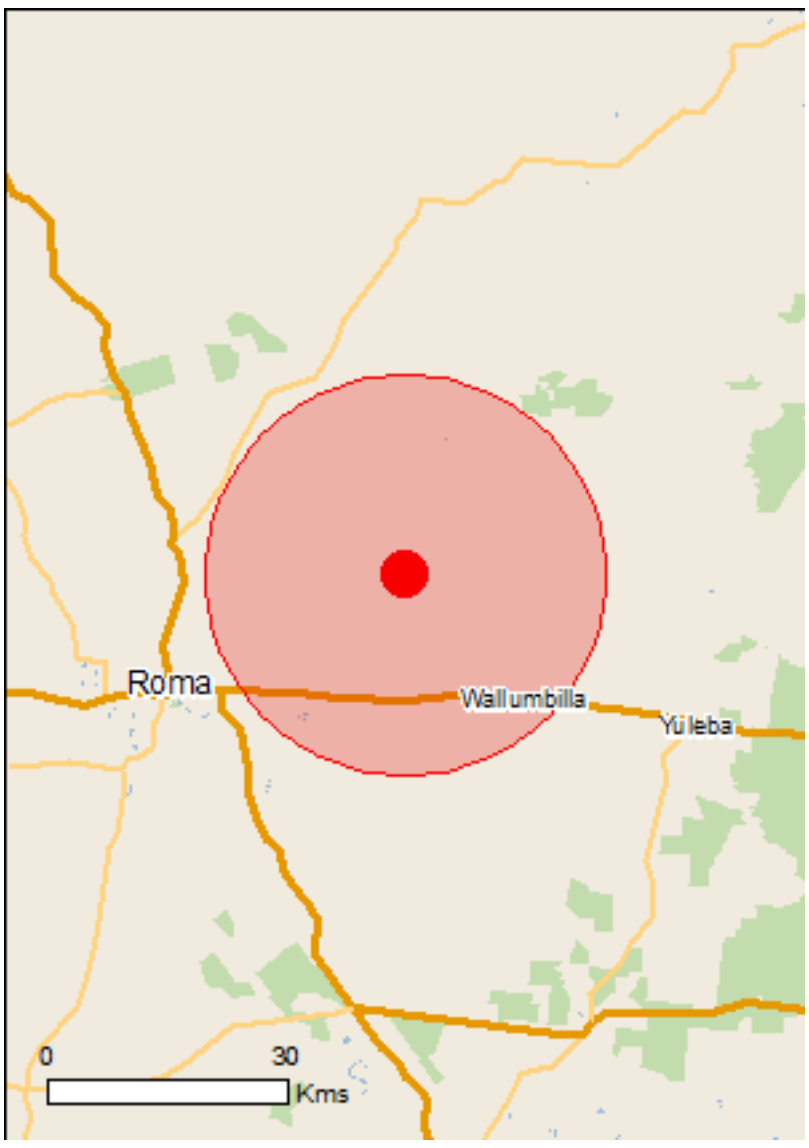
Information on the coverage of this report and qualifications on data supporting this report are contained in the caveat at the end of the report.

Information is available about Environment Assessments and the EPBC Act including significance guidelines, forms and application process details.

Report created: 12/04/21 21:42:22

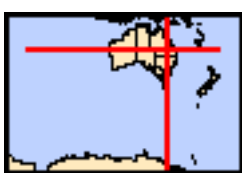
Summary
Details
- Matters of NES
- Other Matters Protected by the EPBC Act
- Extra Information

Caveat
Acknowledgements



Coordinates

Buffer: 25.0Km



Summary

Matters of National Environmental Significance

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

World Heritage Properties:	None
National Heritage Places:	None
Wetlands of International Importance:	4
Great Barrier Reef Marine Park:	None
Commonwealth Marine Area:	None
Listed Threatened Ecological Communities:	5
Listed Threatened Species:	22
Listed Migratory Species:	10

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 http://www.environment.gov.au/heritage

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

Commonwealth Land:	None
Commonwealth Heritage Places:	None
Listed Marine Species:	15
Whales and Other Cetaceans:	None
Critical Habitats:	None
Commonwealth Reserves Terrestrial:	None
Australian Marine Parks:	None

Extra Information

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

State and Territory Reserves:	None
Regional Forest Agreements:	None
Invasive Species:	26
Nationally Important Wetlands:	None
Key Ecological Features (Marine)	None

Details

Matters of National Environmental Significance

Wetlands of International Importance (Ramsar)	[Resource Information]
Name	Proximity
Banrock station wetland complex	1100 - 1200km
Narran lake nature reserve	300 - 400km upstream
Riverland	1100 - 1200km
The coorong, and lakes alexandrina and albert wetland	1300 - 1400km

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.		
Name	Status	Type of Presence
Brigalow (Acacia harpophylla dominant and co-dominant)	Endangered	Community known to occur within area
Coolibah - Black Box Woodlands of the Darling Riverine Plains and the Brigalow Belt South Bioregions	Endangered	Community likely to occur within area
Poplar Box Grassy Woodland on Alluvial Plains	Endangered	Community likely to occur within area
Semi-evergreen vine thickets of the Brigalow Belt (North and South) and Nandewar Bioregions	Endangered	Community likely to occur within area
Weeping Myall Woodlands	Endangered	Community likely to occur within area

Listed Threatened Species		[Resource Information]
Name	Status	Type of Presence
Birds		
Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	Species or species habitat may occur within area
Erythrotriorchis radiatus Red Goshawk [942]	Vulnerable	Species or species habitat likely to occur within area
Falco hypoleucos Grey Falcon [929]	Vulnerable	Species or species habitat likely to occur within area
Geophaps scripta scripta Squatter Pigeon (southern) [64440]	Vulnerable	Species or species habitat may occur within area
Grantiella picta Painted Honeyeater [470]	Vulnerable	Species or species habitat likely to occur within area
Hirundapus caudacutus White-throated Needletail [682]	Vulnerable	Species or species habitat may occur within area
Rostratula australis Australian Painted Snipe [77037]	Endangered	Species or species habitat likely to occur within area

Name	Status	Type of Presence
Fish		
Maccullochella peelii Murray Cod [66633]	Vulnerable	Species or species habitat may occur within area
Mammals		
Chalinolobus dwyeri Large-eared Pied Bat, Large Pied Bat [183]	Vulnerable	Species or species habitat likely to occur within area
Dasyurus hallucatus Northern Quoll, Digul [Gogo-Yimidir], Wijingadda [Dambimangari], Wiminji [Martu] [331]	Endangered	Species or species habitat may occur within area
Nyctophilus corbeni Corben's Long-eared Bat, South-eastern Long-eared Bat [83395]	Vulnerable	Species or species habitat may occur within area
Phascolarctos cinereus (combined populations of Qld, NSW and the ACT) Koala (combined populations of Queensland, New South Wales and the Australian Capital Territory) [85104]	Vulnerable	Species or species habitat known to occur within area
Plants		
Arthraxon hispidus Hairy-joint Grass [9338]	Vulnerable	Species or species habitat may occur within area
Cadellia pentastylis Ooline [9828]	Vulnerable	Species or species habitat likely to occur within area
Dichanthium setosum bluegrass [14159]	Vulnerable	Species or species habitat likely to occur within area
Homopholis belsonii Belson's Panic [2406]	Vulnerable	Species or species habitat may occur within area
Swainsona murrayana Slender Darling-pea, Slender Swainson, Murray Swainson-pea [6765]	Vulnerable	Species or species habitat likely to occur within area
Tylophora linearis [55231]	Endangered	Species or species habitat may occur within area
Reptiles		
Delma torquata Adorned Delma, Collared Delma [1656]	Vulnerable	Species or species habitat may occur within area
Egernia rugosa Yakka Skink [1420]	Vulnerable	Species or species habitat known to occur within area
Furina dunmalli Dunmall's Snake [59254]	Vulnerable	Species or species habitat may occur within area
Rheodytes leukops Fitzroy River Turtle, Fitzroy Tortoise, Fitzroy Turtle, White-eyed River Diver [1761]	Vulnerable	Species or species habitat may occur within area

Listed Migratory Species [Resource Information]

* Species is listed under a different scientific name on the EPBC Act - Threatened Species list.

Name	Threatened	Type of Presence
Migratory Marine Birds		
Apus pacificus Fork-tailed Swift [678]		Species or species habitat likely to occur

Name	Threatened	Type of Presence within area
Migratory Terrestrial Species		
[Cuculus optatus](#) Oriental Cuckoo, Horsfield's Cuckoo [86651]		Species or species habitat may occur within area
[Hirundapus caudacutus](#) White-throated Needletail [682]	Vulnerable	Species or species habitat may occur within area
[Motacilla flava](#) Yellow Wagtail [644]		Species or species habitat may occur within area
[Myiagra cyanoleuca](#) Satin Flycatcher [612]		Species or species habitat may occur within area
Migratory Wetlands Species		
[Actitis hypoleucos](#) Common Sandpiper [59309]		Species or species habitat may occur within area
[Calidris acuminata](#) Sharp-tailed Sandpiper [874]		Species or species habitat likely to occur within area
[Calidris ferruginea](#) Curlew Sandpiper [856]	Critically Endangered	Species or species habitat may occur within area
[Calidris melanotos](#) Pectoral Sandpiper [858]		Species or species habitat may occur within area
[Gallinago hardwickii](#) Latham's Snipe, Japanese Snipe [863]		Species or species habitat may occur within area

Other Matters Protected by the EPBC Act

Listed Marine Species [Resource Information]		
* Species is listed under a different scientific name on the EPBC Act - Threatened Species list.		
Name	Threatened	Type of Presence
Birds		
[Actitis hypoleucos](#) Common Sandpiper [59309]		Species or species habitat may occur within area
[Apus pacificus](#) Fork-tailed Swift [678]		Species or species habitat likely to occur within area
[Ardea alba](#) Great Egret, White Egret [59541]		Species or species habitat known to occur within area
[Ardea ibis](#) Cattle Egret [59542]		Species or species habitat may occur within area
[Calidris acuminata](#) Sharp-tailed Sandpiper [874]		Species or species habitat likely to occur within area
[Calidris ferruginea](#) Curlew Sandpiper [856]	Critically Endangered	Species or species

Name	Threatened	Type of Presence
		habitat may occur within area
Calidris melanotos Pectoral Sandpiper [858]		Species or species habitat may occur within area
Chrysococcyx osculans Black-eared Cuckoo [705]		Species or species habitat likely to occur within area
Gallinago hardwickii Latham's Snipe, Japanese Snipe [863]		Species or species habitat may occur within area
Haliaeetus leucogaster White-bellied Sea-Eagle [943]		Species or species habitat likely to occur within area
Hirundapus caudacutus White-throated Needletail [682]	Vulnerable	Species or species habitat may occur within area
Merops ornatus Rainbow Bee-eater [670]		Species or species habitat may occur within area
Motacilla flava Yellow Wagtail [644]		Species or species habitat may occur within area
Myiagra cyanoleuca Satin Flycatcher [612]		Species or species habitat may occur within area
Rostratula benghalensis (sensu lato) Painted Snipe [889]	Endangered*	Species or species habitat likely to occur within area

Extra Information

Invasive Species	[Resource Information]

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

Name	Status	Type of Presence
Birds		
Anas platyrhynchos Mallard [974]		Species or species habitat likely to occur within area
Columba livia Rock Pigeon, Rock Dove, Domestic Pigeon [803]		Species or species habitat likely to occur within area
Passer domesticus House Sparrow [405]		Species or species habitat likely to occur

Name	Status	Type of Presence
		within area
Sturnus vulgaris Common Starling [389]		Species or species habitat likely to occur within area
Frogs		
Rhinella marina Cane Toad [83218]		Species or species habitat known to occur within area
Mammals		
Bos taurus Domestic Cattle [16]		Species or species habitat likely to occur within area
Canis lupus familiaris Domestic Dog [82654]		Species or species habitat likely to occur within area
Felis catus Cat, House Cat, Domestic Cat [19]		Species or species habitat likely to occur within area
Feral deer Feral deer species in Australia [85733]		Species or species habitat likely to occur within area
Lepus capensis Brown Hare [127]		Species or species habitat likely to occur within area
Mus musculus House Mouse [120]		Species or species habitat likely to occur within area
Oryctolagus cuniculus Rabbit, European Rabbit [128]		Species or species habitat likely to occur within area
Sus scrofa Pig [6]		Species or species habitat likely to occur within area
Vulpes vulpes Red Fox, Fox [18]		Species or species habitat likely to occur within area
Plants		
Acacia nilotica subsp. indica Prickly Acacia [6196]		Species or species habitat may occur within area
Asparagus africanus Climbing Asparagus, Climbing Asparagus Fern [66907]		Species or species habitat likely to occur within area
Asparagus plumosus Climbing Asparagus-fern [48993]		Species or species habitat likely to occur within area
Dolichandra unguis-cati Cat's Claw Vine, Yellow Trumpet Vine, Cat's Claw Creeper, Funnel Creeper [85119]		Species or species habitat likely to occur within area
Lantana camara Lantana, Common Lantana, Kamara Lantana, Large-leaf Lantana, Pink Flowered Lantana, Red Flowered Lantana, Red-Flowered Sage, White Sage, Wild Sage [10892]		Species or species habitat likely to occur within area
Lycium ferocissimum African Boxthorn, Boxthorn [19235]		Species or species habitat likely to occur within area

Name	Status	Type of Presence
Opuntia spp. Prickly Pears [82753]		Species or species habitat likely to occur within area
Parkinsonia aculeata Parkinsonia, Jerusalem Thorn, Jelly Bean Tree, Horse Bean [12301]		Species or species habitat likely to occur within area
Parthenium hysterophorus Parthenium Weed, Bitter Weed, Carrot Grass, False Ragweed [19566]		Species or species habitat likely to occur within area
Prosopis spp. Mesquite, Algaroba [68407]		Species or species habitat likely to occur within area
Senecio madagascariensis Fireweed, Madagascar Ragwort, Madagascar Groundsel [2624]		Species or species habitat likely to occur within area
Reptiles		
Hemidactylus frenatus Asian House Gecko [1708]		Species or species habitat likely to occur within area

Caveat

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

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

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

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

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

Where very little information is available for 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 reliable distribution mapping methods are used to update these distributions as time permits.

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

- migratory and
- marine

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

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

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

- non-threatened seabirds which have only been mapped for recorded breeding sites
- seals which have only been mapped for breeding sites near the Australian continent

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

Coordinates

-26.46061 149.05127

Acknowledgements

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

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

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

Please feel free to provide feedback via the Contact Us page.

