



AEP

BIODIVERSITY | BUSHFIRE | ARBORICULTURE

NEWCASTLE SYDNEY

Biodiversity Assessment Report

Rezoning Planning Proposal

361 Oxley Highway, Gilgandra, NSW



Prepared for: Gilgandra Shire Council

January 2024

AEP Ref: 3371

Revision: 01

Newcastle | Sydney

10 Darvall St Carrington NSW 2294 | 275 Stanmore Rd Petersham NSW 2049

ABN: 57 659 651 537 | +61 420 624 707 | info@andersonnep.com.au | www.andersonnep.com.au

Cover: PCT 206 - Dirty Gum – White Cypress Pine Woodland of alluvial sand (sand monkeys) in Darling Riverine Plains Bioregion and Brigalow Belt South Region within the subject Site.

Document Control

Document Name	Biodiversity Assessment Report, Rezoning Planning Proposal, 361 Oxley Highway, Gilgandra, NSW. Rev 01
Project Number	3371
Client	Gilgandra Shire Council
AEP Project Team	Oscar Anderson Natalie Black Matt Booker Darren Hall Dennis Neader Jodie Pullen

Document History

Revision	Date	Authors	Reviewed	Approved
00	17/12/2023	Darren Hall Oscar Anderson Dennis Neader	Dennis Neader	Natalie Black
01	22/01/2024	Matt Booker	Dennis Neader	Natalie Black

Distribution

Revision	Date	Name	Organisation
00	17/12/2023	Kristy Cosier	Gilgandra Shire Council
01	22/01/2024	Kristy Cosier	Gilgandra Shire Council

Executive Summary

Anderson Environment & Planning was commissioned by Gilgandra Shire Council to undertake a Biodiversity Assessment Report for a Rezoning Planning Proposal within Lot 1 and Part Lot 2, DP 1070081, known as 361 Oxley Highway, Gilgandra, New south Wales. The site is currently zoned RU1 – Primary Production under the Gilgandra Local Environmental Plan 2011. The proposal is to change the land zoning to E4 - General Industrial.

The report is specifically intended to indicate the likelihood of the rezoning having any significant impact on potentially occurring threatened species or ecological communities. In this regard, the report aims to recognise the relevant requirements of the *Environmental Planning & Assessment Act 1979*, the *Biodiversity Conservation Act 2016* (NSW) (BC Act) and the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act).

The proposed development comprises approximately 52ha and ground-truthing of the vegetation present revealed that approximately 1.96ha of disturbed PCT 206 - *Dirty Gum – White Cypress Pine Woodland of alluvial sand (sand monkeys) in Darling Riverine Plains Bioregion and Brigalow Belt South Region* would be impacted within Stage 1 development works. Despite exceeding the BOS clearing threshold (>1ha), entry into the BOS would be voluntary. Vegetation onsite was observed to be highly disturbed with a managed ground layer comprised primarily of exotic grasses. Exotic tree and shrub layer abounded the northern and eastern boundaries of the site.

Assessment under the 5-part Test of Significance of Impacts determined that no significant impacts upon threatened entities listed under the *BC Act* would be likely to occur if mitigation measures are implemented, and consideration of the *EPBC Act* revealed that impacts on Matters of National Environmental Significance are unlikely to occur, and as such, referral to the Commonwealth is unlikely to be required.

Review of the *State Environmental Planning Policy (Biodiversity and Conservation) 2021* revealed that this SEPP is applicable to the site in relation to *Chapter 4 Koala Habitat Protection 2021*. An assessment against the provisions of this chapter concluded that no significant impacts on Koala are expected as a result of the proposal.

General recommendations and mitigation measures have been included in the report to minimise and mitigate environmental impacts of the proposal. These measures would provide adequate mitigation against impacts from construction.

Contents

1.0	Introduction	1
2.0	Site Description	2
3.0	Proposed Development.....	4
4.0	Scope and Purpose.....	5
5.0	Study Certification and Licencing.....	6
6.0	Methodology.....	7
6.1	Information Sources	7
6.2	Considerations of Biodiversity Offsets Scheme	7
6.2.1	Biodiversity Values Map	8
6.2.2	Area Clearing Threshold	8
6.2.3	Test of Significance	8
6.2.4	Vegetation Communities	8
6.2.5	Flora	9
6.2.6	Habitat	9
6.2.7	Fauna	9
6.2.8	Details of Field Surveys	10
7.0	Results	11
7.1	Vegetation Communities	11
7.1.1	Regional Vegetation Mapping	11
7.1.2	Ground-truthed Vegetation Mapping.....	13
7.2	Flora	19
7.3	Habitat Assessment	19
7.4	Fauna	20
7.5	Database Searches.....	22
8.0	Key Species Considerations	24
9.0	5-part Test Assessment	25
10.0	EPBC Act Assessment.....	27
11.0	State Environmental Planning Policy (Biodiversity and Conservation) 2021	29
12.0	Recommendations	30
13.0	References	31

Tables

Table 1 – Site Particulars	2
Table 2 - Area Clearing Thresholds (BC Act)	8
Table 3 – Field Survey Periods	10
Table 4 - Habitat Assessment	19
Table 5 – Threatened Species Appraisal (10 km x 10 km)	22
Table 6 – Subject Species	23
Table 7 – Key Species Analysis	24
Table 8 – 5-Part Test Assessment	25

Figures

Figure 1 – Site Location	3
Figure 2 – Regional Vegetation Mapping	12
Figure 3 - Ground-truthed Vegetation Map	18
Figure 4 - Survey Effort	21

Appendices

Appendix A – Flora Species List	
Appendix B – Expected Fauna Species List	
Appendix C – BOSET Report	
Appendix D – Authors’ CV	

1.0 Introduction

Anderson Environment & Planning (AEP) was commissioned by Gilgandra Shire Council (the Client) to undertake a Biodiversity Assessment Report (BAR) to assess impacts of construction of a proposed rezoning of land for employment purposes within Lot 1 and part Lot 2, DP 1070081, known as 361 Oxley Highway, Gilgandra, NSW (the Subject Site) (Refer **Figure 1**).

It is proposed to rezone the Subject Site from RU1 - Primary Production to E4 - General Industrial within the Gilgandra LGA (the Proposal). The Proposal area encompasses the whole of Lot 1 (approx. 21ha), and Part Lot 2 (approx. 12ha).

Anderson Environment & Planning (AEP) have undertaken necessary investigations for the production of this BAR. This assessment has been undertaken with reference to the NSW *Environmental Planning and Assessment Act 1979* (EP&A Act), the *NSW Biodiversity Conservation Act 2016* (BC Act) and the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act).

This report is specifically intended to indicate the likelihood of the proposal having a significant impact on threatened species or ecological communities. In this regard, the report aims to recognise the relevant requirements of the *EP&A Act*, the *BC Act* and the *EPBC Act* and consideration of other relevant policies are given including *State Environmental Planning Policy (SEPP) (Biodiversity and Conservation) 2021* and *SEPP (Resilience and Hazards) 2021*. The purpose of this report is to:

- Describe the ecological values of the Subject Site;
- Explore the potential for threatened species to utilise the area; and
- Assess ecological impacts associated with the proposal against relevant legislation.

Potential ecological impacts on native species in general are also considered, as are recommendations for minimising any impacts within the scope of the development.

For the purposes of referencing, this document should be referred to as:

Anderson Environment & Planning (2023). *Biodiversity Assessment Report for Rezoning Planning Proposal 361 Oxley Highway, Gilgandra, NSW*. Rev 01. Unpublished report for Gilgandra Shire Council, January, 2024.

2.0 Site Description




Table 1 – Site Particulars

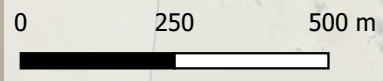

Detail	Comments
Client	Gilgandra Shire Council.
Address	Oxley Highway Gilgandra NSW 2827.
Title(s)	Lot 1 & 2 DP 1070081.
Study Area	The Study Area is located on the western outskirts of the Gilgandra township, on the Oxley Highway. For this BAR, the Study Area encompasses Lots 1 and 2, DP 1070081 (approx. 133ha), adjoining lots and the wider locality.
Subject Site	The Subject Site comprises all of Lot 1 (40ha) and part Lot 2 (12ha).
LGA	Gilgandra.
Zoning	Under the <i>Gilgandra Local Environmental Plan 2011</i> (the LEP), (pub. 9-12-2011) the Study Area comprises land zoned RU1 – Primary Production (pub. 24-02-2023).
Current Land Use	The Study Area has been historically used for grazing and broad acre cropping. Approx. 54ha of Lot 2 is dedicated to cropping of <i>Secale cereale</i> (Rye) as shown in Figure 3 .
Surrounding Land Use	The site is surrounded to the west & south by broad acre agricultural cropping and to the east by residential and Gilgandra State Forest. The Oxley Highway runs along the north of the site with further cropping continuing on the northern side of the Oxley Highway. Surrounding lands are zoned R1, further east is an area zoned E4

Figure 1 depicts the extent of the site overlaid on an aerial photograph of the locality.

Disclaimer: While all reasonable care has been taken to ensure the information shown on this map is up to date and accurate, no guarantee is given that the information portrayed is free from error or omission. Please verify the accuracy of all information prior to use.

Legend

-  Cadastre
-  Site Boundary
-  Stage 1 Development Works



Note:
1. Boundaries are not survey accurate
2. Do not scale off the plan



Figure 1 - Site Location
Date: January 2024
Location: Lot 1 and 2 Oxley Highway, Gilgandra
Client: Gilgandra Shire Council
AEP ref: 3371

3.0 Proposed Development

Gilgandra Shire Council is preparing a planning proposal to rezone the Subject Site which comprises approx. 52 ha from RU1 - Primary Production to E4 - General Industrial. The proposed future development contains a minimum lot size of 5,000m² and no height limit or floor space ratio. A solar farm has also been proposed within the study area covering an area approximately 11.3ha. At the time of writing, the proposed development plans are still yet to be finalised therefore, were not shown within this report.

4.0 Scope and Purpose

Investigations were carried out within the Subject Site and via literature / database searches to gather information required to adequately address the requirements of the Environmental Planning & Assessment Act 1979, the Biodiversity Conservation Regulation 2017 (BCR), Section 7.3 of the *BC Act* (known as the “5-part test”).

Also afforded consideration were the *EPBC Act*, and relevant SEPPs.

The assessment approach was tailored to undertake sufficient works to ensure that legislative requirements were met relating to threatened species and native species in general for the proposed specific development. This was achieved by background research and literature review, database searches, consultation, targeted ecological fieldwork and mapping, detailed habitat assessment, and ultimately impact assessment consideration against the type and form of development proposed.

Impact assessment was undertaken with due reference to the “*Threatened Species Test of Significance Guidelines*” (OEH, 2018).

Specifically, the scope of this study is to:

- Identify vascular plant species occurring within the site, including any threatened species listed under the *BC Act* or *EPBC Act*;
- Identify and map the extent of vegetation communities within the site, including any EECs listed under the *BC Act* or *EPBC Act*;
- Identify any fauna species, including threatened and migratory species, and populations or their habitats, which occur within the site and are known to occur in the wider locality;
- Assess the potential of the proposed development to have a significant impact on any threatened species, populations or ecological communities (or their habitats) identified from the site; and
- Describe measures to be implemented to avoid, minimise, manage or monitor potential impacts of the proposal.