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Queensland Government

Wildlife Online Extract

Search Criteria: Species List for a Specified Point
Species: All
Type: All
Status: All
Records: All
Date: Since 1980
Latitude: -26.4606
Longitude: 149.0512
Distance: 25
Email: jessie.mckee@aecom.com
Date submitted: Thursday 15 Apr 2021 10:02:19
Date extracted: Thursday 15 Apr 2021 10:10:04

The number of records retrieved = 684

Kingdom	Class	Family	Scientific Name	Common Name	I	Q	A	Records
animals	amphibians	Hylidae	*Cyclorana sp.*			C		2
animals	amphibians	Hylidae	*Litoria peronii*	emerald spotted treefrog		C		2
animals	amphibians	Hylidae	*Litoria rubella*	ruddy treefrog		C		6
animals	amphibians	Hylidae	*Litoria caerulea*	common green treefrog		C		108
animals	amphibians	Hylidae	*Cyclorana novaehollandiae*	eastern snapping frog		C		16
animals	amphibians	Hylidae	*Cyclorana cultripes*	grassland collared frog		C		1
animals	amphibians	Hylidae	*Cyclorana verrucosa*	rough collared frog		C		14
animals	amphibians	Hylidae	*Litoria latopalmata*	broad palmed rocketfrog		C		7
animals	amphibians	Hylidae	*Cyclorana alboguttata*	greenstripe frog		C		52
animals	amphibians	Hylidae	*Cyclorana brevipes*	superb collared frog		C		39
animals	amphibians	Limnodynastidae	*Limnodynastes tasmaniensis*	spotted grassfrog		C		90
animals	amphibians	Limnodynastidae	*Limnodynastes terraereginae*	scarlet sided pobblebonk		C		1
animals	amphibians	Limnodynastidae	*Limnodynastes fletcheri*	barking frog		C		1
animals	amphibians	Limnodynastidae	*Platyplectrum ornatum*	ornate burrowing frog		C		73
animals	amphibians	Limnodynastidae	*Notaden bennettii*	holy cross frog		C		3
animals	amphibians	Limnodynastidae	*Limnodynastes peronii*	striped marshfrog		C		1
animals	amphibians	Limnodynastidae	*Limnodynastes salmini*	salmon striped frog		C		69
animals	amphibians	Myobatrachidae	*Crinia parinsignifera*	beeping froglet		C		2
animals	amphibians	Myobatrachidae	*Uperoleia laevigata*	eastern gungan		C		3
animals	amphibians	Myobatrachidae	*Uperoleia rugosa*	chubby gungan		C		22
animals	amphibians	Myobatrachidae	*Uperoleia sp.*			C		1
animals	birds	Acanthizidae	*Pyrrholaemus sagittatus*	speckled warbler		C		3
animals	birds	Acanthizidae	*Smicrornis brevirostris*	weebill		C		14
animals	birds	Acanthizidae	*Acanthiza nana*	yellow thornbill		C		1
animals	birds	Acanthizidae	*Gerygone olivacea*	white-throated gerygone		C		7
animals	birds	Acanthizidae	*Acanthiza apicalis*	inland thornbill		C		5
animals	birds	Acanthizidae	*Acanthiza chrysorrhoa*	yellow-rumped thornbill		C		8
animals	birds	Acanthizidae	*Acanthiza uropygialis*	chestnut-rumped thornbill		C		4
animals	birds	Accipitridae	*Accipiter cirrocephalus*	collared sparrowhawk		C		1
animals	birds	Accipitridae	*Haliastur sphenurus*	whistling kite		C		3
animals	birds	Accipitridae	*Aquila audax*	wedge-tailed eagle		C		2
animals	birds	Accipitridae	*Milvus migrans*	black kite		C		3
animals	birds	Accipitridae	*Elanus axillaris*	black-shouldered kite		C		5
animals	birds	Accipitridae	*Circus approximans*	swamp harrier		C		1
animals	birds	Accipitridae	*Lophoictinia isura*	square-tailed kite		C		2
animals	birds	Accipitridae	*Haliaeetus leucogaster*	white-bellied sea-eagle		C		2
animals	birds	Acrocephalidae	*Acrocephalus australis*	Australian reed-warbler		C		10
animals	birds	Aegothelidae	*Aegotheles cristatus*	Australian owlet-nightjar		C		3
animals	birds	Alaudidae	*Mirafra javanica*	Horsfield's bushlark		C		1
animals	birds	Anatidae	*Anas gracilis*	grey teal		C		14
animals	birds	Anatidae	*Malacorhynchus membranaceus*	pink-eared duck		C		3
animals	birds	Anatidae	*Nettapus coromandelianus*	cotton pygmy-goose		C		1
animals	birds	Anatidae	*Stictonetta naevosa*	freckled duck		C		1
animals	birds	Anatidae	*Dendrocygna arcuata*	wandering whistling-duck		C		1
animals	birds	Anatidae	*Spatula rhynchotis*	Australasian shoveler		C		2
animals	birds	Anatidae	*Cygnus atratus*	black swan		C		7

Kingdom	Class	Family	Scientific Name	Common Name	I	Q	A	Records
animals	birds	Anatidae	*Aythya australis*	hardhead		C		10
animals	birds	Anatidae	*Anas superciliosa*	Pacific black duck		C		21
animals	birds	Anatidae	*Chenonetta jubata*	Australian wood duck		C		10
animals	birds	Anatidae	*Dendrocygna eytoni*	plumed whistling-duck		C		3
animals	birds	Anhingidae	*Anhinga novaehollandiae*	Australasian darter		C		3
animals	birds	Ardeidae	*Egretta novaehollandiae*	white-faced heron		C		12
animals	birds	Ardeidae	*Ardea alba modesta*	eastern great egret		C		5
animals	birds	Ardeidae	*Egretta garzetta*	little egret		C		1
animals	birds	Ardeidae	*Ardea intermedia*	intermediate egret		C		6
animals	birds	Ardeidae	*Ardea pacifica*	white-necked heron		C		6
animals	birds	Artamidae	*Cracticus nigrogularis*	pied butcherbird		C		20
animals	birds	Artamidae	*Artamus cinereus*	black-faced woodswallow		C		1
animals	birds	Artamidae	*Gymnorhina tibicen*	Australian magpie		C		23
animals	birds	Artamidae	*Strepera graculina*	pied currawong		C		4
animals	birds	Artamidae	*Cracticus torquatus*	grey butcherbird		C		24
animals	birds	Artamidae	*Artamus leucorynchus*	white-breasted woodswallow		C		5
animals	birds	Artamidae	*Artamus superciliosus*	white-browed woodswallow		C		1
animals	birds	Cacatuidae	*Eolophus roseicapilla*	galah		C		33
animals	birds	Cacatuidae	*Cacatua sanguinea*	little corella		C		1
animals	birds	Cacatuidae	*Calyptorhynchus lathami lathami*	glossy black-cockatoo (eastern)		V		1
animals	birds	Cacatuidae	*Nymphicus hollandicus*	cockatiel		C		15/1
animals	birds	Cacatuidae	*Cacatua galerita*	sulphur-crested cockatoo		C		9
animals	birds	Campephagidae	*Coracina maxima*	ground cuckoo-shrike		C		4
animals	birds	Campephagidae	*Coracina tenuirostris*	cicadabird		C		1
animals	birds	Campephagidae	*Lalage tricolor*	white-winged triller		C		5
animals	birds	Campephagidae	*Coracina novaehollandiae*	black-faced cuckoo-shrike		C		6
animals	birds	Casuariidae	*Dromaius novaehollandiae*	emu		C		1
animals	birds	Charadriidae	*Vanellus tricolor*	banded lapwing		C		1
animals	birds	Charadriidae	*Vanellus miles*	masked lapwing		C		4
animals	birds	Charadriidae	*Vanellus miles novaehollandiae*	masked lapwing (southern subspecies)		C		7
animals	birds	Charadriidae	*Elseyornis melanops*	black-fronted dotterel		C		7
animals	birds	Charadriidae	*Erythrogonys cinctus*	red-kneed dotterel		C		1
animals	birds	Ciconiidae	*Ephippiorhynchus asiaticus*	black-necked stork		C		2
animals	birds	Cisticolidae	*Cisticola exilis*	golden-headed cisticola		C		1
animals	birds	Climacteridae	*Cormobates leucophaea*	white-throated treecreeper		C		1
animals	birds	Columbidae	*Geopelia humeralis*	bar-shouldered dove		C		2
animals	birds	Columbidae	*Geopelia striata*	peaceful dove		C		4
animals	birds	Columbidae	*Columba livia*	rock dove	Y			3
animals	birds	Columbidae	*Ocyphaps lophotes*	crested pigeon		C		27
animals	birds	Coraciidae	*Eurystomus orientalis*	dollarbird		C		2
animals	birds	Corcoracidae	*Struthidea cinerea*	apostlebird		C		11
animals	birds	Corcoracidae	*Corcorax melanorhamphos*	white-winged chough		C		2
animals	birds	Corvidae	*Corvus orru*	Torresian crow		C		26
animals	birds	Corvidae	*Corvus coronoides*	Australian raven		C		5
animals	birds	Corvidae	*Corvus sp.*			C		2
animals	birds	Cuculidae	*Cacomantis flabelliformis*	fan-tailed cuckoo		C		1

Kingdom	Class	Family	Scientific Name	Common Name	I	Q	A	Records
animals	birds	Cuculidae	*Chalcites basalis*	Horsfield's bronze-cuckoo		C		1
animals	birds	Cuculidae	*Cacomantis pallidus*	pallid cuckoo		C		1
animals	birds	Cuculidae	*Cacomantis variolosus*	brush cuckoo		C		1
animals	birds	Estrildidae	*Lonchura castaneothorax*	chestnut-breasted mannikin		C		1
animals	birds	Estrildidae	*Neochmia modesta*	plum-headed finch		C		2
animals	birds	Estrildidae	*Taeniopygia bichenovii*	double-barred finch		C		5
animals	birds	Estrildidae	*Taeniopygia guttata*	zebra finch		C		4
animals	birds	Falconidae	*Falco longipennis*	Australian hobby		C		2
animals	birds	Falconidae	*Falco berigora*	brown falcon		C		2
animals	birds	Falconidae	*Falco cenchroides*	nankeen kestrel		C		10
animals	birds	Gruidae	*Antigone rubicunda*	brolga		C		5
animals	birds	Halcyonidae	*Dacelo novaeguineae*	laughing kookaburra		C		9
animals	birds	Halcyonidae	*Todiramphus sanctus*	sacred kingfisher		C		1
animals	birds	Hirundinidae	*Petrochelidon nigricans*	tree martin		C		2
animals	birds	Hirundinidae	*Hirundo neoxena*	welcome swallow		C		9
animals	birds	Hirundinidae	*Petrochelidon ariel*	fairy martin		C		3
animals	birds	Jacanidae	*Irediparra gallinacea*	comb-crested jacana		C		1
animals	birds	Laridae	*Chlidonias hybrida*	whiskered tern		C		3
animals	birds	Maluridae	*Malurus leucopterus*	white-winged fairy-wren		C		3
animals	birds	Maluridae	*Malurus lamberti*	variegated fairy-wren		C		9
animals	birds	Maluridae	*Malurus cyaneus*	superb fairy-wren		C		13
animals	birds	Megaluridae	*Cincloramphus cruralis*	brown songlark		C		2
animals	birds	Megaluridae	*Megalurus timoriensis*	tawny grassbird		C		1
animals	birds	Megaluridae	*Cincloramphus mathewsi*	rufous songlark		C		4
animals	birds	Megaluridae	*Megalurus gramineus*	little grassbird		C		5
animals	birds	Megapodiidae	*Alectura lathami*	Australian brush-turkey		C		1
animals	birds	Meliphagidae	*Lichmera indistincta*	brown honeyeater		C		7
animals	birds	Meliphagidae	*Gavicalis virescens*	singing honeyeater		C		1
animals	birds	Meliphagidae	*Manorina flavigula*	yellow-throated miner		C		11
animals	birds	Meliphagidae	*Entomyzon cyanotis*	blue-faced honeyeater		C		8
animals	birds	Meliphagidae	*Meliphaga lewinii*	Lewin's honeyeater		C		1
animals	birds	Meliphagidae	*Grantiella picta*	painted honeyeater		V	V	5
animals	birds	Meliphagidae	*Sugomel niger*	black honeyeater		C		1
animals	birds	Meliphagidae	*Melithreptus gularis*	black-chinned honeyeater		C		1
animals	birds	Meliphagidae	*Plectorhyncha lanceolata*	striped honeyeater		C		12
animals	birds	Meliphagidae	*Melithreptus albogularis*	white-throated honeyeater		C		1
animals	birds	Meliphagidae	*Acanthagenys rufogularis*	spiny-cheeked honeyeater		C		10
animals	birds	Meliphagidae	*Philemon citreogularis*	little friarbird		C		2
animals	birds	Meliphagidae	*Manorina melanocephala*	noisy miner		C		23
animals	birds	Meliphagidae	*Ptilotula penicillata*	white-plumed honeyeater		C		5
animals	birds	Meliphagidae	*Philemon corniculatus*	noisy friarbird		C		1
animals	birds	Meliphagidae	*Nesoptilotis leucotis*	white-eared honeyeater		C		1
animals	birds	Meropidae	*Merops ornatus*	rainbow bee-eater		C		3
animals	birds	Monarchidae	*Grallina cyanoleuca*	magpie-lark		C		37
animals	birds	Monarchidae	*Myiagra inquieta*	restless flycatcher		C		2
animals	birds	Monarchidae	*Myiagra rubecula*	leaden flycatcher		C		2

Kingdom	Class	Family	Scientific Name	Common Name	I	Q	A	Records
animals	birds	Motacillidae	*Anthus novaeseelandiae*	Australasian pipit		C		2
animals	birds	Nectariniidae	*Dicaeum hirundinaceum*	mistletoebird		C		17
animals	birds	Neosittidae	*Daphoenositta chrysoptera*	varied sittella		C		2
animals	birds	Oriolidae	*Oriolus sagittatus*	olive-backed oriole		C		4
animals	birds	Oriolidae	*Sphecotheres vieilloti*	Australasian figbird		C		1
animals	birds	Otididae	*Ardeotis australis*	Australian bustard		C		4
animals	birds	Pachycephalidae	*Colluricincla harmonica*	grey shrike-thrush		C		4
animals	birds	Pachycephalidae	*Pachycephala rufiventris*	rufous whistler		C		7
animals	birds	Pardalotidae	*Pardalotus punctatus*	spotted pardalote		C		2
animals	birds	Pardalotidae	*Pardalotus striatus*	striated pardalote		C		15
animals	birds	Passeridae	*Passer domesticus*	house sparrow	Y			2
animals	birds	Pelecanidae	*Pelecanus conspicillatus*	Australian pelican		C		6
animals	birds	Petroicidae	*Microeca fascinans*	jacky winter		C		3
animals	birds	Petroicidae	*Eopsaltria australis*	eastern yellow robin		C		3
animals	birds	Petroicidae	*Petroica goodenovii*	red-capped robin		C		1
animals	birds	Phalacrocoracidae	*Phalacrocorax sulcirostris*	little black cormorant		C		6
animals	birds	Phalacrocoracidae	*Phalacrocorax carbo*	great cormorant		C		1
animals	birds	Phalacrocoracidae	*Microcarbo melanoleucos*	little pied cormorant		C		4
animals	birds	Phasianidae	*Coturnix ypsilophora*	brown quail		C		2
animals	birds	Podicipedidae	*Poliocephalus poliocephalus*	hoary-headed grebe		C		1
animals	birds	Podicipedidae	*Tachybaptus novaehollandiae*	Australasian grebe		C		15
animals	birds	Pomatostomidae	*Pomatostomus temporalis*	grey-crowned babbler		C		9
animals	birds	Pomatostomidae	*Pomatostomus superciliosus*	white-browed babbler		C		1
animals	birds	Psittacidae	*Trichoglossus chlorolepidotus*	scaly-breasted lorikeet		C		1
animals	birds	Psittacidae	*Trichoglossus haematodus moluccanus*	rainbow lorikeet		C		5
animals	birds	Psittacidae	*Barnardius zonarius*	Australian ringneck		C		1
animals	birds	Psittacidae	*Platycercus adscitus*	pale-headed rosella		C		13
animals	birds	Psittacidae	*Psephotus haematonotus*	red-rumped parrot		C		4
animals	birds	Psittacidae	*Northiella haematogaster*	blue bonnet		C		2
animals	birds	Psittacidae	*Aprosmictus erythropterus*	red-winged parrot		C		7
animals	birds	Psittacidae	*Barnardius zonarius barnardi*	mallee ringneck		C		1
animals	birds	Ptilonorhynchidae	*Ptilonorhynchus maculatus*	spotted bowerbird		C		3
animals	birds	Rallidae	*Porzana pusilla*	Baillon's crake		C		1
animals	birds	Rallidae	*Tribonyx ventralis*	black-tailed native-hen		C		1
animals	birds	Rallidae	*Gallinula tenebrosa*	dusky moorhen		C		11
animals	birds	Rallidae	*Gallirallus philippensis*	buff-banded rail		C		1
animals	birds	Rallidae	*Fulica atra*	Eurasian coot		C		5
animals	birds	Rallidae	*Porphyrio melanotus*	purple swamphen		C		5
animals	birds	Recurvirostridae	*Himantopus himantopus*	black-winged stilt		C		14
animals	birds	Rhipiduridae	*Rhipidura albiscapa*	grey fantail		C		9
animals	birds	Rhipiduridae	*Rhipidura leucophrys*	willie wagtail		C		21
animals	birds	Scolopacidae	*Tringa glareola*	wood sandpiper		SL		1
animals	birds	Scolopacidae	*Gallinago hardwickii*	Latham's snipe		SL		4
animals	birds	Scolopacidae	*Tringa stagnatilis*	marsh sandpiper		SL		3
animals	birds	Scolopacidae	*Calidris acuminata*	sharp-tailed sandpiper		SL		3
animals	birds	Sturnidae	*Sturnus vulgaris*	common starling	Y			4

Kingdom	Class	Family	Scientific Name	Common Name	I	Q	A	Records
animals	birds	Threskiornithidae	*Platalea regia*	royal spoonbill		C		3
animals	birds	Threskiornithidae	*Platalea flavipes*	yellow-billed spoonbill		C		8
animals	birds	Threskiornithidae	*Threskiornis spinicollis*	straw-necked ibis		C		7
animals	birds	Threskiornithidae	*Threskiornis molucca*	Australian white ibis		C		9
animals	birds	Threskiornithidae	*Plegadis falcinellus*	glossy ibis		SL		1
animals	birds	Timaliidae	*Zosterops lateralis*	silvereye		C		1
animals	birds	Tytonidae	*Tyto delicatula*	eastern barn owl		C		1
animals	insects	Nymphalidae	*Junonia villida villida*	meadow argus				1
animals	insects	Nymphalidae	*Danaus petilia*	lesser wanderer				1
animals	mammals	Bovidae	*Bos taurus*	European cattle	Y			2
animals	mammals	Dasyuridae	*Planigale maculata*	common planigale		C		6
animals	mammals	Dasyuridae	*Sminthopsis crassicaudata*	fat-tailed dunnart		C		12
animals	mammals	Dasyuridae	*Sminthopsis murina*	common dunnart		C		5
animals	mammals	Dasyuridae	*Sminthopsis macroura*	stripe-faced dunnart		C		25
animals	mammals	Dasyuridae	*Planigale tenuirostris*	narrow-nosed planigale		C		7
animals	mammals	Leporidae	*Oryctolagus cuniculus*	rabbit	Y			3
animals	mammals	Leporidae	*Lepus europaeus*	European brown hare	Y			2
animals	mammals	Macropodidae	*Macropus giganteus*	eastern grey kangaroo		C		5
animals	mammals	Macropodidae	*Notamacropus rufogriseus*	red-necked wallaby		C		3
animals	mammals	Macropodidae	*Notamacropus dorsalis*	black-striped wallaby		C		1
animals	mammals	Macropodidae	*Wallabia bicolor*	swamp wallaby		C		5
animals	mammals	Molossidae	*Austronomus australis*	white-striped freetail bat		C		1
animals	mammals	Muridae	*Mus musculus*	house mouse	Y			19
animals	mammals	Muridae	*Pseudomys gracilicaudatus*	eastern chestnut mouse		C		1
animals	mammals	Muridae	*Pseudomys delicatulus*	delicate mouse		C		1
animals	mammals	Muridae	*Rattus tunneyi*	pale field-rat		C		1
animals	mammals	Peramelidae	*Isoodon macrourus*	northern brown bandicoot		C		1
animals	mammals	Phalangeridae	*Trichosurus vulpecula*	common brushtail possum		C		3
animals	mammals	Phascolarctidae	*Phascolarctos cinereus*	koala		V	V	3
animals	mammals	Pteropodidae	*Pteropus scapulatus*	little red flying-fox		C		2
animals	mammals	Tachyglossidae	*Tachyglossus aculeatus*	short-beaked echidna		SL		3
animals	mammals	Vespertilionidae	*Scotorepens greyii*	little broad-nosed bat		C		1
animals	mammals	Vespertilionidae	*Nyctophilus geoffroyi*	lesser long-eared bat		C		3
animals	mammals	Vespertilionidae	*Nyctophilus corbeni*	eastern long-eared bat		V	V	1
animals	ray-finned fishes	Clupeidae	*Nematalosa erebi*	bony bream				1
animals	ray-finned fishes	Cyprinidae	*Carassius auratus*	goldfish	Y			2
animals	ray-finned fishes	Eleotridae	*Hypseleotris sp.*					2
animals	ray-finned fishes	Terapontidae	*Leiopotherapon unicolor*	spangled perch				2
animals	reptiles	Agamidae	*Pogona barbata*	bearded dragon		C		50
animals	reptiles	Agamidae	*Amphibolurus burnsi*	Burns's dragon		C		5
animals	reptiles	Boidae	*Antaresia maculosa*	spotted python		C		6
animals	reptiles	Boidae	*Morelia spilota*	carpet python		C		4
animals	reptiles	Chelidae	*Chelodina longicollis*	eastern snake-necked turtle		C		16
animals	reptiles	Chelidae	*Emydura macquarii macquarii*	Murray turtle		C		1
animals	reptiles	Chelidae	*Chelodina expansa*	broad-shelled river turtle		C		3
animals	reptiles	Diplodactylidae	*Rhynchoedura ormsbyi*	eastern beaked gecko		C		2

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animals	reptiles	Diplodactylidae	*Oedura elegans*	elegant velvet gecko		C		1
animals	reptiles	Diplodactylidae	*Diplodactylus tessellatus*	tessellated gecko		C		14
animals	reptiles	Diplodactylidae	*Strophurus taenicauda*	golden-tailed gecko		NT		8
animals	reptiles	Diplodactylidae	*Diplodactylus vittatus*	wood gecko		C		2
animals	reptiles	Diplodactylidae	*Lucasium steindachneri*	Steindachner's gecko		C		1
animals	reptiles	Elapidae	*Pseudechis porphyriacus*	red-bellied black snake		C		1
animals	reptiles	Elapidae	*Brachyurophis australis*	coral snake		C		1
animals	reptiles	Elapidae	*Cryptophis nigrescens*	eastern small-eyed snake		C		1
animals	reptiles	Elapidae	*Pseudechis australis*	king brown snake		C		12
animals	reptiles	Elapidae	*Vermicella annulata*	bandy-bandy		C		2
animals	reptiles	Elapidae	*Pseudonaja textilis*	eastern brown snake		C		24
animals	reptiles	Elapidae	*Pseudechis guttatus*	spotted black snake		C		1
animals	reptiles	Elapidae	*Demansia psammophis*	yellow-faced whipsnake		C		14
animals	reptiles	Elapidae	*Cacophis harriettae*	white-crowned snake		C		1/1
animals	reptiles	Elapidae	*Denisonia devisi*	De Vis' banded snake		C		11
animals	reptiles	Elapidae	*Furina diadema*	red-naped snake		C		9/1
animals	reptiles	Elapidae	*Suta dwyeri*	Dwyer's snake		C		8
animals	reptiles	Elapidae	*Suta suta*	myall snake		C		45
animals	reptiles	Elapidae	*Hoplocephalus bitorquatus*	pale-headed snake		C		2
animals	reptiles	Gekkonidae	*Gehyra dubia*	dubious dtella		C		38
animals	reptiles	Gekkonidae	*Gehyra versicolor*			C		1
animals	reptiles	Gekkonidae	*Heteronotia binoei*	Bynoe's gecko		C		43
animals	reptiles	Pygopodidae	*Delma tincta*	excitable delma		C		2
animals	reptiles	Pygopodidae	*Paradelma orientalis*	brigalow scaly-foot		C		3
animals	reptiles	Pygopodidae	*Delma plebeia*	common delma		C		6/1
animals	reptiles	Pygopodidae	*Lialis burtonis*	Burton's legless lizard		C		3
animals	reptiles	Pygopodidae	*Pygopus schraderi*	eastern hooded scaly-foot		C		1
animals	reptiles	Pygopodidae	*Delma sp.*			C		1
animals	reptiles	Scincidae	*Ctenotus spaldingi*	straight-browed ctenotus		C		20
animals	reptiles	Scincidae	*Tiliqua scincoides*	eastern blue-tongued lizard		C		29
animals	reptiles	Scincidae	*Lygisaurus foliorum*	tree-base litter-skink		C		6
animals	reptiles	Scincidae	*Morethia boulengeri*	south-eastern morethia skink		C		15/1
animals	reptiles	Scincidae	*Ctenotus taeniolatus*	copper-tailed skink		C		2
animals	reptiles	Scincidae	*Anomalopus leuckartii*	two-clawed worm-skink		C		13/1
animals	reptiles	Scincidae	*Morethia taeniopleura*	fire-tailed skink		C		2
animals	reptiles	Scincidae	*Lerista punctatovittata*	eastern robust slider		C		2
animals	reptiles	Scincidae	*Cryptoblepharus pannosus*	ragged snake-eyed skink		C		10
animals	reptiles	Scincidae	*Eremiascincus fasciolatus*	narrow-banded sand swimmer		C		4
animals	reptiles	Scincidae	*Carlia pectoralis sensu lato*			C		2
animals	reptiles	Scincidae	*Liopholis modesta*	eastern ranges rock-skink		C		1
animals	reptiles	Scincidae	*Egernia striolata*	tree skink		C		6
animals	reptiles	Scincidae	*Ctenotus ingrami*	unspotted yellow-sided ctenotus		C		2
animals	reptiles	Scincidae	*Tiliqua rugosa*	shingle-back		C		10
animals	reptiles	Scincidae	*Menetia greyii*	common dwarf skink		C		2
animals	reptiles	Scincidae	*Lerista timida*	timid slider		C		4
animals	reptiles	Scincidae	*Egernia rugosa*	yakka skink		V	V	2

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animals	reptiles	Scincidae	*Ctenotus sp.*			C		1
animals	reptiles	Scincidae	*Lerista sp.*			C		1
animals	reptiles	Scincidae	*Carlia vivax*	tussock rainbow-skink		C		7
animals	reptiles	Typhlopidae	*Anilios ligatus*	robust blind snake		C		3
animals	reptiles	Typhlopidae	*Anilios wiedii*	brown-snouted blind snake		C		3
animals	reptiles	Varanidae	*Varanus varius*	lace monitor		C		3
animals	reptiles	Varanidae	*Varanus panoptes*	yellow-spotted monitor		C		17
animals	reptiles	Varanidae	*Varanus tristis*	black-tailed monitor		C		3
animals	reptiles	Varanidae	*Varanus gouldii*	sand monitor		C		2
animals	uncertain	Indeterminate	*Indeterminate*	Unknown or Code Pending				1
fungi	Agaricomycetes	Agaricaceae	*Tulostoma*					1/1
fungi	Agaricomycetes	Agaricaceae	*Lycoperdon*					1/1
fungi	Agaricomycetes	Agaricaceae	*Calvatia candida*			C		1/1
fungi	Agaricomycetes	Cortinariaceae	*Cortinarius*					1/1
fungi	Agaricomycetes	Geastraceae	*Geastrum*			C		2/2
fungi	arthoniomycetes	Chrysothricaceae	*Chrysothrix xanthina*			C		1/1
fungi	eurotiomycetes	Verrucariaceae	*Placidium lacinulatum*			C		2/2
fungi	eurotiomycetes	Verrucariaceae	*Placidium squamulosum*			C		1/1
fungi	eurotiomycetes	Verrucariaceae	*Endocarpon simplicatum*			C		1/1
fungi	lecanoromycetes	Acarosporaceae	*Acarospora citrina*			C		2/2
fungi	lecanoromycetes	Caliciaceae	*Pyxine subcinerea*			C		2/2
fungi	lecanoromycetes	Caliciaceae	*Amandinea punctata*			C		1/1
fungi	lecanoromycetes	Caliciaceae	*Buellia spuria var. spuria*			C		1/1
fungi	lecanoromycetes	Caliciaceae	*Pyxine rugulosa*			C		1/1
fungi	lecanoromycetes	Caliciaceae	*Buellia dispersa*			C		1/1
fungi	lecanoromycetes	Caliciaceae	*Pyxine petricola*			C		1/1
fungi	lecanoromycetes	Caliciaceae	*Buellia epigaella*			C		1/1
fungi	lecanoromycetes	Cladoniaceae	*Cladia beaugleholei*			C		1/1
fungi	lecanoromycetes	Collemataceae	*Collema coccophorum*			C		1/1
fungi	lecanoromycetes	Graphidaceae	*Diploschistes euganeus*			C		1/1
fungi	lecanoromycetes	Graphidaceae	*Diploschistes actinostomus*			C		2/2
fungi	lecanoromycetes	Graphidaceae	*Diploschistes sticticus*			C		1/1
fungi	lecanoromycetes	Lecanoraceae	*Lecanora pseudargentata*			C		1/1
fungi	lecanoromycetes	Ochrolechiaceae	*Ochrolechia africana*			C		1/1
fungi	lecanoromycetes	Pannariaceae	*Physma ahtianum*			C		2/2
fungi	lecanoromycetes	Parmeliaceae	*Punctelia pseudocoralloidea*			C		2/2
fungi	lecanoromycetes	Parmeliaceae	*Xanthoparmelia hypoconstictica*			C		1/1
fungi	lecanoromycetes	Parmeliaceae	*Xanthoparmelia exuviata*			C		1/1
fungi	lecanoromycetes	Parmeliaceae	*Austroparmelina conlabrosa*			C		1/1
fungi	lecanoromycetes	Parmeliaceae	*Austroparmelina subarida*			C		1/1
fungi	lecanoromycetes	Parmeliaceae	*Xanthoparmelia aridella*			C		1/1
fungi	lecanoromycetes	Parmeliaceae	*Punctelia subflava*			C		1/1
fungi	lecanoromycetes	Parmeliaceae	*Parmotrema subsumptum*			C		2/2
fungi	lecanoromycetes	Parmeliaceae	*Parmotrema cristiferum*			C		1/1
fungi	lecanoromycetes	Parmeliaceae	*Xanthoparmelia incerta*			C		1/1
fungi	lecanoromycetes	Pertusariaceae	*Pertusaria leucostomoides*			C		1/1