In addition to targeted survey conducted within the Study Area and its immediate surrounds, consideration has been afforded to the wider locality, via database searches within 10km of the site and via consideration of habitat areas that may be linked ecologically to the site.

5.0 Study Certification and Licencing

The fieldwork for this BAR was undertaken by Darren Hall (BScEnvSc&ParksRecHeritage). Reporting and mapping were undertaken by Darren Hall, Dennis Neader, Matt Booker and Jodie Pullen. Review was undertaken by Dennis Neader (BSc).

Research was conducted under the following licences:

- NSW National Parks and Wildlife Service Scientific Investigation Licence SL101313;
- Animal Research Authority (Trim File No: 14/600(2)) issued by NSW Agriculture; and
- Animal Care and Ethics Committee Certificate of Approval (Trim File No: 14/600(2)) issued by NSW Agriculture.

Certification:

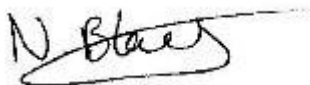
As the certifier, I, Natalie Black, make the following declaration:

The results presented in the report are, in the opinion of the certifier, a true and accurate account of the species recorded, or considered likely to occur within the Study Area;

Commonwealth, state and local government policies and guidelines formed the basis of project surveying methodology, unless specified departures from industry standard guidelines are justified for scientific and/or animal ethics reasons; and

All survey and research undertaken complies with relevant laws and codes relating to the conduct of flora and fauna research, including the Animal Research Act 1995, National Parks and Wildlife Act 1974 and the Australian Code of Practice for the Care and Use of Animals for Scientific Purposes.

Principal Certifier:



Natalie Black
Senior Environmental Manager
Biodiversity Accredited Assessor BAAS: 19076
Anderson Environment & Planning

6.0 Methodology

The field surveys for the site have been prepared and performed with due recognition of the relevant state survey guidelines (DEC 2004; DPIE 2020a; DPIE 2020b; DPE 2022b).

The size of the site, the type of native vegetation and habitats remaining, the status of existing and proposed surrounding land use, and the level and type of habitat linkages to proximate bushland areas were considered in formulating the methodology employed and described below.

The assessment approach was tailored to undertake sufficient works to ensure that legislative requirements were met relating to threatened species and native species in general for the proposed specific development.

6.1 Information Sources

Information and spatial data provided within this BAR has been compiled from various sources including:

- Aerial Photograph Interpretation (API) of current and historical of the Study Area;
- *NSW Biodiversity Values Map* (accessed November 2023);
- DPE State Vegetation Type Map (2022a);
- State survey guidelines (DEC 2004; DPIE 2020a; DPIE 2020b; DPE 2022b);
- DPE Threatened Species, Populations and Ecological Communities website (https://www.environment.nsw.gov.au/AtlasApp/UI_Modules/TSM/Default.aspx?a=1) (accessed October 2023); and
- Collective knowledge gained from previous ecological survey and assessment in the greater NSW region over the past 25 years.

In addition, database searches were carried out, namely:

- Review of flora and fauna records held by the BioNet Atlas of NSW Wildlife within a 5km radius of the site (October 2023); and
- Review of flora and fauna records held by the Commonwealth Department of Climate Change, Energy, the Environment and Water (DCCEEW) Protected Matters Search within a 5km radius of the Subject Site (October 2023).

6.2 Considerations of Biodiversity Offsets Scheme

There are three criteria that require assessment under the Biodiversity Offsets Scheme (BOS) to determine whether or not entry into the BOS is required. The three criteria include;

- Whether or not the site contains Biodiversity Values Mapped land;
- Whether or not it exceeds the Area Clearing Threshold applicable to the minimum lot size; and / or
- Whether or not a 5-part Test of Significance determines that a significant impact on threatened biodiversity is likely to occur.

These criteria are addressed below.

6.2.1 Biodiversity Values Map

The Biodiversity Values Map (BV Map) does not identify land with high biodiversity value, as defined by the Biodiversity Conservation Regulation 2017. The Biodiversity Offsets Scheme (BOS) applies to all local developments, major projects or the clearing of native vegetation where the SEPP (Vegetation in Non-Rural Areas) 2017 applies. Any of these will require entry into the BOS if they occur on land mapped on the BV Map. Exempt and complying development or private native forestry are not subject to the Biodiversity Offsets Scheme.

The BV Map does not intersect with the Subject Site; therefore, the proposal does not trigger the BOS, nor the requirement for a Biodiversity Development Assessment Report (BDAR) under this criterion (refer **Appendix C**).

6.2.2 Area Clearing Threshold

“The area threshold varies depending on the minimum lot size (shown in the Lot Size Maps made under the relevant Local Environmental Plan (LEP)), or actual lot size (where there is no minimum lot size provided for the relevant land under the LEP). The area threshold applies to all proposed native vegetation clearing associated with a development proposal”.

Table 2 - Area Clearing Thresholds (BC Act)

Minimum lot size	Threshold for clearing, above which the BOS applies
< 1ha	>0.25ha
1ha to <40ha	>0.5ha
40ha to <1000ha	>1.0ha
>1000ha	>2ha

In this case, as per the Biodiversity Values Map and Threshold Report included in **Appendix C**, the applicable minimum lot size is 500ha under the Gilgandra LEP. Therefore, the applicable area clearing threshold is **1.0ha**. The area of native vegetation to be removed totals approx. 1.96ha, which exceeds the BOS clearing threshold however, entry into the BOS is voluntary, as stated within the *Biodiversity Conservation Act (2016), Part 6 Biodiversity offsets scheme, Division 1 General scheme provisions*:

Section 6.2 Biodiversity offsets scheme

(e) In relation to environmental impact assessment of proposed activities under Part 5 of the Environmental Planning and Assessment Act 1979—the option for proponents of those activities to use those biodiversity assessment reports and offsetting measures to comply with their obligations under that Part.

6.2.3 Test of Significance

Following the above assessments, it is a requirement to determine whether or not the development is likely to significantly affect threatened species, ecological communities or their habitats using a Test of Significance. The Test of Significance is used to undertake qualitative analysis of the likely impacts and determine whether further assessment is required in association with the development. As part of this BAR, a 5-part Test of Significance has been undertaken in **Section 9.0**.

6.2.4 Vegetation Communities

Vegetation was surveyed and ground-truthed utilising a variety of methods, as outlined below.

- Consideration of regional mapping for the site by SVTM (DPE, 2022a);
- Aerial Photo interpretation (API) to identify any notable variations within the site;

- Consultation of 1:25,000 topographic map series for the area;
- Full walking traversal of the development area and four (4) BAM Plots to confirm vegetation communities and generate a botany list for the site;

The final derived vegetation map was based on comparison of vegetation mapping with field data collected in surveys.

Consideration was given to the potential for the derived vegetation communities to constitute an EEC as listed under the *BC Act* and/or *EPBC Act*. The floristic composition, geomorphological characteristics and geographical extent were important considerations in this process.

6.2.5 Flora

A flora survey was undertaken to produce a flora species list for the Subject Site, to search specifically for threatened flora species known from the wider locality, and to gather data necessary to both derive vegetation community type(s) and to meet relevant survey guidelines. Such works included:

- Identification of all vascular plant species encountered during fieldwork;
- Survey involved systematic coverage of the Subject Site. The Random Meander Technique (Cropper, 1993) was utilised to maximise species encountered. All vascular plant species encountered during fieldwork were recorded; and
- Four (4) BAM Flora plots were undertaken within the Subject Site.

6.2.6 Habitat

An assessment of the relative habitat values present within the Subject Site was carried out. This assessment focused primarily on the identification of specific habitat types and resources within the site favoured by known threatened species from the region. The assessment also considered the potential value of the Subject Site (and surrounding areas) for all major guilds of native flora and fauna.

The assessment was based on the specific habitat requirements of each threatened fauna species in regards to home range, feeding, roosting, breeding, movement patterns and corridor requirements. Consideration was given to contributing factors including topography, soil, light and hydrology for threatened flora and assemblages.

In particular, focus was put on documenting the presence of key habitat features such as tree hollows. Hollows are an important resource utilised by a variety of fauna, and are particularly relevant for several of the likely key threatened species in this locality. Vertebrate and invertebrate species use hollows as diurnal or nocturnal shelter sites, for rearing young, feeding, thermoregulation, and to facilitate ranging behaviour and dispersal.

Tree hollows were surveyed for within the Study Area utilising the methodology of tree hollow identification set by OEH in the BioBanking field plot methodology (2009), namely:

“A hollow is only recorded if: (a) the entrance can be seen; (b) the minimum entrance width is at least 5 cm across; (c) the hollow appears to have depth (i.e., you cannot see solid wood beyond the entrance); and (d) the hollow is at least 1 m above the ground (this omits hollows in cut stumps or at the base of trees)”.

6.2.7 Fauna

Fauna survey was carried out utilising techniques as outlined below. Fauna survey work was undertaken with reference to relevant guidelines and to add information to the Expected Fauna Species List developed for the Subject Site and is provided in **Appendix B**.

Avifauna Surveys

The presence of avifauna within the site was assessed via a diurnal fauna survey. For the diurnal survey, birds were identified by direct observation or by recognition of calls or distinctive features such as nests, feathers etc.

Mammals

The occurrence of mammals within the site was assessed by utilising habitat assessment as an analogue for presence in combination with a diurnal survey including. Habitat assessment included survey for foraging resources (blossom, herbaceous, prey etc), hollows and roosting opportunity, connectivity and water as outlined in **Section 6.2.3** above.

Incidental Observations & Secondary Indications

Incidental records of any fauna species observed during fieldwork were noted. This included opportunistic sightings of secondary indications (scratches, scats, diggings, tracks etc.) of any resident or migratory species. Searches were also conducted for whitewash, regurgitation pellets and prey remains from Owls, chewed *Allocasuarina* cones from Glossy Black-Cockatoos, chewed fruit remains from frugivorous birds etc.

6.2.8 Details of Field Surveys

A summary of the survey effort is below in **Table 3** and **Figure 4**.

Table 3 – Field Survey Periods

Date	Time	Field Activity	Ecologists
17/10/2023	0930 - 1600	Flora site walkover Random Meander through Study Area for threatened species Diurnal bird survey 4 X Flora BAM Plots Habitat assessment Incidental flora and fauna	1

The above survey methodology was considered to provide sufficient understanding of the biodiversity of the Subject Site.

In addition, by applying rigorous habitat assessment to more mobile species identified in BioNet Atlas records within the locality, it was ensured that all possible use of the Subject Site by notable species was considered, and accommodated within subsequent ecological assessment and management recommendations.

7.0 Results

7.1 Vegetation Communities

7.1.1 Regional Vegetation Mapping

State vegetation mapping undertaken for the Department of Planning and Environment (2022a) - indicates that native vegetation is mapped within the lot boundary and over the surrounding area.