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fungi	lecanoromycetes	Pertusariaceae	*Pertusaria scaberula*			C		1/1
fungi	lecanoromycetes	Physciaceae	*Hyperphyscia pruinosa*			C		1/1
fungi	lecanoromycetes	Physciaceae	*Physcia undulata*			C		1/1
fungi	lecanoromycetes	Physciaceae	*Rinodina ramboldii*			C		1/1
fungi	lecanoromycetes	Physciaceae	*Rinodina*					1/1
fungi	lecanoromycetes	Physciaceae	*Physcia jackii*			C		1/1
fungi	lecanoromycetes	Psoraceae	*Psora crystallifera*			C		1/1
fungi	lecanoromycetes	Schaereriaceae	*Schaereria xerophila*			C		1/1
fungi	lecanoromycetes	Teloschistaceae	*Caloplaca montisfracti*			C		1/1
fungi	lecanoromycetes	Teloschistaceae	*Caloplaca fraserensis*			C		1/1
fungi	lecanoromycetes	Teloschistaceae	*Caloplaca rexfilsonii*			C		1/1
fungi	lecanoromycetes	Tephromelataceae	*Tephromela connivens*			C		1/1
fungi	lichinomycetes	Lichinaceae	*Heppia lutosa*			C		1/1
fungi	lichinomycetes	Lichinaceae	*Heppia*					1/1
fungi	lichinomycetes	Peltulaceae	*Peltula patellata*			C		1/1
plants	land plants	Acanthaceae	*Rostellularia adscendens var. adscendens*			C		1
plants	land plants	Acanthaceae	*Rostellularia adscendens*			C		1/1
plants	land plants	Acanthaceae	*Brunoniella australis*	blue trumpet		C		4
plants	land plants	Acanthaceae	*Dipteracanthus australasicus subsp. corynothecus*			C		1/1
plants	land plants	Amaranthaceae	*Ptilotus psilorhachis*			C		1/1
plants	land plants	Amaranthaceae	*Alternanthera pungens*	khaki weed	Y			1/1
plants	land plants	Amaranthaceae	*Ptilotus semilanatus*			C		3/1
plants	land plants	Amaranthaceae	*Alternanthera nana*	hairy joyweed		C		2/2
plants	land plants	Amaranthaceae	*Nyssanthes erecta*			C		2
plants	land plants	Amaranthaceae	*Gomphrena celosioides*	gomphrena weed	Y			1
plants	land plants	Apiaceae	*Ammi majus*	bishop's weed	Y			1/1
plants	land plants	Apiaceae	*Daucus glochidiatus*	Australian carrot		C		2/2
plants	land plants	Apocynaceae	*Parsonsia eucalyptophylla*	gargaloo		C		2/2
plants	land plants	Apocynaceae	*Parsonsia lanceolata*	northern silkpod		C		2/2
plants	land plants	Asteraceae	*Zinnia peruviana*	wild zinnia	Y			1/1
plants	land plants	Asteraceae	*Camptacra barbata*			C		4/4
plants	land plants	Asteraceae	*Helianthus annuus*		Y			2/2
plants	land plants	Asteraceae	*Picris barbarorum*			V		1/1
plants	land plants	Asteraceae	*Schkuhria pinnata*		Y			2/2
plants	land plants	Asteraceae	*Xanthium spinosum*	Bathurst burr	Y			1/1
plants	land plants	Asteraceae	*Calotis cuneifolia*	burr daisy		C		1/1
plants	land plants	Asteraceae	*Calotis lappulacea*	yellow burr daisy		C		1/1
plants	land plants	Asteraceae	*Erigeron canadensis*		Y			2/2
plants	land plants	Asteraceae	*Senecio glossanthus*	slender groundsel		C		1/1
plants	land plants	Asteraceae	*Calyptocarpus vialis*	creeping cinderella weed	Y			2/2
plants	land plants	Asteraceae	*Hypochaeris radicata*	catsear	Y			2/2
plants	land plants	Asteraceae	*Xanthium occidentale*		Y			3
plants	land plants	Asteraceae	*Leiocarpa brevicompta*			C		1/1
plants	land plants	Asteraceae	*Podolepis longipedata*	tall copper-wire daisy		C		1/1
plants	land plants	Asteraceae	*Pycnosorus chrysanthus*	golden billy buttons		C		2/2
plants	land plants	Asteraceae	*Sigesbeckia orientalis*	Indian weed		C		1

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plants	land plants	Asteraceae	*Vittadinia pterochaeta*	rough fuzzweed		C		2/1
plants	land plants	Asteraceae	*Senecio madagascariensis*	fireweed	Y			1/1
plants	land plants	Asteraceae	*Symphyotrichum subulatum*		Y			1/1
plants	land plants	Asteraceae	*Chrysocephalum apiculatum*	yellow buttons		C		2/1
plants	land plants	Asteraceae	*Pseudognaphalium luteoalbum*	Jersey cudweed		C		1/1
plants	land plants	Asteraceae	*Lactuca serriola forma serriola*		Y			1/1
plants	land plants	Asteraceae	*Olearia canescens subsp. canescens*			C		1/1
plants	land plants	Asteraceae	*Cirsium vulgare*	spear thistle	Y			1/1
plants	land plants	Asteraceae	*Bidens pilosa*		Y			1
plants	land plants	Asteraceae	*Calotis cuneata*			C		2/1
plants	land plants	Boraginaceae	*Cynoglossum australe*			C		1/1
plants	land plants	Brassicaceae	*Lepidium*					1/1
plants	land plants	Brassicaceae	*Stenopetalum nutans*			C		2/2
plants	land plants	Brassicaceae	*Arabidella eremigena*			C		1/1
plants	land plants	Brassicaceae	*Stenopetalum lineare*			C		1/1
plants	land plants	Brassicaceae	*Rapistrum rugosum*		Y			2/2
plants	land plants	Brassicaceae	*Lepidium bonariense*	Argentine peppercress	Y			1/1
plants	land plants	Byttneriaceae	*Seringia hookeriana*			C		1/1
plants	land plants	Byttneriaceae	*Seringia collina*			C		1/1
plants	land plants	Cactaceae	*Opuntia stricta*		Y			4
plants	land plants	Cactaceae	*Opuntia tomentosa*	velvety tree pear	Y			2
plants	land plants	Cactaceae	*Opuntia sulphurea*		Y			2/2
plants	land plants	Caesalpiniaceae	*Senna coronilloides*			C		1/1
plants	land plants	Caesalpiniaceae	*Senna sophera var. (40Mile Scrub J.R.Clarkson+ 6908)*			C		1/1
plants	land plants	Caesalpiniaceae	*Senna artemisioides subsp. artemisioides*			C		1/1
plants	land plants	Caesalpiniaceae	*Parkinsonia aculeata*	parkinsonia	Y			1/1
plants	land plants	Caesalpiniaceae	*Senna occidentalis*	coffee senna	Y			1/1
plants	land plants	Caesalpiniaceae	*Senna planitiicola*			C		1/1
plants	land plants	Campanulaceae	*Wahlenbergia graniticola*	granite bluebell		C		2/1
plants	land plants	Campanulaceae	*Wahlenbergia gracilis*	sprawling bluebell		C		1/1
plants	land plants	Capparaceae	*Capparis mitchellii*			C		2
plants	land plants	Caryophyllaceae	*Spergularia bocconei*		Y			1/1
plants	land plants	Chenopodiaceae	*Sclerolaena muricata var. semiglabra*			C		2/2
plants	land plants	Chenopodiaceae	*Chenopodium desertorum subsp. anidiophyllum*			C		1/1
plants	land plants	Chenopodiaceae	*Enchylaena tomentosa var. tomentosa*			C		1
plants	land plants	Chenopodiaceae	*Einadia trigonos subsp. stellulata*			C		1/1
plants	land plants	Chenopodiaceae	*Sclerolaena bicornis var. horrida*			C		2/2
plants	land plants	Chenopodiaceae	*Einadia nutans subsp. linifolia*			C		2
plants	land plants	Chenopodiaceae	*Einadia nutans subsp. nutans*			C		2/1
plants	land plants	Chenopodiaceae	*Sclerolaena tetracuspis*	brigalow burr		C		1/1
plants	land plants	Chenopodiaceae	*Maireana enchylaenoides*			C		2/2
plants	land plants	Chenopodiaceae	*Sclerolaena diacantha*	grey copper burr		C		1/1
plants	land plants	Chenopodiaceae	*Maireana microphylla*			C		2/2
plants	land plants	Chenopodiaceae	*Atriplex semibaccata*	creeping saltbush		C		1/1
plants	land plants	Chenopodiaceae	*Dysphania cristata*			C		1/1

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plants	land plants	Chenopodiaceae	*Chenopodium murale*	green fat-hen	Y			1/1
plants	land plants	Chenopodiaceae	*Salsola australis*			C		2
plants	land plants	Chenopodiaceae	*Maireana coronata*			C		1/1
plants	land plants	Chenopodiaceae	*Chenopodium album*	fat-hen	Y			1/1
plants	land plants	Chenopodiaceae	*Atriplex muelleri*	lagoon saltbush		C		2/2
plants	land plants	Clusiaceae	*Hypericum gramineum*			C		2
plants	land plants	Commelinaceae	*Murdannia graminea*	murdannia		C		1/1
plants	land plants	Commelinaceae	*Commelina diffusa*	wandering jew		C		3/2
plants	land plants	Convolvulaceae	*Evolvulus alsinoides var. decumbens*			C		2/2
plants	land plants	Convolvulaceae	*Evolvulus alsinoides*			C		1
plants	land plants	Cucurbitaceae	*Cucumis melo*			C		1/1
plants	land plants	Cucurbitaceae	*Sicyos australis*	star cucumber		C		1/1
plants	land plants	Cyperaceae	*Cyperus sanguinolentus*			C		2
plants	land plants	Cyperaceae	*Cyperus victoriensis*			C		1/1
plants	land plants	Cyperaceae	*Fimbristylis neilsonii*			C		1/1
plants	land plants	Cyperaceae	*Eleocharis cylindrostachys*			C		1/1
plants	land plants	Cyperaceae	*Cyperus gunnii subsp. gunnii*			C		1/1
plants	land plants	Cyperaceae	*Cyperus leptocarpus*			C		1/1
plants	land plants	Cyperaceae	*Bulbostylis barbata*			C		1/1
plants	land plants	Cyperaceae	*Cyperus dactylotes*			C		2/2
plants	land plants	Cyperaceae	*Abildgaardia ovata*			C		1
plants	land plants	Cyperaceae	*Cyperus difformis*	rice sedge		C		1/1
plants	land plants	Cyperaceae	*Cyperus concinnus*			C		1/1
plants	land plants	Cyperaceae	*Cyperus castaneus*			C		1/1
plants	land plants	Cyperaceae	*Fuirena ciliaris*			C		2
plants	land plants	Cyperaceae	*Eleocharis plana*	ribbed spikerush		C		1/1
plants	land plants	Cyperaceae	*Cyperus gracilis*			C		3/1
plants	land plants	Cyperaceae	*Cyperus flavidus*			C		1
plants	land plants	Cyperaceae	*Scleria brownii*			C		1/1
plants	land plants	Cyperaceae	*Schoenus apogon*			C		1
plants	land plants	Cyperaceae	*Cyperus haspan*			C		1
plants	land plants	Cyperaceae	*Cyperus fulvus*			C		1
plants	land plants	Cyperaceae	*Cyperus*					3
plants	land plants	Cyperaceae	*Cyperus leiocaulon*			C		1/1
plants	land plants	Cyperaceae	*Schoenus yarrabensis*			C		1/1
plants	land plants	Cyperaceae	*Fimbristylis dichotoma*	common fringe-rush		C		2/1
plants	land plants	Dilleniaceae	*Hibbertia sp. (Barakula V.Hando 122)*			C		1/1
plants	land plants	Droseraceae	*Drosera burmanni*			C		1
plants	land plants	Elatinaceae	*Elatine gratioloides*	waterwort		C		1
plants	land plants	Ericaceae	*Styphelia mitchellii*			C		1/1
plants	land plants	Ericaceae	*Melichrus sp. (Isla Gorge P.Sharpe+ 601)*			C		1/1
plants	land plants	Euphorbiaceae	*Euphorbia dallachyana*			C		1
plants	land plants	Euphorbiaceae	*Croton phebalioides*	narrow-leaved croton		C		2/2
plants	land plants	Euphorbiaceae	*Euphorbia papillifolia var. papillifolia*			C		1/1
plants	land plants	Fabaceae	*Glycine*					3/3
plants	land plants	Fabaceae	*Crotalaria dissitiflora subsp. dissitiflora*			C		2/2

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plants	land plants	Fabaceae	*Hovea longipes*	brush hovea		C		3/3
plants	land plants	Fabaceae	*Glycine tabacina*	glycine pea		C		3/1
plants	land plants	Fabaceae	*Desmodium varians*	slender tick trefoil		C		4/1
plants	land plants	Fabaceae	*Rhynchosia minima*			C		2
plants	land plants	Fabaceae	*Swainsona luteola*	dwarf darling pea		C		1/1
plants	land plants	Fabaceae	*Glycine stenophita*			C		1/1
plants	land plants	Fabaceae	*Glycine tomentella*	woolly glycine		C		1
plants	land plants	Fabaceae	*Aeschynomene indica*	budda pea		C		1
plants	land plants	Fabaceae	*Glycine microphylla*			C		1/1
plants	land plants	Fabaceae	*Medicago truncatula*	barrel medic	Y			1/1
plants	land plants	Fabaceae	*Indigofera ewartiana*			C		1/1
plants	land plants	Fabaceae	*Indigofera linifolia*			C		1/1
plants	land plants	Fabaceae	*Swainsona procumbens*	broughton pea		C		1/1
plants	land plants	Fabaceae	*Desmodium brachypodum*	large ticktrefoil		C		2/1
plants	land plants	Fabaceae	*Templetonia stenophylla*	leafy templetonia		C		1/1
plants	land plants	Fabaceae	*Medicago minima var. minima*		Y			1
plants	land plants	Fabaceae	*Rhynchosia minima var. minima*			C		1
plants	land plants	Fabaceae	*Glycine clandestina var. sericea*			C		2
plants	land plants	Fabaceae	*Rhynchosia minima var. australis*			C		1
plants	land plants	Fabaceae	*Vigna lanceolata var. lanceolata*			C		2/2
plants	land plants	Fabaceae	*Medicago laciniata var. laciniata*		Y			2/2
plants	land plants	Funariaceae	*Funaria*					1/1
plants	land plants	Goodeniaceae	*Goodenia glabra*			C		1
plants	land plants	Goodeniaceae	*Goodenia delicata*			C		1/1
plants	land plants	Goodeniaceae	*Goodenia fascicularis*			C		1/1
plants	land plants	Goodeniaceae	*Scaevola spinescens*	prickly fan flower		C		1/1
plants	land plants	Goodeniaceae	*Brunonia australis*	blue pincushion		C		1/1
plants	land plants	Haloragaceae	*Gonocarpus urceolatus*			C		1/1
plants	land plants	Haloragaceae	*Haloragis heterophylla*	rough raspweed		C		2
plants	land plants	Hydrocharitaceae	*Ottelia ovalifolia subsp. ovalifolia*			C		1/1
plants	land plants	Juncaceae	*Juncus usitatus*			C		1/1
plants	land plants	Juncaceae	*Juncus prismatocarpus*	branching rush		C		2
plants	land plants	Juncaceae	*Juncus continuus*			C		2
plants	land plants	Juncaceae	*Juncus aridicola*	tussock rush		C		2/2
plants	land plants	Lamiaceae	*Teucrium junceum*			C		1
plants	land plants	Lamiaceae	*Prostanthera ringens*			C		1/1
plants	land plants	Lamiaceae	*Lamium amplexicaule*	deadnettle	Y			1/1
plants	land plants	Lamiaceae	*Teucrium daucoides*			C		2/2
plants	land plants	Lamiaceae	*Stachys arvensis*	stagger weed	Y			3/3
plants	land plants	Lamiaceae	*Prostanthera sp. (Baking Board V.Hando 135)*			C		1/1
plants	land plants	Lamiaceae	*Marrubium vulgare*	white horehound	Y			1/1
plants	land plants	Laxmanniaceae	*Lomandra multiflora subsp. multiflora*			C		1
plants	land plants	Loranthaceae	*Amyema congener subsp. rotundifolia*			C		1/1
plants	land plants	Loranthaceae	*Dendrophthoe glabrescens*			C		1/1
plants	land plants	Loranthaceae	*Amyema miquelii*			C		2/2
plants	land plants	Malvaceae	*Abutilon oxycarpum var. oxycarpum*			C		3/3

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plants	land plants	Malvaceae	*Sida atherophora*			C		1/1
plants	land plants	Malvaceae	*Malva parviflora*	small-flowered mallow	Y			2/2
plants	land plants	Malvaceae	*Sida platycalyx*	lifesaver burr		C		1/1
plants	land plants	Malvaceae	*Sida fibulifera*			C		1
plants	land plants	Malvaceae	*Sida corrugata*			C		4/4
plants	land plants	Malvaceae	*Sida laevis*			C		1/1
plants	land plants	Malvaceae	*Sida*					1
plants	land plants	Malvaceae	*Malvastrum americanum var. americanum*		Y			2
plants	land plants	Malvaceae	*Abutilon oxycarpum var. subsagittatum*			C		2/2
plants	land plants	Malvaceae	*Abutilon tubulosum var. tubulosum*			C		1/1
plants	land plants	Malvaceae	*Abutilon oxycarpum*			C		4
plants	land plants	Malvaceae	*Abutilon oxycarpum var. incanum*			C		2/2
plants	land plants	Malvaceae	*Hibiscus brachysiphonius*			C		1
plants	land plants	Malvaceae	*Abutilon calliphyllum*	velvet lanternflower		C		1/1
plants	land plants	Malvaceae	*Hibiscus verdcourtii*			C		1/1
plants	land plants	Malvaceae	*Abutilon tubulosum*			C		2/2
plants	land plants	Mimosaceae	*Acacia excelsa subsp. excelsa*			C		1
plants	land plants	Mimosaceae	*Acacia jucunda*			C		1
plants	land plants	Mimosaceae	*Acacia conferta*			C		2/2
plants	land plants	Mimosaceae	*Acacia salicina*	doolan		C		3/1
plants	land plants	Mimosaceae	*Acacia macradenia*	zig-zag wattle		C		1/1
plants	land plants	Mimosaceae	*Acacia polybotrya*	western silver wattle		C		2
plants	land plants	Mimosaceae	*Acacia leiocalyx subsp. leiocalyx*			C		1/1
plants	land plants	Mimosaceae	*Neptunia gracilis forma gracilis*			C		1
plants	land plants	Mimosaceae	*Neptunia*					1/1
plants	land plants	Mimosaceae	*Acacia aneura var. major*			C		1/1
plants	land plants	Mimosaceae	*Acacia spectabilis*	pilliga wattle		C		1/1
plants	land plants	Myrtaceae	*Backhousia angustifolia*	narrow-leaved backhousia		C		1/1
plants	land plants	Myrtaceae	*Eucalyptus melanophloia*			C		2
plants	land plants	Myrtaceae	*Eucalyptus sideroxylon subsp. sideroxylon*			C		1
plants	land plants	Myrtaceae	*Eucalyptus exserta*	Queensland peppermint		C		1/1
plants	land plants	Myrtaceae	*Eucalyptus populnea*	poplar box		C		5
plants	land plants	Myrtaceae	*Eucalyptus chloroclada*	Baradine red gum		C		1
plants	land plants	Nyctaginaceae	*Boerhavia pubescens*			C		1/1
plants	land plants	Nyctaginaceae	*Boerhavia dominii*			C		4
plants	land plants	Oleaceae	*Notelaea microcarpa*			C		2/2
plants	land plants	Oleaceae	*Jasminum dianthifolium x Jasminum simplicifolium subsp. australiense*			C		1/1
plants	land plants	Onagraceae	*Oenothera indecora subsp. bonariensis*		Y			1
plants	land plants	Ophioglossaceae	*Ophioglossum lusitanicum*	adder's tongue		C		1/1
plants	land plants	Oxalidaceae	*Oxalis perennans*			C		1/1
plants	land plants	Oxalidaceae	*Oxalis radicosa*			C		2/2
plants	land plants	Papaveraceae	*Papaver somniferum subsp. setigerum*		Y			1/1
plants	land plants	Papaveraceae	*Papaver hybridum*	rough poppy	Y			1/1
plants	land plants	Pedaliaceae	*Josephinia eugeniae*	josephinia burr		C		1/1
plants	land plants	Phyllanthaceae	*Flueggea leucopyrus*			C		1/1

Kingdom	Class	Family	Scientific Name	Common Name	I	Q	A	Records
plants	land plants	Phyllanthaceae	*Bridelia leichhardtii*			C		1/1
plants	land plants	Phyllanthaceae	*Phyllanthus gunnii*			C		3/2
plants	land plants	Plantaginaceae	*Gratiola pedunculata*			C		2/1
plants	land plants	Plantaginaceae	*Veronica plebeia*	trailing speedwell		C		2/2
plants	land plants	Poaceae	*Sporobolus coromandelianus*		Y			1/1
plants	land plants	Poaceae	*Cynodon dactylon var. dactylon*		Y			1/1
plants	land plants	Poaceae	*Aristida calycina var. calycina*			C		1/1
plants	land plants	Poaceae	*Dinebra decipiens var. peacockii*			C		1
plants	land plants	Poaceae	*Aristida benthamii var. benthamii*			C		1/1
plants	land plants	Poaceae	*Chloris divaricata var. divaricata*	slender chloris		C		2
plants	land plants	Poaceae	*Megathyrsus maximus var. coloratus*		Y			1/1
plants	land plants	Poaceae	*Bothriochloa decipiens var. decipiens*			C		4
plants	land plants	Poaceae	*Poa labillardierei var. labillardierei*	tussock grass		C		2/2
plants	land plants	Poaceae	*Aristida jerichoensis var. subspinulifera*			C		1
plants	land plants	Poaceae	*Panicum queenslandicum var. queenslandicum*			C		2
plants	land plants	Poaceae	*Digitaria divaricatissima var. divaricatissima*			C		2/2
plants	land plants	Poaceae	*Poaceae*					1
plants	land plants	Poaceae	*Arundo donax*		Y			1/1
plants	land plants	Poaceae	*Perotis rara*	comet grass		C		1/1
plants	land plants	Poaceae	*Melinis repens*	red natal grass	Y			2
plants	land plants	Poaceae	*Panicum effusum*			C		2
plants	land plants	Poaceae	*Setaria surgens*			C		1/1
plants	land plants	Poaceae	*Digitaria orbata*			C		1/1
plants	land plants	Poaceae	*Themeda triandra*	kangaroo grass		C		4/1
plants	land plants	Poaceae	*Aristida echinata*			C		1
plants	land plants	Poaceae	*Aristida muricata*			C		1/1
plants	land plants	Poaceae	*Astrebla lappacea*	curly mitchell grass		C		1/1
plants	land plants	Poaceae	*Cenchrus ciliaris*		Y			4
plants	land plants	Poaceae	*Cenchrus setaceus*		Y			11
plants	land plants	Poaceae	*Digitaria brownii*			C		1/1
plants	land plants	Poaceae	*Enneapogon virens*			C		1/1
plants	land plants	Poaceae	*Phalaris paradoxa*	paradoxa grass	Y			1/1
plants	land plants	Poaceae	*Sporobolus caroli*	fairy grass		C		2
plants	land plants	Poaceae	*Thellungia advena*	coolibah grass		C		3
plants	land plants	Poaceae	*Triticum aestivum*	wheat	Y			1/1
plants	land plants	Poaceae	*Urochloa pubigera*			C		1/1
plants	land plants	Poaceae	*Aristida leptopoda*	white speargrass		C		1
plants	land plants	Poaceae	*Aristida personata*			C		4
plants	land plants	Poaceae	*Austrostipa scabra*			C		1/1
plants	land plants	Poaceae	*Bromus catharticus*	prairie grass	Y			1/1
plants	land plants	Poaceae	*Chloris ventricosa*	tall chloris		C		2
plants	land plants	Poaceae	*Chrysopogon fallax*			C		1
plants	land plants	Poaceae	*Eragrostis curvula*		Y			2/2
plants	land plants	Poaceae	*Paspalum dilatatum*	paspalum	Y			3
plants	land plants	Poaceae	*Paspalum distichum*	water couch	Y			1
plants	land plants	Poaceae	*Cymbopogon obtectus*			C		1/1

Kingdom	Class	Family	Scientific Name	Common Name	I	Q	A	Records
plants	land plants	Poaceae	*Digitaria ammophila*	silky umbrella grass		C		1/1
plants	land plants	Poaceae	*Eragrostis elongata*			C		2
plants	land plants	Poaceae	*Homopholis belsonii*			E	V	1/1
plants	land plants	Poaceae	*Imperata cylindrica*	blady grass		C		1/1
plants	land plants	Poaceae	*Paspalidium gracile*	slender panic		C		2
plants	land plants	Poaceae	*Tragus australianus*	small burr grass		C		2
plants	land plants	Poaceae	*Aristida platychaeta*			C		2/2
plants	land plants	Poaceae	*Aristida psammophila*			C		1
plants	land plants	Poaceae	*Cymbopogon refractus*	barbed-wire grass		C		3
plants	land plants	Poaceae	*Enneapogon avenaceus*			C		3
plants	land plants	Poaceae	*Eragrostis lacunaria*	purple lovegrass		C		2/1
plants	land plants	Poaceae	*Sporobolus elongatus*			C		2/1
plants	land plants	Poaceae	*Eragrostis parviflora*	weeping lovegrass		C		1/1
plants	land plants	Poaceae	*Heteropogon contortus*	black speargrass		C		5/1
plants	land plants	Poaceae	*Sporobolus natalensis*		Y			1/1
plants	land plants	Poaceae	*Alloteropsis semialata*	cockatoo grass		C		1/1
plants	land plants	Poaceae	*Arundinella nepalensis*	reedgrass		C		3/1
plants	land plants	Poaceae	*Enneapogon lindleyanus*			C		2/1
plants	land plants	Poaceae	*Enteropogon acicularis*	curly windmill grass		C		3
plants	land plants	Poaceae	*Eragrostis alveiformis*			C		2
plants	land plants	Poaceae	*Eragrostis cilianensis*		Y			2/2
plants	land plants	Poaceae	*Eragrostis trichophora*		Y			1/1
plants	land plants	Poaceae	*Paspalidium globoideum*	sago grass		C		2/2
plants	land plants	Poaceae	*Urochloa mosambicensis*	sabi grass	Y			1/1
plants	land plants	Poaceae	*Ancistrachne uncinulata*	hooky grass		C		1
plants	land plants	Poaceae	*Austrostipa ramosissima*	bamboo grass		C		1/1
plants	land plants	Poaceae	*Eragrostis leptostachya*			C		1/1
plants	land plants	Poaceae	*Eragrostis megalosperma*			C		2/2
plants	land plants	Poaceae	*Eragrostis spartinoides*			C		1/1
plants	land plants	Poaceae	*Paspalidium caespitosum*	brigalow grass		C		1/1
plants	land plants	Poaceae	*Polypogon monspeliensis*	annual beardgrass	Y			1/1
plants	land plants	Poaceae	*Rytidosperma bipartitum*			C		2/2
plants	land plants	Poaceae	*Capillipedium spicigerum*	spicytop		C		1
plants	land plants	Poaceae	*Lachnagrostis filiformis*			C		1
plants	land plants	Polygonaceae	*Persicaria subsessilis*	hairy knotweed		C		1/1
plants	land plants	Polygonaceae	*Rumex brownii*	swamp dock		C		1
plants	land plants	Polygonaceae	*Rumex crispus*	curled dock	Y			2/2
plants	land plants	Polygonaceae	*Polygonum aviculare*	wireweed	Y			1/1
plants	land plants	Polygonaceae	*Rumex tenax*			C		1/1
plants	land plants	Portulacaceae	*Portulaca*					1/1
plants	land plants	Portulacaceae	*Portulaca pilosa*		Y			1
plants	land plants	Potamogetonaceae	*Potamogeton tricarinatus*	floating pondweed		C		1/1
plants	land plants	Pottiaceae	*Syntrichia laevipila*			C		4/4
plants	land plants	Pteridaceae	*Pellaea falcata*			C		1/1
plants	land plants	Pteridaceae	*Cheilanthes distans*	bristly cloak fern		C		1/1
plants	land plants	Pteridaceae	*Platyzoma microphyllum*	braid fern		C		2/2