Figure 2 shows the extent of mapped vegetation communities within the Subject Site and surrounding areas as mapped by NSW SVTM (DPE 2022a).

Disclaimer: While all reasonable care has been taken to ensure the information shown on this map is up to date and accurate, no guarantee is given that the information portrayed is free from error or omission. Please verify the accuracy of all information prior to use.

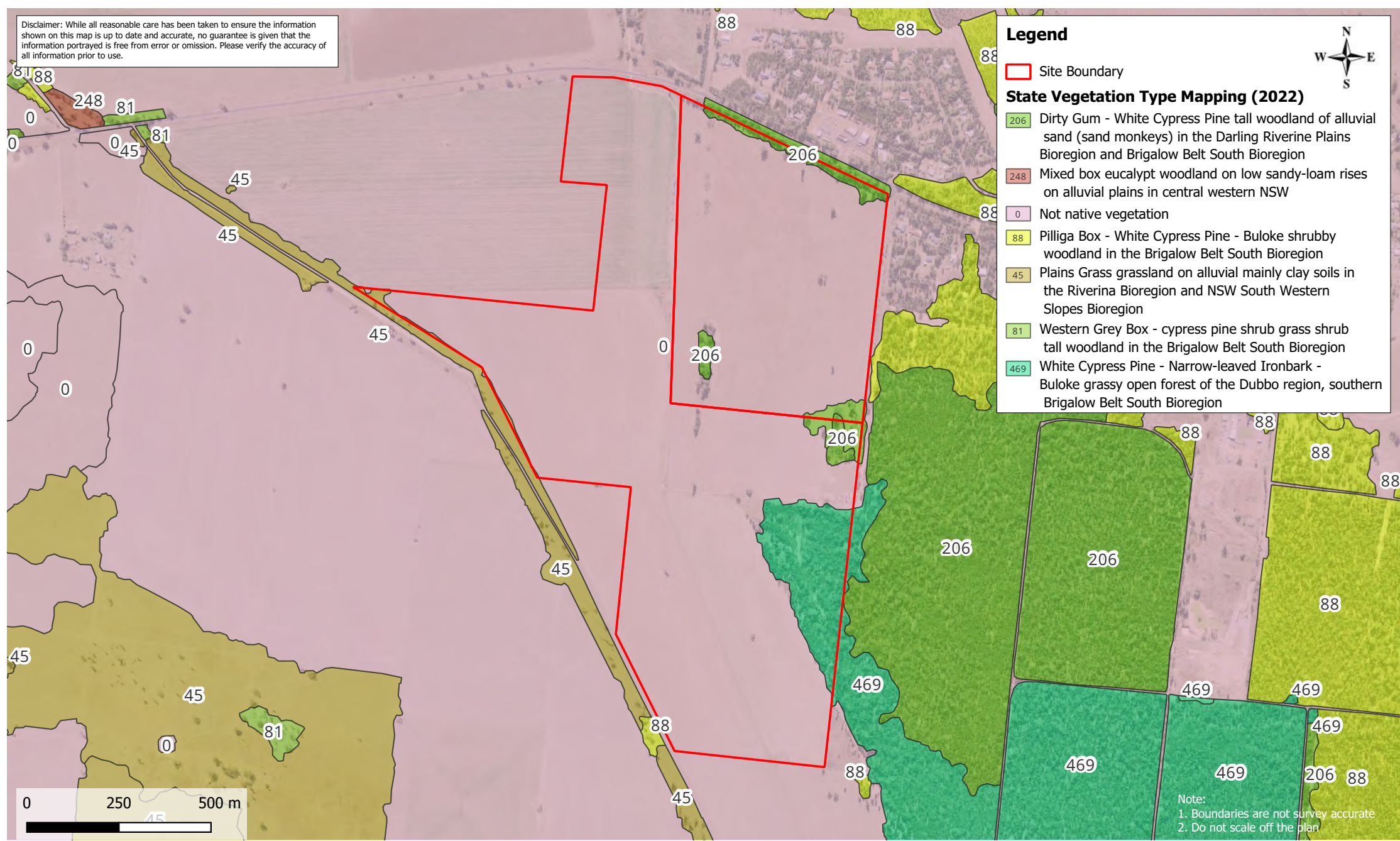


Figure 2 - State Vegetation Type Map

Date: January 2024

Location: Lot 1 and 2 Oxley Highway, Gilgandra

Client: Gilgandra Shire Council

AEP ref: 3371

7.1.2 Ground-truthed Vegetation Mapping

Fieldwork was conducted to identify flora species and determine the occurrence of any Plant Community Types (PCT) on the Subject Site. Vegetation within the Subject site is characterised as mixed native and exotic forb / grassland within a large paddock showing signs of past cropping/grazing. The paddock to the west and south consists of recently sowed broad acre cropping present. In the southeast of the Study Area is approx. 7.5ha of remnant native vegetation representing PCT 206 - *Dirty Gum – White Cypress Pine Woodland of alluvial sand (sand monkeys) in Darling Riverine Plains Bioregion and Brigalow Belt South Region*.

7.1.2.1 Vegetation Assemblages

Site walkover indicated three (3) different preliminary ground-truthed vegetation variations across the site. Variants include a paddock of mixed and exotic lower stratum species, monoculture of broad acre cropping and PCT 206.

The vegetation within the paddock of mixed native and exotic lower stratum species is comprised primarily of exotic forbs with only a few native species present. Exotic forbs dominating are *Hypochaeris glabra* (Catsear), *Taraxacum officinale* (Common Dandelion), *Brassica tournefortii* (Mediterranean Turnip), *Conyza bonariensis* (Fleabane) & *Silybum marianum* (Variegated Thistle).

Within the Subject Site, native species included *Cynodon dactylon* (Couch) and *Wahlenbergia stricta* (Australian Bluebells). While *C. dactylon* is considered native under the NSW Herbarium, the absence of any other native strata and diversity of note indicates the species has been cultivated as a pasture grass and not indicative of a native vegetation community.

In the south-eastern edge of the Study area adjoining the State Forest, approx. 7.5ha of PCT 206 was recorded. The upper stratum of this community includes *Callitris glaucophylla* growing in association with *Eucalyptus populnea* subsp. *bimbil*. *Brachychiton populneus* is present in a lesser extent. The lower stratum consists on predominantly endemic species including *Wahlenbergia stricta*, *Cynodon dactylon*, *Aristida ramosa* and *Hibbertia obtusifolia*. The composition of this area resembles the adjoining State Forest area and consists of only one exotic species being *Opuntia* sp.

PCT 206 is also found as a linear strip within the paddock consisting of a mixed native and exotic species with both *Eucalyptus populnea* subsp. *bimbil* and *E. pilligaensis* (Narrow-leaved Grey Box) present in a dominant mid stratum of the exotic *Lycium ferocissimum* (African Boxthorn). The lower stratum is represented by the endemic species *Cynodon dactylon*, along with exotic forbs *Brassica tournefortii* (Mediterranean Turnip), *Silybum marianum* (Variegated Thistle), *Lepidium bonariense* (Argentine Peppergrass) and *Citrullus* sp.

The western and southern extents of the study area consist largely of a broad acre cropping monoculture of *Secale cereale* (Rye) with *Wahlenbergia stricta* and *Sonchus oleraceus* (Milk Thistle) occurring in a lower density.

Ground-truthed vegetation communities are represented in **Figure 3**.



Plate 1: BAM Plot 1 Start



Plate 2: BAM Plot 1 End



Plate 3: Bam Plot 2 Start



Plate 4: BAM Plot 2 End



Plate 5: BAM Plot 3 Start



Plate 6: BAM Plot 3 Finish



Plate 7: BAM Plot 4 Start




Plate 8: BAM Plot 4 End

Disclaimer: While all reasonable care has been taken to ensure the information shown on this map is up to date and accurate, no guarantee is given that the information portrayed is free from error or omission. Please verify the accuracy of all information prior to use.

Legend

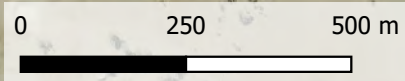
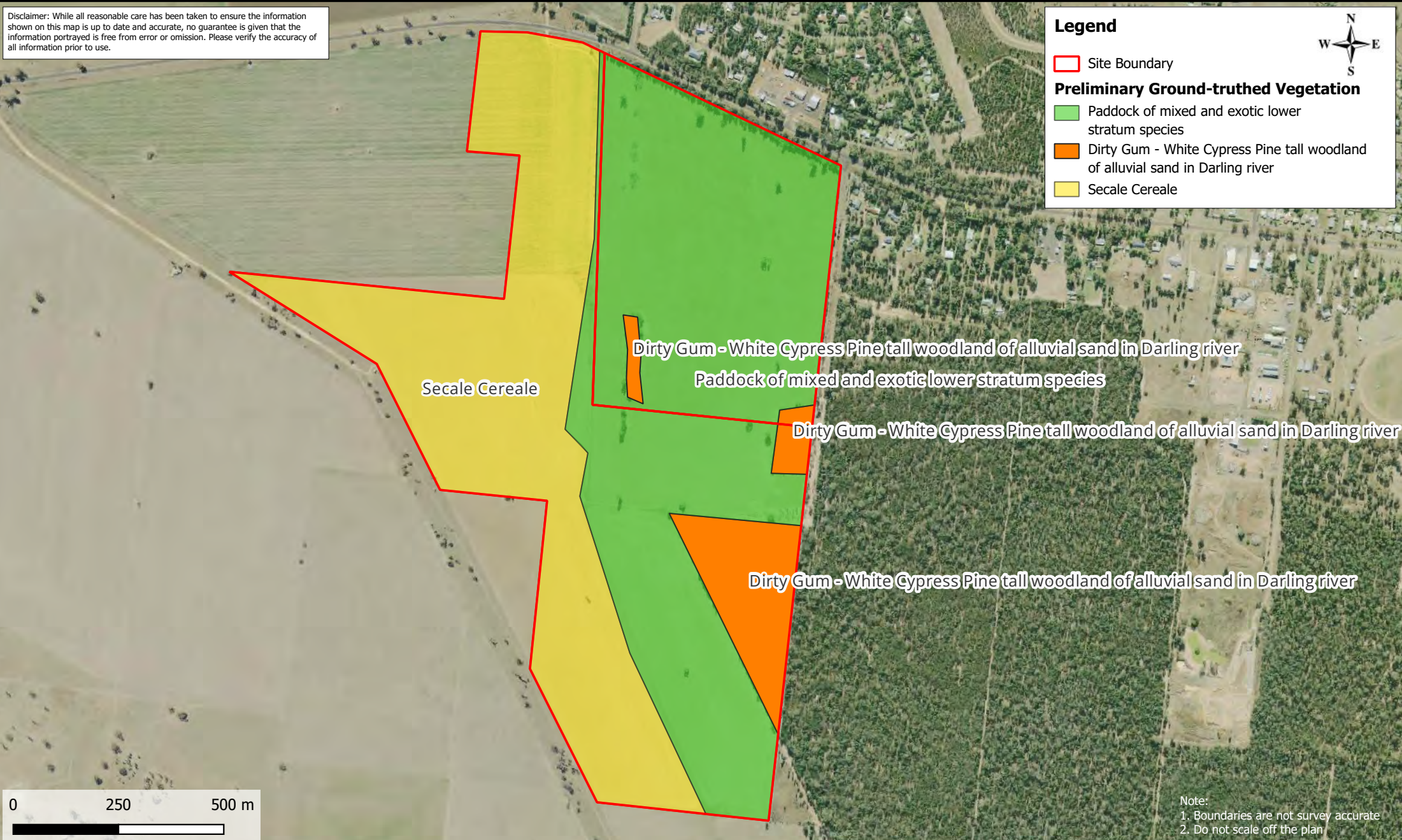
 Site Boundary