Kingdom	Class	Family	Scientific Name	Common Name	I	Q	A	Records
plants	land plants	Pteridaceae	*Cheilanthes sieberi subsp. sieberi*			C		2/2
plants	land plants	Ptychomitriaceae	*Ptychomitrium australe*			C		4/4
plants	land plants	Ranunculaceae	*Clematis microphylla*			C		1/1
plants	land plants	Ranunculaceae	*Ranunculus sessiliflorus var. sessiliflorus*			C		1/1
plants	land plants	Rhamnaceae	*Cryptandra longistaminea*			C		1/1
plants	land plants	Ricciaceae	*Riccia*					1/1
plants	land plants	Rubiaceae	*Asperula geminifolia*			C		1/1
plants	land plants	Rubiaceae	*Asperula conferta*			C		1
plants	land plants	Rubiaceae	*Paranotis mitrasacmoides subsp. trachymenoides*			C		1/1
plants	land plants	Rubiaceae	*Psydrax odorata subsp. australiana*			C		1/1
plants	land plants	Rutaceae	*Geijera parviflora*	wilga		C		6
plants	land plants	Santalaceae	*Santalum lanceolatum*			C		1/1
plants	land plants	Santalaceae	*Anthobolus leptomerioides*			C		1/1
plants	land plants	Sapindaceae	*Alectryon oleifolius subsp. elongatus*			C		1
plants	land plants	Sapindaceae	*Atalaya hemiglauca*			C		3/1
plants	land plants	Sapotaceae	*Planchonella cotinifolia var. pubescens*			C		1/1
plants	land plants	Scrophulariaceae	*Myoporum acuminatum*	coastal boobialla		C		2/1
plants	land plants	Scrophulariaceae	*Eremophila mitchellii*			C		10
plants	land plants	Scrophulariaceae	*Verbascum virgatum*	twiggy mullein	Y			2/2
plants	land plants	Scrophulariaceae	*Eremophila deserti*			C		2/2
plants	land plants	Solanaceae	*Solanum ellipticum*	potato bush		C		2/1
plants	land plants	Solanaceae	*Solanum nigrum*		Y			1/1
plants	land plants	Solanaceae	*Physalis lanceifolia*		Y			1/1
plants	land plants	Solanaceae	*Lycium ferocissimum*	African boxthorn	Y			2/2
plants	land plants	Solanaceae	*Solanum parvifolium subsp. parvifolium*			C		1/1
plants	land plants	Solanaceae	*Solanum sisymbriifolium*		Y			2/2
plants	land plants	Solanaceae	*Solanum mitchellianum*			C		2/2
plants	land plants	Solanaceae	*Solanum ferocissimum*			C		1/1
plants	land plants	Solanaceae	*Solanum esuriale*	quena		C		1/1
plants	land plants	Surianaceae	*Cadellia pentastylis*	ooline		V	V	1/1
plants	land plants	Thymelaeaceae	*Pimelea microcephala subsp. microcephala*			C		1/1
plants	land plants	Thymelaeaceae	*Pimelea trichostachya*	flaxweed		C		2/2
plants	land plants	Verbenaceae	*Glandularia aristigera*		Y			3
plants	land plants	Verbenaceae	*Verbena litoralis var. litoralis*		Y			1/1
plants	land plants	Verbenaceae	*Verbena incompta*		Y			1/1
plants	land plants	Violaceae	*Afrohybanthus stellarioides*			C		3/3
plants	land plants	Viscaceae	*Korthalsella rubra subsp. geijericola*			C		2/2
plants	land plants	Viscaceae	*Viscum whitei subsp. whitei*			C		1/1
plants	land plants	Xyridaceae	*Xyris complanata*	yellow-eye		C		2/1
plants	land plants	Zygophyllaceae	*Tribulus micrococcus*	yellow vine		C		1/1
plants	land plants	Zygophyllaceae	*Zygophyllum glaucum*	pale twinleaf		C		1/1
plants	land plants	Zygophyllaceae	*Zygophyllum apiculatum*	gall weed		C		1/1

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 in the Wild (PE), Endangered (E), Vulnerable (V), Near Threatened (NT), Least Concern (C) or Not Protected ( ).

A - Indicates the Australian conservation status of each taxon under the *Environment Protection and Biodiversity Conservation Act 1999.* The values of EPBC are Conservation Dependent (CD), Critically Endangered (CE), Endangered (E), Extinct (EX), Extinct in the Wild (XW) and Vulnerable (V).

Records – The first number indicates the total number of records of the taxon for the record option selected (i.e. All, Confirmed or Specimens).
This number is output as 99999 if it equals or exceeds this value. The second number located after the / indicates the number of specimen records for the taxon.
This number is output as 999 if it equals or exceeds this value.

Appendix B

Scoring Species Habitat Attributes

Appendix B Fauna habitat index scoring criteria

To complete the habitat quality assessment method, species-specific habitat attributes must be assessed in areas of potential habitat. This assessment allows a determination to be made about a sites capacity to support a species for all or part of its life cycle, permanently or from time to time, based on the following attributes:

- Quality and availability of food and habitat required for foraging
- Quality and availability of habitat required for shelter and breeding
- Quality and availability of habitat required for mobility
- Absence of threats.

Table 16 below details how each habitat attribute (quality and availability) has been assessed for individual species. The assessment of threats (absence of threats) considers both the severity of threat and the spatial extent of related impacts in the area.

Table 16 Habitat quality and availability assessment parameters per species

Species	Foraging and food	Shelter and breeding	Movement
Koala (*Phascolarctos cinereus*)	Dominance of myrtaceous (Eucalyptus, Angophora, Corymbia) trees, number large trees; presence of favoured feed species (*E. tereticornis*, *E. camaldulensis*, *E. major*, *E. longirostrata*), other feed trees (*E. chloroclada*, *E. populnea*, *E. crebra*, *E. melanophloia*, *E. orgadophila*, *C. citriodora*); presence of adjacent waterbodies or streamlines.	Number large trees.	Contiguous remnant/regrowth cover, rate cleared 1 to full remnant 5.
Greater glider (*Petauroides volans*)	Dominance of myrtaceous (Eucalyptus, Angophora, Corymbia) trees, number large trees.	Number of tree hollows ≥ 10cm.	Contiguous remnant/regrowth cover, rate cleared 1 to full remnant 5.
South-eastern long-eared bat (*Nyctophilus corbeni*)	Wooded cover (rate cleared 1 to full remnant 5), presence of cypress pine (yes, dominant = 5; yes, sub-dominant = 3, no = 1).	Rate presence of loose bark, smaller hollows (count data).	Contiguous remnant/regrowth cover, rate cleared 1 to full remnant 5.
Australasian bittern (*Botaurus poiciloptilus*)	Presence and extent of shallow swamps with reeds.	Presence and extent of shallow swamps with reeds.	Proximity to wetland habitats.
Australian painted snipe (*Rostratula australis*)	Presence of shallow swamps with low vegetation.	Presence of shallow swamps with low vegetation.	Proximity to wetland habitats.
Glossy black cockatoo (*Calyptorhynchus lathami*)	Presence and abundance of *Casuarina sp.* or *Allocasuarina sp.* in the canopy.	Number of tree hollows ≥ 10cm.	Contiguous remnant/regrowth cover, rate cleared 1 to full remnant 5.

Species	Foraging and food	Shelter and breeding	Movement
Painted honeyeater (*Grantiella picta*)	Presence and abundance of mistletoe.	Presence of Acacia spp. (e.g. *A. harpophylla*, *A. pendula*, and *A. aneura*), belah (*Casuarina cristata*), bull-oak (*Allocasuarina luehmannii*) and *Callitris glaucophylla*.	Contiguous remnant/regrowth cover, rate cleared 1 to full remnant 5.
White-throated needletail (*Hirundapus caudacutus*)	Presence and diversity of insects. Sites that are highly connected may provide better foraging opportunities.	This species is almost exclusively aerial and no breeding occurs in Australia. All sites to score 0 (minimum score).	Due to its highly mobile nature habitat condition does not change movement potential. All sites score 25 (maximum score).
Collared delma (*Delma torquata*)	Evidence of small invertebrates, litter cover stone cover.	Litter cover, stone cover.	Litter cover, stone cover, contiguous remnant/regrowth cover, rate cleared 1 to full remnant 5.
Golden-tailed gecko (*Strophurus taenicauda*)	Presence of trees with decorticating bark or deep furrowing bark.	Presence of preferred habitat trees including brigalow (*Acacia harpophylla*), belah (*Casuarina cristata*) and white cypress pine (*Callitris glaucophylla*).	Presence of trees with decorticating bark or deep furrowing bark; rate cleared 1 to full remnant 5.
Yakka skink (*Egernia rugosa*)	Evidence of insect and other arthropods, ground cover (litter, grass).	Presence of logs (large, hollow, mostly on ground); direct evidence of occupation (burrows, scats).	Contiguous remnant/regrowth cover, rate cleared 1 to full remnant 5.
Woma python (*Aspidites ramsayi*)	Litter, coarse woody debris / log abundance (shelter for prey).	Presence of soil cracks and large hollow logs	Contiguous remnant/regrowth cover, rate cleared 1 to full remnant 5. High weed cover reduces overall score.
Dunmall's snake (*Furina dunmalli*)	Litter, log abundance (shelter for prey).	Unknown but possibly logs (count).	Contiguous remnant/regrowth cover, rate cleared 1 to full remnant 5. High weed cover reduces overall score.
Grey snake (*Hemiaspis damelii*)	Eucalypt habitat; located within or in proximity to a drainage line or depression which may	Abundance of coarse woody debris	Contiguous remnant/regrowth cover, rate cleared 1 to full remnant 5. High weed cover reduces overall score.

Species	Foraging and food	Shelter and breeding	Movement
	be periodically inundated (frog habitat).		
Murray cod (*Maccullochella peelii*)	Aquatic habitat with flow.	Presence of submerged microhabitat (logs or rocks) or clay substrates.	Aquatic habitat with flow.
Pale imperial hairstreak butterfly (*Jalmenus eubulus*)	Presence of *Acacia harpophylla*.	Presence of *Acacia harpophylla*.	*Acacia harpophylla* dominant contiguous remnant/regrowth cover, rate cleared 1 to full remnant 5.

Table 17 Habitat index scoring

Habitat quality site	Analogous RE	Greater glider				Koala			
		Foraging and Food	Shelter and Breeding	Movement	Threats	Foraging and Food	Shelter and Breeding	Movement	Threats
B01	11.10.11	15	10	5	6	15	10	15	6
B02	11.3.2 (HVR)	10	5	5	4	15	10	15	4
B03	11.3.2	15	10	10	6	20	20	15	6
B04	11.9.5	5	5	5	4	5	15	15	4
B05	11.3.25	20	15	15	10	20	15	20	10
B06	11.3.1	5	5	10	6	5	5	15	10
B07	11.3.18	15	15	20	10	15	20	20	10
B08	11.8.x	0	0	10	6	0	0	10	6
B09	11.8.3	0	0	10	6	0	0	10	6
B10	11.8.x	0	0	10	6	0	0	10	6
B11	11.8.3	0	0	5	4	0	0	10	6
B12	11.8.5	10	10	10	4	20	20	15	10
B13	11.9.10	5	5	10	6	5	5	15	10
B14	11.3.17	15	10	10	4	20	20	15	6
B15	11.9.4 (HVR)	0	0	5	4	0	0	10	6
B16	11.9.5 (HVR)	0	0	5	4	0	0	10	4
B17	11.9.10	10	10	5	4	15	5	10	4
B18	11.3.17 (HVR)	10	10	5	4	15	10	10	4
B19	11.3.27	15	10	10	4	20	20	15	6
B20	11.9.5 (HVR)	0	0	5	4	0	0	10	4
B21	11.9.10 (HVR)	5	5	5	4	5	5	10	6
B22	11.10.9	15	5	15	10	15	20	15	10

Habitat quality site	Analogous RE	Greater glider				Koala			
		Foraging and Food	Shelter and Breeding	Movement	Threats	Foraging and Food	Shelter and Breeding	Movement	Threats
B23	11.9.5 (HVR)	0	0	5	4	0	0	10	4
B24	11.9.10 (HVR)	5	5	5	4	5	5	10	6
B25	11.5.1	15	10	15	10	15	15	20	10
B26	11.9.5	5	5	5	4	5	5	15	4
B27	11.3.18	10	0	15	4	10	5	20	4
B28	11.3.1	5	5	10	6	5	5	15	6
B29	11.9.10	15	10	15	10	15	20	20	10
B30	11.3.2	10	5	15	10	15	15	20	10
B31	11.3.25	20	15	15	10	20	20	20	10

Habitat quality site	Analogous RE	South-eastern long-eared bat				Australasian bittern			
		Foraging and Food	Shelter and Breeding	Movement	Threats	Foraging and Food	Shelter and Breeding	Movement	Threats
B01	11.10.11	15	10	15	6	0	0	5	1
B02	11.3.2 (HVR)	10	5	15	4	0	0	5	1
B03	11.3.2	15	10	15	6	0	0	5	1
B04	11.9.5	15	15	15	6	0	0	5	1
B05	11.3.25	15	15	20	10	5	0	10	1
B06	11.3.1	15	10	20	10	0	0	5	1
B07	11.3.18	20	15	20	10	0	0	5	1
B08	11.8.x	20	10	20	10	0	0	5	1
B09	11.8.3	20	5	20	10	0	0	5	1
B10	11.8.x	20	10	20	10	0	0	5	1
B11	11.8.3	20	5	20	10	0	0	5	1

Habitat quality site	Analogous RE	South-eastern long-eared bat				Australasian bittern			
		Foraging and Food	Shelter and Breeding	Movement	Threats	Foraging and Food	Shelter and Breeding	Movement	Threats
B12	11.8.5	20	15	20	10	0	0	5	1
B13	11.9.10	15	15	20	10	0	0	5	1
B14	11.3.17	10	5	15	6	0	0	5	1
B15	11.9.4 (HVR)	15	5	20	10	0	0	5	1
B16	11.9.5 (HVR)	10	5	15	4	0	0	5	1
B17	11.9.10	20	20	15	10	0	0	5	1
B18	11.3.17 (HVR)	10	5	15	4	0	0	5	1
B19	11.3.27	15	10	15	6	5	0	10	1
B20	11.9.5 (HVR)	10	5	15	4	0	0	5	1
B21	11.9.10 (HVR)	10	5	15	4	0	0	5	1
B22	11.10.9	20	15	20	10	0	0	5	1
B23	11.9.5 (HVR)	10	5	15	4	0	0	5	1
B24	11.9.10 (HVR)	15	5	15	4	0	0	5	1
B25	11.5.1	20	15	20	10	0	0	5	1
B26	11.9.5	10	15	15	6	0	0	5	1
B27	11.3.18	20	10	20	10	0	0	10	1
B28	11.3.1	10	10	15	10	0	0	5	1
B29	11.9.10	15	15	20	10	0	0	5	1
B30	11.3.2	10	10	20	10	0	0	10	1
B31	11.3.25	10	10	20	10	5	0	10	1

Habitat quality site	Analogous RE	Curlew sandpiper				Glossy black cockatoo			
		Foraging and Food	Shelter and Breeding	Movement	Threats	Foraging and Food	Shelter and Breeding	Movement	Threats
B01	11.10.11	0	0	5	1	0	5	15	3
B02	11.3.2 (HVR)	0	0	5	1	0	5	20	3
B03	11.3.2	0	0	5	1	0	10	20	6
B04	11.9.5	0	0	5	1	20	5	20	6
B05	11.3.25	5	0	10	1	0	15	20	10
B06	11.3.1	0	0	5	1	0	5	20	6
B07	11.3.18	0	0	5	1	5	15	20	10
B08	11.8.x	0	0	5	1	5	0	20	6
B09	11.8.3	0	0	5	1	0	0	20	6
B10	11.8.x	0	0	5	1	0	0	20	6
B11	11.8.3	0	0	5	1	0	0	20	6
B12	11.8.5	0	0	5	1	5	5	20	6
B13	11.9.10	0	0	5	1	5	5	20	6
B14	11.3.17	0	0	5	1	0	5	20	6
B15	11.9.4 (HVR)	0	0	5	1	0	0	20	6
B16	11.9.5 (HVR)	0	0	5	1	0	0	15	6
B17	11.9.10	0	0	5	1	5	10	20	6
B18	11.3.17 (HVR)	0	0	5	1	0	5	15	6
B19	11.3.27	5	0	10	1	0	10	15	6
B20	11.9.5 (HVR)	0	0	5	1	0	0	15	3
B21	11.9.10 (HVR)	0	0	5	1	0	5	15	3
B22	11.10.9	0	0	5	1	20	10	20	6
B23	11.9.5 (HVR)	0	0	5	1	0	0	15	6

Habitat quality site	Analogous RE	Curlew sandpiper				Glossy black cockatoo			
		Foraging and Food	Shelter and Breeding	Movement	Threats	Foraging and Food	Shelter and Breeding	Movement	Threats
B24	11.9.10 (HVR)	0	0	5	1	0	5	15	3
B25	11.5.1	0	0	5	1	5	0	15	3
B26	11.9.5	0	0	5	1	20	5	20	6
B27	11.3.18	0	0	10	1	0	0	20	6
B28	11.3.1	0	0	5	1	0	5	20	6
B29	11.9.10	0	0	5	1	0	5	20	6
B30	11.3.2	0	0	10	1	0	5	20	6
B31	11.3.25	5	0	10	1	0	15	20	10

Habitat quality site	Analogous RE	Painted honeyeater				White-throated needletail			
		Foraging and Food	Shelter and Breeding	Movement	Threats	Foraging and Food	Shelter and Breeding	Movement	Threats
B01	11.10.11	0	10	20	3	20	0	25	20
B02	11.3.2 (HVR)	0	5	15	3	20	0	25	15
B03	11.3.2	0	20	20	3	20	0	25	20
B04	11.9.5	0	10	20	3	20	0	25	20
B05	11.3.25	0	15	20	3	20	0	25	20
B06	11.3.1	0	10	20	3	20	0	25	20
B07	11.3.18	0	20	20	3	20	0	25	20
B08	11.8.x	5	10	20	6	25	0	25	25
B09	11.8.3	0	0	15	6	25	0	25	25
B10	11.8.x	5	10	20	6	25	0	25	25
B11	11.8.3	5	0	15	6	20	0	25	20

Habitat quality site	Analogous RE	Painted honeyeater				White-throated needletail			
		Foraging and Food	Shelter and Breeding	Movement	Threats	Foraging and Food	Shelter and Breeding	Movement	Threats
B12	11.8.5	0	15	20	6	20	0	25	20
B13	11.9.10	0	15	20	6	20	0	25	20
B14	11.3.17	0	10	20	6	20	0	25	20
B15	11.9.4 (HVR)	0	0	15	3	20	0	25	20
B16	11.9.5 (HVR)	5	5	15	3	20	0	25	20
B17	11.9.10	0	0	15	3	20	0	25	20
B18	11.3.17 (HVR)	0	5	15	3	20	0	25	20
B19	11.3.27	0	5	15	3	20	0	25	20
B20	11.9.5 (HVR)	0	10	15	3	20	0	25	20
B21	11.9.10 (HVR)	0	5	15	3	20	0	25	20
B22	11.10.9	0	5	20	6	20	0	25	20
B23	11.9.5 (HVR)	0	10	15	3	20	0	25	20
B24	11.9.10 (HVR)	5	5	15	3	20	0	25	20
B25	11.5.1	0	5	20	3	20	0	25	20
B26	11.9.5	0	10	20	3	20	0	25	20
B27	11.3.18	10	15	20	3	20	0	25	20
B28	11.3.1	0	10	20	3	20	0	25	20
B29	11.9.10	0	10	20	3	20	0	25	20
B30	11.3.2	0	0	15	3	20	0	25	20
B31	11.3.25	0	0	15	6	20	0	25	20

Habitat quality site	Analogous RE	Australian painted snipe				Collared delma			
		Foraging and Food	Shelter and Breeding	Movement	Threats	Foraging and Food	Shelter and Breeding	Movement	Threats
B01	11.10.11	0	0	5	1	10	10	10	6
B02	11.3.2 (HVR)	0	0	5	1	5	5	5	3
B03	11.3.2	0	0	5	1	15	15	10	6
B04	11.9.5	0	0	5	1	15	15	10	6
B05	11.3.25	5	0	10	1	15	0	5	2
B06	11.3.1	0	0	5	1	15	15	15	10
B07	11.3.18	0	0	5	1	20	15	15	10
B08	11.8.x	0	0	5	1	15	15	5	10
B09	11.8.3	0	0	5	1	15	15	10	10
B10	11.8.x	0	0	5	1	15	15	5	10
B11	11.8.3	0	0	5	1	15	10	10	6
B12	11.8.5	0	0	5	1	15	15	10	8
B13	11.9.10	0	0	5	1	15	15	10	6
B14	11.3.17	0	0	5	1	10	10	5	6
B15	11.9.4 (HVR)	0	0	5	1	10	10	5	6
B16	11.9.5 (HVR)	0	0	5	1	10	10	10	6
B17	11.9.10	0	0	5	1	10	10	10	6
B18	11.3.17 (HVR)	0	0	5	1	10	10	5	6
B19	11.3.27	5	0	10	1	5	5	5	3
B20	11.9.5 (HVR)	0	0	5	1	5	5	5	3
B21	11.9.10 (HVR)	0	0	5	1	5	5	5	3
B22	11.10.9	0	0	5	1	10	10	10	6
B23	11.9.5 (HVR)	0	0	5	1	5	5	5	3

Habitat quality site	Analogous RE	Australian painted snipe				Collared delma			
		Foraging and Food	Shelter and Breeding	Movement	Threats	Foraging and Food	Shelter and Breeding	Movement	Threats
B24	11.9.10 (HVR)	0	0	5	1	5	5	5	3
B25	11.5.1	0	0	5	1	5	5	5	3
B26	11.9.5	0	0	5	1	15	15	10	6
B27	11.3.18	0	0	5	1	20	15	15	6
B28	11.3.1	0	0	5	1	10	10	10	10
B29	11.9.10	0	0	5	1	15	15	15	10
B30	11.3.2	0	0	5	1	10	10	10	6
B31	11.3.25	5	0	10	1	15	15	10	6

Habitat quality site	Analogous RE	Golden-tailed gecko				Yakka skink			
		Foraging and Food	Shelter and Breeding	Movement	Threats	Foraging and Food	Shelter and Breeding	Movement	Threats
B01	11.10.11	10	10	10	6	5	5	10	6
B02	11.3.2 (HVR)	5	0	5	3	5	0	10	3
B03	11.3.2	15	15	15	8	15	10	10	8
B04	11.9.5	15	15	15	8	15	10	10	6
B05	11.3.25	15	0	5	2	15	0	5	2
B06	11.3.1	15	10	10	10	15	5	10	4
B07	11.3.18	20	15	15	10	15	10	10	8
B08	11.8.x	15	15	5	10	10	10	5	10
B09	11.8.3	5	0	5	8	5	0	5	8
B10	11.8.x	15	15	5	10	10	10	5	10
B11	11.8.3	5	0	5	6	5	0	5	6

Habitat quality site	Analogous RE	Golden-tailed gecko				Yakka skink			
		Foraging and Food	Shelter and Breeding	Movement	Threats	Foraging and Food	Shelter and Breeding	Movement	Threats
B12	11.8.5	15	10	10	8	15	10	10	8
B13	11.9.10	15	15	15	8	10	10	10	6
B14	11.3.17	5	0	5	8	10	10	10	6
B15	11.9.4 (HVR)	5	0	5	3	5	0	5	6
B16	11.9.5 (HVR)	10	10	5	3	5	5	5	6
B17	11.9.10	5	10	10	6	5	5	10	6
B18	11.3.17 (HVR)	0	10	5	3	5	0	5	3
B19	11.3.27	5	0	5	2	5	5	5	2
B20	11.9.5 (HVR)	0	10	5	2	5	0	5	2
B21	11.9.10 (HVR)	0	10	5	3	5	0	5	2
B22	11.10.9	5	10	10	6	10	10	10	6
B23	11.9.5 (HVR)	5	10	5	3	5	5	5	2
B24	11.9.10 (HVR)	0	10	5	3	5	0	5	2
B25	11.5.1	0	0	5	6	5	0	5	4
B26	11.9.5	15	15	15	8	10	10	10	8
B27	11.3.18	15	10	10	6	15	5	5	4
B28	11.3.1	15	10	10	10	15	5	10	8
B29	11.9.10	15	10	10	8	15	5	10	8
B30	11.3.2	5	0	5	2	5	10	10	8
B31	11.3.25	15	0	5	2	15	10	10	4

Habitat quality site	Analogous RE	Woma python				Dunmall's snake			
		Foraging and Food	Shelter and Breeding	Movement	Threats	Foraging and Food	Shelter and Breeding	Movement	Threats
B01	11.10.11	5	5	10	6	5	5	10	6
B02	11.3.2 (HVR)	5	0	10	3	5	0	10	3
B03	11.3.2	15	10	15	8	15	15	15	8
B04	11.9.5	10	10	15	6	15	15	15	8
B05	11.3.25	15	0	5	2	15	5	10	6
B06	11.3.1	15	5	10	4	15	10	10	6
B07	11.3.18	15	10	10	8	20	15	15	10
B08	11.8.x	10	10	5	10	15	15	5	10
B09	11.8.3	5	0	5	8	5	0	5	8
B10	11.8.x	10	10	5	10	15	15	5	10
B11	11.8.3	5	0	5	6	5	0	5	8
B12	11.8.5	15	10	10	8	15	10	10	8
B13	11.9.10	15	10	10	8	15	10	10	8
B14	11.3.17	10	10	5	6	15	10	5	6
B15	11.9.4 (HVR)	5	0	5	6	5	0	5	6
B16	11.9.5 (HVR)	5	0	5	6	5	5	5	3
B17	11.9.10	5	0	10	6	5	5	10	6
B18	11.3.17 (HVR)	5	0	5	3	5	0	5	3
B19	11.3.27	5	0	5	2	5	0	5	3
B20	11.9.5 (HVR)	5	0	5	2	5	0	5	3
B21	11.9.10 (HVR)	5	0	5	2	5	0	5	3
B22	11.10.9	10	10	10	8	15	10	10	8

Habitat quality site	Analogous RE	Woma python				Dunmall's snake			
		Foraging and Food	Shelter and Breeding	Movement	Threats	Foraging and Food	Shelter and Breeding	Movement	Threats
B23	11.9.5 (HVR)	5	0	5	3	5	5	5	3
B24	11.9.10 (HVR)	5	0	5	2	5	0	5	3
B25	11.5.1	5	0	5	3	5	0	5	3
B26	11.9.5	10	15	15	8	15	15	15	8
B27	11.3.18	15	5	10	6	20	10	10	8
B28	11.3.1	15	5	10	6	15	10	10	8
B29	11.9.10	15	5	10	6	15	10	10	8
B30	11.3.2	10	5	5	6	5	10	10	6
B31	11.3.25	10	15	10	4	20	15	15	6

Habitat quality site	Analogous RE	Grey snake				Murray cod			
		Foraging and Food	Shelter and Breeding	Movement	Threats	Foraging and Food	Shelter and Breeding	Movement	Threats
B01	11.10.11	0	0	5	3	0	0	0	1
B02	11.3.2 (HVR)	10	5	10	4	0	0	0	1
B03	11.3.2	15	15	10	8	0	0	0	1
B04	11.9.5	0	0	5	3	0	0	0	1
B05	11.3.25	10	15	15	8	0	0	0	1
B06	11.3.1	15	15	15	8	0	0	0	1
B07	11.3.18	10	10	10	4	0	0	0	1
B08	11.8.x	0	0	5	3	0	0	0	1
B09	11.8.3	0	0	5	3	0	0	0	1
B10	11.8.x	0	0	5	3	0	0	0	1

Habitat quality site	Analogous RE	Grey snake				Murray cod			
		Foraging and Food	Shelter and Breeding	Movement	Threats	Foraging and Food	Shelter and Breeding	Movement	Threats
B11	11.8.3	0	0	5	3	0	0	0	1
B12	11.8.5	0	0	5	3	0	0	0	1
B13	11.9.10	0	0	5	3	0	0	0	1
B14	11.3.17	0	5	10	3	0	0	0	1
B15	11.9.4 (HVR)	0	0	5	3	0	0	0	1
B16	11.9.5 (HVR)	0	0	5	3	0	0	0	1
B17	11.9.10	0	0	5	3	0	0	0	1
B18	11.3.17 (HVR)	10	5	5	3	0	0	0	1
B19	11.3.27	15	10	10	4	0	0	0	1
B20	11.9.5 (HVR)	0	0	5	3	0	0	0	1
B21	11.9.10 (HVR)	0	0	5	3	0	0	0	1
B22	11.10.9	0	0	5	4	0	0	0	1
B23	11.9.5 (HVR)	0	0	5	3	0	0	0	1
B24	11.9.10 (HVR)	0	0	5	3	0	0	0	1
B25	11.5.1	0	0	5	3	0	0	0	1
B26	11.9.5	0	0	5	3	0	0	0	1
B27	11.3.18	15	15	10	8	0	0	0	1
B28	11.3.1	10	15	15	8	0	0	0	1
B29	11.9.10	0	5	5	4	0	0	0	1
B30	11.3.2	15	15	10	8	0	0	0	1
B31	11.3.25	15	15	15	8	0	0	0	1