Preliminary Ground-truthed Vegetation

 Paddock of mixed and exotic lower stratum species

 Dirty Gum - White Cypress Pine tall woodland of alluvial sand in Darling river

 Secale Cereale



Note:
1. Boundaries are not survey accurate
2. Do not scale off the plan



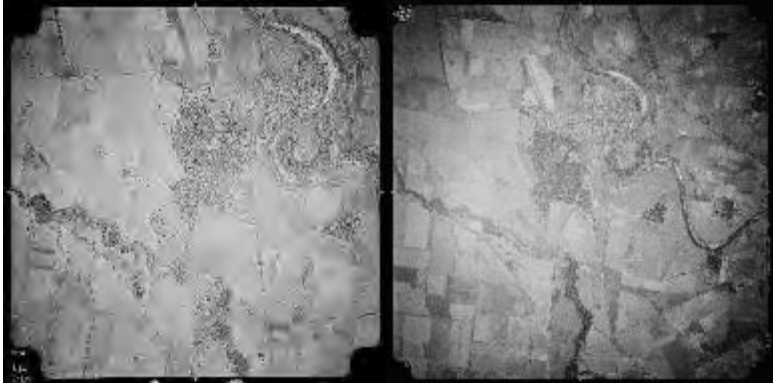
Figure 3 - Ground-truthed Vegetation
Date: January 2024
Location: Lot 1 and 2 Oxley Highway, Gilgandra
Client: Gilgandra Shire Council
AEP ref: 3371

7.2 Flora

Flora surveys resulted in the identification of 20 species within the Subject Site, comprising 10 exotic species and 10 native species. A full list of flora species identified within the site is included in **Appendix A**.

7.3 Habitat Assessment

Table 4 - Habitat Assessment

Habitat Features	Assessment
Native vegetation	<p>The Study Area of approx. 133ha comprises approx. 12ha of native vegetation. Tree and shrub species are native and ground covers were also observed to be dominated by non-native species.</p> <p>Detail design has excluded the majority of remnant native vegetation PCT 206 from the Proposal footprint.</p>
Hollow-bearing/habitat trees	<p>No hollow-bearing trees were observed, only one (1) large tree fallen onsite provides potential ground habitat.</p>
Water features	<p>No hydro lines, waterbodies, drainage lines or sinks were observed. The nearest waterbody is the Castlereagh River approx. 2.3km east of the Subject Site.</p>
Patch size and connectivity	<p>The Study Area is partly surrounded by farm lands and residential properties. Historic aerial photographs below show that the Subject Site and lands to the west has been cleared since at least 1963.</p> <p>There is retained remnant vegetation on the eastern side of the Subject Site in the Gilgandra State Forest which has been excluded from the Proposal design.</p> <div data-bbox="523 1137 1299 1518" style="text-align: center;">  </div> <p>Left: 1961 Historical imagery Right: 1981 Historical imagery</p>
Other habitat features	<p>There are no caves, crevices or rocky outcrops present within the Subject Site. There were several piles of disused farm equipment and small amounts of scattered rubbish. There was evidence of rabbits using the site.</p>

7.4 Fauna

Fauna recorded was as expected in a highly degraded and managed site. Fauna surveys identified four (4) bird species, and evidence of Feral Rabbit burrows within the Subject Site (refer to **Appendix B**).





The entire Subject Site is managed and highly disturbed and comprises primarily exotic grasses, with scattered trees and shrubs which would provide marginal-at-best foraging habitat for native fauna.

Detail Design of the Proposal has excluded an approx. 7.5ha patch of remnant native vegetation, in the south east of Lot 2 and with connectivity to the adjoining Gilgandra State Forest. This patch would be protected from construction impacts.

It is considered construction for the Proposal would not impact any threatened fauna.

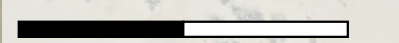
Disclaimer: While all reasonable care has been taken to ensure the information shown on this map is up to date and accurate, no guarantee is given that the information portrayed is free from error or omission. Please verify the accuracy of all information prior to use.

Legend

-  Site Boundary
- Survey Effort**
-  BAM Plots
-  BAM Plot Directions
-  Survey Effort Tracks



0 250 500 m



Note:
1. Boundaries are not survey accurate
2. Do not scale off the plan



Figure 4 - Preliminary Survey Effort

Date: January 2024

Location: Lot 1 and 2 Oxley Highway, Gilgandra

Client: Gilgandra Shire Council

AEP ref: 3371

7.5 Database Searches

Searches were undertaken of databases within a 10km area surrounding the Subject Site for BC Act listings and EPBC Act listings, with additional consideration of candidate species generated from the BAM-C. Note that any records considered erroneous, historic only, or obviously of no relevance to the site in regards to habitat (e.g., seabirds, marine species etc.) were omitted.

The potential for listed threatened species to occur within the site is considered in **Table 5** and selection for subject species in **Table 6** below. Detailed ecological profiles of threatened species can be found at: <https://www.environment.nsw.gov.au/threatenedspeciesapp/>

Table 5 – Threatened Species Appraisal (10 km x 10 km)

Scientific Name	Common Name	NSW	Com	Records	Likelihood of Occurrence
Flora					
<i>Commersonia procumbens</i>		V	V	2	Species was not identified on site. The Subject Site has suitable habitat however it is degraded from clearing which is listed as the key threat to the species. When other native species are providing a canopy, the species is known for its ability to be a pioneer species. In areas of native vegetation, the species is likely to recolonise, therefore the proposed rezoning may impact the species. Subject Species
Birds					
<i>Circus assimilis</i>	Spotted Harrier	V		1	Occurs in grassy open woodland including Acacia and mallee remnants, inland riparian woodland, grassland and shrub steppe. It is found most commonly in native grassland, but also occurs in agricultural land, foraging over open habitats including edges of inland wetlands. No unused stick nests on site. Possibly uses site for marginal foraging. Unlikely to be impacted by the proposed development
<i>Ninox connivens</i>	Barking Owl	V		3	No suitable hollows present. Marginal foraging habitat at best. Considered unlikely to occur.
<i>Hirundapus caudacutus</i>	White-throated Needletail	P	V	1	No records on site nor was it identified, species likely to occur in adjacent forested area whereby an abundance of resources is available from October to April.
<i>Pomaoastomus temporalis</i>	Grey-crowned Babbler	V		1	Limited records within study area suggest species doesn't occur, although there is potential given it inhabits open Box-Gum Woodlands on the slopes, and Box-Cypress-pine and open Box Woodlands on alluvial plains. However, species likely to occur in adjacent forested area whereby an abundance of resources is available. Therefore, it is considered

Scientific Name	Common Name	NSW	Com	Records	Likelihood of Occurrence
					unlikely that the species will be impacted by the proposed development.
<i>Lophoictinia isura</i>	Square-tailed Kite	V		1	No large stick nests were sighted during surveys, species likely to occur in adjacent forested area whereby an abundance of resources is available.
Mammals					
<i>Phascolarctos cinereus</i>	Koala	E	E	3	New record in 2019 was made approximately 1.5km away from subject site. Although feed trees are present on site, species likely to occur in adjacent forested area whereby an abundance of resources is available. Subject Species

Table Key - Status (BC Act & EPBC Act): CE: Critically Endangered, E: Endangered, V: Vulnerable (#) – Indicates number of Atlas Records within 10km area of the Subject Site.

From **Table 5** above, the species listed in **Table 6** are considered key subject or indicator species for the Subject Site due to being recorded on site, or having potential to forage and roost or nest on the site. The site potentially forms an important part of a local home range for resident species and some potential habitat will be removed by the proposal.

Table 6 – Subject Species

Scientific Name	Common Name	BC Act listing	EPBC Act listing
Flora			
<i>Phascolarctos cinereus</i>	Koala	V	V
<i>Commersonia procumbens</i>		V	V

Table Key - Status (BC Act & EPBC Act):
CE: Critically Endangered, E: Endangered, V: Vulnerable

8.0 Key Species Considerations

The species identified for further consideration have been categorised into guilds in **Table 6**. By considering these species and their lifecycle needs, many other species are also inadvertently considered. The analysis below considers key lifecycle features for each guild of species in more detail, and assists in informing the subsequent 5-part test assessment.

Table 7 – Key Species Analysis

Guild / Species	Key Habitat Feature	Comment
<i>Phascolarctos cinereus</i>	Suitable habitat is located within the Subject Site	Proximity of local BioNet records within a 5 km radius and specifically within 2 km of the study area. New record in 2019 was made approximately 1.5km away from subject site. Although feed trees are present on site, species likely to occur in adjacent forested area whereby an abundance of resources is available.
<i>Commersonia procumbens</i>	Suitable habitat is located within the Subject Site	Abundance and proximity of local BioNet records within a 5km radius, although not detected nor likely to be found within the Subject Site due to the disturbed site condition. Habitat in the wider locality is considered to be more suitable for this species.

9.0 5-part Test Assessment

Section 7.3 of the BC Act lists five factors that must be taken into account in determining the significance of potential impacts of proposed activities on threatened species, populations, ecological communities and/or their habitats as listed within the *BC Act*.

The 5-part test is used to determine whether there is likely to be a significant impact, and thus whether the Biodiversity Offsets Scheme (BOS) is triggered.