Habitat quality site	Analogous RE	Pale imperial hairstreak butterfly			
		Foraging and Food	Shelter and Breeding	Movement	Threats
B01	11.10.11	0	0	0	1
B02	11.3.2 (HVR)	0	0	0	1
B03	11.3.2	0	0	0	1
B04	11.9.5	0	0	0	1
B05	11.3.25	0	0	0	1
B06	11.3.1	20	15	15	20
B07	11.3.18	0	0	0	1
B08	11.8.x	20	20	15	25
B09	11.8.3	0	0	0	1
B10	11.8.x	15	15	15	20
B11	11.8.3	0	0	0	1
B12	11.8.5	0	0	0	1
B13	11.9.10	15	15	15	20
B14	11.3.17	15	15	15	20
B15	11.9.4 (HVR)	0	0	0	1
B16	11.9.5 (HVR)	15	15	10	20
B17	11.9.10	0	0	0	1
B18	11.3.17 (HVR)	15	15	10	1
B19	11.3.27	0	0	0	1
B20	11.9.5 (HVR)	15	15	15	20
B21	11.9.10 (HVR)	15	15	15	20
B22	11.10.9	0	0	0	1
B23	11.9.5 (HVR)	15	15	10	20

Habitat quality site	Analogous RE	Pale imperial hairstreak butterfly			
		Foraging and Food	Shelter and Breeding	Movement	Threats
B24	11.9.10 (HVR)	15	15	10	20
B25	11.5.1	0	0	0	1
B26	11.9.5	5	0	0	1
B27	11.3.18	0	0	0	1
B28	11.3.1	20	15	15	20
B29	11.9.10	0	0	0	1
B30	11.3.2	0	0	0	1
B31	11.3.25	0	0	0	1

Appendix C

Site Condition and Context Assessment Scores

Appendix C Site condition and context assessment scores

Table 18 Survey site condition and context assessment data

	AU1				AU 2				AU3	
RE	**11.3.1**		**11.3.1**		**11.3.2**		**11.3.2**		**11.3.2(HVR)**	
Site ID	**B06**		**B28**		**B03**		**B30**		**B02**	
Field based attributes	**Raw**	**Score**	**Raw**	**Score**	**Raw**	**Score**	**Raw**	**Score**	**Raw**	**Score**
Recruitment of woody perennial species	100	5	100	5	100	5	100	5	100	5
Native plant species richness										
Trees	5	5	8	5	5	5	6	5	1	2.5
Shrubs	5	5	6	5	4	5	2	5	1	2.5
Grasses	5	5	4	5	3	2.5	8	2.5	3	2.5
Forbs	7	2.5	0	0	6	2.5	9	2.5	4	0
Tree Canopy Height	12	5	12	5	13	5	16	5	10	3
Sub-canopy Height	4	0	10		na		9		na	
Tree Canopy Cover	38.7	4	37.3	2.5	44.9	5	36.5	5	3.4	0
Sub-canopy Cover	21.5	0	0.8		na		17.9		na	
Shrub canopy cover	0.3	0	3.8	3	0.6	3	0	0	0	0
Native perennial grass cover	5	3	1.8	1	1.4	0	18.8	3	18	3
Organic litter cover	29	5	57	5	29.8	5	58.6	5	57	5
Large trees	6	5	4	5	30	15	16	10	2	5
Coarse woody debris	122.1	0	798	2	197.5	5	158	5	9.1	0
Weed cover	5	5	65	0	15	5	30	3	0	10
Site condition score (maximum 80)		49.5		43.5		63		56		38.5
GIS based attributes										
Fragmented - Patch size		7		2		0		2		0
Fragmented - Connectivity		4		0		0		0		0
Fragmented - Context		2		0		0		2		0
Ecological Corridors		0		0		0		6		0
Landscape context score (maximum 26)		13		2		0		10		0
Total site and context score (maximum 106)		62.5		45.5		63		66		38.5

	AU4		AU5		AU6			
RE	**11.3.17**		**11.3.17(HVR)**		**11.3.18**		**11.3.18**	
Site ID	**B14**		**B18**		**B07**		**B27**	
Field based attributes	**Raw**	**Score**	**Raw**	**Score**	**Raw**	**Score**	**Raw**	**Score**
Recruitment of woody perennial species	50	3	0	0	0	0	66	3
Native plant species richness								
Trees	4	2.5	4	2.5	8	5	10	5
Shrubs	10	5	5	2.5	0	0	3	2.5
Grasses	4	2.5	2	0	5	2.5	6	2.5
Forbs	3	2.5	1	0	2	0	6	2.5
Tree Canopy Height	18	5	10	4	13	4	15.5	5
Sub-canopy Height	10		6		6		7.5	
Tree Canopy Cover	6.9	1	35.1	4	31.2	5	23.1	5
Sub-canopy Cover	0		41.9		15.9		40.7	
Shrub canopy cover	12	5	12.1	5	0	0	4.8	5
Native perennial grass cover	17	3	0	0	1.4	0	0	0
Organic litter cover	40.8	5	39	5	58.6	5	31.8	5
Large trees	16	5	4	5	94	15	2	5
Coarse woody debris	189	2	41	0	251.3	5	331	5
Weed cover	15	5	21	5	0	10	70	0
Site condition score (maximum 80)		46.5		33		51.5		45.5
GIS based attributes								
Fragmented - Patch size		2		0		7		0
Fragmented - Connectivity		0		0		2		0
Fragmented - Context		0		0		4		0
Ecological Corridors		0		0		3		0
Landscape context score (maximum 26)		2		0		16		0
Total site and context score (maximum 106)		48.5		33		67.5		45.5

	AU7				AU8		AU9	
RE	**11.3.25**		**11.3.25**		**11.3.27**		**11.5.1**	
Site ID	**B05**		**B31**		**B19**		**B25**	
Field based attributes	**Raw**	**Score**	**Raw**	**Score**	**Raw**	**Score**	**Raw**	**Score**
Recruitment of woody perennial species	0	0	100	5	100	5	100	5
Native plant species richness								
Trees	7	5	4	5	4	5	3	2.5
Shrubs	3	2.5	1	2.5	2	5	6	5
Grasses	5	2.5	5	2.5	5	5	6	2.5
Forbs	3	0	1	0	8	5	11	5
Tree Canopy Height	16	3	23	5	19	2.5	15	5
Sub-canopy Height	5		13		0		7	
Tree Canopy Cover	56.4	2.5	39.1	4	29.4	2.5	12	3.5
Sub-canopy Cover	0		28.7		0		23.4	
Shrub canopy cover	0	0	1.2	3	2.6	na	0.3	0
Native perennial grass cover	2	0	1	0	7.8	5	13.4	3
Organic litter cover	56.8	3	40.2	5	41	3	34	5
Large trees	16	10	40	15	18	10	22	15
Coarse woody debris	100	2	448	5	130	2	177	5
Weed cover	30	3	70	0	6	5	0	10
Site condition score (maximum 80)		33.5		52		55		66.5
GIS based attributes								
Fragmented - Patch size		7		2		0		2
Fragmented - Connectivity		5		0		0		0
Fragmented - Context		2		2		0		0
Ecological Corridors		0		6		0		0
Landscape context score (maximum 26)		14		10		0		2
Total site and context score (maximum 106)		47.5		62		55		68.5

	AU10				AU11				AU12	
RE	**11.8.x**		**11.8.x**		**11.8.3**		**11.8.3**		**11.8.5**	
Site ID	**B08**		**B10**		**B11**		**B09**		**B12**	
Field based attributes	**Raw**	**Score**	**Raw**	**Score**	**Raw**	**Score**	**Raw**	**Score**	**Raw**	**Score**
Recruitment of woody perennial species	100	5	100	5	0	0	100	5	0	0
Native plant species richness										
Trees	6	5	10	5	13	2.5	26	5	14	5
Shrubs	17	5	13	5	11	2.5	13	2.5	7	5
Grasses	4	2.5	1	0	0	0	3	5	1	0
Forbs	17	5	14	5	12	2.5	17	5	5	2.5
Tree Canopy Height	15	4	14	5	7	2.5	8	5	13	5
Sub-canopy Height	5		6		0		4		3.7	
Tree Canopy Cover	43.8	5	17	5	75.1	2.5	32.8	5	21.7	4
Sub-canopy Cover	25.2		33.4		0		19.8		43.4	
Shrub canopy cover	16.8	5	4	3	6.4	3	6.4	3	9.2	3
Native perennial grass cover	0	0	0	0	0	0	0	0	0	0
Organic litter cover	79	5	72.6	5	18.8	3	60	5	48	5
Large trees	52	15	52	15	32	5	38	10	68	15
Coarse woody debris	172.3	2	326	2	53.8	0	83	0	253.7	5
Weed cover	0	10	0	10	0	10	0	10	23	5
Site condition score (maximum 80)		68.5		65		33.5		60.5		54.5
GIS based attributes										
Fragmented - Patch size		10		10		2		10		0
Fragmented - Connectivity		5		5		2		2		0
Fragmented - Context		4		4		2		4		0
Ecological Corridors		0		0		0		0		0
Landscape context score (maximum 26)		19		19		6		16		0
Total site and context score (maximum 106)		87.5		84		39.5		76.5		54.5

	AU13		AU14			
RE	**11.9.4HVR**		**11.9.5**		**11.9.5**	
Site ID	**B15**		**B04**		**B26**	
Field based attributes	**Raw**	**Score**	**Raw**	**Score**	**Raw**	**Score**
Recruitment of woody perennial species	40	3	100	5	66	3
Native plant species richness						
Trees	19	5	8	5	10	5
Shrubs	13	5	5	2.5	4	2.5
Grasses	8	5	5	5	6	5
Forbs	4	2.5	6	2.5	10	5
Tree Canopy Height	8	4	12	4	15	4
Sub-canopy Height	4		6		7.5	
Tree Canopy Cover	32	5	39.3	3.5	46.4	3.5
Sub-canopy Cover	14.9		21.7		19.8	
Shrub canopy cover	5.2	3	3.5	3	0	0
Native perennial grass cover	3	3	4.4	5	7.2	5
Organic litter cover	29	5	54.6	5	33.8	5
Large trees	72	5	32	5	48	5
Coarse woody debris	269	2	251.1	2	689	5
Weed cover	25	3	0	10	25	3
Site condition score (maximum 80)		50.5	0	57.5		51
GIS based attributes						
Fragmented - Patch size		0		0		0
Fragmented - Connectivity		0		0		0
Fragmented - Context		0		0		0
Ecological Corridors		0		0		0
Landscape context score (maximum 26)		0		0		0
Total site and context score (maximum 106)		50.5		57.5		51

	AU15					
RE	**11.9.5 HVR**		**11.9.5 HVR**		**11.9.5 HVR**	
Site ID	**B16**		**B20**		**B23**	
Field based attributes	**Raw**	**Score**	**Raw**	**Score**	**Raw**	**Score**
Recruitment of woody perennial species	100	5	100	5	100	5
Native plant species richness						
Trees	2	5	5	5	7	5
Shrubs	2	0	6	2.5	6	2.5
Grasses	3	2.5	8	5	7	5
Forbs	2	0	9	5	6	2.5
Tree Canopy Height	9	3	10	3	8	3
Sub-canopy Height	5		5		4	
Tree Canopy Cover	26.1	2	23.1	3.5	32.5	3.5
Sub-canopy Cover	10.2		33		11.9	
Shrub canopy cover	0.2	0	4.4	3	0	0
Native perennial grass cover	1	1	12.8	5	13	5
Organic litter cover	19.4	3	41.8	5	28.2	3
Large trees	2	5	22	5	20	5
Coarse woody debris	8.1	0	48.5	0	24	0
Weed cover	35	3	2	10	11	5
Site condition score (maximum 80)		29.5		54		44.5
GIS based attributes						
Fragmented - Patch size		0		2		2
Fragmented - Connectivity		0		2		0
Fragmented - Context		0		0		0
Ecological Corridors		0		0		0
Landscape context score (maximum 26)		0		4		2
Total site and context score (maximum 106)		29.5		58		46.5

	AU16					
RE	**11.9.10**		**11.9.10**		**11.9.10**	
Site ID	**B17**		**B13**		**B29**	
Field based attributes	**Raw**	**Score**	**Raw**	**Score**	**Raw**	**Score**
Recruitment of woody perennial species	0	0	50	3	66	3
Native plant species richness						
Trees	14	5	6	5	12	5
Shrubs	6	2.5	7	2.5	1	0
Grasses	5	2.5	7	5	2	2.5
Forbs	6	2.5	5	2.5	0	0
Tree Canopy Height	14	5	11	4	17	5
Sub-canopy Height	9		6		9	
Tree Canopy Cover	47.5	4	31.3	4	27.4	5
Sub-canopy Cover	45.4		63.3		34	
Shrub canopy cover	14.4	5	0	0	0.3	0
Native perennial grass cover	7.4	3	15.2	5	0.4	0
Organic litter cover	29	5	37.8	5	39.6	5
Large trees	38	15	20	15	34	15
Coarse woody debris	216.1	5	273	5	600	5
Weed cover	46	3	1	10	95	0
Site condition score (maximum 80)		57.5		66		45.5
GIS based attributes						
Fragmented - Patch size		0		0		0
Fragmented - Connectivity		0		0		0
Fragmented - Context		0		0		0
Ecological Corridors		0		0		0
Landscape context score (maximum 26)		0		0		0
Total site and context score (maximum 106)		57.5		66		45.5

	AU17				AU18		AU19	
RE	**11.9.10 HVR**		**11.9.10 HVR**		**11.10.9**		**11.10.11**	
Site ID	**B24**		**B21**		**B22**		**B01**	
Field based attributes	**Raw**	**Score**	**Raw**	**Score**	**Raw**	**Score**	**Raw**	**Score**
Recruitment of woody perennial species	100	5	50	3	100	5	100	5
Native plant species richness								
Trees	7	5	6	5	6	5	4	5
Shrubs	11	5	9	5	7	5	2	2.5
Grasses	5	2.5	8	5	10	2.5	5	2.5
Forbs	9	2.5	5	2.5	14	5	6	2.5
Tree Canopy Height	11	4	15	5	12	4	13.5	5
Sub-canopy Height	6		7		8		6	
Tree Canopy Cover	1.6	1.5	12.5	2.5	29.5	5	27.6	4
Sub-canopy Cover	45.3		61.6		28.5		49.4	
Shrub canopy cover	12.1	5	0	0	0.9	3	1.3	3
Native perennial grass cover	7.4	3	6.4	1	6	1	1	0
Organic litter cover	30.4	5	35.4	5	38.6	3	20	5
Large trees	18	15	12	15	114	15	54	15
Coarse woody debris	25.5	0	39	2	62.5	2	208.9	5
Weed cover	4	10	21	5	7	5	15	5
Site condition score (maximum 80)		58.5		56		57.5		59.5
GIS based attributes								
Fragmented - Patch size		0		2		0		0
Fragmented - Connectivity		0		2		2		0
Fragmented - Context		0		0		2		0
Ecological Corridors		0		0		6		0
Landscape context score (maximum 26)		0		4		10		0
Total site and context score (maximum 106)		58.5		60		67.5		59.5