Table 8 – 5-Part Test Assessment

Section of BC Act 7.3	Requirement	Assessment
a)	<p>In the case of a threatened species, whether the proposed development or activity is likely to have an adverse effect on the life cycle of the species such that a viable local population of the species is likely to be placed at risk of extinction Including:</p> <p><i>Phascolarctos cinereus</i> (Koala) <i>Commersonia procumbens</i></p>	<p>Minimal native vegetation is proposed to be impacted within the Study Area as part of this development. Any impacts to threatened species (Koala) at the population level are considered extremely unlikely.</p> <p>The Study Area of approx. 133ha comprises approx. 12ha of native vegetation with connectivity to the Gilgandra State Forest</p> <p>No threatened species were recorded on site, nor considered likely to be present. However, taking a precautionary approach, the following species were assessed:</p> <p><i>Phascolarctos cinereus</i> (Koala)</p> <p>The Subject Site does contain suitable feed species such as <i>Eucalyptus pilligaensis</i> (Pilliga Box), which are considered to be a primary feed tree species that may be important to Koalas within the Gilgandra LGA. However, there is an existing population within the Gilgandra State Forest next to the study area. The presence of <i>Callitris glaucophylla</i> (White Cypress Pine) has the potential to be used also as a shelter tree to assist Koala movement during extreme weather conditions.</p> <p>There is 1 sighting recorded on BioNet within the 10km area. The most recent sighting within or in close proximity to the site was in 2019. The most recent nearby sighting was located 1.5km west of the Subject Site in 2021.</p> <p>The retention of primary feed trees within the proposal will reduce the impact to the species. Other measures outlined in the recommendations such as koala feed tree plantings and fencing types will allow for the species to move throughout the Subject Site and provide foraging opportunities. Therefore, it has been determined that the proposal is not likely to have an adverse impact on the population within the local area.</p> <p><i>Commersonia procumbens</i></p> <p>The species was not observed on site during the inspection, however the species is known for its ability to be pioneer species, hence the Subject Site may contain a seed bank for the species. The proposal is not likely to have an adverse impact on the species however retention of existing canopy within the Subject Site with vegetation management of the understorey may allow for the species to naturally regenerate.</p>

Section of BC Act 7.3	Requirement	Assessment
b)	<p>In the case of an endangered ecological community or critically endangered ecological community, whether the proposed development or activity:</p> <p>is likely to have an adverse effect on the extent of the ecological community such that its local occurrence is likely to be placed at risk of extinction, or</p> <p>is likely to substantially and adversely modify the composition of the ecological community such that its local occurrence is likely to be placed at risk of extinction</p>	<p>The Subject Site was determined as predominantly non-native vegetation upon ground-truthing. Therefore, no associated TEC is present, thus, the proposal would not result in a significant impact to any EEC.</p>
c)	<p>In relation to the habitat of a threatened species or ecological community:</p> <p>the extent to which habitat is likely to be removed or modified as a result of the proposed development or activity, and</p>	<p>The native vegetation present within the Subject Site will receive minimal clearance with the proposed development and the recommendation promote regeneration and management of retained lands.</p>
	<p>whether an area of habitat is likely to become fragmented or isolated from other areas of habitat as a result of the proposed development or activity, and</p>	<p>The retained habitat within the subject Site contains connectivity to the Gilgandra State Forest which will prevent fragmenting or isolation.</p>
	<p>the importance of the habitat to be removed, modified, fragmented or isolated to the long-term survival of the species or ecological community in the locality</p>	<p>As stated above, the Subject Site contains minimal habitat, located within an already predominantly cleared area previously used historically for grazing and cropping. This development proposal is not expected to result in further habitat fragmentation or degradation, thus no significant impact on species within the locality is expected.</p>
d)	<p>Whether the proposed development or activity is likely to have an adverse effect on any declared area of outstanding biodiversity value (either directly or indirectly)</p>	<p>No vegetation within the Study Area or within proximity to the site is considered to contain outstanding biodiversity values.</p>
e)	<p>Whether the proposed development or activity is or is part of a key threatening process or is likely to increase the impact of a key threatening process (KTP)</p>	<p>The vegetation to be removed on site is minimal and in a disturbed state.</p> <p>No key threatening processes are expected to increase with this proposed development.</p>

10.0 EPBC Act Assessment

A search was conducted in November 2023 for Matters of National Environmental Significance (MNES) as relevant to the *Environment Protection & Biodiversity Conservation Act 1999* (EPBC Act). The following MNES are considered in this assessment.

World Heritage Properties:

The site is not a World Heritage area and is not in close proximity to any such area.

National Heritage Places:

The site is not a National Heritage Place and does not contain any matters of national heritage.

Wetlands of International Significance (declared Ramsar wetlands):

There are four (3) wetlands of international significance linked to the site reported in the MNES report.

- Banrock station wetland complex – 800-900km Upstream from Ramsar site
- Riverland – 700-800km Upstream from Ramsar site
- The Coorong, and lake Alexandrina and Albert wetlands – 900-1000km upstream from Ramsar site.

Great Barrier Reef Marine Park:

The site is not part of, or within close proximity to, the Great Barrier Reef Marine Park.

Commonwealth Marine Areas:

The site is not part of, or within close proximity to, any Commonwealth Marine Area.

Threatened Ecological Communities (TECs):

There are six (6) listed TECs known or assumed to occur within the area of the Subject Site:

- *Coolibah - Black Box Woodlands of the Darling Riverine Plains and the Brigalow Belt South Bioregions;*
- *Grey Box (Eucalyptus microcarpa) Grassy Woodlands and Derived Native Grasslands of South-eastern Australia;*
- *Natural grasslands on basalt and fine textured alluvial plains of northern New South Wales and southern Queensland;*
- *Poplar Box Grassy Woodland on Alluvial Plains;*
- *Weeping Myall Woodlands;* and
- *White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland.*

Vegetation within the Subject Site has not been identified as being commensurate with any State or Commonwealth listed TEC.

Threatened Species:

A total of 39 threatened species may occur in, or may relate to areas within a 5 km radius of the Subject Site. It is not considered that the development of this land is likely to significantly affect the availability of potential habitat for any of the identified threatened species with the retention of native vegetation and the recommendation to regenerate and managed retained lands. .

Migratory Species:

A total of 9 migratory species may occur in, or may relate to areas within 5km of the Subject Site. The limited number and sporadic nature of records close to the Study Area appear to reflect opportunistic rather than regular use of any habitat considered of importance to any threatened species.

It is not considered that the development of this land is likely to significantly affect the availability of potential habitat for such mobile species, or disrupt migratory patterns.

EPBC Act Assessment Conclusion:

No Matters of National Environmental Significance (specifically in this instance threatened species, threatened ecological communities or listed migratory species) are expected to be impacted upon significantly as a result of the proposal, therefore, an EPBC Act Referral is considered unlikely to be required.

11.0 State Environmental Planning Policy (Biodiversity and Conservation) 2021

Chapter 4 Koala Habitat Protection 2021 Assessment

SEPP (Biodiversity and Conservation) 2021 (BC SEPP) commenced on 1 March 2022. This SEPP consolidated 11 other SEPPs within this SEPP on the 1 March 2022. The *State Environment Planning Policy (Koala Habitat Protection) 2020* was one SEPP that was consolidated within the *BC SEPP* under *Chapter 3 – Koala Habitat Protection 2020*. No policy changes were made as part of the consolidation nor did the legal effect of the existing SEPPs, with section 30A of the *Interpretation Act 1987* applying to the transferred provisions. The consolidation was undertaken in accordance with section 3.22 of the *Environmental Planning and Assessment Act 1979*.

This Policy aims to encourage the conservation and management of areas of natural vegetation that provide habitat to support a permanent free-living population over their present range and reverse the current trend of population decline.

The land which comprises the Subject Site has no approved Koala Plan of Management (KPoM). According to the Biodiversity and Conservation SEPP, the policy applies if:

4.9 Development assessment process—no approved KPoM for land

- 1) *This clause applies to land to which this Policy applies if the land—*
 - (a) *has an area of at least 1 hectare (including adjoining land within the same ownership), and*
 - (b) *does not have an approved KPoM applying to the land.*

The Subject Site comprises approx. 52ha, and does not have a KPoM. Therefore, the BC SEPP 2021 applies and additional assessments are required to satisfy the Development Assessment Process.

- (5) However, despite subclauses (3) and (4), the council may grant development consent if the applicant provides to the council –
 - a. information, prepared by a suitably qualified and experienced person, the council is satisfied demonstrates that the land subject of the development application –
 - i. does not include any trees belonging to the koala use tree species listed in Schedule 2 for the relevant koala management area, or
 - ii. is not core koala habitat.

Scattered Eucalyptus species were observed in survey, including the SEPP Schedule 2 feed tree *Eucalyptus populnea* subsp. *bimbil* (Poplar Box), but given the severely discontinuous nature of trees present within the Subject Site, the Subject Site is not considered to represent Core Koala Habitat.

Therefore, no further assessment is deemed necessary.

12.0 Recommendations

The following general recommendations are made for consideration to minimise localised impacts on biodiversity in general as a result of the development of the site:

Water quality and hydrology

An Environmental Construction Management Plan (ECMP) should be developed by the Client with erosion and sedimentation controls informed by the “Blue Book” (Landcom, 2004), including:

- Best practice erosion and sedimentation controls should be put in place to limit offsite movement of materials into remnant native vegetation to the south and east of the Subject Site; and
- Erosion and sedimentation controls should be checked daily and maintained in working order especially after rain events.

Vegetation Management Plan

- The preparation of Vegetation Management Plan is require for the retain lands with the following objectives:
 - Regeneration of Native Vegetation;
 - Management of priority weeds;
 - Clearance procedures to limited impact on native fauna;
 - Enhancement of habitat; and
 - Protect and enhance wildlife corridors.

Protection of potentially occurring native fauna

- The ECMP should schedule mitigation measures against native flora and fauna welfare during construction; and
- Local native fauna carers should be used to mitigate construction impacts on fauna.

13.0 References

- Australian Department of Climate Change, Energy, the Environment and Water (2022). Protected Matters Search. Accessed November 2023. DCCEEW, Canberra, ACT.
- Australian Museum (1983). *The Complete Book of Australian Mammals*. Strahan, R., (ed.), Angus & Robertson, London.
- Churchill, S (2008). *Australian Bats*. Second Edition. Allen & Unwin Publishers.
- Cogger, H (2014). *Reptiles and Amphibians of Australia*. CSIRO Publishing, Melbourne.
- Harden, G. (ed) (2000). *Flora of New South Wales*, Vols 1-4. Revised edition. UNSW, Kensington, NSW.
- Jacobs, S.W.L., Whalley, R.D.B. and Wheeler, D.J.B., *Grasses of New South Wales*, 4th Edition. The University of New England, Armidale NSW.
- Keith, D. 2004, *Ocean Shores to Desert Dunes: The native vegetation of New South Wales and the ACT*, Department of Environment and Conservation, NSW.
- Landcom (2004). *Managing Urban Stormwater: Soils and Construction* 4th edition. New South Wales Government, Parramatta, NSW.
- NSW Department of Environment and Conservation (2004). *Threatened Biodiversity Survey and Assessment: Guidelines for Developments and Activities*. Working Draft. NSW Department of Environment and Conservation 2004.
- NSW Department of Planning and Environment (2022a). *State Vegetation type Map*. NSW DPE, Sydney, NSW.
- NSW Department of Planning and Environment (2022b). *Koala (Phascolarctos cinereus) Biodiversity Assessment Method Survey Guide*. NSW DPE, Sydney, NSW.
- NSW Department of Planning and Environment (2022c). BAM - Important Areas Viewer. NSW DPE, Sydney NSW.
- NSW Department of Planning and Environment (2022d). Atlas of NSW Wildlife. Accessed October 2022. NSW DPE, Sydney NSW.
- NSW Department of Planning and Environment (2022e). Threatened Species, Populations and Ecological Communities website. NSW DPE, Sydney NSW.
- NSW Department of Planning, Industry and the Environment (2020a). Surveying threatened plants and their habitats NSW survey guide for the Biodiversity Assessment Method. Sydney, NSW.
- NSW DPIE (2020b). *NSW Survey Guide for Threatened Frogs. A guide for the survey of threatened frogs and their habitats for the Biodiversity Assessment Method*. Sydney, NSW.
- NSW Government 2023 SEED portal www.seed.nsw.gov.au accessed October, 2023
- NSW Office of Environment and Heritage (2018). *Threatened Species Test of Significance Guidelines*. OEH, Sydney.
- Pizzey, G (2012). *The Field Guide to the Birds of Australia* (9th ed.). Harper Collins Publishers, Sydney NSW.
- Robinson, L (1991). *Field Guide to the Native Plants of Sydney*. Revised Second Edition. Kangaroo Press.
- Strahan, R (2004). *The Mammals of Australia*. New Holland Publishers.
- Swan, G., Shea, G., and Sadler, R. (2004). *A Field Guide to the Reptiles of New South Wales*. 2nd Edition. New Holland Publishing, Sydney.

Appendix A – Flora Species List

The following list includes all species of vascular plants observed on site during fieldwork. It should be noted that such a list cannot be considered comprehensive, but rather indicative of the flora present on the site. It can take many years of flora surveys to record all of the plant species occurring within any area, especially plant species that are only apparent in some seasons such as Orchids.

A number of species cannot always be accurately identified during a brief survey, generally due to a lack of suitable flowering and/or fruiting material. Any such species are identified as accurately as possible, and are indicated in the list as thus:

- specimens that could only be identified to genus level are indicated by the generic name followed by the abbreviation “sp.”, indicating an unidentified species of that genus;
- specimens for which identification of the genus was uncertain are indicated by a question mark (“?”) placed in front of the generic, which is followed by the abbreviation “sp.” and;
- specimens that could be accurately identified to genus level, but could be identified to species level with only a degree of certainty are indicated by a (“?”) placed in front of the epithet.

Authorities for the scientific names are not provided in the list. These follow the references outlined below.

Harden, G. (ed) (2000). *Flora of New South Wales, Volume 1*. Revised edition. UNSW, Kensington, NSW.

Harden, G. (ed) (2002). *Flora of New South Wales, Volume 2*. Revised edition. UNSW, Kensington, NSW.

Harden, G. (ed) (1992). *Flora of New South Wales, Volume 3*. UNSW, Kensington, NSW.

Harden, G. (ed) (1993). *Flora of New South Wales, Volume 4*. UNSW, Kensington, NSW.

Names of families and higher taxa follow a modified Cronquist System (1981).

Introduced species are indicated by an asterisk “*”.

Threatened species listed under the *Biodiversity Conservation Act 2016* (BC Act) or the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) would be indicated in **bold font** (none observed).

Family	Scientific Name	Common Name
Asteraceae	<i>Conyza bonariensis</i> *	Flaxleaf Fleabane
	<i>Hypochaeris glabra</i> *	Smooth Catsear
	<i>Silybum marianum</i> *	Thistle
	<i>Taraxacum officinale</i> *	Dandelion
Brassicaceae	<i>Brassica tournefortii</i> *	Mediterranean Turnip
	<i>Lepidium bonariense</i> *	
Cactaceae	<i>Opuntia</i> sp.*	A Prickly Pear
Chenopodiaceae	<i>Einadia nutans</i>	Climbing Saltbush
Cupressaceae	<i>Callitris glaucophylla</i>	White cypress
Cucurbitaceae	<i>Citrullus</i> sp*	Wild Melon
Dilleniaceae	<i>Hibbertia obtusifolia</i>	Hoary Guinea Flower
Malvaceae	<i>Brachychiton populneus</i>	Kurrajong
Myrtaceae	<i>Eucalyptus pilligaensis</i>	Narrow-leaved Grey Box
	<i>Eucalyptus populnea</i> subsp. <i>bimbil</i>	Poplar Box
Poaceae	<i>Aristida ramosa</i>	Purple Wiregrass
	<i>Cynodon dactylon</i>	Couch
	<i>Eragrostis lacunaria</i>	Purple Lovegrass
	<i>Secale cereale</i> *	Ryecorn
Scrophulariaceae	<i>Myoporum montanum</i>	Western Boobialla
Solanaceae	<i>Lycium ferocissimum</i> *	African Boxthorn

Appendix B – Expected Fauna Species List

The following list includes fauna species that could be reasonably expected, within a 10 km radius, to occur on the Subject Site at some point, given site attributes and location.

“Threatened species listed under the BC Act or the EPBC Act are indicated in **bold font**.

Observations Key:

- Observed (O) Heard (W) Scat (S) Marking (M)
- Track (T) Nest (N) Burrow (B)

Family Name	Scientific Name	Common Name	Record Type
Amphibians			
Myobatrachidae	<i>Crinia parinsignifera</i>	Eastern Sign-bearing Froglet	
Myobatrachidae	<i>Crinia signifera</i>	Common Eastern Froglet	
Myobatrachidae	<i>Uperoleia rugosa</i>	Wrinkled Toadlet	
Limnodynastidae	<i>Limnodynastes tasmaniensis</i>	Spotted Grass Frog	
Limnodynastidae	<i>Limnodynastes terraereginae</i>	Northern Banjo Frog	
Limnodynastidae	<i>Neobatrachus sudellae</i>	Sudell's Frog	
Limnodynastidae	<i>Notaden bennettii</i>	Crucifix Frog	
Limnodynastidae	<i>Platyplectrum ornatum</i>	Ornate Burrowing Frog	
Hylidae	<i>Litoria latopalmata</i>	Broad-palmed Frog	
Hylidae	<i>Litoria peronii</i>	Peron's Tree Frog	
Hylidae	<i>Litoria rubella</i>	Desert Tree Frog	
Reptiles			
Chelidae	<i>Chelodina longicollis</i>	Eastern Snake-necked Turtle	
Diplodactylidae	<i>Oedura monilis</i>	Ocellated Velvet Gecko	
Diplodactylidae	<i>Strophurus intermedius</i>	Southern Spiny-tailed Gecko	
Gekkonidae	<i>Gehyra dubia</i>	Dubious Dtella	
Gekkonidae	<i>Gehyra variegata</i>	Tree Dtella	
Pygopodidae	<i>Lialis burtonis</i>	Burton's Snake-lizard	
Pygopodidae	<i>Pygopus schraderi</i>	Eastern Hooded Scaly-foot	
Scincidae	<i>Ctenotus robustus</i>	Robust Ctenotus	
Scincidae	<i>Egernia striolata</i>	Tree Skink	
Scincidae	<i>Tiliqua scincoides</i>	Eastern Blue-tongue	
Agamidae	<i>Pogona barbata</i>	Bearded Dragon	
Agamidae	<i>Tympanocryptis tetraporophora</i>	Eyrean Earless Dragon	
Varanidae	<i>Varanus varius</i>	Lace Monitor	
Typhlopidae	<i>Anilius Proximus</i>	Proximus Blind Snake	
Elapidae	<i>Suta dwyeri</i>	Dwyer's Snake	
Elapidae	<i>Suta suta</i>	Curl Snake	
Birds			
Casuariidae	<i>Dromaius novaehollandiae</i>	Emu	
Phasianidae	<i>Synoicus ypsilophora</i>	Brown Quail	
Columbidae	<i>Columba livia</i>	Rock Dove	
Columbidae	<i>Geopelia cuneata</i>	Diamond Dove	

Family Name	Scientific Name	Common Name	Record Type
Columbidae	<i>Geopelia humeralis</i>	Bar-shouldered Dove	
Columbidae	<i>Geopelia striata</i>	Peaceful Dove	
Columbidae	<i>Ocyphaps lophotes</i>	Crested Pigeon	
Columbidae	<i>Phaps chalcoptera</i>	Common Bronzewing	
Columbidae	<i>Spilopelia chinensis</i>	Spotted Turtle-Dove	
Podargidae	<i>Podargus strigoides</i>	Tawny Frogmouth	
Apodidae	<i>Hirundapus caudacutus</i>	White-throated Needletail	
Accipitridae	<i>Accipiter fasciatus</i>	Brown Goshawk	
Accipitridae	<i>Aquila audax</i>	Wedge-tailed Eagle	
Accipitridae	<i>Elanus axillaris</i>	Black-shouldered Kite	
Accipitridae	<i>Haliastur sphenurus</i>	Whistling Kite	
Accipitridae	<i>Hieraetus morphnoides</i>	Little Eagle	
Accipitridae	<i>Lophoictinia isura</i>	Square-tailed Kite	
Accipitridae	<i>Milvus migrans</i>	Black Kite	
Falconidae	<i>Falco berigora</i>	Brown Falcon	
Falconidae	<i>Falco cenchroides cenchroides</i>	Nankeen Kestrel	
Falconidae	<i>Falco longipennis</i>	Australian Hobby	
Falconidae	<i>Falco subniger</i>	Black Falcon	
Charadriidae	<i>Vanellus miles</i>	Masked Lapwing	
Charadriidae	<i>Vanellus tricolor</i>	Banded Lapwing	
Cacatuidae	<i>Cacatua galerita</i>	Sulphur-crested Cockatoo	
Cacatuidae	<i>Cacatua sanguinea</i>	Little Corella	
Cacatuidae	<i>Eolophus roseicapilla</i>	Galah	
Cacatuidae	<i>Nymphicus hollandicus</i>	Cockatiel	
Psittacidae	<i>Alisterus scapularis</i>	Australian King-Parrot	
Psittacidae	<i>Aprosmictus erythropterus</i>	Red-winged Parrot	
Psittacidae	<i>Barnardius zonarius</i>	Australian Ringneck	
Psittacidae	<i>Northiella haematogaster</i>	Blue Bonnet	
Psittacidae	<i>Platycercus elegans</i>	Crimson Rosella	
Psittacidae	<i>Platycercus eximius</i>	Eastern Rosella	
Psittacidae	<i>Psephotus haematotus</i>	Red-rumped Parrot	
Psittacidae	<i>Trichoglossus haematodus</i>	Rainbow Lorikeet	
Cuculidae	<i>Cacomantis flabelliformis</i>	Fan-tailed Cuckoo	
Strigidae	<i>Ninox connivens</i>	Barking Owl	
Strigidae	<i>Ninox novaeseelandiae</i>	Southern Boobook	
Tytonidae	<i>Tyto javanica</i>	Eastern Barn Owl	
Alcedinidae	<i>Dacelo novaeguineae</i>	Laughing Kookaburra	
Alcedinidae	<i>Todiramphus sanctus</i>	Sacred Kingfisher	
Coraciidae	<i>Eurystomus orientalis</i>	Dollarbird	
Climacteridae	<i>Cormobates leucophaea</i>	White-throated Treecreeper	
Ptilonorhynchidae	<i>Chlamydera maculate</i>	Spotted Bowerbird	
Maluridae	<i>Malurus cyaneus</i>	Superb Fairy-wren	

Family Name	Scientific Name	Common Name	Record Type
Maluridae	<i>Malurus lamberti</i>	Variegated Fairy-wren	
Acanthizidae	<i>Acanthiza apicalis</i>	Inland Thornbill	
Acanthizidae	<i>Acanthiza chrysorrhoa</i>	Yellow-rumped Thornbill	
Acanthizidae	<i>Acanthiza nana</i>	Yellow Thornbill	
Acanthizidae	<i>Acanthiza uropygialis</i>	Chestnut-rumped Thornbill	
Acanthizidae	<i>Aphelocephala leucopsis</i>	Southern Whiteface	
Acanthizidae	<i>Gerygone fusca</i>	Western Gerygone	
Acanthizidae	<i>Smicronis brevirostris</i>	Weebill	
Pardalotidae	<i>Pardalotus striatus</i>	Striated Pardalote	
Meliphagidae	<i>Acanthagenys rufogularis</i>	Spiny-cheeked Honeyeater	
Meliphagidae	<i>Anthochaera carunculata</i>	Red Wattlebird	
Meliphagidae	<i>Caligavis chrysops</i>	Yellow-faced Honeyeater	
Meliphagidae	<i>Entomyzon cyanotis</i>	Blue-faced Honeyeater	
Meliphagidae	<i>Lichmera indistincta</i>	Brown Honeyeater	
Meliphagidae	<i>Manorina flavigula</i>	Yellow-throated Miner	
Meliphagidae	<i>Manorina melanocephala</i>	Noisy Miner	
Meliphagidae	<i>Meiithreptus lunatus</i>	White-naped Honeyeater	
Meliphagidae	<i>Philemon citreogularis</i>	Little Friarbird	
Meliphagidae	<i>Philemon corniculatus</i>	Noisy Friarbird	
Meliphagidae	<i>Plectorhyncha lanceolata</i>	Striped Honeyeater	
Meliphagidae	<i>Ptilotula ornata</i>	Yellow-plumed Honeyeater	
Meliphagidae	<i>Ptilotula penicillata</i>	White-plumed Honeyeater	
Pomatostomidae	<i>Pomatostomus temporalis temporalis</i>	Grey-crowned Babbler (eastern subspecies)	
Falcunculidae	<i>Falcunculus frontatus frontatus</i>	Eastern Shrike-tit	
Campephagidae	<i>Coracina novaehollandiae</i>	Black-faced Cuckoo-shrike	
Campephagidae	<i>Lalage sueurii</i>	White-winged Triller	
Pachycephalidae	<i>Colluricincla harmonica</i>	Grey Shrike-thrush	
Pachycephalidae	<i>Pachycephala rufiventris</i>	Rufous Whistler	
Oriolidae	<i>Oriolus sagittatus</i>	Olive-backed Oriole	
Artamidae	<i>Artamus cinereus</i>	Black-faced Woodswallow	
Artamidae	<i>Artamus cyanopterus cyanopterus</i>	Dusky Woodswallow	
Artamidae	<i>Artamus leucorhynchus</i>	White-breasted Woodswallow	
Artamidae	<i>Cracticus nigrogularis</i>	Pied Butcherbird	
Artamidae	<i>Cracticus torquatus</i>	Grey Butcherbird	
Artamidae	<i>Gymnorhina tibicen</i>	Australian Magpie	O
Artamidae	<i>Strepera graculina</i>	Pied Currawong	
Rhipiduridae	<i>Rhipidura albiscapa</i>	Grey Fantail	
Rhipiduridae	<i>Rhipidura leucophrys</i>	Willie Wagtail	
Corvidae	<i>Corvus bennetti</i>	Little Crow	
Corvidae	<i>Corvus coronoides</i>	Australian Raven	OH

Family Name	Scientific Name	Common Name	Record Type
Corvidae	<i>Corvus mellori</i>	Little Raven	
Monarchidae	<i>Grallina cyanoleuca</i>	Magpie-lark	O
Monarchidae	<i>Myiagra inquieta</i>	Restless Flycatcher	
Corcoracidae	<i>Corcorax melanorhamphos</i>	White-winged Chough	OH
Corcoracidae	<i>Struthidea cinerea</i>	Apostlebird	
Petroicidae	<i>Eopsaltria australis</i>	Eastern Yellow Robin	
Petroicidae	<i>Microeca fascians</i>	Jacky Winter	
Petroicidae	<i>Petroica goodenovii</i>	Red-capped Robin	
Cisticolidae	<i>Cisticola exilis</i>	Golden-headed Cisticola	
Acrocephalidae	<i>Acrocephalus australis</i>	Australian Reed-Warbler	
Locustellidae	<i>Cincloramphus mathewsi</i>	Rufous Songlark	
Hirundinidae	<i>Hirundo neoxena</i>	Welcome Swallow	
Hirundinidae	<i>Petrochelidon ariel</i>	Fairy Martin	
Hirundinidae	<i>Petrochelidon nigricans</i>	Tree Martin	
Turdidae	<i>Turdus merula*</i>	Eurasian Blackbird	
Sturnidae	<i>Sturnus vulgaris*</i>	Common Starling	
Zosteropidae	<i>Zosterops lateralis</i>	Silvereye	
Estrildidae	<i>Stizoptera bichenovii</i>	Double-barred Finch	
Estrildidae	<i>Taeniopygia guttata</i>	Zebra Finch	
Passeridae	<i>Passer domesticus*</i>	House Sparrow	
Motacillidae	<i>Anthus novaeseelandiae</i>	Australian Pipit	
Mammals			
Tachyglossidae	<i>Tachyglossus aculeatus</i>	Short-beaked Echidna	
Phascolarctidae	<i>Phascolarctos cinereus</i>	Koala	
Petauridae	<i>Petaurus breviceps</i>	Sugar Glider	
Pseudocheiridae	<i>Pseudocheirus peregrinus</i>	Common Ringtail Possum	
Phalangeridae	<i>Trichosurus vulpecula</i>	Common Brushtail Possum	
Macropodidae	<i>Macropus giganteus</i>	Eastern Grey Kangaroo	
Macropodidae	<i>Osphranter robustus</i>	Common Wallaroo	
Macropodidae	<i>Osphranter rufus</i>	Red Kangaroo	
Macropodidae	<i>Wallabia bicolor</i>	Swamp Wallaby	
Pteropodidae	<i>Pteropus scapulatus</i>	Little Red Flying-fox	
Vespertilionidae	<i>Chalinolobus gouldii</i>	Gould's Wattled Bat	
Vespertilionidae	<i>Nyctophilus geoffroyi</i>	Lesser Long-eared Bat	
Vespertilionidae	<i>Scotorepens balstoni</i>	Inland Broad-nosed Bat	
Leporidae	<i>Oryctolagus cuniculus*</i>	European rabbit	O
Canidae	<i>Vulpes vulpes*</i>	Fox	
Felidae	<i>Felis catus*</i>	Cat	

Appendix C – BOSET Report

Biodiversity Values Map and Threshold Report

This report is generated using the Biodiversity Values Map and Threshold (BMAT) tool. The BMAT tool is used by proponents to supply evidence to your local council to determine whether or not a Biodiversity Development Assessment Report (BDAR) is required under [the Biodiversity Conservation Regulation 2017 \(Cl. 7.2 & 7.3\)](#).

The report provides results for the proposed development footprint area identified by the user and displayed within the blue boundary on the map.

There are two pathways for determining whether a BDAR is required for the proposed development:

1. Is there Biodiversity Values Mapping?
2. Is the 'clearing of native vegetation area threshold' exceeded?

Biodiversity Values Map and Threshold Report		
Date of Report Generation		22/01/2024 2:33 PM
1. Biodiversity Values (BV) Map - Results Summary (Biodiversity Conservation Regulation Section 7.3)		
1.1	Does the development Footprint intersect with BV mapping?	no
1.2	Was <u>ALL</u> BV Mapping within the development footprinted added in the last 90 days? (dark purple mapping only, no light purple mapping present)	no
1.3	Date of expiry of dark purple 90 day mapping	N/A
1.4	Is the Biodiversity Values Map threshold exceeded?	no
2. Area Clearing Threshold - Results Summary (Biodiversity Conservation Regulation Section 7.2)		
2.1	Size of the development or clearing footprint	1,303,466.1 sqm
2.2	Native Vegetation Area Clearing Estimate (NVACE) (within development/clearing footprint)	96,554.4 sqm
2.3	Method for determining Minimum Lot Size	LEP
2.4	Minimum Lot Size (10,000sqm = 1ha)	5,000,000 sqm
2.5	Area Clearing Threshold (10,000sqm = 1ha)	10,000 sqm
2.6	Does the estimate exceed the Area Clearing Threshold? (NVACE results are an estimate and can be reviewed using the Guidance)	yes
REPORT RESULT: Is the Biodiversity Offset Scheme (BOS) Threshold exceeded for the proposed development footprint area? (Your local council will determine if a BDAR is required)		yes

What do I do with this report?

- If the result above indicates the BOS Threshold has been exceeded, your local council may require a Biodiversity Development Assessment Report with your development application. Seek further advice from Council. An accredited assessor can apply the Biodiversity Assessment Method and prepare a BDAR for you. For a list of accredited assessors go to: <https://customer.lmbc.nsw.gov.au/assessment/AccreditedAssessor>.
- If the result above indicates the BOS Threshold has not been exceeded, you may not require a Biodiversity Development Assessment Report. This BMAT report can be provided to Council to support your development application. Council can advise how the area clearing threshold results should be considered. Council will review these results and make a determination if a BDAR is required. Council may ask you to review the area clearing threshold results. You may also be required to assess whether the development is “likely to significantly affect threatened species” as determined under the test in Section 7.3 of the *Biodiversity Conservation Act 2016*.
- If a BDAR is not required by Council, you may still require a permit to clear vegetation from your local council.
- If all Biodiversity Values mapping within your development footprint was less than 90 days old, i.e. areas are displayed as dark purple on the BV map, a BDAR may not be required if your Development Application is submitted within that 90 day period. Any BV mapping less than 90 days old on this report will expire on the date provided in Line item 1.3 above.

For more detailed advice about actions required, refer to the Interpreting the evaluation report section of the [Biodiversity Values Map Threshold Tool User Guide](#) .

Review Options:

- If you believe the Biodiversity Values mapping is incorrect please refer to our [BV Map Review webpage](#) for further information.
- If you or Council disagree with the area clearing threshold estimate results from the NVACE in Line Item 2.6 above (i.e. area of Native Vegetation within the Development footprint proposed to be cleared), review the results using the [Guide for reviewing area clearing threshold results from the BMAT Tool](#).

Acknowledgement

I, as the applicant for this development, submit that I have correctly depicted the area that will be impacted or likely to be impacted as a result of the proposed development.

Signature: _____

(Typing your name in the signature field will be considered as your signature for the purposes of this form)

Date: _____

22/01/2024 02:33 PM



Biodiversity Values Map and Threshold Tool

The Biodiversity Values (BV) Map and Threshold Tool identifies land with high biodiversity value, particularly sensitive to impacts from development and clearing.

The BV map forms part of the Biodiversity Offsets Scheme threshold, which is one of the factors for determining whether the Scheme applies to a clearing or development proposal. You have used the Threshold Tool in the map viewer to generate this BV Threshold Report for your nominated area. This report calculates results for your proposed development footprint and indicates whether Council may require you to engage an accredited assessor to prepare a Biodiversity Development Assessment Report (BDAR) for your development.

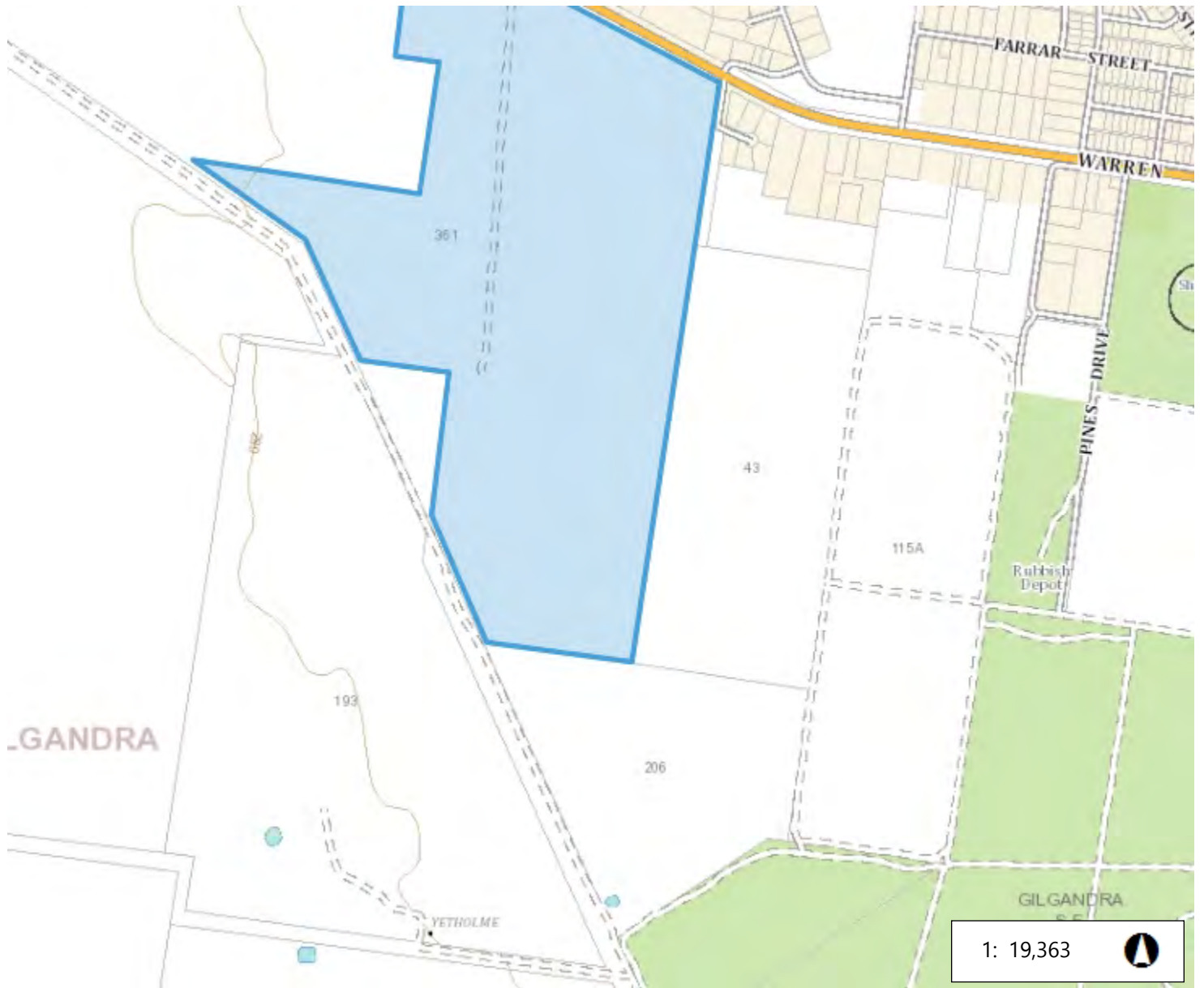
This report may be used as evidence for development applications submitted to councils. You may also use this report when considering native vegetation clearing under the State Environmental Planning Policy (Biodiversity and Conservation) 2021 - Chapter 2 vegetation in non-rural areas.

What's new? For more information about the latest updates to the Biodiversity Values Map and Threshold Tool go to the updates section on the [Biodiversity Values Map webpage](#).

Map Review: Landholders can request a review of the BV Map where they consider there is an error in the mapping on their property. For more information about the map review process and an application form for a review go to the [Biodiversity Values Map Review webpage](#).

If you need help using this map tool see our [Biodiversity Values Map and Threshold Tool User Guide](#) or contact the Map Review Team at map.review@environment.nsw.gov.au or on 1800 001 490.

Biodiversity Values Map



983.7 0 491.83 983.7 Metres

WGS_1984_Web_Mercator_Auxiliary_Sphere

Legend

- Biodiversity Values that have been mapped for more than 90 days
- Biodiversity Values added within last 90 days
- Native Vegetation Area Clearing Estimate (NVACE)
- Development area selected by proponent

22/01/2024 02:33 PM

This map is a user generated static output from an Internet mapping site and is for reference only. Data layers that appear on this map may or may not be accurate, current, or otherwise reliable.

Imagery © Airbus DS/Spot Image 2016

© NSW Department of Customer Service, Basemaps 2019

© NSW Department of Planning and Environment

The results provided in this tool are generated using the best available mapping and knowledge of species habitat requirements.

This map is valid as at the date the report was generated. Checking the [Biodiversity Values Map viewer](#) for mapping updates is recommended.

Appendix D – Authors’ CV



Dennis Neader Curriculum Vitae

Dennis works with AEP in the role of senior ecologist. He is an experienced bird watcher and a regular participant in Hunter Bird Observers' Club (HBOC) Bird Surveys in the wider Hunter Valley. Dennis has previously had a varied career as an environmental scientist, contaminated land consultant and bush regenerator with local firms. His background in birdwatching, post-approval project management and bush regeneration, combined with his ecological knowledge is utilised in a diverse array of applications in his current role.

Qualifications

Bachelor of Science (Environmental Geoscience) University of Newcastle (2011).

Further Education & Accreditations

- NSW Class HR Driver's Licence, experienced 4WD operator.
- Current Senior First Aid, ChemCert, EWP, Rigging, Chainsaw Operation and Maintenance, Light Forklift Truck.
- Open Water PADI Dive Certificate.
- Non-Friable Asbestos Removal.

Fields of Competence

- Ecological field survey, covering terrestrial and aquatic flora and fauna.
- Avifauna surveys, including challenging wetland and bushland environs.
- Native plant ID and seed collection.
- Field transects survey for cryptic flora species, Native plant ID and seed collection.
- Field survey for terrestrial fauna species including bird and reptile survey, koala habitat and SAT assessment, microbat, mammal track, scat identification and herpetological survey.
- Spotlighting, call playback, and stag watch for arboreal mammal species, including Forest Owls, Squirrel Glider and Koala.
- Trapping and translocation work with mammals, reptiles and amphibians.
- Remote trapping including SongMeter and camera trapping emplacement and analysis.
- Post-approval Project management including Fauna Welfare.
- Bush regeneration.
- Contaminated Land – Asbestos Identification and Removal.

Relevant Employment History

- 2016 – Present Senior Ecologist, Anderson Environment & Planning
- 2014 - 2016 Env. Scientist, JM Environments, Newcastle
- 2010 - 2014 Env. Technician, AECOM, GIS Technician, Geodata, Newcastle
- 2006 – 2010 Coal Superintending, ALS & SGS Newcastle

Relevant Ecological Experience

- Bird Surveys Hunter Bird Observers Club. Avifauna Baseline Surveys Broughton Is, targeted surveys.
- NPWS - Population Surveys Gould's Petrel Cabbage Tree Island Port Stephens.
- Bush Regeneration, Plant ID and Seed Collection, Dune Care, Coral Reef Research Lady Elliot Island

Professional Affiliations / Memberships

- Birdlife Australia, Society for Growing Australian Plants, Australian Assoc. of Bush Regenerators.

JODIE PULLEN

Curriculum Vitae

Jodie works with AEP in the role of GIS Officer. She graduated with a Bachelor of Geography (Honours) and a postgraduate masters in Wildlife and Conservation Management. Jodie previously worked in marine licensing before coming to AEP where she was the GIS lead for the team. She was also a volunteer at the Wildlife Trust where she completed wildlife surveys. Jodie has a variety of environmental work, both paid and unpaid in GIS and mapping, terrestrial field surveys, reporting, project management and data analysis.

Qualifications

- MSc Wildlife and Conservation Management | Upper Second-Class honour – University of South Wales (2018-2019)
- BSc (hons) Geography accredited by the Royal Geographical Society- University of South Wales (2015-2018)

Further Education & Training

- Class C NSW Driver's Licence
- Project Management for Wildlife Conservation (WildTeam UK)
- Open Water Diver (PADI)
- NSW Construction White Card

Fields of Competence

- GIS
- Restoration ecology, environmental legislation, and terrestrial and aquatic conservation.
- Environmental surveys
- Bird Surveys, water vole surveys, vegetation management and various practical habitat management for nature conservation.

Relevant Employment History

2023 – Present	GIS Officer Anderson Environment & Planning, Newcastle
2019-2023	Marine Licensing Officer Natural Resources Wales
2019	Wildlife Surveyor Wildlife Trust

Natalie Black

Curriculum Vitae

Natalie works with AEP in the role of Senior Environmental Manager. She has extensive knowledge in environmental management, environmental planning, and report writing and assessment. With a detail understanding of planning, catchment management, coastal management and rehabilitation. Natalie has had a successful career with both state and local government in conservation, planning and field investigation roles. Natalie has also gained extensive communication skills and project management through her previous career in lecturing. Her background and experience in the ecological and planning fields is utilised in a diverse array of application in her current role.

Qualifications

- B.Sc (Hons), University of Newcastle, 2002 Sustainable Resource Management and Marine Science.
- Master Planning, University of Technology Sydney 2007.
- Certificate IV Training and Assessment at NSW TAFE 2012.
- BAM Assessor; accreditation number: BAAS19076.

Further Education & Training

- Evidence Gathering and Legal Process (Australian Institute of Environmental Health).
- Conflict Resolution Course (LGSA).
- Report Writing Course (LGSA).
- Powerful Presentation (LGSA).
- NSW Rural Fire Services Bush Fire Assessment
- Relocation of Threatened Species (Botanical Gardens Sydney).
- Sustainable Home Assessment Reduction Revolution.
- Flora and Fauna Survey Assessments Niche Environment and Heritage.
- First Aid TAFE.

Fields of Competence

- Environmental Planning
- Environmental Management and rehabilitation of catchments coastal waterways. Statement of Environmental Effects (preparation and assessing).
- Fish Passage
- Marine ecosystems including; mangroves, seagrasses, algae, Fauna and habitat assessment.
- vegetation.
- Communicating with a wide range of stakeholders.
- Development Application.
- Education in both Environmental and Planning industries.
- Koala Plans of Management.
- Policy Development.

Relevant Employment History

2019 – Present	Senior Environmental Manager Anderson Environment & Planning, Newcastle
2010 - 2019	Principal Environmental Planner Black Earth
2003-2010	Natural Resource Manager and Development Assessment Officer Lismore City
2002- 2003	Jervis Bay Indigenous Fishing Strategy